7TH INTERNATIONAL CONFERENCE
ACCOUNTING AND FINANCE
IN TRANSITION
– Conference Proceedings –

Edited by Željko Šević

Greenwich University Press
in association with The Caledonian Business School
London–Glasgow, 2009
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CONCEPT OF ACCOUNTABILITY AS PERCEIVED
BY BRITISH, CZECH AND CHINESE MANAGERS:
GROUNDED THEORY INTERPRETED USING
CRITICAL DISCOURSE ANALYSIS

1. Introduction

Is the concept of accountability parochial, or is it a universal concept that is equally applicable around the world? This question is important because the long-term trend towards multinational business in the developed world is being accelerated by the opening of transition economies, global capital markets continue to extend their reach and influence, and current concerns about corporate governance are fuelled by growing expectations by investors and the public.

Accountability is a cornerstone of corporate governance expectations in at least the English-speaking world (Cadbury Committee 1992). If the notion of accountability depends on culture and institutions, there may be implications for how international operations of multinational companies (MNCs) can meet these expectations, for corporate governance of MNCs and for management control theory. There may also be implications for regulation of corporate governance of multi-national companies (MNCs).

However, this paper has more modest aims. It builds from more modest empirical work. It extracts findings concerning accountability and related concepts from a grounded theory study into British, Czech and Chinese managers’ perceptions of management control, i.e. into what notions they found important to providing control assurance and what the meaning was to them of these concepts. It found that British managers tended to see accountability as important, if not critical, to providing control assurance, but found that Czech and mainland Chinese managers generally did not see accountability as important to control assurance. Accountability and related notions of such as responsibility, reliability and loyalty were found to have different mean-
ings for these managers. While Czech and Chinese managers tended to differ from the British counterparts in the use and understanding of the concept of accountability, Czech and Chinese views were as far apart as they differed from British views. This was neither a Chinese, nor a Czech phenomenon. Critical discourse analysis (CDA) informed the exploration of how these concepts as text are related to their cultural, institutional and organisational context.

1.2. Structure of the paper

This paper begins by explaining the cultural context and grounded theory methodology of the field study. Then, in keeping with grounded theory, it describes the study findings that are relevant to this inquiry into accountability, before relating these to theory from the extant literature and to insights provided by critical discourse analysis (CDA). It concludes by considering the possible implications of these relationships between the fieldwork findings and extant theory.

2. Cultural context of the study

2.1. National culture

Culture, in the sense of shared values and assumptions, is often treated as an ideational factor that influences behaviour and organisational processes (Hofstede, 1984; Triandis, 1995; Trompenaars & Hampden-Turner, 1997). Accountability might therefore be influenced by cultural factors. This ideational view can be contrasted to other views of culture, including an institutional approach (Tayeb, 1988) and culture as symbols (Smircich, 1983; Allaire & Firsirotu, 1984; Harrison & McKinnon, 1999). For example, the culture might represent the shared significance of behaviour and social processes in which accountability is acted out. Both of these concepts of culture may be relevant to understanding accountability: culture may affect people’s notions of accountability, how they expect accountability to be acted out, and how they use expectations of accountability in their daily life; in contrast, culture may affect the processes of accountability, how people hold each other to account, irrespective of whether they have or use any notion of accountability.

It is dangerous to assume that any particular person will conform to a cultural stereotype. Indeed, the study found considerable variety among the subjects, and that the views of each were unique. Nevertheless, cultural tendencies may be significant and result in different patterns of understanding and of what people expect of each other.
2.2. Mainland China and Chinese culture

The People’s Republic of China is changing rapidly both economically and socially as it develops its socialist market economy (Jiang, 1997). At the time of the study, in 1997 to 1998, it had a population of 1.2 billion people and had applied to join the World Trade Organisation. Yet the influences of China’s history, traditions, language, government and established business practices are pervasive (Fairbank, 1987).

Among Taoist, Buddhist, folklore and other sources, Confucian tradition and philosophy stand out as a defining foundation of Chinese culture. While it is impossible to summarise the richness of a culture in a few paragraphs, four cultural values based on Confucian thoughts (Child, 1994; Lu, 1996) are relevant here.

First is respect for age and hierarchy, based upon the Confucian concept of 礼, 礼. Each person is seen as having his/her position in society. Elders, hierarchy within society, government, business organisations and families are traditionally respected. Related to this is respect for received wisdom, such as the teachings of Confucius.

Group orientation is a second Chinese characteristic. The traditional Chinese social unit is the extended family, which was included by Confucius in his hierarchy of society. Strong attachment to family groups, and to a lesser extent other groups, directs loyalties. With this group orientation, Chinese people tend to see their identity as members of the ‘in-groups’ to which they belong.

The third concern is maintaining ‘face’. Idiosyncratic behaviour risks losing face and respect. Maintenance of face connects with group identity, because norms mandate that conflict within an in-group should be kept private, for, if publicised, the whole group would be demeaned.

There is fourthly the importance of relationships within mainland Chinese society. These are most frequently described in terms of 关系, 关系, which are long standing relationships built from sharing background, experiences or gifts and favours (Yang, 1994). The importance of personal relationships has a basis in the Confucian regard for maintaining order within hierarchies of family and state, and also in greater concern for rule by people and by morals rather than by the law. In modern Chinese business, personal relationships are extensively used in order to obtain information, to control relations between superiors and subordinates, and to negotiate between people from different organisations. Consequently, trust, reciprocity, and scope for renegotiation, as opposed to the formality, certainty and transparency of explicit contractual arrangements, are expected to count for more in Chinese than in Western business dealings (Child, 1994; Lu, 1996; Carver, 1996; Ch’ng, 1997).
2.3. The Czech Republic and Czech culture

Czechoslovakia emerged from the Austro-Hungarian Empire in 1918 to rank among the most industrialised and economically advanced countries in Europe (E.I.U., 1999). From 1938, it suffered first German invasion, then Soviet domination and invasion (Krejči, 1990). Following the Velvet Revolution of 1989, Czechoslovakia began transforming itself from a communist to a democratic regime, and its economics to markets and private enterprise (Leff, 1997). New institutions have been created through legislation and rapid fundamental second order change (Seal et al., 1995). In 1993, the Czech Republic separated from Slovakia, to form a new country of just 10.3 million people (E.I.U., 1999). It joined the European Union in May, 2004, after the fieldwork for this study.

The characteristics of the Czech culture include strong individualism. Pynsent (1994) draws on the views of Pater, that individualism means being consciously different and seeing individuals as ultimately more important than any larger group. Pynsent quotes (op. cit. pages 8–9) Havel, President of the Czech Republic at the time of the study, from his letters when a dissident:

“A sense of responsibility makes the individual and supplies the key to one individual’s understanding of another”.

Individual ethical responsibility (Meyer, 1997) is clearly based on guilt, rather than shame, being concerned more with an individual’s conscience than opinion of others. Pynsent makes this clear (op. cit., page 9) in another quote from Havel:

“to accept the idea of collective guilt and collective responsibility means consciously or involuntarily to diminish individual guilt and responsibility… Thinking of that sort is the imperceptible embryo of moral nihilism”.

Concern for truth is another Czech characteristic. Pynsent (1994, page 18) explains its importance to the Czech identity by describing how the Czech dissident community

“characterised itself as living in truth – in contrast to living in the lie which socialist society constituted”.

Truth was the most basic of values for Masaryk (Warren, 1941) the first President of Czechoslovakia, who refers to the conviction of Jan Hus, the 15th century Czech martyr, that

“the Bible and personal conscience are the touchstones of truth” (Masaryk, 1978, page 60).

Masaryk adopted as a motto ‘Pravda v Kateře’, or ‘Truth prevails’. Writing as a dissident, Havel put great value on truth:
“In its most original and broadest sense, living within the truth covers a vast territory ... full of modest expressions of volition ... you simply straighten your backbone and live in greater dignity as an individual” (1991 page 177) “the basic job of the ‘dissident’ movements is to serve truth, that is, to serve the real aim of life” (op. cit. page 192).

For Havel, truth and individual responsibility are the basis for one’s identity as an individual (Pynsent, 1994).

2.4. The UK and British culture

In contrast to China’s revolution in 1911 and Czechoslovakia’s revolution in 1989, social change in the UK has been more gradual since its civil war and revolution in the 17th century. Although much social and economic change has occurred through the 20th century, it was through evolution rather than revolution.

While British culture has traditionally had respect for hierarchy, it has also had space for challenge to authority, such as the suffragette movement and the centuries’ long struggle for power between the monarch and Parliament. It has not shared China’s reverence for received wisdom, but has given respect to rebellious thinkers such as Wycliffe, Bacon and Darwin.

British culture is less intensely individualistic than Czech culture but is far from the group orientation of China (Trompenaars & Hampden-Turner, 1997). Like individualist Czech culture, British culture puts more value on an individual’s conscience than on the opinion of an in-group, and is spurred by guilt rather than face and shame in front of others.

3. Methodology

3.1. Grounded theory study

The study inquired into differences between British, Czech and mainland Chinese managers in their perceptions of gaining control assurance. Three national cultures were studied in order to avoid the trap for cross-cultural researchers of attributing findings too readily to obvious dichotomies between two cultures (Bond 1996). The three locations of the UK, Prague and Beijing provided a comparison between a Northern European Anglo-Saxon culture, a Slav Central European culture, and an oriental Chinese culture. In addition, the political and economic environments vary from a long established democracy where a market economy is taken for granted, to a young democracy formed in 1989 that was grappling with the rapid introduction of its Western style market economy, to a Communist country introducing a socialist market economy (Jiang 1997).
The fieldwork was done between August 1997 and January 1998 with two western based MNCs who have operations at all three of these locations. The MNCs have asked to remain anonymous. They are identified here as CoX and CoY. Because they are major players in their fields, their industries and markets must also remain confidential. One of them supplies products to industrial customers. It has a largely matrix organisation, and interviewees were selected mostly from its finance and sales functions. The other MNC provides corporate services and is organised by service product division. Interviewees from this MNC were selected mostly from a single service division. Data was also gathered from documents, emails, systems, observation, while business and national press provided contextual data.

Findings that are reported here are based on the views of 97 managers, all but 15 of whom worked for the 2 MNCs. Interviewees were initially chosen for the potential variation in views and insights that they may offer. Further interviewees were selected from those expected to challenge and extend the emerging theory. Sampling was therefore neither random nor representative.

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Figure 1: Number of interviewees by culture, organisation, location and gender
Much data was gathered from a core of 30 managers, who were asked what gave them control assurance. Discussions focused initially on credit control. A diagram of their views on gaining credit control assurance was drawn and confirmed with each of the 30 managers.

Interviews were conducted in English, which is the working language for the MNCs in all 6 sites. Data was built up from interviewees’ concepts of control elements that they saw relevant to firstly credit control and then wider control assurance. The researcher at times introduced concepts used by other interviewees in order to check a particular interviewee’s opinion on common themes.

The study was primarily qualitative and interview-based, inquiring into what gave managers the feeling that their business was under control. It was cognitive research into control assurance, for which the building blocks were concepts introduced by interviewees. Discussion of concepts compared what was meaningful to interviewees. Here opinions about other managers were used as much for data on the interviewees, as for their observation of control attitudes in others.

While the study focused on perceptual differences between managers from different countries, differences were also checked between other groupings for the managers, such as between the 2 MNCs, functions, levels of seniority and gender. This demonstrated that differences identified between national cultures, did not arise from cultures of these other groupings. Although the substantive grounded theory emerged predominantly from managers’ opinions illustrated with their anecdotes, checking patterns between different groupings of managers required some quantification, such as the proportion of managers who were of a particular opinion. Complexity arose from interviewees expressing a range of views. For example, several described accountability as both equivalent to responsibility, and embracing explanation for behaviour as well as responsibility. A simple ordinal scale was therefore constructed to represent the strength of opinion for each meaning. When aggregated across interviewees, this scale gave a weight of opinion. It represented a position on a range for a category in Strauss and Corbin’s grounded theory research method. Significance of differences in weights of opinion between national cultures and other groupings were checked with the Kruskal-Wallis and Wilcoxon-Mann-Whitney tests.

National culture was identified with an interviewee’s country of upbringing, because of the importance of childhood in acquiring national culture (Hofstede, 1991). Cultural data was collected by survey, observation and gathering attitudes through interview. It was compared to cultural theory (e.g. Hall, 1977; Hofstede, 1991; Trompenaars & Hampden-Turner, 1997) and to literature on cultural characteristics and philosophical traditions.

Methodology for the study was interpretive within the sociology of regulation paradigm, rather than of radical change (Burrell & Morgan, 1979). For example, the researcher arrived at each of the 6 sites with endorsement by senior management.
Neither he nor the interviewees questioned the legitimacy of whether organisational objectives should be pursued through management control.

The Strauss and Corbin (1998) version of grounded theory recognises that the initial research question and opening inquiries can be influenced by prior theory and by a researcher’s theoretical sensitivity built up from prior research and experience. The research question in this study asked about the effect of national culture among other contextual factors on managers’ perceptions of management control. Prior research (e.g. Tannenbaum, Kavčič, Rosner, Vianello & Weiser, 1974; Frucot & Shearon, 1991; Ahrens, 1996; Chow, Kato & Merchant, 1996) and the researcher’s working experience suggested that national culture would affect perceptions, but he was open to the possibility that no cultural effects might be identified. Prior assumptions and emerging ideas were repeatedly challenged through constant comparison with the field data, and from checking the emerging theory with interviewees. The researcher’s prior work experience included practice and review of management control as an external and internal auditor, management accountant and financial controller. His cultural experience included being brought up in the USA and the UK, and working in the UK, other Western European countries and several Far Eastern locations including Beijing. He has some knowledge of mandarin Chinese and lives with a wife from Beijing and two bilingual daughters; which gives him a daily challenge of communicating across cultures.

3.2. Critical discourse analysis

Some years after completion of the grounded theory study with its comparison of the meaning for managers of concepts, linguistic theory and in particular critical discourse analysis (CDA) were identified as offering insight into these meanings.

Accountability in the sense of demanding and providing an account is an example of language in action; it is discourse (Blommaert, 2005). Such an account can be viewed as a text, suitable for linguistic analysis. Interviewees’ explanations of the importance to management control of accountability and related concepts were ‘metadiscourse’, as were negotiation by managers over standards of accountability in their work (Urban, 1996). The grounded theory study itself turned words such as ‘accountability’ into text when identifying their frequency and how they were used by managers. Lifting text of what interviewees said from the original interview context and comparing it within the study to what others could be described by linguists as ‘entextualisation’ (Blommaert, 2005).

Culture of a society has been described as an ensemble of texts that are open to shared interpretation within the society (Geertz, 1973; see also Silverstein and Urban, 1996). As indeed the extent that a language is shared can signify the boundaries of a culture.
CDA goes beyond identifying shared texts as culture by insisting on analysing discourse within its context, seeing language in dialectical relationship with society (Blommaert, 2005). CDA attempts above all to theorise the mediation between the social and the linguistic (Chouliaraki and Fairclough, 1999). It attempts to see beyond the sociolinguistic system of the analyst’s own society with its norms, codes and conventions for understanding language, for example in analysing discourse of other cultures and discourse of those who attempt to communicate across cultural barriers (Blommaert, 2005).

Findings of the grounded theory study were therefore re-examined in light of CDA principles, in order to identify the social significance of how managers in the study used and understood accountability and related concepts.

4. Findings

4.1. British accountability

Accountability, as distinct from responsibility, was identified as important to gaining credit control assurance by 7 of the 11 British managers’ within the 30 core managers, but by none of the 9 Chinese and only 2 out of the 10 Czech managers. When discussing wider management control, accountability was frequently seen as important by the wider body of British interviewees. Hardly any of the wider body of Chinese and Czech interviewees mentioned accountability, although when asked most in the 2 MNCs were familiar with the word.

Emergence of this surprising finding stimulated inquiry into what the British managers understood by accountability. In this way, inquiry into accountability started from British managers’ perceptions rather than from prior theory.

Among the 17¹ British interviewees who saw accountability as important, about two-thirds of the weight of opinion understood accountability as some combination of responsibility with either or both of roles and information. These roles described positions of responsibility and of being owed responsibility. Information or explanation related to how the responsibility was being fulfilled. A third of the British weight of opinion either saw accountability as virtually identical to responsibility, or distinguished accountability and responsibility according to whether one or the other could be delegated.

¹ Availability of interviewees, including the 30 managers whose control perceptions were captured in a diagram, made it impossible to discuss every concept with all of them. Selection of what to discuss with whom was on the principles of theoretical sampling (Strauss and Corbin, 1998), constrained by availability of interviewees and time within the field.
While there was some variety in the British explanations of what accountability means, the mainstream views among British managers centred on responsibility, relationships between people who owed responsibility and to whom it was owed, and information or explanation for fulfilment of these responsibilities. Inquiry into these component categories for accountability would, it was hoped, identify why they were important to the British managers and why they apparently had a different significance for the Chinese and most of the Czech managers.

4.2. British views on roles and responsibility

British interviewees described responsibility as what one should do or achieve, typically within some job, functional position or other role. Roles emerged as a characteristically British feature in discussions about control. For example, British interviewees spoke of job descriptions, functional roles, benefits of checks and balances from multiple perspectives on a control issue, and interdepartmental co-operation.

These roles defined how someone within the organisation was expected to behave by his or her colleagues, superiors and subordinates. They also defined external expectations, such as by a sales manager of customers, and what customers expected from the organisation. There were expectations by the head offices and sister sites, while managers at the sites in the study expected support from their MNC. They also expected infrastructure, legal institutions, tax regimes and so forth from local authorities.

British expectations included informal as well as formal responsibilities. Responsibilities for which people were accountable, were not only set out in formal job descriptions and service agreements, but also implicit in language and behaviour. For example a British manager communicated the content and strength of his expectations in the tone of his voice, corridor chats and his intervention by email and at meetings.

At the same time, British interviewees identified the interests of people, such as colleagues, superiors, subordinates and counterparties outside their organisation, according to the particular role they held. For example, some interviewees assumed that sales staff were interested in achieving sales volume and revenue, whereas finance staff were interested in profit contributions and cash flow from sales.

Roles, both formal and informal, were seen by British interviewees in the business environment for the organisation, the structure of its business, and its activities within the community. Virtually all widely commented on the contextual uncertainty for control. A feature of this uncertainty was the frequent change in roles for people. Whether welcomed as a challenge or sometimes resented as a source of stress, changing roles were seen by British interviewees as constantly redefining responsibilities and interests. A manager was expected to assume the responsibilities and interests of
a new position to which he or she transferred into, even if this were a move between functions, say from a sales to a finance position or from one organisation to another. So for example, an IT manager who transferred to a logistics role was expected to take on the interests of his new department, even though he might expect to return to an IT position later in his career within the same organisation.

Any individual, of course, held multiple roles. A service manager was a superior to her staff and subordinate to more senior managers, a provider of service to her customers and a colleague to fellow managers. Besides holding a line position, she might also be a member of several project teams. British interviewees recognised the tensions from multiple responsibilities and interests of any individual. Principal among these was concern about potential conflicts of interest, including the classic concern in control theory that key duties should be segregated. For example, responsibility for measuring performance was generally segregated from those whose performance was measured, while there were independent checks on performance measurements for the most senior managers. The structure of responsibilities and roles was complex, because responsibility for taking on high risk business was shared beyond managers who would be responsible for executing the business, so that others who could monitor the risks were expected to take some responsibility. A related but frequent concern was the organisational structure of objectives and responsibilities within each organisation, whether they were as far as possible internally consistent and structured efficiently. Examples ranged from a high level issue of determining who should be responsible for deciding the extent that credit controls should be standardised internationally, to mundane arrangement of responsibilities for receiving and distributing mail.

British discussion of roles linked to views on organisational structures. These views, as will be seen, included the concept of empowerment, which British managers saw as a counterbalance to accountability.

While British interviewees tended to see the organisational context of roles, individuals were widely expected to shape their organisational roles. This was expressed as a desire for empowerment. About two-thirds of the weight of opinion among 12 British interviewees was that subordinates should contribute something beyond their defined job or instructions. Such empowerment was a characteristically British expectation.

Subordinates expected to be given latitude in how they do their work, perhaps subject to some monitoring. These views were reciprocated by bosses expecting their staff to contribute more than the fulfilment of job descriptions, procedures and instructions. There were explicit risks that called for commensurate trust from both bosses and subordinates. Bosses trusted their empowered subordinates to act sensibly, to advance wider objectives for the organisation. They were expected to coach and guide their staff, to develop their capabilities. For example:
“Supervision is how you impress upon staff, lead by example, discuss, communicate and so forth. It is doing spot checks and using some form of making sure that people are on top of their job.”

Subordinates expected their bosses to give them sufficient latitude and support to develop their role towards achieving organisational objectives beyond formal job descriptions. But this involved risk of recrimination for failure. Subordinates expected, and were expected, to be empowered with appropriate autonomy if they are to be held accountable in their roles. At the same time, accountability was seen as necessary to control empowered staff.

4.3. British attitudes to information

A number of examples illustrated a British expectation that monitoring within an organisation be done with free flow of information, transparent to all. One interviewee said that assumptions on which critical decisions were made should be transparent, so that others could monitor the decisions. Another explained that some British managers like to keep their boss informed so that there are ‘no surprises’. While from the superior’s point of view it was said

“I think (British managers) need to demonstrate that people have done what they are supposed to do. .... ought to be able to follow some kind of audit trail”.

There was also greater flow of information between organisations in the UK than in the Czech Republic or China. For example, one of the British locations routinely received management accounting information from customers, while this was not apparent at the Czech or Chinese locations.

Transparency in British organisations was more extensive than required for monitoring. League tables plotting managers’, including senior managers’, performance were pinned up in a UK office beside the coffee machine, where all staff could not fail to see them. Some embarrassment was frequently caused to those whose performance appeared below norm, including embarrassment to senior managers. In contrast, these same league tables were calculated in the organisation’s Prague office, where they were referred to as ‘tables of shame’ but were not posted for all staff to see. Such league tables were apparently not produced at all for the organisation’s Beijing office.

To summarise, accountability was found to be important to most British views of how to provide control assurance. It was generally understood to involve responsibilities that people are expected to fulfil in particular roles, and transparency in explaining fulfilment of those responsibilities. Aligning and regulating the interests of parties, based on transparency and trust, was a typically British view of managing relations.
4.4. Czech accountability

Czechs generally gave odpovědný as the equivalent Czech word for responsible or responsibility, and zodpovědný as equivalent to accountable or accountability. However, 10 out of 14 Czech interviewees felt they could not make a meaningful distinction between these concepts in their own language. Of the four Czech interviewees who distinguished accountability from responsibility, two mentioned that responsibility that cannot be delegated. Views of only two Czech managers fell within the mainstream British concept of accountability by combining responsibility with a relationship to whom it is owed, with or without information on its fulfilment. Several Czech interviewees admitted to not knowing what accountability means, to not having heard of it, or that the term is not used.

The study increased attention on the concept of accountability and its components when it emerged that the word generally lacked significant meaning to Czech interviewees. Conceptual sampling explored emerging differences between Czech and British views on responsibility, relationships between people and attitudes to information.

4.5. Czech responsibility

Czech interviewees mentioned responsibility rather than accountability. Several stressed the importance of responsibility. Responsibility, but not accountability, was included in local Prague procedures of one of the MNCs.

Czech responsibility appeared to be an obligation, but not necessarily one that was defined by a role. It tended to be a personal duty that one as an individual should do, as a matter of integrity and conscience. If responsibility was owed to someone, it was to oneself, to society at large and possibly to God.

Several Czech managers emphasised that staff should understand their responsibilities, with the implication that failure to understand their responsibilities reflected either inability or unwillingness on the part of staff. The predominant weight of opinion among Czech managers was that staff should be reliable in fulfilling their duties, rather than step beyond these responsibilities to wider organisational objectives. Empowerment of staff did not appear as a control issue for Czech managers.

Czech reluctance to accept responsibility appeared in the often quoted phrase “It’s not my responsibility”. However, this was typical of only some Czech staff and was linked to old attitudes, prevalent during the Communist era up to 1989, of people going through the motions of work while putting their energy into their private lives.
“People pretended they are working and the Government pretended to pay them” (and similar observations by Pynsent, 1994 and Vlčil, 1996).

The Czech retort ‘It’s not my responsibility’ can be compared to responses quoted by British managers:

“It’s not my responsibility – ask a secretary to do it”, and

“Hang on a minute, that’s not my bloody job!”

In both British cases, the rejection of an instruction was supported by an organisational role, which was absent from the Czech response.

4.6. Czech organisational relationships

Czech superiors were generally described as instructing or explaining to staff what is expected of them. While there was some mention of Czech bosses coaching their staff in order to help develop staff capabilities, they were described as generally less good at this than were British managers.

Organisational structures and roles did not appear in discussions with Czech interviewees as they did with their British counterparts. Instead, organisational concerns of Czechs centred on individuals, both that staff should understand their duties, and that senior managers should have sufficient integrity, ability and leadership qualities to command respect among subordinates.

For Czech managers, the major organisational aspect of control appeared to be control system design. This was a matter of arranging processes so as to help ensure achievement of organisational objectives. People were seen as critical to this control system design, in terms of integrity and understanding their responsibilities.

Czech loyalty

Czech staff were described by 8 interviewees as predominantly loyal to themselves. However, the state of the job market in Prague, with ‘negative unemployment’, was clearly relevant. Opportunities for English-speaking staff, such as the Czech interviewees in this study, were particularly attractive. This may have enhanced their loyalty to themselves. Yet Czech interviewees had generally been with their employer for some years. They linked loyalty to their employer with being treated as individuals, while reasons given for staying with their current employer included personal ambi-

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2 Care was taken in the field work not to refer to literature or prior research until the findings were complete. Exceptions were made for local and business press that described the contexts where the study was conducted, and for literature that interviewees specifically referred to. The substantive theory was therefore built up from data appearing in the field. However, references are interposed here with the field work findings for ease of explanation, and to illustrate corroborating evidence and theories.
tion, salary, housing shortages and conservatism. Thus staying with their employer was linked to individual self-interest.

Czech, like British interviewees, talked of teamwork. Czech allegiance to teams appeared to be individual self-interest, bound with common purpose and camaraderie.

Respect for authority

Respect for leaders in a position of authority may be distinguished from attitudes to authority *per se*. Whereas British interviewees appeared to respect authority that came with various roles, Czech comments resented anonymous and invisible authority. Strongest resentment was thrown at the previous Communist regime, and for the loss of fundamental respect for individuals under the previous Communist regime and Nazi occupation. This put loyalty on more personal terms.

It appeared that when a superior lost the respect of Czech subordinates, he or she also tended to lose authority:

“If I respect him, his ability, knowledge, experience, as a person, I would probably follow him, after trying to persuade him that I do not agree with his view. But without this respect, he can think whatever he wants, and I will follow what I want!”. Again

“Us Czechs we think the boss is a stupid, lazy shit. We are not scared of our bosses; we make a lot of jokes about them.”

Another explained that Czechs like the character of Švejk3 because he makes superiors look ridiculous. So, whereas British views tended to accept authority as a cloak of particular roles, Czech views were of respect for people as individuals.

4.7. Czech availability of information

Although the opinion of British interviewees was universally in favour of transparency, weights of opinion among Czech interviewees were only one-third for transparency. Czech people were described as tending to be relatively secretive compared to British people. They appeared to be generally less willing than British or Chinese staff to keep their bosses informed. This was attributed to fear of revealing problems, which might have raised problems for oneself in the previous Communist regime (see also Sucher, Moizer,. & Zelenka, 1998).

Lower Czech than British demand for transparency was reflected in the availability of public information. For example, in the Czech Republic, accounts of unlisted companies were generally not available. There were doubts about the accuracy of recorded titles to land and mortgages in the Czech public land register. In the UK,

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3 ‘The Good Soldier vejk’ (Hašek, 1974) tells of a fictional soldier in the First World War, who, through his apparent imbecility and breaking all rules, shows up the stupidity and incompetence of his officers and others in authority.
Companies House makes company returns on all companies available to the public, and land ownership and land securities can be verified. This information made it much easier in the UK than in the Czech Republic to check on the assets and credit worthiness of counterparties.

In the UK, credit reference agencies are well established and work from wide sources of both published information and information provided by their clients. The Czech Republic also had credit reference agencies, but these had fewer sources of information. Czech companies were reluctant to divulge information about themselves to strangers, while at the time of the study, Czech law had more prohibitions than British law on disclosure of personal information about individuals, such as directors’ dates of birth.

Public information may be viewed as transparent if it conveys information so that the nature of the underlying subject can be understood. Lack of this transparency in the Czech Republic is illustrated in an interviewee’s anecdote of a local Czech auditor: the auditor qualified his published audit report on a bank and referred in it to his unpublished letter to the bank’s management, thus leaving the public ignorant of the reason for the qualified audit opinion. In the UK such lack of publication would probably have led to criticism of the auditor by the Stock Exchange and his profession, if not also by the bank regulator. The Czech National Bank accepted that the auditor had truthfully done his job, but from then on required to see all such auditors’ letters to Czech banks. This left Czech securities’ markets still unaware of reasons for audit qualifications.

4.8. Czech attitudes to accuracy and truth

Several Czech interviewees mentioned truth. For example,

“You cannot have liars in your department”.

An interviewee referred to the phrase

‘Pravda zvřtezří’, Truth prevails,

which he attributed as the words of the Czech martyr Jan Hus dying at the stake in 1415 and as the motto of both Masaryk, who was the first President of Czechoslovakia, and of Havel who was the last President of Czechoslovakia. This motto appeared to have considerable significance to Czech interviewees. They variously explained ‘Truth’ in this motto as true to God, to the scriptures, to one’s convictions, or to oneself; but all were explanations of absolute truth rather than of any shade of relative truth.

Truth, in the sense of being honest to oneself, was reflected in the complaint of a Czech interviewee about an internal newsletter publicising a new organisational structure:
“The words attributed to me were not mine; they had been put to me by someone from (head office), and I said ‘OK if you want’, but they were not what I really thought. The worst was that in these words I was supposed to have said, that I would get to work with (colleagues in other countries), but nothing has happened. ....... Now we hear all this about the new organisation that will come ..., that it is much better and hence the old was bad, but can we believe it?!”.

This complaint was accompanied by a comparison to the previous Communist regime. A similar comparison was made when a budget was imposed so that unrealistic figures had to be used in order to arrive at an imposed total:

“it is just like Communism; I can get the right answer for you”;

while those Czechs who did not joke were upset by the need for dishonesty. These anecdotes did not imply widespread truthfulness in the Czech Republic, as there were many complaints about dishonesty outside the two MNCs. Instead they evidenced widespread Czech views that people should be truthful.

4.9. Chinese views on accountability

Unlike the Czechs, Chinese interviewees seemed not to reach a consensus on how to translate accountability into their own language, variously offering Chinese equivalents of **xin ren 信任**, **ke kao xing 可靠性**, **ke yi lai xing 可以 赖 赖 性**, **jie shi 解释**, and **bian hu 辩护**. Some could not translate it into their own language, or admitted to ignorance as to what accountability means. Only 3 out of 14 Chinese interviewees offered a distinction between accountability and responsibility, describing accountability as a combination of responsibility with either information or a relationship to whom it is owed, or as responsibility resting with an organisation rather than a person. More fundamentally, interviewees suggested that the typical Chinese preference for secrecy and lack of transparency is incompatible with accountability in the sense of holding someone to account. This contrast deepened the research interest in the comparison of responsibility, relationships between people and attitudes to information, as the components of mainstream British perceptions of accountability.

4.10. Chinese responsibility

Chinese, like Czech interviewees, generally emphasised responsibility. Chinese explanations were in terms of how people personally relate to their in-group:

“If I give credit to a customer, they cannot pay me, what is the reaction of the other people, my colleagues?”

This sales manager explained that if the organisation lost a significant sum because he failed in his responsibilities, he would not know what he could say to his boss; he would have seen no option but to leave the company. Another explained
how school children’s responsibility to study hard was expected by their teachers and parents. These examples illustrate shame felt before important members of a Chinese person’s in-group, and loss of face, when he or she failed to fulfil a responsibility. This differed from the personal guilt felt by Czech and British people.

Several Chinese interviewees translated responsibility into their own language as *fu ze* 负 责 负 implying a heavy duty or moral burden, while some translated it as *ze ren* 责 任, implying a position or appointment of duty. Chinese staff talked of feeling responsible, which contrasted with Czech staff understanding their responsibilities. They described this feeling of responsibility or duty as felt by staff in their working life towards others within their in-group. Responsibility within an in-group is a facet of group orientation, which Child (1994) puts forward as a reason for difficulties in development of individual responsibility within mainland China.

A number of interviewees discussed the reluctance by Chinese staff to accept responsibility (also Hoon-Halbauer, 1999). Several reasons were mentioned. Firstly, there were stronger feelings by Chinese than by Western people for the burden of responsibility owed to their in-group, together with fear of losing face if responsibilities were not met. Secondly, it was pointed out that there is less separation for Chinese staff between work and home life, so that the concerns of work are taken home. Thirdly, there were explanations of a general reluctance by Chinese people to step outside their comfort zone (also E.I.U., 1998). This was illustrated in two instances when interviewees compared the Western saying that ‘The early bird catches the first worm’ to the Chinese proverb:

‘qiang da chu tou niao’
枪 打 出 头 鸟
‘The first chick from the nest gets shot’.

Responsibility for Chinese interviewees therefore appeared to mean a strong personal duty sanctioned by face. Responsibilities tended to be identified not in terms of jobs, but of in-groups, which identify the people before whom the shame of losing face is felt. However, because many of these interpersonal relationships, relevant to control assurance, fell within organisations, Chinese views of organisations throw some light on their concept of responsibility.

4.11. Chinese views of organisational relationships

Chinese staff and managers expected staff to be reliable, rather than to make a wider contribution to organisational objectives. One quoted the saying:

‘bu qiu you gong, dan qiu wu guo’,
不 求 有 功 ， 但 求 无 过
‘you don’t need to earn merit, just don’t make mistakes’.
Nearly half of the Chinese weight of opinion was that bosses should look after staff, which appeared as a predominantly Chinese expectation. An example was the view that a superior should look after subordinates, and even their families, if their positions were under threat. Although there was some Chinese suggestion that bosses should coach their staff, it received much lower emphasis than in British opinions.

**Chinese loyalty**

Half of the weight of opinion among interviewees was that Chinese staff are loyal to their superior, while there were some views of loyalty to the organisation and to themselves. This contrasted with views that British staff are generally loyal to themselves, and that Czech staff are preponderantly so. Chinese loyalty to bosses was described in peculiarly Chinese terms. An interviewee linked strong Chinese interpersonal relationships between superiors and subordinates to the characteristic Chinese interpersonal relationships of *ren qing* 人情 and *guan xi*. The job market in Beijing, like that in Prague, was very attractive for English-speaking staff with experience of working in MNCs. However, Chinese interviewees made less mention of this market condition than of their boss when giving reasons for staying or moving job. Indeed, two interviewees mentioned staff resigning because their boss transferred to another position.

**Chinese hierarchy**

The predominant weight of opinion among Chinese interviewees on organisational structure was in terms of hierarchy. Where teams were described, they were hierarchical: Chinese team leaders were seen as people who bear responsibility and are looked to for resolving intra-team problems. This was very different from the flat teams understood by British and Czech interviewees.

Strong hierarchy was evident in the emphasis that a subordinate should always, as a matter of duty, respect his or her superior (see also Ch’ng, 1997; Morris et al., 1998). For example:

“Bill Gates is not such a dictator as Li Ka Shing4. In Chinese companies the boss really exercises authority, much more than in Western companies where everybody thinks that they can contribute their ideas”.

Another example was:

“In China, like other communist countries, decisions are made at a very high level. … Our education is wide and superficial, so we are not experts in any field. The boss is

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4 Li Ka Shing of Hong Kong heads the business empires of Cheung Kong and of Hutchison Whampoa.
worried he will lose face if you have a brilliant idea, which can be very embarrassing. You can have a brilliant idea, but it depends on the leader whether they listen.”

This Chinese type of organisational hierarchy was described by some interviewees as paternal and as a surrogate for ‘Confucian hierarchy’ (see also Ch’ng, 1997).

4.12. Chinese availability of information

Low availability of public information seen in the Czech Republic was more pronounced in mainland China (see also Emmanuel et al 2001). Besides the lack of accounts for unlisted companies, there were no sources such as public registers of property holdings and land securities, publication of court decisions, or markets for credit information.

A number of comments illustrated reluctance by Chinese people to appear conspicuous from volunteering information or ideas, the implication being that to stand out is to risk losing face. Related to this was Chinese concern for the virtue of studied modesty, based on a desire of not wanting to stand out as better than others. For example:

“We are influenced by Confucius who said you should be obedient and modest. Also proverbs we were told by our elders when we were young, and are still told by mothers today to their children, such as , yu shi wu zheng 与世无争 ‘Hold oneself aloof from the world’, stand aloof from success (and you will be safe); ren pa chu ming, zhu pa zhuang 人怕出名，猪怕状. ‘Man fears fame, like pigs fear getting fat’.”

A Hong Kong interviewee said he found it strange how Western people on a Friday evening like to go to a bar, to talk after work, to tell stories. He preferred to play tennis or mah-jong.

“Why do they like to expose themselves so much, to say what they are thinking and feeling?”

Another example showed how mainland Chinese managers prefer not to be in a position where information can be used as evidence against them. Chinese members of a joint venture were described as liking critical internal audit findings to be communicated verbally, rather than being put in writing; they received the message but were not threatened by written evidence.

However, apart from situations involving loss of face, lack of modesty, or potentially dangerous disclosure, there were examples where Chinese managers and business people communicated more than might be expected by Czech, or in some cases British, people. A Chinese manager remarked on how they like to check with their boss before making decisions, even for those matters that are clearly within their authority. Secondly, among senior Chinese executives within a management team there may be a very short, direct, feedback cycle; that is a clear understanding
of what is required, that bad as well as good news needs to be communicated in both directions. This communication may be more rapid, direct and frank than is typical among Western senior managers. Thirdly, networks of Chinese contacts can transmit informal information remarkably quickly. For example, after threatening a non-paying customer in Inner Mongolia, a manager heard about it the next day from an apparently unconnected source in Beijing. These examples suggest that Chinese reluctance to be open with information may be reversed where it is a matter of maintaining valuable interpersonal relationships.

Communication at one of the MNCs in Beijing appeared to be mostly vertical: problems arose from insufficient communication between departments that reported to different superiors. Such problems were less evident in the UK and the Czech Republic where there seemed to be more lateral communication.

Chinese staff appeared to favour vertical rather than lateral communication (see also Child and Lu, 1996). For example, there was greater evidence of problems in Beijing, than in the UK or Prague, from insufficient communication between departments that reported to different superiors. This is consistent with the Chinese emphasis on organisational hierarchy and reluctance to communicate outside superior to subordinate relationships.

4.13. Chinese attitudes to accuracy and truth

Interviewees explained that, whereas Westerners may tend to look for absolute truth, Chinese people tend to look for relative truth, based on the particular situation and relationships with people. A Chinese interviewee claimed that, while a Western person might expect absolute truth in a business partner, a Chinese person would expect his or her business partner to give support rather than to stand on principle.

Traditionally, auditors ask a selection of a client’s customers to confirm the trade debtor balances owed by the customers to the audit client. However, an interviewee maintained that the accuracy of this information given to auditors in mainland China is not highly rated because Chinese customers, valuing their relationship with their supplier, confirm whatever figure the supplier wants confirmed. Similarly, external users do not give much credence to audited accounts of unlisted Chinese companies because these are prepared only for tax purposes.

It appeared during the field work that Chinese interviewees were more prone than Czech or British interviewees to give replies that they thought the researcher wanted to hear. This seemed to be a further example of greater Chinese concern for fostering relationships than for accuracy.

Some interviewees considered that interpersonal trust is more important to Chinese people than transparency, and that Chinese control mechanisms rely more on implicit relationships between people than on explicit and clear reporting of in-
formation. It is submitted that most British people would put greater priority on truth and transparency than on trust in interpersonal relationships. In this respect, Czech views were stronger than British in emphasising absolute truth over interpersonal relationships. This in no way belittles the reverse order of values that may be held and expected within mainland Chinese culture.

These findings are a subset of a grounded theory that was induced from data gathered in the field. It was corroborated during the fieldwork by constant comparison to emerging findings, and by seeking countervailing evidence.

5. Context

The context of the study was important to the grounded theory analysis in order to attribute concepts and meanings contextual factors, such as the national background or organisation of the interviewees. It is also important to critical discourse analysis (CDA), as this is concerned with relationships between language and its social context. CDA shows that meaning resides not in texts, but arises from texts within their contexts (Chouliaraki and Fairclough, 1999).

The grounded theory study analysed apparent relationships between these management control concepts and the context, including the national culture in which interviewees were brought up as children, the organisation for which they worked, their level in its organisational hierarchy, and their gender. This was done both using non-parametric statistics, and qualitatively in interviews, observation, email records, organisational procedures, and the local business press. This analysis is described more fully in Williamson (2004). It confirmed that the findings identified here as tendencies according to the nationalities of the interviewees, rather than to organisational or other groupings of the interviewees.

Nevertheless, institutions were also identified as contextual factors relevant to, and no doubt influencing, the concepts and meanings for the managers in this study. Institutions of political systems, the law, accepted audit practices, public availability of information, education systems are mentioned in this paper among the institutional factors identified in the study. Other factors of market forces and philosophical traditions are also identified here. The extent that national culture influenced institutions and these other factors, or they influenced the cultural factors could not be unravelled: they appeared to work hand-in-hand together as the social context within which these managers used accountability and related concepts in providing control assurance (Williamson, 2005).

However, context highlighted by CDA extends beyond factors identified in this grounded theory study to the other parties to whom text is communicated:
“It is not the speaker alone who offers context to statements and generates context, but the other parties in the communication process do so as well … meaning is always a meeting of (at least) two minds and consciousnesses, creating results that cannot be reduced to either one of them.” (Blommaert, 2005, 43 – 44).

This opens the analysis to recontextualisation of these accountability concepts.

6. Recontextualisation of accountability

Recontextualisation is transferring text from one context to another. For the British managers, in seeking to use in the Czech Republic and mainland China accountability notions familiar to them from the UK, were recontextualising the concepts. Czech and Chinese managers were also recontextualising concepts such as reliability and their own understandings of responsibility to the MNCs where they worked.

The grounded theory study findings were based largely on interviews in which managers used concepts to explain management control. There was field evidence that they used these words in the daily work with their colleagues. This included British use of accountability in the Czech Republic and China, and use by Czech and Chinese managers of their own meanings of responsibility when working with British colleagues. But the major finding here is of misunderstanding. This recontextualisation was largely unsuccessful in communicating intended meanings. It has implications for the micro-societies of these sites where the managers worked, and for effective management control.

Firstly, managers, in using concepts such as accountability, truth or reliability were attempting to build institutions of expected behaviour, to promote an ideology of accountability. For example a British manager, newly appointed as credit controller, was concerned about the level of service and credit control he expected his department to provide across functional boundaries. He set out to communicate the content and strength of his expectations in the tone of his voice, corridor chats and his intervention by email and at meetings. This communication made it clear that he would hold to account his subordinates for meeting these expectations, and that he would hold managers of other departments to account for achieving the credit control standards that he was introducing. This was relatively unproblematic at his location in the UK. But misunderstanding occurred in Prague, where a British manager insisted on segregation of roles of responsibilities, and when Czech staff did not respect their boss and his expectations. In China, problems arose from a reluctance of departments to exchange information, and when instructions were given without sufficient attention to the expected boss – subordinate relations. It was apparent that British managers
faced some frustration in building the institutional expectations for accountability that they hoped for.

A second, at least potential, problem was constrained communication ability or ‘discourse resources’.

“It is almost always the capacity to master certain modes of speech or specialized languages that decides whether one will move higher or lower, up or down, in a society” (Andersen, 2003, p. 43, quoting Kosselleck)

Although the Czech and Chinese staff working for the 2 MNCs in Prague and Beijing were proficient in spoken and written English, a lack of understanding or of confidence in using key concepts such as accountability, would no doubt limit their ability to talk the talk of the British managers, and to meet the British aspirations for accountability based management. This was a two-way problem of limited discourse resources, as only British managers, seasoned with longstanding local experience, appreciated Czech attitudes to truth or Chinese concern for face and guanxi type relationships.

Indeed ‘accountability’ appeared in one of the MNCs policy manuals on control, which was reputedly used by staff and was open to everyone in the MNC at all three locations.

Responsibility, but not accountability, was included in local Prague procedures of one of the MNCs.

To add:
- Indications from the field data and other evidence of change in use of accountability and related concepts, to support above history of the concept.

7. Relating findings to theory of accountability

This section was drafted for earlier versions of this paper, which were focused only on accountability. It is temporarily removed because it needs to be reduced greatly from its present length of 4,000 words, in order to focus it more specifically on the aims of this paper that uses CDA to consider implications of the social context of the study. Conclusions, limitations and implications
8. Key conclusions

The British managers in this study generally saw accountability as very important, if not critical, to assurance that their business was under control. The mainstream of these British perceptions of accountability was consistent with and supports the accountability theory, which has been identified here from the English-speaking world and Northern Europe. However, this view of accountability was generally not meaningful to the Czech and Chinese managers. This study therefore gives counter-evidence to any universal theory of accountability. It suggests that it may be parochial to expect that Anglo-Saxon notions and theory of accountability are applicable in all national cultures.

While the Czech and Chinese subjects in this study were not concerned about accountability, they emphasised responsibility. And their concern for responsibility was generally greater than that of their British counterparts. However, Czech and Chinese responsibilities within their respective societies, tended to differ from the role-based responsibilities that underpinned British accountability. There were also considerable differences between these Czech and Chinese notions of responsibility, with Czech responsibility being largely individualist concern about individual integrity and duty, whereas Chinese responsibility was collectivist responsibility to those with which the responsible person had a strong interpersonal relationship. In some respects, the British notion of responsibility tended to lie between Czech and Chinese notions of responsibility.

The grounded theory study found linguistic and cognitive differences between interviewees of different national cultures. Firstly, there were the variety and difficulties in how the word ‘accountability’ was understood and how it was translated into Czech and Chinese languages. Secondly and more fundamentally, Czech and Chinese interviewees, unlike their British counterparts, generally did not identify accountability as important to providing control assurance. Nor did they identify transparency, roles and empowerment. These are cognitive differences in that accountability concepts are meaningful to providing control assurance. Some concepts implicit in British views and theory of accountability, such as hierarchy and information, were meaningful to the Czech and Chinese managers, but for reasons different from British managers. Thirdly, a comparison of meaning and of what is meaningful gave insight into differences in interviewees’ cognition of what provides control assurance.

Critical discourse analysis (CDA) helped show how these differences in meaning related to the context where these concepts were used, including the context of with whom accountability discourse was held. It highlighted problems of recontextualisation, where promotion of accountability by British managers within Czech or Chinese contexts did not achieve the intended understanding and institutionalised management control practice. The ideology of British accountability carries with it
baggage of implicit assumptions, and this baggage may not be obvious to managers from organisations and societies where accountability-based management control is institutionalised.

**Limitations**

It should be remembered that the research subjects were primarily managers of two western based MNCs. Indigenous organisations and regional cultures of China and the UK were not studied. There were the biases inherent in the researcher’s theoretical sensitivity. These findings from a grounded theory case study should not be used to predict what might be found in other populations. Care should be taken not to fall into the ecological fallacy of assuming that individuals conform to stereotypes for their culture (Hofstede, 1984; Lloyd & Trompenaars, 1993). These findings are therefore offered not as a predictive theory, but to challenge premises about accountability that underlie Anglo-Saxon theory and practice emanating from Western Europe and the English-speaking world.

**Implications:**

Proponents of CDA maintain that it openly professes commitments to change and that it should suggest corrections to particular discourses (Blommaert, 2005). Implications from this study into accountability indicate that managers who wish to export accountability-based management control need to be aware of its cultural baggage, of the potential difficulties in recontextualising it some other cultures. The study may help managers who are unfamiliar with the concept of accountability, but encounter attempts to introduce it. Both sets of managers, familiar and unfamiliar with this concept, can then have fruitful discourse about whether and how to introduce accountability-based management control systems, including how to adapt them to the particular context.

**References**

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ACCOUNTING AND THE SECOND ENCLOSURE MOVEMENT: A QUESTION OF JUSTICE, EQUALITY OF OPPORTUNITIES AND FREEDOM!

The recent debate at the American Accounting Association Annual Congress concerning the “privatisation” of AAA journals served as a springboard for considering the “freedom” of accounting knowledge, research and thought more generally. The production of knowledge in the 21st century is now intricately linked with intellectual property rights and consequently, the latest moves by (in particular) the World Trade Organisation in support of new laws on intellectual property. The economic ideology underpinning the expansion of Intellectual Property is “trickle-down” economics.

Intellectual property laws come in the form of copyrights, trademarks, patents, and related rights. Concern has been expressed about intellectual property laws by the legal profession and various social movements, sometimes described as the “commons movement”, the “CopyLeft” and the “dot.communists”. In this paper we will draw upon the emerging literature of the “commons movement” as a framework for our analysis of accounting knowledge.

1 Second affiliation: Université Paris Dauphine, DRM – CEREG
2 Historically patents have served to protect the lone inventor from being ripped-off by big business, though whether he can afford to establish his right in law is another matter. Patents, intellectual property rights, exist to award intellectual endeavour “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof” they were never meant to award mere discovery. On the basis of the current granting of patents, Newton could have patented the Laws of Gravity, Einstein the Theory of Relativity, the elements could have been patented, new planets could be patented and a royalty charged for anyone who chose to look at them etc. (http://home.clara.net/heureka/gaia/genetix.htm, 8th Feb., 2008)
Intellectual Property and enclosure movements

Historically, the idea of enclosure\(^3\) emanated from intellectual sources who presented enclosure as a progressive, socially beneficial reform. The supporters of enclosure believed that “commons” operated against “sacred private property rights” (the basis of the individualistic doctrine and the spirit of liberal economics) (Rozental, 1956). The first enclosure movement was presented as entirely beneficial and many arguments were developed to promote its nationwide adoption.

The first enclosure movement

The first enclosure movement took place in England, mainly in the seventeenth and eighteenth centuries\(^4\). Enclosure entailed fencing off common land and turning it into private property. In effect, rich landowners used their control of state processes to appropriate public land for their private benefit. This meant that many feudal peasants were robbed of their means of survival. While historians disagree about the level of hardship caused by enclosure, there seems to be little doubt that it imposed terrible costs on some of the most vulnerable sections of society.

However, some social groups benefitted from enclosure. Marx (in Das Capital) argued that the forcible expropriation of the people from the soil produced a new wage earning class desperate for even the lowest wages in order to prevent their families from starving to death. Although the Physiocrats advocated “laissez faire, laissez passer”, for those who lost their rights to use the land, freedom was only a chimera. Enclosure supplied the labour market with people who had no alternative. Moreover, these people had no chance to develop their own talent and initiative. They were forced to move to urban districts in search of work (Neilson, 1950). Thus the emerging capitalist class benefitted from enclosure in that it produced many “willing” workers.

Others have argued that enclosure allowed for an unparalleled expansion of the productive possibilities of the land (Boyle 2003, Polanyi, 1957) since before the enclosure movement, feudal lords would not invest in drainage systems, sheep purchases, crop rotation and so on. Whereas enclosure meant that more grain could be grown (using the technically advanced crop rotation systems), more sheep raised and perhaps in the long run, fewer people would starve. Boyle (2003 pp 35 – 36) states that

If the price of this social gain is a greater concentration of economic power, or the introduction of market forces into areas where they previously had not been so

\(^3\) The idea of enclosure was also fundamental to justify colonialism ideology and in dissociable of the indigenous people extermination processes. Those people were not actually considered as human beings, they were considered as belonging to fauna. That’s how the concept of “Terra Nullius” justified the progressive privatisation and divisibility of what was commonly held land.

\(^4\) There were in fact many “enclosures” beginning in the 15\(^{th}\) century and ending in the 19\(^{th}\) century
obvious, or the disruption of a *modus vivendi* with the environment – then, enclosure’s defenders say, so be it…. Those who weep tears about the terrible effects of private property should realise that it literally saves lives.

Consistent with the age, many moral arguments were brought to bear to support enclosure. Besides the argument that open lands were highly inefficient, commons were considered to be “a major source of social evils, harbouring ‘a base encroaching crew’ of thieves and idlers whose activities robbed the rest of the local population of their livelihood” (Kain et al, 1995). As the young shepherds who led the animals along the common grazing grounds were deprived of proper schooling, they became depraved, debauched and vile (Rozental, 1956).

For the purposes of this paper it is interesting to note that while earlier scholarship extolled enclosure’s beneficial effects, (Ernle, 1961), some more recent work has indicated that it had few, if any, effects in increasing agricultural production (Allen, 1982; Boyle, 2003). Indeed, the commons may have been, on the whole, well-run before enclosure. In short, the enclosure movement certainly produced significant changes in the distribution of wealth, although there remain significant questions about whether it led to greater efficiency or innovation.

The parallels between the arguments surrounding land enclosure and contemporary “trickle-down” economic theory are profound. Competing communitarian ideologies would counter that systems which allow people to survive can only be shared; if they are privately owned or exploited for profit then there can be no social justice! As Mahatma Gandhi said “the land provides enough for the needs of all, but not for the cupidity of each one”. This is why the enclosure of the commons was called the revolution of the rich against the poor, or “a plain enough case of class robbery” (Kain et al, 1995).

*The second enclosure movement*

It has been argued that we are in the middle of a “second enclosure movement” (Boyle 2003). This second movement is concerned with state-created property rights; but this time the property in question is mainly “intellectual” rather than physical land (although we have also seen the enclosure of land happening in the 21st century). Once again, things which were formerly thought of as either common property or uncommodified are being covered with new, or newly extended, property rights.

One commonly cited example is the production and sale of seeds⁵. Traditionally, farmers kept the seeds from a part of their crop for the following year’s planting. Different farmers had their own “favourite varieties” some of which were passed through  

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⁵ This literature has been used in other fields of enquiry intellectual property and information and communications technology (Benkler, 2000; Evans, 2005), copyright (Travis, 2000), land (Bromley, 1994) and the sea (Lewis, 1983).
several generations. Their seeds were also swapped or shared with neighbours. This swapping, sharing and maintenance of many varieties helped to promote genetic diversity. It would have been unthinkable to suggest that farmers’ seeds did not belong to them in the same way that it would be unimaginable that it would be illegal for a child to attempt to plant an acorn found in the park in a small pot at home.

However, we now have legally patented seeds. Farmers who use these seeds will have to pay royalties to plant them and are forbidden to save seeds. Dissatisfied with this legal protection, following their $1.6 billion buy-out of Delta and Pine Land, Monsanto acquired the patent rights to the “Terminator Technology” which will ensure that farmers will be unable to reuse their seeds. Terminator Technology introduces a “suicide gene” into plants so that they are unable to produce viable seeds.

It has been argued that terminator technology will bring about a loss in biodiversity alongside the genuine fear that the terminator gene may spread, causing the world’s crops to fail.

Similar private property arguments are used in terms of the second enclosure movements as they were in the first. It has been argued that agri-businesses have spent much money developing new plant varieties which will lead to more efficient farming. The crops which they produce can be used to feed the world’s hungry. But genetic engineering is not about feeding the hungry. Corporations do not make money selling products to people who cannot pay for them. Genetic engineering is about corporate ownership of the food chain, and catching farmers in the snare of the intellectual property laws.

Thus, in the case of seeds, intellectual property laws have “enclosed” (taken away) the rights to use one’s own seeds. Another example which is frequently quoted in the literature relates to gene technology. It has been argued that global corporations are scouring the world, extracting genetic material, and then patenting these finds as ‘their discoveries’. Paradoxically, no intellectual endeavour is involved in the automated (or soon to be) cataloguing of genes. In Cambridge, a bank of automated DNA sequencers is busy sequencing human DNA as part of the Human Genome Project. Aligned to gene technology, the literature is concerned with intellectual property and the development of medicine. The discovery of genetic links to diseases is being patented. This means that anyone offering a diagnosis or cure based upon the patent will be obliged to pay royalties.

With regard to the development of drugs, patents are considered as the stimulator of the basic research. The dominant argument is that the products of drug companies need to be protected or else they wouldn’t bother to develop new drugs. However, in the case of drugs, intellectual property rights introduce two essential biases which make it impossible for private property and public interest to cohere. The first is due

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6 But even if intellectual effort were involved, it is not intellectual invention; it is basic research, the results of which have always been shared to the benefit of all.
to the fact that capitalist medical research develops only in the fields where there is a solvent demand. That is why there is a tragic dearth of research relating to pathologies specific to the developing countries. The second is due to the fact that patents increase the cost of drugs considerably, making them prohibitively expensive to those in desperate need of them in developing countries.

Pharmaceutical companies have used intellectual property laws against several countries such as South Africa, which saw its policy to fight against AIDS blocked by the prohibitive price of therapies leading to many deaths. This was a direct consequence of patents. The recourse to the production of generic medicines as a solution was not possible without the intervention of international agencies evoking the requirements of public health recognised by the agreements of Trips. In summary, if enclosure was described to be necessary to avoid the overuse of the commonly held resources, in order to protect them and indirectly to save lives, it is never argued that the risk of enclosure is the under-use of the world’s resources and this in itself could lead to a moral crisis!

These examples further highlight the similarities between the rhetoric of the first enclosure movement and those of the second. Both are concerned to demonstrate how they can harvest new technologies for the benefit of “society”, the first movement in terms of new farming technologies; the second in terms of genetic and communications’ technologies. They both argue that enclosure is the sole way to encourage greater efficiency/innovation that will lead directly to increases in food production to save lives. Furthermore, both are based on the premise that enclosure encourages lazy indolent people to work harder. While there are strong ideological parallels, materially, both serve to enhance the wealth of the owners of the land and the means of production.

It is beyond the scope of this paper to debate the strong contention that enclosure, rather than enhancing the development of science, in fact does the opposite. A short example will suffice here. Linus Torvalds started a revolution of sorts in the computer industry when he created the Linux operating system and decided to share it with fellow programmers on the Internet. Linux could then be enhanced by programmers and their work shared with others on the internet, who will in turn develop it further. The outcome is more efficient, computer operating systems than those developed by large capitalist companies.

While there may be strong arguments made for (for example) the “un-enclosing” of certain technologies (especially in medicine, food production and computer technology), how can these insights be used to inform our understanding of accounting? It is all too easy to forget the importance of accounting knowledge in the functioning of our economic and political systems. If it were not so important, then perhaps the World Bank, the IMF and other lending institutions would not insist upon the introduction of IFRS as a condition of their loans. In the next section, we consider the debate about
AAA journals in order to highlight some of the ideas surrounding intellectual property and freedom, and then we will discuss accounting knowledge more generally.

**AAA academic journals and the sphere of public knowledge**

To be considered as “public knowledge”, two conditions need to be fulfilled by AAA academic journals. They should be available for all users who can take advantage from their use, no matter how many they are. And they should be available for all: no rivalry and no exclusion. To fulfil these two conditions, not only should there be free access to AAA journals and on the internet, but also, academic knowledge production should be a common enterprise.

But what about the production of the academic knowledge which is reproduced in AAA journals? How does this relate to the sphere of public knowledge? Arguably, in recent decades, the content of the journals has very much been restricted to the narrow methodological commitment of a small group of researchers. While describing their research as mainstream, it serves to support the contemporary neo-liberal political, social and economical order. The perpetuation of the idea that the market is the only possible social order was the ultimate knowledge production in the majority of AAA journals. Therefore, academic enterprise in the U.S. is ideologically orientated. To become public knowledge, an idea should experience a biased process by which it is validated, disseminated, and endorsed by the public process of review and publication (Paul Williams).

If this argument illustrates the non-common character of the knowledge production in AAA journals, why did the AAA community consider privatising its journals when this could lead to the loss of control over knowledge? One answer to this may be financial. The elitist orientation and sectarian attitude of some AAA academic journals editors is in part responsible for AAA’s declining membership. It is mainly for this reason that AAA journals could not be considered to be in the sphere of public knowledge. Exclusion is carried out upstream; Academics experience an implicit exclusion process that ultimately consecrates the tribal logic of some editors. Thus, the question of the privatisation should be analysed within the context of an organisation with a declining membership. Faced with this dilemma, the market-commodification of AAA journals, using an international publisher, would provide a global production and distribution platform – potentially bringing the AAA to the desktops of millions. In the longer term, such an internationalisation of the AAA community, might reverse the AAA’s declining membership and potentially could bring about a transformation of the content of journals designed to serve its members.

Thus, the consequences of the market-commodification of AAA journals are multiple and should be analysed on the economical, political and social levels.
The concept of Intellectual Property is partially about the relationship between authors and editors. The implicit content of the concept “IP” is different from its explicit one. Explicitly, it is based on the recognition of the rights of the author which are the pivot of the legislation. Implicitly, however, it denigrates them. The intellectual work is actually nothing without its “material support”. The IP is consequently the base of that of the “material support” from which authors are, to a large extent, excluded. The author has one choice -- to yield the commercial property of his intellectual work to the owner of the “material support”, the editor and on acceptance, the publisher. As a result, the concept of academic intellectual property becomes primarily commercial.

Within the new enclosure movement, relinquishing control to a publisher inevitably subordinates “public access” to profit and intellectual work is endangered by the editors, who become the managers and even the guards. Academic intellectual property becomes subsequently the object of political stake. Intellectual property rights aim to integrate creative enterprise into the capitalistic production system. Journal content is continuously transcended and designed to serve the interests of the new lords of knowledge (the dominant schools and editors) to the detriment of the researchers who become their labourers. IP is basic for the control and the regulation of a “market of the intelligence”. It leads to capital and power accumulation. Besides the expansion of their profits, capitalists increase their power to shape the political processes which are at the origin of the rules of the global economic and social game. Knowledge is produced in accordance with their agenda. They transform it into private property by all the means at their disposal (legal and economical restrictions) and enforce protection over it. Then, the ability to pay will become a selection criteria dictating access to accounting knowledge and excluding those who cannot pay from using it. Hence, IP becomes a source of social inequalities, a stake of social struggles.

Thus, the privatisation of AAA academic journals could be considered within the wave of the new enclosure movement or the second enclosure movement (Boyle, 2003). It could be the introduction to a global monopoly, a “property rights imperialism” (Weber and Bussell, 2005) that influences the course of growth by increasing the gap between the north and the south, inequalities within the north and within the south in the globalisation context. It would also accentuate exclusion rather than distribution and the rights to “commons” and of knowledge sharing (Evans, 2005). It allows the control of ideas more than the protection of any freedom! It would lead to more concentration of wealth, which could lead to a “New Dark Ages” (Evans, 2005).

The following section considers accounting knowledge in its broader social context. There is a paradox with accounting knowledge in that at first sight much of it appears to be common. Anyone with access to the internet has access to international accounting standards, alongside a plethora of accounting information including annual reports as well as the research of the big 4 accounting firms and so on. However,
accounting techniques and standards production is not a common enterprise. The only thing “common” about accounting knowledge is its ideology which serves to enclose what is acceptable in terms of financial measurement, the performance of organisations and indeed what *counts* as important. Moreover, access to international accounting standards is not the same as access to (say) computer software. Developing countries, for example, are not allowed to take the accounting standards of the north and develop them for their own purposes and needs. Accounting knowledge serves also to ossify the development of accounting. Moreover, only certain “legitimate” accounting practitioners can “use” the seemingly common accounting knowledge, which perpetuate the legitimacy of the profession and its role to maintain the system. These issues will be dealt with in the following sections and conclusions and recommendations set out in the final section.

**International accounting standards and enclosure**

*Accounting’s relationship with the state*

Bookkeeping is a very old practice which appeared initially in Mesopotamia (Iraq) about 3500 BC. This was possible, thanks to the existence of “writing” and “enumeration” systems. Thus, any civilization that has developed their alphabet and numbers improved bookkeeping. We can find traces from the old Egyptian period, the Phoenician one (Carthage), ancient Greece, Rome, the Middle Ages and the Order of the Knights of the Temple, the Italian cities in the 13th and 14th centuries (Florence and Venice). In parallel with the evolution of the practice of accounting, sometimes there were articulated legal connections. For example, in ancient Egypt, law was not very important with respect to accounting, whereas in ancient Rome, it was consequential. This is why, today, we talk about the legal substance of accounting.

Baker and Barbu (2007) argue that accounting is a complex form of socio-economic activity whose historical evolution is co-extensive with that of human civilization. Moreover, that the rise of capitalism and the current hegemony of global capital would not have been possible without the existence of an institutionalised set of organised accounting practices. Articulated to globalisation, there have been increasing calls for the “internationalisation” of accounting.

Moves towards international accounting “harmonisation” accelerated in March 2001, when the International Accounting Standards Committee (IASC) Foundation was formed as a not-for-profit corporation incorporated in the State of Delaware, US. The IASC Foundation is the parent entity of the International Accounting Standards Board, an independent accounting standard-setter based in London, UK. On 1 April 2001, the International Accounting Standards Board (IASB) assumed accounting
standard-setting responsibilities from its predecessor body, the International Accounting Standards Committee.\(^7\)

International Accounting Standards

While the US-based IASC Foundation does not directly set International Accounting Standards, its Trustees appoint the IASB members who set the standards. Additionally it exercises oversight and raises the funds needed. The IASC Foundation Constitution provides that the Trustees shall:

select members of the IASB so that it will comprise a group of people representing, within that group, the best available combination of technical skills and background

\(^7\) http://www.iasb.org/About+Us/International+Accounting+Standards+Board+-+About+Us.htm (14\(^{th}\) March, 2008)
experience of relevant international business and market conditions in order to contribute
to the development of high quality, global accounting standards. [Paragraph 20]

Thus the IASC has immense power.

The International Accounting Standards Board is therefore privately-funded and
its members are selected by a privately funded unelected body based in the US. Of
the 14 board members, all but one appears to have an accounting qualification. Thus
accountants dominate the standard-setting process. This could be contrasted with the
prior situation in France where the standards setting body was characterised by the
presence of multiple actors. The ideological differences between the IASB and its
French counterpart can be seen by comparing the PCG (Plan Comptable Général) the
equivalent of the conceptual framework, and the conceptual framework of the IASC.
In the former, there is no specification about who are the major users of accounting
information, whereas in the latter, the dominant concern is to meet the needs of the
providers of capital.

Williams (2002) suggests that academics and professionals, at least in the United
States, were led to consider accounting problems in a binary way, in which there are
only two parties: managers and shareholders. So, any accounting developments must
be considered in so far as they contribute to the information of the principal about the
actions of the agent. In France, this conception was frankly not present until the intro-
duction of international standards and its consequences on the accounting regulation
process (Collette and Richard, 2005)\(^8\). Until now, the standard-setting process was
always a field of democracy which is enforced by the bicephalous organisation of the
accounting profession and of the standard-setting process. The accounting informa-
tion is not conceived to meet the interests of one party. It is the result of power and
counter-power game. Since the introduction of international standards, the situation
in France is changing and everywhere in the world, the shareholder perspective con-
tinues to disguise its interest by driving accountants to act in the interests of capital
(Aglietta and Rebérious, 2004).

IASB accounting standards are called International Financial Reporting Stand-
ards. At the time of writing, there are 8 IFRSs currently in use. These supplement
about 30 International Accounting Standards (IASs) which were set by the IASB’s
predecessor body. The IASB states that it

Is committed to developing, in the public interest, a single set of high quality,
understandable and enforceable global accounting standards that require transparent
and comparable information in general purpose financial statements. In addition, the

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8 Germany was similar. Codetermination (worker participation), has forced companies since
1951 (especially in the Coal and steel industry where labour unions were strongest) to recognise the
interests of labour. Hence, the difficulties in adopting the new international standards there.
IASB co-operates with national accounting standard-setters to achieve convergence in accounting standards around the world.9

It is interesting to note that the IASB clearly claims that it is acting in the public interest. As we have seen earlier, this claim is one which is frequently made by “those adopting common property” for their own. Moreover, the IASB states that its standards are “enforceable” (see Diagram 1). As we shall see, in many countries, this is indeed the case. Yet, the average person has no say whatsoever on who can set the standards, what they contain, or how they will impact upon their everyday lives (although they do in a myriad of ways).

The legal enforcement of IFRS came as of 1 January 2005, when all companies domiciled in the European Union with publicly traded securities had to prepare their consolidated accounts in accordance with International Financial Reporting Standards. The alliance between The International Organisation of Securities Commissions (IOSCO) and the International Federation of Accountants were important drivers behind that European commission giving the IASB the role of European accounting harmonisation.

Many countries that are aligned with Europe have followed the EU lead in adopting IFRS including Australia, New Zealand and Hong Kong. Canada and Japan are moving towards full adoption while many third-world countries in the Asia Pacific Region and Latin America have either adopted part or all of the International Accounting Standards (Nino, 2007). The adoption by developing countries may seem surprising. The adoption of IFRS is a condition of developing countries being given aid. The relations between the Federal Reserve System in US and the international monetary fund ensure this.

**Fair value**

Biondi and Suzuki (p 585, 2007) argue that

Theoretically speaking, there should be many ways of doing “account-ing” — an act of explaining business realities to multiple stakeholders of socio-economies. Practically speaking, however, the current trend is to use “Fair Value Accounting” which is considered to be useful particularly for investors, and this is now being globally standardized.

Embracing the “fair value” concept will serve to further hide the fact that value is created by labour. Moreover, the conflation of market values with fairness is extremely concerning.

The implantation and adoption of IFRS has not been without its detractors or problems. Aside from significant concerns surrounding the homogenisation of ac-

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9 [http://www.iasb.org/About+Us/International+Accounting+Standards+Board+-+About+Us.htm](http://www.iasb.org/About+Us/International+Accounting+Standards+Board+-+About+Us.htm) (14th March, 2008)
counting, the new accounting standards are very complex. The complexities of the new standards of the IASB have made accountants irreplaceable. Some have even argued that the new standards could have dangerous consequences for the company and its creditors (Colasse and Casta, 2001). There have been specific difficulties of IFRS implementation within the banking and insurance sector.

One of the “complexities” introduced within the new accounting standards was their embracing of the “fair (market) value” paradigm. The IASB made the doctrine of the “fair value” its war-horse to demonstrate that equilibrium is possible only if we trust the financial markets (Aglietta and Rebérioux, 2004). The equivalence of the sign “fair” with the market is interesting. There is a presumption that market values are “fair” – or in other words, market values are correct.

Aside from its significant ideological associations, in practice, their adoption is problematic from a technical accounting perspective. If fair-value is applied to banks, an extra volatility may be created, for example (Boyer, 2007).

The introduction of the fair value and even of the full fair value constitutes another step in the sophistication process of accounting knowledge and practice, which while claiming to guarantee the reliability of the financial communication, in a world dominated by financial debacles, is basically oriented to justify and legitimise the role of the accounting profession. It also allows the big accounting firms, which dominate the international standard-setting process, to maintain a high level of turnover while observing the new Sox act rules. Tinker and Carter (?) state that the consulting branches of the big firms grew typically from 20 – 40% per annum during the bull market. Auditing, in contrast, delivered typically around 5%. As accounting firms are market entities, their competitive market survival and expansion cannot be contained by invocations for individual restrain. Legislative rules for divorcing the joint provision audit and consulting services push them to find a way to increase either the audit fees or the consulting offer. Thus, the introduction of the international standards and their complexity could serve to enhance the profitability and longevity of the accounting profession. It is never a good idea for a profession to make its knowledge too easily accessible to others (Armstrong, 1985; 1987).

Elad (2007) disputes the claim that fair value accounting has the capacity to enhance the stewardship function by providing relevant information to stakeholders, thus alleviating social conflict Barlev and Haddad (2003). Looking at the agricultural sector, Elad argues that far from reducing conflict and alienation, the fair value approach is underpinned by neoclassical economic ideals that are not conducive to emancipatory accounting.
Conclusions

Biondi and Suzuki (p 585, 2007) argue that many aspects of our lives may have been undemocratically administered without “being noticed” because of the use of accounting. The critical and social accounting literatures have had a tradition of highlighting both accounting’s standardisation (e.g. Gray 2002) and the hidden impact this standardisation has on state and private sector decision-making (e.g. Cooper and Taylor, 2005). Accounting certainly “constructs” a reality (Hines, 1988) but the reality which it constructs has material implications. For example, privatised English water companies are legally allowed to make a “fair” rate of return on their investments. Regulators set water prices to ensure that this is the case. Returns are guaranteed on capital expenditure. This has the unfortunate material consequence that water companies tend to spend their money on capital (new infra-structure projects) rather than revenue items (repairs). While capital and revenue are social constructs, they have material implications. Accounting has a significant impact on our lives, yet on the whole, people who set accounting standards are unelected and the average person has no say whatsoever in the development of accounting.

The imposition of IFRS is worsening the situation. The citizens of countries with cultures far removed from those of Delaware and London are being forced to comply with IFRS. This means that they have to legally sanction an ideological position which makes market values the correct and “fair” ones. IFRS are also self-consciously designed to meet the needs of the richest in society (investors and large creditors). The enclosure of what constitutes accounting knowledge is a sinister accompaniment to the neo-liberal project.

References


Tinker, T., and Carter, C. (?), Enron Lays Bush: Contradictions or Conflicts of Interest, ????


1. Introduction

Danneels (2002) argues that since the business environment is rapidly changing in terms of customers, technologies and competition, firms should continuously renew themselves if they want to survive and succeed both in short- and long-term. Hurley and Hult (1998) believe that innovation, market orientation and organisational learning are the primary capabilities that lead a company to competitive advantage and the creation of wealth. Ireland et al (2001) add one more – entrepreneurship. All these ideas come out of the so-called resource-based view (RBV) of the firm which has its roots in the theory of the growth of the firm, developed by Penrose in 1959. Since then, many writers contributed to the development of this theory which has become a very powerful theoretical framework and one of the most prevailing theories in the field of strategic management (Wernerfelt, 1984; Barney, 2001; Barney, Wright and Ketchen, 2001; Fahy, 2002, Hoopes, Madsen and Walker, 2003; and Chuang, 2004). RBV is based on the principle that competitiveness is a function of distinctive and valuable resources and, especially, capabilities controlled by a firm (Henri, 2006).

Up until now, the vast majority of management accounting and strategy literature has examined either the effects of strategy on management control systems (MSCs) or, although to a lesser extent, the effects of MSC on strategy (Langfield-Smith, 1977). Both directions of research found, in many instances, ambiguous and contradictory results. According to Simons (1990) and Langfield-Smith (1977) these contradictory results are mainly due to the variety of definitions, conceptualisation and operationalisations used for the measurement of the complicated constructs of MCSs and strategy.
Henri (2006) adds two more reasons in explaining these contradictory results: first, the absence of a theoretical background which tries to explain these relationships and especially the non-use of the prevailing strategy theory based on the RBV, and second, the rather small attention paid to the dynamic tension stemming from the different uses or roles of MCS.

Ittner and Larcker (2001) suggest that one key point that must be considered when one tries to study the relationship between MCSs and strategy is the determination of all those factors that lead to strategic success. According to the RBV approach, the relationship between MCSs and strategy should be examined at the capabilities’ level rather than the strategic choice level, since the RBV is based on the principle that competitiveness is a function of the strength, expert exploitation, and leveraging of specific internal resources and capabilities controlled by a firm (Lengnick-Hall and Wolff, 1999).

On the other hand, based on Simons’ work (1990; 1991; 1994; 1995), many studies explored the role of MCSs in terms of strategy formulation and strategic change implementation (see: Chenhall and Langfield-Smith, 2003; and Bisbe and Otley, 2004 among others).

Another part of research examined how the organisations balance the traditional and more active roles of MCSs (see: Dent, 1987; and Ahrens and Chapman, 2004).

However, up until now, the effects of dynamic tension, resulting from the balance use of MCSs in different ways, has not yet been extensively examined (Henri, 2006). He (Henri, 2006) suggests that a more complete understanding of the link between MCSs and strategy requires the integration of the theoretical and empirical analyses of both traditional and more active roles of MCSs, and also the tension/interaction resulting from those uses.

The present study, following Henri’s design (2006) for comparison purposes, explores only one component of MCSs, namely the performance measurement system (PMS), which represents a group of measures (financial or non-financial, internal or external, short- or long-term, etc.) used to quantify actions (Neely, Gregory and Platts, 1995).

It aims to examine, from a resource-based perspective, how the use of PMS by top management teams can act as an antecedent to organisational capabilities, leading to strategic choices. It focuses on the traditional feedback role of PMS to support the implementation of strategy (‘diagnostic use’) and the more active role of PMS associated with the signals sent throughout the firm to focus organisational attention, stimulate dialogue and support the emergence of new strategies (‘interactive use’). Moreover, these two types of use work simultaneously, but for different purposes. However, collectively, their power lies in the tension generated by their balanced use which simultaneously reflects a notion of competition and complementarity. Consequently, it also explores the influence of the dynamic tension emerging from the joint
use of PMS in a diagnostic and interactive mode on capabilities leading to strategic choices (Henri, 2006).

The remainder of the paper is organised as follows. Section two briefly discusses the use of MCS and the resource-based view and capabilities. Accordingly, the research model is presented, followed by the hypotheses development. Section three refers to methodology, whilst in section four the results coming from the structural equation modelling analysis are presented and discussed. Section five concludes the study.

2. Theoretical Background

2.1. Constructs definition

2.1.1. Use of Management Control Systems

Management control systems are viewed typically as tools of strategy implementation (Simon, 1991). More analytical, MCSs are broadly defined as ‘the formalised routines and procedures using information to maintain or alter patterns in organisational activity, and include formalised information-based processes for planning, budgeting, cost control, environmental scanning, competitor analysis, performance evaluation, resource allocation, and employee rewards’ (Simon, 1987a, p. 49).

Simons’ (1987a, 1990, 1991, 1994, and 1995) studies, on the levels of controls, focus mainly on the concept of tension, which in turn, conceptualise that the aim of MCSs is to manage the inherent organisational tension between creative innovation and predictable or pre-established goal accomplishment. Consequently, management teams use MCSs either as positive or negative forces to produce dynamic tension that may deal with the inherent organisational tension (Henri, 2006).

The broad literature on MCSs (see: Simons, 1991, 1994, 1995; Langfield-Smith 1997; Haas and Kleingeld, 1999; and Kaplan and Norton, 2001, among others) distinguish the use of MCSs in diagnostic and interactive use. According to Green and Welsh (1988), MCSs are described as information feedback systems, where goals are set in advance, outcomes are compared with preset objectives, and important variances are given to management teams for amendments, adjustments and follow-up (Anthony, Dearen, and Bedford, 1989). Since this type of system is considered as the primary tool for management-by-exception, the literature characterises them as diagnostic control systems (Simon, 1991). Moreover, diagnostic use of control systems represents a negative force, mainly for two reasons: (a) it is focused on mistakes and negative variances, and (b) the derived sign of the deviation when outcomes and preset goals are compared is reversed in the feedback signal to adjust the process (Henri, 2006). Simons (1991) mentions that MCSs are not always used to manage by exception. In many cases, top management use MCSs for day-to-day issues to support
organisational decision-making. Thus, MCSs can be characterised as interactive when top management teams use them to ‘personally and regularly involve themselves in the decisions of subordinates’ (Simons, 1999, p. 49). The interactive use of MCSs represents a positive force since they are utilised to encourage opportunity-seeking and learning throughout the firm (Henri, 2006).

The diagnostic and interactive uses of MCSs, including PMS, form two complementary uses. Although they function simultaneously, they are focused on different purposes. The diagnostic use constrains the role of PMS to a measurement tool, whilst the interactive use expands its role to a strategic management tool (Kaplan and Norton, 2001). On the other hand, according to Simons’ (1990, 1991, 1994, and 1995) framework, diagnostic and interactive uses of MCSs represent countervailing forces used to balance the inherent organisational tension. Thus, as Lewis (2000) argues, the joint use of MCSs in a diagnostic and interactive manner to manage inherent organisational tensions creates dynamic tension.

In the present study, following Henri’s design (2006) for comparison purposes, only one component of MCSs is explored, namely the performance measurement system (PMS), which represents a group of measures (financial or non-financial, internal or external, short- or long-term, etc.) used to quantify actions (Neely, Gregory and Platts, 1995). In other words, the present study explores the influence of the dynamic tension emerging from the joint use of PMS in a diagnostic and interactive mode on capabilities leading to strategic choices (Henri, 2006).

2.1.2. Resource-based view and capabilities

According to Amit and Schoemaker (1993) the resource-based view-RBV considers firms as bundles of resources heterogeneously distributed across firms, and that resource differences remain over time. Barney (1991) stresses that resources that are valuable, rare, difficult to imitate, and, moreover, non-substitutable, almost certainly lead to the achievement of competitive advantage, that cannot be copied or adopted by competitors. Resources include different components that can be utilised to apply a wealth-creating strategy. These might be: (a) specific physical assets, (b) organisational assets, (c) human resources, and (d) competencies (Eisenhardt and Martin, 2000).

Day (1994) argues that capabilities create a link between resources and allow their deployment. Moreover, dynamic organisational capabilities illustrate the ability of an organisation to implement repeatedly, or replicate, productive activities that encourage an organisation’s capacity to generate value through influencing the transformation of inputs into outputs (Teece, Pisano and Shuen, 1997).

Market orientation, organisational learning, innovativeness, entrepreneurship, and market responsiveness are recognised as primary capabilities to gain competitive
advantage and create market change. However, although each capability is capable of positively contributing, it is not sufficient to develop competitive advantage.

*Market orientation* is regarded as a common way for satisfying market demand and originating superior value for customers. It is described as a complex of beliefs that evolves long-lasting profit, taking into great consideration firstly the customers’ interests and secondly that of stakeholders’. Narver and Slater (1990) and Kohli and Jawoski (1990) discuss the importance of market orientation and clearly link it with business performance.

According to Fiol and Lyles (1985) *organisational learning* develops insights, knowledge and links amongst past actions. Moreover, it refers to the efficacy of these actions, and, in turn, to future actions. Organisational learning is considered as a very important factor of strategic management in terms of gaining competitive advantage, since it aids in enhancing the information processing activities within a firm in a faster way than the competitors, and thus, it is strongly associated with the firms’ performance (Baker and Sinkula, 1999).

Hurley and Hunt (1998) argue that *innovativeness* is the firm’s positive attitude towards new ideas, processes and products, and its focus on innovation. Moreover, they stress that innovative firms can easily gain competitive advantage and consequently achieve high levels of performance.

Naman and Slevin (1993) and Daily *et al* (2002) consider *entrepreneurship* as the firm’s ability to constantly renew, innovate and take risks in its area of operation. Many other studies discuss entrepreneurship’s strengths and clearly point out its contribution to a firm’s survival and performance (see: Miller, 1983; Hitt *et al*, 2001, among others).

Finally, *market responsiveness*, refers to the firm’s capability to change its attitudes in a speedy manner due to the appearance of market demand shifts. As a result, market responsiveness happens in cases where the organisation not only looks at the necessity, but also is able to act, relying on market stimuli. This may lead to gaining competitive advantage and enhance a firm’s performance (De Geus, 1988; Slater and Narver, 1999; Griffith, Noble and Chen, 2006; Garrett, Covin and Dennis, 2008).

Many scholars (see: Ireland *et al*, 2001; Hult and Ketchen, 2001; Bhuian, Menguc and Bell, 2005) argue that capabilities, only when acting collectively, can make an organisation unique and competitive.
2.2. Theoretical model and hypotheses

Consequently, the theoretical model of the present study is formed in Figure 1. It reflects the relationships amongst two PMS uses (diagnostic and interactive), five capabilities (market orientation, organisational learning, innovativeness, entrepreneurship, and market responsiveness), and organisational performance.

![Theoretical Model Diagram]

Figure 1: The theoretical model

Diagnostic use of PMS supports the attainment of pre-established goals and is described as a negative force that creates constraints and ensures compliance with orders (Simons, 1995; Henri, 2006). According to Simons (1995), diagnostic systems constrain innovation and opportunity-seeking to ensure predictable goal achievement needed for intended strategies. Diagnostic use of PMS is used to signal when productivity and efficiency have fallen, and when innovation needs to be curbed (Miller and Friesen, 1982). Hence, PMS is used diagnostically to limit the deployment of the five capabilities by providing boundaries and restrict risk-taking. Hence:
Hypothesis 1: A diagnostic use of PMS tends to negatively influence capabilities of market orientation, entrepreneurship, innovativeness, organisational learning and market responsiveness.

On the other hand, interactive use of PMS supports the development of ideas and creativity. It has the power to represent a positive impetus that fosters creative and inspirational forces. ‘Senior managers use interactive control systems to build internal pressure to break out of narrow search routines, stimulate opportunity-seeking, and encourage the emergence of new strategic initiatives’ (Simons, 1995, p.93). Relying on organisational dialogue and signalling, the interactive use of PMS represents an adequate means to foster the five aforementioned capabilities because it reflects two important features associated with organic controls: (a) loose and informal control reflecting norms of co-operation, communication and emphasis on getting things done, and (b) open channels of communication and the free flow of information throughout the organisation (Burns and Stalker, 1961). Globally, there is a natural fit between the requirements of the five capabilities and organic use of control systems (Chenhall and Morris, 1995; Van de Ven, 1986). Hence:

Hypothesis 2: An interactive use of PMS tends to positively influence capabilities of market orientation, entrepreneurship, innovativeness, organisational learning and market responsiveness.

Together, diagnostic and interactive uses create a dynamic tension which has two effects: (a) ensuring that positive effects of interactive use on capabilities will be achieved; and (b) expanding these positive effects of interactive use (Henri, 2006).

In some circumstances, the potential benefits of interactive use may disappear due to insufficient diagnostic use to set boundaries and highlight effectiveness issues. This can produce a loss of direction, wasted energy and a disruption of continuity (Chenhall and Morris, 1995). Similarly, the potential benefits of interactive use can be lost due to excessive diagnostic use, which constrains innovation and risk-taking. This can produce stagnation, loss of energy and declining morale (Chenhall and Morris, 1995). More importantly, a diagnostic use of PMS helps to increase the positive effects of an interactive use on capabilities: Beyond the underlying assumptions that conflict and tension are negative and destructive, growing evidence from conflict literature suggests that they may be beneficial to individual and organisational performance, and that avoiding and suppressing conflict reduces creativity, decision quality, product development, and communication (DeDteu, 1991; Nicoreta, 1995 in Henri, 2006). Hence:

Hypothesis 3: The dynamic tension resulting from a balanced use of PMS in a diagnostic and interactive fashion tends to positively influence capabilities of market orientation, entrepreneurship, innovativeness, organisational learning and market responsiveness.
According to the RBV of the firm, valuable, rare, inimitable, and non-substitutable resources and capabilities lead to a sustained competitive advantage, which in turn contribute to performance differences among firms (Wernerfelt, 1984; Barney, 1991). Market orientation, market responsiveness, organisational learning, innovativeness, and entrepreneurship constitute five capabilities that have all of the above-mentioned attributes. They are considered to be key drivers of organisational transformation and strategic renewal by manipulating resources into new value-creating strategies (Bhuian et al. 2005; Eisenhardt and Martin, 2000; Ireland et al. 2001). Empirically, previous studies provide evidence showing that these five capabilities contribute positively to performance (Hult and Ketchen, 2001; Lee, Lee, and Pennings, 2001; Naman and Slevin, 1993; Narver and Slater, 1990; Spanos and Loukas, 2001; Garrett, Covin and Dennis, 2008).

The diagnostic and interactive uses of PMS, as well as the dynamic tension resulting from their balanced use, have already been linked to the five capabilities (Hypotheses 1–3). Also, these five capabilities are expected to lead to positive organisational performance. Hence, the diagnostic and interactive use of PMS and the dynamic tension resulting from their balanced use influence the five capabilities, which in turn increase performance. Therefore, the following two hypotheses:

**Hypothesis 4a**: The diagnostic and interactive use of PMS has an indirect effect on organisational performance through their contribution to capabilities of market orientation, entrepreneurship, innovativeness, organisational learning and market responsiveness.

**Hypothesis 4b**: The dynamic tension resulting from a balanced use of PMS in a diagnostic and interactive fashion has an indirect effect on organisational performance through its contribution to capabilities of market orientation, entrepreneurship, innovativeness, organisational learning and market responsiveness.

### 3. Methodology

#### 3.1. Measurement of constructs – the questionnaire

This study adopts the questionnaire used by Henri (2006), adds one more capability (market responsiveness), and adjusts it to the Greek context by translating it into the Greek language.

Henri (2006) developed his instrument based on (a) an adapted version of Vandenbosch (1999) to measure diagnostic and interactive uses of PMS, (b) the well-established MKTOR instrument of Narver and Slater (1990) to measure market orientation (c) an instrument proposed by Naman and Slevin (1993) to measure entrepreneurship,
(d) a framework suggested by Hult (1998) to measure organisational learning, and
(e) the instrument proposed by Burke (1989) to measure innovativeness.

In the present study, market responsiveness is a measure based on the argumentation of Griffith, Noble and Chen (2006). Finally, organisational performance is measured with an instrument using five indicators: (a) sales volume, (b) ROI, (c) profitability, (d) market share, and (e) meeting budget targets.

Content validity is ensured by using existing and validated scales and by the pre-test of the first draft of the questionnaire. Three academics were asked to scan the questionnaire; several CEOs contributed by adjusting the questions to their ‘language’ and more than ten MSc students tried to answer the questions. Convergent validity was established by using confirmatory factor analysis (CFA). The detailed results are shown in Appendix 1.

3.2. Research design and the sample

A survey was undertaken to gather all the appropriate data by use of a structured questionnaire. The design of the survey follows that of Henri (2006). Henri (2006) developed his instrument based on (a) an adapted version of Vandenbosch (1999) to measure diagnostic and interactive uses of PMS, (b) the well-established MKTOR instrument of Narver and Slater (1990) to measure market orientation (c) an instrument proposed by Naman and Slevin (1993) to measure entrepreneurship, (d) a framework suggested by Hult (1998) to measure organisational learning, and (e) the instrument proposed by Burke (1989) to measure innovativeness. In the present study, market responsiveness is measured based on the argumentation of Griffith, Noble and Chen (2006). Finally, organisational performance is measured with an instrument using five indicators: (a) sales volume, (b) ROI, (c) profitability, (d) market share, and (e) meeting budget targets.

In order to achieve a sufficient sample size and generalisability of the result, the target population consisted of all 157 large-size Greek manufacturing companies that employed at least 250 people. The population was drawn from a database compiled by ICAP, which is a well-known and reliable source of data for Greek companies. The size limitation was introduced for the reason that small and medium firms present some difficulties and mostly these companies do not have the appropriate management accounting tools (Chenhall and Langfield-Smith, 1998). Especially in the small ones information is rare, and in some cases, is far from reliable. In Greece, as with anywhere, larger companies are those expected to use most of the tools and proposed practices. The questionnaire items used in this survey are exactly the same as the ones used in Henri (2006).

The survey implementation followed four steps: pre-notification, initial mailing, first follow-up, and second follow-up. To generate early interest, the first step was to
notify respondents in the form of a letter, phone call or e-mail. A mail-out package including a cover letter, the questionnaire and a business reply-paid envelope was then sent to every contact name. In a few cases, the questionnaire was sent by fax or e-mail. The first follow up consisted of a postcard reminder which was sent to every respondent, while the second was a phone call or replacement questionnaire sent only to those who had not answered. From the 157 firms contacted, only 120 accepted to participate in the survey. The remaining CEOs were either too busy to participate or denied to do so because of company privacy concerns.

A total of 103 questionnaires were finally completed, generating a response rate of 85.83 per cent. After excluding four questionnaires with missing data, the final sample decreased to 99 responses resulting in a response rate of 82.50 per cent.

Generally speaking, researchers normally work to a 95 per cent certainty. This actually means that with a total population of 157 firms, the minimum sample size should be around 108 instead of 99 (Saunders, Lewis and Thornhill, 2000: 156) a small difference of 9 observations. Although the smaller size could be considered as one of the limitations of this research, we could defend it on the grounds stated by the famous scholar, Shelby Hunt: ‘No manuscript should be rejected on the basis of potential non-response bias—no matter what the response rate is—unless there is good reason to believe that the respondents do in fact differ from the non-respondents on the substantive issues in question and that these differences would make the results of the study unreliable’ (Hunt, 1990: p.174).

To test whether our respondents were different from the non-respondents, we looked at whether there were any differences in the mean of all variables used in this study between early and late respondents. The rationale behind such an analysis is that late respondents (i.e. sample firms in the second mailing) are more akin to the population, from which they were drawn, than the early respondents (Armstrong and Overton, 1977). No statistically significant differences were found, thus suggesting that non-response bias is not a serious issue in the study.

The demographic features of the respondents and their firms are analysed in the following Table 1:
Table 1: Demographic Data

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>%</th>
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<td></td>
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<td>Listed</td>
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<td>70</td>
</tr>
<tr>
<td>Non Listed</td>
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<tr>
<td>Total sample</td>
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<td>100</td>
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Size of Organisations:

Turnover – m Euro

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<tr>
<td>&gt;101–200</td>
<td>33</td>
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<td>&gt;301</td>
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<td>20</td>
</tr>
<tr>
<td>Total sample</td>
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<td>100</td>
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Position of Respondent

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<tr>
<td>CFO</td>
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</tr>
<tr>
<td>COO</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Senior Vice-President</td>
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<td>4</td>
</tr>
<tr>
<td>Total sample</td>
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<td>100</td>
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Size of Organisations:

Manpower – employees

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<td>41</td>
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<tr>
<td>501–1000</td>
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<tr>
<td>&gt; 1000</td>
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<td>23</td>
</tr>
<tr>
<td>Total sample</td>
<td>99</td>
<td>100</td>
</tr>
</tbody>
</table>

3.2.1. Measurement of the constructs

Descriptive statistics and the Pearson correlation matrix are presented in Tables 2 and 3 respectively.
Table 2: Descriptive Statistics

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<th>Mean</th>
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<td>2.25</td>
<td>6.75</td>
<td>4.77</td>
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<tr>
<td>Interactive use</td>
<td>7</td>
<td>3.00</td>
<td>5.57</td>
<td>4.36</td>
</tr>
<tr>
<td>Dynamic tension</td>
<td>-1.47</td>
<td>2.10</td>
<td>4.28</td>
<td>0.077</td>
</tr>
<tr>
<td>Market orientation</td>
<td>12</td>
<td>2.50</td>
<td>6.50</td>
<td>4.56</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>6</td>
<td>1.67</td>
<td>6.50</td>
<td>4.41</td>
</tr>
<tr>
<td>Innovativeness</td>
<td>4</td>
<td>2.50</td>
<td>6.50</td>
<td>4.37</td>
</tr>
<tr>
<td>Organisational learning</td>
<td>4</td>
<td>2.00</td>
<td>6.25</td>
<td>4.24</td>
</tr>
<tr>
<td>Market responsiveness</td>
<td>4</td>
<td>2.00</td>
<td>6.75</td>
<td>4.46</td>
</tr>
<tr>
<td>Organisational performance</td>
<td>5</td>
<td>2.00</td>
<td>5.60</td>
<td>3.98</td>
</tr>
</tbody>
</table>

Table 3: Pearson correlation matrix

<table>
<thead>
<tr>
<th>Diagnostic use</th>
<th>Interactive use</th>
<th>Dynamic tension</th>
<th>Market orientation</th>
<th>Entrepreneurship</th>
<th>Innovativeness</th>
<th>Organisational learning</th>
<th>Market responsiveness</th>
<th>Organisational performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic use</td>
<td>1</td>
<td>-.360**</td>
<td>-.128*</td>
<td>.656**</td>
<td>.614**</td>
<td>.303**</td>
<td>.075</td>
<td>.662**</td>
</tr>
<tr>
<td>Interactive use</td>
<td>-.360**</td>
<td>1</td>
<td>-.128*</td>
<td>.656**</td>
<td>.614**</td>
<td>.303**</td>
<td>.075</td>
<td>.662**</td>
</tr>
<tr>
<td>Dynamic tension</td>
<td>-.128*</td>
<td>1</td>
<td>-.098</td>
<td>-.194**</td>
<td>.888**</td>
<td>.683**</td>
<td>.510**</td>
<td>.454**</td>
</tr>
<tr>
<td>Market orientation</td>
<td>.656**</td>
<td>-.128*</td>
<td>1</td>
<td>.888**</td>
<td>.888**</td>
<td>.683**</td>
<td>.510**</td>
<td>.454**</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>.614**</td>
<td>-.194**</td>
<td>-.098</td>
<td>.888**</td>
<td>.888**</td>
<td>.683**</td>
<td>.510**</td>
<td>.454**</td>
</tr>
<tr>
<td>Innovativeness</td>
<td>.303**</td>
<td>.614**</td>
<td>.888**</td>
<td>.683**</td>
<td>.683**</td>
<td>1</td>
<td>.510**</td>
<td>.454**</td>
</tr>
<tr>
<td>Organisational learning</td>
<td>.075</td>
<td>.510**</td>
<td>.888**</td>
<td>.683**</td>
<td>.683**</td>
<td>1</td>
<td>.510**</td>
<td>.454**</td>
</tr>
<tr>
<td>Market responsiveness</td>
<td>.662**</td>
<td>.454**</td>
<td>.746**</td>
<td>.789**</td>
<td>.529**</td>
<td>.097</td>
<td>.779**</td>
<td>1</td>
</tr>
<tr>
<td>Organisational performance</td>
<td>.662**</td>
<td>.171*</td>
<td>.455**</td>
<td>.746**</td>
<td>.789**</td>
<td>.529**</td>
<td>.097</td>
<td>.779**</td>
</tr>
</tbody>
</table>

* Significant at the 0.05 level; ** Significant at the 0.01 level.

From the Pearson correlation matrix we notice the following: (a) diagnostic use is positively correlated with all capabilities at the 0.01 significance level (except organisational learning, which is statistically insignificant); (b) interactive use is positively correlated with all five capabilities at the 0.01 significance level (except entrepreneurship); (c) dynamic tension is negatively correlated with all five capabilities, two of them statistically significant (entrepreneurship at 0.01 level and organisational learning at 0.05 level) and the remainder, market orientation, innovativeness, and market responsiveness, which are not statistically significant, and (d) diagnostic use is positively correlated with organisational performance at the 0.01 level, interactive use is also positively correlated with performance at the 0.05 level, but dynamic tension is negatively correlated with organisational performance at the 0.01 level. However, no safe conclusions can be drawn from such univariate statistical analysis.
Results from the confirmatory factor analysis are presented in Appendix 1. The questionnaire items, Cronbach Alpha for each construct, and other statistics (Goodness-of-fit of the model, non-norm fit index – NNFI, comparative fit index – CFI, and root mean square error of approximation – RMSEA) are emerged. According to the literature (see: Browne and Cudeck, 1993; Hu and Bentler, 1995; and, Tabachnick and Fidell, 2001) the recommended thresholds are: (a) NNFI >0.90; (b) CFI>0.95; and (c) RMSEA<0.10.

Examining the diagnostic and interactive uses, CFA revealed that all first and second order loadings are significant ($p<0.01$ and in some cases $p<0.05$), the Cronbach Alpha exceed the 0.70 (see: Nunnally, 1967) and the goodness-of-fit indices are in accordance with the recommended threshold values. Similar, if not better, are the results for the five capabilities. As for organisational performance, we see a rather high Cronbach Alpha, a significant $\chi^2$ and the remainder of the indices to respect the recommended threshold values.

4. Results from the structural equation models (SEM)

Structural equation modelling represents the relationships between the variables (see Figure 1), and data collected from the survey, analysed with AMOS as a statistical tool. Table 4 shows the results from the two SEM. All five hypotheses are tested via models A and B, where model A is similar to that of Henri (2006) while model B incorporates the market responsiveness in the organisational capabilities increasing them from four to five. For both models, goodness-of-fit indices are consistent with the recommended thresholds.

4.1. Hypotheses tests

PMS diagnostic uses and capabilities: Hypothesis 1 (H1) is partially supported since as we can see in Table 4, only innovativeness and organisational learning are negatively influenced by PMS diagnostic uses (in both A and B models), with only the organisational learning to show statistical significant values. On the other hand, significant results ($p<0.01$) are drawn for market orientation in both models and market responsiveness in model B. However, the positive signs do not support the H1 which expects negative signs. These results are not consistent with those of Henri (2006) which fully supported H1 in the Canadian context.

PMS interactive uses and capabilities: Hypothesis 2 (H2) is fully supported (see Table 4) since the interactive use of PMS tends to positively influence all five capabilities of market orientation (at .001 level in both models A and B), entrepreneurship (at .10 level in both models A and B), innovativeness (positive path coefficient...
but not statistically significant), organisational learning (at .001 level in both models A and B), and market responsiveness (at .001 level in model B). These results are consistent with the results of Henri (2006) who also fully supported H2.

Table 4: Structural Equation Models – Results

<table>
<thead>
<tr>
<th>Path Coefficients</th>
<th>p-value</th>
<th>Path Coefficients</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>.688</td>
<td>***</td>
<td>.688</td>
<td>***</td>
</tr>
<tr>
<td>.657</td>
<td>.128</td>
<td>.657</td>
<td>.128</td>
</tr>
<tr>
<td>-.357</td>
<td>.952</td>
<td>-.364</td>
<td>.953</td>
</tr>
<tr>
<td>-.05</td>
<td>***</td>
<td>-.05</td>
<td>***</td>
</tr>
<tr>
<td>n/a</td>
<td>n/a</td>
<td>.746</td>
<td>***</td>
</tr>
<tr>
<td>.073</td>
<td>***</td>
<td>.073</td>
<td>***</td>
</tr>
<tr>
<td>.137</td>
<td>*</td>
<td>.137</td>
<td>*</td>
</tr>
<tr>
<td>.156</td>
<td>*</td>
<td>.154</td>
<td>*</td>
</tr>
<tr>
<td>.565</td>
<td>***</td>
<td>.565</td>
<td>***</td>
</tr>
<tr>
<td>n/a</td>
<td>n/a</td>
<td>.880</td>
<td>***</td>
</tr>
<tr>
<td>.162</td>
<td>**</td>
<td>.162</td>
<td>**</td>
</tr>
<tr>
<td>.028</td>
<td>.740</td>
<td>.028</td>
<td>.740</td>
</tr>
<tr>
<td>.237</td>
<td>***</td>
<td>.244</td>
<td>***</td>
</tr>
<tr>
<td>.254</td>
<td>***</td>
<td>.254</td>
<td>***</td>
</tr>
<tr>
<td>n/a</td>
<td>n/a</td>
<td>.220</td>
<td>***</td>
</tr>
</tbody>
</table>

Market Orientation → Org. Performance (+) .139 .507 .026 .931
Entrepreneurship → Org. Performance (+) 1.708 *** 1.706 ***
Innovativeness → Org. Performance (+) 1.560 *** 1.589 ***
Organisational learning → Org. Performance (+) .287 .019 .301 .013
Market Responsiveness → Org. Performance (+) n/a n/a .136 .621
Diagnostic Use → Org. Performance (-) .663 *** .664 ***
Interactive Use → Org. Performance (+) .306 *** .229 ***
Dynamic Tension → Org. Performance (+) .227 *** .229 ***

Fit indices of the model
Chi-square 15.808 16.87
DF 4 4
NFI .991 .993
CFI .997 .997
RMSEA .068 .086

Note *Significant at the 0.10 level; ** Significant at the 0.05 level; ***Significant at the 0.01 level
Dynamic tension and capabilities: Hypothesis 3 (H3) is also fully supported, since dynamic tension positively influences all five capabilities, of market orientation (at .05 level in both models A and B), entrepreneurship (positive path coefficient but not statistically significant), innovativeness (at .001 level in both models A and B), organisational learning (at .001 level in both models A and B), and market responsiveness (at .001 level in model B). These results are consistent with the results of Henri (2006) which also show positive relationships between dynamic tension and the four capabilities but all these relationships are not statistically significant.

PMS and organisational performance through capabilities: Hypothesis 4a (H4a) examines the indirect effects of diagnostic and interactive uses of PMS on organisational performance through the capabilities. The results revealed, consistent with those of Henri (2006), partially support this hypothesis. Market orientation, organisational learning and market responsiveness are positively related to organisational performance, but these relationships are not statistically significant. However, entrepreneurship and innovativeness are positively related to performance (at a level of .001 significance in both models A and B). Additionally, diagnostic use and interactive use are both positively related to performance at a .001 level of significance of both models A and B. These results are similar to those of Henri (2006), which, on the one hand, show positive relationships between the four capabilities and organisational performance, and on the other hand, show a positive relationship between diagnostic use and performance and negative relationship between interactive use and performance, but all these relationships are not statistically significant.

Dynamic tension and organisational performance through capabilities: Finally our results verify Hypothesis 4b (H4b), showing a positive and statistically significant (at .001 level) relationship between dynamic tension and organisational performance. These findings agree with those of Henri (2006) who also finds a positive and statistically significant (at .001 level) relationship between dynamic tension and performance.

5. Conclusions

The results show that in the Greek context, and specifically in the manufacturing sector, diagnostic and interactive use of PMS positively influence the five most important capabilities of market orientation, entrepreneurship, innovativeness, organisational learning, and market responsiveness. This is in direct contradiction with theory, as far as the negative influence of diagnostic use on the five capabilities is concerned. However, this can easily be explained. Greece is a newly-developed country, still retaining many characteristics of an emergent economy. That means, simply, that even the large-sized firms in Greece still use mostly traditional MCSs (including the PMS), which have
diagnostic uses, and, of course, after so many years of experience they still have a competitive advantage and increased performance. However, as time passes, firms are experimenting in the new MCSs with interactive use properties which they show have a positive influence on their performance. Consequently, Greek manufacturing firms should first learn how to use the new non-traditional MCSs with interactive use properties, gain more confidence, and then try to use them in a dynamic way (i.e. a balanced use of PMS in a diagnostic and interactive fashion).

References


Appendix 1 – Confirmatory Factor Analysis

Performance measurement systems use

Please rate the extent to which your top management team currently uses performance measures to:

*Scale: 1 = not at all  to  7 = to a great extent*

<table>
<thead>
<tr>
<th>Constructs and items</th>
<th>Confirmatory factor analysis</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First-order loadings</td>
<td>Second-order loadings</td>
</tr>
<tr>
<td>Diagnostic use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Track progress towards goals</td>
<td>.830**</td>
<td></td>
</tr>
<tr>
<td>Monitor results</td>
<td>.908**</td>
<td></td>
</tr>
<tr>
<td>Compare outcomes to expectations</td>
<td>.839**</td>
<td></td>
</tr>
<tr>
<td>Review key measures</td>
<td>.698**</td>
<td></td>
</tr>
<tr>
<td>Interactive use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enable discussion in meetings of superiors, subordinates</td>
<td></td>
<td>-.155*</td>
</tr>
<tr>
<td>and peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enable continual challenge and debate underlying data,</td>
<td>.807**</td>
<td>.702</td>
</tr>
<tr>
<td>assumptions and action plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide a common view of the organisation</td>
<td>.157*</td>
<td></td>
</tr>
<tr>
<td>Tie the organisation together</td>
<td>.755**</td>
<td></td>
</tr>
<tr>
<td>Enable the organisation to focus on common issues</td>
<td>.740**</td>
<td></td>
</tr>
<tr>
<td>Enable the organisation to focus on critical success</td>
<td>.339**</td>
<td></td>
</tr>
<tr>
<td>factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop a common vocabulary in the organisation</td>
<td>.059*</td>
<td></td>
</tr>
</tbody>
</table>

Goodness-of-fit of the model: $\chi^2 (30) = 44.14; p < .046; \text{NNFI} = .930; \text{CFI} = .975; \text{RMSEA} = .069$

Note: *Significant at the 0.05 level; ** Significant at the 0.01 level
**Internal capabilities**

Please rate the extent to which the following items describe your organisation

*Scale: 1 = not descriptive to 7 = very descriptive*

<table>
<thead>
<tr>
<th>Constructs and items</th>
<th>Confirmatory factor analysis</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First-order loadings</td>
<td>Second-order loadings</td>
</tr>
<tr>
<td>Market orientation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicate information about customer experience</td>
<td>.930**</td>
<td>.942</td>
</tr>
<tr>
<td>Understanding of customer needs</td>
<td>.699**</td>
<td></td>
</tr>
<tr>
<td>Commitment and orientation to serving customers’ needs</td>
<td>.984**</td>
<td></td>
</tr>
<tr>
<td>Integration of functions to serve the needs of markets</td>
<td>.896**</td>
<td></td>
</tr>
<tr>
<td>After-sales service</td>
<td>.894**</td>
<td></td>
</tr>
<tr>
<td>Share of information concerning competitors’ strategies</td>
<td>.795**</td>
<td></td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>.950**</td>
<td></td>
</tr>
<tr>
<td>Managers understand how everyone can create value</td>
<td>.213*</td>
<td></td>
</tr>
<tr>
<td>Target customers where we have competitive advantage</td>
<td>.712**</td>
<td></td>
</tr>
<tr>
<td>Discussion about competitors’ strengths and strategies</td>
<td>.913**</td>
<td></td>
</tr>
<tr>
<td>Creation of greater value for customers</td>
<td>.455**</td>
<td></td>
</tr>
<tr>
<td>Visit of current and prospective customers</td>
<td>.803**</td>
<td></td>
</tr>
<tr>
<td><strong>Entrepreneurship</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wide-ranging acts are necessary to achieve objectives</td>
<td>.946**</td>
<td></td>
</tr>
<tr>
<td>Strong proclivity for high risk projects</td>
<td>.753**</td>
<td></td>
</tr>
<tr>
<td>First business to introduce new products, techniques, etc</td>
<td>.973**</td>
<td></td>
</tr>
<tr>
<td>Cautious, “wait and see” posture</td>
<td>.714**</td>
<td></td>
</tr>
<tr>
<td>Adopt a very competitive, “undo-the-competitors” posture</td>
<td>.909**</td>
<td></td>
</tr>
<tr>
<td>Gradually explore the environment, cautious behaviour</td>
<td>.740**</td>
<td></td>
</tr>
<tr>
<td><strong>Innovativeness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation is readily accepted in program/project management</td>
<td>.915**</td>
<td></td>
</tr>
<tr>
<td>Technical innovation (research results) is readily accepted</td>
<td>.661**</td>
<td></td>
</tr>
<tr>
<td>(32) Innovation is perceived as too risky and is resisted</td>
<td>-.300*</td>
<td></td>
</tr>
<tr>
<td>Management actively seeks innovation and ideas</td>
<td>.946**</td>
<td></td>
</tr>
<tr>
<td><strong>Organisational learning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to learn is the key improvement</td>
<td>.703**</td>
<td></td>
</tr>
<tr>
<td>Basic values include learning as a key to improvement</td>
<td>.524**</td>
<td></td>
</tr>
<tr>
<td>Once we quit learning we endanger our future</td>
<td>.641**</td>
<td></td>
</tr>
<tr>
<td>Employee learning is an investment, not an expense</td>
<td>.827**</td>
<td></td>
</tr>
<tr>
<td>Your company is much better than competitors in relation to responding to new customer needs in a speedy manner</td>
<td>.905**</td>
<td></td>
</tr>
<tr>
<td>Your company is much better than competitors in relation to tailoring products/services to individual customer needs</td>
<td>.953**</td>
<td></td>
</tr>
<tr>
<td>Your company is much better than competitors in relation to the speed at which new markets can be entered</td>
<td>.743**</td>
<td></td>
</tr>
<tr>
<td>Your company is much better than competitors in relation to the rate of introduction of new product/services</td>
<td>.866**</td>
<td></td>
</tr>
</tbody>
</table>

Goodness-of-fit of the model: \( \chi^2(342) = 906.987; p < .001; \) NNFI = .903; CFI = .917; RMSEA = 0.0878

Note: *Significant at the 0.05 level; **Significant at the 0.01 level

(a) When item 32 removed from the construct. Cronbach’s alpha = .847
Organisational performance

Please rate the performance of your organisation against initial expectations on each of the following dimensions for the past 12 months

Scale: 1 = not at all satisfactory  to  7 = outstanding

<table>
<thead>
<tr>
<th>Constructs and items</th>
<th>Confirmatory factor analysis</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First-order loadings</td>
<td>Second-order loadings</td>
</tr>
<tr>
<td>Organisational performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(42) Sales volume</td>
<td>.737</td>
<td></td>
</tr>
<tr>
<td>(43) Return on investment</td>
<td>.979</td>
<td></td>
</tr>
<tr>
<td>(44) Profitability</td>
<td>.955</td>
<td></td>
</tr>
<tr>
<td>(45) Market share</td>
<td>.860</td>
<td></td>
</tr>
<tr>
<td>(46) Meeting budget targets</td>
<td>.630</td>
<td></td>
</tr>
</tbody>
</table>
| Goodness-of-Fit of the model: \( \chi^2 (5) = 7.064**; \) NNFI = .984; CFI = .995; RMSEA = 0.065

Note:  
* Significant at the 0.05 level;  
**Significant at the 0.01 level
1. Introduction

Stakeholders of organisations anticipate that companies and their management will comply with the best practices of good corporate governance. This means that they expect organisations to implement any activities that enhance their corporate governance structures. In order to demonstrate that transparency and accountability are important to the stakeholders’ view of corporate governance, these activities should positively influence risk management procedures and the effectiveness of the board of directors.

Corporate governance is the process by which organisations are managed and controlled. It concerns the effective management of organisations. There is no single best corporate governance model. McCarthy & Puffer (2002, p.2) state that “corporate governance systems recognise the inherent conflict in objectives between owner-shareholders and managers, and thus establish institutions, policies, and procedures to protect shareholders’ interests”. The Combined Code on Corporate Governance gives guidance on keeping good structures in relation to aspects of board responsibility, accountability, audit and relations with shareholders. In the UK, all listed companies are required, as part of the Listing Rules, to report the way they comply with the Code’s principles in their annual reports. If they have failed to comply with any of the Code’s provisions, they are expected to provide an explanation.

In this paper, the concept of corporate governance is discussed in relation to the internal auditing function, the audit committee and the related internal control and risk management aspects of the governance structure. The paper also examines the role of internal audit in corporate governance. Although corporate governance compliance is analysed, the emphasis in this study is on the role that internal audit plays in improving the corporate governance system.
Increasing importance seems to be placed on the role of internal audit in strengthening the corporate governance structures. It can be seen that internal auditors help organisations to meet corporate governance expectations (Crawford & Stein, 2002). The European Confederation of Institutes of Internal Auditing (ECIIA) states that good corporate governance expects the board to be responsible for setting strategies to manage the business risks, for ensuring the effectiveness of the internal controls, and for improving company performance. Therefore, the board is expected to implement effective risk management systems. Risk management involves identifying and detecting business risks and finding ways to avoid it. The board must ensure that internal controls are adequate for the level of risk that may occur. The internal audit function should assist the management and the board with risk management implementation (ECIIA, 2005).

Good corporate governance involves having effective organisational management which in turn enables the company to achieve its objectives (Holm & Laursen, 2007). Corporate governance in the UK has stressed the importance of strengthening financial controls and the accountability of the board of directors to shareholders. A sound system of internal controls should detect any fraud and avoid any incompetence that could lead to financial risk. The Combined Code of best practice suggests guidelines on improving the systems of internal controls (Spira & Page, 2003).

Directors are required by the Turnbull Guidance, now incorporated into the Combined Code, to produce a statement that they have carried out an annual review of the effectiveness of the internal control system of their organisation. The Turnbull Guidance’s purpose was to provide guidance on the internal control provisions found in the Combined Code. The Turnbull Guidance as part of the Combined Code asserts that when firms have an effective internal control system, then this will safeguard the investors’ investment as well as the company’s assets. This way, companies can achieve their strategic objectives by managing the business risks and reviewing the effectiveness of their internal controls (Holm & Laursen, 2007).

The Turnbull Guidance, importantly, emphasises the significant role that the internal audit function plays in maintaining a sound system of internal controls. An effective internal audit function enables the board to perform its corporate governance duties. The board are ultimately responsible for internal control to be maintained in sound condition (Crawford & Stein, 2002). The internal auditing function has, therefore, an important role in helping the board to monitor the effectiveness of the internal controls. By helping the board in this way, internal auditing becomes an essential element of the corporate governance process.

The primary objective of this paper is to examine the role of internal audit in relation to corporate governance. For the purposes of achieving a practical insight into the role of internal audit in corporate governance, an online survey was sent to FTSE 100 companies asking for information on corporate governance and
the importance placed on the role of internal audit in enhancing the governance framework.

The main objectives of this study were as follows:
- to analyse UK corporate governance rules and the extent of compliance;
- to assess the effectiveness of the internal audit functions of FTSE 100 companies against corporate governance standards;
- to describe the impact of internal audit on corporate governance;
- to evaluate ways of enhancing corporate governance through the services offered to management and stakeholders.

First, a critical evaluation of corporate governance literature will be presented, focusing on the role of internal audit. The literature review will provide background research in order to achieve the research objectives. Second, the research methodology will be discussed based on the previous research approaches. Then the results will be analysed and findings discussed. Finally, the conclusion and limitations will be presented.

2. Corporate governance and the role of internal audit.

2.1. General overview of corporate governance

A substantial volume of research within management studies examines corporate governance issues. Much of the related corporate governance literature is on the role of audit committees, rather than the role of internal audit. But, the role of the internal auditor is becoming increasingly important to create good corporate governance structures (Allegrini et al 2006). In this section, the implications of the rapid developments in corporate governance standards and the effects on the role of the internal audit are discussed.

The past years have indicated that companies were not being managed properly (Pass 2006). This has given rise to several reports (such as the Cadbury Report in 1992; the Greenbury Report in 1995; the Hampel Report in 1998; Turnbull Report in 1999, and the Higgs and Smith Reports in 2003) produced to guide companies towards good corporate governance. These corporate governance principles were also included as part of the listing rules for companies listed on stock exchanges such as the London Stock Exchange (Pass, 2006; Weir & Laing, 2001).

The Combined Code of 2003 keeps the ‘comply or explain’ philosophy. This means that UK listed companies should, as with the previous Code, follow the best practice recommendations. When guidance within the Combined Code is not complied with, this should be explained in the annual report (Pass, 2006). MacNeil & Li (2006) discussed the problems associated with monitoring non-compliance.
Their research shows that company non-compliance with the Combined Code is associated with high share price performance. Their study revealed that share price performance was used by companies to justify non-compliance. The authors suggest that the corporate governance rules should be incorporated into company law, as the ‘comply and explain’ principle does not entirely satisfy the needs of the marketplace.

Pass (2006) researched how some of the UK’s largest firms have complied with the principles of the 2003 Combined Code. According to this Code, companies listed on the London Stock Exchange (LSE) are required to follow and abide by its rules. This requirement was created to boost the confidence of shareholders and other stakeholders (Ho, 2005). The Code also proposes that non-executive directors should be independent, stressing the important role they play in contributing to and enhancing corporate governance structures. Chambers (2005) investigated whether non-executive directors add value to organisations. His findings indicated that they do add value by providing good corporate governance practices.

According to Pass (2006), the Combined Code proposes that non-executive directors should have greater responsibilities. This means that non-executive directors are given greater powers when it comes to decision-making on the board and its committees. He also stresses that the Code of 2003 gives greater emphasis to the independence of non-executive directors, in order to achieve objectivity and fairness in decision-making. Nonetheless, his findings indicate that most of the companies he surveyed had difficulty implementing and sometimes in understanding the independent status expected from non-executive directors.

There is no one corporate governance structure that will fit all companies (Weir & Laing 2001). However, the Combined Code of 2003 encourages improved corporate governance structures by giving guidelines on how to achieve the best possible structure for each company. The Code is required to be complied with by listed companies (Hamil et al 2004). The Code can also be adopted voluntarily by non listed companies. Ho (2005) indicates that good corporate governance systems ensure accountability and enhance competitiveness. He, like Weir & Laing (2001), states that no single corporate governance structure is suitable for all companies.

2.2. The effectiveness of internal controls and risk management

Crawford and Stein (2002) explain that internal controls and risk management are essential elements of corporate governance. Boards of Directors are responsible for developing and overseeing the risk management and internal control systems. As internal control is an essential concept in corporate governance, the Combined Code gives guidance and recommendations on keeping sound internal control systems (Holm & Laursen, 2007).
In 1999, the Institute of Chartered Accountants of England and Wales (ICAEW) published the Turnbull Report, to provide guidance and expand further on the internal control recommendations found in the Combined Code. In particular, they stressed the importance of having an objective internal audit function, which provided assurance services to management on the effectiveness of the internal controls in controlling and managing the risks of the business entity (Crawford & Stein, 2002).

The Turnbull Guidance became a requirement for UK listed companies which had accounting year ends on or after 23rd December 2000 (Crawford & Stein, 2002). It recommended that companies review their internal control procedures, in order to detect, manage and control any risk through the internal control systems. Companies are required to produce a statement in their annual reports of how they have complied with these recommendations. The Turnbull guidance, part of the Combined Code, has influenced good corporate governance practices from publicly listed companies (Crawford & Stein, 2002). After the Turnbull Guidance came into effect, managers were required to consider all business risks which could affect the company in reaching its goals and objectives. Meanwhile, the internal audit function, whose job would be to review the internal control and risk management procedures, was given a larger role (Crawford & Stein, 2002).

Crawford & Stein (2002) investigated how companies complied with the Turnbull Guidance of 1999. They explain that internal auditors are becoming more like risk managers. However, they continue to state that organisations still count on external auditors for the annual review of the internal controls. Holm & Laursen (2007) believe that corporate governance has enhanced the role of internal audit and, at the same time, increased its benefits to the external auditor. Their findings indicate that internal control developments in corporate governance have influenced the changing role of the internal auditor. The authors highlight the fact that the internal auditors have been given bigger responsibilities in strengthening the internal control systems and the risk management procedures put in place by the board.

From a risk management perspective, internal auditors can act as risk managers to monitor risk management procedures set up for the business. The concept of risk management has recently come to the forefront of the developments taking place in corporate governance principles (Holm & Laursen, 2007). Holm & Laursen point out that both risk management and risk identification have become great concerns for many businesses. Traditionally the audit committee would only be expected, with help from the auditors, to evaluate the internal control system. Currently, after the effect of the Turnbull Guidance, the audit committee’s reviews of the internal control system have been expanded to include the risk assessment processes of organisations (Holm & Laursen, 2007).

The Committee of Sponsoring Organisations (COSO) has proposed a framework known as the ‘Enterprise Risk Management Framework’ to help organisations improve their risk management systems (Holm & Laursen, 2007). According to Crawford &
Stein (2002), COSO’s framework recognises risk assessment and risk management as part of the internal control activities. On the other hand, the Turnbull Guidance places internal controls as being part of the risk management process, and not the other way around. This is consistent with a KPMG survey that suggests that having internal control systems properly set up is one way risk can become manageable.

2.3. Changing role of internal audit

The role of internal audit has been affected by the dramatic changes in regulations, mainly from corporate governance standards and the emphasis on strengthening the internal controls of organisations (Holm & Laursen, 2007). According to IIA, internal audit is “an independent, objective assurance and consulting activity designed to add value and improve an organisation’s operations” (Nagy & Cenker, 2002, p.1). Its new definition of the internal audit function suggests that the role of internal auditors has moved towards adding value. Furthermore, the profession seems to be more rule-based than ever before (Nagy & Cenker, 2002).

Traditionally, the internal auditors have acted as police-type characters that check and monitor the company’s procedures and level of compliance with rules (Skinner & Spira, 2003). Currently, internal auditors can be portrayed as consultants, and the internal audit function of companies as helping to achieve and add value. This shows that internal audit has changed from the traditional image of just checking processes and transactions of the auditing system to being involved in a more widespread way in risk management procedures across the operations of the business (Skinner & Spira, 2003). Sarens & De Beelde (2006) state that internal auditors are currently expected to make things happen rather than wait to respond to it after it has occurred. This means they need to play a more proactive role in creating internal control systems and improving them, as well as raising awareness of any new and existing risk management procedures.

As internal auditors are part of the internal control system, one of their important roles is to give assurance on the risk management systems, objectively, to the management of the organisation (Dittenhofer, 2001 and Spira & Page, 2003). This assurance involves testing, checking and providing advice on the internal control systems set up to manage the risks. So it can be seen that the internal auditor is an essential provider of support to the management of the organisation in achieving its corporate governance responsibilities.

Fraser & Henry (2007) investigated how companies control risk and set internal control and risk management procedures. They found that although companies expected internal auditors to be monitoring the effectiveness of internal control systems, they questioned their level of expertise and also their degree of independence. The authors recommended that the risk management role and the internal audit role should be separated, in order to maintain objective and independent internal audit
functions. And, as the audit committee is participating more in the review of risk management procedures, the authors recommended that companies set up separate risk committees, which would solely deal with risk management issues. This would allow audit committees to concentrate more on the work carried out by the internal audit function and on monitoring the effectiveness of the system of internal controls (Fraser & Henry, 2007). They also suggest that boards are increasingly relying on internal auditors to monitor the risk management processes. As a result, internal auditors can end up becoming involved with activities which can damage their objectivity and independence. Fraser & Henry (2007) found that when internal auditors become involved with these business operations, they usually lack the experience and expertise to perform the role properly. The authors argue that, for example, some internal auditors may not be qualified to suggest any improvements when reporting on risk management procedures.

The IIA stresses that the internal auditor should provide assurance services to organisations (Spira & Page, 2003). Nagy & Cenker (2002) found that the internal audit functions vary from one company to another. Some companies have their internal auditors concentrating more on assurance services, rather than value adding services; others follow the opposite path. Holm & Laursen (2007) found that the value adding activity and achieving objectivity and transparency can become conflicting. This puts pressure on the internal auditors and their role in internal control and risk management.

2.4. Internal audit effectiveness

Internal auditing is a difficult operation to carry out. It involves lengthy time periods of planning, checking, analysing and organising data. It also requires extra processes such as interviewing, reporting and evaluating the procedures and systems of the business (Dittenhofer, 2001). Zain et al (2006) state that the internal audit function is demanding and for it to be effective, it needs adequate resources such as founding, people and systems. Al-Twajiry et al (2004) found that the co-operation between the internal and external auditors is dependent on the objectivity and competence of the internal auditors, as well as how much experience they have, which in turn affected the level of quality of the audit work.

Internal audit effectiveness is achieved when targets and objectives are accomplished (Dittenhofer, 2001). If internal auditing procedures are properly carried out and targets are achieved, then favourable results should be achieved. Mihret & Yismaw (2007) state that internal audit effectiveness can be achieved with the help of four interlinked components: internal audit quality, management support, organisational setting, and the attributes of the audited company. This suggests that the internal audit function needs to be able to produce quality audits. If the audit’s results are useful
to management, then they will support the internal audit function, for example by providing more resources to improve the effectiveness of the audit. This way, management is more likely to exercise and implement any duties that are recommended by the internal auditors. The organisational setting where the internal audit procedures take place should allow audits to be carried out efficiently. And finally, the audited company’s interaction with the audit operation and its degree of helpfulness has consequences for the effectiveness of the internal audit. Mihret & Yismaw (2007) stress that the four factors listed above, if their relations are understood, can increase internal audit effectiveness.

Vinten (1999) states that internal audit effectiveness is achieved when there is independence, sufficient resources and support from management. The author argues that the objectives of internal auditors should be supported when they perform their duties. He stresses the importance of independence from management and the avoidance of any conflict of interest that may arise. This means that the internal auditors should be perceived as being independent and objective. According to Al-Twaijry et al. (2004) the overall internal audit quality and effectiveness is affected by the objectivity and competence of the internal auditor.

The internal audit department should operate with professionalism and comply with the relevant standards. In addition, the internal audit staff should be competent and have the appropriate skills necessary to carry out their tasks (Vinten, 1999). Al-Twaijry et al. (2003) state that complying with the standards could also be a way to enhance internal audit effectiveness. He also stresses that this is one of the ways the internal audit function can add value to the company.

The internal audit function has to add value to the company and has to be perceived to be doing so (Mihret & Yismaw, 2007). For the internal audit to add value to the company, it is important that the external auditors and the internal auditors co-operate. Because the internal audit function is part of the internal control system, the external auditors may rely on the work carried out by the internal auditors (Al-Twaijry et al., 2004). If the internal auditors are seen to be competent and objective they are more likely to produce high quality audits, which aid the external auditors to arrive at their findings.

Zain et al. (2006) argue that the size of the internal audit unit and its level of experience have the biggest impact on the quality of the internal audit. The authors explain that larger internal audit departments have a greater volume of audit work than smaller ones. Research carried out by Al-Twaijry et al. (2004) in Saudi Arabia also indicates that external auditors find the size of the internal audit function is a good indicator of the quality of the internal audit. The authors, moreover, state that the smaller the size of the internal audit department, the less the external auditors rely on the work conducted by the internal audit department. Smaller internal audit departments are limited in the range of work they do as the resources the company gives
are more likely to be limited. Zain et al (2006) also agree that the quality of internal audits is a factor of the size and experience of the internal audit department.

2.5. Audit committee

The audit committee oversees the responsibilities of the internal auditors and ensures that auditors fulfil their duties. The audit committee can improve the effectiveness of the internal audit function by reviewing its activities (Zain et al., 2006). It is important for the audit committee to be competent and independent, so that it can enhance the effectiveness of internal audit functions. The internal audit function is a part of the internal control system, so external auditors can rely on its findings. The internal audit function is also part of the overall corporate governance system in place. The audit committee plays an important part in this system because it is the control mechanism set to monitor the internal audit function (Zain et al 2006).

Zain et al (2006) suggest that if the audit committee exercises its control and makes the key decisions, this reduces the influence of management’s decisions. This way, the audit committee enhances the independence of the internal audit function. Internal auditors will do their jobs much better and have greater confidence when conducting their audit activities. When the audit committee supports the internal audit function, this should, as a result, enhance the quality of internal audits. The more the audit committee reviews the scope of the internal audit function, the higher the probability of finding inadequacies and correcting them (Zain et al 2006).

Nagy & Cenker (2002) explain that the internal auditor should help the audit committee to meet its corporate governance objectives. In general, the internal audit’s role is to identify and evaluate risk. And risk management is one possible way of adding value (Spira & Page, 2003). The internal audit function should help in managing any business risks that might arise, should advise on ways of identifying potential risks and on whether the control systems set are adequate to manage it. Professional internal auditors are expected to give professional opinions on internal control system capabilities. Accordingly, they check that policies to manage risk are properly implemented.

As referred to previously, internal auditors are playing bigger roles in improving operational matters and corporate performance (Spira & Page, 2003). As internal auditors become more involved with the company’s operations, the question is whether this will reduce their level of independence (Bou-Raad, 2000). Internal auditors have to be independent when providing the services expected from them. Being independent from management ensures that they give objective opinions without any powerful influences from management interfering with their judgement. (Zakaria et al., 2006).

Sarens & De Beelde (2006) used a case study approach to understand the relationship between internal auditors and senior management. Their findings indicate that senior management’s expectations affect the outcome of the internal audit. Internal
audit is expected to help to improve risk management and internal control systems. However, the internal auditors expect management to initiate improvements in these areas and to provide support for their work.

Allegrini et al. (2006) mention that the type of relationship internal audit has with the management and audit committee is one of the challenges for the internal audit function. The internal auditors need to perform their roles independently and objectively, reporting to the audit committee. An effective audit committee can enhance the internal audit function by allowing the internal auditors to report to them and raise issues regarding management independently (Sarens & De Beelde, 2006). Accordingly, the internal auditors are expected to be independent of the management structure. The audit committee can help to enhance the internal auditor’s independence, where the auditors only report to the committee. This allows the internal auditors to objectively give advice on management issues relating to corporate governance processes.

2.6. Internal audit function

The IIA emphasises the importance of corporate governance. It sees the internal audit function as an important mechanism that supports company management and the audit committee in achieving effective governance structures (Nagy & Cenker, 2002). As indicated by Skinner & Spira (2003), internal audit is essential to corporate governance as it focuses on key factors such as the system of internal controls and risk management procedures. Al-Twaijry et al. (2003) explain that there are two benefits in having an internal audit function. First, on the effectiveness of the system of internal controls, which includes preventing fraud and safeguarding the company’s assets. Second, by adding value to the organisation through improving the processes and systems of operations. In addition, they stress that for any benefits to arise, the internal auditor must comply with the professional standards applicable to them.

The ECIIA states that a good corporate governance structure depends on the way the internal auditors work with the board of directors, the audit committee and the external auditors. To produce better corporate governance systems, all these parties need to work together. This shows that a good corporate governance system requires an internal audit function because internal auditors can support management with ensuring the control and risk management systems are correctly put in place and effective (ECIIA, 2005).

The internal audit function can add value to corporate governance through their assurance services and maybe by acting as consultants within the firm. They contribute to the achievement of enhanced corporate governance by providing assurances on the organisations’ risks and operational matters objectively to the board of directors. By acting as consultants they are also seen to influence the corporate governance system, as they will be sharing their knowledge and advising management to make amendments and improvements in these corporate governance processes (Nagy & Cenker, 2002).
Ultimately, the board of directors are responsible for risk management. The internal audit function has the role of identifying potential business risks and advising the board on how to improve the risk management systems and internal controls of the organisation (Spira & Page, 2003). The internal audit function should provide information to management on the organisation’s ability to manage risks. They do this after checking the operations of the business, to see if the rules and principles set are followed properly. Organisations may face dangerous risks in order to achieve their strategic objectives. How the board of directors attempts to manage those risks is reflected in their corporate governance structures. Overall, research suggests that the internal audit function helps to promote good corporate governance principles. It is an essential aspect of achieving enhanced corporate governance structures, as the literature review indicates.

Internal auditing allows companies to achieve their strategic objectives efficiently. The internal audit function helps to improve corporate governance processes by enhancing internal control systems and risk management procedures that have been set to achieve those objectives. It is said that an effective internal audit function has the potential to add value (Spira & Page, 2003). In addition, the internal audit function can help to meet corporate governance expectations. Crawford & Stein (2002) state that as corporate governance continues to be developed, this has placed greater importance on the role of the internal audit function.

3. Research approach

Research methodologies on corporate governance are usually based on surveys, questionnaires and case studies. For example, Zakaria et al (2006) used surveys and questionnaires to collect their data. They also conducted some telephone surveys. An example of a case study approach can be seen in the article by Reid & Ashelby (2002).

Alleyne, et al (2006) investigated the role and function of audit committees in public companies in Barbados, after corporate scandals in the US. For their research they used mixed methods of constructed questionnaires, interviews with management and they also conducted a content analysis of the published annual accounts. Questionnaires were sent to 26 local publicly listed firms. Razae & Olibe (2003) also applied content analysis of the annual accounts as their research methodology. They mainly focused on the audit committee report within the corporate governance statement.

Alleyne, et al (2006) and Paape et al (2003) investigated the role of internal audit within the field of corporate governance. A questionnaire was created and sent to FTSE 100 listed firms. The questionnaire was designed to collect practical information and primary data on corporate governance and the role of internal audit. Important
factors relating to the enhancement of the corporate governance system, such as the internal audit function, the audit committee and external auditors were covered by the questionnaire. By focusing on these areas of corporate governance, it was possible to analyse the ways in which these firms set business risk management policies and how effective their internal controls are.

For the purpose of this project an online questionnaire was sent to FTSE 100 listed companies. As the research is very descriptive in nature, a questionnaire was considered to be the best approach to collect the data. The survey was created to target only senior level officials of the FTSE 100 firms.

The questions have mainly attempted to examine the extent to which the companies comply with those corporate governance rules focused on the internal audit function. To increase the chance of attracting the respondent’s attention, the questionnaire began with a few simple questions about compliance with corporate governance standards in the UK and then looked at the changing role of internal audit. Questions asked in the questionnaire covered the following areas:

- internal audit function;
- role of the audit committee;
- independence of the members of the audit committee, management and internal auditors; and
- internal and external auditors and their relationships with each other.

The questionnaires were sent to the FTSE 100 firms via email, which was considered to be the most appropriate and cost effective way of distributing the online survey. Before sending the email to the companies, a covering letter was attached to it specifying the research topic being followed. To improve the accuracy and reliability of the results, the covering letter confirmed the confidentiality of the respondents’ answers. The online survey was loaded by clicking on a link in the covering letter. This ensured that any response was quickly captured by the online system created to record the responses. A copy of the survey is included in the Appendix. The online survey created was first tested using a pilot questionnaire sent to ten randomly selected companies (Goodwin & Yeo, 2001). This produced a single response out of the ten companies. Consequently, it was believed that the questionnaire was too long and as a result, an improved and final questionnaire was created. The improved questionnaire only included 14 questions, which required less time to answer. The questions themselves were also improved.
4. Corporate Governance and the Role of Internal Audit – results and discussion

The data for this study was collected using the automatic online survey system. The response rate was reasonably high, with a total successful response rate of 22% (21 out of 95) after adjusting for delivery failures. A total of 102 companies were included in the survey, but 7 of them did not receive the questionnaire due to address delivery problems. The response rate is a bit higher than the 17% that Paape et al (2003) achieved from UK respondents.

Table 1: Corporate governance in the UK

<table>
<thead>
<tr>
<th>Percentage of responses</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate governance standards in the UK are weak in describing the role of the internal audit</td>
<td>0</td>
<td>14.3</td>
<td>28.6</td>
<td>47.6</td>
<td>9.5</td>
</tr>
<tr>
<td>The UK corporate governance standards need to be improved</td>
<td>0</td>
<td>14.3</td>
<td>28.6</td>
<td>52.4</td>
<td>4.8</td>
</tr>
<tr>
<td>Compliance with corporate governance principles is difficult</td>
<td>0</td>
<td>14.3</td>
<td>4.8</td>
<td>66.7</td>
<td>14.3</td>
</tr>
</tbody>
</table>

As can be seen from the Appendix, the online survey questionnaire asked a variety of questions relating to corporate governance and the role of internal audit. From Table 1 it can be seen that of the 21 successful responses, over 47% believe that the corporate governance standards in the UK are strong in giving guidance on the role of internal audit. However, just slightly more than 14% agreed that corporate governance standards in the UK are weak in describing the role of internal audit and almost 29% gave a neutral response.

Responses to the next question followed a similar pattern. The majority of the respondents (52.4%) disagreed that the corporate governance standards in the UK needed to be improved (see Table 1). Having said that, a significant percentage (14.3%), agreed with this question, while less than 5% strongly disagreed. Most of the respondents disagreed that complying with the corporate governance principles is difficult. On the other hand, a high amount of responses (14.3%) argued the opposite, suggesting that some companies are finding it quite difficult to comply with the principles of good corporate governance.
Table 2: Expertise and role of internal audit

<table>
<thead>
<tr>
<th></th>
<th>Percentage of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>The corporate governance standards and principles have strongly affected the role of the internal auditor</td>
<td>9.5</td>
</tr>
<tr>
<td>The internal auditors have the experience and the expertise to solve the risk management problems that arise within the organisation</td>
<td>9.5</td>
</tr>
</tbody>
</table>

One of the important questions asked in the questionnaire was whether the standards have strongly affected the role of internal audit. Consistent with the literature, Table 2 suggests that the majority of responses agreed with this, while some companies seem to be unsure, giving a neutral answer. Spira and Page’s (2003) paper also suggests that corporate governance has enhanced the internal audit profession and emphasised the importance of its role. In addition, almost 43% of respondents indicated that internal auditors are experienced and competent to solve risk management issues. The second highest response (38.1%) was neutral. Significantly, a few of the companies that responded disagreed with the question.

Table 3 analyses the effectiveness of a company’s internal audit department. It shows that most companies (47.6%) seem to be developing and training their internal auditors. This is reflected by the next question, where over 52% of the companies believe that their internal audit staff is able to improve the efficiency of operations. It also seems that most companies have dedicated enough resources to their internal audit departments. Nearly 60% of the companies that have responded to the questionnaire agreed that their internal audit department is well resourced. But almost 15% responded that this was not the case, disagreeing with the question. The study carried out by Pickett (2000) highlights the importance of the training and development of internal audit staff to the success of organisations. He illustrates how staff development will lead to, in the long run, a reduction in time spent inspecting their work. This is one reason why the internal audit department needs to be adequately resourced.
**Table 3: Internal audit department effectiveness**

<table>
<thead>
<tr>
<th></th>
<th>Percentage of responses</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>Internal audit staff get all the training and development they require</td>
<td>19</td>
<td>47.6</td>
<td>28.6</td>
<td>4.8</td>
<td>0</td>
</tr>
<tr>
<td>The internal auditors are competent in enhancing the efficiency of operations</td>
<td>23.8</td>
<td>52.4</td>
<td>19</td>
<td>4.8</td>
<td>0</td>
</tr>
<tr>
<td>Internal audit department is well-resourced</td>
<td>19</td>
<td>57.1</td>
<td>9.5</td>
<td>14.3</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 4: Changing role of internal audit towards value added activities**

<table>
<thead>
<tr>
<th></th>
<th>Percentage of responses</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>The internal audit department carries out value-added activities</td>
<td>23.8</td>
<td>47.6</td>
<td>19</td>
<td>9.5</td>
<td>0</td>
</tr>
<tr>
<td>Value-added activities bring greater pressures for the internal audit department</td>
<td>0</td>
<td>65</td>
<td>20</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>The role of the internal audit has changed for the right reasons e.g. value added activities</td>
<td>23.8</td>
<td>57.1</td>
<td>9.5</td>
<td>9.5</td>
<td>0</td>
</tr>
<tr>
<td>The larger role of the internal audit improves the communication and cooperation with the external auditors</td>
<td>20</td>
<td>50</td>
<td>30</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Mostly, the responses suggested that the role of internal audit has changed. This finding is consistent with the research literature. As identified in Table 4, the majority of the responses (57.1%) indicate that its role has changed towards adding value to
the organisation. This larger role of the internal auditors appears to have enhanced the communication and co-operation with the external auditors, as suggested by the majority of responses given by the companies. It was found that nearly all of the companies (23.8% plus 47.6%) who responded, had their internal audit department carrying out value added activities. However, 65% of them also agreed that these value added activities had produced more pressure for their internal audit departments. It can be seen that 15% of participants surveyed disagreed with this statement. As can be seen in the Appendix there are 20 responses rather than 21. It seems that one of the companies either missed or perhaps skipped the question. This, however, has not reduced the significance and reliability of the received responses.

![Figure 1: Measuring value added activities](source: Adapted from IIA (2005, p. 7))

A 2005 IIA survey highlights that 26% of the survey participants did not have any formal methods set up to measure the value added by their internal audit departments. This suggests that some companies are not utilising the value adding role of their internal audit departments. However, some companies do seem to have some formal methods in place to measure the value adding activities carried out by the internal audit department (see Figure 1).
Table 5: Internal audit independence

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal auditors report directly to the audit committee</td>
<td>61.9</td>
<td>28.6</td>
<td>4.8</td>
<td>4.8</td>
<td>0</td>
</tr>
<tr>
<td>Internal audit department has the authority and independence to carry out its duties</td>
<td>57.1</td>
<td>42.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The last part of the questionnaire identified that the internal audit departments of all the companies which responded are able to perform their responsibilities freely and independently. It is important that internal auditors are seen to be independent from management. The questionnaire reveals that most companies surveyed (61.9%) strongly agree with this important principle. But it also reveals that some companies (almost 5%) have not been taking this crucial concept seriously (see Table 5).

Figure 2: Who do the internal auditors report to?
Source: Adapted from IIA (2005, p. 13)

The 2005 survey by the IIA revealed that some companies had internal auditors reporting to their management. As illustrated by Figure 2, the survey found that the majority (76%) of the respondents had their internal audit department reporting to the audit committee on an operational basis – which is when internal auditors report
internal auditing plans. But the results also highlight that some internal audit departments are reporting to senior management, as clearly shown by Figure 2. This is not in accordance with best practice because it could reduce the level of independence and objectivity of the audit department.

The questionnaire sent to the companies revealed, in general, that UK corporate governance standards strongly influence the role of internal audit. It also shows that internal audit departments are becoming more involved with value added activities, even though it was realised that these activities can increase pressure on the department. However, it can be seen that this enhanced role has had a positive impact on the relationship between the internal and external auditors. The relationship with the audit committee is also very professional, as the internal audit departments seem to report directly to them, strengthening their level of independence. Responses also suggested that the internal auditors of the sample companies are properly skilled, as their departments are well-resourced and they themselves seem to receive further training and development. This shows that listed companies are looking after their internal audit staff properly and are improving their level of expertise by allowing them to perform their duties and support themselves with adequate resources allocated to their departments.

5. Conclusions and limitations

In this paper, the role of internal audit was discussed in the context of corporate governance. From the findings of this study, it can be seen that the internal audit function supports the achievement of good corporate governance standards. It provides assurance as to the effectiveness of internal controls and other corporate governance processes. The internal auditors can advise management on how to enhance and maintain good corporate governance processes, such as risk management. They can also independently provide feedback to management on essential issues relating to corporate governance.

The research indicates, however, that the role of internal audit is expected to deliver against increasing demands. For this reason, it is vital that the internal audit department is adequately resourced so that the internal auditors can overcome obstacles due of lack of adequate skills. Reports on corporate governance, such as the Turnbull Guidance, have caused changes in the way businesses identify and manage risk (Fraser & Henry, 2007). The Guidance emphasises the significance of having an internal audit function, which provides reasonable assurance to management on the effectiveness of the internal control system. This means the internal audit function has to be capable of discharging its duties competently.
With a 21% response rate, the survey, sent to FTSE 100 firms, found that the role of internal audit is heavily influenced by developments in corporate governance principles. It identified that internal auditors are given significant roles in improving the operations of their companies. The results show that internal auditors are becoming more involved in value adding activities in their businesses. On the whole, the results of the survey suggest that companies are recognising the major role that the internal audit function plays, and that companies are increasing the level of resources in order to improve the quality and expertise of their internal audit departments. Overall, the findings of this study are quite encouraging and suggest that companies appreciate the importance of corporate governance and that UK listed companies are complying with the Combined Code.

For this paper the internet has been the main method of gathering data. One of the limitations of this study is the difficulty of conducting interviews in person and by telephone with sample companies, although any information obtained in this way would have been more reliable and very useful. Face to face interviews are the most difficult to conduct (Nagy & Cenker, 2002). Questionnaires sent by post or email are easier to distribute and more likely to get a response. The online survey itself could have been improved. Some of the questions were too straightforward to answer. There was a purpose behind this, however, which was to encourage participation in the research. If questions were more information-seeking, more data could have been gathered, the analysis would have been much more comprehensive, and as a result, research objectives would have been more fully satisfied. A further limitation worth mentioning is that, although the response rate was exceptionally high, most of the FTSE 100 companies chose not to participate.

References:


Appendix: Corporate Governance and the Role of Internal Audit

1) **Corporate governance standards in the UK are weak in describing the role of the internal audit**

<table>
<thead>
<tr>
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<tr>
<td>Agree</td>
<td>14.3 3</td>
</tr>
<tr>
<td>Neutral</td>
<td>28.6 6</td>
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<td>Disagree</td>
<td>47.6 10</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>9.5 2</td>
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</table>

Total responses: 21

2) **The UK corporate governance standards need to be improved**

<table>
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<tbody>
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<tr>
<td>Disagree</td>
<td>52.4 11</td>
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<tr>
<td>Strongly Disagree</td>
<td>4.8 1</td>
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</tbody>
</table>

Total responses: 21

3) **Compliance with corporate governance principles is difficult**

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<tbody>
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<tr>
<td>Agree</td>
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<td>4.8 1</td>
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<tr>
<td>Strongly Disagree</td>
<td>14.3 3</td>
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Total responses: 21

4) **The corporate governance standards and principles have strongly affected the role of the internal auditor**

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</tr>
<tr>
<td>Strongly Disagree</td>
<td>0.0 0</td>
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</table>

Total responses: 21
5) The internal auditors have the experience and the expertise to solve the risk management problems that arise within the organisation

<table>
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Total responses: 21

6) Internal audit staff get all the training and development they require

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<tr>
<td>Strongly Disagree</td>
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Total responses: 21

7) The internal auditors are competent in enhancing the efficiency of operations

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Total responses: 21

8) Internal audit department is well-resourced

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Total responses: 21
9) The internal audit department carries out value-added activities

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<tr>
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Total responses: 21

10) Value-added activities bring greater pressure for the internal audit department

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Total responses: 20

11) The role of the internal audit has changed for the right reasons e.g. value added activities

<table>
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Total responses: 21

12) The larger role of the internal audit improves the communication and cooperation with the external auditors

<table>
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<tr>
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Total responses: 20
13) **Internal auditors report directly to the audit committee**

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</tr>
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</tr>
<tr>
<td>Strongly Disagree</td>
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<td>0</td>
</tr>
</tbody>
</table>

Total responses: 21

14) **Internal audit department has the authority and independence to carry out its duties**

<table>
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<th>Responses</th>
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<tbody>
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<tr>
<td>Disagree</td>
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</tr>
<tr>
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<td>0.0%</td>
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</table>

Total responses: 21
1. Introduction

Management accounting (MA), management accounting systems (MAS), management control systems (MCS), and organisational control (OC) are terms with a similar content and many times are used interchangeably. The first, MA, refers to various practices such as budgeting or product costing, etc. and while MAS refers to the systematic use of MA to achieve some goal, MCS is a wider term which includes MAS and other types of controls such as personal or mass controls. OC could be used for controls included in activities or processes such as statistical quality control or just-in-time management (Chenhall, 2003, p.129).

Besides management’s opinion that management accounting systems (MAS) pass the cost-benefit test (Foster and Young, 1997) there are no significant research results to validate the alleged benefits of MAP combinations and their interaction with internal and external environmental and organisational factors and their impact on organisational performance. MAP are considered as a vital part of management control systems (MCS), Chenhall (2003). He suggests that MCS are useful, improve job satisfaction and enhance organisational performance; however, he argues that there is no evidence to suggest that such links exist. He also proposes an investigation of contextual settings within which they may be most beneficial (Ibid, pp.130–132).

2. Development of Hypotheses

Management accounting research presents evidence for some selective management accounting practices which, combined with various internal and external factors, lead to improved organisational performance, both financial and non-financial
(Chenhall and Langfield-Smith, 1998a, 1998b, 1998c; Cagwin and Bouwman, 2002; Chenhall, 2003; Cohen et al, 2005). The arguments in support of MAP are generally based on the comparative advantage that organisations can gain from the valuable information generated through MAP and eventually improve financial performance. Although MA tools, as a basic component of an MCS, have strong theoretical support, various researchers (Otley, 1986; Ward, 1992; Otley, 1999; Chenhall and Langfield-Smith, 1998a; 1998b; 1998c; Chenhall, 2003) suggest that practitioners should be cautious in selecting the appropriate tools suitable for their organisations, attempting to gain maximum benefits and eventually to maximise performance, because not every MAP will produce the same benefits across firms. Also, the selection of these tools rely heavily on various internal and external organisational factors.

The first issue for investigation here is whether increasing use of MAP (more MA tools) is directly associated with improvement of financial performance without regard to firm and sector-specific environmental characteristics. The second is, what is the “best” combination of MA tools (or the most prevalent tools) available that maximise performance. Both issues have not been empirically tested simultaneously. This leads to the following alternative hypotheses.

**H1. There is a positive association between the extent of the use of MAP and relative improvement in financial performance (compared with other firms in the industry).**

With null hypothesis:

**H1₀. There is no positive association between the extent of the use of MAP and relative improvement in financial performance (compared with other firms in the industry).**

Financial (market and corporate) performance is measured relatively to other firms in the industry, while some variables of interest and some independent variables are tested. The evaluation of the aforementioned hypotheses constitute a baseline for this research. If MAP provide a comparative advantage, on average, for every firm, regardless of its circumstances, then confirmation would be expected for the alternative hypotheses. Also, if an expected realisation of the benefits of MAP require some other specific conditions then the focus will shift to hypotheses two.

**H2. The association between the extent of the use of MAP and relative improvement in financial performance is impacted by specific contingent factors and organisational characteristics.**

With null hypothesis:

**H2₀. The association between the extent of the use of MAP and relative improvement in financial performance is not impacted by specific contingent factors and organisational characteristics.**
3. Model development – research design

For the purposes of this study the impact of MAP on financial performance with interactions from internal and external organisational factors is examined based on the following relationship:

$$\Delta FP = f (MAP, \text{contingencies}, \text{control variables})$$

Where, $\Delta FP$ is the change in the composite construct of financial performance measurement including both the Market Performance (MP) construct and the Corporate Performance (CP) construct. The relationships between the constructs are presented graphically in Figure 1. The figures show that MAP is a latent construct that consists of five components or endogenous constructs: Planning and Budgeting Tools (PB Tools), Decision Support Tools (DS Tools), Cost Analysis Tools (CA Tools), Performance Evaluation Tools (PE Tools), and Strategic Management Accounting Tools (SMA Tools). The figure also identifies five specific enabling conditions: Management Techniques (MAN.TEC), Other Influences (OTH.INF), Business Philosophy (BUS.PHI) and Basic Factors (BAS.FRS) and Other Practices (OTH.PRA). Control variables include: Type (TYP), Size (SIZ) and Time (TIM). Variable names are capitalized (Table 1). The literature used to identify an appropriate measure for each construct is included in the Appendix – Table 1. Most constructs are latent constructs, composed of two or more manifest variables (items). Composite scores of multiple variables have the advantage of capturing more of a construct’s multi-dimensionality than individual questions (Foster and Swenson, 1997). Use of multi-item measures also reduces the effect of random and measurement errors.

4. Sample selection – survey instrument

The sample of this research was the top 415 Greek companies, which were selected from the ICAP (2008) list. ICAP S.A. is a Greek financial and business information company which issues various reports and statistics concerning all Greek industry sectors on an annual basis and is considered a very reliable source.

Based on sales revenue, firms should belong in the large (>40m euro) and medium-size (>5 and <40 m euro) categories. Concerning manpower, firms should also belong in the large (>250 employees) and medium-size organisations (50–250 employees). This is because the small ones present some difficulties and, more important, these companies do not have the tools, information is rare, and in some cases, the available information is far from reliable. In Greece, as anywhere else, larger companies are those expected to use most of the tools and practices proposed. The aforementioned classification is ac-
According to EU directive 96/280/EC 03–04-1966. For the remainder of the demographic data, see Appendix – Table 2.

Regarding collection of data from 415 companies, 214 returned the questionnaire, which corresponds to a 51.57% response rate. After excluding 16 incomplete questionnaires, a total of 198 questionnaires (or 48%) were retained for analysis.

Concerning the suitability of the sample size, most researchers normally work to a 95 per cent level of accuracy. Taking into consideration the fact that the total number (population) of Greek private companies listed in ICAP SA with more than 50 employees and also between 5 and 40 million euros (i.e. medium and large companies) are 415 out of the total 600, the sample of this research should be 196 companies at a 95 per cent level of confidence (Saunders, Lewis, and Thornhill, 2000, p.156).

Prior to official hypothesis testing, a rough approximation of the main model was tested. The model produced information regarding the overall efficacy of variables. One construct was composed of two performance variables and these were regressed against constructs of the thirteen independent variables. Survey items are weighted equally within constructs and constructs are weighted equally within composite constructs. The regression model is:

\[ \Delta FP = \alpha_{FP} + b_{1FP}x_{1} + b_{2FP}x_{2} + \ldots + b_{13FP}x_{13}. \]

Where:

\( \Delta FP \) = the average of five-point measures of industry improvement of financial performance items over three years (composite construct of market and corporate performance).

\( b_{1FP}, b_{2NFP} \) = the respective beta coefficients of independent variables.

\( x_{1}, \ldots, x_{13} \) : The respective thirteen independent variables.

As mentioned above, all items carry equal weight in the analysis and this was necessary in order to avoid any bias in manipulating the data. Cronbach’s coefficient alpha (\( \alpha \)) was used to measure the reliability of scale (Cronbach, 1951). The total number of items of all units was 118. It was necessary to remove some items from each dimension to improve the value of \( \alpha \). Therefore, after removing 50 items, the coefficient \( \alpha \) was calculated from the beginning and the new values ranged from 0.633 to 0.860.

Exploratory factor analysis (EFA) was used in order to verify and validate the construct of the remaining items and to further reduce the number (Chu and Murrmann, 2006), The final number of variables to be analysed were 54.

Also, the coefficients of reliability of the correlated variables (factors) fluctuated between 0.633 and up to 0.853, showing that the internal consistency of factors is good. Finally, the most common form of validity is the validity of content (Zikmund, 1997) which, in sum, refers to the acceptance by practitioners that the variables proposed are appropriate to measure and test the concept or hypothesis in question. Academics and practitioners of management accounting were asked to give their professional opinion.
for the constructs created after the factor analysis and the majority agreed that the variable content is appropriate and their concept is suitable for the respective factors. SPSS 12 was the statistical software employed for all the aforementioned analyses.

6. Results

The analysis comprised four models. First, only the ten MAPs are regressed against financial performance. Then, in the following three models, each time, one additional contingent factor is added to examine the impact of these factors to financial performance; analytically, for the synthesis of each model see Appendix – Table 3. For the synthesis of each independent variable see Appendix – Table 4 and for the dependent variables see Appendix – Table 5.

Model 1: The model is statistically significant (F=4.681 and Sig=0.000) and the ten (10) independent variables explain the dependent variable by 27.3 per cent (adjusted R² = 0.273). More specifically, for MAP: Detail budgeting systems, Value chain analysis, Cost analysis methods, SMA techniques, beta coefficients are positive and statistically significant at 0.01 level, thus H1 is accepted (H1: There is a positive association between the use of MAP and a relative improvement in financial performance). The remaining independent variables are statistically insignificant, therefore do not support the suggested model.

Model 2: The model is statistically significant (F=5.389 and Sig=0.000). By adding one more independent variable in the previous model, the R² increases by 26.22 per cent (from R² 0.347 to 0.438). This additional contingent variable has a positive beta coefficient (0.215) and it is statistically significant at 0.10 level. Thus H2 is accepted (H2: The association between the use of MAP and relative improvement in financial performance is impacted by specific contingent factors, i.e. the ‘Other Practices’).

Model 3: The model is statistically significant (F=4.86 and Sig=0.000). By adding one more independent variable in the previous model, the R² increases by 0.30 per cent (from R² 0.438 to 0.441). However, this additional contingent variable has a negative beta coefficient (-0.055) and it is statistically insignificant at 0.10 level. Thus H2 is accepted for the specific contingent variable ‘Other influences’ (The association between the use of MAP and relative improvement in financial performance is not impacted by specific contingent factors).

Model 4: The model is statistically significant (F=4.474 and Sig=0.000). By adding one more independent variable in the previous model, the R² increases by 6 per cent (from R² 0.441 to 0.480). This additional contingent variable has a positive beta coefficient (0.234) and it is statistically significant at 0.10 level. Consequently, H2 is accepted (The association between the use of MAP and relative improvement in financial performance is impacted by specific contingent factors, i.e. the ‘Management techniques’).
Financial performance – Analysis

According to practitioners, the following combinations of practices (variables) provide positive synergies for financial performance improvement: Detail budgeting systems, Value chain analysis, Cost analysis methods, SMA techniques. Also, their interaction on financial performance is positive and significant, therefore these practices are positively related with market and corporate performance improvement.

According to them the following practices have improved their companies’ financial performance indicators (Market performance: Sales, Growth in sales volume, Market share, Growth in market share, and Corporate performance: ROI, Net profit, Profit margin, Asset turnover).

The items of the practices are the following:

Detail budgeting systems for: Compensating managers, Planning – Cash flows, Planning – Financial position.

Value chain analysis: same item, Value chain analysis.

Cost analysis methods: Absorption or Full costing, Process Costing, Job Order Costing, Standard Costing.

SMA techniques: Life cycle costing, Quality costing, Strategic costing, Strategic pricing, Target costing, Value chain costing, Brand value budgeting and monitoring, Competitor appraisal based on published financial statements.

Also, the following contingent factors have a significant impact on financial performance improvement.

Other practices (B): Just-in-Time, Total Quality Management (TQM), Materials requirements planning (MRPI), Manufacturing resource planning (MRPII).

Management techniques (D): Integrating information systems with supplier and/or distributors, Downsizing the organisation, Reorganising existing manufacturing/service processes.

These findings are consistent with statements by researchers that MAS is meant to be efficient in supporting operational effectiveness (Granlund and Lukka, 1998; Cooper, 1996; Granlund, 1997, Cagwin and Bouman, 2002, Sulaiman et al 2004), and that MAP have contributed positive effects to the practicing firms (Ghosh and Chan, 1997; Chenhall and Langfield-Smith, 1998; Guilding et al 1998, Chenlall, 2003; Shields, 1998; Hadma and Laats, 2002; O’Connor et al 2004).

Figure 2 represents graphically the new model after the final regression analysis.

According to practitioners involved in this study, their financial performance indicators have been improved in the last three years in relation to the respective industry averages, declaring a further organisational performance improvement. This leads to the conclusion that when companies implement the aforementioned bundles of suggested MCS, there is a firm probability of enjoying an improvement in their respective financial performance indicators.
7. Directions for the future

This article suggests several extensions for future research. One direction involves extending the sample. Both the number of firms and industries could be increased.

Even although it is difficult to have both large sample sizes and the volume of information necessary for making correct construct measurements this could be a significant issue to consider. First, tests involving additional organisations in all size categories would increase the sample size and, therefore, allow for more powerful statistical analysis. Second, industry segmentation will provide further insights into the role that industry plays in the relationships outlined in our research. In particular, expansion of the study to industries which face more or less hostile and competitive environments, may increase understanding of the respective practices. Also, companies in less hostile environments may implement different practices from those in more aggressive ones. Also a better understanding is necessary of the factors that influence the differences in the levels of adoption and benefits received from different systems between industries and countries.
Figure 1: The association of MAP and contingent factors with financial performance – Proposed Model
Table 1 – Definition Of Questionnaire Variables

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMA Tools</td>
<td>Strategic Management Accounting Tools</td>
<td>Analytical list of tools, group questions A5, adapted from Guilding et al (2000)</td>
</tr>
<tr>
<td>OTH.PRA</td>
<td>Other Practices</td>
<td>Operationalised through the eight items in section B of the survey instrument. The items developed based on Kotha and Swamidass (2000), and Rimmer et al (1996).</td>
</tr>
<tr>
<td>OTH.INF</td>
<td>Other Influences</td>
<td>Operationalised through the nine items in section C of the survey instrument. The items developed based on Bhimani (1996) and Lizcano (1996), Blake et al (2003).</td>
</tr>
<tr>
<td>MAN.TEC</td>
<td>Management Techniques</td>
<td>Operationalised through the fourteen items in section D of the survey instrument. The items developed based on Chenhall and Langfield-Smith (1998c).</td>
</tr>
<tr>
<td>MAR.PER</td>
<td>Market Performance</td>
<td>Industry median adjusted, measured by self-reported five point Likert responses provided by appropriate company staff. Questionnaire items G2, 1–4. (Spanos and Lioukas, 2003).</td>
</tr>
<tr>
<td>COR.PER</td>
<td>Corporate Performance</td>
<td>Industry median adjusted, measured by self-reported five point Likert responses provided by appropriate company staff. Questionnaire items G2, 5–8. (Friedlob et al 2002).</td>
</tr>
</tbody>
</table>
Abbreviation | Name | Definition
--- | --- | ---
OPE.PER | Operational Performance | Industry median adjusted, measured by self-reported five point Likert responses provided by appropriate company staff. Questionnaire items G2, 9–14. (Israelsen, 1996; Bruggeman, 1996; Groot, 1996).
TIM | Time since implementation of MAP tools | Operationalised through the items G1, General Questions. Adopted from Cagwin and Bouwman, (2002).
SIZ | Size | Operationalised through the items G4 and G5 in General Questions section of the survey instrument. Adopted from Krumwiede (1996).
TYP | Type of business | Operationalised through the items Reid and Smith (2000) Business type, General Questions, G 3 and G6.
MAP | Management Accounting Practice | The extent and depth use of MAP. Composite of the variables PB Tools, DS Tools, CA Tools, PE Tools, SMA Tools.
ΔFP | Change in Financial Performance | Composite of the variables MAR. PER and COR.PER.

Table 2: Demographic Data

<table>
<thead>
<tr>
<th>Company classification</th>
<th></th>
<th>Position of Respondent</th>
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</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>53</td>
<td>Financial Manager</td>
</tr>
<tr>
<td>Services</td>
<td>52</td>
<td>Financial Controller</td>
</tr>
<tr>
<td>Commerce</td>
<td>93</td>
<td>Sr Management Accountant</td>
</tr>
<tr>
<td>Total sample</td>
<td>198</td>
<td>Sr Accountant</td>
</tr>
<tr>
<td>Listed in Athens Stock Exchange</td>
<td></td>
<td>Accountant</td>
</tr>
<tr>
<td>Listed</td>
<td>105</td>
<td>Total sample</td>
</tr>
<tr>
<td>Non Listed</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>198</td>
<td></td>
</tr>
<tr>
<td>Size of Organisations:</td>
<td></td>
<td>Size of Organisations:</td>
</tr>
<tr>
<td>Turnover – m Euro</td>
<td></td>
<td>Manpower – employees</td>
</tr>
<tr>
<td>0–300</td>
<td>149</td>
<td>0–200</td>
</tr>
<tr>
<td>301–600</td>
<td>36</td>
<td>201–500</td>
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<tr>
<td>601–900</td>
<td>7</td>
<td>501–1000</td>
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<tr>
<td>901–1,000</td>
<td>2</td>
<td>1001–2500</td>
</tr>
<tr>
<td>1,001–2,000</td>
<td>3</td>
<td>2501–7000</td>
</tr>
<tr>
<td>2,001–3,500</td>
<td>1</td>
<td>7001+</td>
</tr>
<tr>
<td>Total sample</td>
<td>198</td>
<td>Total sample</td>
</tr>
<tr>
<td>According to EU statistics</td>
<td></td>
<td>According to EU statistics</td>
</tr>
<tr>
<td>&lt;=5m (small)</td>
<td>0</td>
<td>&lt;50 employees (small)</td>
</tr>
<tr>
<td>&gt;5m and &lt;=40m (medium)</td>
<td>9</td>
<td>50–250 employees (medium)</td>
</tr>
<tr>
<td>&gt;40m (large)</td>
<td>189</td>
<td>&gt;250 employees (large)</td>
</tr>
<tr>
<td>Total sample</td>
<td>198</td>
<td>Total sample</td>
</tr>
</tbody>
</table>
Table 3. Financial performance models

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>Beta</td>
<td>t</td>
<td>Sig.</td>
<td>Beta</td>
</tr>
<tr>
<td>Formal strategic planning</td>
<td>0.020</td>
<td>0.215</td>
<td>0.830</td>
<td>0.150</td>
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<tr>
<td>Capital budgeting techniques</td>
<td>0.133</td>
<td>1.123</td>
<td>0.264</td>
<td>0.138</td>
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<tr>
<td>Long range forecasting</td>
<td>-0.024</td>
<td>-0.266</td>
<td>0.791</td>
<td>-0.049</td>
</tr>
<tr>
<td>Detail budgeting systems</td>
<td>0.420</td>
<td>3.234</td>
<td>0.002***</td>
<td>0.187</td>
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<tr>
<td>Decision support systems</td>
<td>0.035</td>
<td>0.300</td>
<td>0.765</td>
<td>-0.032</td>
</tr>
<tr>
<td>Value chain analysis</td>
<td>0.313</td>
<td>3.180</td>
<td>0.002***</td>
<td>0.148</td>
</tr>
<tr>
<td>Operations research techniques</td>
<td>0.132</td>
<td>1.022</td>
<td>0.310</td>
<td>0.004</td>
</tr>
<tr>
<td>Cost analysis methods</td>
<td>0.365</td>
<td>3.901</td>
<td>0.000***</td>
<td>0.490</td>
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<tr>
<td>Performance evaluation methods</td>
<td>0.070</td>
<td>0.657</td>
<td>0.513</td>
<td>0.095</td>
</tr>
<tr>
<td>SMA techniques</td>
<td>0.349</td>
<td>2.930</td>
<td>0.004***</td>
<td>0.327</td>
</tr>
<tr>
<td>Other practices (B)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.215</td>
</tr>
<tr>
<td>Other influences (C)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Management techniques (D)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*** significant at 0.01 level
**  significant at 0.05 level
*   significant at 0.10 level

F=4.681  Sig.=0.000
F=5.389  Sig.=0.000
F=4.86   Sig.=0.000
F=4.474  Sig.=0.000
R² = 0.347
R² = 0.438
R² = 0.441
R² = 0.48
Adg. R² = 0.273 = 27.30%
Adg. R² = 0.34 = 34.00%
Adg. R² = 0.35 = 35.00%
Adg. R² = 0.373 = 37.30%
Figure 2: The association of MAP, contingent factors and improvement in financial performance
Table 4: Final Regression Analysis, Questionnaire Items – Independent Variables (after final reduction)

<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Independent Variables</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal strategic planning</td>
<td>Formal Strategic planning</td>
<td>1</td>
</tr>
<tr>
<td>Capital Budgeting: Return on Investment (ROI)</td>
<td>Capital Budgeting Techniques</td>
<td>3</td>
</tr>
<tr>
<td>Capital Budgeting: Net present value (NPV)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Budgeting: Internal rate of return (IRR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Range Forecasting</td>
<td>Long Range Forecasting</td>
<td>1</td>
</tr>
<tr>
<td>Detail budgeting systems for: Compensating managers</td>
<td>Detail Budgeting Systems</td>
<td>3</td>
</tr>
<tr>
<td>Detail budgeting systems for: Planning – Cash flows</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detail budgeting systems for: Planning – Financial position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision support systems: Product life cycle</td>
<td>Decision Support Systems</td>
<td>2</td>
</tr>
<tr>
<td>Decision support systems: Activity based management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value chain analysis</td>
<td>Value Chain Analysis</td>
<td>1</td>
</tr>
<tr>
<td>Operations research techniques</td>
<td>Operations Research Techniques</td>
<td>1</td>
</tr>
<tr>
<td>Cost analysis: Absorption or Full costing</td>
<td>cost Analysis</td>
<td>4</td>
</tr>
<tr>
<td>Cost analysis: Process Costing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost analysis: Job Order Costing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost analysis: Standard Costing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance evaluation is based on: Divisional profit</td>
<td>Performance Evaluation Methods</td>
<td>9</td>
</tr>
<tr>
<td>Performance evaluation is based on: Residual income (e.g. interested adjusted profit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance evaluation is based on: Return (profit) on investment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance evaluation is based on: Non – financial measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance evaluation is based on: Team performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance evaluation is based on: Employee attitudes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance evaluation is based on: Qualitative measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance evaluation is based on: Balance scorecard (mix of financial and non-financial measures)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance evaluation is based on: Customer satisfaction surveys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Man. Accounting: Life cycle costing</td>
<td>SMA Techniques</td>
<td>8</td>
</tr>
<tr>
<td>Strategic Man. Accounting: Quality costing</td>
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<td></td>
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<tr>
<td>Strategic Man. Accounting: Strategic costing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Man. Accounting: Strategic pricing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Man. Accounting: Target costing</td>
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<td></td>
</tr>
<tr>
<td>Strategic Man. Accounting: Value chain costing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Man. Accounting: Brand value budgeting and monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Man. Accounting: Competitor appraisal based on published financial statements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questionnaire Item</td>
<td>Independent Variables</td>
<td>Items</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>-----------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Just-in-Time (JIT)</td>
<td>Other Practices (B)</td>
<td>4</td>
</tr>
<tr>
<td>Total Quality Management (TQM)</td>
<td>Other Influences – C</td>
<td>4</td>
</tr>
<tr>
<td>Materials requirements planning (MRP)</td>
<td></td>
<td></td>
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<tr>
<td>Manufacturing resource planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academics</td>
<td>Management Techniques (D)</td>
<td>3</td>
</tr>
<tr>
<td>Professional associations: which promote specific management accounting practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection and Competition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonus schemes</td>
<td></td>
<td></td>
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<tr>
<td>Integrating information systems with supplier and/or distributors</td>
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<td></td>
</tr>
<tr>
<td>Downsizing the organisation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reorganizing existing manufacturing/service processes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Independent Variables – Total Items**  

<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Dependent Variables</th>
<th>Items</th>
</tr>
</thead>
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<tr>
<td>Sales Volume</td>
<td>Market Performance</td>
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<tr>
<td>Growth in Sales Volume</td>
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<td></td>
</tr>
<tr>
<td>Market Share</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth in Market Share</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return on investment (ROI)</td>
<td>Corporate Performance</td>
<td>4</td>
</tr>
<tr>
<td>Net profit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit margin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset turnover</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dependent Variables – Total Items**  

**References**


ICAP, 2008. www.icap.gr


Sandra Janković, Ana Klikovac and Branko Ž. Ljutić

THE CHALLENGES IN COMPLYING WITH THE EUROPEAN UNION’S AUDIT REGULATION IN TWO NON-EU COUNTRIES

INTRODUCTION

In the Republic of Croatia and the Republic of Serbia the activities of formal adoption of the IFRS has a long history from the present day perspective. Listed companies in both countries are legally obliged to use IFRS by financial reporting. Since IFRS is the accepted legally binding standard in the EU, and both countries have publicly opted to fully join the EU in the near future, all the reporting entities in those two countries are obliged by the same set of standards as EU companies, regardless of the same national regulation adopted at the beginning of the 3rd Millennium. Business co-operation with partner companies in the EU and in other countries is urging domestic companies to strictly follow the required IFRS in venture dealings. EU companies, as well as Croatian and Serbian companies, in the period before full EU membership of Croatia and Serbia will be in a better position to co-operate, enter new markets, expand cross-border co-operation, raise capital and be properly licensed and regulated. Proper implementation of the accounting and audit regulatory framework of the EU will have, in those two countries, a significant positive impact on all reporting entities. The real obstacle and problem on the road to “Heaven” (e.g. joining EU) is certainly conservatism and the inertia of the accounting and audit profession, inefficient public administration and weak government, the absence of real interest and motivation to establish and develop highly respected institutions of civil society such as auditing. Auditing, without a proper context and framework, is nothing more than a paper dragon.
1. INTERNATIONAL AND EUROPEAN HARMONISATION OF AUDIT REGULATION

The beginning of a new millennium was marked with a series of corporate scandals, in the US and in other countries worldwide.

In 2001, 257 publicly traded companies in the US filed for bankruptcy, and in 2002 another 191 public companies did the same. Twelve of the 20 largest bankruptcy filings in US history took place in 2001 and 2002. All 12 companies received an unqualified opinion on their most recent financial statements filed prior to the bankruptcy filing. None of the audit opinions included an explanatory paragraph reflecting the auditor’s substantial doubt about the entity’s ability to continue as a going concern. (Venuti, 2004)

Indeed, this was not a good start to the millennium for the accounting and auditing profession. However, the scandal that had the biggest impact on these professions was Enron. Enron’s collapse, together with the fall of its audit firm Arthur Andersen, changed the auditing profession in such a way that that point in time would be specially marked in the history of auditing. The developments in audit regulation can now be referred to as auditing pre-Enron and post-Enron.

Enron was a scandal that questioned the sole purpose of auditing. Investors, shareholders and the public lost their trust in auditors. They did not need auditors if the auditors were not able to predict such bankruptcies, detect fraud in financial statements, and warn shareholders and the public about it. Above all, if auditors do not obey their Code of Ethics, if they shred the audit documentation as Arthur Andersen did, then the public has every right to doubt the role of the auditor in protecting the public interest. Something had to be done urgently to restore the public trust in the auditing profession.

The new wave in auditing came with Sarbanes-Oxley Act of 2002 in the US, followed by the modernisation of the Eighth Company Law Directive on Statutory Audit in the European Union. With these new regulations, the role of internal auditors, audit committees, and good corporate governance was enhanced. Also, after the scandals, many national and international bodies were formed for the purpose of rebuilding the public’s trust in financial reporting and auditing, and for the protection of the capital markets from future corporate and auditing scandals.

The role of auditors is of great importance to global capital markets. The auditor has an intermediary role between the companies that prepare financial reports and the users of these financial reports. Shareholders, investors, and other users of the financial reports want to know that the information in these reports was compiled, classified, reported and audited according to the relevant financial reporting and auditing regulatory framework. And this has to be done on a consistent basis across countries. This could only be achieved if a process were launched that would harmonise the current
IFAC’s International Standards on Auditing with national auditing standards. This process should follow the current harmonisation process in financial reporting and a convergence project between IASB and US FASB, where International Financial Reporting Standards are being widely accepted as global standards in more than 100 countries.

The auditor’s role is to provide this information and to express an independent opinion on the financial statements. After the big corporate and auditing scandals throughout the world, the auditor’s independence was frequently questioned and debated. There is a question of non-audit services, and whether the auditor’s independence is affected by providing these services to their audit clients. There is also the question of whether the mandatory audit rotation every five to seven years would improve the auditor’s independence, and if it would reduce the risk of fraud. These are matters that were considered in an audit regulation worldwide.

1.1. Audit regulatory framework in the United States

To start a discussion on European audit regulation, one must first look into audit regulation of the United States. Since most of the corporate scandals after the year 2000 happened in the US, the first reactions to the scandals and new audit regulation began there. On July 30, 2002, the Sarbanes-Oxley Act of 2002 was enacted. The purpose of the Act was to restore investor confidence in U.S. markets.

The most important provision of the Sarbanes-Oxley Act was the establishment of the Public Company Accounting Oversight Board (PCAOB). The Board has the following duties (AICPA):1

1. register public accounting firms;
2. establish, or adopt, by rule, “auditing, quality control, ethics, independence, and other standards relating to the preparation of audit reports for issuers;”
3. conduct inspections of accounting firms;
4. conduct investigations and disciplinary proceedings, and impose appropriate sanctions;
5. perform such other duties or functions as necessary or appropriate;
6. enforce compliance with the Act, the rules of the Board, professional standards, and the securities laws relating to the preparation and issuance of audit reports and the obligations and liabilities of accountants with respect thereto; and
7. set a budget and manage the operations of the Board and the staff of the Board.

Other provisions of the Act were the following:\footnote{2}{Ibid.}

- Annual quality reviews (inspections) must be conducted for firms that audit more than 100 issues, all others must be conducted every 3 years. The SEC and/or the Board may order a special inspection of any firm at any time.
- Foreign accounting firms who audit a U.S. company are subject to registration with the Board. This includes foreign firms that perform some audit work, such as in a foreign subsidiary of a U.S. company that is relied on by the primary auditor.
- The SEC has oversight and enforcement authority over the Board.
- It is "unlawful" for a registered public accounting firm to provide any non-audit service to an issuer contemporaneously with the audit.
- The lead audit or coordinating partner and the reviewing partner must rotate off the audit every 5 years.
- The accounting firm must report to the audit committee all critical accounting policies and practices to be used; all alternative treatments of financial information within [GAAP] that have been discussed with management, the ramifications of the use of such alternative disclosures and treatments, and the treatment preferred by the firm.
- The audit committee of an issuer is directly responsible for the appointment, compensation, and oversight of the work of any registered public accounting firm employed by that issuer.
- Requires each annual report of an issuer to contain an internal control report, which has to state the responsibility of management for establishing and maintaining an adequate internal control structure and procedures for financial reporting; and contain an assessment, as of the end of the issuer's fiscal year, of the effectiveness of the internal control structure and procedures of the issuer for financial reporting.
- It is forbidden to destroy or create documents to impede, obstruct or influence any existing or contemplated federal investigation. Auditors are required to maintain all audits or review work papers for five years.

1.2. Audit regulatory framework in the European Union

Following the example of the US, which adopted the Sarbanes-Oxley Act to restore the public’s confidence in financial reporting and auditing, the Council of the European Union adopted a new directive on the audit of company accounts on April 25, 2006. The directive broadens the scope of the application of existing EU legislation (directive 84/253/EEC) by specifying the duties of statutory auditors, their independence, and ethics. It introduces requirements for external quality assur-
ance and public oversight of the auditing profession. The directive’s main provisions enforced to protect the public’s interest and to enhance the quality of audit in the EU are as follows:\(^3\)

- Independent audit committees are required to monitor the financial reporting process and the statutory audit.
- Independence must be clearly defined. An auditor/firm cannot be involved in any way in the decision-making of the audited entity.
- All statutory auditors and audit firms are subject to a system of quality assurance and subject to public oversight.
- Statutory audits must be carried out in accordance with international standards on auditing.
- Member states must organise effective systems of investigation and sanctions, which may be civil, administrative, or criminal.
- Member states must designate the competent authorities responsible for approval, registration, quality assurance, inspection, and discipline for the purposes stipulated by the directive. They must co-operate with each other.
- A statutory auditor or audit firm can only be dismissed if there is a significant reason why the statutory auditor cannot finalise the audit. The reasons for dismissal or resignation must be disclosed.
- Key audit partner(s) responsible for carrying out a statutory audit rotate(s) from the audit engagement within a maximum period of seven years from the date of appointment and is/are allowed to participate in the audit of the audited entity again after a period of at least two years.
- Audited companies must disclose total fees paid to the statutory auditor or audit firm, broken down by fees for audit services, other assurance services, tax services and other non-audit services.
- Statutory auditors and audit firms that carry out statutory audit(s) of public-interest entities publish on their websites, within three months of the end of each financial year, annual transparency reports that include a description of the legal structure and ownership, a description of the governance structure of the audit firm; a description of the internal quality control system of the audit firm and a statement by the administrative or management body on the effectiveness of its functioning, etc.

2. AUDIT REGULATORY FRAMEWORK IN THE REPUBLIC OF CROATIA

The development of the auditing profession in the Republic of Croatia began in 1992 with its first Auditing Act. In 1993, the Croatian Association of Auditors was founded and its role was to translate and adopt IFAC’s International Standards on Auditing, and to certify professional auditors. According to the Auditing Act, an audit could be performed only by domestic audit firms, and foreign audit firms could perform an audit only in co-operation with domestic firms. The use of International Standards on Auditing was required by this Act. This Act also required compulsory insurance for audit firms, for possible damage caused to their client, on purpose or due to negligence. The liability was capped at a value of 50.000 DEM.

Some of the matters that this Act did not cover were:
- Quality control of the auditor’s performance was not required.
- Setting up of an audit committee was not required.
- Public oversight was not required.
- Non-audit services were not prohibited.
- Rotation of key audit partners was not required.

On June 18, 2004, the Republic of Croatia was awarded candidate status for membership in the EU. This reflected on the accounting and auditing profession in Croatia, because, in order to join the Union, the economic and political conditions, known as the ‘Copenhagen criteria’, would have to be fulfilled. According to these criteria, a prospective member must:

1. Be a stable democracy, respecting human rights, the rule of law, and the protection of minorities. Fulfilling this criterion is key for the start of accession negotiations.
2. Have a functioning market economy as well as the capacity to cope with competitive pressure and market forces within the Union.
3. Adopt and enforce the common rules, standards and policies that make up the body of EU law.

According to the third criteria stated above, the Republic of Croatia has to consolidate all accounting and auditing standards with EU standards. With regard to auditing, Croatia has to comply with the EU’s Eighth Council Directive on Statutory Audit of annual accounts and consolidated accounts. To achieve this task, a new Accounting Act and an Auditing Act were adopted in 2005. New provisions in the Auditing Act were the following:

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• Croatian Auditing Chamber is a professional body that performs quality control over the performance of audit firms and certified auditors and reports it to the Department of Finance every six months.
• Department of Finance performs public oversight over Croatian Auditing Chamber.
• Providing non-audit services to audit clients was prohibited.
• Clearer terms for auditor's independence were set.
• A statutory auditor or audit firm can only be dismissed if there is a significant reason why the statutory auditor cannot finalise the audit, but the Act does not require the reasons for dismissal or resignation to be disclosed. The client or an audit firm or an independent auditor can notify the Croatian Auditing Chamber and Department of Finance if unjustified dismissal of an auditor occurred.
• All companies of public interest are required to set up an audit committee with at least one member of the committee who has knowledge in accounting and/or auditing. The role and tasks of an audit committee are in line with the requirements of the EU's Eighth directive.
• Audit firms have to be insured for possible damages to third persons, and the minimum liability is set at 300,000 kunas. Minimum liability for banks, pension and investment funds and insurance companies is set at three million kunas.

For further harmonisation of the audit regulation in Croatia with the new EU Eighth Directive, a new Law on the changes of the Auditing Act was enforced in November 2008. New provisions of this law are the following:
• Auditors from third countries can provide audit services in the Republic of Croatia, based on the reciprocity between the Republic of Croatia and third countries.
• The Department of Finance is no longer performing public oversight over the Croatian Auditing Chamber. Instead, public oversight is to be performed by a special body, independent of the profession, comprising non-practitioner members knowledgeable in the areas relevant to auditing. The public oversight will be performed by the independent Public Oversight Board, and the Board has to publish its report on the findings of the oversight.
• A statutory auditor or audit firm can only be dismissed if there is a significant reason why the statutory auditor cannot finalise the audit. The reasons for dismissal or resignation must be disclosed to the Public Oversight Board.
• Key audit partners responsible for carrying out a statutory audit rotate from the audit engagement within a maximum period of seven years from the date of appointment and are allowed to participate in the audit of the audited entity again after a period of at least two years.
• An audit firm and independent auditor must publish on their websites, within three months of the end of each financial year, an annual transparency report consisting of all the elements as stated in the EU's Eighth Directive.

• The Public Oversight Board co-operates, provides help, transfers information and provides other forms of co-operation with a competent authority of a member state.

• Penalties for audit firms and independent auditors, if they do not publish transparency report, do not rotate key audit partners, and do not confirm their independence to the audit committee, range from 20,000 to 100,000 kunas.

Apart from the challenge of complying with the EU regulation, audit firms in the Republic of Croatia also have to face the challenge of complying with the Sarbanes-Oxley Act if they audit a company that is a SEC registrant, or a subsidiary of a SEC’s registrant. This is clearly stated in Section 106 of the Sarbanes-Oxley Act of 2002: “Any foreign public accounting firm that prepares or furnishes an audit report with respect to any issuer, shall be subject to this Act and the rules of the Board and the Commission issued under this Act, in the same manner and to the same extent as a public accounting firm that is organised and operates under the laws of the United States or any State” (SOX Act, 2002).

3. AUDIT REGULATORY FRAMEWORK IN THE REPUBLIC OF SERBIA

The accounting and auditing profession in Serbia has been more or less under the dominant influence of the so-called “German tradition” and from the historic point of view, accounting and auditing activities were performed almost on the same legislative and institutional framework as in model European countries for Serbia such as France and Germany. The period after the Second World War, during the existence of the Second Yugoslavia as a communist oriented state, was somehow close to the Russian model just after the War. Towards the end of the 1980’s, regulation has become closer to the market economics criteria, but surely not adequate. After the breakaway of Yugoslavia, Serbia has been in a time of prolonged isolation from regional and global co-operation and influences. Reintegration of Serbia as a country and economy into a regional and global framework of free market institutions, under the rule of law, stresses the new role and significance of the economics of information. The function of financial reporting, availability and transparency is more than significant, not only for the stability of the national financial system but also, from early 2009, for mere existence and survival. Serbia’s financial system is more of a concept of growth than a real system of small numbers of stable, reliable, predictable, transparent and well-functioning efficient financial institutions. Prolonged economic and political sanctions
of the UN Security Council against Serbia have somehow created some form of intellectual “Splendid Isolation”. There is a public feeling and prevailing opinion in public and professional debates that Serbia is much closer to the EU regarding legislature and regulatory reforms and an institutional framework that is based on our intuitive assessment. That is not the case. Accounting and auditing standards are adopted from the formal standpoint such as International Financial Reporting Standards (IFRS), and International Standards on Auditing (ISA). The German philosopher, Niche, said a long time ago something like this: “It is much easier to advocate the principles than to live a life based on it”. The case most likely is the same in Serbia regarding full professional implementation of the framework of financial reporting and auditing in a country with a weak legal system and government regulatory institutions, still in the process of self-creation and institutional reconstruction.

The European Union (EU) law, also known as the acquis communautaire, is like a line on the horizon. If you make one step forward, the line is two steps further in Serbia’s case, since every new change and insight sheds new light on how weak the real financial system is within accounting and auditing. In Serbia there is a general perception and acceptance that the new auditing regulation harmonised with the EU regulatory framework is *sine qua non* of any future reintegration of the country into the regional and global financial and economic institutions. But, from the verbal pledge to the real changes, there is a long and bumpy road ahead of Serbia.

Generally, financial information in Serbia is not of the highest quality and has been characterised by a tradition of unreliable financial reporting for many decades during the socialist economic system. During the period of democratic government corruption, criminal activities (organised crime, white collar crime, etc.) were more than undermining the formal orientation of the government to implement strict financial reporting based on the stringent IFRS and IAS implementation. Any system of standards in accounting and auditing professions is merely a system based on the general social, economic and market order, values and valuation. All those mentioned aspects are more than rudimentary in Serbia. Consequently, the implementation of the IFRS is theoretical, more superficial than even a technical exercise, while the real market valuation is a rather distant practical concept and approach. (Ljutic, 2005)

The economic crisis, illiquidity, tycoons and political patronage are still protecting the largest monopolistic illiquid companies, while the profitable and liquid smaller ones and small and medium-sized enterprises are carrying most of the burden of economic reforms, taxation and liquidity. For instance, in Serbia, larger companies are not fully obeying the rules for payment settlements, although from the legal point of view, analysis would show that the rules are obeyed. Financial regulatory institutions are very liberal regarding the illiquidity of the “big-shots”, while the others must cover all liquidity demands, even pay VAT in advance. However, the big companies do not pay outstanding invoices for 3 to 6 months and even longer. These are more
than significant aspects of the real role of auditing, since this activity is not adequately prepared to audit the complex cross-ownership deals and transactions between banks, insurance companies, real sector and emerging conglomerates. (Gielen et al. 2005)

4. CHALLENGES FACING THE AUDIT PROFESSION IN CROATIA AND SERBIA AND POSSIBLE IMPROVEMENTS OF THE REGULATION

Croatia and Serbia began their accounting and auditing profession development from the same basis in 1991. The fact is that they followed new EU accounting and audit regulations from the formal standpoint, but the quality of their implementation is questionable.

To our knowledge, there is no theoretical framework to make a proper and objective assessment of how well the business accounting and auditing practices comply with IFRS and ISA. Our further explanation is only a general idea to begin discussions on the eventual creation of self-assessment questionnaires which will reveal and expose the gaps in Croatian and Serbian local auditing standards as implemented specifically in each country. Such a study would serve as a solid ground and argument for a greater implementation of the International Standards on Auditing.

Convergence of the Serbian auditing standards with the EU regulation is unquestionable from a legal point of view. In open public debate, the leading politicians, much less the top professional experts in the field, do not question or criticise this as a strategic orientation of the Serbian Government. Probably, in the medium term, within the next 5 to 10 years, Serbia will posses and implement the full conceptual framework of the audit regulation that the EU will have at that time. The EU is strongly encouraging Serbia to fully adopt those and other related standards, but implementation is more words than sincere deeds. The institutional assistance of the EU has being somehow lacking, since the bulk of the initial steps have been undertaken by the World Bank and US Aid which has generously funded a full translation of the International Accounting Standards, International Financial Reporting Standards and International Standards of Auditing from English into Serbian. And, sadly, that is the end of that chapter, since after those initial steps, the Serbian Government and some quasi professional bodies have stumbled into denial and regression. Serbia has a strategic vital interest to be actively involved in the reform of auditing regulation, to improve the capacity of its national accounting and auditing system and to establish new institutions in this field.

According to the first Accounting Act in Croatia (NN 90/92), International Accounting Standards were adopted as the national accounting standards for all companies in Croatia (listed and non-listed). After 15 years of their implementation, according
to new the Accounting Act from 2007 (NN 109/07), IFRS became obligatory only for large companies, listed companies and companies who are preparing for an initial public offering. Other companies (unlisted – small and medium-sized companies) are using Croatian Financial Reporting Standards. At the time when IASB finished the development of IFRS for small and medium-sized companies (SMS), Croatian standard setters decided to develop their own.

Regarding auditing, Croatia has to comply with the EU’s Eighth Council Directive on Statutory Audit of annual accounts and consolidated accounts. To achieve this task, Croatia changed its Auditing Act in 2005 and in 2008.

The real problem for these two countries is that the process of establishing the public regulatory and self-regulatory institutions and bodies require civil society and citizens with a high regard for free market institutions, democracy and the rule of law. That is the only solid foundation upon which to construct the pyramid of audit institutions, since it makes no sense to expect the tycoons to be interested in developing the national audit profession and institutions. On the other hand, big international auditing firms also have more than a strong interest in monopolising the market, which is a negative impetus to develop a local respected audit profession. Just like the River Seine, which brings fresh water from the province to Paris, intellectuals also come to Paris from the province. The Big 4\(^5\) are so strong and influential in Serbia that there is no room for smaller firms to function properly, and the profession of auditors is not attractive to the younger generation. Any regulation, regardless of how well elaborated and sophisticated, without a well trained, properly supervised professional work force, which is respected and well paid, does not make any sense at all.

Therefore the most important measures which both countries need to implement as soon as possible are the following:

1. Development of Corporate governance
2. Implementation of Forensic auditing
3. Education, certification and continuous life-long learning of auditors
4. Efficient oversight conducted by the independent professional body.
5. Legal framework reform

For the implementation of forensic auditing, it is recommended to consider 5 possible options:

- Including a forensic auditor in the team of auditors during the regular annual audit of financial reports,
- Introduction of mandatory forensic auditing once a year for all companies of public interest,

\(^5\) Or why not one day Big 1, and what is after Big 1
• Introduction of random forensic auditing for all companies of public interest by which the companies would know that they could be subject to random forensic auditing at any time.
• Performing of forensic auditing only at the request of stakeholders.
• Performing of forensic auditing on the basis of a reported or suspected fraud.

5. CONCLUSION

The globalisation of capital markets has shown the need for a clearly defined role for auditing as a means to add credibility to the financial information provided by companies seeking finance in international capital markets. In order to define this role clearly, ISAs are increasingly recognised by the business community, users and regulators as setting the benchmarks for audits.

Because the recent corporate scandals were the results of fraudulent behaviour, the shareholders and investors want absolute assurance that the financial statements are free from any fraud. Today, during the financial crisis, they want this assurance even more than previously. There is a great misconception that the auditor’s role is to find all fraud and errors that might occur in financial statements. There is a significant “expectation gap” between what various stakeholders believe auditors do or should do in detecting fraud, and what auditors are actually capable of doing, at the prices that companies are willing to pay for audit services. The users of the financial statements want absolute assurance that financial statements are free from any material misstatement regarding fraud and error. The reality is that an auditor can only express reasonable and not absolute assurance. Because of this, modern auditing literature considers forensic auditing to be a possible answer to this problem. By introducing the services of fraud auditors (on a mandatory or random basis), the risk of fraud will be eliminated or greatly reduced. A forensic audit might also be a powerful tool for fraud prevention, because the potential fraudsters would know that their financial statements would be subject to fraud investigation at some point in the future.

The education of auditors (external, internal and forensic) is a key factor necessary for the survival of the auditing profession and for the stability of the capital markets. In today’s world, auditors have to possess a wide range of knowledge: accounting techniques and standards (IFRS, US GAAP, national standards), auditing techniques and standards (ISAs, or national standards), finance, taxes, information technologies, and more auditing-related knowledge. Besides all this, auditors should have all the necessary skills to detect fraud, and they should comply with the code of professional ethics. The kind of expertise that is required from auditors can only be achieved with the highest quality education, strict procedures for certification of
auditors, continuous education, and audit quality oversight conducted by the independent professional body. This is the procedure that Croatia and Serbia should follow to ensure the implementation of the legal framework.

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1. Introduction

In this paper we present the research results on determinants of corporate risk management decisions in large Croatian and Slovenian non-financial companies. Financial risks – the risks to a corporation stemming from price fluctuations – directly or indirectly influence the value of a company. Whether it is a multinational company and its exposure to exchange rates, a transportation company and the price of fuel, or a highly leveraged company and its interest rate exposure, how and to what extent such risks are managed now often plays a major role in the success or failure of a business. Therefore, it could be argued that financial risk management is one of the most important corporate functions as it contributes to the realisation of the company’s primary goal – stockholder wealth maximisation.

For a long time it was believed that corporate risk management is irrelevant to the value of the firm and the arguments in favour of the irrelevance were based on the Capital Asset Pricing Model (Sharpe, 1964; Lintner, 1965; Mossin, 1966) and the Modigliani-Miller theorem (Modigliani and Miller, 1958). Despite the fact that, according to modern portfolio and corporate finance theory, hedging does not alter a company’s value, financial managers and treasurers are highly concerned about a company’s exposure to corporate risks. Additionally, the corporate use of derivatives as risk management instruments is widespread and growing. As an explanation for this discordance between theory and practice, imperfections in the capital market

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2 The analysis of corporate risk management includes the group of financial risks; interest-rate, exchange-rate and commodity price risk management.
are used to argue for the relevance of a corporate risk management function. Two classes of explanations for management concern with hedging of corporate risk are constructed. The first class of explanations focuses on risk management as a means to maximise shareholder value, while the second focuses on risk management as a means to maximise managers’ private utility. This paper produces new empirical evidence on hedging rationales by exploring risk management activity in Croatian and Slovenian companies, which should support the implications of the theory that it develops. Hypotheses explaining corporate hedging decision are tested, and empirical evidence on the relative importance of these corporate motives is offered. Our research aim was to explore whether financial risk management has different rationales in Slovenian and Croatian companies than among their western counterparts.

2. Theorising the Framework

Positive theories of risk management, as a lever for shareholder value creation, argue that firm value is a concave objective function because of capital market imperfections. The first theory suggests that, by reducing the volatility of cash flows, firms can decrease costs of financial distress (Mayers and Smith, 1982; Myers, 1984; Stulz, 1984; Smith and Stulz, 1985; Shapiro and Titman, 1998). In the MM world, financial distress is assumed to be costless. Hence, altering the probability of financial distress does not affect firm value. If financial distress is costly, firms have incentives to reduce its probability, and hedging is one method by which a firm can reduce the volatility of its earnings. By reducing the variance of a firm’s cash flows or accounting profits, hedging decreases the probability, and thus the expected costs, of financial distress. Additionally, Smith and Stulz (1985) have argued that, while the reduction of financial distress costs increases firm value, it augments shareholder value even further by simultaneously raising the firm’s potential to carry debt. Corporate risk management lowers the cost of financial distress, which leads to a higher optimal debt ratio and the tax shields of the additional debt capital further increases the value of the firm. This theory has been empirically proven by, among others, Campbell and Kracaw, 1987; Bessembinder 1991; Dolde, 1995; Mian, 1996 and Haushalter 2000.

The second hedging rationale suggests that, by reducing the volatility of cash flows, firms can decrease agency costs (see: Jensen and Meckling, 1976). According to Dobson and Soenen (1993) there are three sound reasons, based on agency costs, why management should hedge corporate risk. First, hedging reduces uncertainty by smoothing the cash flow stream, thereby lowering the firm’s cost of debt. Since the agency cost is borne by management, assuming informational asymmetry between management and bondholders, hedging will increase the value of the firm. Therefore, management will rationally choose to hedge. Second, given the existence of debt fi-
nancing, cash flow smoothing through exchange risk hedging will tend to reduce the risk-shifting as well as the underinvestment problems (see Jensen and Smith, 1985). Finally, hedging reduces the probability of financial distress and thereby increases the duration of contractual relations between shareholders. By fostering corporate reputation acquisition, hedging contributes directly to the amelioration of the moral-hazard agency problem. Results of MacMinn (1987), MacMinn and Han (1990), Bessembinder (1991), Minton and Schrand (1999) and Haushalter, Randall and Lie (2002) support this hedging rationale.

Another theory that focuses on risk management as a means to maximise shareholder value argue that, by reducing the volatility of cash flows, firms can decrease expected taxes. This rationale is put forward by Smith and Stulz (1985), who have argued that the structure of the tax code can make it beneficial for firms to take positions in futures, forward, or option markets. If a firm faces a convex tax function, then the after-tax value of the firm is a concave function of its pre-tax value. If hedging reduces the variability of pre-tax firm values, then the expected tax liability is reduced and the expected post-tax value of the firm is increased, as long as the cost of the hedge is not too large. By reducing the effective long run average tax rate, activities which reduce the volatility in reported earnings will enhance shareholder value. The more convex an effective tax schedule is, the greater the reduction in expected taxes. This rationale has been supported by Zimmerman (1988), Froot, Scharfstein and Stein (1993), Nance, Smith and Smithson (1993), Mian (1996) and Graham and Smith (1996).

In addition, reducing cash flow volatility can improve the probability of having sufficient internal funds for planned investments, eliminating the need either to cut profitable projects or bear the transaction costs of obtaining external funding. The main hypothesis is that, if access to external financing (debt and/or equity) is costly, firms with investment projects requiring funding will hedge their cash flows to avoid a shortfall in their funds, which could precipitate a costly visit to the capital markets. An interesting empirical insight, based on this rationale, is that firms which have substantial growth opportunities and face high costs when raising funds under financial distress will have an incentive to hedge more of their exposure than the average firm. This rationale has been explored by numerous scholars, among others by Smith and Stulz (1985), Stulz (1990), Lessard (1990), Shapiro and Titman (1998), Hoshi, Kashyap and Scharfstein (1991), Froot, Scharfstein and Stein (1993), Getzy, Minton and Schrand (1997), Gay and Nam (1998), Graham and Rogers (1999), Minton and Schrand (1999), Haushalter (2000), Mello and Parsons (2000), Allayannis and Ofek (2001) and Haushalter, Randall and Lie (2002).

Another line of reasoning that differs from the shareholders value maximisation hypothesis refers to the managerial utility maximisation hypothesis. It has been argued that firm managers have limited ability to diversify their own personal wealth position, associated with stock holdings and the capitalisation of their career earnings...
associated with their own employment position. Therefore, they will have an incentive to hedge their own wealth at the expense of the shareholders. Usually that kind of hedging is not conducted to improve the value of a company’s stockholders, but to improve managers’ own wealth. To avoid this problem, a managerial compensation contract must be designed, so that when managers increase the value of the firm, they also increase their expected utility. This can usually be obtained by adding option-like provisions to managerial contracts. This rationale was firstly proposed by Stulz (1984) and has been further explored by Smith and Stulz (1985). Results of some empirical studies have confirmed this hypothesis (e.g. see: Tufano, 1996; Gay and Nam, 1998) while, in contrast, Geczy, Minton and Schrand (1997) and Haushalter (2000) have not found evidence that corporate hedging is affected by managerial shareholdings.

A very different managerial theory of hedging, based on asymmetric information, has been presented by Breeden and Viswanathan (1990) and DeMarzo and Duffie (1992), who have focused on managers’ reputations. In both of these models, it is argued that managers may prefer to engage in risk management activities in order to better communicate their skills to the labour market. Breeden and Viswanathan (1990) and DeMarzo and Duffie (1992) have argued that younger executives and those with shorter tenures have less developed reputations than older, as well as longer-tenure, managers. Therefore, they are more willing to embrace new concepts such as risk management, with the intention to signal their management quality. Tufano (1996) has tested these assumptions and found that there is no meaningful relationship between CEO and CFO age and the extent of risk management activity. However, he has proven that firms whose CFOs have fewer years in their current job are more likely to engage in greater risk management activities, confirming the hypothesis that newer executives are more willing to engage in risk management activities than are their counterparts with long tenures. Thus, the results can be seen as consistent with Breeden and Viswanathan (1996) and DeMarzo and Duffie (1992) theory.

Results of empirical studies have also proven that the benefits of a risk management programme depend on the size of the company. Nance, Smith and Smithson (1993), Dolde (1995), Mian (1996), Getzy, Minton and Schrand (1997) and Hushalter (2000) have argued that larger firms are more likely to hedge. One of the key factors in the corporate risk management rationale pertains to the costs of engaging in risk-management activities. The cost of hedging includes the direct transaction costs, as well as the agency costs of ensuring that managers transact appropriately. Transaction costs of hedging include the costs of trading, as well as the substantial costs of information systems needed to provide the data necessary to decide on the appropriate hedging positions to take. The agency costs that such activities bring include the costs of the internal control systems to run the hedging programme. These costs are associated with opportunities for the speculation that participation in derivative markets allows. The assumption underlying this rationale is that there are substantial economies of
scale or economically significant costs related to hedging. Indeed, for many firms (particularly smaller firms), the marginal benefits of a hedging programme may be exceeded by the marginal costs. These facts suggest there may be sizable set-up costs related to operating a corporate risk-management programme. Thus, numerous firms may not hedge at all, even though they are exposed to financial risks, simply because it is not an economically worthwhile activity. On the basis of the empirical results, it can be argued that only large firms with sufficiently large risk exposures are likely to benefit from a formal hedging program.

It is also important to mention that, instead of managing risk through hedging, companies could pursue alternative activities, which substitute for financial risk management strategies. Firms could adopt conservative financial policies, such as maintaining low leverage or carrying large cash balances to protect them against potential financial difficulties (a form of negative leverage). Greater use of these substitute risk management activities should be associated with less financial risk management activities (Froot et al 1993; Nance et. al., 1993).

3. Determinants of Hedging Decisions in Croatian and Slovenian Companies

3.1. Methodology and Data Collection

Empirical research was conducted on the largest Croatian and Slovenian non-financial companies and the criteria for selecting companies in the sample were similar for both countries. Croatian and Slovenian companies needed to meet two out of three conditions required by the Croatian Accounting Law\(^3\) and Slovenian Company Law\(^4\) relating to large companies.\(^5\) A list of the largest 400 Croatian companies in the year 2005\(^6\) has been used and 157 companies that have met the required criteria were selected in the sample. In the case of the Slovenian companies, the GVIN\(^7\) electronic database has been used and, on the basis of selected criteria, 189 companies were

\(^3\) In Croatian: Zakon o računovodstvu, Narodne novine 146/05

\(^4\) In Slovene: Zakon o gospodarskih družbah, Uradni list 15/05

\(^5\) Criteria related to large Croatian companies: a value of total assets higher than 108 million kuna, (2) income in the last 12 months higher than 216 million kuna, and/or (3) annual number of employees higher than 250. Criteria related to large Slovenian companies: a value of total assets higher than 3,400 million tolars, (2) operating income in the last 12 months higher than 6,800 million tolars, and/or (3) annual number of employees higher than 250.

\(^6\) The list has been published by the special edition of Privredni vjesnik (in English: Business Herald).

\(^7\) www.GVIN.com is intended for both synthetic business overview of individual companies or industries and for extremely sophisticated analysis. GVIN.com data cover 3 main information domains: market information, Slovenian companies, and management and governance. In this research domain “Slovenian companies” has been used, which enabled analysis of more than 220,000 companies and selection of a research sample.
chosen for further analysis. The primary advantage of these samples is that the evidence can be generalised to a broad class of firms in different industries. Financial firms were excluded from the sample because most of them are also market makers, hence their motivation in using derivatives may be different from the motivations of non-financial firms.

Data were collected from two sources: from annual reports and notes to the financial statements for the fiscal year 2005, and through the survey. The questionnaire was mailed at the beginning of September 2006 to the Croatian and Slovenian managers involved in financial risk management decisions. It was designed to explore how many companies manage financial risks by using derivatives and which types of derivatives instrument are employed by the analysed companies. Additionally, a part of the questionnaire referred to those companies that classified themselves as derivatives non-users in order to search for reasons not to manage financial risks. In the case of Croatia, only 19 companies answered by the end of September, so a follow-up letter was sent to the non-respondents. Sending a follow-up letter encouraged a response rate from 12 to 31 per cent. In the case of Slovenian companies, 41 companies answered the questionnaire without any additional contact with potential respondents, creating a response rate of 22 per cent. An adequate response rate is the problem that has been often raised in research, based on a survey. The accomplished response rates regarding both the Croatian and Slovenian samples are satisfactory for statistical generalisation (e.g. the response rate of the 1998 Wharton survey of derivative usage, as reported in Bodnar et al (1998) was 21 per cent). However, it is important to mention that the inability to compare the survey results to the data of non-responding companies should be treated as a limitation of this research.

Survey data were analysed by using both univariate and multivariate analysis. First, descriptive statistics were presented which gave an insight into the corporate characteristics of firms in both samples. Then, by using an independent sample t-test, the differences between means for Slovenian and Croatian hedgers and non-hedgers were explored. The independent sample t-test enables a calculation of statistically significant differences between small and mutually unrelated parametric samples (Bryman and Cramer, 1997). Both Slovenian and Croatian research samples were small, unrelated and parametric. In addition, research data were of a non-categorical nature (interval/ratio data), therefore t-test was found as the most suitable for univariate analysis. Additionally, correlation analysis was conducted by calculating Pearson’s correlation coefficient as it is the most common measure of linear correlation when variables are of interval/ratio nature. Regarding the multivariate analysis, binomial logistic regression was estimated to distinguish between the possible explanations for the decision to hedge. Binomial (or binary) logistic regression has been selected because it is a form of regression that is used when the dependent variable is a dichotomy (limited, discrete and not continuous) and the independents are of any type.
(Hosmer and Lemeshow, 1989; Allison, 1999; Menard, 2001). Besides the fact that the dependent variable in this research is discrete and not continuous, logistic regression has been chosen because it enables the researcher to overcome many of the restrictive assumptions of OLS regression. A comparative analysis has also been employed as a method used to compare the results of empirical research conducted on the Croatian and Slovenian companies. The comparative analysis was designed as compare-and-contrast work in which results for both countries were weighted equally trying to find crucial differences as well as commonalities in financial risk management practices and hedging rationales adopted by the Croatian and Slovenian companies.

3.2. Research Hypothesis

Based on the arguments that arise from the presented literature survey, several hypotheses have been proposed in this paper. First, we argue that hedging can increase the value of the firm by reducing the costs associated with financial distress, the agency costs of debt, expected taxes and capital market imperfections. These premises are known as the shareholder maximisation hypothesis and are tested in the following assumptions. The argument of reducing the costs of financial distress implies that the benefits of hedging should be greater, the larger the fraction of fixed claims in the firm’s capital structure (Myers, 1984; Stulz, 1984; Smith and Stulz, 1985; Campbell and Kracaw, 1987; Bessembinder, 1991; Dobson and Soenen, 1993; Dolde, 1995; Shapiro and Titman, 1998; Mian, 1996; Haushalter 2000). The agency cost of debt argument implies that the benefits of hedging should be greater, the higher the firm’s leverage and asymmetric information problem (Mayers and Smith, 1982; 1987; MacMinn, 1987; MacMinn and Han, 1990; Bessembinder, 1991; Dobson and Soenen, 1993; Minton and Schrand, 1999; Haushalter et al 2002). The argument of costly external financing implies that the benefits of hedging should be greater the more growth options are in the firm’s investment opportunity set (Froot, et. al., 1993; Getzy et. al., 1997; Gay and Nam, 1998; Minton and Schrand, 1999; Allayannis and Ofek, 2001; Haushalter et. al., 2002).

The tax hypothesis suggests that the benefits of hedging should be greater, the higher the probability that the firm’s pre-tax income is in the progressive region of the tax schedule, and the greater the value of the firm’s tax loss carry-forwards, investment tax credits and other provisions of the tax code (Froot et al 1993; Nance et al 1993; Mian, 1996; Graham and Smith, 1996). Additionally, the informational and transactional scale economies argument implies that larger firms will be more likely
to hedge (Nance et al 1993; Dolde, 1995; Mian, 1996; Getzy et al 1997; Hushalter, 2000). Therefore, a positive relation between a decision to hedge and a company’s size, leverage, asymmetric information problem, investment (growth) opportunities and expected taxes has been predicted.

The next group of assumptions regards the managerial utility maximisation hypothesis. We argue that, due to the fact that a firm’s managers have limited ability to diversify their own personal wealth position associated with the stock holdings and the capitalisation of their career earnings, they have strong incentives to hedge (see: Amihud and Lev, 1981; Stulz, 1984; Smith and Stulz, 1985; Tufano, 1996; Fatemi and Luft, 2002). We test the hypothesis that managers with greater stock ownership would prefer more risk management, while those with greater option holdings would prefer less risk management. Additionally, firms with younger managers and those whose managers have shorter tenures on the job would be more inclined to manage risk (Breeden and Viswanathan, 1996; DeMarzo and Duffie, 1995; Tufano, 1996). We have also tested the hypothesis regarding the alternative financial policies that are considered substitutes for corporate hedging because they reduce expected taxes, transaction costs, or agency costs (Froot et al 1993; Smithson and Chew, 1992; Nance et al 1993). We propose the assumption that the likelihood of the firm employing risk management instruments is lower, the more liquid the firm’s assets are, and the higher the firm’s dividend payout is.

3.3. Research Variables

A dependent variable has been designed in the form of a binary (dichotomous) measure and was coded as “1” for those firms that hedge corporate risks and “0” for those firms that do not hedge corporate risks. In the group of companies named “hedgers” we included not only companies that use derivatives instruments as an instrument of corporate risk management, but also companies that use other types of hedging strategies such as operational hedging, natural hedging, international diversification of business etc. The majority of the earlier empirical studies on risk management such as Nance et al (1993), Mian (1996), Geczy et al (1997), Allayannis and Weston (2001) and Cummins et al (2001) have used a dichotomous variable that equalled one, if a firm has used derivatives, and zero if it has not. Because of the decision to include all corporate risk management activities, our dichotomous variable should not be subject to the inaccurate categorisation of functionally-equivalent financial position. This has allowed us to disentangle derivatives activity from risk management activity, which is a major advantage of our approach.

However, it should be emphasised that the use of a binary dependent variable is problematic because it does not fully describe the extent of a firm’s hedging activity. That is, a firm which hedges 1 per cent or 100 per cent of its risk exposure, is treated
the same in the model when a binary variable is employed. Regarding the analysis of derivative users, a second dependent variable that we planned to employ and which should correct the disadvantages of a binary dependent variable, was a continuous measure. As a proxy for a company’s hedging, we wanted to use a notional value of forward contracts, options and other derivatives divided by the market value of the company’s assets. This measure is the aggregate notional value of all reported derivative contracts deflated by the market value of assets measured at the beginning of the year for which derivative information is collected.

Using the notional value as a dependent variable has several advantages over using a binary variable to indicate whether or not a firm uses derivatives (e.g. see: Tufano (1996) or Allayannis and Ofek (2001), who have employed a continuous variable). For example, by using this continuous measure, we would be able to test hypotheses on the determinants of the amount of hedging, and examine the impact of a firm’s derivative use on its risk exposure. However, a disadvantage of this measure is that the notional principal of the derivatives positions only gives a rough indication of the size of the exposures (e.g. see Hentschel and Kothari, 2001). Consequently, the reported notional principal values have to be interpreted with care. Unfortunately, we were not able to collect information on the notional value of derivatives used in the analysed companies. We asked financial managers to provide us with this information, but the majority of them were not willing to disclose it. Therefore, in our analysis, we used only dichotomous measures as our dependent variable.

To examine the hypothesis regarding the reduction of the financial distress cost and the informational and transactional scale economies argument, the size of the company and the firm’s leverage have been employed. The size of a company was measured by using two alternative proxies – the book value of assets (Haushalter, 2000; Hoyt and Khang, 2000; Allayannis and Weston, 2001; Allayannis and Ofek, 2001) and the book value of total sales revenues (Allayannis and Weston, 2001). Leverage was used as a proxy for the impact of fixed claims on the decision to hedge. Three different measures were constructed for the degree of a firm’s financial leverage. First, financial leverage was defined as the ratio of the book value of long-term debt to the book value of assets (Tufano, 1996; Nance et al 1993; Geczy et al 1997), while the other measures were the ratio of the book value of long-term debt to the book value of equity (Hoyt and Khang, 2000; Allayannis and Weston, 2001; Mian, 1996) and the interest cover ratio defined as earnings before interest and taxes to the total interest expense (Geczy et al 1997; Nance et al 1993). The coefficients on all variables presented were predicted to be positive.

A binary variable was used to indicate whether a firm is rated by the rating agencies, which was a proxy for asymmetric information problem. The variable was coded as “1” for companies that have a credit rating and “0” otherwise. Everything else being equal, firms with a credit rating have undergone more capital market
scrutiny and are thus assumed to face fewer informational asymmetries than those with no rated debt (Barclay and Smith, 1995b). Therefore, firms with a credit rating are predicted to hedge less extensively, while firms with greater informational asymmetry will benefit greatly from risk management activity (DeMarzo and Duffie, 1995; Haushalter, 2000). The coefficient on this variable was predicted to be negative. Other proxy used for the asymmetric information problem was the percentage of a firm’s stocks owned by institutional investors. DeMarzo and Duffie (1995), Tufano (1996) and Geczy et al (1997) have predicted that a greater share of institutional investors’ ownership is positively related to the availability of information, and thus negatively related to the probability of hedging. Therefore, we predict that the coefficient on this variable is negative with the decision to hedge.

Investment (growth) opportunities were measured as the ratio of investment expenditures to the book value of assets (Haushalter, 2000; Froot et al 1993; DeMarzo and Duffie, 1991; Geczy et al 1997; Smith and Stulz, 1985). Investment opportunities are also measured as the ratio of investment expenditures to the value of total sales (DeMarzo and Duffie, 1991; Froot et al 1993; Geczy et al 1997; Smith and Stulz, 1985; Dolde, 1995). The coefficients on these variables were predicted to be positive. To examine the tax hypothesis, we have used several measures of the firm’s effective tax function – total value of the tax loss carry-forwards and tax-loss carry-backs (Nance et al 1993), total value of the tax loss carry-forwards plus tax-loss carry-backs to the total assets (Smith and Stulz, 1985; Geczy et al 1997; Tufano, 1996), investment tax credits used to offset income tax payable (Nance et al 1993) and finally a dummy variable that is equal to 1 if a firm has tax loss carry-forwards, tax-loss carry-backs or investment tax credits, and 0 otherwise (Allayannis and Ofek, 2001). The coefficients on all variables were predicted to be positive.

The level of a manager’s firm-specific wealth is represented in two ways – by the book value of the firm’s equity owned by officers and directors (Tufano, 1996; Geczy et al 1997) and by the fraction of the firm’s outstanding shares held by officers and directors (Hoyt and Khang, 2000; Haushalter, 2000). The incentives for managers to hedge should be increasing in both these variables (Smith and Stulz, 1985) and therefore the coefficients were predicted to be positive. The extent to which options are used in managers’ compensation is gauged using a binary variable that equals one if managers of a firm own stock options and zero otherwise. We have predicted this proxy to be negatively related with the extent of hedging. We have employed two additional measures that proxy for risk aversion of the manager – manager age and tenure or human capital vested in the firm (Tufano, 1996). We have predicted that younger managers and those whose managers have shorter tenures on the job would be more inclined to manage risk.

To examine hypotheses about the substitutes for hedging, among others, we have employed several measures suggested by the literature. Cummins et al (2001)
have considered the possibility that publicly traded and privately held stock companies may behave differently with regard to risk management. The owners of closely held firms are likely to have a high degree of control over managerial behaviour and, hence, should be able to align the managers’ interests with their own. Generally, the authors expect the owners of such firms to prefer value-maximisation. However, it is also possible that they may exhibit a degree of risk aversion, to the extent that the wealth of the shareholders is sub-optimally diversified because of their holdings in the company. To test for differences between publicly traded and closely held stock firms, we specify a dummy variable equal to one if the firm is a publicly traded company and zero otherwise. If closely held firms tend to be risk-averse, the coefficient of the publicly held company dummy variable is predicted to be negative. However, if closely held companies primarily pursue value-maximisation, this variable will be statistically insignificant.

The company’s dividend payout ratio has been included in the regressions as a proxy for dividend policy. This variable is defined as annual dividends paid to common stockholders as a fraction of income after interest and tax (Haushalter, 2000; Geczy et al. 1997). We have assumed that the higher the firm’s dividend payout ratio, the lower its need to hedge as the company does not experience a cash-shortfall (Nance et al. 1993). Additionally, a company’s quick ratio has been used as a proxy for the firm’s liquidity, defined as money and short-term securities divided by short-term liabilities (Smith and Stulz, 1985; Froot et al. 1993). Another measure of a firm’s liquidity is the liquidity ratio calculated as short-term assets divided by short-term liabilities (Nance et al. 1993). The coefficient on all three variables is predicted to be negative. In the following Tables, we present descriptive statistics of the variables we have used in our univariate analysis, as well as in the logistic regression model for the Croatian and Slovenian sample.
### Descriptive statistics of independent variables – Croatian sample

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Skewness</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>49</td>
<td>3,117</td>
<td>3,796,086</td>
<td>262,189.67</td>
<td>599,929.59</td>
<td>.340</td>
<td>4.848</td>
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<tr>
<td>Total sales revenues</td>
<td>49</td>
<td>0.000</td>
<td>1,304,680</td>
<td>129,032.61</td>
<td>213,620.29</td>
<td>3.340</td>
<td>4.321</td>
</tr>
<tr>
<td>Debt-to-assets ratio</td>
<td>49</td>
<td>.0569</td>
<td>1.6767</td>
<td>.536147</td>
<td>.310749</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Long-term debt-to-equity ratio</td>
<td>49</td>
<td>.0000</td>
<td>1.6767</td>
<td>.536147</td>
<td>.310749</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Interest cover ratio</td>
<td>49</td>
<td>.0000</td>
<td>2.2400</td>
<td>.06776</td>
<td>.02465</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Share owned by institutional investors</td>
<td>49</td>
<td>.0000</td>
<td>0.7250</td>
<td>0.06776</td>
<td>.14510</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Cash &amp; cash equivalents-to-assets ratio</td>
<td>49</td>
<td>.0000</td>
<td>0.7250</td>
<td>0.06776</td>
<td>.14510</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Investment expenditures-to-assets ratio</td>
<td>49</td>
<td>.0000</td>
<td>0.7250</td>
<td>0.06776</td>
<td>.14510</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>R&amp;D expenditures-to-assets ratio</td>
<td>47</td>
<td>.0000</td>
<td>0.0546</td>
<td>0.045117</td>
<td>.02465</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Total value of tax loss carry-forward and carry-backs</td>
<td>49</td>
<td>.0000</td>
<td>31.1823</td>
<td>.74151</td>
<td>.445132</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Total value of tax loss carry-forward and carry-backs-to-total assets</td>
<td>49</td>
<td>.0000</td>
<td>.74151</td>
<td>.445132</td>
<td>.63962</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Investment tax credits</td>
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<td>.0000</td>
<td>9,660</td>
<td>298,3125</td>
<td>1,438,9671</td>
<td>3.40</td>
<td>3.40</td>
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<td>Share value of the company owned by managers</td>
<td>49</td>
<td>.0000</td>
<td>1.0000</td>
<td>1.9263</td>
<td>.33858</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Share of the company owned by foreign investors</td>
<td>49</td>
<td>.0000</td>
<td>1.0000</td>
<td>1.9263</td>
<td>.33858</td>
<td>.340</td>
<td>1.001</td>
</tr>
<tr>
<td>Dividend pay-out ratio</td>
<td>49</td>
<td>.0000</td>
<td>2.6250</td>
<td>547,654</td>
<td>1,04173</td>
<td>.340</td>
<td>3.947</td>
</tr>
<tr>
<td>Quick ratio</td>
<td>49</td>
<td>.0000</td>
<td>2.6250</td>
<td>547,654</td>
<td>1,04173</td>
<td>.340</td>
<td>3.947</td>
</tr>
</tbody>
</table>

(Variables that are presented in absolute values are in Euro 000)

Source: Croatian survey data
## Table 2. Descriptive statistics of independent variables – Slovenian sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum Statistic</th>
<th>Maximum Statistic</th>
<th>Mean Statistic</th>
<th>Std. Deviation Statistic</th>
<th>Skewness Statistic</th>
<th>Std. Error Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>41</td>
<td>12,194</td>
<td>1,179,145</td>
<td>151,221.51</td>
<td>236,982.42</td>
<td>3.089</td>
<td>.369</td>
</tr>
<tr>
<td>Total sales revenues</td>
<td>41</td>
<td>14,094</td>
<td>1,754,016</td>
<td>141,072.39</td>
<td>275,470.64</td>
<td>5.286</td>
<td>.369</td>
</tr>
<tr>
<td>Debt-to-assets</td>
<td>41</td>
<td>0.0456</td>
<td>0.9967</td>
<td>0.406892</td>
<td>0.206677</td>
<td>0.284</td>
<td>.369</td>
</tr>
<tr>
<td>Long-term debt-to-assets ratio</td>
<td>41</td>
<td>0.0000</td>
<td>0.3069</td>
<td>0.121320</td>
<td>0.921496E-02</td>
<td>0.407</td>
<td>.369</td>
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<tr>
<td>Long-term debt-to-equity ratio</td>
<td>41</td>
<td>0.0000</td>
<td>0.8407</td>
<td>0.280353</td>
<td>0.261797</td>
<td>0.861</td>
<td>.369</td>
</tr>
<tr>
<td>Interest cover ratio</td>
<td>40</td>
<td>-95.0833</td>
<td>564.3571</td>
<td>19.742316</td>
<td>91.284027</td>
<td>5.677</td>
<td>.374</td>
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<tr>
<td>Share owned by institutional investors</td>
<td>40</td>
<td>0.00</td>
<td>100.00</td>
<td>17.6833</td>
<td>28.3987</td>
<td>1.786</td>
<td>.374</td>
</tr>
<tr>
<td>Cash &amp; cash equivalents-to-assets ratio</td>
<td>41</td>
<td>0.0003</td>
<td>2.499</td>
<td>3.62719E-02</td>
<td>5.23842E-02</td>
<td>2.480</td>
<td>.369</td>
</tr>
<tr>
<td>Investment expenditures-to-assets ratio</td>
<td>41</td>
<td>0.0000</td>
<td>2.336</td>
<td>7.19644E-02</td>
<td>5.62824E-02</td>
<td>.744</td>
<td>.369</td>
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<tr>
<td>Investment expenditures-to-sales ratio</td>
<td>41</td>
<td>0.0000</td>
<td>7.295</td>
<td>8.43506E-02</td>
<td>1.19113</td>
<td>4.251</td>
<td>.369</td>
</tr>
<tr>
<td>R&amp;D expenditures-to-assets ratio</td>
<td>35</td>
<td>0.0000</td>
<td>0.591</td>
<td>1.19042E-02</td>
<td>1.65807E-02</td>
<td>1.422</td>
<td>.398</td>
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<tr>
<td>Total value of tax loss carry-forward and carry backs</td>
<td>40</td>
<td>0.00</td>
<td>1,696.00</td>
<td>42.4400</td>
<td>268.154</td>
<td>6.325</td>
<td>.374</td>
</tr>
<tr>
<td>Total value of tax loss carry-forward and carry backs-to-total assets</td>
<td>40</td>
<td>0.0000</td>
<td>0.500</td>
<td>1.25292E-03</td>
<td>7.90787E-03</td>
<td>6.325</td>
<td>.374</td>
</tr>
<tr>
<td>Investment tax credits</td>
<td>38</td>
<td>0.00</td>
<td>26,978.00</td>
<td>2,656.2105</td>
<td>5,196.7128</td>
<td>3.571</td>
<td>.383</td>
</tr>
<tr>
<td>Value of equity owned by managers</td>
<td>41</td>
<td>0.00</td>
<td>78,375.0</td>
<td>100.00</td>
<td>17.7960</td>
<td>4.705</td>
<td>.378</td>
</tr>
<tr>
<td>Share of the company owned by managers</td>
<td>39</td>
<td>2.00</td>
<td>5</td>
<td>3.25</td>
<td>95</td>
<td>0.023</td>
<td>.374</td>
</tr>
<tr>
<td>Managers’ age</td>
<td>40</td>
<td>3</td>
<td>37</td>
<td>15.14</td>
<td>9.73</td>
<td>0.675</td>
<td>.383</td>
</tr>
<tr>
<td>Dividend pay-out ratio</td>
<td>38</td>
<td>0.00</td>
<td>160.00</td>
<td>23.7161</td>
<td>38.0949</td>
<td>1.873</td>
<td>.383</td>
</tr>
<tr>
<td>Quick ratio</td>
<td>41</td>
<td>-5,976</td>
<td>3,0000</td>
<td>221,750</td>
<td>53,4335</td>
<td>3.828</td>
<td>.369</td>
</tr>
<tr>
<td>Liquidity ratio</td>
<td>41</td>
<td>-10,857.0</td>
<td>20,0000</td>
<td>1,896,927</td>
<td>3,693,41</td>
<td>2.075</td>
<td>.369</td>
</tr>
<tr>
<td>Share of the company owned by foreign investors</td>
<td>40</td>
<td>0.00</td>
<td>100.00</td>
<td>23,0070</td>
<td>40,1712</td>
<td>1.291</td>
<td>.374</td>
</tr>
</tbody>
</table>

(Variables that are presented in the absolute values are in Euro 000)

*Source:* Slovenian survey data
3.4. Research Results

3.4.1. Univariate analysis

According to a mean comparison test for Croatian hedgers and non-hedgers, the hedgers are statistically different from non-hedgers with respect to variable that proxy for alternative financial policy as substitutes for hedging. Hedgers have a statistically greater quick ratio as a measure of short-term liquidity. We argue that although hedge substitutes are not considered as a special kind of risk management strategy, alternative financial policies can also reduce a firm’s risk without requiring the firm to directly engage in risk management activities (see: Nance et al 1993; Tufano, 1996; Getzy et al 1997). Contrary to our prediction, as well as to the findings of the cited studies, our results show a positive relation between the decision to hedge and this explanatory variable, suggesting that companies that are more liquid are more likely to hedge (see Table 3). Hence, our assumption regarding hedging substitutes should be rejected in the case of the Croatian companies. However, it needs to be emphasised that this result has not been supported by the correlation analysis which has shown no significant evidence between quick ratio and hedging.

Other results of univariate tests suggest that hedgers are not statistically different from non-hedgers with respect to the cost of financial distress, agency cost of debt, capital market imperfection, tax preference items or managerial utility. Therefore, we should reject all research hypotheses regarding shareholder maximisation, as well as managerial utility maximisation in the case of Croatian companies. Additionally, we should reject our hypothesis regarding alternative financial policies that substitute for risk management strategies. Our findings predict the opposite to what we assumed, suggesting that the Croatian companies that are more liquid have more incentives to hedge. Regarding these results, it should be mentioned that Froot et al (1993) have predicted a positive association between liquidity and hedging, which results from the interpretation of liquidity, not as a substitute for hedging, but as a measure of the availability of internal funds. It could be argued that the positive relation between the decision to hedge and quick ratio can be explained by the capital market imperfection and costly external financing hypothesis and not by hedging substitute’s rationale.

Comparison of the Croatian univariate analysis results with the findings of the identical analysis conducted for the Slovenian sample has revealed that the tested hedging theories have little predictive power regarding the risk management practices in both countries (see Table 4). Univariate tests have discovered that the Slovenian hedgers are statistically different from non-hedgers with respect only to the coefficient of the publicly held company dummy variable that proxy for alternative financial policy as substitutes for hedging. A positive relation between the decision to hedge and the coefficient of the publicly held company dummy variable leads to the conclusion that companies that list their shares on the stock-exchange have more incentives
to hedge, while privately held companies do not act in a risk-averse manner and do not hedge. This is contrary to what we have predicted in our assumption connected to the different behaviour of publicly traded and privately held stock companies with regard to risk management (e.g. see: Stulz, 1984; Smith and Stulz, 1985; Froot et al 1993; Cummins et al 2001). This result has not been supported by the correlation analysis. Other univariate results have shown that the Slovenian hedgers are not statistically different from non-hedgers with respect to the cost of financial distress, agency cost of debt, capital market imperfection, tax preference items or managerial utility. Therefore, we should reject all research assumptions regarding the shareholder maximisation hypothesis and managerial utility maximisation hypothesis for the Slovenian companies.

3.4.2. Multivariate analysis

Binomial logistic regression was estimated to distinguish among the possible explanations for the decision to hedge. The variables tested in multivariate analysis were based on the determinants we have presented in the literature review as the key rationales of corporate hedging decision. In our logistic model, we have tested whether the decision to hedge or not is a function of the six factors – the financial distress costs, agency costs, capital market imperfections, taxes, managerial utility and hedge substitutes. Because multiple proxies were available to measure some firm characteristics, we have estimated separate logistic regressions, using all possible combinations of variables representing each predicted construct. Of these main factors, the first five are expected to have a positive influence on the firm’s decision to hedge. That is, higher values for factors related to financial distress costs, agency costs, capital market imperfections, taxes and managerial utility are expected to be associated with a greater likelihood that the firm will engage in hedging activities. The sixth factor (hedge substitutes), however, is expected to have a negative influence on the firm’s hedging decision. The dependent variable is coded 1 if the firm hedges corporate risks and 0 otherwise. The relationship between the decision to hedge and its potential determinants can be expressed in the format of a general function as follows:

\[
\text{Hedge} = f(FC, AC, CEF, T, MU, HS)
\]  

where:
- Hedge – binary variable which takes on a value of 1 if the firm hedges and 0 if the firm does not hedge
- FC – the firm's probability of financial distress or bankruptcy
- AC – agency costs of debt facing the firm
- CEF – costly external financing
• T – the convexity of the firm's tax function
• MU – level of managerial wealth invested in the company
• HS – the extent of alternative hedging-related financial policies or hedge substitutes utilised by the firm.

Table 5 reports multivariate analysis results relating the probability of hedging to the determinants of hedging for the analysed Croatian companies. The predetermined independent variables include total sales revenues as a proxy for size and financial costs, debt rating as a proxy for agency cost of debt, investment expenditures to assets as a proxy for costly external financing, total value of tax loss carry-forwards as a proxy for tax incentives, share of the company value owned by management as a proxy for managerial utility, and quick ratio as a proxy for hedge substitutes. The underlined variables represent those independent variables which appear to be the most consistent in reporting statistically significant t-values, and which appear to be most consistent and relevant in the stepwise construction of logistic models. Apart from the model presented, as we have created multiple proxies available to measure some firm characteristics, we have estimated separate logistic regressions using all possible combinations of variables representing each predicted construct.

The multivariate regression model for the Croatian companies has revealed that the corporate decision to hedge is related to the company’s credit rating, investment expenditures-to-assets ratio and share of the company owned by management. Company credit rating is a proxy for the agency cost of debt. In our research assumptions we argue that firms that have a credit rating hedge less extensively. The severity of agency cost of debt is related to the extent of informational asymmetries present in the firm and it is expected that firms with greater asymmetric information problems are more likely to have a greater incentive to engage in risk-shifting and under-investment activities. Our evidence is inconsistent with the predictions derived from the agency cost of debt model, because the relationship between the dependent variable and credit rating in our model is positive, leading to the conclusion that companies that have a credit rating hedge more extensively.

This is contrary to the findings of DeMarzo and Duffie (1995) and Haushalter (2000), who have proven that firms with a credit rating hedge less extensively, while firms without credit rating and therefore, greater informational asymmetry, benefit greatly from risk management activity. An alternative variable that has been used as proxy for the agency cost (the share of the company owned by institutional investors) has not been shown as relevant for making the decision to hedge. We argue that the positive relation between the decision to hedge and a company’s credit rating can be explained by the fact that the activity of corporate risk management has a positive influence on the company’s rating grade, because a company that manages its risk exposures is seen as a less risky investment or a better rated business partner. How-
ever, we cannot support this argument by theoretical or empirical evidence, meaning that this explanation is based only on our opinion and that further research should be conducted to test this assumption.

The investment expenditures-to-assets ratio, which controls for company’s investment (growth) opportunities, tests our prediction that hedgers are more likely to have larger investment opportunities (e.g., see: Froot et al. (1993) for theoretical arguments, or Bessembinder (1991), Dobson and Soenen (1993), Nance et al. (1993), Getzy et al. (1997) and Allayannis and Ofek (2001) for empirical evidence). The main hypothesis is that, if access to external financing (debt and/or equity) is costly, firms with investment projects requiring funding will hedge their cash flows to avoid a shortfall in their funds, which could precipitate a costly visit to the capital markets. The results of our logistic model support this prediction and show a statistically significant positive relation between the decision to hedge and investment expenditures-to-assets ratio. However, robustness tests employed by replacing investment expenditures-to-assets ratio with other variables that were used as proxies for capital market imperfections and costly external financing hypothesis have not shown statistically significant results. These findings suggest that the association between hedging and capital market imperfections is not robust. Overall, the data, at best, provide a weak support for the prediction of the tested hypothesis.

The third variable that is statistically significant in our model is the fraction of the firm’s outstanding shares held by the company’s management. We argue that, because a firm’s managers have limited ability to diversify their own personal wealth position associated with the stock holdings and their earnings’ capitalisation, they have strong incentives to hedge. Usually, that kind of hedging is not conducted to improve the value of a company’s stockholders, but to improve managers’ own wealth. To avoid this problem, managerial compensation contracts need to be designed so that when managers increase the value of the firm, they also increase their expected utility. This can usually be achieved by adding option-like provisions to managerial contracts. This rationale was firstly proposed by Stulz (1984) and has been further explored by Smith and Stulz (1985). The results of some empirical studies have confirmed this hypothesis (e.g., see Tufano, 1996; Gay and Nam, 1998), while, in contrast, Geczy et al. (1997) and Haushalter (2000) have not found evidence that corporate hedging is affected by managerial shareholdings. Our results show a negative relation between the decision to hedge and share of the company owned by management, which leads to the conclusion that firms that have a greater fraction of outstanding shares held by the company’s management have less incentive to hedge. This is contrary to our prediction, and to the evidence of Tufano (1996), who has found that firms whose managers have more wealth invested in the firm’s stocks, manage more corporate risks. Other variables that were employed as proxies for the managerial utility hypothesis (value of company share owned by management, managers’ ownership
of stock options, managers’ age and tenure) were not statistically significant in the model. Therefore, we should reject the hypothesis regarding managerial utility maximisation.

However, we need to emphasise that the inability to use variables employed in other studies (see e.g. Smith and Stulz, 1985; Tufano, 1996; Geczy et al 1997; Gay and Nam, 1998; Haushalter, 2000) as proxies for the extent to which options are used in managers’ compensation plans, has prevented us from testing whether managerial option holdings in Croatian companies has an impact on the fact that managers who own company’s shares do not act in a risk averse manner and have less incentive to hedge corporate risks. Managerial option holdings are not available as public information in the case of Croatian companies and managers were not willing to reveal this information in the survey questionnaire. Therefore, we believe a negative relation between the decision to hedge and share of the company owned by management can be explained by the fact that, apart from stock holdings, Croatian managers also have option-like provisions. It has been proven (see: Tufano, 1996; Gay and Nam, 1998) that managers with greater option holdings would prefer less risk management. The theoretical explanation for this is offered by Smith and Stulz (1985) who claimed that the expected utility of managerial wealth has the shape of a convex function of the firm’s expected profits when managers own unexercised options. Therefore, the more option-like features there are in the compensation plans, the less managers will hedge. In this case, managers can choose to increase the risk of the firm in order to increase the value of their options. Yet, further research among the analysed Croatian companies should be conducted to confirm this argument as it is based only on our opinion, not on empirical evidence.

Overall, it could be concluded that the evidence based on an empirical relation between the decision to hedge made by Croatian non-financial companies and financial distress costs, agency costs, capital market imperfections and costly external financing, taxes, managerial utility and hedge substitutes, fails to provide any support for any of the tested hypotheses but one – costly external financing measured by investment expenditures-to-assets ratio. Regarding this result, we need to emphasise that the association between hedging and capital market imperfections is not robust to other variables employed as proxies for testing this hypothesis.

Table 6 reports multivariate analysis results relating the probability of hedging to the determinants of hedging for Slovenian companies. The predetermined independent variables include total sales revenues as a proxy for size and financial costs, credit rating as a proxy for agency cost of debt, investment expenditures to assets as a proxy for capital market imperfections, total value of tax loss carry-forwards as a proxy for tax benefits, and investment expenditures-to-assets ratio as a proxy for investment opportunities. The results indicate that these variables have a significant impact on the probability of hedging.

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9 Like the total option holdings held by officers and directors or the market value of shares that could be owned by managers and directors by exercising their options.
proxy for tax incentives, value of company’s equity owned by management as a proxy for managerial utility, and quick ratio as a proxy for hedge substitutes. The underlined variables represent those independent variables which appear to be the most consistent and relevant in the stepwise construction of logistic models. The dependent variable is coded 1 if the firm hedge corporate risks and 0 otherwise.

The regression model presented in Table 6 has revealed that there is no statistically significant explanatory variable, therefore it could be concluded that the decision to hedge in the Slovenian companies is not dependent on any of the predicted theories of hedging. Evidence based on empirical relation between decision to hedge and financial distress costs, agency costs, capital market imperfections and costly external financing, taxes, managerial utility and hedge substitutes, fails to provide any support for any of the tested hypotheses. We have tested the robustness of this result by employing separate logistic regressions with all combinations of exploratory variables, and these tests have supported the results of the model presented in Table 6. It should be emphasised that, in the regression models where outliers have not been controlled, the total sales revenues as a proxy for size was marginally significant (p = 0.0503). When we removed the standardised residuals from the model (which is one of the important assumptions of logistic regressions and the reliability of the results), the total sales revenues were not significant (p = 0.0543).

4. Conclusion

Our research results have revealed an important conclusion that the explored hedging rationales have little predictive power in explaining corporate risk management decisions, in both Croatian and Slovenian companies. The evidence, based on both univariate and multivariate empirical relations between the decision to hedge in Croatian non-financial companies and financial distress costs, agency costs, costly external financing, taxes, managerial utility and hedge substitutes, fails to provide any support for any of the tested hypotheses but one – capital market imperfections and costly external financing measured by investment expenditures-to-assets ratio. The univariate analysis and multivariate regression conducted for the Slovenian companies have shown that there is no statistically significant explanatory variable for the decision to hedge; therefore we can conclude it is not dependent on any of the predicted theories of hedging.

Moreover, our analysis has revealed statistically significant relations between the decision to hedge and different hedging theories, but these relations are contrary to the predicted sign. Univariate tests conducted for the hedging substitutes’ hypothesis have shown that the Croatian hedgers have a statistically greater quick ratio, which is confirmed by the multivariate analysis. Therefore, not only have we rejected the
assumption that less liquid companies have more incentives to hedge, but we have proven that companies that are more liquid are more likely to hedge. The positive relation between the decision of Slovenian companies to hedge and the coefficient of the publicly held company dummy variable leads to the conclusion that companies which list their shares on the stock-exchange have more incentives to hedge and use derivatives as risk management instruments. We have predicted that, if closely held firms tend to be risk-averse, the coefficient of the publicly held company dummy variable is negative. Therefore, the hypothesis regarding the different behaviour of publicly traded and privately held stock companies with regard to risk management is proven to be relevant, but it is rejected because the relation is reversed – publicly traded companies are more risk-averse in comparison with those that are privately held. Other hypotheses where the opposite has been proven are managerial utility maximisation, together with the agency cost of debt hypothesis in the case of the Croatian companies. The multivariate regression model has shown that the corporate decision to hedge is positively related to the company’s credit rating and negatively related to the share of the company owned by management. Therefore, we can conclude that the Croatian companies that have a credit rating, and therefore less asymmetric information, have more incentives to hedge. Additionally, companies where managers have more wealth invested in the company stocks are less likely to hedge.

Our paper contributes to the existing theory, as it indicates the weak predictive power of well-known and accepted hedging theories on corporate risk management behaviour in the Croatian and Slovenian companies. Our research has confirmed that, in spite of the extensive body of literature on corporate risk management and the efforts that have been devoted to developing theoretical rationales for hedging, there is no single accepted framework which can be used to guide hedging strategies, and no widely accepted explanations for risk management as a corporate policy. Directions for further research stem from our research findings, as well as from missed opportunities that indicate avenues for future research. It would be worthwhile to conduct a more comprehensive and detailed analysis of reasons why our research has revealed several significant relations between the decision to hedge or use derivatives and different hedging theories, but these relations were contrary to the predicted sign. The advantage of our work is that it provides an impetus for further research to address these issues and move beyond the existing hedging theories, which have proven inadequate in explaining risk management decisions in the Croatian and Slovenian companies. We believe that this cannot be accomplished by using the same research methods as we have used in our thesis. Qualitative methods, such as the in-depth explanatory case study type of research, need to be employed because they enable scholars to expand existing theories or test new ones, and to produce results that can be generalised. As discussed by Spicer (1992), the objective of the case study research is not to draw inferences to a larger population based on sample evidence, but rather to generalise back to the theory.
Further research should explore why the analysed Croatian and Slovenian companies act in the opposite way to that which was predicted by existing hedging theories. By using the explanatory case study research, new theories which provide a convincing explanation of hedging behaviour should be retained and used in other case studies, while theories that do not offer an explanation should be modified or rejected. This kind of approach provides scholars with a deeper understanding of the research problem and offers possible solutions. We believe that the in-depth explanatory case study type of research would enable a more comprehensive analysis of corporate risk management rationales in the Croatian and Slovenian companies and, consequently, find answers to the questions this paper has left open.

References


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Zakon o gospodarskih družbah (2005) *Uradni list* 15/05.

Zakon o računovodstvu (2005), *Narodne novine* 146/05.
List of tables

*Table 3:* Independent sample t-test – Croatian hedgers/non-hedgers

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<th>Quick ratio</th>
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<th>t-test for Equality of Means</th>
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*Source:* Croatian survey data

*Table 4:* Independent sample t-test – Slovenian hedgers/non-hedgers

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*Source:* Slovenian survey data
Table 5. Multivariate results – Croatian sample

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Independent variables:
- FINCOST2: Total sales revenues
- AGCOST1: Credit rating
- CEF2: Investment expenditures-to-assets ratio
- TAX1: Total value of tax loss carry-forward and carry backs
- SUBSTIT3: Quick ratio
- MNGUTIL2: Share of the company owned by management

Estimation terminated at iteration number 7 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood: 26.268
Goodness of Fit: 26.163
Cox & Snell - R^2: .463
Nagelkerke - R^2: .671

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Hosmer and Lemeshow Goodness-of-Fit Test

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Variables in the Equation

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Source: Croatian survey data
Table 6. Multivariate results – Slovenian sample

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Independent variables:
- FINCOST2 Total sales revenues
- AGCOST1 Credit rating
- CEF2 Investment expenditures-to-assets ratio
- TAX1 Total value of tax loss carry-forward and carry backs
- MNGUTIL1 Value of equity owned by managers
- SUBSTIT3 Quick ratio

Estimation terminated at iteration number 9 because Log Likelihood decreased by less than .01 percent.

-2 Log Likelihood 16.542
Goodness of Fit 15.928
Cox & Snell - R^2 .448
Nagelkerke - R^2 .697

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Source: Slovenian survey data
1. INTRODUCTION

“Performance” is a term used in a variety of disciplines. This paper focuses on organisational performance that is in the heart of strategic management and accounting disciplines (Venkatraman and Ramanujam, 1986). Although widely used in theoretical and empirical research, the notion of organisational performance remains largely unexplained. There is relatively little agreement about which definitions are “best” and which criteria should be used to judge the definitions. Moreover, many definitions capture the notion of performance very partially (Verweire and Van den Berghe, 2004). The reason why organisational performance is so difficult to define is the multi-dimensionality of the performance concept. For example, performance can be defined in financial terms (e.g. market value, profitability), but it is often used in other environments, such as operations (e.g. efficiency, effectiveness, number of outputs, throughput-time, product or service quality), marketing (e.g. customer satisfaction, number of customers retained over a certain period), and others. In this paper, the concept of an organisation’s performance management is based on the premise that it is the goals (and purposes) of the company that determine how performance should be considered and measured.

In general, performance measurement can be viewed as the process of quantifying the efficiency and effectiveness of purposeful action and decision-making (Waggoner et al 1999). Performance measurement has to provide the data that will be collected, analysed, reported and, ultimately used to make sound business decisions. As such, performance measurement is a process of monitoring and reporting on how well someone or something is doing. In theory, it is a broad concept applicable to people,
things, situations, activities and organisations. Strategic performance measurement is defined as a measurement and reporting system that quantifies the degree to which managers achieve their strategic objectives (Verweire and Van den Berghe, 2004). However, today’s managers have more trouble managing their business than finding optimal performance measures (and measurement frameworks). Therefore, more attention should be paid to performance management which is defined in this paper according to Verweire and Van den Berghe (2004, p. 7) as “a process that helps an organisation to formulate, implement, and change its strategy in order to satisfy its stakeholders’ needs”. In other words, performance management is “a comprehensive management process framing the continuous improvement journey, by ensuring that everyone understands where the organisation is and where it needs to go to meet stakeholder needs” (Statement on Management Accounting No. 4DD, 1998, p. 3). The ultimate goal of performance management is to achieve sustainable organisational performance.

Important aspects of performance management are setting performance goals, developing strategies, and translating them into concrete guidelines for action (i.e., making the strategies operational). Performance management is also about creating commitment and motivation to carry out the proposed goals. Communication plays an important role in this process. To summarise, performance management is much more than merely measuring performance. It is about doing the right things, and doing the things right. What this means in practice can differ from company to company. There is no one way of managing performance. Performance management delivers success only if it is integrated or strategically aligned. That means that all performance management processes and activities have to be linked to a company’s strategy, focusing on those critical activities that, if done well, will lead to competitive advantage and long-term growth. Appropriate performance measurement systems (PMS) are important facilitators in this journey. PMS assist managers in tracking the implementation of strategy by comparing actual results against strategic goals and objectives. A performance measurement system typically comprises systematic methods of setting business goals together with periodic feedback reports that indicate progress against those goals (Simons, 1995). Managing organisational performance during a financial crisis becomes even more difficult without any pre-defined PMS framework in place. An organisation going through a financial crisis has to draw out various measures to effectively cope up with the problems. Reporting on the wrong performance measures can result in future deepening of the crisis. In such a situation key performance indicators (KPIs) can be called upon to assist the organisation in effectively measuring and managing performance and meeting the challenges of the economic downturn.

The purpose of our paper is to evaluate the progress that Slovenian companies have made in the 5-year period (from 2003 to 2008) regarding the developments in
performance measurement and management. Our comparative surveys were conducted in 2003 and 2008 with a sample of 108 and 323 Slovenian companies respectively. To accomplish the purpose of our paper, we will attempt to answer the following questions: What do companies understand by “successful performance”?; What are characteristics of companies’ performance management and decision-making?; What are the most and the least important performance measures for companies?; What are the most and the least important performance measures for companies considering the size of companies?; and What performance measurement systems do companies use?; By answering these questions we will discuss the impact of our results (especially those regarding the use of KPIs and integrated PMS) on the ability of firms to survive the financial crisis. We will investigate whether the mostly used KPIs in Slovenian companies represent good or bad foundations to cope with the crisis and prevent certain re-occurrence of the same problems in the future.

The paper is organised as follows. Performance management issues and research propositions are discussed in section 2. In section 3, we present results of the empirical research based on a survey carried out in 323 Slovenian companies. In section 4 we discuss the results and in section 5 we provide our final conclusions.

2. LITERATURE REVIEW AND RESEARCH PROPOSITIONS

It has long been recognised that performance measures are an integral part of the planning and control cycle (Barnard, 1968) and managers must have been planning and controlling the deployment of resources since the first company was established. Traditionally, managers have relied on financial measures for decision-making and performance evaluation purposes (Anthony and Govindarajan, 2001; cf. Berry et al 2005). Since the end of the 1980s, on the other hand, academics, consulting companies and practitioners have all emphasised the need to give more weight to non-financial measures in performance measurement systems. For example, Kaplan (1983) was among the first to induce the challenge related to the measurement of manufacturing performance by insisting on the need for senior management to abandon short-term financial measures based on manufacturing assumptions of standardisation in favour of developing indicators that foster long-term competitiveness and profitability. Numerous authors discuss the problems with the performance measures used by companies. Traditional financial measures are criticised because of the following reasons (Johnson and Kaplan, 1987; Schmenner, 1988; Kaplan and Norton, 1992): (1) They present a one-sided view of organisational activities, making effective co-ordination difficult. (2) They lack strategic focus and fail to provide data on quality, responsiveness, and flexibility. (3) They encourage managers to minimise the variances from standard rather than seek to improve continually. (4) They fail to provide
information on what customers want and how competitors are performing. (5) They are historically focused.

Emphasis has to shift from controlling operations to continuous improvement by providing timely and relevant information to workers and managers. The essence of continuous improvement is to constantly seek ways in which products and processes can be improved, so that greater value can be delivered to customers at ever greater levels of efficiency (Neely, 1999). However, before any company can determine what it needs to improve, it has to establish where and why its current performance falls short. Hence, the need for performance measures. Although financial measures are unlikely to capture fully the many dimensions of organisational performance, implementing an evaluation system with too many measures can lead to measurement disintegration. This occurs when an overabundance of measures dilutes the effect of the measurement process. Managers may follow a variety of measures simultaneously, but fail to monitor the main drivers of success. Numerous managers suffer from data overload. Most companies have information systems which generate at least some redundant performance reports. Comments such as “we measure everything that walks and moves, but nothing that matters” (Neely, 1999, p. 206) are common. Yet another problem with the performance measures used in many companies is that they are rarely integrated with one another or aligned to the business processes (Lynch and Cross, 1991). Performance measures are also often poorly defined. It is not unusual to observe two people heatedly arguing over some dimension of performance and later find that the root cause of their disagreement was the imprecise definition of a measure.

Different performance measurement frameworks (also called models or systems) began to reconcile the use of financial and non-financial measures. Examples include the balanced scorecard (Kaplan and Norton 1992, 1993, 1996, 1999a, 1999b, 2001, 2008), Performance Pyramid (McNair et al., 1990; Lynch and Cross, 1991; Nilsson and Olve, 2001), stakeholder model (Atkinson et al., 1997), Tableaux de Bord (Epstein and Manzoni, 1998), and performance management framework (Otley, 1999). These models all use financial and non-financial measures for strategy formulation and implementation. As follows, we discuss the Balanced Scorecard in more detail because it has received the most attention in the relevant literature.

The Balanced Scorecard (BSC) is a concept launched by Kaplan and Norton in an influential article in 1992, where the authors describe how a concise summary of key success factors can be used to aid management in aligning business operations with strategy. In later years, Kaplan and Norton increasingly stressed the use of their model as a tool of strategic control. It is a key for driving performance in companies and can be viewed as a cockpit with access to all relevant strategic information. Act-

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1 Sales turnover, for example, simply reports what happened last week, last month or last year, whereas most managers want predictive measures that indicate what will happen next week, next month, or next year.
ing as a generic multi-dimensional instrument, the BSC aims to extend the scope of management information from financial measures to include other non-financial aspects linked to strategy. Furthermore, these systems measure the achievement of the components of the strategic plan and act as a strategic management system (Kaplan and Norton, 2001). BSC is a framework for performance measurement that incorporates four perspectives on performance (Kaplan and Norton, 1992, 2008a): financial perspective, customer perspective, process perspective, and learning and growth perspective. The four perspectives provide a balance between external and internal measures of performance for a company and help translate a company’s strategic objectives into a coherent set of performance measures.

Kaplan and Norton (1993) note that the BSC is not a template that can be applied to businesses in general or even industry-wide. Different market situations, product strategies, and competitive environments require different scorecards. Business units devise customised scorecards to fit their mission, strategy, technology, and culture. The methodology is intended to assist companies in improving their performance measurement and performance management processes. BSC is a means of performance management in that it enables measuring organisational performance along a variety of dimensions, so that a company might ensure that it is implementing its strategic intent. The linking of performance measures with the strategy in BSC becomes even more explicit in the work of Kaplan and Norton on the strategy-focused organisation, which maintains that the process of strategy mapping is necessary in the construction of effective performance measures within a balanced scorecard (Kaplan and Norton, 2001).

Several surveys indicate that the BSC concept is widely used in large companies in the United States and throughout Europe. For example, Silk (1998) estimates that 60 per cent of the Fortune 1000 companies in the United States have had experience with BSC. Marr (2001, p. 30) reports: “The latest data suggest that over 50 per cent of the largest US firms had adopted a measurement framework, such as the Balanced Scorecard, by the end of 2000”. Another study estimates that more than 40 per cent of all Fortune 500 US companies use Balanced Scorecards (see: Williams, 2001). In a worldwide study of management tools, Rigby and Bilodeau (2009) show that the Balanced Scorecard has a utilisation rate of 53 per cent. Despite these encouraging figures, Speckbacher et al’s (2003) study shows that only a minority of companies from German-speaking countries (26 per cent) use BSCs, and most of these appear to use only a limited or incomplete version. In Slovenia, we conducted the survey “Cost management in Slovenian companies” during the winter of 2000/2001, including 264 companies. We found out that only 7 per cent of companies implement or use BSC (more on this research see, for example, in Tekavčič and Peljhan, 2003). Moreover, research evidence is demonstrating that companies that are managed using integrated balanced performance measurement systems outperform and have superior stock prices
to those that are not “measure managed” (Kennerley and Neely, 2003). Neely (2007) also reports positive impact of BSC on organisational performance in terms of sales and gross profits. Crabtree and DeBusk (2008) show that firms who adopt the BSC significantly outperform firms that do not adopt the BSC.

Finally, we want to point out that the contingency theory literature suggests that the size of companies is related to the design of organisational structure and the use of PMS (Speckbacher et al., 2003). Bruns and Waterhouse (1975), Ezzamel (1990), Libby and Waterhouse (1996), and Merchant (1981) suggest that as the size of the company increases, accounting and control processes tend to become more specialised and sophisticated as a broader set of information and measurement issues arises in larger companies. Larger companies are associated more specialised functions and processes; therefore, co-ordination and communication problems increase with size. As a broader set of information and measurement issues arises in larger companies, more advanced and more sophisticated management accounting systems are required. Hoque and James (2000), for example, report that non-financial representations of performance are more prevalent in larger companies than in small and medium-sized companies. Their survey of 66 Australian companies revealed that the performance measurement practices of the largest companies most closely resemble the BSC and that BSC usage is positively associated with organisational size. Furthermore, Speckbacher et al. (2003) found a significant association of size and BSC usage. Namely, larger companies are more likely to use the BSC concept. Since it is important for performance measurement systems to be well structured and to measure performance systematically, we expect the importance of specific performance measures to be dependent on company size.

Arguments presented above lead to the following research propositions:

- **P1**: Financial and non-financial performance measures are equally important in organisational performance management.
- **P2**: Importance of specific performance measures differs according to company size.
- **P3**: Companies are using integrated performance measurement systems (PMS) in their organisational performance management.

Propositions 1, 2 and 3 are tested using the following research questions:

- What do companies understand by “successful performance”?
- What are characteristics of companies’ performance management and decision-making?
- What are the most and the least important performance measures for companies considering the size of companies?
- What performance measurement systems do companies use?
In the following section we present the results based on the research conducted in Slovenian companies, describing characteristics of performance measurement and management in Slovenian companies.

3. EMPIRICAL RESEARCH IN SLOVENIAN COMPANIES: RESULTS OF COMPARATIVE STUDIES

3.1. Research setting

A sample of companies operating in the Slovenian economy represents our research setting. Slovenia is a small economy with a population of about 2 million. It gained its sovereignty in June 1991, breaking away from the former Yugoslav federation. It is a small country with a land area of 20,296 square km, neighbouring Italy in the West, Austria in the North, Hungary in the East and Croatia in the South. It used to be a constitutional part of former socialist republic Yugoslavia in the period 1945–1991. From 2004 Slovenia has been a member of the European Union, and is by far the best developed of all advanced transitional economies that joined the Union. This fact was reflected in the high GDP per capita (PPP) at around €16,400 in 2003, when Slovenia was at 77 per cent of the EU-25 average (70 per cent of the EU-15 average) (Purchasing power parities (PPP) and gross domestic product in PPP, 1995–2003 – First Release, http://www.stat.si/eng/novice_poglej.asp?ID=336). In 2008, the GDP per capita (PPP) was at 90.6 per cent of the EU-27 average (Eurostat: GDP per capita in PPS, 2008).

Following the independence and the loss of a unified federal market, the Slovenian companies had to shift the focus and quickly find alternative markets. In principle, the Slovenian industry was successful in finding substitute markets. The national economy had some advantages due to the positive legacy of its Yugoslav past that gave Slovenian companies an initial advantage over the rest of Central and East Europe when it came to transition. In the former Yugoslavia the state withdrew from the economic sector since the mid-1950s and to a large extent companies were aware of the market forces and their power. However, the shortcoming of the Yugoslav model was that unsuccessful companies were rarely put into bankruptcy due to the practice of socialisation of losses (i.e. the state would cover for inefficient companies to preserve social peace). Slovenian, traditionally export-oriented, companies had been exposed to the market economy for decades and had held trade links with Western European partners. When Slovenia became a full member of the European Union, deregulation, liberalisation and foreign competition increased even further. Major changes in the business environment strongly influenced the performance management processes in proactive and outward oriented companies, while others are still lagging behind.
3.2. Research method

The aim of the research is to develop a better understanding of performance measurement and management in Slovenian companies with the emphasis on the relationship between performance management issues and the financial crisis. The main source of data is the survey “Cost management and contemporary management tools in Slovenian companies” conducted during the summer of 2008. The empirical research is based on an extensive questionnaire, fully structured and with pre-coded responses. After a careful consideration, it was decided to fill in the questionnaires by using personal interviews with top managers or middle managers. We chose personal interviews because we believe that they provide more complete and precise information than mail, telephone or e-mail questionnaires, taking account of the length of questionnaires. Personal interviews provide the opportunity for feedback in clarifying any questions a respondent has about the instructions or questions. Other advantages of personal interviews are moderate to fast speed of data collection, excellent respondent co-operation, low number of unanswered questions, and lowest possibility for respondent misunderstanding (Zikmund, 2000). We conducted personal interviews with 160 specially trained interviewers. Each interviewer questioned 2–3 companies. Slovenia is a relatively small country, so we could cover all geographical areas at a relatively low cost, which is usually not the case when using personal interviews (Zikmund, 2000).

This study is based on the research sample of 323 companies. When choosing companies to be included in the sample we had no intent to exclude any company. However, our sampling technique corresponds the judgmental or purposive sampling as the population elements were selected based on the judgment of interviewers. Nevertheless, the sample is relatively big and offers a good representation of the whole population, as regards the size of companies, their geographical position and industry (branch) they belong to.

The sample consists of 34 per cent micro, 19 per cent small, 18 per cent medium, and 29 per cent large companies. Companies are classified according to valid Slovenian legislation at the time of conducting the interviews. ‘Micro company’ fulfils two of the following criteria: average number of employees does not exceed 10, annual revenues are less than € 2 million, assets at the end of the financial year do not exceed € 2 million. ‘Small company’ fulfils two of the following criteria: average number of employees does not exceed 50, annual revenues are less than € 7.3 million, assets at the end of the financial year do not exceed € 3.65 million. ‘Medium company’ is a

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2 Interviewers were properly trained because the research was part of their postgraduate course work.

3 For more on judgement or purposive sampling consult for example Churchill, 1999; Malhotra, 1999 or Zikmund, 2000.
company fulfilling two of the following criteria: average number of employees does not exceed 250, annual revenues account for less than € 29.2 million, average assets at the end of business year do not exceed € 14.6 million. Other companies were classified as ‘large companies’. The sample consists of 38 per cent manufacturing companies and 60 per cent service companies. 2 per cent of companies operate in both sectors. The sample consists of 64 per cent limited liability companies, 24 per cent joint stock companies, 9 per cent entrepreneurs and 3 per cent other legal entities.

We mainly use descriptive statistics to analyze the survey data. The calculation of relative proportions is used to analyze data regarding the understanding of “successful performance” and the type of performance measurement system being used in Slovenian companies. When appropriate, companies are divided into groups by size and proportions are recalculated. These proportions are compared among groups and against the total sample proportions using $z$-test for relative proportions\(^4\). The data on attitudes towards performance measurement and decision-making, and types of performance measures being used is based on a five point scale. Means, standard deviations, minimum and maximum values are calculated. We use independent samples $t$-test to find out whether the importance of performance measures depends on company size. Our results only report on performance measures that are significantly different\(^5\).

### 3.3. Research results

In the following sections we are presenting results regarding the understanding of “successful performance” by Slovenian companies, their attitudes towards performance measurement and decision-making and importance of a particular performance measure in the organisational performance management.

#### 3.3.1. Understanding of “successful performance”

We asked companies what they understand by “successful performance”. Companies were offered various possibilities. When more were chosen, they had to be ranked from the most to the least important one. Companies ranked as the most important understanding of “successful performance” the following (two companies did not answer this question):

- Achieving goals of the owners (41 per cent; 33 per cent in 2003);
- Achieving goals of different stakeholders (29 per cent; 24 per cent in 2003);
- Following the strategy (26 per cent; 25 per cent in 2003);
- Increasing the market share (12 per cent; 8 per cent in 2003);

\(^4\) $H_0: p = \pi_0$ and $H_1: p \neq \pi_0$ is tested by $z = \frac{p - \pi_0}{\sqrt{\frac{\pi_0 \cdot (1 - \pi_0)}{n}}}$.

\(^5\) We have chosen a 95% confidence level that corresponds to $\alpha = 0.05$. 
• Keeping the market share (7 per cent in 2003 and 2008);
• Other, e.g. keeping up with or beating the competitors (5 per cent in 2003 and 2008).

The most evident changes from 2003 are as follows: (1) The increase in achieving goals of the owners by 8 percentage points. (2) The increase in achieving goals of different stakeholders by 5 percentage points. When analyzing large companies only, the ranking changes: more companies primarily follow the strategy (38 per cent; 32 per cent in 2003) and less companies pursue the goals of the owners (33 per cent; 37 per cent in 2003). Very important shift in large companies is evident in achieving goals of different stakeholders: from 15 per cent in 2003 to 32 per cent in 2008.

44 per cent of medium companies primarily pursue goals of the owners and 30 per cent goals of different stakeholders. 30 per cent of medium companies primarily follow their strategy. The important shift in medium companies is evident in achieving goals of the owners: from 30 per cent in 2003 to 44 per cent in 2008. 45 per cent of micro and small companies primarily follow goals of their owners, while 27 per cent pursue goals of different interest groups and 19 per cent follow their strategy. The important shift in micro and small companies is evident in achieving goals of the owners: from 30 per cent in 2003 to 45 per cent in 2008. However, significant differences are obtained for the following: (1) the proportion of micro and small companies that primarily pursue goals of owners – this proportion is significantly higher than the proportion in large companies; (2) the proportion of micro and small companies that are primarily following the strategy – this proportion is significantly lower than the proportion in large companies.

3.3.2. Attitudes towards performance measurement and decision-making

We asked companies to select on the Likert five point scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree) their attitude towards 16 statements regarding the characteristics of their performance management and decision-making. Companies could choose to answer that the particular statement cannot be applied to their company. Results are shown in Figure 1. We can see that companies evaluate performance from financial and non-financial perspective, but in 2008 survey financial perspective was perceived as relatively more important than in 2003. We would like to emphasise the following positive shifts in performance management:

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6 For the reasons of comparison with the 2003 research results, micro and small companies are considered together.
Our performance is evaluated from financial and non-financial perspective. Organisational performance results are evaluated according to the implementation of our strategic guidelines. We use modern information system. Information for decision-making is available on time. Financial information (e.g. cash flows, liquidity) is the most important performance information. Our current performance measures are very well related to our strategy. Financial and non-financial measures are considered equally important. We primarily use financial / accounting performance measures. Accounting information (e.g. ROE, ROA) is the most important performance information. Employees are familiar with measures of their work performance. Employees are familiar with organisational performance measures. The majority of employees are familiar with organisational performance measures. The use of non-financial measures in our company is increasing. We evaluate our performance just from financial perspective. Organisational performance is evaluated mainly intuitively. Decision-makers consider only financial performance measures. We evaluate our performance just from financial perspective. The use of non-financial measures in our company is increasing. The majority of employees are familiar with organisational performance measures. Employees are familiar with measures of their work performance. Accounting information (e.g. ROE, ROA) is the most important performance information. We primarily use financial / accounting performance measures. Financial and non-financial measures are considered equally important. Our current performance measures are very well related to our strategy. Financial information (e.g. cash flows, liquidity) is the most important performance information. Information for decision-making is available on time. We use modern information system. Organisational performance results are evaluated according to the implementation of our strategic guidelines. Our performance is evaluated from financial and non-financial perspective.

1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree


- More companies use modern information system (from 3.71 in 2003 to 3.79 in 2008).
- More companies agree that current performance measures they are using are very well related to their strategy (from 3.40 in 2003 to 3.60 in 2008). Moreover, companies think that organisational performance results are evaluated according to the implementation of strategic guidelines (3.80). This is a good foundation for developing integrated performance measurement systems.
- More companies agree that employees are familiar with measures of their work performance (from 3.40 in 2003 to 3.60 in 2008). Also, research results show that more employees are familiar with organisational performance measures (from 2.92 in 2003 to 3.06 in 2008).

However, fewer companies agree that information for decision-making is available on-time. Therefore, the question is whether companies are fully taking advantage of their modern information systems.
3.3.3. Importance of a particular performance measure in the performance management

We wanted to find out, what were the most and the least important performance measures for companies. We asked companies to select on the Likert five point scale (1 = not important at all; 2 = little important; 3 = in between; 4 = important; 5 = very important) their attitude towards 70 financial and non-financial performance measures. Companies could choose to answer that the particular measure cannot be applied to their company. Ten most important and ten least important performance measures are shown in Table 1 and Table 2.

<table>
<thead>
<tr>
<th>Performance measure</th>
<th>Mean (Rank)</th>
<th>Mean (Rank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquidity</td>
<td>4.31 (1)</td>
<td>4.36 (1)</td>
</tr>
<tr>
<td>Revenues growth</td>
<td>4.24 (2)</td>
<td>4.13 (4)</td>
</tr>
<tr>
<td>Solvency</td>
<td>4.14 (3)</td>
<td>4.15 (2)</td>
</tr>
<tr>
<td>Profit growth</td>
<td>4.08 (4)</td>
<td>4.06 (5)</td>
</tr>
<tr>
<td>Revenues to cost ratio</td>
<td>4.08 (4)</td>
<td>4.15 (2)</td>
</tr>
<tr>
<td>Labour productivity</td>
<td>3.90 (6)</td>
<td>3.88 (7)</td>
</tr>
<tr>
<td>Number of customers</td>
<td>3.88 (7)</td>
<td>3.90 (6)</td>
</tr>
<tr>
<td>Supplier partnerships</td>
<td>3.83 (8)</td>
<td>3.84 (8)</td>
</tr>
<tr>
<td>Profit margin</td>
<td>3.82 (9)</td>
<td>3.79 (11)</td>
</tr>
<tr>
<td>Days sales outstanding</td>
<td>3.77 (10)</td>
<td>3.83 (9)</td>
</tr>
</tbody>
</table>

1 = unimportant; 2 = of little importance; 3 = medium; 4 = important; 5 = very important

For example, the percentage of suppliers the company does business with for 5 or more years.


The most important performance measure relates to liquidity (4.31). It is followed by revenues growth (4.24) and solvency (4.14). Profit growth and revenues to cost ratio are also measures with average above 4 (4.08). These measures are followed by the number of customers, labour productivity and the supplier partnerships. The first five most important measures appear to be financial. This is in line with findings of the previous section where companies on average agree that financial information (e.g., cash flows, liquidity) is the most important performance information. The second half of the most important measures includes four non-financial measures (labour productivity, number of customers, supplier partnerships, and days sales outstanding) although we miss measures representing “innovation and learning” perspective. What
is more, in Figure 1 we found that the use of non-financial performance measures in companies does not seem to be increasing (mean 2.96). When compared to 2003 research results we can see that in the five year period companies perceive more or less the same performance measures as the most important. Also, in the five year period companies haven’t included “innovation and learning” perspective measures among the most important ones.

Table 2. The least important performance measures in Slovenian companies in 2003 and 2008.

<table>
<thead>
<tr>
<th>Performance measure</th>
<th>2008 Mean (Rank)</th>
<th>2003 Mean (Rank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products (services) removal ratio</td>
<td>2.25 (1)</td>
<td>2.47 (1)</td>
</tr>
<tr>
<td>Number of products (or services) removed</td>
<td>2.36 (2)</td>
<td>2.54 (2)</td>
</tr>
<tr>
<td>Share price</td>
<td>2.47 (3)</td>
<td>2.56 (3)</td>
</tr>
<tr>
<td>Weighted average cost of capital (WACC)</td>
<td>2.71 (4)</td>
<td>2.99 (9)</td>
</tr>
<tr>
<td>R&amp;D cost to revenues ratio</td>
<td>2.73 (5)</td>
<td>2.68 (4)</td>
</tr>
<tr>
<td>Earnings per share (EPS)</td>
<td>2.78 (6)</td>
<td>3.03 (14)</td>
</tr>
<tr>
<td>Assets per employee</td>
<td>2.79 (7)</td>
<td>2.78 (5)</td>
</tr>
<tr>
<td>Average age of employees</td>
<td>2.92 (8)</td>
<td>3.06 (18)</td>
</tr>
<tr>
<td>Time-to-market</td>
<td>2.94 (9)</td>
<td>3.24 (24)</td>
</tr>
<tr>
<td>Costs of faulty products / services</td>
<td>2.98 (10)</td>
<td>3.00 (11)</td>
</tr>
</tbody>
</table>

1 = unimportant; 2 = of little importance; 3 = medium; 4 = important; 5 = very important

Products (services) removal ratio is perceived as the least important measure with the average grade of 2.25. It is followed by the number of products (services) removed from the production (2.36), share price (2.47), WACC – weighted average cost of capital (2.71), and R&D cost to revenues ratio (2.73) that represents “innovation and learning” perspective. When compared to 2003 research results we can see that in the five year period companies perceive more or less the same performance measures as the least important. We would like to emphasise the positive shifts in the measurement of the following non-financial performance indicators:

- Fluctuation (from 2.88 in 2003 to 3.21 in 2008);
- R&D cycle (from 2.97 in 2003 to 3.23 in 2008);
- New products (services)’ sales ratio – the percentage of sales of new (2 years or less) products (or services) in all sales (from 2.99 in 2003 to 3.21 in 2008).

We also investigated what are the most important performance measures for companies considering the size of the companies. Ten most important performance measures by company size are shown in Table 3, Table 4, and Table 5.
Table 3. The most important performance measures in Slovenian micro and small companies in 2003 and 2008.

<table>
<thead>
<tr>
<th>Performance measure</th>
<th>Mean (Rank) 2008</th>
<th>Mean (Rank) 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquidity</td>
<td>4.37 (1)</td>
<td>4.45 (1)</td>
</tr>
<tr>
<td>Revenues growth</td>
<td>4.23 (2)</td>
<td>3.85 (7)</td>
</tr>
<tr>
<td>Solvency</td>
<td>4.16 (3)</td>
<td>4.16 (2)</td>
</tr>
<tr>
<td>Number of customers</td>
<td>4.01 (4)</td>
<td>3.98 (5)</td>
</tr>
<tr>
<td>Revenues to cost ratio</td>
<td>4.00 (5)</td>
<td>4.00 (3)</td>
</tr>
<tr>
<td>Supplier partnerships</td>
<td>3.95 (6)</td>
<td>3.00(^2)</td>
</tr>
<tr>
<td>Profit growth</td>
<td>3.94 (7)</td>
<td>3.98 (4)</td>
</tr>
<tr>
<td>Labour productivity</td>
<td>3.89 (8)</td>
<td>3.76(^2)</td>
</tr>
<tr>
<td>Profit margin</td>
<td>3.79 (9)</td>
<td>3.75(^2)</td>
</tr>
<tr>
<td>Order fulfilment ratio(^1)</td>
<td>3.71 (10)</td>
<td>3.88 (6)</td>
</tr>
</tbody>
</table>

\(^1\) The percentage of completed orders.
\(^2\) The measure was not included among top 10 in 2003 survey.


When comparing 2003 and 2008 research results for micro and small companies we observe the following changes:

- New non-financial measures are included among the ten most important ones (supplier partnerships and labour productivity – both pertaining to internal processes perspective). On the other hand, in 2003, companies perceived as more important some innovation and learning perspective measures (i.e. cost savings due to products (services) improvements and employee inventiveness) that are not included among 2008 top 10 measures;
- Among financial measures profit margin is included among the ten most important ones;
- Supplier partnerships and revenues growth are measures that gained the most in their relative importance compared to the others.

When comparing 2003 and 2008 research results for medium companies we observe the following changes:

- New non-financial measures are included among the ten most important ones (days sales outstanding and use of working time – both pertaining to internal processes perspective; and days payable outstanding included in the customer perspective). On the other hand, in 2003, companies also perceived as more important innovation and learning perspective measures, i.e. cost savings due to products (services) improvements that is not included among 2008 top 10 measures;
• Day’s sales outstanding are the measure that has gained the most in its relative importance compared to the others. This indicator was not among top 10 in the 2003 survey.

Table 4. The most important performance measures in Slovenian medium companies in 2003 and 2008.

<table>
<thead>
<tr>
<th>Performance measure</th>
<th>Mean (Rank)</th>
<th>Mean (Rank)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2003</td>
</tr>
<tr>
<td>Liquidity</td>
<td>4.39 (1)</td>
<td>4.26 (4)</td>
</tr>
<tr>
<td>Profit growth</td>
<td>4.34 (2)</td>
<td>4.17 (6)</td>
</tr>
<tr>
<td>Revenues growth</td>
<td>4.32 (3)</td>
<td>4.39 (2)</td>
</tr>
<tr>
<td>Solvency</td>
<td>4.30 (4)</td>
<td>4.35 (3)</td>
</tr>
<tr>
<td>Revenues to cost ratio</td>
<td>4.23 (5)</td>
<td>4.48 (1)</td>
</tr>
<tr>
<td>Days sales outstanding</td>
<td>4.11 (6)</td>
<td>3.92(^1)</td>
</tr>
<tr>
<td>Labour productivity</td>
<td>4.09 (7)</td>
<td>4.18 (5)</td>
</tr>
<tr>
<td>Days payable outstanding</td>
<td>4.02 (8)</td>
<td>3.96(^1)</td>
</tr>
<tr>
<td>Supplier partnerships</td>
<td>3.91 (9)</td>
<td>4.10 (9)</td>
</tr>
<tr>
<td>Use of working time</td>
<td>3.71 (10)</td>
<td>3.86(^1)</td>
</tr>
</tbody>
</table>

\(^1\) The measure was not included among top 10 in 2003 survey.

Table 5. The most important performance measures in Slovenian large companies in 2003 and 2008.

<table>
<thead>
<tr>
<th>Performance measure</th>
<th>Mean (Rank)</th>
<th>Mean (Rank)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2003</td>
</tr>
<tr>
<td>Revenues growth</td>
<td>4.22 (1)</td>
<td>4.25 (2)</td>
</tr>
<tr>
<td>Profit growth</td>
<td>4.18 (2)</td>
<td>4.08 (5)</td>
</tr>
<tr>
<td>Liquidity</td>
<td>4.15 (3)</td>
<td>4.33 (1)</td>
</tr>
<tr>
<td>Revenues to cost ratio</td>
<td>4.12 (4)</td>
<td>4.13 (4)</td>
</tr>
<tr>
<td>Solvency</td>
<td>4.00 (5)</td>
<td>4.03 (7)</td>
</tr>
<tr>
<td>Days sales outstanding</td>
<td>4.00 (5)</td>
<td>4.13 (3)</td>
</tr>
<tr>
<td>ROE</td>
<td>3.95 (7)</td>
<td>3.87 (10)</td>
</tr>
<tr>
<td>Profit margin</td>
<td>3.93 (8)</td>
<td>3.73(^1)</td>
</tr>
<tr>
<td>Value added</td>
<td>3.87 (9)</td>
<td>3.54(^1)</td>
</tr>
<tr>
<td>Days payable outstanding</td>
<td>3.86 (10)</td>
<td>4.08 (5)</td>
</tr>
</tbody>
</table>

\(^1\) The measure was not included among top 10 in 2003 survey.

When comparing 2003 and 2008 research results for large companies we observe the following changes:
• No new non-financial measures are included among the ten most important ones. Moreover, two non-financial measures (i.e., market share and supplier partnerships) that were among top 10 are not included among top 10 in 2008 survey. Large companies haven’t included any innovation and learning perspective indicator among top 10 in neither survey.

• Financial indicators profit margin and value added have gained the most in their relative importance compared to the others. These indicators were not among top 10 in the 2003 survey. We believe this is an important shift in the performance management as value added is the indicator of future development and growth of the company.

When comparing micro and small companies to medium companies, we find that calculated means are significantly different for measures ROE, ROA, profit growth, EVA, WACC, days sales outstanding, days payable outstanding, new customers’ revenues ratio, environment management cost, use of working time, average staff education, average staff age, hours of staff training, cost of staff training, employee inventiveness, share of highly educated staff, share of sick leave, earnings per share (EPS), revenues to cost ratio, debt to equity ratio, number of work injuries, and cost decrease due to product/services improvements. We can conclude that these measures are less important to small companies than to medium companies.

When comparing micro and small companies to large companies, we realise that calculated means are significantly different for measures ROE, ROA, profit growth, WACC, ROI (return on investment), value added, value added per employee, days sales outstanding, days payable outstanding, market share in the main market, cost of customer complaints, environment management cost, raw materials inventory turnover, average staff education, average staff age, hours of staff training, cost of staff training, share of highly educated staff, EPS, R&D cost to sales revenues ratio, debt to equity ratio, number of work injuries, and share price. These measures are less important to small companies than to large companies. On the other hand, calculated means are significantly different for the following measures being less important to large companies than to small companies: liquidity, supplier partnerships, number of customers, average order value, number of new customers, and production cycle efficiency.

When comparing medium companies to large companies we find that calculated means are significantly different for measures ROE, ROA, market share in the main market, and share price. These measures are less important to medium companies than to large companies. On the other hand, calculated means are significantly different for the following measures being less important to large companies than to medium companies: solvency, EVA, revenues decrease due to process errors, use of working time, labour productivity, proper raw material quality, and supplier partnerships.
3.3.4. Type of performance management system being used

We wanted to find out, what performance measurement systems companies used. Results are as follows:

- 54 per cent of companies do not use any specific system of performance measurement;
- 38 per cent of companies use balanced scorecard (13 per cent) or some other form of integrated performance measurement system (25 per cent). We can expect these companies to use non-financial measures more extensively.

When dividing companies by their size we got more meaningful results. The relative proportion of companies using BSC or integrated performance measurement system is the highest among large companies (70 per cent). The proportion is significantly lower in medium companies (48 per cent) and in micro and small companies (26 per cent) that generally lack any system of performance measurement (77 per cent of small companies have no specific system of performance measurement). We also asked companies about the reasons for non-implementing BSC. Answers are presented in Table 6. Again, we found some differences among large, medium, and micro and small companies. In large and medium companies the most important reason is lack of initiative (27% and 35% respectively) whereas in micro and small companies the most important reason is the lack of knowledge on the BSC (46%).

Table 6. Reasons for non-implementing BSC.

<table>
<thead>
<tr>
<th>Company size</th>
<th>Reasons for non-implementing BSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Not familiar with BSC (33%)</td>
</tr>
<tr>
<td></td>
<td>Lack of initiative (23%)</td>
</tr>
<tr>
<td></td>
<td>Implementation costs would exceed benefits (9%)</td>
</tr>
<tr>
<td></td>
<td>Lack of initiative (27%)</td>
</tr>
<tr>
<td>Large</td>
<td>Not familiar with BSC (11%)</td>
</tr>
<tr>
<td></td>
<td>Lack of management support (9%)</td>
</tr>
<tr>
<td></td>
<td>Lack of initiative (35%)</td>
</tr>
<tr>
<td>Medium</td>
<td>Not familiar with BSC (30%)</td>
</tr>
<tr>
<td></td>
<td>Lack of management support (9%)</td>
</tr>
<tr>
<td></td>
<td>Not familiar with BSC (46%)</td>
</tr>
<tr>
<td>Micro and small</td>
<td>Lack of initiative (17%)</td>
</tr>
<tr>
<td></td>
<td>Implementation costs would exceed benefits (12%)</td>
</tr>
</tbody>
</table>

Source: Research results, 2008.
4. DISCUSSION

The proposition 1 about the financial and non-financial performance measures being equally important in organisational performance management is not confirmed by our research results. Namely, Slovenian companies still perceive financial performance measures as more important than non-financial9. The thing that could be concerning is that the use of non-financial performance measures in companies does not seem to be increasing, although we would expect the contrary as Ittner and Larcker (2001) for example have revealed that short-term financial measures rank fifth behind four non-financial measures in terms of perceived importance. We find that the least represented non-financial perspective is “innovation and learning” perspective, which is quite discouraging as well. The reason for this is related to the fact that most Slovenian companies are technological followers and not innovators, when considering industry or global market level (Marc et al., 2008). Existing literature suggests a careful selection of performance measures that capture different perspectives of organisational performance. Furthermore, these measures should be aligned with company’s strategy and systematically linked. Taking into account that Slovenian companies still perceive financial measures as more important than non-financial, we believe that companies have to put more effort in implementing some sort of integrated performance measurement system (e.g., the Balanced Scorecard) to measure performance systematically and provide the right information to decision-makers.

As follows we provide some additional arguments against confirming the proposition 1. First, we found out that Slovenian companies evaluate performance from financial and non-financial perspective, but in 2008 survey the financial perspective was perceived as relatively more important than in 2003. Second, the first five most important measures companies are monitoring appear to be financial. This is in line with findings of the section 3.3.2., where companies on average agree that financial information (e.g., cash flows, liquidity) is the most important performance information. The second half of the ten most important measures includes four non-financial measures (labour productivity, number of customers, supplier partnerships, and days sales outstanding) although we miss measures representing “innovation and learning” perspective10. Third, in Figure 1 we found that the use of non-financial performance measures in companies does not seem to be increasing (mean 2.96). Fourth, when compared to 2003 research results we can see that in the five year period companies perceive more or less the same performance measures as the most important (e.g., liquidity, solvency, revenues and profit growth, revenues to cost ratio). Also, in the five year period companies haven’t included “innovation and learning” perspective

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9 This is also evident in the Vitezić and Knez-Riedl’s (2005) results for Croatian companies.
10 This perspective was also the most “ignored” one by companies analyzed in Speckbacher et al’s (2003) study.
measures among the most important ones. This domination of financial measures demonstrates a strong presence of traditional (more financially oriented) performance measurement systems in Slovenian companies where performance is measured from the owners’ point of view. This is evident from our results as 41 per cent of the companies (micro and small: 45 per cent; medium: 44 per cent; large: 33 per cent) consider achieving goals of the owners as the most important understanding of “successful performance”. Here, we would like to emphasise the positive shift in large companies where 38 per cent primarily follow the strategic goals (32 per cent in 2003) and less companies pursue the goals of the owners (37 per cent in 2003). Very important shift in large companies is also evident in achieving goals of different stakeholders: from 15 per cent in 2003 to 32 per cent in 2008. Nevertheless, Rejc (2001) has found that almost 50 per cent of large companies ranked achieving goals of different stakeholders as the most important understanding of “successful performance”. Our results show improvement from 2003 to 2008 and thus imply a step forward in implementation of multidimensional performance measurement systems where it is emphasised that interests of all stakeholders must be taken into account for long term successful performance.

In the proposition 2, we expected the importance of various performance measures to differ according to company size. Our findings support this proposition. The variations among companies of different size already appear in their understanding of “successful performance”. 41 per cent of all companies perceive “achieving goals of the owners” as the best description of “successful performance”. “Achieving goals of different stakeholders” and “following the strategy” were ranked second (29 per cent of companies) and third (26 per cent of companies). Micro and small companies perceive “achieving goals of the owners” as the best description of “successful performance” (45 per cent). The same is true for medium companies (44 per cent). We believe that this is because the SMEs’ strategy setters are usually owners themselves who are close to the “action” (see: Hoque, 2003).

On the other hand, the percentage of large companies following the strategy increased substantially from 2001 when Rejc (2001) found 9 per cent of large companies to consider following the strategy as the most important understanding of “successful performance”, while our results show there are 38 per cent of such companies (in 2003: 32 per cent). However, this finding does not imply the use of diverse performance measures that capture different perspectives of organisational performance as large companies primarily use financial performance measures (see section 3.3.3.). Similar results were obtained by the survey of Lucianetti (2008) for Italian large companies. As shown in Table 5, the most important performance measures for large companies are all financial. Exceptions are days sales outstanding (customer perspective) and days payable outstanding (internal processes perspective) – but also these two indicators are very closely related to cash flow management and as such indirectly certain-
According to the financial perspective. These arguments imply that large companies do not pay enough attention to non-financial performance measures that relate to different stakeholders; instead they concentrate too much on financial performance measures. Further, micro, small, and medium companies include more non-financial measures (e.g., supplier partnerships, use of working time) among the most important ones than large companies. However, we would like to emphasise that in 2003 companies perceived as more important innovation and learning perspective indicators, i.e., cost savings due to products (services) improvements and employee inventiveness that are not included among 2008 top 10 measures.

The proposition 3 about companies using integrated PMS in organisational performance management is supported only for large companies. As shown in section 3.3.4., we found that 54 per cent of companies do not use any specific system of performance measurement. 38 per cent of companies use BSC or some other form of integrated PMS. The relative proportion of companies using some form of integrated performance measurement system is the highest among large companies (70 per cent) and is significantly higher than the proportion in medium (48 per cent) and micro and small companies (26 per cent). According to Chow et al. (1997) this is because large companies tend to face a more competitive environment, have more varied products and processes to be coordinated but also dispose of more resources for executing necessary strategic initiatives compared to medium, small and micro companies. Additionally, micro and small companies generally lack any system of performance measurement. Namely, 77 per cent of micro and small companies have no specific system of performance measurement. Anyhow, these findings are in accordance with previous research (Hoque, 2003; Hoque and James, 2000; Libby and Waterhouse, 1996) that suggests larger organisations would have more resources available to establish more complex PMS than smaller organisations. Hale and Cragg (1996) and Packham (2002) suggest that particularly the strategic management function in micro, small and medium companies varies in that of large companies regarding resource absence of internal specialist expertise, managerial time and capabilities. Similar results were obtained by the research of Yeb-Yun Lin (1999) which provided evidence by a study in Taiwan that managers in micro, small and medium companies usually do not possess sufficient expertise, training and time that is necessary for the implementation of more complex management models which is also in accordance with our research results.

All PMS emphasise the importance of all-company wide communication in achieving goals and implementing strategies. Our research results show that employees are not well familiar with organisational performance measures (only 35 per cent of companies agree that employees are familiar with organisational performance measures). However, this result is not so bad when compared to the research data (Kaplan and Norton, 2001) suggesting that only 5 per cent of the workforce understand their company’s strategy.
Employees are relatively better familiar with measures of their work performance as 41 per cent of companies think that employees are familiar with measures of their work performance. These results are also better than in 2003 research. We believe this is also one of the indicators of improvement of systematic deployment of organisational performance management. This makes it easier to motivate employees to perform better as they have information on performance measures by which their work and company operations are evaluated. For those companies that still manage their performance in a non-systematic and non-integrated way (i.e., they are not using any of integrated PMS), we conclude that in these cases strategy development and the links between strategy and operations remain ad hoc, varied, and fragmented. There are many strategy and operational management tools now available. Therefore, companies can benefit from taking a systems approach to link strategy with operations (see also: Kaplan and Norton, 2008). Having a comprehensive and integrated management system can help companies overcome the difficulties and frustration that most of them experience when attempting to implement their strategies – this is the case especially with new, transformational strategies that are important also in times of economic downturn.

In the period of financial crisis many managers react instinctively by cutting discretionary spending across the organisation. This is the case also in Slovenian companies. According to Kaplan and Norton (2008b) such an indiscriminate slash-and-burn response is a big mistake because it fails to distinguish between short-term operational and long-term strategic programs. Faced with short-term economic hardship, managers often defer or transfer funds from their strategic initiatives (measured with financial as well as non-financial KPIs) to achieve near-term financial targets. We would like to emphasise that unless the downturn threatens a company’s existence, managers should focus on rooting out operational slack and inefficiency, not on modifying or sacrificing strategic initiatives, which build capabilities for long-term competitive advantage. Therefore, it is important for Slovenian companies to systematically improve the process of performance management to ensure that everyone understands where the organisation is and where it needs to go to meet stakeholder needs. This is possible only with the balanced use of financial as well as non-financial KPIs related to organisational strategy and communicated to all employees.

5. CONCLUSION

Several authors have stressed the crucial importance of non-financial indicators based on organisational strategy including key measures of success, and perceived as immune from the various shortcomings of financial measures. The role of short-term financial performance measurement has become inadequate for the new reality of companies characterised by, for example, accelerated changes in technology,
needs for innovation and flexibility, shortened product life cycles, changing nature of work, and increasing competition. Performance measurement systems (PMS) are the focus of considerable attention in academic and practitioner communities as they contribute to the management of organisational performance. The literature suggests that companies have to put much more emphasis on non-financial measures than they did in the past and that they should implement some kind of integrated performance measurement system. The purpose of our paper was to investigate developments in performance measurement and management in Slovenian companies when comparing and discussing results of two studies conducted in 2003 and 2008.

The research results show that Slovenian companies still perceive financial performance measures as more important than non-financial, although they measure both perspectives of their business. What is more, the use of non-financial performance measures is not increasing. As Slovenian companies still perceive financial measures more important than non-financial, we believe that companies have to put more effort in implementing and using integrated PMS to measure performance systematically and provide the right information to decision-makers. Further, we confirmed our proposition that the importance of various performance measures differs according to company size. The proposition about companies using integrated PMS in organisational performance management was supported only for large Slovenian companies. Finally, our conclusion is that the prevailing role of financial KPIs in Slovenian companies is appropriate for monitoring the effects of the financial crisis but if companies want to succeed in the long-run they have to base their decisions also on non-financial measures (focusing on employees, quality, innovations, customers, suppliers, environment etc.) that enable monitoring of many important capabilities for achieving long-term strategic goals.

In future studies, we plan to investigate the impact of organisational performance, type of operations, and level of competition in the structure of key performance indicators companies are using to further improve the knowledge on organisational performance management.

REFERENCES


Research results (2008): *Cost management and contemporary management tools in Slovenian companies*.


1. INTRODUCTION

Bosnia and Herzegovina (hereinafter BH) is a transition country (from socialism to capitalism) and the whole of BH society is in a very dynamic and turbulent process of change, transformation and adaptation, especially regarding the economy. The situation is specific to BH because of its political and legal background. It is a country comprising two entities, the Federation of Bosnia and Herzegovina and the Republic of Srpska, and one district, Brcko district. All of these entities have a different legislative framework. Also, there are two Stock Exchanges – one in Banja Luka (Republic of Srpska) and the other in Sarajevo (Federation of BH), and many other parallel institutions. The consequence of that governmental organisation is the existence of many different and weakly harmonised systems, which is also reflected in the financial reporting.

The introduction of international standards (IAS/IFRS) in 2006 and their full implementation in BH represents the first step in financial reporting harmonisation at state level. The implementation of a new accounting law has resulted in new financial statement schemes, which mainly fulfil minimal postulates from IAS 1 (alternative) model financial statements. However, despite attempts at harmonisation, there is still a partially different approach to financial reporting in the two Entities, which is supported by the Entities’ statutory “duty” to prescribe financial reporting provisions.

In the first part of this paper, we analyse the present institutional framework for financial reporting in BH, with special focus on the quality of financial statements. Through an analysis of the quality of financial statements, we point out the major problems and submit some recommendations to solve them. One of these recommendations is that BH has to begin, as soon as possible, with the introduction of XBRL as a standard data format for financial reporting. Obligatory usage of XBRL in financial reporting could help the country to comply with regulatory burdens, to
close the gap between what information organisations want to report or access, and what they actually can report and access, and help in ensuring the quality of data as well as its completeness.

2. FINANCIAL REPORTING REGULATORY FRAMEWORK IN BOSNIA AND HERZEGOVINA

The regulation of financial reporting and the accounting profession, as well as others in Bosnia and Herzegovina, are prescribed at the entity level – in the Federation of B&H and in the Republic of Srpska. Introduction of the new Law on accountancy and auditing in BH (Accounting and auditing law of B&H, 2004), with elaboration in entities accounting and auditing law (Accounting and auditing law of F B&H, 2005 and Accounting and auditing law of Republic of Srpska, 2005) represent the first step towards unification of financial reporting and the accounting profession in entire countries.

The institutional frameworks for making and presenting financial statements for companies in BH since January 1, 2006 are:

- Law on accountancy and auditing in BH and entities Law on accountancy and auditing,
- IAS/IFRS and
- EU accountancy directives

The Law on accountancy and auditing in BH is the first step towards the unification of the legal background of accountancy and auditing in BH. This Law required a new law in both entities (in FBH and RS). The two main aims of this law are:

1) to prescribe a unique criteria for acceptance in the accounting profession, and to ensure the recognition of qualifications for auditors in BH
2) to prescribe a direct application of International Financial Reporting Standards (IFRS) and International Auditing Standards (IAS)

The entities law on accounting and auditing defines periods for which financial reports are drawn up (for a six-month period – half-yearly report, and for a one year period – annual report), to which they are submitted (to the appropriate Tax administration), deadlines for their submission (within 30 and 60 days of reporting period), and they prescribe the obligation of keeping financial records, preparing and storing bookkeeping documents, and general principles of assessment. The adoption of new entity laws on accounting and auditing secured the harmonisation of positive laws and other regulations across the entire territory of BH.

IAS/IFRS – in 1998 BH had the first application of IFRS. Up until January 1, 2006, both entities have had a completely different financial reporting framework. In the Federation BH companies had their own accounting standards (AS FBH), whilst
in the Republic of Srpska companies applied IAS. At the moment of implementation, both AS FBh and IAS/IFRS had been harmonised with the relevant IAS/IFRS at the international level. The problem emerges with time and IASC/IASB (International Accounting Standards Board) prescribed many changes in the relevant IAS/IFRS (some new standards were issued, some standards were withdrawn, while most of them had a couple of revisions), while prescribed accounting standards in both entities in BH had not suffered any changes during the period from 1998 till the end of 2005.

The new Law on accountancy and auditing in BH prescribed International Financial Reporting Standards (IFRS) and International Standards of Audit (ISA) as the official standards for all companies with public responsibility in the whole of BH. These standards are relevant to financial statements for 2006. In other words, from January 1, 2006, all companies in BH had to accord their financial statements with the requests of (IFRS) because in BH we have no other accountancy standard (such as national accountancy standards) for private entities.

**EU Directives** – referring to financial reporting as well as IAS and IFRS, the EU accountancy directives give basic directions for financial reporting in the EU. The directives which refer to financial reporting are: The Fourth Directive and the Seventh Directive in the field of accounting, the Eighth and New directive for auditing 2006/43/EC in the field of auditing, and the Transparency Directive, which regulates the transparency of financial statements for companies listed on the EU stock exchange.

**The Fourth Council Directive** (www.fee.be) from 1978 presents the most comprehensive set of accountancy regulations in the EU. This directive relates to private and public companies no matter their size. ‘‘Whereas annual accounts must give a true and fair view of a company’s assets and liabilities, its financial position, profit and loss, layout for the balance sheet and the profit and loss accounts and minimum content of the notes on the accounts and the annual report must be laid down’’. Besides the design of these statements, this Directive gives alternatives in financial reporting for small and medium companies. So the small and medium companies can produce a shortened Balance Sheet, Profit and Loss Account, and Notes to financial statements. However, the shortened schemes for small companies must not in any way affect the quality of financial statements.


- that companies have an obligation to consolidate their financial statements when the parent company has authority to control one or more sister companies
- schemes for consolidated financial statements

**The Eighth Council Directive** (www.fee.be) from 1984 – relates to the statutory audit of the financial statement. This directive describes the obligation criteria
for carrying out the statutory audits of accounting documents in EU countries. The absence of a part dealing with public monitoring and no control on audit companies and licensed auditors influenced the fact that a New Directive of auditing was issued in 2006.

The New Directive of auditing (www.fee.be) from 2006 – the subject of this directive is the statutory audit of annual accounts and consolidated accounts, with regard to the implementation powers conferred on the Commission. This Directive prescribes the application of IAS (International Auditing Standard). The most important change in this directive lies in the regulation of public monitoring on the auditing profession and in the quality control of auditing companies and auditors. The main aim of this directive is to improve the quality of statutory audits in EU countries.

Transparency directive (www.fee.be) – is a directive which, in greater detail, deals with the area of financial reporting transparency of EU listed companies. The aim of this directive is the harmonisation of a transparency postulate i.e. the establishment of a requirement for the public disclosure of current and periodical financial reports information for EU listed companies. So, in order to achieve a higher degree of transparency of listed companies, this directive prescribes:

a) Harmonised publishing deadlines – at the latest four months after the end of each financial year for annual financial reports and two months for interim financial reports.

b) The condensing of the annual financial report – the audited financial statements and the management report

c) Time of launching of the financial report – financial reports must remain available to the public for at least five years.

d) The condensing of half-yearly financial reports – According to IAS 34, the half-yearly financial reports shall include a set of financial statements and an interim management report

e) The condensing of the interim management reports (major related parties’ transactions and indication of important events that have occurred, together with a description of the principal risks and uncertainties facing management) for listed companies in the first and third quarters.

f) Obligation to publish the information on Internet.

g) Harmonisation of ad hoc reporting.

In order to remove the obstacles and to effectively implement new transparency requirements in the community, the special control of national competent authorities is requested which will ensure the timely availability of information under this directive. For that reason, transparency enhancements in EU countries also imply the development of a strong and reliable national system of transparency. Financial market participants are obliged to translate all current and periodical information into all member country languages in which they perform stock market transactions.
The problem for the regulation of the accounting profession with those Directives (for EU countries or for ‘futures’ EU countries – such as BH) is the fact that these directives are not obligatory for the countries’ members, but they have to be enacted by the legislation of each individual member country. The reporting requirements set out in the Directives, which refer to accountancy in the EU, cannot ensure a high level of transparency and comparability of financial reporting from all publicly traded Community companies, which is a necessary condition for building an integrated capital market which operates effectively, smoothly and efficiently. Because of this, on 13th June 2000, the Commission published its Communication on ‘EU Financial Reporting Strategy: the way forward’. In this publication it was proposed that all publicly traded Community companies prepare their consolidated financial statements in accordance with one single set of accounting standards, namely the International Accounting Standards (IASs), at the latest by 2005.

BH, like most other countries, incorporated the recommendations of the European Council Directives in its Law on accountancy and auditing as good practice for financial reporting.

3. QUALITY OF FINANCIAL STATEMENTS IN BH

The main attributes of financial statements which ensure their quality in the sense of the quality and usefulness of information contained in them are: understand ability, importance, reliance and comparability. These attributes are known as accounting principles and are presented in the Framework for the Preparation and Presentation of Financial Statements that was published as an addition to the IAS/IFRS. Therefore, the implementation of these accounting principles in financial reporting will enable the necessary quality of information presented in them.

Improvement in financial reporting quality becomes more and more important as society realises the benefits of good quality financial reporting. Emphasis on quality ensures transparent and well-established decision-making for the different stakeholders.

The benefits of quality financial reporting for the different stakeholders are presented in Table 1. (http://siteresources.worldbank.org/).
Stakeholders of financial reporting | Benefit from financial quality
--- | ---
Investors | Decide whether they invest (buy or sell) the stock of certain companies
Stockholders | Evaluates the work of management
Employees | Evaluate the stability and profitability of employer
Creditors | Decide whether they credit the companies (or evaluate the companies’ possibility to pay debts)
Suppliers and Buyers | Evaluate possible time lapse for payment
Government and tax institutions | Prescribe tax policy
Public | Brings benefit to the local economy

Table 1. Benefit of quality financial reporting for different stakeholders

As Table 1 shows, the main users of financial reporting are: investors, stockholders, creditors, employees, creditors, suppliers and buyers, government and tax institutions and the public. They each have the same aim – to have quality financial reporting as a basis for high quality decision-making (no matter what the different purposes are of these financial reports). The quality of financial reporting depends on the development of the laws and institutional framework in that country. In BH, the law and institutional framework are also divided at the entities level (in the Federation BH and Republic of Srpska). As mentioned in part 2, the financial reporting regulatory framework in BH – the Law on accountancy and auditing in BH – and its elaboration in entities low on accounting and auditing, prescribes IAS/IFRS and International Standards of Audit as official standards for all public responsible companies in BH. The main problem for financial reporting in BH is that there are no harmonised criteria for ‘public responsibility’ within entities.

According to stipulations in the entity laws (and Brcko District laws), a legal entity is considered publicly responsible if it fulfils any of the criteria listed in Table 2.

**Legal entity is publicly responsible if it fulfils any one of the listed criteria:**

<table>
<thead>
<tr>
<th>Federation of B&amp;H</th>
<th>Republic of Srpska</th>
<th>Brcko District</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is registered with the Securities Commission with the purpose of public offering of financial instruments in the capital market; submits, or is in the process of submission, financial statements to the Securities Commission or some other regulatory organisation;</td>
<td>It submits (or is obliged to submit) its financial statements to the Securities Commission or some other regulatory organisation, with the purpose of public offerings of any kind of financial instruments in the stock market or other organised market;</td>
<td>It submits, or is in the process of submission, financial statements to the Securities Commission or some other regulatory organisation, with the purpose of public offerings of any kind of financial instruments in the stock market or other organised market;</td>
</tr>
</tbody>
</table>
Legal entity is publicly responsible if it fulfils any one of the listed criteria:

<table>
<thead>
<tr>
<th>Federation of B&amp;H</th>
<th>Republic of Srpska</th>
<th>Brcko District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receives all kinds of monetary deposits as an authorised trustee, such as: banks, insurance companies, pension funds, brokers or stock dealers, privatisation funds, private persons’ open funds for investment banking;</td>
<td>It is a financial enterprises such as a bank or other financial institution, insurance company, pension fund, broker or securities dealer, privatisation investment funds, closed or open investment funds, etc.</td>
<td>It holds resources as an authorised trustee of a large outside group of people, such as banks and other financial institutions, insurance companies, pension funds, brokers or securities dealers, privatisation investment funds, closed or open investment funds, etc.</td>
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<td>It performs an activity of general public interest, according to the Law on public enterprises</td>
<td>It is a public enterprise that provides important public services.</td>
<td>It has an annual average of more than 50 employees, annual turnover of over 2.8 million KM, average assets valued at the beginning and end of a business year of more than 1.4 million KM (at least two out of three criteria listed must be fulfilled)</td>
</tr>
<tr>
<td>If it has a total annual turnover, including VAT, of over 1 million KM or if it employs 50 or more people</td>
<td>If it is an enterprise of special economic interest to the Republic of Srpska, and in addition, it has a total annual turnover, including VAT, in the amount of over 3 million KM, or if it employs 50 or more people</td>
<td></td>
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</table>

Table 2 Public responsibility criteria

All business entities that fulfil at least one of the above public responsibility criteria and therefore qualify as legal entities, must meet special requirements, as follows:

(1) The integral implementation of IAS/IFRS,
(2) Preparation of half-yearly financial statements (not just annual),
(3) Annual financial statement auditing

Companies that do not have public responsibility have no obligation to apply IAS/IFRS, but they have no other option because in BH there is no alternative, as yet, for financial reporting of private entities. However, the law on accountancy and auditing sets out some rules for the financial reporting of private entities. The most important is that private entities in financial reporting need to use their judgement and apply accounting policies that ensure information that is:

– Consistent with the IASB’s Framework for the Preparation and Presentation of Financial Statements,
– Consistent with the IASB’s standards, applicable to legal entities,
– Relevant to users for economic decision-making, and
– Reliable in the sense of financial statements:

1 KM (convertible mark) is bound to the Euro, and its central exchange rate is 1€ = 1,95583 KM
Legal entities that do not have public responsibility are obliged to prepare only annual financial statements, which are not subject to auditing.

Besides the problem of harmonisation of a low and institutional framework in BH (not only in entities) and harmonisation of criteria for the categorisation of different types of companies, some research on the quality of financial reporting in BH showed a few other inefficiencies in financial reporting. The non-existent relevant accountancy standards for private entities, unreliable financial reporting means that companies have not realised the benefits from ‘good’ financial reporting and still have a fear of presenting comprehensive information about their companies. The questionable quality of information presented in a financial report is the result of an absence of notes on the financial statement, as a part of the financial report, absence of information about Cash Flow and a lack of audited financial reports and consolidated financial statements.

The research into the application of IAS/IFRS shows that in BH, companies apply standards which are not completely consistent with valid IAS/IFRS at the international level. When we compare the IAS and IFRS that were published and that are applicable in BH since 2006 with those published throughout the world, the only difference is in the number of IFRS, i.e. valid IAS and IFRS 1–5 are applicable and were published in BH (IFRS 6, IFRS 7 and IFRS 8 have not yet been published), and due to the latest translation and publishing of audited standards on March 31, 2004, certain differences in the contents of published IAS have appeared (i.e. in IAS 39).

4. IMPLEMENTATION OF XBRL – PATH TO QUALITY IMPROVEMENT OF FINANCIAL REPORTING

The present situation relating to the quality of financial reporting in Bosnia and Herzegovina (BH), explained in the above paragraphs, points to the necessity for its transparency and quality improvement. The fact that accounting legislature was established, together with international accounting standards, means that Bosnia and Herzegovina has developed the necessary infrastructure, but it is not sufficient to guarantee the quality and transparency of financial reporting. The truth of this statement has been proved by many financial scandals in countries which implemented accounting legislature and standards long before BH. Corporate and accounting scandals, including those affecting Enron, Tyco International, Adelphia, Peregrine Systems and WorldCom in the USA resulted in a new, more rigorous accounting law known as the Sarbanes-Oxley Act, which was passed in 2002. The fourth title of this Act, Enhanced Financial Disclosures, describes the enhanced reporting requirements for financial transactions, including off-balance-sheet transactions, pro-forma figures and stock transactions of corporate officers, but it also stressed the need for electronic
filing and the availability of financial data. Although Sarbanes-Oxley Act applies only to public companies, it is important because it points to the necessity for publishing more financial, but also non-financial, information.

The implementation of laws such as the European Union Accounts Modernisation Directive and the United Kingdom’s Companies Bill 2006, introduced formal requirements around non-financial, narrative and forward-looking information that will impact financial reporting for all but the smallest companies.

Namely, financial reporting, as a foundation of information for decision-makers, both inside and outside organisations, (investors, shareholders, governments regulators, etc.), has to be more complete and transparent in order to meet the different needs of decision-makers. One of the potential problems is that financial information (i.e. what is reported in the income statement, balance sheet and footnotes), while being critically important to investment decisions (both internally and externally), is usually incomplete. Making quality financial reports today means supplementing them with non-GAAP (Generally Accepted Accounting Principles) financial information (e.g. pro forma earnings) and non-financial information (e.g. intangible assets) in order to help managers and potential investors take a longer-term view of value creation.

Side by side with changes in accounting legislation in the USA and leading EU countries, another process was happening – a process related to forming new financial and business reporting data standards, today known as eXtensible Business Reporting Language (XBRL). The XBRL story began in 1998, when a CPA by the name of Charlie Hoffman began experimenting with emerging Internet-based technologies to solve what he thought of as a manually intensive, error-prone and inefficient method of analysing and organising his clients’ financial information. A few months later, Charlie took his idea to the American Institute of Certified Public Accountants’ High Tech Task Force and the XBRL was born.

Prior to XBRL, reported data – whether in online digital formats such as the hypertext mark-up language (HTML) for Web pages, as attachments (e.g. Adobe Acrobat or Microsoft Word), or on paper – was little more than a photocopy. That is, the data could be read by humans, but not easily or quickly incorporated into other electronic media.

XBRL, the financial and operational business reporting offshoot of the Extensible Mark-up Language (XML), is a freely licensable open technology standard which makes it possible to store and/or transfer data along with the complex hierarchies, data-processing rules and descriptions that enable analysis and distribution.

Implementation of XBRL could provide two major benefits related to the creation and electronic dissemination of financial and non-financial information. These benefits are (Romney & Steinbart, 2006):

1. Information is published only once, using standard XBRL tags
2. Information that XBRL tags provide is interpretable by computer.
The appearance of XBRL (eXtensible Business Reporting Language) opens new opportunities related to financial reporting, but also brings new challenges. By standardising financial and non-financial information in terms of structure, content and meaning, XBRL provides a more accurate and flexible comparison and communication of information. It provides unified reporting in a single environment to increase data accuracy and keep maintenance and other costs down. A compliance reporting software solution, based on XBRL, enables users to support a wider variety of global regulations and taxonomies and bridge the gap between systems, accounting standards and global financial reporting, while providing full transparency and auditability from source to disclosure (Eccles et al 2006).

The crucial success factor in any XBRL solution is the capability to convert and route financial information derived from existing systems without impacting them. Non-XBRL data needs to be converted so that XBRL-enabled applications can utilise the information. Namely, XBRL makes data “smart.” It determines how information is stored and how software presents, manipulates, and exchanges that information, using a set of standards and a family of taxonomies (dictionaries of terms). Therefore, recipients know all of the pertinent context of the data—for example, whether the information is segment information, part of an audited statement, or another type of business data (Penler & Schnitzer, 2007).

Since the goal of XBRL is to facilitate data interchange globally, an international organisation – XBRL International was established (www.xbrl.org) in order to coordinate similar activities in each jurisdiction, where a local XBRL “chapter” would represent its specific needs. The structure of XBRL now recognises both regional jurisdictions and various industry domains involved in business reporting (Waldt, 2004).

There are currently 18 active jurisdictions listed on the XBRL web page (Australia, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Korea, Luxembourg, The Netherlands, New Zealand, South Africa, Spain, Sweden, UAE, United Kingdom, and United States) and the International Accounting Standards Board (IASB), with four additional provisional members in China, India, Poland and Switzerland (www.xbrl.org).

Development of XBRL is evolving everywhere, but unevenly, driven by various stakeholders such as governments, stock exchanges, banks and other industry sectors. While the U.S. and Asia focus on XBRL for use in capital markets, Europe has developed an eye-opening array of government-wide and cross-border applications that can share consistently structured XBRL data. The first wave of adoption in Europe began about five years ago, with stakeholders in the private and public sectors working together to develop XBRL taxonomies. In 2008, XBRL Europe (www.xbrl.org/eu) was formed to generate better consistency, knowledge sharing, and cross-border interoperability of XBRL implementations (Kernan, 2008).

A brief overview of the current state of XBRL adoption in EU countries that have established full XBRL jurisdiction is given in Table 3 (www.xbrlplanet.org).
<table>
<thead>
<tr>
<th>No</th>
<th>Country</th>
<th>Jurisdiction name</th>
<th>Website</th>
<th>XBRL reporting Status</th>
<th>Description</th>
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<tbody>
<tr>
<td>1.</td>
<td>Belgium</td>
<td>xbrl.be, <a href="http://www.xbrl.org/be">www.xbrl.org/be</a></td>
<td>Mandatory filing: 1. National Bank of Belgium 2. Banking, Finance And Insurance Commission 3. COREP Belgium</td>
<td>Since April 2007, Belgian non-financial companies use XBRL for the drawing up of their statutory annual accounts to be filed with the National Bank (Central Balance Sheet Office – CBSO) in the form of XBRL instance documents. The CBSO currently receives more than 90% of all the annual accounts filed in XBRL format. The NBB and the CBFA have mandated XBRL for Basle II and COREP reporting starting January 2008.</td>
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<td>2.</td>
<td>Denmark</td>
<td>xbrl.dk, <a href="http://www.xbrl.dk">www.xbrl.dk</a></td>
<td>Voluntary filing: 1. Danish Commerce and Companies Agency</td>
<td>XBRL group is continuously in close collaboration with the Danish Commerce and Companies Agency (DCCA) about the Danish Financial Taxonomy and the XBRL enabling of the reporting process for Statutory Financial Statements.</td>
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<td>3.</td>
<td>Germany</td>
<td>xbrl.de, <a href="http://www.xbrl.de">www.xbrl.de</a></td>
<td>Mandatory filing: 1. Federal Bank of Germany 2. The German Public Register Authority (Bundesanzeiger) 3. COREP Germany 4. DATEV eG Voluntary filing: 1. Bundesanstalt fur Finanzdienstleistungsaufsicht (Securities Regulator)</td>
<td>XBRL filing with the German Public Register Authority hits the 425,000 mark. Up to one million German corporations, including listed companies and banks, have to file their annual statements with the German Public Register Authority (electronic public register acting on behalf of the German government) for disclosing.</td>
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<td>5.</td>
<td>Ireland</td>
<td>xbrl.ie, <a href="http://www.xbrl-ie.org">www.xbrl-ie.org</a></td>
<td>Voluntary filing: 1. Irish Financial Service Reg Auth.</td>
<td>Several Irish agencies and SMEs are contributing to both MUSING and BRITE projects, endorsed by the European Business Register, a collaboration of several leading European Companies Registration Offices in the electronic exchange of financial information.</td>
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<td>No</td>
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<td>6.</td>
<td>Italy</td>
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<td>xbrl.it <a href="http://www.xbrl.org/it">www.xbrl.org/it</a></td>
<td>Mandatory filing:</td>
<td>Although still using Pilot projects, Italy is moving rapidly forward with legislative support. About 900 annual and consolidated accounts began filing in 2007 with the Chambers of Commerce in Italy.</td>
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<td>1. Borsa Italiana</td>
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<td>Voluntary filing:</td>
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<td>1. Camera di Commercio</td>
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<td>7.</td>
<td>Luxembourg</td>
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<td>xbrl.lu <a href="http://www.xbrl.org/lu">www.xbrl.org/lu</a></td>
<td>No official XBRL</td>
<td>During 2007, the Luxembourg Central Bank announced the introduction of a new reporting to be produced by non-monetary UCIs and modifications of the reporting to be applied to existing monetary UCIs. These changes came into force on 1st January 2009.</td>
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<td>reporting</td>
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<td>8.</td>
<td>The Netherlands</td>
<td>xbrl.nl <a href="http://www.xbrl.org/nl">www.xbrl.org/nl</a></td>
<td>Voluntary filing:</td>
<td></td>
<td>Two major Dutch banks – ABN AMRO and Rabobank – publicly stated they are going to collect financial information for credit risk rating in XBRL format and deal with this kind of information online in real-time. The Dutch Central Bank is able to receive XBRL-filings (CEBS-project).</td>
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<td>1. Dutch National Bank</td>
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<td>2. Government of Nether-</td>
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<td>lands NTP</td>
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<td>9.</td>
<td>Spain</td>
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<td>xbrl.es <a href="http://www.xbrl.es">www.xbrl.es</a></td>
<td>Mandatory filing:</td>
<td>One of the missions of the Bank of Spain is to collect, process and store the financial information from non-financial companies in Spain, with the object of increasing the knowledge of each Spanish sub-industry. By means of this XBRL Annual Questionnaire, it is possible to collect, on a voluntary basis, information about the annual Balance Sheet, Income Statement, features, activities and other data, including complete identification with the DGI taxonomy.</td>
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<td>1. Bank of Spain</td>
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<td>2. Ministerio de Econo-</td>
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<td>mia y Hacienda</td>
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<td>10.</td>
<td>Sweden</td>
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<td>xbrl.se <a href="http://www.xbrl.se">www.xbrl.se</a></td>
<td>Voluntary filing:</td>
<td>30 June 2008 The Swedish Companies Registration Office, Bolagsverket and XBRL Sweden released Public Working Drafts of updated versions of the two present taxonomies: one for small to mid-size companies (se-smp) and one for the Swedish audit report (se-ar).</td>
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<td>1. Bolagsverket (Company Register)</td>
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<td>2. Finansinspektionen (Securities regulator)</td>
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<td>No</td>
<td>Country</td>
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<td>11</td>
<td>United Kingdom</td>
<td></td>
<td>xbrl.gb</td>
<td>Mandatory filing:</td>
<td>Effort in the XBRL UK jurisdiction is centred on supporting projects by the companies’ regulator, Companies House, and tax authority, HM Revenue and Customs (HMRC), to introduce filing in XBRL. Companies House has already received more than 200,000 accounts from small companies in XBRL using an extension to the UK GAAP taxonomy, while HMRC has begun receiving Corporation Tax submissions in XBRL. The government is making XBRL mandatory for filing of tax returns, including accounts, by all companies from March 2011.</td>
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</table>

Table 3 State of XBRL adoption in EU countries with full XBRL jurisdiction

In Asia, XBRL is being used by capital markets. Stock exchanges in China, Japan, Singapore and South Korea all mandate XBRL data. Japan’s Financial Services Agency required all public companies to submit financial statements in XBRL format from the beginning of this year. Japanese companies, such as Wacoal and Fujitsu, have begun to benefit from the use of XBRL for internal applications. In 2004, China became the first country to formally adopt XBRL reporting for its equity markets. Chinese innovation continues to lead XBRL into new areas, such as risk profiling, data mining and communicating text information along with financial data (Kernan, 2008).

To develop a collection of terms for a reporting application, XBRL US assembles a project team comprised of XBRL and subject matter experts to establish or build upon an existing data standard. The resulting collections of terms are rolled up into a single master dictionary of terms to ensure the interoperability of reporting applications; the dictionary includes diverse reporting applications, e.g. US GAAP, mutual fund risk return summaries, corporate actions, etc. First released in April 2009, the US GAAP taxonomy includes over ten thousand elements covering primary financial statements and disclosures (each footnote plus financial and text elements within the footnotes). The 2009 Release draft was published for public comment from November 2008 until mid-January 2009. It was accepted by the Securities and Exchange Commission (SEC) and published for use in April, 2009. The SEC mandated the use of XBRL for three reporting applications (www.xbrl.us):

1. Public Company Reporting – all public companies must file in XBRL format; companies with a worldwide public float greater than $5 billion must comply start-
ing with the period ending June 2009; all other large accelerated filers must comply starting with the period ending June 2010; all other public companies must comply starting with the period ending June 2011.

2. Risk Return Summary portion of Mutual Fund Prospectus – mutual funds must begin publishing the risk return summary portion of their prospectuses in XBRL format starting January 1, 2011.

3. Credit rating agencies – must begin reporting all ratings actions (initial rating, upgrades, downgrades, etc.) in XBRL format starting in August 2009 (180 days after publishing in the Federal register).

This short overview of XBRL implementation emphasises that there is significant acceleration in the adoption of XBRL as a standard data form for financial reporting across Europe, the USA and some Asian counties. Unfortunately, it cannot be said that Bosnia and Herzegovina (BH) is following this trend. In the last few years, there were only a few papers published by BH authors that were related to XBRL. It seems that there is no awareness about the importance of XBRL, either amongst accountants, government or business and we think that some of the reasons may be:

– Weak financial markets in BH
– Weak attractiveness of BH for financial investments
– Non-harmonised legislation at the entities levels
– Unfinished governmental structure and continuous requests for a change in Dayton’s Agreement contribute to the further uncertainty of domestic and foreign investments.

However, besides all these evident obstacles, government institutions should see XBRL as a tool, not only for reporting and controlling purposes, but also for attracting investments, especially foreign.

The major responsibility also lies with the Association of Accountants and Auditors in the Republic of Srpska and with the Federation Union of Accountants and Auditors because these organisations should be the main drivers for XBRL’s promotion and implementation.

Although the present state of XBRL awareness and readiness could lead to the conclusion that BH has no chance of catching up with EU states, we believe that it is not too late and that BH could take major step forward if it begins as soon as possible. Namely, BH has the opportunity to use EU experience in all aspects of XBRL implementation, especially methods of harmonisation, co-operation and knowledge transfer (inside EU and EU-USA). Forms of “waterfall-like” knowledge transfer and support (from EU 15 to EU 25/27 to EU candidates) should be developed through concrete projects and be widely communicated. Figure 1 shows the path that BH should follow, beginning from global best practices, through European law, national regulation and the implementation of the XBRL challenge. Of course, obstacles and problems can be expected along the way. Some of these are: harmonisation of exist-
ing financial and accounting legislation, forming a basic XBRL support group at state level, developing BH specific XBRL taxonomies, and so on. But, in spite of all the potential problems, we think it is high time that the BH accountant community take the first step towards XBRL.

5. CONCLUSION

Our analysis shows that BH problems related to the quality of financial reporting are: different laws and institutional frameworks (established at entity level), different criteria for the categorisation of companies, weak and divided financial markets in BH, weak attractiveness of BH for foreign financial investments, the unfinished and inefficient government structure of the country, the non-existence of relevant accountancy standards for private entities, unreliable financial reporting, absence of notes on financial statement as part of the financial report, absence of information about Cash Flow and a lack of financial report auditing. The result is the questionable quality of information presented in BH financial reports.

The first step in achieving quality in financial reporting in BH is to ensure the same legislative and criteria for financial reporting throughout the country. Further steps relate to international harmonisation, especially within the EU. The introduction of XBRL as a standard data format for financial reporting in BH could be one major step towards the improvement of the quality of BH financial reporting and its harmonisation with EU standards. Of course, XBRL does not change the accounting standards or methods used for financial and business reporting, but it puts reported information into an instantly reusable computer-readable format. Although XBRL implementation offers many benefits, to what extent they will be exploitable significantly depends both on the legislator’s pressure to use XBRL as a standard for financial reporting, and on the influence of the globalisation processes (especially foreign investments) in Bosnia and Herzegovina.
Figure 1: Path to XBRL development and implementation

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Accounting and auditing law of F B&H. 2005. *Official gazette of F B&H* 32/05


http://www.xbrl.us/Learn/Pages/SECActivitiesandHelp.aspx. 7th June 2009.
1. Introduction

The Financial Market requires quality, timeliness and credibility of financial information from companies for better allocation of resources and lower overall cost of capital. This fails to occur when the accounting standard-setter does not operate independently of any private and public special interest. Whenever the national or international bodies formulate accounting rules, the governmental and quasi-governmental agencies, companies, financial analysts and investment advisors, auditors, tax advisors, employees’ representatives, accounting professors, lawyers and other users of accounting information who are affected or would be affected by the new rules, all seek to influence the rule-making system. In order to promote accounting rules that are as favourable to them as possible, they propose changes or defend the status quo, comment on the suggestions of the accounting bodies, wield knowledge, money and other instruments of power. Such activities that people employ to influence national or international standard-setting processes can be called ‘political intervention’ in the accounting standard-setting process\(^1\).

The accounting standards produced by the present-day standard-setting systems of different countries mostly involve three common characters:

i) Accounting standards are set to the idealism of a true and fair view: The users of accounting information belong to different interest groups from various

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\(^1\) Ordelheide (2004) confirmed that the politicisation of accounting is a thinking process. It emerges from the thought constructs of those who shape accounting and is directed at the thought patterns of all of those who are involved in accounting. For politics to change the ways of thinking, it is not necessary to directly influence those who are involved in accounting; it can make use of other societal institutions with which accounting is linked. These are but intermediaries affecting the thought patterns of those involved in accounting. But how the ‘thought constructs’ emerge in people’s brains is often complex and generally not exposed to view.
economic, social and political fields. The assorted points of view of the users of accounting information influence the idealism of true and fair financial reporting. The stakeholders raise issues and provide advice to the standard-setters on project priorities and matters of relevance.

ii) Accounting standards are set on the basis of the influence of external factors: Just because the economic-social-political issues are the most powerful driving forces in the development process within a market-economy, an accounting standard-setting body depends heavily on and incorporates the identified major and influencing issues into its standard-setting process. The interested groups influence the way in which the standard setter views possible accounting standards. The most significant fact is that accounting standards have to make the financial reports relevant and reliable to the users who happen to be more dependent on financial reports of those entities, which have more political influence on accounting standard-setting.

iii) Accounting standards are set in a democratic process: When financial reports are regulated by accounting standards, it is generalised that the standards place restrictions on corporate behaviour and hence the standard-setting process has been democratic in order that the affected parties comply with the standards. Companies are either compelled to accept the standards or they do it voluntarily. In any case, a standard calls for a swap among alternative consequences and in respect of a choice of an accounting rule, the individual preferences usually differ. To meet this situation, according to Accounting Handbook (2001, p xxii—13) the standard-setting body should consult with the members of its broadly constituted consultative group to increase the involvement of various interest groups in the standard-setting process.

These three common characters of accounting standard-setting inform us about the reasons, involvements and influence of various interest groups in the standard-setting process. The companies’ management, the accounting firms and sometimes government officials intervened for the final shaping of accounting rules as per their special interests and lobbied to have more alternative accounting treatments and a larger scope for adjustments in the rules. The individuals and groups are called interveners who, from the outside, influence the standard-setting process and usually adopt various direct and indirect lobbying methods to achieve their special goals. These parties know one weakness of a standard-setter i.e. that the standard has to be consistent with the provisions of the laws of a country and for any changes in laws, standards need to be amended, which may favour the lobbyists.

There is an association between the outcome of political intervention and the financial reporting regulatory structure. The financial reporting regulatory systems are driven either by public sector regulators or private sector standard-setting bodies. Dyckman (1988) observed that the public sector financial regulators may be suscep-
tible to intervention by people antagonistic to business. Sutton (1984) opined that the private sector standard-setting bodies are also susceptible in their deliberations with the constituent lobbyists, due to the lack of a legal mandate over their proposals. Vieten (1995) exposed that governments have intervened in different degrees when private initiatives run the accounting standard-setting systems. The degree of government intervention is very prominent in the USA, UK, Germany, and France (Kirk, 1988).

Many political interventions have occurred in the USA. Interventions have taken place on a good number of occasions in Australian, British and international standard-setting systems. The regulatory structures of The Netherlands, Germany, Austria, China, India etc also bear the indications of the impact of political intervention. Although the effect of differing regulatory structures over the regulatory power distribution is ambiguous, there is a need for an analysis of alternative financial reporting regulatory systems in order to have a broader understanding of the impact of political lobbying. To understand the products of alternative accounting regimes, there must be evidence of the success of political lobbying and its impact on the process of accounting rule development. Moreover, globalisation of trade and investment, expansion of capital markets and the absence of a worldwide common accounting language have all geared up to a convergence of financial accounting practices of different countries, mainly with international standards. The national standard-setters, such as the Australian Accounting Standards Board (AASB), together with the Financial Accounting Standards Board (FASB) of the USA and the Accounting Standards Board (ASB) of the UK, have committed themselves to integrate their standards with the international financial reporting standards (IFRS) issued by the International Accounting Standards Board (IASB). But, political lobbying by special interest groups has been a challenge in that regard.

2. Objectives

Lobbying has become an important part of accounting standard-setting. Sometimes lobbying continues after a final pronouncement has been issued, because the lobbyists hope for a change in the standard-setters’ minds concerning a certain issue. The

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2 It is known that in the process of standard-setting by the US FASB, US Congress continuously intervenes. There is always a threat that there will be increased involvement by the US Congress (Kirk, 1988). In the UK, the recent structural change in standard-setting created a direct link between the UK Government Department of Trade & Industry and the Financial Reporting Council. The link created the possibility that at any time in future, the Department may actively become involved in standard-setting. In Germany and France, although accounting standards are formulated by the newly established standard-setting bodies, the state budget of the countries still undertake the financial responsibility for accounting regulation.
identified reasons for lobbying are that some individuals and groups lobby in favour of, or against, an accounting proposal because they believe that what they know is right. Others lobby depending on what is in their best interests. Whenever a government of any country was directly involved in standard-setting, it could have effortlessly used the accounting standards to serve the politically preferred public policies.

This article has chosen five cases of intervention with reference to Australia and has tried to examine whether such interventions, as in other countries, have undermined the objectives of transparent and accurate financial information in Australia and have made the standards purposefully biased towards the special interest objectives of corporate Australia. The foundation of this question lies on the requirements of the financial markets, which deserve quality, timeliness and credibility of financial information supplied by companies for a better allocation of resources and lower cost of capital.

An evaluation of the process of intervention in accounting standard-setting effectively begins with a complete view of accounting rules, which primarily allows us to understand how the political dimension of accounting becomes apparent (Ordelheide, 2004). However, the distribution of lobbying power amongst the competing interest groups varies as a function of a particular accounting issue. This is required in order to judge the effect of an accounting issue on power distribution for accounting lawmaking, because that effect decides the lobbying preferences of the contending groups, as well the responsiveness of the accounting policymakers to the constituent pressure.

3. Conditions for rational lobbying

It is essential for an intervener to produce an important impact on the political process of financial reporting rule-making, especially if the rule-making practice is legislative and if the regulation is to be first discussed among the interested groups and then passed in a legislative body. Under these circumstances, the government of a country may work as an interest group because the interested parties demand regulation and government supplies regulation to satisfy the self-interest of the actors in the political procedure (Downs, 1967; Tollison, 1982). Here, the politicians are the actors who compete for votes in the political process and the stage of the political process seems to be a market-place where demand for and supply of regulation interact with each other. Rahman et al (1994) recommended that the accounting standards be seen as products of a process in which regulations are set on the strength of the demands of effectively participating interest groups to carry out the needs of the standard-setters.

A party does not lobby without self-interest and it is well-known that the interveners consider lobbying as significantly more effective than the non-interveners. The choice of an interest group to lobby or not is considered to be the function of costs and benefits’
accruing from successful lobbying. The decision to lobby can be analysed from the per-
spective of the rational choice theory developed by Sutton (1984). There it is assumed
that lobbyists act prudently. Li, Pincus & Rego (2004) opined, while carrying out a review
of stock market reactions to the events surrounding the Sarbanes Oxley Act 2002 in the
USA that because lobbying is a costly activity, it is reasonable to assume that the affected
parties will lobby only when they perceive the expected benefits of altering the proposed
legislation or regulations make it worthwhile to do so.

Sutton (1984) presented the condition for rational lobbying for making a choice
between two alternative proposals in his cost/benefit analysis. People lobby when the
differential wealth effect, associated with two proposals, discounted by the perceived
probability of influencing the outcome, exceeds the cost of lobbying. The two condi-
tions for people carrying out more lobbying, i.e. for increasing the propensity of lobby-
ing are: i) a higher magnitude of the perceived wealth effect and ii) greater expectation
of influencing the final decision. Focusing on these two lobbying conditions, the forms
of lobbying and the timing for lobbying are elaborated by the researchers. Klumpes
(1994), Walker and Robinson (1994), Harding and McKinnon (1997) have carried out
research on lobbying on the development of Australian accounting standards on the
basis of actions which the interested parties took to influence the rule-making body.
This research offers little evidence as to whether there is any effect of the institutional
form upon the lobbying process. Also, there is little evidence regarding Sutton’s
(1984) additional assertion that irrespective of any change in institutional setting for
accounting regulation, the lobbying propensity will not change.

4. Politicisation of accounting rules in Australia

This article discusses five specific cases of political lobbying in Australia:
(i) ED 49: recognition & disclosure of identifiable intangible assets
(ii) True & fair override and scale down of local standards
(iii) Withdrawal of compulsory status of Statement of Accounting Concepts
     (SAC)
(iv) Institutional arrangement made by Treasurer / CLERP proposal for replace-
     ment of local standards by international standards
(v) Standard for reconstruction AASB 1015

4.1. ED 49: Accounting of Identifiable Intangible Assets

In Australia, the exposure draft (ED) no. 49: accounting of identifiable intangible
assets proposed systematic amortisation within 20 years of the identifiable intangible
assets which were either purchased or internally developed. ED 49 required recognising
those identifiable intangible assets such as brand, trademark, etc. that were not only purchased, but had also been developed internally by the company. Although ED 49 succeeded in defining the identifiable intangible asset, the intangible assets were not, until that time, defined by accounting professionals either in Australia or elsewhere. Gerhardy (2000) reported that in 1989, the public companies in Australia submitted comments on ED 49 to the Australian Accounting Research Foundation (AARF). Once ED 49 attempted to introduce a few accounting methods and disclosure of such assets in the balance sheet, the companies lobbied for i) capitalisation and ii) lower rate of amortisation of identifiable intangible assets. ED 49 was lobbied against because its requirement did not suit the practice of continuous development of those assets and showing them for indefinite period in the balance sheet. This practice allured to the companies for recognition of unidentifiable intangible assets and also goodwill. The AARF Media Release, 1992, stated that a lack of consensus at the time of issue, both nationally and internationally, led to the exposure draft being withdrawn in 1992.

4.2. True & Fair legal override and its consequences

Self-regulation by the accounting profession was gradually replaced with government regulation in Australia in 1984. The Federal government and the accounting profession of Australia had to jointly engage in the development of accounting standards because State Governments around Australia were becoming increasingly concerned about the levels of corporate crime, which raised questions as to the appropriateness of accounting standards. Together with the question of appropriateness of standards, an over-riding legal requirement for companies to give a ‘true and fair view’ was being used since 1970s as an excuse for avoiding compliance with the accounting standards in financial statements (Hoggett, 1998).

The standards produced by the accounting profession through the Accounting Standards Board of the AARF were augmented by direct representation of community interests including government. (Godfrey, Hodgson and Holmes in Hoggett, 1998) The professional accountants of Australia: Institute of Chartered Accountants in Australia (ICAA) and Australian Society of Certified Practising Accountants (ASCPA) wanted a legislative backing of the standards. However, the profession conceded that in a volatile political and legal environment, legal backing only would not make the standards widely accepted. In 1984, the Accounting Standards Review Board (ASRB) was established at the Federal government level and AARF was attached to ASRB. The primary objective of this conjunction was to ensure a neutral democratic standard-setting process by a representative body with adequate research support provided.

After the removal of the ‘true & fair override’ (change made in Corporations Law, 1991), corporate Australia appeared to become more active in lobbying within the standard-setting process. The finance directors of the Australian Stock Exchange
ASX lobbied, in particular, for the re-introduction of the ‘true and fair override’ and used international harmonisation debate as a means of achieving this, as the true and fair override existed with international standards. ASX lobbied the Australian government to scale down the local standard-setting process in favour of a wholesale adoption of international standards as the local standards. For two consecutive years, ASX funded the project of IFRS-adoption and it also threatened to stop funding if the country did not fully adopt the IFRS. ASX paid one million Australian dollars to the AARF and the issue of international comparability was placed as a priority on the agenda of the Australian Accounting Standards Board (AASB).

4.3. Compliance status of SAC 4

AASB used to develop the statement of accounting concepts (SAC) for general purpose financial reporting in Australia. Initially, these concepts were mandatory for all companies. In 1992, AASB issued SAC 4 on the definition and recognition of the elements in financial statements. After issue of SAC 4, many parties, particularly the Group of 100, lobbied to make all concepts, including this one, non-mandatory. In 1995, AASB withdrew the compulsory status on all SACs and converted them into guidance for the standard-setting boards for developing or reviewing standards. Henderson (in Hoggett, 1998) commented: “It is apparent that the business community was prepared to tolerate radical proposals as long as they remained quarantined in non-compulsory statements of accounting concepts. However, as soon as the radical proposals became compulsory, the business community exercised its considerable influence and the statements of accounting concepts were promptly and unceremoniously emasculated.”

4.4. Changes in regulatory requirements on Australian companies

Through the listing requirements of the securities market’s listing rules, the Australian government tried to solve the problem of non-compliance with standards. In 1993, the Australian Attorney General introduced the Corporate Law Simplification Programme in an effort to reduce the regulatory requirements on companies and reissue the requirements as part of the accounting standards issued by the Australian Accounting Standards Board (AASB). AASB completed this task in December 1996 with the issue of AASB 1034 on information to be disclosed in financial reports. However, with a change in government in 1996, the Simplification Programme was dropped and replaced by the Corporate Law Economic Reform Programme (CLERP) in March, 1997. Owing to this change, the power for the development of accounting standards in Australia moved from the hands of the Attorney General to the hands of the Treasurer. Hoggett (1998) detected that the Treasurer was lobbied by ASX and,
as a result of ASX-lobbying, the Treasurer proposed some institutional arrangements. The impact of the institutional arrangements was the gradual replacement of self-regulation by the accounting profession with regulation by the Australia government, which would give rise to a transfer of the power of standard-setting to the hands of the most powerful lobby groups in Australia.

Kaidonis (2008) referred to two government events that legitimised the accounting standards in Australia to serve the specific needs of companies going for cross-border capital raising. These two events were:

(i) The CLERP Act, 1999 created a Financial Reporting Council (FRC) to act as an administrative link between AASB and the Federal Attorney General. FRC monitors the implementation of domestic standards. FRC cannot direct AASB in relation to developing any such standard, but it gives advice to the Government concerning the adoption of IFRS in the country. The Government does not consult with AASB on IFRS matters but considers the advice of FRC and then directs AASB which must comply. Hence, on IFRS-issues in Australia the FRC is more powerful than the national standard-setter AASB.

(ii) The Australian Securities and Investment Commission (ASIC) Act, 2001 provided that AASB, while it operates, must bear in mind and accommodate the particular interests of the Australian companies which require capital from international financial centres.

These two political moves undermined the self-regulation of the accounting profession as it could not maintain representational fidelity to all sections of society, especially the non-corporate sector and those companies raising capital only within the country. We have to remember that accounting standards play a distinct role in the context of today’s globalisation, working through local economies via deregulation and market reforms. Capital markets are being increasingly interconnected and expanded. Leisenring (1998) opined “With the increase in the number and volume of cross-border capital raising and investment transactions, comes an increasing demand for comparability in financial reporting among companies of different domestic origin”. The CLERP proposed replacing the Australian standards with international standards. Baulch (2003) noted that such a proposal was strongly opposed by members of the accounting profession, AASB and the Group of 100.

Ravlic (2000) explained that in order to safeguard the interests of the investment community, in February 2000, the Australian Senate invoked its authority to disallow AASB 1015: Reconstructions within a Business Enterprise. The Australian Senate overturned AASB 1015 that allowed companies to record assets falling within internal reconstruction either at book value or at fair value. Companies could use an optional treatment. However, the Senate was of the view that the book value method cannot serve comparability and consistency between two or more reporting periods or entities.
5. Motivation behind intervention

A new accounting proposal is very likely to cause instant changes in the conduct of corporate enterprises. The regulatory instructions cannot persuade or encourage corporate people to change their behaviour. But, an accounting rule-change via its economic consequences immediately instigates the preparers of financial reports to alter their behaviour to regain the financial health of the company that existed prior to the change or to improve it further. Corporate managers, accounting firms and governments took the lead role as interveners in the process of setting accounting standards, especially in controversial or sensitive areas. Sometimes the interveners succeeded and sometimes they failed.

There is hardly any accounting standard which is without practical financial impact for any one of the three dominant groups involved in self-interested lobbying. In relation to the present area of discussion, it can be considered that the most direct impact of a new accounting method on revenues and earnings or a less apparent consequence of an accounting change, for example, the desire to make a better financial reporting, motivates corporate executives to intervene in the standard-setting process. The reason for political intervention may be profit-oriented and there may be a constant inducement for such people to rush off to their legislative representatives to interfere. But that reason is not directly observed; in any case the self-interest reasons are not expressly disclosed to the political persons by the lobbyists, but can only be inferred by noting the behaviour of interveners who initiate and persist to move towards their target.

The government of a country usually tries to enforce the politically preferred public policies. Such effort reduces the trust and confidence of investors on accuracy of financial reporting. Still, the government departments are interested in ascertaining the societal impact of selecting a particular policy from among competing public policies. For this they may study the ‘economic impact of the standard’ that delays the enforcement of standards.

The government may be motivated in its intervention in the accounting rule-making process as it has to secure those entrepreneurial and business efforts which are indispensable for the economic development of society, as well as for the equitable distribution of income and wealth to the people. Both those who prepare financial statements and auditors neither disclose the points of their self-interest to political persons, whilst lobbying, nor do they argue in terms of accounting issues. They know that the ‘save the society’ argument will do its best to provide for their personal benefit. The reason may be that they think it is useless to discuss the technicalities of financial reporting problems with the legislators and administrators who normally do not possess sufficient accounting knowledge. Hence, instead of wasting time and money, they employ the lobbying resources to build an impression that intervention is necessary for the implementation of public policy. When those who prepare financial
statements succeed in making the legislators and government departments believe that an accounting proposal is going to create volatility in corporate earnings, or going to produce a loss of business so that the business may not continue further, or it is causing disinvestment in infrastructure and capital projects, the government may decide to intervene in the standard-setting process. Government would naturally dislike an accounting standard bringing about a closure of plants and loss of employments.

5.1. Motivation for lobbying in Australia against adoption of international standards

Australia is one of the eight countries whose standard setters act in liaison with the international standard setters. [The other countries are: Canada, France, Germany, Japan, New Zealand, United Kingdom and United States]. Industries in some of these liaison-countries, together with other European, as well Asian countries, have intervened to prevent the IASC / IASB from imposing any objectionable requirement. Australia once rejected international accounting standards.

In the 1970s the two professional accounting bodies – the Institute of Chartered Accountants in Australia (ICAA) and the Australian Society of CPAs (AICPA) initiated the programme of international harmonisation of accounting rules in Australia. In the beginning, it was a policy of comparability (Parker, 2002). Later, in April 1996, AASB released its new Policy Statement on the development of internationally accepted standards. However, AASB anticipated that it would take a long time to develop such a set of accounting rules. Hence, it wanted to ensure compliance with domestic standards, which would result in compliance with international standards.

Within Australia there was problem of non-compliance with the Australian standards. There was a legal requirement to prepare true and fair financial reports. This true and fair override helped Australian companies to avoid compliance with standards. After removal of this provision, the Australian companies lobbied the Australian government to scale down the local standard-setting process in favour of wholesale adoption of international standards as local standards. Ultimately, some new institutional arrangements were proposed in Corporate Law, which projected the power of standard-setting in the hands of the most powerful lobby groups in Australia.

Stoddart (1999) opined that serving the public interest was not the purpose of the federal government of Australia for the adoption of IFRS in the country. Rather, the government was lobbied by ASX and the large corporate houses. The benefits of ASX through the adoption of IFRS were: retaining Australian companies and increasing the number of foreign companies listed on ASX. The government also looked for an increase in the credibility of the Australian stock exchanges in the business world and for them to be a focus point for more and more foreign companies in Australia. This objective did not take into consideration public interest arguments.
David Baulch, President of the CPA, Australia, presented his comments on IAS convergence in ASEAN, in October 2003, part of which is synthesized as follows: In the late 1990s, Australia rejected proposals to adopt the then international accounting standards. Instead, they committed to a process of harmonisation of Australian standards with international standards and applying government policies to determine local standards for some exceptional areas. Later, IASB revised their standards into IFRS, which had the potential to overcome earlier reservations by Australia and on that basis, in July 2002, the Federal Government of Australia committed to adopt fully IFRS from 1st January 2005. The decision for full adoption of IFRS was an important step, beyond harmonisation. The other key factor to note is that IFRS would apply to all reporting entities in Australia, covering major listed companies, not-for-profit organisations and also the public sectors. At present, the more than 40 standards that comprise the ‘Australian accounting standards framework’ are largely consistent with those of the IASB, with notable exceptions in areas such as superannuation and public sector accounting, where local standards have been determined by Government policies.

5.2. Motivation for lobbying in Australia against the local standard-setting processes

There are a large number of cases of intervention by the industry against the accounting standard setters of their own countries, which take the initiative of prescribing specific accounting treatments, eliminating alternative treatments, imposing additional disclosure requirements or tightening the allowed interpretations. Let us analyse the reasons for lobbying against several accounting proposals in Australia.

5.2.1 Movement against ED 49 in Australia

In Australia, ED 49 – Accounting for Identifiable Intangible Assets, proposed systematic amortisation within 20 years of the identifiable intangible assets such as brand and trademark which were either purchased or internally developed. ED 49 was lobbied against as its requirement did not suit the practice of continuous development of those assets and showing them during an indefinite period in the balance sheet. This practice drew companies towards the recognition of unidentifiable intangible assets and goodwill.

The Exposure Draft was withdrawn in 1992 after public companies in Australia submitted it to the Australian Accounting Research Foundation (AARF) in 1989. ED 49 required recognising those identifiable intangible assets which were not only purchased, but also had been developed internally by a company. Gerhardy (2000) observed that this requirement represented a significant change from normal practice at the time the exposure draft was issued.
Amortisation of those assets, for quite some time, had been a contentious issue in Australia:

a) Many identifiable intangible assets were included in indefinitely in the balance sheet. Many companies did not comply with the amortisation requirements to avoid the impact of amortisation on the Profit and Loss Statement. It was sometimes argued that intangibles, such as brands and trademarks, which were receiving continued support from a company, had an unlimited life and hence were not subject to any amortisation requirement. ED 49 proposed to remove any discretion in this matter and explicitly required those assets, whether purchased or internally developed, to be systematically amortised.

b) ED 49 proposed a finite period of 20 years maximum for amortisation, after which the benefits from the asset were expected to increase. It also suggested that a few assets could be expected to provide benefits in excess of the 20-year period, and if this 20-year period was to be exceeded, detailed disclosures were required. Prior to ED 49, no maximum amortisation period was set for identifiable intangible assets, which allowed the directors to argue for longer amortisation periods and therefore to reduce the year-to-year impact of amortisation. This also provided an incentive for companies to recognise identifiable intangible assets, rather than goodwill, which is an unidentifiable intangible asset. The economic factors were investigated and this influenced public companies to make a submission on ED 49 in relation to capitalisation and amortisation of identifiable intangibles. It was observed by Gerhardy and Watt, in an analysis of corporate lobbying on ED 49, that a firm will lobby for the capitalisation of identifiable intangible assets and for a lower rate of amortisation in a situation of higher debt to equity ratio, lower interest coverage ratio, lower effective tax rate and in case the firm belongs to a politically sensitive industry.

5.2.2. Australian standard for reconstruction invoked

AASB 1015 was withdrawn simply because the Australia government disliked the book value method for recording internal reconstruction assets.

6. Judgemental power of the standard-setting body

When accounting standards are established taking into consideration economic consequences, either prior to or subsequent to the issue of standards, probably the standard setter realises that it is virtually impossible to make a complete and precise analysis of all the economic consequences of all the accounting standards. Probably it is more difficult to anticipate most of the socio-economic responses to the accounting standards before the standards are finalised. Sometimes, there is the apprehension that
the consequences are much worse than the actual result. Someone may ask why comprehensive ex-post and ex-ante analysis of economic impacts of accounting standards are not viable and why the anticipated and actual consequences are so widely apart. One answer is that it is because no-one really knows what will happen in a complex business world in an uncertain future. Another response is that the analytical inability arises because apart from the necessity to identify the wealth-distribution effects of accounting standards, it is also essential to judge whether the effects are desirable or not from political, social and moral yardsticks within a country.

The socio-political desirability of the wealth-distributional effects of the accounting standards which are followed by a country, changes over time. Even if we believe that the socio-political objectives of financial reporting standards do not change over time, it is not possible for the standard-setter to measure all consequences on a one-dimensional scale. Hence, the standard-setter may simply prefer to predict the consequences of any selectable accounting rule and believe that the rule, together with its wealth-distributional effects, will endorse the socio-political goals of the economy.

Although there is no other way but for the standard setter to rely on the prospects of an accounting standard, fulfilling the wealth distributional requirements in a society, the accounting standard-setters in most of the countries are not empowered to make judgements over the socio-political desirability of the wealth-distributional effects of the accounting standards. In the course of accounting rule-making, new rules are easily added to the list and old rules are deleted whenever the political surface is changed and thus, the institutional basis of the standard-setting mechanism loses its credibility. Hence, the standard-setters should have the power to judge the socio-political desirability of the wealth-distributional effects of the accounting standards, so as to retain their trustworthiness.

7. The conceptual framework considerations

The accounting standard-setting process is confronted by the challenge of developing and using the conceptual framework for financial accounting and reporting. A conceptual framework may reasonably reduce the political and personal pressures that intervene in the standard-setting process and influence its outcome. The conceptual framework of accounting would provide less scope for political interference because dependence on sound concepts by an independent private body or a governmental agency in setting accounting standards develops its strength to avoid lobbying pressure. Self-interested political lobbying always moves in the opposite direction to appropriate and dependable financial reporting, whilst under the guidance of sound concepts, the standard-setter can measure and report the real-world economic phenomena as factually and faithfully as possible. The standard-setter has to select the line.
Kirk (1988), after taking over the Chairmanship of FASB, commented: “There are cost/benefit trade-offs and practical limitations that will constrain the standard-setter even if the course charted by the concepts may seem clear. But with a framework, standard-setting will have direction. Without a framework, progress may well be slower than with one; and certainly the lack of a framework will result in criticism that the standard-setting process has no direction or theme that guides it.”

Hoggett (1998), concluded that with the introduction of reforms to the standard-setting arrangements, in Australia, several opportunities arose for the greater involvement of stakeholders, with a danger, as well, that accounting standards would become less conceptually pure, standards may begin to reflect the will of the most politically capable lobbyists in the Financial Reporting Council of Australia and the needs of users of accounting statements are likely to be brushed aside. Hence, Hoggett opined that the use of an agreed-upon framework could reduce the influence of predispositions on standard-setting decisions.

Usually, when accounting standards are not established taking into consideration the economic consequences, the standard-setter seeks to explain and respond to accounting questions on conceptual and technical parameters within which the accounting issues can be addressed. A conceptual framework, in principle, guides the standard-setter with respect to the accounting questions: What should the objectives of financial reporting be? What should the qualities of accounting information be? How do we define the accounting elements? How do we settle the practical recognition and measurement aspects? A standard-setting body can easily attain the agreement of all members on the objectives and qualitative characteristics of accounting information. The members also have the same opinion on the definitions of accounting terms. Sometimes, a more defensible standard is formulated by the members on a new approach, taking longer, but in the end, with full consensus. However, in general, all members do not agree with the recognition and measurement parameters declared in a conceptual framework when issues become more specific. McGregor (1995), in relation to the current accounting regulatory situation in Australia, has reported on the parallel efforts made by the government (public) standard-setter, the Australian Accounting Standards Board (AASB), producing standards for private sector reporting entities

and a private sector standard-setter (PSASB) producing standards for public sector reporting entities. To McGregor, this concurrence of two standard-setting bodies in Australia appears to be anomalous and unwieldy but nevertheless has been successful in developing a common conceptual framework for general purpose financial reporting in both the private and public sectors.

8. Fluctuations in the profession’s authoritative influence over standard-setting

The accounting profession is a specialised social institution, which has the authority to influence the society in which it exists. Since the Trueblood Study Group issued the ‘Objectives of Financial Statements’ in 1973, advocating the decision-usefulness approach in standard-setting, the conceptual framework has served as a basis for setting new and revised accounting standards. Subsequently, the conceptual framework became the basis for the accounting profession to assert and extend its authority. We have also seen fluctuations in the accounting profession’s authoritative influence over standard-setting. In the last part of the 20th century, the authoritative influence of the accounting profession has been challenged. Abeysekera (2005) has mentioned that there has been an increasing degree of intervention by the Australian government in the affairs of the accounting profession in the period 1940–2002. From a particular point of view, he narrated the Australian accounting profession as a corporative association and found other institutions acting as social, political, capital constituents trying to reshape the authoritative influence between their respective constituencies and the accounting profession. However, it can be assumed that the accounting profession can retain its authoritative position in relation to standard-setting so long as the decision-usefulness logic is upheld in its conceptual framework.

References


4 The Institute of Actuaries in Australia (IAA), as a social constituent, the Australian Prudential and Regulatory Authority (APRA) and the Australian Securities and Investment Commission (ASIC) as political constituents, the Australian Stock Exchange as a capital constituent making submissions on the fall of the HIH group in 2002.


Stoddart, E., Politics in Action: Inter-organisational conflict in proposed changes to setting Australian accounting standards, Working Paper, School of Business, Swinburne University of Technology, Victoria, Australia, 1999.


1. Introduction

Accounting today is more than just an activity offering support to management in its decision making, but rather an activity reflecting – in its solutions – wider processes in society, thus epitomising the philosophy of each individual company. An important novelty in the developing theory of accounting is that it is not only about the monetary evaluation of economic categories or about the calculation of business performance, but it tends to extend to the area of corporate social responsibility. This idea is substantiated by the fact that companies and other organisations also have a social responsibility, which reaches beyond generating money for shareholders. If the interests of all the stakeholders (management, employees, customers, suppliers, the government and wider communities) are not taken into consideration, such groups could turn away from co-operating with a company, which could then threaten its future performance. The operating circumstances on the one hand, which have changed in the past decade because of advances in technology – particularly IT – and the political changes on the other, brought about the globalisation of business (Kavčič and Ivanković, 2004b: 134).

The first consequences of globalisation in the hotel industry can be identified in the enforcement of hotel standards as a benchmark for quality in the hotel business. Hotel chains have definitely most of the merit for such enforcement.¹ Standardisation in the hotel industry does not affect only the quality of hotel services, but influences entire business processes as well. The current system of categorisation of hotels by

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¹ Eight great hoteliers have to be credited with the development of hotel chains and hotel standards: Cesar Ritz, Elsworth Statler, Conrad N. Hilton, Ralf Hitz, Ernest Henderson, Howard Dearin Johnson, Willard Marriot and Kemon Wilson (Ivanković, 2004: 40–42).
quality (number of stars) and size (number of rooms), and particularly the Uniform System of Accounts for the Lodging Industry, (USALI, 2006) offers the possibility to compare hotels in terms of quality and other factors, regardless of any individual hotel’s location on the world map.

The business environment in the hotel industry is characterised by fierce competition and constantly changing circumstances. Each hotel is in direct or indirect competition with every other hotel. Strong competition forces management to try to get closer to their guests’ wishes, since it is the only way to achieve success. Numerous authors claim that the lodging industry lacks a sufficiently developed management accounting system (MAS) (Phillips, 1999; Mia and Patiar, 2001; Banker et al 1999; Brander Brown and McDonell, 1995 and others), which could offer valid information for adopting relevant decisions.

An adequate MAS helps management to meet their customers’ demands and achieve business objectives (Damonte et al 1997). Chenhall and Morris (1986) and Mia and Chenhall (1994) state that MAS information are strongly needed, since it helps management to make valuable decisions, thus contributing to better achievements (cf. also Downie, 1997). MAS must therefore supply the information that management is requesting (Dent, 1996; Govidarajan, 1984; Mia and Chenhall, 1994; Simons, 1990). In the paper, we give a brief illustration of Slovenia, its hotel industry, the level of development of MAS in Slovenian hotels and its influence on performance.

2. Some information on Slovenia and Slovenian tourism

Slovenia is a central European country, which, up until recently, was part of Yugoslavia. The country – located between Croatia, Hungary, Austria and Italy – became independent in 1991. There are over 2 million people living in an area of 20,273 km². The country’s capital is Ljubljana with around 300,000 inhabitants. On 1st May 2004, Slovenia became a member country of the European Union. Slovenians speak Slovenian, which is a Slavic language. The currency was the Slovenia adopted euro – € by 2007.

Tourism presents an important development and business opportunity for Slovenia. Given the current level of development and existing potential, tourism could become one of the leading sectors of the Slovenian economy in the next few years, thus significantly contributing to Slovenia’s development goals, and particularly the economic objectives, stipulated in Slovenia’s Development Strategy 2007–2013. The basic policies of Slovenia’s tourism for the next few years (2007–2011) are defined in the Development Plan and Policies of Slovenian Tourism 2007–20011 and the Marketing Strategy of Slovenian Tourism 2007 -2011. Tourist policies focus on increasing both global competitiveness and tourist capacities, which translated into
the following quantitative goals: increasing the volume of tourism i.e. the number of tourists by 6%, the number of overnight stays by 4%, foreign currency revenues by 8%, and tourist spending, and raising awareness about Slovenian tourism. On the European and global scale, Slovenian tourism is becoming increasingly more competitive, which was confirmed by its 37th place in the World Economic Forum’s list of countries in terms of travel and tourism competitiveness. The report, which included 124 countries, was based on 13 factors of tourism competitiveness.

The vision of Slovenian tourism is to develop a tourist destination with a diverse and high quality tourist offer, specialising in short-term stays, while, at the same time, offering appealing and diverse integrated tourist products that can render Slovenia a popular destination for longer stays. After all, Slovenia is one of the relatively undiscovered European destinations – pristine, authentic and traditional, while at the same time modern, innovative and easily negotiable, due to its size, offering unique cosiness and comfort, unspoilt nature, rich cultural heritage, and plenty of opportunities to enjoy active and relaxing holidays.

The characteristics of the hotel industry (60% share of fixed costs) make the occupancy rate an important factor for success. Hotels are able to manage their costs if they have a good information system. Such a system must be adapted to be used by people having the possibility to manage costs at various levels, i.e. General Managers (GMs) and Department Managers (DMs) – Food & Beverage Departments and the Rooms Department at lower levels of responsibility. Both need a MAS that could help them make decisions. Our fundamental assumption is that one of the reasons for the poor performance of hotels is inadequate MAS, which – in Slovenian hotels – are used by people who make decisions at various levels. (Ivanković, 2004: 3–4)

3. What is an adequate MANAGEMENT ACCOUNTING system?

Proper MAS is an ever greater need in the hotel industry. The reason for that is fierce and increasingly global competition. Adequate MAS offers hotel managements the possibility to make decisions that could ensure the best possible results, taking into account the special characteristics of the hotel business. Such special features show in the high share of fixed costs in overall expenses and in the need to be focused on marketing (Brander Brown and Harris, 1998; Kotas, 1975; Harris, 1995). Services in the hotel industry are complex, personal, intangible, heterogeneous and simultaneous (Jones and Lockwood, 1989; Fitzgerald et al 1991). The same can be said about the products, which feature elements of services, as well as those of retail and manufacturing (Harris, 1995). An idea gaining ground (Brander Brown and Atkinson, 2001: 130) is that the key factor of success in the hotel industry is focus on people: employees
and guests.\(^2\) The starting point for creating an adequate MAS is to know the objectives of an individual hotel and the strategies to achieve them (Geller, 1985a, b, c; Brotherton and Shaw, 1996; Croston, 1995; Jones, 1995; Brander Brown, 1995) and the recognition of the factors that are of critical importance for the achievement of the objectives. If we equal success with achieving goals, we can say that the critical factors for achieving objectives are the same as the CSFs.

Since the demand for computerised information needed for budgeting, making decisions, supervising and comparing, MAS proves to be an important reason for introducing a high-quality IT system. Such a system will not ensure the results desired if the responsibilities for making decisions are not clearly divided among the various levels of management before the introduction of an IT system. Hotels usually have different decision-making levels. Managers at each level make decisions within their areas of competence and responsibility. MASs must supply information to each decision-making level that is customised for the purpose and the subject of decisions. We believe that MAS information is as useful as the degree to which management is satisfied with them. If the information is not supplied on time, the management will not use it, even if it would like to do so. The opposite is also true. If management is not satisfied with the information supplied, it will not use it (Kavčič and Ivankovič, 2004a: 550). Satisfaction with the MAS is therefore very important.

Kaplan and Norton (1992) proved that organisations operating in today’s dynamic circumstances need to resort to different criteria (financial and non-financial indicators and indices) and also take into account multiplication performance measures. Only by taking into account both financial and non-financial measures, such as profitability, customer satisfaction, response time, team work and productivity, are we able to create a consistent MAS that will also offer a more effective system of supervision. The lodging industry is a people-oriented industry. The economic and financial success of a hotel therefore depends on the attitude and behaviour of employees, the development of new products and services, as well as on customer satisfaction. Hotel companies must think of their performance in a wider sense (from the point of view of employees, customers, suppliers, management etc) and not only from merely a financial perspective, which is the epitome of all the aspects of success. Hotel General and Department Managers must give equal importance to the goals of all the stakeholders and not only of their shareholders. The achievement of the objectives of all the stakeholders (i.e. guests, employees, strategic partners, community) can be measured by both financial and non-financial measures.

\(^2\) Also increasing is the belief that hotels need a higher level of information among employees, since the employee’s morale and customer satisfaction are two key areas.

\(^3\) By taking into consideration the characteristics of individual companies, Geller identified the goals that are typical of the entire industry, such as critical success factors (CSF) and criteria.
Hotel companies usually work in a very competitive environment. Competition brings about threats, as well as opportunities. Proactive companies study their environment very carefully and take into consideration all the economic, social and technological changes, accepting them as opportunities and challenges (Rolfe, 1992: 33). As hotels prepare a new product on the basis of the opportunities perceived, the new idea is often copied by competitor hotels, which shortens the useful life of such a product or service. Hotels that are market leaders must therefore constantly progress if they wish to keep their cutting edge. New competitors can easily enter the hotel industry, since almost every hotel is able to manipulate prices through special discounts and packages. Managements are aware that hotels need to catch the interest of customers, turning customer satisfaction into a priority. If they want to be successful at it, they have to know their competition well and know which differentiated products or services (at low costs) can be their competitive advantage. Hotels will be able to ensure long-term success, if they have satisfied customers that keep returning and thus contributing to the hotels’ good performance. Another key factor for every hotel is the business strategy adopted, alongside Strategic Management Accounting (SMA), which supplies information for monitoring the implementation of the business strategy.

After having taken into consideration the theoretical assumptions, we have formulated our basic hypothesis that hotels with an adequate MAS perform better than those without one.

In order to test our hypothesis, we first had to define what an adequate MAS should look like. We have made the claim that a company has an adequate MAS, if the MAS meets the following requirements:

1. General Managers – GMs and Department Managers – DMs (Food & Beverage Departments and Rooms Department) of the hotel:
   1a) use the information of the MAS frequently;
   1b) both management levels are satisfied with the timeliness and usefulness (content) of the information.

2. When evaluating their performance, top management and heads of units of a hotel pay equal attention to monetary and non-monetary measures.

3. The hotel:
   3.a) has a well-defined business strategy – measured by its mid-term budget (3 years or more); and
   3.b) uses SMA for making decisions – measured by its own market share and the market shares of its main competitors and their prices.

We were also aware that Slovenian hotels may fulfil one, two or all of the conditions above. For this reason, we had to counter-balance some of the conditions. Having made a thorough analysis of the importance of individual factors, the experts of the Faculty of Tourism – Turistica at the University of Primorska, agreed that it would be better to compare factors with comparable importance. The next step in our analysis
was to check whether Slovenian hotel companies have MASs. This would enable us to conclude whether inadequate MASs are to be blamed for the poor performance of some Slovenian hotels. The analysis of such verification is given below.

4. Methodology

We analysed the development level of MASs in Slovenian hotels. We decided to survey the management and the guests of Slovenian hotels. For this purpose, we have prepared two questionnaires: one for the guests and one for the hotel’s management. In the first questionnaire, we asked the guests their opinion on the quality of the hotel, their satisfaction, while classifying the guest (thermal-spa, domestic, foreign etc). The questionnaire for hotel management was divided into eight chapters: general information on the hotel, use of MAS at various levels of decision-making, marketing information, information about the employees, company owners and IT systems, performance measures, implementation of SMA and methods used for budgeting. Both questionnaires were sent to 51 hotels, which covers all hotels in Slovenia with more than 100 rooms. The questionnaires were filled out by 39 hotels or 76% of the entire section of the industry. Of all the hotels included, 61% have three stars, the others have four.

4.1. Criteria for evaluating variables

Consistent with the definition of the development level of MASs and their importance for the performance of a company, we also had to define our relative and absolute variables.

4.1.1. Definition of independent variables

1) We measured the importance of MASs in making business decisions separately in the case of hotel General and Department managers (Food & Beverage and separately rooms), through:
   – Frequency of use of MAS information in taking short- and long-term business decisions (condition 1a)

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4 Hotels which did not answer are located in different parts of Slovenia and differ in size. This means that the unanswered questionnaires do not imply that hotels of a certain size or in a certain region in Slovenia have been left out.

5 The frequency of use of MAS information was measured by using a five-degree scale of importance (ranging from 1-never to 5-very often), previously used by Mia and Patiar (2001); ibid. also Chenhall and Morris (1986); Mia and Clarke (1999); Simons (1990). We measured the use of MAS information in
– Satisfaction with the timeliness and usefulness of MAS information (condition 1b); and

2) Evaluation of the importance of goals, which we adapted from Kaplan’s and Norton’s BSC (1992) (condition 2).

3) The hotel has a well-defined business strategy and SMA, if it has a long-term strategy, a consequent strategic plan for three or more years, and if it follows its own market share and the market shares of its main competitors, as well as their prices (condition 3).

4.1.2. Definition of dependent variables

We have defined the business performance of a hotel to be a dependent variable, measured by financial and non-financial measures.

1) In order to guarantee comparability, we have chosen two financial indicators in the period of the preceding five years and we have de-flationed the figures: average net sales revenues per room (USALI, 2006; Kwansa and Schmidgall, 1999: 90) and average profit or loss per room.

2) Among the non-financial criteria we have taken into consideration: the number of new products in the preceding two years, the average share of return guests in the preceding five years (Foster et al, 1996) and the average number of employees per room in the period of the preceding five years (USALI, 2006).

5. Results Of The Analysis Of The Development Level Of Mass And Their Influence On The Performance Of Slovenian Hotels

We started by verifying the first condition to be met by a hotel, if we are to say that it has a developed MAS. So, we first checked how frequently MAS information is used in Slovenian hotels by directors and heads of units for taking short- and long-term decisions. By applying the reliability rate of a measuring scale (Cronbach’s alpha), we first verified the internal consistency of the measuring scale, composed by the variables used to check the frequency of use of MAS information. We obtained a high value for the rate (0.92), which proves that the variables have been chosen correctly.

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five different units separately: effectiveness of advertising and marketing, prices of products and services, booking systems and marketing strategies, customer satisfaction and profitability of units.

6 The level of satisfaction with MAS information was measured with a five-degree scale, ranging from 1-not satisfied to 5-very satisfied.

7 We have grouped the goals in financial (monetary achievements and results compared to the budget) and non-financial goals (customer complaints, fluctuations in staff numbers and quality of services).
Table 1: Use of MAS information for taking short- and long-term decisions

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Decision-making level</th>
<th>AM-S</th>
<th>AM-L</th>
<th>AM_Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness of promotion and sales</td>
<td>GMs</td>
<td>3.9</td>
<td>4.1</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.1</td>
<td>3.2</td>
<td>3.1</td>
</tr>
<tr>
<td>Costs of goods and services</td>
<td>GMs</td>
<td>4.5</td>
<td>4.5</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.7</td>
<td>3.7</td>
<td>3.7</td>
</tr>
<tr>
<td>Booking system and marketing strategy</td>
<td>GMs</td>
<td>3.7</td>
<td>4.0</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.2</td>
<td>3.2</td>
<td>3.3</td>
</tr>
<tr>
<td>Guest satisfaction</td>
<td>GMs</td>
<td>4.5</td>
<td>4.6</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>4.2</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Profitability of department</td>
<td>GMs</td>
<td>4.3</td>
<td>4.6</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.5</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>GMs</td>
<td>4.2</td>
<td>4.4</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.6</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>TOTAL (GM + DM)</td>
<td>3.9</td>
<td>4.0</td>
<td>3.9</td>
<td></td>
</tr>
</tbody>
</table>

Legend:
GMs = General Managers
DMs = Department Managers of Food & Beverage and of Rooms
AM-S = arithmetic mean of a short-term decision
AM-L = arithmetic mean of a long-term decision

Table 1 shows that (condition 1a), on average, General and Department Managers of hotel use the information for taking decisions with the same frequency, which is above average, since the arithmetic mean was 3.9 on a five-degree scale. General and Department Managers do not show considerable statistic differences in using information on customer satisfaction ($t = 0.96; p>0.5$) for making short- and long-term decisions.

Table 2 shows the levels of satisfaction with the MAS information, in terms of timeliness and usefulness (contents) of the information supplied to General and Department Managers (condition 1b)

Table 2: Satisfaction of hotel management with the timeliness and usefulness of MAS information

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Decision-making level</th>
<th>AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeliness of MAS information</td>
<td>GMs</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.4</td>
</tr>
<tr>
<td>Usefulness (contents) of MAS information</td>
<td>GMs</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>GMs</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.5</td>
</tr>
<tr>
<td>TOTAL (GM + DM)</td>
<td>3.7</td>
<td></td>
</tr>
</tbody>
</table>
The table shows that General Managers tend to be more satisfied with the timeliness and usefulness of information than the Department Managers. Both groups show a combined rate of 74%.

The second condition for having an adequate MAS, is to pay the same level of attention to financial and non-financial goals when General and Department Managers evaluate the performance of their hotel. When checking the difference between General and Department Managers in terms of goal importance, we see a considerable statistical difference between General and Department Managers in giving more importance to financial goals than to non-financial ones (t=3.97; p<0.5), while there are no statistically relevant differences between the treatment of non-financial goals by General and Department Managers (t=-0.176; p>0.5) The arithmetic mean of the answers on a five-degree scale is shown in Table 3.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Decision-making level</th>
<th>AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial goals</td>
<td>GMs</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.4</td>
</tr>
<tr>
<td>Non-financial goals</td>
<td>GMs</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>4.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>GMs</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>DMs</td>
<td>3.8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>(GM + DM)</td>
<td>4.0</td>
</tr>
</tbody>
</table>

The data show that top management, i.e. General Managers, pay the same amount of attention to financial and non-financial goals, while heads of units tend to be more focused on non-financial than on financial objectives. The results make sense, since Department Managers are faced with non-financial issues (customers’ complaints, fluctuations of staff and quality of services) on a daily basis, while financial questions are more remote to them.

The third condition that we have set for a good MAS is composed of a well-defined business strategy and the use of SMA. Business strategy was defined as the adoption of a long-term strategy, while SMA meant that the management knew their market share and the market shares of their main competitors along with their prices.

The analysis of the answers received is shown in Table 4.
Table 4: Use of SMA and definition of business strategy

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term strategy</td>
<td>3.8</td>
</tr>
<tr>
<td>Knowing one’s own market share</td>
<td>3.5</td>
</tr>
<tr>
<td>Knowing the market shares of the major competitors</td>
<td>3.0</td>
</tr>
<tr>
<td>Knowing the prices of the main competitors</td>
<td>4.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3.7</td>
</tr>
</tbody>
</table>

The figures show that most Slovenian hotels meet the third condition for a good MAS.

The level of compliance with the three conditions is shown in Table 5.

Table 5: Level of development of MASs in Slovenian hotels

<table>
<thead>
<tr>
<th>Condition</th>
<th>AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of use of information (1a)</td>
<td>3.9</td>
</tr>
<tr>
<td>Utility of information (1b)</td>
<td>3.7</td>
</tr>
<tr>
<td>Use of monetary and non-monetary measures (2)</td>
<td>4.0</td>
</tr>
<tr>
<td>Long-term strategy and SMA (3)</td>
<td>3.7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3.8</td>
</tr>
</tbody>
</table>

If we consider the presence of all the conditions set out for a good MAS in Slovenian hotels, we can conclude that 74% of hotels have a well-developed MAS. The level of development of MASs in Slovenian hotels indicates that they should be successful.

The following step was to verify whether the hotels with a good MAS perform better than those that do not. In order to answer this question, we gathered information on the average performance of the hotels surveyed in the preceding five years. In line with the definition of performance measures, the financial and non-financial measures are shown in Table 6. We have divided the hotels into coastal, thermal-spa and others.

Table 6: Hotel performance measures

<table>
<thead>
<tr>
<th>Type of hotel</th>
<th>Net revenue per room (in €)</th>
<th>Net profit per room (in €)</th>
<th>Number of employees per room</th>
<th>Portion of return guests</th>
<th>Number of new products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal baths</td>
<td>17,283</td>
<td>1,933</td>
<td>0.68</td>
<td>0.15</td>
<td>10</td>
</tr>
<tr>
<td>Coastal</td>
<td>16,233</td>
<td>2,004</td>
<td>0.54</td>
<td>0.04</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>12,142</td>
<td>-1,104</td>
<td>0.37</td>
<td>0.15</td>
<td>1</td>
</tr>
</tbody>
</table>

The data indicate that thermal-bath hotels are the most successful in terms of net sales revenue per room, while the others do not perform that well. Thermal-bath
hotels also tend to have a larger number of new products. In terms of profit or loss and a lower number of employees per room, the coastal hotels are more successful than the thermal baths. Other hotels tend to achieve the worst financial results, in spite of having, on average, fewer employees per room.

According to our hypothesis that hotels with a good MAS tend to perform better, the figures would indicate that thermal-bath and coastal hotels have good MASs, while the others have not. Therefore, the next step was to verify the level of development of MASs in the different types of hotels. We have discovered that thermal-bath hotels have comparably developed MASs (3.82 on a five-degree scale), followed by coastal hotels (3.80 on a five-degree scale), while the other hotels are in the last position (3.23 on a five-degree scale). The result proves that the hotels with better developed MASs do perform better than those without one.

Since several equally important factors have been taken into consideration in defining an adequate MAS, we had to verify the connections between individual factors of MAS development with performance. For this purpose, we have calculated the Pearson’s correlation rate. The results have shown that none of the MAS factors can considerably affect the level of success. Neither rate that we have calculated has exceeded the value of 0.0368. The only factor to achieve this value was the correlation rate between net sales revenues per room and the frequency of the use of a MAS for making long-term decisions by hotel General Managers. The rates calculated therefore have no explanatory value. The results have confirmed our expectations, since figures on the business performance of Slovenian hotels show that most of them perform poorly, in spite of having relatively well-developed MAS.

6. DISCUSSION

Figures show that in most cases, Slovenian hotels show poor economic performance. This could lead us to say that they have inadequately developed MASs. The analysis of the answers showed that the average level of MAS development is comparably good, since it reaches 3.8 on a five-degree scale.

The fundamental assumption of our paper was that the hotels with better developed MASs perform better than those without one. The hypothesis has been only partially proven. Thermal-bath hotels have the highest net sales revenues per room and the largest number of new products. Coastal hotels have the highest profit per room and the lowest number of employees per room. Both types of hotels have MASs at similar levels of development, while the other hotels, with less developed MASs, also tend to perform worse. When we verified the correlations between individual factors of MAS development against performance, we did not find any. We have to conclude, therefore, that the development of MASs does not affect the performance
of Slovenian factors as other factors do. This conclusion has also been proven in the case of thermal-bath hotels. The reason for their success is mostly their monopolistic position in the market, since most of their guests are supplied by the government’s Health Insurance Institute. The hotels have agreements stipulated by the Institute, on the basis of which they have better occupancy rates, revenues and cash flows. The agreements also guarantee prices and timely payments. For this reason, the thermal baths pay less attention to costs and achieve lower profits in spite of higher revenues. The opposite can be said about the coastal hotels, which operate in market conditions and therefore have to be more focused on managing costs. For this reason, they have better profits per room in spite of lower revenues per room. Thermal-bath hotels use their MASs mostly to define the prices for their services that can be charged to the Health Insurance Institute.

The results of our research of Slovenian hotels failed to confirm our hypothesis, which is unusual. There has been much research published in the world about the issue that we have investigated in Slovenia and their conclusions were that MAS development levels affect the performance of hotels (Brander Brown and McDonnell, 1995; Mia and Clarke, 1999; Mia and Patiar, 2001; Brander Brown and Atkinson, 2001; Phillips, 1999; Denton and White, 2000; Huckeinstein and Duboff, 1999; Collier and Gregory, 1995; Dunn and Brooks, 1990; Noone and Griffin, 1997; Brotherton and Shaw, 1996; Croston, 1995; Jones, 1995). One reason for the different results in Slovenia is probably due to the fact that in the system of self-management socialism – in force in Slovenia up until 1990 – there was no global competition, which would force companies to weigh the positive and negative sides of individual business decisions. The need for considerate decision-making, based on adequate information, only made its appearance in Slovenia once the economic system had been changed in all the companies, including hotels. Hotels, as with other companies, gather information for making decisions. The question remains as to whether such pieces of information are relevant and whether they are being used. The reply to this question will have to be given by future studies.

LITERATURE:


The reorganisation of the Bankruptcy Debtor presupposes the possibility of him/her continuing his/her business, even if Bankruptcy Proceedings have begun. In the Reorganisation Proceedings, the Organisational or Bankruptcy Plan is submitted, which is the principal act of the process and on which it depends whether the Bankruptcy Debtor will continue his work and whether the Bankruptcy proceedings against him will be continued or not. This decision is taken by the Creditors. The Reorganisation Plan supplies a vast range of possibilities for defining the Bankruptcy status of the Debtor, following the opening of the Bankruptcy proceedings, in the case where there is a possibility that the Debtor abstains and when the Reorganisation Proceedings are successfully carried out. The possibility of the Bankruptcy Debtor to abstain depends first of all on the Reorganisation Plan propositions, i.e. from the reorganisation measures (this term is being used in Bankruptcy legislation) but they must be justified and the opportunity must exist for their realisation in the Reorganisation Proceedings.

With the Bankruptcy legislation of the Republic of Serbia, the Reorganisation Proceedings for the Bankruptcy Debtor are taken into account. This was also the case in the legislations in neighbouring republics, such as the Bankruptcy legislation of BiH (Republic of Srpska) and Croatia, whereby the legislations and the reorganisation of the Bankruptcy Debtor are determined in a significantly different manner. The biggest similarities of the Serbian Bankruptcy legislation, when compared to the

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1 Dika M., Insolvencijsko pravo (Insolvency law), Zagreb 1998., p. 75
2 Code on Bankruptcy Proceedings BiH (Sl.novine Federacije BiH no.29/2003)
3 Code on Bankruptcy Proceedings of the Republic of Srpska (Sl.glasnik R.Srpske no. 67/02, 77/02, 4/03, 96/03)
aforementioned legislations, are the measures regarding the Reorganisation Plan. The Code on Bankruptcy Proceedings of the Republic of Serbia (hereinafter referred to as CBP)\(^5\) regulates the Reorganisation Proceedings for the Bankruptcy Debtor, enabling the person to continue his/her work and continue performing his/her activity, so that “erasure” from the Register can be avoided. The fact is that the basic purpose of Bankruptcy proceedings is related to the settling of Creditors’ claims. However, one can reach this outcome through the Reorganisation Proceedings. This target can be achieved through a proper and true identification of Measures or Reorganisation Forms which means that by establishing the plan contents, one should focus on how the Bankruptcy Debtor will be able to respond to the Reorganisation Plan and also to Creditors’ claims and other proceedings.

We can see that in our Bankruptcy legislation, as well as in that of the neighbouring republics, the organisation has a double sense, which refers to the Debtor continuing to work and also to the Creditors’ settlement. For example, when these two targets are in question, regulation by German Bankruptcy reorganisation legislation is carried out in another way. In the first place, the Bankruptcy Plan is put into place, giving more possibilities for the Creditors’ claims to be settled, so that the relations between Debtors and Creditors are resolved in an enforced or in a voluntary manner. Practically, this means that the Bankruptcy Plan in German Bankruptcy legislation can have a contractual or enforced character. However, besides the Bankruptcy Plan, there is also the Rehabilitation Plan, giving in the first place, the possibility for the Debtor to continue with his/her business, but also the possibility of the Bankruptcy Debtor’s work to be transferred to a third person (economic subject) who can complete successfully these jobs and settle with the Creditors.\(^6\) The subjects of the proceedings decide which plan will be accepted.\(^7\) Otherwise, the German Bankruptcy legislation, namely the Code on German Insolvency\(^8\), regulates the Bankruptcy or Insolvency Plan in three stages, as is the case in our legislation and that of neighbouring countries. The first stage refers to the plan’s contents and Creditor’s rights in the Reorganisation Proceedings.\(^9\) The second stage refers to the acceptance and contents of the plans\(^10\), whilst the third covers their surveillance and application.\(^11\) The measures, or in other words the forms, being proposed in the foundation of the plan and whose acceptance and approval depends on the Creditors, are left up to the Applicant.\(^12\)

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5 Code on Bankruptcy Proceedings of the Republic of Serbia (Sl.glasnik R.Srbije no.84/2004)
6 Fialski H., Insolvency Law in the Federal Republic of Germany, 1994., p. 27
7 Ibidem
9 Insolvenzordnung, p.217–234
10 Insolvenzordnung, p.235–253
11 Insolvenzordnung, p. 254–269
say that the German Bankruptcy legislation has strongly influenced the Bankruptcy legislations of Croatia and B&H (R. Srpska). Also, if we compare the above stated stipulations on Reorganisation Proceedings in the German Insolvency Code, we can see that its Reorganisation Proceedings structure is similar to the Bankruptcy legislation of Serbia.

Reorganisation Proceedings offer various possibilities for Bankruptcy Debtor “healing”. This applies to the Measures or, as we shall call them, the Reorganisation Forms, which can be executed for the purpose of the Debtor continuing to work and his obligations to complete. As mentioned, the term “measures” is used by the Code on Bankruptcy Proceedings but we shall call them “Forms” for various reasons. The first motivation refers to the basic Act in the Reorganisation Proceedings, which is the Reorganisation or Bankruptcy Plan, which in our opinion, is a more acceptable term for the stated Act. The most difficult decision is to determine the legal nature of the Bankruptcy Plan, since it can be defined as an agreement of will, which is a Contract, taking into consideration the participation of all subjects of the Bankruptcy proceedings in its presentation. The second motivation is linked to the first regarding the freedom to accept or refuse the plan, whilst the term “Measures” implies imperative norms that cannot be modified. Finally, the third motivation relates to the possibility of combining various Reorganisation Forms with the purpose of the Debtor continuing to work, although the CBP does not precisely refer to this. Using the term “Reorganisation Forms” instead of “Reorganisation Measures” does not have to imply criticism of the legislation, but refers to the character of the Reorganisation Plan itself as has been defined by the Code on Bankruptcy Proceedings.

1. Legislative Nature Of The Reorganisation Plan And Of Bankruptcy Proceedings Status

The reorganisation proceedings of the Bankruptcy Debtor should ensure not only the continuation of the Debtor’s work, but also the settling of Creditors’ claims. We can state that reorganisation, as well as Bankruptcy, has two basic purposes. However, in the Reorganisation Proceedings, some issues arise which require responses prior to analysing, not only the reorganisation form, but the proceedings themselves. Such issues relate to the Reorganisation Plan, i.e. to its legal nature, and also to the status of the Bankruptcy proceedings at the moment of acceptance of the Reorganisation Plan and also of the status of the Bankruptcy proceedings after the Reorganisation Plan’s execution, when there is no longer the probability of this leading to Bankruptcy proceedings. The Reorganisation Plan is an act which must be accepted by all persons
in the Bankruptcy proceedings, as well as by the Bankruptcy Debtor and Creditors.\(^{13}\) The Bankruptcy Judge approves the plan if the majority of the Creditors have voted for it. On the other hand, the possibility should exist that the Bankruptcy Debtor executes the proposed Reorganisation Forms. When contemplating the Reorganisation Plan, as in a Contract and Reorganisation Plan as a Court Act, we shall choose the first one, since all the stated subjects have to acknowledge it positively. Although the bankruptcy Judge leads the Reorganisation Proceedings, the Reorganisation Plan is not a Court Act.

As far as the Bankruptcy proceedings are concerned, the Legislator does not determine his status in case of the opening of Reorganisation Proceedings. After acceptance, and upon its acknowledgment by the absolute decision, the Reorganisation Proceedings begin. The Code on Bankruptcy Proceedings has no precise stipulation on this, except in the case where a company, by accepting the plan, does not have to state “In Bankruptcy” in its appellation of the Bankruptcy Debtor.\(^{14}\) If we accept this stipulation, this would mean that the Bankruptcy proceedings become final or cancelled. This decision is not the most appropriate one, although other Bankruptcy legislations define this issue in the same way. When issues of the Reorganisation Plan execution are in question and if the Bankruptcy Debtor acts contrary to the plan contents, the Bankruptcy Judge can make a decision regarding starting new Bankruptcy proceedings against the subject. These circumstances have been specified in the CBP\(^{15}\) so that it is clear when new Bankruptcy proceedings are opened for failing to execute the Reorganisation Plan. Pursuant to the CBP stipulations, we can conclude that in case of the acceptance of the Reorganisation Plan, the Bankruptcy proceedings are cancelled or else, if the Reorganisation Plan is not applied, new Bankruptcy proceedings will be opened. If the Reorganisation Plan is executed pursuant to the CBP and on the basis of the plan’s contents, the Debtor will then definitely continue his work.

We will concentrate exclusively on the Reorganisation Forms and will briefly analyse other parts of the Reorganisation Proceedings. However, prior to that, we will study the previous resolutions in our Bankruptcy legislation relating to the possibility of the Bankruptcy Debtor continuing to function. The Code on Settlement, Compounding, Bankruptcy and Liquidation (hereinafter referred to as CSCBL)\(^{16}\) has also foreseen the possibility for the Bankruptcy Debtor to continue functioning by undertaking certain procedures, which could result in the settlement of Creditors, without beginning Bankruptcy proceedings. This refers to an enforced settlement and also to the possibility of the Bankruptcy Debtor’s sale. Some Reorganisation Forms,
regulated by the Code on Bankruptcy Proceedings, have some similarities with the resolutions contained in former Bankruptcy legislation in our country. We must say that within its stipulations’ framework on Bankruptcy proceedings reorganisation, the CBP takes into consideration the personal management of the entrepreneur\(^{17}\) since this Code includes the possibility to undertake Bankruptcy proceedings against the entrepreneur or against other physical persons. No particular attention will be paid here to the entrepreneur’s personal management.

### 2. Reorganisation Proceedings

Some attention will be given to the Reorganisation Proceedings, in other words to the basic characteristics of its phases, to enable us to determine more precisely the nature of the Reorganisation or Bankruptcy Plan (we will be using the first term for the Plan as given in the CBP). The Reorganisation Proceedings in Serbian Bankruptcy legislation are different when compared to the above mentioned legislations. This particularly refers to the Reorganisation Plan structure, which is, in our opinion, more clearly and precisely regulated by the aforementioned legislations. Acceptance of the Reorganisation Plan depends on its contents or on the proposed Reorganisation Forms. With regard to the Reorganisation Proceedings, the three basic issues are set. Such issues are interconnected with the basic phases of the Reorganisation Proceedings and are as follows:

1) Who submits the Reorganisation (Bankruptcy) Plan?
2) In what manner is the Reorganisation Plan accepted?
3) In what manner is the Reorganisation Plan executed?

For the Reorganisation Plan, it is vital that this is submitted with a proposition for the opening of Bankruptcy proceedings with a precise deadline after the opening of the proceedings.\(^{18}\) If the Applicant of the Reorganisation Plan deems satisfactory the conditions for the execution of the Reorganisation Proceedings for the Debtor, he would then provide all facts supporting it and also consider the Reorganisation Forms to be undertaken in the proceedings. We have stated that the Reorganisation Plan can be submitted with a proposition for beginning Bankruptcy proceedings. This means that we have to answer the question of whether these proceedings run in parallel or if the Bankruptcy proceedings are interrupted for the duration of the Reorganisation Proceedings. We will see later that in the CBP there is a particular inconsistency with regard to these two proceedings. In the Reorganisation Plan the Applicant must supply all the basic data on the Bankruptcy Debtor and on the possibility of execution.

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17 Art. 140.-144. CBP
18 Ninety days. Art.127(2), Art.130 (1) CBP
of the Reorganisation Proceedings; in other words, on the person who will handle the procedure’s execution. The Legislator has specified what the Reorganisation Plan should contain but has not separated the significant from the irrelevant points, as has been done, for example, in the Bankruptcy legislation of Croatia or B&H (Republic Srpska), where the Reorganisation or Bankruptcy Plan is divided into two parts: the preparatory part and the basics for execution (as the principal part). The Reorganisation Plan contains the following important points: a) Information on the Bankruptcy Debtor, including the financial dealings reports; b) Reorganisation Forms; c) Pecuniary means at the disposal of the Debtor which can be directly divided amongst the Creditors; d) Deadlines for the execution of the Reorganisation Forms; e) The persons who will undertake the Reorganisation Forms (for example, experts in this field); f) Evaluation of the Reorganisation Proceedings results, i.e. whether these proceedings will lead to the settlement of Creditors and also to the continuation of the Debtor’s work. We can see from the enumeration of the plan’s basic contents that all points do not have the same value, since the Reorganisation Plan can be divided into two parts, as has been stipulated in the stated Bankruptcy legislations.

As previously mentioned, we will not go into detail regarding the analysis of the Reorganisation Proceedings, but will only mention the basic phases and focal points of these. The subjects of the Reorganisation or Reorganisation Plan are the Bankruptcy Debtors and Bankruptcy Creditors, as well as all other subjects of these proceedings for whom the Debtor plan functions. These include the various Creditors and those who have shares in the Bankruptcy Debtor’s company etc. The Bankruptcy Manager should also be mentioned, since he can also submit the Bankruptcy Plan, as well as those previously mentioned. The plan is to be submitted to the Bankruptcy Judge who leads the reorganisation procedure. The discussions and voting of the Reorganisation Plan take place during a hearing or hearings. From the CBP stipulations, it is not clear whether particular hearings are in question. The Bankruptcy Court sets the hearing for discussions and for voting on the plan within 20 days from the date of the plan’s receipt. The hearing must be announced. The Creditors vote for the Reorganisation Plan according to the amounts of their claims, otherwise the voting takes place according to the Creditors’ classes and groups. If approved, the plan is executed in accordance with the proposed Reorganisation Forms. The Reorganisation Plan refers to all those concerned by the Reorganisation Proceedings.

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19 Art. 127(3) CBP
20 Dika M., Insolvencijsko pravo (Insolvency law), Zagreb 1998., p. 76
21 Art. 129(1) CBP
22 Art. 131 (1) CBP
23 Art. 131 (3) CBP
24 Art. 132 (4) CBP
25 Art. 133 (1) CBP
Reorganisation Plan’s execution is obligatory, in line with CBP stipulations, and is carried out by the Bankruptcy Manager. If the Bankruptcy Manager completes all obligations in accordance with the proposed Reorganisation Plan, he will continue his work without any obstacles. In the case of social and state capital, this will be sold in accordance to privatisation rules. If the Bankruptcy Debtor does not execute the Reorganisation Plan, then every person concerned, the Creditors first of all, can submit notice on this to the Court. In this regard, the Court can order particular measures against the Bankruptcy Debtor which he is compelled to execute, i.e. the Court can make a decision on the opening of Bankruptcy proceedings if the Bankruptcy Debtor does not act in accordance with the rules set out by the Reorganisation Plan, or if he acts against the law or does not cooperate with any other parts of the procedures contained in the plan’s execution.

On the basis of the stated, concise representation of the Reorganisation Proceedings, we can answer the three elementary questions which are relevant in this domain. The Reorganisation Plan proposes three categories of Bankruptcy proceedings’ subjects: the Bankruptcy Debtor, the Bankruptcy Manager and the Creditors of the various groups. The Creditors decide on the Reorganisation Plan, whilst the Bankruptcy Debtor carries out the plan under the surveillance of the Bankruptcy Manager and with the Creditors’ approval. In practice, it depends on these people whether the Bankruptcy Debtor will continue his work or whether the targets of these proceedings will be fulfilled and this ultimately must suit all the Creditors.

3. Financial And Other Reorganisation Forms

The Reorganisation Forms, as defined by the CBP, require explanations relating first of all to the possibility of their merging. We must say that reorganisation subjects are provided with a choice of other Reorganisation Forms which are not foreseen by the CBP. This means that the Reorganisation Plan Applicants are not limited by forms foreseen by the CBP but can propose others, which we believe is unlikely, since the Legislator has included twenty-one forms which can be combined, so that in the Reorganisation Plan, one or several forms can be proposed for the realisation of the reorganisation proceedings. However, we will only analyse those forms stated in the CBP. For practical reasons, it is not recommended to individually analyse in detail every form because of them possibly being combined. It is not possible with the plan to propose only one of the Reorganisation Forms since this cannot accommodate every

26 Art. 133 (5) CBP
27 Art. 137 CBP
28 Art. 138 (1) CBP
29 Art. 138 (2) CBP
case for both the Bankruptcy Debtors and Creditors. We will list the Reorganisation Forms as given in the CBP and will give a short evaluation of each; in other words, we will analyse the possibility of the application of each of these forms, whether independent or not. On the other hand, when analysing the Reorganisation Forms, we will focus on the financial Reorganisation Forms but will have to say that these too can become combined with other financial and other forms. We will concentrate on financial reorganisation forms such as: 1) payment of debts through instalments and their postponement; 2) modification of maturity deadlines and of other conditions connected to deadlines or to the credits; 3) modification of non-warranty covered credits into covered credits; 4) modification of debts into shares which are in capital stock; 5) taking other (new) credits; 6) providing new investments; 7) issuance of new stock values or cancellation by the emitter – the Bankruptcy Debtor of the already issued stock values to one or several existing or newly formed legal persons – economic subjects. We can see that the largest portion of the Reorganisation Forms is often of a financial nature. If we take into consideration combining all Reorganisation Forms in order to make the Reorganisation Plan successful, we can conclude that the realisation of this plan is impossible without financial Reorganisation Forms.

The Reorganisation Forms foreseen by the CBP are the following:

1) Holding up the entire property of the Bankruptcy Debtor or part of the Bankruptcy mass. The first reorganisation form previewed by the CBP refers to the possibility of leaving the Debtor with either part of, or all of the property, in order to enable him to continue working. However, whilst applying this form, the Creditors must be convinced that they are able to obtain payment of their claims in the most efficient manner. With this Reorganisation Form there is the possibility of leaving part of the property to the Debtor with which he could continue his activity. Although it has not yet been defined how this will be dealt with, the remaining part of the Debtor’s property most probably will be sold so that the proceeds can be divided between the Creditors. The application of this form depends mostly on the Creditors. This means that there are, in fact, two Reorganisation Forms since, on the one hand, the entire property remains the property of the Debtor in order to continue his business and on the other only a part remains so that the Creditors can be partially paid from this remaining part.

2) Sale of Bankruptcy Debtor property (with or without a pledge right), in other words transfer of his property for the repayment of the claims. The question here is that of the significance of this form. As mentioned, the CSCBL had foreseen the sale of the Bankruptcy Debtor’s property so that the Bankruptcy proceedings would still be forwarded against the Bankruptcy mass which would come from the sale price obtained for the property. The Bankruptcy
Debtor would further continue to perform his activity, meaning that he would not be eradicated from the Economic Subjects Register. However, pursuant to CBBP stipulations, whilst defining this reorganisation form, one cannot conclude that the legislation had the intention of modelling the Bankruptcy mass against which the Bankruptcy proceedings would be led. This form could be interpreted in such a manner that the money obtained from the sale of part of the Bankruptcy Debtor’s property would be utilised for the continuation of the Bankruptcy Debtor’s business. However, with this form, the possibility of the sale of the entire property is foreseen. We believe that this form of the Reorganisation or Bankruptcy Plan must be combined with some other form defined by the CBP or with several of the forms, the application of which would be set by the preceding subjects.

3) Termination or closing of part of the Debtor’s facilities which are not profitable or changing the activity of the Debtor. With the approval of the Creditors, the closing down of production or other sectors of the Bankruptcy Debtor would be imposed, since their continued existence would only create expenses. Where an activity modification is concerned, attention must be paid to an activity that is profitable. Of course, this reorganisation form must be followed by an appropriate plan, notwithstanding whether a Bankruptcy Debtor’s part will be closed or the activity modified, to be referred to the further performance of the Bankruptcy Debtor’s activity. In other words, this plan must prove that the continuation of the Debtor’s work would lead to the repayment of the Creditors. This means that this form does not represent the closing down of the subject, but simply diminishes his productivity and dismissal of employees, so that this form should be combined with others.

4) Revision (modification) or cancelling of Contracts which are not favourable to the Debtor. Practically, this reorganisation form represents one Bankruptcy proceedings phase, after the launch of Bankruptcy proceedings. The Bankruptcy Manager decides which of the Bankruptcy Debtor’s contracts will remain in force and which will not. A Modification of Contract can take place during the Reorganisation Proceedings if it does not suit the proper execution of its obligations. This form is not independent from the application but requires defining any other contractual party’s status, in other words his compensation rights.

5) Repayment of debts by instalment and the postponement of their payment. This measure represents enforced settlement, but debt reduction is not foreseen. This measure, as with the one on enforced settlement, enables the continuation of the Bankrupt Debtor’s work with the payment of debts when debt reduction does not take place. As far as enforced settlement is concerned, the conditions and presumptions for its stipulation can be defined in the following manner: a) the subject is not able to complete his obligations or the subject is insolvent; b)
there is a proposition to begin proceedings to carry out enforced settlements; 

e) to reach an accord with the qualified Creditor’s majority on a settlement 
agreement and d) that the settlement is confirmed by the competent Court. We 
can conclude that the stated elementary characteristics of enforced settlement 
can be exposed when defining this reorganisation form, but we cannot apply 
stipulations on fractional claims’ reduction. This form can also be combined 
with the first ones in point 1 (of the 3).

6) Modifications of the maturity deadlines, of interests or other conditions relating 
to debts or credits. This Reorganisation Form is “linked” to the previous one, 
since it represents its partial modification. Conditions of payment and interest 
rates are modified with the Creditors’ approval so that the Bankruptcy Debtor 
finds it easier to pay off the claims. Probably the forms given under points 
5) and 6) should have been defined as one. This means that this measure is 
another element of enforced settlement, when we know that such elements 
relate to the reduction of the Bankruptcy Debtor’s debts and to the payment 
deadlines.

7) Writing off (exoneration) of the debts of the Bankruptcy Debtor. This form 
should also be combined with others, since primarily the Creditors’ interests 
must be considered and settled by claims repayment or in some other way. 
The fact that exoneration of the Bankruptcy Debtor’s debts is unavoidable 
means that some other form should be introduced which can relate either to 
shares issuance of the Bankruptcy Debtor to Creditors or the transfer of the 
whole or part of the Debtor’s property to them.

8) Modification or execution of the pledge right. The modifications connected 
to the pledge right of the Debtor, as well as its execution, depend on other 
subjects in this regard and on the status of the Debtor’s property.

9) Transformation of unsecured credit into secured credit. First of all, with this 
form, the Legislator has not defined whether the credits have been given or 
have been taken by the Bankruptcy Debtor. The case where the Bankruptcy 
Debtor is a credit donor would be more appropriate. If the Debtor is the ben-
ficiary of the credit, the question would be asked as to whether he is capable 
of undertaking such a reorganisation form. The Bankruptcy Debtor must prove 
that he is able to assure the credit given to a third person, which would, of 
course, depend on this person’s solvency.

10) Pledging a debt-free property if owned by the Bankruptcy Debtor. To be able to 
reimburse the Creditors faster and in a more efficient manner, the Bankruptcy 
Debtor can pledge a debt-free property. Of course, certain conditions must be 
met regarding obtaining the funds from third persons or the funds connected 
to debt-free property, as well as the amounts due to the Creditors, who do not 
have to accept this reorganisation form if they can, by application of other
forms, be paid higher amounts and more efficiently. This form would be more convenient to the Bankruptcy Debtor than to the Creditors.

11) Transformation of debts into shares or into stock capital. Here we have a new emission of shares, when the Debtor’s capital increases; when the position of a new stockholder must be defined, as well as the relation of the Debtor, against whom the Bankruptcy proceedings have been opened with these new shareholders. The capital enlargement can be considered only if it suits the Creditors since the basic purpose of new shares emission would be the appropriate settlement of the Creditors. This measure in itself does not have to represent a “new beginning” for the Debtor.

12) Taking another (new) credit. For this form, it is not clear whether the claims transformation or Debtor’s obligations are being transformed into a credit or not. Namely, whilst transforming obligations into credit, a warranty issue is posed and a guarantee is issued for the execution of the Debtor’s obligations.\(^{31}\) In this case, the pledge undertaking has not been formally foreseen as a particular reorganisation right, but we believe it is indispensable that these two forms are simultaneously applied with the purpose of first of all protecting the Creditors.

13) Obtaining new investment. This reorganisation form has similarities with the form stated under point 11) but only in respect of capital enlargement through shares emission. However, acceptance of any new investment can be carried out in another way. As can be seen, this form requires other subjects’ participation when obtaining a new investment is not considered to be a credit, which is not the same thing. If any of the existing solvent subjects intends to invest in the Bankruptcy Debtor, we think that in that case he would have to propose an investment programme – a decision to be taken by the Creditors. In a way, part of the Bankruptcy property is thus sold, although this form can also be applied with some other form.

14) Cancelling of or objecting to legally faulty claims of Creditors by the Bankruptcy Debtor. Whilst examining the Creditors’ claims in the Bankruptcy proceedings, the above stated action takes place and can result in them being objected to or their cancellation. In the Reorganisation Proceedings, this form, when combined with the others, is reasonable as the Debtor’s intention is to reduce his obligations.

15) Settling the due claims. This form requires additional explanations from the Legislator of the CBP, namely, in the Bankruptcy Proceedings, matured and non-matured claims are settled. This is a basic rule. However, in the Reorganisation Proceedings it is not very clear what this form refers to. Does it refer

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\(^{31}\) Eraković A., Stečajni zakon s komentarom i primjerima (Bankruptcy Code with comments and samples), Zagreb 1997., p. 143
only to the payment of due claims with the fulfilment of particular conditions, or does it refer to the priority payment of all claims, so that the non-matured claims would, in most of the opened reorganisation procedures be paid by application of some other reorganisation form? Of course, the Creditors will also decide on this form.

16) Cancelling of Employment Contracts of employees with the Bankruptcy Debtor. This form also represents one of the actions undertaken in the Bankruptcy proceedings, when the Bankruptcy Manager decides which employees’ contracts he will terminate; in other words, who will continue to work for the Bankruptcy Debtor during the Bankruptcy Proceedings? If the Applicant of the Reorganisation Plan evaluates that this form would confirm that the Debtor continues his work and if the Creditors agree with its application, this would then be possible with the combined application of some other reorganisation form.

17) Concession of non-indebted property as settlement of the claims. The non-indebted property of the Debtor and property not pledged or inscribed as a guaranty for any other debt can be given for the claims settlement. The Legislator has stated the term “concession” can lead to some confusion. In our opinion, the problem is not about temporary concessions or about claims warranty, but about the transfer of the Debtor’s property which is debt-free by a third person’s rights or by other Creditors.

18) Modifications and additions to the Statute and other acts of the Bankruptcy Debtor, relating to incorporation and management. If, amongst other things, in the Reorganisation Proceedings the status of the Bankruptcy Debtor is changed, this will lead to the modification of the incorporation act and of other acts of this subject. It is necessary to define every status modification and we can see that many forms, in fact, relate precisely to this. This will particularly relate to the case of the closure of non-profitable parts or facilities of the Bankruptcy Debtor or to transfer the whole or part of the Debtor’s property, the creation of new subjects to whom the Debtors’ property would be transferred and the new shares emission etc.

19) Merging of the Bankruptcy Debtor with other legal persons or other persons. In this case it has not been defined when a new legal person is formed, or the rights of the new legal person, or when the merger with the existing legal person would take place. Of course, one should be precise about the obligations’ execution of legal persons towards the Creditors and also the consequences, due to its non-execution.

20) Transfer of the whole or part of the Bankruptcy Debtor’s property to one or several existing or newly-formed legal persons or economic subjects. One of the Reorganisation Forms refers to the transfer of part of or the entire property of the Debtor to one or several existing or newly founded legal
persons, according to the CBP. We should cite this form, since it can create some misunderstandings, considering that the stated property transfer of the Bankruptcy Debtor to other subjects would lead to the termination of the Bankruptcy Debtor. The property transfer cannot be seen only as a means transfer but also as a transfer of all rights and obligations of the Bankruptcy Debtor. Other legal persons to whom the stated property (in the given sense) would be transferred would have to create conditions for settling Creditors’ claims. However, this reorganisation form also foresees that part of a property can be transferred. It should then be defined which obligations other legal persons should undertake, to whom part of a property would be transferred, and which obligations the Bankruptcy Debtor would continue to cover.\textsuperscript{32}

21) Issuance of new stock values or cancellation of stocks already issued by the emitters – Bankruptcy Debtor to one or more existing or newly formed legal persons – economic subjects. This form can create misunderstandings or can pose the question of whether the Debtor’s rights and obligations are being transferred with the goal of settling Creditors’ claims, or if some other

22) Disposition is in question. If we accept the first point, then we cannot claim that the transfer of all Debtor’s rights and obligations is in question. On the other hand, when applying this form, when another person is already an existing legal subject, then the question of his warranty is posed. However, we shall treat it as utilisation by the Bankruptcy Debtor of his property.

23) Undertaking other Reorganisation Forms. The Legislator has foreseen the possibility of undertaking other Reorganisation Forms which the person in charge of the reorganisation plan would propose. This means that several forms can be combined here, which underline the autonomy in the Reorganisation Plan. However, one should be cautious when choosing a particular reorganisation form, due to uniform participation of Creditors in the plan’s acceptance and in its payment. We can question the reorganisation forms that can be previewed by the applicant of a Reorganisation Plan which have not already been previewed by the Legislator. This can appear only as an addition to other forms, which would depend on the Bankruptcy Debtor or on the status and particularities being characteristic to him.

The stated Reorganisation Forms, as defined by the CBP and those that the subjects themselves can propose during the proceedings must represent the basis for Reorganisation Proceedings’ realisation. We believe that the Legislator has precisely defined most of the existing Reorganisation Forms. On the other hand, however, this could be carried out in a simpler manner, by defining a smaller number of forms or by combining several forms into one for easier undertaking. The Reorganisation Forms are much more clearly regulated in the Bankruptcy legislation of Croatia. This is

\textsuperscript{32} Ibidem
confirmed by the possibility that the proceedings’ subjects or the plan Applicant can propose yet another form, which has not been previewed by the Legislator. It has to be said that the Reorganisation Forms proposed by the plan depend on the nature of the claims or debts and not only on the Bankruptcy Debtor (his status, form and the activity in which he has been engaged etc.) and on the Creditors’ will, directed mainly by the possibility of claims settlement.

4. Conclusion

The Reorganisation Proceedings of the Debtors depends on forms being undertaken from the contents of the Reorganisation Plan. The subjects of these proceedings prefer that the Debtor continues his work, even although Bankruptcy proceedings have been opened against him.33 The Reorganisation Proceedings are particularly distinctive by the fact that they are performed even during the Bankruptcy proceedings. The Reorganisation Proceedings of the Bankruptcy Debtor is a new institution in our legal science or, in other words, in Serbian Bankruptcy legislation, which can replace in a more efficient manner the institution of enforced settlement.34 The Reorganisation Forms are varied. Some forms include the right to separate the settlements of Creditors. However, all Reorganisation Forms could be (even if the CBP contains twenty-one, not counting the possibility that others can be proposed) grouped together, such as: the transfer of a Debtor’s property to Creditors, sale to Creditors, postponement of claims payment, grouping of the Debtor with other newly formed and existing subjects and also property transfer to these subjects. These forms are the basis of all those mentioned. Other forms represent additions and modifications without which the above could not be realised and without which the Reorganisation Proceedings would not be efficient.

Pursuant to the CBP, the existing seven financial reorganisation forms represent indispensable forms of these proceedings, without which other Reorganisation Forms could not be eradicated. Some modifications will take place in Serbian Bankruptcy legislation, which will influence the Reorganisation Proceedings. One should expect that upon modification and additions to the CBP, the financial reorganisation forms will play a significant role in these particular proceedings.

33 Dika M., Insolvencijsko pravo (Insolvency law), Zagreb 1998., p. 75
34 Ibidem
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FINANCIALISATION AS AN OBSTACLE TO ECONOMIC GROWTH AND A PATH TO DEBT PEONAGE

1. Introduction

The economic and financial crisis of 2007–2009 has reverberated through world financial markets and caused massive debt write-offs in the financial sectors of many countries. It has struck a serious blow to world production and trade, which is threatening to grind the world economy to a halt. At the same time, asset values have dropped in an unprecedented wave of panic sales. The potential meltdown is a serious threat to world security and prosperity, while there are very few detailed analyses in the mainstream media coverage and academic circles on the roots and underlying causes of this crisis which cannot be described as anything else but structural crisis. Lack of confidence and optimism of investors, consumers and producers has not undermined the very structure of financialised capitalism but it sank into abyss due to its own contradictions.

2. Institutional Privileges

The major flaw which has manifested itself in the present economic crisis relates to the belief that bank credit represents a key factor of production, *conditio sine qua non* of the modern economy. But this merely creates an intellectual platform for establishing monopoly right to issue interest-bearing bank credit in order to secure transfer from society to a privileged elite. This ‘factor of production’ that has no actual labour-cost of production, fits in with the definition of institutional privilege. Monopoly power, business fraud, political insider dealing and special privileges for vested interests cannot be a part of an optimal medium for allocating resources referred to as a free market. *Economic writers from the 16th through the 20th centuries recognised that free markets required government oversight to prevent monopoly*

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pricing and other charges levied by special privilege. The labour theory of intrinsic cost-value found its counterpart in the theory of economic rent: land rent, monopoly price gouging, interest and other returns to special privilege that increased market prices purely by institutional property claims.\(^\text{3}\)

According to vested interest groups, which are clearly the beneficiaries of the underlying institutional framework, ‘free market’ means a market free of government regulation, ‘free’ of anti-trust protection, and even of protection against fraud, as opposed to deontological liberalism that highlights the social regulation of economic affairs. One of the most remarkable institutional privileges in the history of modern industrialised economies is the complete privatisation of the money creation process. Classical economists distinguished between earned income (wages and profits) and unearned income (land rent, monopoly rent and interest) whereby interests can be labelled an unearned increment.\(^\text{4}\) The monopoly over the control of the money supply is the great over-riding monopoly of the world as it is works at the present time. (Nuri, 2002) For instance, by paying attention to the US monetary system and its history, one cannot avoid the conclusion that the Federal Reserve system is a privately owned central bank and that its ‘property rights’ consist of directing the pace of the U.S. economy by inflation and deflation of national currency. While the Federal Reserve Board is a government body, the process of money creation is controlled by the 12 Federal Reserve Banks, which are privately owned.\(^\text{5}\)

3. Money Creation Embedded In A Ponzi Scheme

‘Fractional reserve’ lending, which allows banks to create ‘credit’ or ‘debt’) with accounting entries represents an unstable house of cards. As the sequence of development of the banking system shows (Table 1), the banks in the fourth stage can create credit completely freed from reserves constraint. Money expansion can be divided into publicly-owned money expansion and privately-owned money expansion. In the latter form of expansion, private banks transform receipt money into fractional money, and the practice is regarded as legal by the government (Griffin, 2006). Publicly-owned money expansion means that the government, with the knowledge of its citizens, debases the currency as a matter of policy for a revenue stream rather than taxation. This expansion ensues either via centralised banking or non-centralised banking, where different banks issue their own ‘banknotes’ in contrast to universal and standardised currency.


\(^{4}\) http://www.laits.utexas.edu/poltheory/sidgwick/ppc/ppc.b03.c06.s05.html

\(^{5}\) http://www.globalresearch.ca/index.php?context=va&aid=12517
Table 1. The sequence of development of the banking system

<table>
<thead>
<tr>
<th>The stages of banking development</th>
<th>Banks and space</th>
<th>Credit and space</th>
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<tr>
<td><strong>Stage 1: Pure financial intermediation</strong></td>
<td>Banks lend out savings</td>
<td>Serving local communities, wealth based, providing foundation for future financial centres</td>
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<td></td>
<td>Payment in commodity money</td>
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<td></td>
<td>No bank multiplier</td>
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<td></td>
<td>Saving precedes investment</td>
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<tr>
<td><strong>Stage 2: Bank deposits used as money</strong></td>
<td>Convenient to use paper money as means of payment</td>
<td>Market dependent on extent of confidence held in banker</td>
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<td></td>
<td>Reduced drain on bank reserves</td>
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<td>Multiplier process possible</td>
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<td>Bank credit creation with fractional reserves</td>
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<td></td>
<td>Investments can now precede savings</td>
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<td><strong>Stage 3: Inter-bank lending</strong></td>
<td>Credit creation still constrained by reserves</td>
<td>Banking system develops at national level</td>
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<td>Risk of reserves lost offset by development of inter-bank lending</td>
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<td>Multiplier process works more quickly</td>
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<td>Multiplier larger because banks can hold lower reserves</td>
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<td><strong>Stage 4: Lender of last resort facility</strong></td>
<td>Central bank perceives need to promote confidence in the banking system</td>
<td>Central bank oversees national system, but limited power to constraint credit</td>
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<td>Lender-of-last-resort facility provided if inter-bank lending inadequate</td>
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<td>Reserves now respond to demand</td>
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<td>Credit creation freed from reserves constraint</td>
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<tr>
<td><strong>Stage 5: Liability management</strong></td>
<td>Competition from non-bank financial intermediaries drives struggle for market share</td>
<td>Banks compete at national level with non-bank financial institutions</td>
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<td>Banks actively supply credit and seek deposits</td>
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<td>Credit expansion diverges from real economic activity</td>
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<tr>
<td><strong>Stage 6: Securitisation</strong></td>
<td>Capital adequacy ratios introduced to curtail credit</td>
<td>Deregulation opens up international competition, eventually causing concentration in financial centres</td>
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<td>Banks have an increasing proportion of bad loans because of over-lending in stage 5</td>
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<td>Securitisation of bank assets</td>
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<td>Increase in off-balance-sheet activity</td>
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<td>Drive to liquidity</td>
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If government lacks funds in order to finance its consumption, taxation is a viable option. But if taxation does not provide government with the necessary funds, the government can issue bonds. In the case of straight borrowing, a government borrows money via issuing bonds at a discount on face value, promising to repay the purchaser the face value at some specified date in the future. Expansion borrowing represents a contrast in that it provides a government with funds and, at the same time, creates additional money to the existing supply. The issuer of the currency in case of expansion borrowing receives seignorage. If a bank buying bonds has assets on deposit equivalent to the borrowed funds, it is «straightforward borrowing». Another case involves only a fraction of the loan backed by assets. The fraction of deposits-to-loans a bank is required to hold is called the reserve requirement. (Nuri, 2002)

In a fiat world, money is printed by the central bank. Bewaring in mind the fact that there is nothing backing up these huge quantities of money, one must conclude that it is inherently worthless. In addition to the money supply created by the central bank, fractional reserve lending allows credit to be extended by banks and financial institutions on top of the previously mentioned money supply. Indeed, banks and financial institutions have leveraged credit to base money at ratios of 30–1, 50–1 or even higher. So, the present form of money system can be labelled as a credit money system with a fiat money sub-system that has some independence, but certainly does not rule the monetary roost. This can be reflected in a simple formula:

\[ F_{m} = F_{b} + MV(Fc) \]

\[ F_{m} = \text{Fiat Money Total} \]
\[ F_{b} = \text{Fiat Monetary Base} \]
\[ Fc = \text{Fiat Credit, the amount of credit on the balances sheets of institutions in excess} \]
\[ \text{of } F_{b} \]
\[ MV(Fc) \text{ is the market value } F_{c} \]

At the moment Fc (credit) dwarfs Fb (base money) which can be seen in the data published by the New York Federal Reserve Board. In April 2008, \text{M1 was approximately $1.4 trillion, more than half of which consisted of currency. While as much as two-thirds of U.S. currency in circulation may be held outside the United States, all currency held by the public is included in the money supply because it can be spent on goods and services in the U.S. economy. Global M1 was around 3.9}\]

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6 It is noteworthy to mention that central banks do still hold substantial reserves of gold and foreign currency as a buffer against financial turbulence. The size of this gold reserve (just 845 bn $ in central banks’ vaults) reminds us of how much fiat money depends on a confidence trick. (http://www.guardian.co.uk/business/dan-roberts-on-business-blog/interactive/2009/jan/29/financial-pyramid)


8 MV is a function of time preference and credit sentiment (i.e belief that one can be paid back). As long as that belief was high, banks were willing to lend.
$ bn in October 2008. M2 was approximately $7.7 trillion and largely consisted of savings deposits.\(^9\)

The conventional money multiplier model is an outrageous flaw and can be challenged on two issues. The money multiplier model claims that credit money comes into existence after the creation of government money. The second claim, which is directly derived from the first one, refers to the notion that the amount of money in the economy should exceed the amount of debt, with the difference representing the government’s initial creation of money. Both of these claims are opposed by empirical evidence (Kydland and Prescott, 1990). The sequence was completely reversed and credit money came first and fiat money only a year later. *In the real world, banks extend credit, creating deposits in the process, and look for reserves later.*\(^10\) The ratio of private debt to money shows that second claim is not consistent with reality.\(^11\)

Another problem with this doctrine and the system of money creation attached to it is that banks create the principal, but not the interest necessary to pay back their loans and that is where the Ponzi scheme emerges into our consideration. For instance, a dollar loaned at 5 per cent interest becomes 2 dollars in 14 years. That means the money supply has to double every 14 years just to cover the interest owed on the money existing at the beginning of this 14-year cycle. The Federal Reserve’s own figures confirm that M3 has doubled or more every 14 years since 1959, when the Fed began reporting it.\(^12\) Since loans from the Federal Reserve or commercial banks are the *only* source of new money in the economy, additional borrowers must continually be found to take out new loans to expand the money supply, in order to pay the interest collected by the bankers. *However, the interest and the debt cannot possibly be paid back, except by an ever-expanding Ponzi scheme of lending. That scheme can last only as long as everyone believes the debt can be paid back and the market value of that debt keeps rising.*\(^13\) Not only does the scale of credit-created money greatly exceed government-created money, but debt in turn greatly exceeds even the broadest measure of the money stock—the M3 series that the Fed some years ago decided to discontinue.

Delving further into our discussion on the Ponzi scheme, we must mention interesting claims by an Argentinean economic analyst, Adrian Salbuchi, that the giant Ponzi scheme consists of four pillars:

1. Programmed monetary insufficiency – generated by ‘independent’ central bank

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2. Private banking based on fractional reserves – this allows banks to create money out of thin air and charge interest for it
3. Debt – the public and private sector are heavily indebted because both finance their activities by borrowing funds, instead of enticing an increase in savings and the investment pertaining to it
4. Privatise Profits /Socialise Losses – using taxpayers’ money in order to cover the losses as a consequence of the prevailing ‘too big to fail’ doctrine

To conclude this section on money creation process, one must refer to the inexorable flaw embedded in our own economy and that is rising debt in excess of the ability to pay. No economy in the history of mankind has been capable of doubling growth on a steady basis. The logic of compound interest causes debts to grow exponentially ‘whereas real’ economies taper off in S-curves. Rising debt makes doing business more expensive, along with a rise in the cost of living. This debt inhibits the modern industrial capitalism to deliver the promise of economic growth to mankind. At the moment, the world is plunging “back to the future,” to an epoch of neo-feudalism and debt peonage.

Figure 1. Total Credit Market Debt


4. Financialisation And Structural Imbalances

Post-industrial faith that whatever increases ‘wealth’ is productive – from producing a car to puffing up real estate and other asset prices – has led to various asset bubbles. At the same time, creating ‘wealth’ by inflating asset prices has had far reaching consequences by omitting to spur tangible capital formation in order to raise wages and living standards. As a result, the value of financial wealth has grown considerably, so the relations between productive capital and financial capital were profoundly modified. Manufacturing was no longer the primary source of wealth accumulation and the financial sector’s role transformed from providing capital for manufacturing to buying and selling assets using borrowed funds for profits. All this vast financial sector expansion, over-accumulated financial capital, in other words ‘the new centrality of the financial sector’ greatly advanced speculation. This process, widely referred to as financialisation, is defined as ‘the increasing role of financial motives, financial markets, financial actors and financial institutions in the operations of domestic and international economies’. Financialised economies have few characteristics:

1. Cost of living and cost of doing business is increased
2. Mortgage buyers are exempt from taxation as much as possible in order to leave enough surplus to be extracted by payments on interest
3. Shift of taxes onto labour and industry which undermines the competitive power of financialised economies
4. Collection of revenues used to finance the public sector by capitalising it into interest charges and to inflate the price of housing and other real estate and privatised monopolies.

From 1973 to 2008 the portion of manufacturing in the GDP of the USA fell from 25% to 12%. The share represented by financial services rose from 12% to 21%. Today, US households spend more of their disposable income to pay off debts (14%) than to buy food (13%). Financial sector indebtedness was 21% of GDP in 1980, 83% in 2000, and 116% by 2007. Bubble economies, based on debt-financed real-estate and stock market inflation, always burst at some point and this has led to ‘boom and bust’ cycles.

19 Ibid.
20 Ibid.
21 Ibid.
Traditional ways of making money by new capital investment has been completely inverted. The quickest path to riches in today’s global financial system is to foreclose and make a profit by selling off property onto world financial markets that are being inflated by central banks. This is clearly a zero-sum game with losers that forfeit their assets and winners that take them over. In the course of this process, resources are funnelled away from real economy which employs labour and invests in machinery and capital equipment to transform raw materials and other inputs into commodities for sale. *Financialised wealth is therefore extractive, not productive. That is because loans, stocks and bond securities are claims on wealth, not real wealth itself.*

Modern industrialised economies are capable of producing wide ranges of commodities and services to meet the needs of everyone in society. But, whole economies and societies are in a web of debt that prevents them from buying and consuming produced goods, while at the same time they are driven to produce more and more. This is because modern industrial production is merged with the monopoly of money-creation held by the banking system. There is always a gap in monetary terms between the value of what is being produced and the purchasing power needed to consume it. Famous economist C.H. Douglas stated in a 1932 pamphlet *The Old and the New Economics*:

*Categorically, there are at least the following five causes of a deficiency of purchasing power as compared with collective prices of goods for sale: 1) Money profits collected from the public (interest is profit on an intangible); 2) Savings; i.e., mere abstention from buying; 3) Investment of savings in new works, which create a new cost without fresh purchasing power; 4) Difference of circuit velocity between cost liquidation and price creation which results in charges being carried over into prices from a previous cost accountancy cycle. Practically all plant charges are of this nature, and all payments for material brought in from a previous wage cycle are of the same nature; 5) Deflation; i.e., sale of securities by banks and recall of loans.*

5. Decline Of Profit

The current economic system rests upon the search for profit and accumulation of capital. In the world economy, the rate of profit remained more or less steady all through the late 1940s, the 1950s and the 1960s. It was frequently referred to as ‘the golden age of capitalism’. But from the late 1960s until 1982, profit rates began to fall and global economy witnessed a real decline in the rate of global GDP increase. Growth slowed, profits dropped, and serious levels of unemployment started to plague developed economies. One thing, which was essential in the partial recovery of the rate of profit in the

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1980s and 1990s, was the increase of the share of total profits in total national incomes at the expense of wages, and this was mainly due to profits incurred in the financial sector. Other ways of making profits were to impose wage constraints, tying wages to productivity in an asymmetrical way and labour-capital pacts that increased profits.

With the growth of world markets, workers were seen merely as ‘costs of production’ not as final consumers. Wages stagnated; social benefits were limited, curtailed or shifted onto workers. Diminished wages paid to the workers led to a vast expansion in credit. As competition intensified, as new industrial powers emerged in Asia, US capital increasingly invested in financial activity. Industrial profits were re-invested (paperised) in financial services. Profits and liquidity grew in proportion to the relative decline in real value generated by the shift from industrial to financial/commercial capital. Over-exploitation of labour in Asia, and the over-accumulation of financial liquidity in the US led to the magnification of the paper economy and what liberal economist later called “global disequilibrium” between savers/industrial investors/exporters (in Asia) and consumers/financiers/importers (in the US). Huge trade surpluses in the East were papered over by the purchase of US T-notes.

The whole dimension of this problem is additionally intensified by the dollar’s role as the leading reserve currency, which offers the U.S economy an opportunity to have a ‘free lunch’ at the expense of global economy. The capacity of the highly polarised economies was too limited in order to absorb capital in productive activity at existing high rates of profit. Therefore, profit was spotted in investing in real estate, commodities, hedge funds, securities, debt-financing and merger and acquisitions.

26 Ibid.
27 Numerous financial crises which originated after the 1973 «oil price shock» can be attributed to this turning point in the second half of the 20th century. Rules of the dollar dominated petroleum imports. OPEC countries used these proceeds to buy necessary goods and services. At the same time, other oil-importing countries had to pay dollars for oil but could not print currency. The only way to do this was to produce goods and services. 1973 represents a very significant year, bearing in mind the huge amount of petrodollars that has been accumulated in oil producing and exporting states since then. Generated surplus increasingly found its way to investments in financial markets because of higher profit margins. Markets were set after U.S Secretary of State Henry Kissinger organised a US-Saudi Arabian Joint Commission on Economic Co-operation which sanctioned the dollar as the sole means of payment for purchasing oil. After other OPEC member countries accepted the deal, the U.S government could virtually print dollars in order to pay for oil and the American economy did not have to produce the goods and services needed to pay for increasing oil imports. OPEC countries used these proceeds to buy necessary goods and services. At the same time, other oil-importing countries had to pay dollars for oil but could not print currency. The only way to do this was to produce goods and services. 1973 represents a very significant year, bearing in mind the huge amount of petrodollars that has been accumulated in oil producing and exporting states since then. Generated surplus increasingly found its way to investments in financial markets because of higher profit margins.

28 The above mentioned dichotomy can be seen in the Dow-Gold ratio as the most important ratio between the relative prices of financial assets and real assets. The Dow component represents the
6. Conclusion

Some of the traits of the current financial and economic crisis are as follows: there are too many goods chasing too few buyers; too much money chasing too few profitable investment outlays; too many workers chasing too few jobs and too many banks chasing too few impoverished savers and depositors. The current financial and economic crisis is the outcome of deeply-rooted contradictions within the structure of the global economic system, so it cannot be labelled as a failure of the system but as an inherent part of its mode of functioning. Huge imbalances in the international monetary system can be recognised as unsustainable trade deficits and surpluses, skyrocketing official dollar reserves in some European and many Asian central banks, and the proliferation of Sovereign Wealth Funds which end up in a myriad of bubbles, overleveraging, and other maladjustments already discussed above.

This crisis is definitely a part of a larger historical process. Officially sanctioned and power-based institutional privileges enable the extraction of wealth, purely by claims on that wealth. The entire paper economy needs to be dismantled in order to free the productive forces from the constraints of unproductive capitalists and their entourage.

valuation of financial assets; the gold component – of real assets. When leverage in the financial system increases significantly, so does this ratio. A very high ratio is interpreted as an imbalance between financial and real assets – financial assets are grossly overvalued, while real assets are grossly undervalued. It also implies that a correction eventually will be necessary – either through deflation, which implies deleveraging and a collapsing stock market, or through inflation, which implies a stagnant stock market for many years and steadily rising prices of real assets, commodities, and gold, usually associated with a stagnant economy and typically resulting in stagflation.

30 The financial sector has been able to translate its influence into political power. One must bear in mind that the current global reserve system enables one particular country, more precisely the interest groups within, to extract economic surplus from other countries. U.S. deficits absorb 70% of global savings. (http://www.globalresearch.ca/index.php?context=va&aid=12471) It pours dollars into the rest of the world for yet further financial speculation and corporate takeovers. Other nations’ central banks recycle these dollar inflows to buy U.S. Treasury bonds to finance the federal U.S. budget deficit. Finally, the military character of the U.S. payments deficit and the domestic federal budget deficit should not be neglected. When the U.S. payments deficit pumps dollars into foreign economies, these banks are being given little option except to buy U.S. Treasury bills and bonds which the Treasury spends on financing an enormous, hostile military build-up to encircle the major dollar-recyclers China, Japan and Arab OPEC oil producers. Yet these governments are forced to recycle dollar inflows in a way that funds U.S. military policies in which they have no say in formulating, and which threaten them more and more beligerently.

31 This can be seen in the case of the U.S. budget which is subjected to radical austerity measures, except in a few areas such as: 1. Defence and the Middle East War; 2. the Wall Street bank bailout, 3. Interest payments on a staggering public debt (http://www.globalresearch.ca/index.php?context=va&aid=12517)
The present configuration of economic, political and social structures finds its expression in astronomical levels of state pillage of the public treasury in order to bail-out insolvent banks and factories, involving unprecedented transfers of income from salaried taxpayers to non-productive ‘rent earners’ and to failed industrial capitalists and shareholders. Advanced countries at the core of the global economy cannot sustain their economies without resorting to a huge build-up of debt and speculative financial asset investment. There are limits to how far economies can be sustained by debt that is not based on any real economic values created. If the current global disequilibrium were not to be solved through the elimination of debts in excess of the ability to pay, the world would end up in a debt peonage. The historical lesson is that economies taken over by creditors are plunged into depression, as predatory lending strips away the surplus, leaving nothing remaining for subsistence, let alone capital renewal. The best example can be found in the collapse of the Roman Empire.

The only possible way to avoid it is to reverse the monetary policy worldwide in order to ensure scarcity integrity. If scarcity-units (money) are allocated to different productions of goods and services in the real economy, scarcity-units are debased (Nuri, 2002). A fair and sound money system is at the core of preventing serious financial and economic crises. A fair money system refers to the fractionally-based system which is publicly-owned, where there is legislative control over it. Ownership of the fully-backed money system is completely irrelevant. It can be concluded that the privately-owned fractional reserve money system is not a fair one because it implies and facilitates private confiscation of public property and leads to debt peonage.

This is something which certainly does not contribute to the solution of the most contentious issues facing the global economy and risks global economic demise. The economic dystopia can be avoided by appropriate government tax policies that diminish the role and influence of rent-seekers, as well as by reforming the monetary system by restoring national sovereignty over money-creation, thereby reducing fiscal expenditures needed to repay outstanding and constantly growing public debt.

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A CROSS-COUNTRY ASSESSMENT OF THE DETERMINANTS OF XBRL ADOPTION

1. Introduction

Emphasis has been placed on the changing environment, which comes from the use of electronic means of reporting by corporations. Without doubt, the most established electronic communications tool is the internet. It provides rapid communication at low cost, and therefore, an increasing number of companies around the globe are using it for corporate reporting (Gowthorpe, 2004). According to Trites (1999), Internet Financial Reporting (IFR) is defined as the distribution of business and financial corporate information through internet technologies and particularly the World Wide Web. Many scholars highlighted the importance of IFR to a company’s prosperity.

But the web also has its limitations. Debreceny and Gray (2000), identified the resource discovery problem, the attribute recognition problem and the consistency in reporting problem as significant limitations of IFR. The answer to these problems came in April of 2000 by the XBRL Steering Committee, which introduced the first XBRL specification. XBRL is an open-source reporting system that accommodates electronically prepared financial statements and reports globally (Richards et al., 2002). Its revolutionary quality has been stressed in literature, as an innovation, promising to change the way financial information is produced and consumed (Doolin and Troshani, 2007).

According to Locke and Lowe (2006) the success of projects, such as XBRL, is being measured by the achievement of widespread adoption. Therefore, in order to decide whether XBRL is a successful technological innovation, we have to examine the degree of its adoption. Since XBRL is a new technology, at an early stage, there are limited studies surrounding its adoption by corporations worldwide. There are

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1 Is the corresponding author
even less studies about the determinants (facilitators and inhibitors) of XBRL adoption decisions. For that reason, this study aims to shed light on the drivers that motivate a company to adopt a financial reporting tool, such as XBRL. For that reason, we use the Technology-Organisation-Environment (TOE) framework to determine the characteristics that influence a company’s decision to adopt XBRL. The determinants identified are firm size, level of technology competence, firm scope, level of internet penetration, national disclosure environment, and trading partner influence.

The remainder of the study is organised as follows: The following section presents a theoretical background on XBRL adoption and its implementation. Then, the research design follows in section three, where the TOE framework is analysed and discussed. Moreover, the conceptual framework for the present study and the determinants of XBRL adoption are also presented and the logit regression model is developed. Section four contains a statistical analysis examining which factors drive a company’s decision to adopt XBRL. The last section concludes the study and limitations and further research is presented and discussed.

2. Theoretical Background

XBRL stands for eXtensible Business Reporting Language and was developed in 2000 by the XBRL Steering Committee. Its purpose is to present financial and other business information in a format that can be easily and quickly used, reused and exchanged by any interested party (Ramin, 2002). The business reporting literature refers to XBRL as a groundbreaking technology and many researchers highlight its revolutionary quality. Jones & Willis (2003) refer to it as the internet revolution. According to Covaleski (2000), the American Institute of CPAs saw XBRL as the most revolutionary change in financial reporting since the first general ledger. Moreover, XBRL has been described as a more significant change than the change from paper and pencil analysis to electronic spreadsheets (PWC, 2003). Richards & Tower (2004, p.81) characterised it as a technology, promising “to revolutionise international accounting” and having the potential to “cause a fundamental paradigm shift” in accounting information systems.

In 1995, when the World Wide Web was developed, serious business interest surrounded it (Lymer, 1999). Since then, there has been increasing attention concerning the web and specifically, concerning corporate financial reporting via the internet. Ausbaugh et al (1999) consider that a firm is practising IFR either when its website contains a complete set of financial statements, or it provides a link to its annual report somewhere else in the web.

Numerous scholars have studied the determinants of voluntary print-based financial reporting during the last thirty years. Firm size, size of a firm’s auditors,
profitability, and industry were found to be the most significant facilitators of corporate financial reporting. Davies and Kelly (1979) found firm size to be the only variable to explain voluntary financial reporting among a sample of fifty Australian companies. Wallace and Naser (1995) explained the importance of corporate size as a financial reporting determinant and argued that big companies normally draw the attention of a significant number of stakeholders, who in turn, demand information. The association between corporate profitability and disclosure was stressed by Malone et al (1993) and Wallace et al (1993). Moreover, Hossain et al (1994) proved a significant positive association between industry and the size of a firm’s auditor to voluntary corporate disclosure.

In the same sense, internet financial reporting literature is growing in parallel with the growth of the internet. A number of studies surrounding internet financial reporting examine the characteristics that motivate companies to voluntarily report their financial information over the internet. Craven and Marston (1999) examined whether internet financial reporting practices of the largest UK companies are explained by the firm’s size and the industry type. It was found that IFR is positively related to corporate size. On the contrary, the industry type, where the company is operating, was not associated to IFR. Ausbaugh et al (1999) examined the association of firm size, profitability, and equity structure to the IFR practices of US companies. They found that larger companies were mostly operating websites and therefore argued that only firm size is a determinant of IFR practices.

Oyelere et al (2003) examined the determinants of IFR adoption in New Zealand. They revealed that firm size, liquidity, industrial sector, and spread of shareholding are determinants of conducting voluntary internet financial reporting. Conversely, leverage, profitability and internationalisation do not affect the IFR employment decision.

Contrary to previous studies, Laswad et al (2005) conducted research on New Zealand’s public sector. They studied the characteristics of 86 local government authorities that had taken the decision to employ IFR. Six determinants were associated to IFR practices: political competition, size, leverage, municipal wealth, press visibility, and type of local authority. The results of the logit analysis indicated that local authority size and the level of political competition were not predictors of IFR practice. On the other hand, leverage, municipal wealth, press visibility, and type of local authority were associated with IFR.

Although internet financial reporting is widely accepted and used, serious limitations do exist. According to Debreceny and Gray (2000), there are three factors that diminish the effective use of the web concerning financial information by stakeholders. These factors are: (a) the resource discovery problem, (b) the attribute recognition problem, and (c) the standards problem, which all deal with the issue of data mining over the internet. Parallel with the growth of the web is the growth of the difficulty in
locating and utilising the desired information (Ciolek, 1996). The resource discovery problem is described by Debreceny and Gray (2000), as the difficulty in locating a company’s official website. Most of the time the company’s official site is not known and search engines, usually generate too many results. The attribute recognition problem arises from the fact that there are no well-structured or robust schemes over the internet to classify data. When searching for a company’s annual report from its official website, problems occur due to the difference in the hyperlink’s labels where the annual report is included. These hyperlinks’ titles vary between “investor relations”, “company information”, “financial data” etc. Furthermore, when searching for a company’s annual report in a search engine, the first 30 results rarely include the “official” annual report and in many instances, the report is not the most recent. The third problem described by Debreceny and Gray (2000) is the standards problem, where companies are not consistent in using existing schemes for their financial reporting on their websites. Web developers can use any term they find appropriate, creating confusion and inefficiency in web data retrieving. This inefficiency is going to increase as the web grows, unless a standardised scheme for the presentation of financial information over the internet is adopted. Such a scheme exists and promises to revolutionise the internet financial reporting. This scheme is called XBRL and is presented in the following section.

2.1. XBRL

In April 2000, the first XBRL specification was introduced by the XBRL steering committee2. It is a non-profit organisation, which by May 2007, counted over 450 members, such as government, accounting, technology, and stock exchange organisations (Premuroso and Bhattacharya, 2007). XBRL is an extension of the eXtensible Markup Language (XML), which in turn is an evolution of the Hyper Text Markup Language (HTML). According to Richards et al (2002), XBRL is an open-source reporting system that accommodates electronically-prepared financial statements and reports globally.

Due to its XML-based nature, XBRL provides a valuable tool for the preparation, exchange, use and reuse of financial information of both public and private entities worldwide (Ramin, 2002). Its revolutionary element is that it instantly displays firm data that can be obtained and analysed across all software and technologies, due to its compatibility with other software, without having to retype anything. Furthermore, XBRL data include non-financial information, which is valuable in today’s business world and which previous incompatible formats could not aggregate (Pinsker, 2004).

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2The initial name of the committee was eXtensible Financial Reporting Markup Language (XFRML) Steering Committee, being established in August 1999 by 12 founding members.
Richards et al (2006) stressed the importance of two key elements in order to understand the function of XBRL. The first one is the **taxonomy** and the second is the **instance document**. The taxonomy acts like a dictionary and almost every element of the financial information is classified according to a specific taxonomy. There are certain ways for a company to develop its own XBRL taxonomy. Richards et al (2006) propose: (a) to collect annual reports of various corporations and use the same items to create its elements, (b) to use the Big 4 sample financial statements, and (c) to create its elements as required disclosures of the relevant accounting standards. After the taxonomy has been designed, it has to be reviewed. Macdonald (2004), suggests three possible ways: (a) a global review to examine whether any sections of the primary financial statements have not been omitted, (b) a review at the GAAP by conducting a two-way-check between the accounting standards and the XBRL taxonomy, and (c) an XBRL review checking the compliance of the designed taxonomy to the XBRL specification.

After the taxonomy has been designed and reviewed, it can be mapped to an **instance document**. A set of instance documents is needed in order for the financial information to be presented in a variety of formats. According to Elliot and Elliot (2004) the instance document has to be used in conjunction with a style sheet or it could be linked to automated software that can produce style sheets. Finally, the ultimate purpose of XBRL is to create business reports that can be easily analysed and compared, for regulatory and other purposes.

However, although it is stated that XBRL increases transparency (Pinsker and Li, 2008), it cannot force managers to disclose honestly and prevent any fraudulent behaviour. That is, XBRL is not an enforcement agency and therefore valuable information could be deliberately omitted or falsified (Ramin, 2002). Furthermore, according to Elliot and Elliot (2004), XBRL is not an accounting standard in itself. The user should be familiar with the accounting standards applicable, in order to analyse any financial statement.

In recent years, the benefits from using XBRL have been discussed and presented. Ramin (2002) highlights the various benefits of XBRL affecting the whole corporate information supply chain. Companies can achieve a reduction in their cost of reporting and analysing their financial data, and succeed in taking quick and efficient decisions. To regulators, analysts and investors, XBRL provides the convenience of receiving easily analysed information without re-keying any data. For financial publishers, XBRL lowers the cost of customising the data and minimises possible errors. Independent software vendors will benefit from XBRL as it provides financial data that is compatible with other financial and analytical applications.

Moreover, since January 2005, the European stock exchanges require all listed companies to prepare their financial statements in accordance with International Financial Reporting Standards (IFRS). Furthermore, Japanese companies are taking up IFRS and several South American companies have adopted IFRS, in order to
explore the benefits of the European capital markets (Catacora and Hannon, 2005). According to Duangploy and Gray (2005), XBRL is a very helpful tool in order to overcome the implications and problems that arise from such numerous reconciliations. Moreover, companies can achieve a reduction in their cost of capital by disclosing in real-time, in a transparent and improved fashion, using the XBRL format (Pinsker and Li, 2008). Therefore, XBRL adopters gain a competitive advantage in today’s business world and should be rewarded by capital markets (Premuroso and Bhattacharya, 2007).

XBRL is not a computer software or programme in the strict sense, but it is an open standard, liberated of licence fees (www.XBRL.org/home). Locke and Lowe (2006) in their study compare XBRL to a successful open-source model and highlight their similarities and differences. According to Bonaccosi and Rossi (2003), there are three key points surrounding the open source development, the motivation for participation, governance of the procedure and the diffusion towards users and adopters. By using this model, the software’s ability to reach the ‘critical mass’ of adopters, is examined.

As XBRL is an open-source development, aiming to be widely disseminated and adopted, it follows the model presented above. Analytically, the motivation is emanated by XBRL International, which is a not-for-profit organisation and is supported by local consortia to achieve its goals. The initial idea for XBRL came from Charles Hoffman, in 1998, supported by the AICPA (American Institute of Certified Public Accountants).

2.2. XBRL adoption and implementation

The adoption of XBRL has quickly grown in Europe (Hannon 2004; and Locke and Lowe 2006). This fact can be explained by two reasons. First, European regulators, agencies and companies are genuinely interested in accepting and implementing technological innovations. Second, all the above expect their governments to set strict regulations for financial reporting over the internet. Additionally, in the US, people are slow in accepting new technologies, and entities prefer to report their financial data in every possible way. Unfortunately, inconsistency in financial reporting leads to unreliability (Hannon, 2004).

As mentioned, the XBRL adoption rate in Europe is accelerating, mostly because of the convergence of international financial reporting standards (IFRS). The EU strongly supports the IFRS-XBRL connection. Consequently, there are many adoption projects already under way in Europe. Analytically, following Hannon (2004):

• Since 2005, the financial services authority of the United Kingdom reports electronically in XBRL format. The aim was to reduce paper-based procedures and ultimately reduce reporting costs to companies.
Since 2007, a large XBRL adoption project has been put in progress by the government of Belgium. It is expected that around 230,000 entities will be using XBRL for their financial reporting to the Central Bank of Belgium. A similar project is also under way by the Central Bank of Spain.

In The Netherlands, the Dutch Water Boards are finalising their XBRL adoption project that will transform paper-based reporting to digital reporting. Moreover, 800 more government institutions are interested in using XBRL for government reporting. Since 2004, the Dutch Ministry of Finance has developed an XBRL taxonomy project, which was called NTP (Nederlandse Taxonomie Project) aiming to reduce business reporting expenses to government.

Similar adoption projects have been implemented by the German Bundesbank, EUROSTAT, and the Danish Commerce and Companies’ agency.

2.3. Organisational adoption of XBRL

Doolin and Troshani (2008) examined the organisational adoption of XBRL in eleven Australian entities. Their study focused on the factors affecting the adoption decision in order to explain the limited adoption rates in Australia, relative to other countries. The issues that were examined through interviews concerned the facilitators and motives for XBRL support and adoption, costs and benefits, the relationship between stakeholders and XBRL, and the role of XBRL consortia. Interviews were held with representatives of three accounting firms, three software vendors, a regulatory authority, a large company and a university, all members of the local XBRL consortium.

The facilitators and inhibitors of XBRL adoption were classified, based on the TOE framework. All the facilitators and inhibitors of XBRL adoption are depicted in Figure 2.1 below. There are two organisational aspects that were found to be influencing XBRL adoption: innovation champions and organisational readiness. According to Doolin and Troshani (2008) there were pioneer companies in Australia that first adopted XBRL and these are characterised as innovation ‘champions’. Furthermore, the organisational readiness is mainly based on whether companies have sufficient financial resources and skilful employees to adopt an innovation.
Concerning the Technological characteristics, there were several facilitators and inhibitors identified. These were the relative advantages, the complexity, trial-ability, observability and stability. The relative advantage is easily perceived with a cost/benefit analysis. Complexity is described as a significant inhibitor of XBRL adoption as it requires specialised knowledge, taxonomies, and financial data tagging. Trial-ability and observability are consistent with Rogers (2003) and are risk-related, as the trials related to an innovation are important for reducing any possible uncertainties, while the ability to observe the potential benefits is also crucial. Finally, stability is presented as a barrier to adopting XBRL as companies are not keen on such changes.

The most influential environmental characteristics are market conditions, trading partner influence, available information, critical mass, and available support. Market conditions were proved to be a significant adoption inhibitor in Australia due to the small number of listed companies. On the other hand, trading partner influence was found to be a very important facilitator of XBRL adoption. Available information in Australia proved to be both a facilitator and an inhibitor, as some interviewees mentioned a lack of success stories, while others reported that, as information about XBRL increases, XBRL awareness also increases. Finally, critical mass and available support proved to be inhibitors of XBRL adoption, based on the absence of XBRL applications, software tools, appropriate taxonomies and users.

Moreover, Pinsker and Li (2008) qualitatively examined the costs and benefits of XBRL adoption by studying four companies already implementing XBRL, located
in Canada, South Africa, Germany and the US. They focused on the adoption process, the effect of the adoption on the company and the potential changes on capital costs and transparency. Concerning the adoption process, all four companies indicated that the adoption procedure was rather easy and that XBRL did not become part of their existing ERP system. Furthermore, with regard to the effect of the adoption, the three non-US companies stated that XBRL led to significant cost reductions. These cost savings were due to the increased processing capability and decreased data redundancy. According to one respondent, another reason was the reduction in bookkeeping, while the affected employees were transferred to other company sections. On the other hand, the US Company did not focus on operating cost reduction but considered XBRL as a very good tool for communicating with the company’s potential investors.

2.4. Early and voluntary filers in XBRL format in US

Premuroso and Bhattacharya (2007) examined the factors affecting the early and voluntary XBRL filing decision by Security and Exchange Commission (SEC) members in the US, as well as whether XBRL adoption signals superior corporate governance. Their research was based on SEC’s Final Rule 33–8529 that motivated registrants to report their financial information using XBRL. The variables used were related to the companies’ performances, market, and structure. The performance-related variables used were liquidity, net profit margin, and return on equity. Accordingly, the market-related variable was the auditor type, whether the auditor company was one of the big 4 auditing firms or not. Finally, the structure-related variables were the leverage ratio and the firm size. They found that liquidity and firm size are determinants of the early XBRL adoption decision. Besides that, they proved a positive association between XBRL filling and superior corporate governance.

3. Methodology

This section demonstrates relevant methodologies using the TOE framework, which was developed by DePietro et al (1990) and was used by many scholars for the study of IS/IT innovations’ adoption. As XBRL is an IS innovation, the TOE framework is considered as absolutely suitable for the study of the determinants of its adoption. Our methodology is mainly based on the studies of Debreceny et al (2002); Zhu et al (2003); Doolin and Troshani (2008); and Pinsker and Li (2008).
3.1. The Technology-Organisation-Environment framework

By examining the relevant literature, multiple approaches were found studying the reasons why companies adopt IS/IT innovative systems. The most common approaches deal with the recognition of possible factors that may influence the company’s decision to adopt an innovative IT system (Fichman 2004; Jeyaraj et al., 2006). The adoption of an innovation is a complex procedure influenced by context factors. These factors can be classified as characteristics of a company’s organisational structure, its environment and its technological level (Flanagin, 2000). The TOE framework was developed by DePietro et al (1990) identifying three aspects of a company’s context that influences its decision to adopt a technological innovation. The concept of the TOE framework is portrayed in Figure 3.1 below.

**Figure 3.1** The context of technological innovation adoption

Analytically, the technological context is described by both the internal and external to the firm technologies i.e. technologies that a company already implements as well as those existing in market technologies. Therefore, the IS innovation decision will be based on the available technology and the degree to which it fits into the company’s technological base (Doolin and Troshani 2008). Concerning the adoption decision, potential adopters evaluate the cost and the possible benefits of IS innovation before the implementation decision (Premkumar et al 1994).

The organisational context can be expressed by descriptive measures such as the size and the scope of the firm, the business process, its human resources and its centralisation and its formalisation. According to Zhu et al (2003), large companies are more likely to enclose the required features for an investment in an IT innovation.
The required features are financial and human resources, a greater need for IT structures and the potential to achieve economies of scale. On the other hand, following Premkumar et al (1997), smaller companies may be less conservative in adopting innovative IT systems than their larger competitors.

Finally, the environmental context is the arena in which a company operates and is constituted by: (a) its competitors, (b) its trading partners, (c) industry associations, (d) the government and (e) the access to resources in general (Tornatzky and Fleischer, 1990). The degree of the competition in a sector influences the decision of an innovation’s adoption. Furthermore, the trading partner influence is another environmental element that determines the innovation adoption decision (Iacovou et al., 1995; Zhu et al 2003). According to Rogers (2003), information availability to potential adopters is significant and depends on the communication characteristics of the sector or the industry. Ultimately, the key role to the adoption decision is played by the environment, which is full of new adopters and successful implementation paradigms (Elliot, 2002).

3.2. The Present study

The TOE framework is a useful analytical tool to distinguish the inherent characteristics of an innovation, from its facilitators, inhibitors and motivations, affecting the adopting organisations. As XBRL has all the characteristics of an IT innovation (Jones and Willis, 2003), our study is going to be based on the TOE theoretical framework discussed above. The aim of this study is to examine the TOE factors affecting the decision of XBRL adoption. Six adoption determinants are identified in order to examine whether, and to what extent, they affect the XBRL adoption decision.

**Figure 3.2** The Conceptual framework for XBRL adoption
Each determinant constitutes a variable in a regression model with the XBRL adoption being the dependent variable. There are three environmental factors, two organisational factors, and one technological factor. Each variable is examined through one hypothesis, all presented analytically in the following section.

3.3. Hypotheses development

Concerning the technological context, there are numerous studies relating a company’s technological level with an IT innovation adoption decision, such as XBRL. According to Amir and Lev (1996), high technology companies, such as electronics, drugs, and communications will disclose more information. This fact can be explained due to their assets’ structure being heavily based on intangible assets such as R&D investments, goodwill, patents and intellectual capital. For these kinds of companies, the revenue figures may not be value-relevant and therefore internet financial reporting on various aspects of their operations might be essential in order to attract potential investors (Debreceny et al 2002).

Besides internal technology, subdivided into infrastructure and technical skills, is the key element of a successful IT adoption. This disaggregation was adopted by Crook and Kumar, (1998) and Kuan and Chau, (2001). In our research, following Zhu et al (2003), the level of technology competence (TCOMP) is the technological variable used and is divided into three sub-constructs. These are: (a) IT infrastructure, (b) internet skills, and (c) on-line reporting know-how. The above issues will be examined through a questionnaire. The IT infrastructure is examined on the basis of internet-related functions implemented by the company, such as access to the internet, e-mail use, intranet, groupware tools, and video-conferencing. Internet skills are referred to as the skills of employees concerning internet and related services. These skills will be examined using a three-point scale (majority-some-none), to find the percentage of employees who can send e-mails to internal and external addresses, can browse internet and intranet sites and can communicate through video-conferencing. Finally, the on-line reporting know-how refers to the executives’ ability to implement their company’s internet financial reporting, as well as checking other companies’ financial statements via the internet.

According to Helfat (1997), the above sub-constructs (skills and know-how) of technology competence comprise not only a company’s physical assets but also intangible resources. IT infrastructure, grants for the field where XBRL adoption can be based, internet skills provide sufficient knowledge of using such an internet reporting tool, and on-line reporting know-how examines the managerial skills of XBRL’s effective use (Zhu and Kramer, 2002). In order to examine the validity of that construct we conduct a confirmatory factor analysis. The construct of the level of technology competence and its sub-constructs are depicted in Figure 3.3 below.
The above analysis leads to the first hypothesis concerning the level of technology competence:

**H1: Firms with higher levels of technology competence are more likely to adopt XBRL.**

Various firm-specific characteristics have been presented in literature as being facilitators of IS/IT innovation adoption. According to Tornatzky and Fleischer (1990), firm size and firm scope are the most important organisational facilitators for IS adoption. Following Brynjolfsson et al (1994), firm size appears to be strongly related to IT investments. Drensmore (1998) found that EDI adoption (IT innovation) amounted to approximately 95 per cent of Fortune 1000 firms, while this percentage was only 2 per cent for small firms. Following Zhu et al (2003), studying e-business adoption, there are four reasons why larger firms are more likely to adopt an IT innovation, as they: (a) have sufficient resources to finance a new implementation project, (b) can achieve economies of scale, due to their mass production, (c) can bear the risk of a premature adoption, and (d) possess bargaining power to put pressure on trading partners to adopt the same technology.

Furthermore, companies of greater size disclose more information than smaller companies (Wong-Boren, 1987). This can be explained by the fact that larger companies deal with higher agency costs, due to the information asymmetry existing between managers and shareholders. Furthermore, large companies need more capital to fund their operations and, as a result, will disclose at a higher level. In turn, this element is very useful in the research of a tool, such as XBRL, which helps significantly the disclosure procedure and increases transparency, while it can potentially decrease a company’s cost of capital (Pinsker and Li, 2008). Consequently, we can hypothesise that:

**H2: Larger firms are more likely to adopt XBRL**

The second organisational determinant is the firm scope (FSCOPE). Firm scope is the horizontal extent of a company’s operations (Gurbaxani and Whang, 1991). According to Chopra and Melinda (2001), companies operating in more than one market segment need to have control of the operations of every segment simultaneously and keep agency and auditing costs as low as possible. Therefore, since XBRL provides
this capability, we expect that great scope enhances XBRL adoption. Besides, firms with greater scope can benefit from synergy from the adoption of XBRL. The new reporting language can overcome any incompatibilities of the past information systems, and give great-scope companies the ability to benefit from synergy (Steinfield et al 2002). The hypothesis developed concerning firm scope becomes as follows:

**H3: Firms with greater scope are more likely to adopt XBRL**

Concerning the environmental context, three characteristics were drawn from the literature, which we expect to influence the XBRL adoption decision. The first environmental characteristic is the level of Internet penetration (INTP) in the country, where the adopting company operates. Internet penetration evaluates the dispersion of PCs and internet in a country’s population (Zhu et al 2003). From the investors’ perspective, the internet penetration creates a higher demand for internet financial reporting (IFR), while from the company’s perspective it builds a channel for effective dissemination and use of the information (Debreceny et al 2002). Based on Eurostat (2007) the level of internet penetration varies across European countries where our research is aimed. Consequently, in countries with high internet penetration rates, it is expected that companies will adopt XBRL as a means of widespread financial disclosure. Zhu et al (2003) combined internet penetration and consumer willingness, creating consumer readiness, as a determinant of e-business adoption. Their finding was that consumer readiness is an important environmental facilitator. For the purposes of our study, the seven countries where the sample companies are located are categorised with a three-point scale of high-medium-low internet penetration level. Analytically, Sweden and the UK belong to the high internet penetration countries. Germany, France and The Netherlands are classified as medium internet penetration countries, while Greece and Spain are classified as low. Therefore the fourth hypothesis generated is:

**H4: Firms located in countries with higher internet penetration levels are more likely to adopt XBRL**

Porter (1980) based a company’s strategic decision to adopt an IS innovation, apart from others features, on the relations with buyers and suppliers. Consistent with this study and following Zhu et al (2003) and Doolin and Troshani (2007), we considered trading partner influence (TPI) to be the second environmental determinant of XBRL adoption. Doolin and Troshani (2007) found the influence of business partners to be a major potential facilitator of XBRL adoption. On the other hand, Zhu et al (2003) examined the lack of trading partner influence as being an inhibitor for e-business adoption. They found a strong relationship of lack of trading partner influence with e-business adoption. Thus, the fifth hypothesis is the following:

**H5: Trading partner influence (XBRL adopter), is positively associated with XBRL adoption.**
The third environmental determinant is the national disclosure environment (DSCENV). It is expected that companies located in countries with higher levels of disclosure will be more motivated to adopt an internet financial reporting software system such as XBRL. This hypothesis was generated in consistency with Hodge et al (2002) and Li and Pinsker’s (2008) finding that XBRL increases transparency.

In order to classify the countries by their level of disclosure, we used the classification method of Nobes (1998). According to this method, in order to classify countries by their level of financial reporting, two dimensions were used. The first dimension is the one introduced by Gray (1988) and is based on cultural factors. Gray (1988) based the different levels of corporate disclosure on the differing patterns existing and caused from cultural variables. The second dimension used is consistent with the classification of Ball (1995), indicating that there are countries that depend more on equity financing, in addition to other countries that depend more on debt financing. Therefore, disclosure is higher in “equity financed” countries than in “debt financed” countries. The combination of cultural dominance and the strengths of equity markets gave birth to Nobe’s (1998) two-way classified model.

Based on this model, and consistent with the country classification of Debreceny et al (2002), the seven countries where the companies studied are located, are classified as either a high, medium, and low disclosure environment. The UK and The Netherlands are classified as being in the high disclosure environment. Hence, Germany, France and Sweden are considered to be of a medium disclosure environment, while Greece and Spain are considered to be the countries with a low corporate disclosure environment. Based on the above analysis and classification, it is reasonable to hypothesise that:

**H6: Firms located in countries with higher levels of corporate financial disclosure are more likely to adopt XBRL**

### 3.4. Model construction

After having analysed the determinants of XBRL adoption, we proceed to the construction of a linear regression model in order to examine the validity of variables. The dependent variable in our model is dichotomous, as it takes two prices (adoption and non-adoption). Therefore, a binary logit model is developed similar to the models of Chau and Tam (1997) examining open system adoption, Kuan and Chau (2001) studying EDI adoption, Zhu et al (2003) studying E-Business adoption and Debreceny et al (2002) studying the determinants of internet financial reporting. Based on the conceptual framework of XBRL adoption previously presented, the logit regression model becomes as follows:
XBRL_{adoption} = \alpha + \beta_1 (TCOMP) + \beta_2 \log (FSIZE) + \beta_3 (FSCOPE) + \\
+ \beta_4 (INTP) + \beta_5 (TPI) + \beta_6 (DSCENV) + \varepsilon

The above model integrates the six hypotheses presented earlier. Testing each one of the six hypotheses is equivalent to checking whether the coefficients $\beta_1$ to $\beta_6$ are non zero. Firm size is going to be measured via the number of employees employed in each company; therefore a logarithm has been used at the firm size variable in order to reduce the variance of data.

4. Empirical Analysis

4.1. Population description and sample selection

This study explores the determinants of XBRL adoption and adoption willingness across seven European countries: the United Kingdom, The Netherlands, Germany, France, Sweden, Spain, and Greece. Specifically, the population of this study was all the listed companies trading in the stock exchanges of London, Amsterdam, Frankfurt, Paris, Stockholm, Madrid, and Athens. Analytically, there are 3,287 companies listed in the London stock exchange (LSE) from more than sixty countries. Since October 2007, LSE has been merged with Borsa Italiana S.p.A, becoming the leader among European equities’ exchanges (londonstockexchange.com). Therefore, in LSE there are trading companies not only of a large size, but of large scope as well.

Similarly, the Frankfurt stock exchange in Germany is the world’s third largest stock exchange with a turnover of 5.2 trillion per year and 79 index funds. There are approximately 6,823 companies quoted on the FSE (boerse-frankfurt.de). The stock exchanges of Paris, Amsterdam, Brussels, and Lisbon merged in September 2000 to form NYSE Euronext, counting 4,000 listed companies. For the purposes of our research, we concentrated on Euronext, Paris and Euronext, Amsterdam, where there are 983 and 425 quoted companies respectively (NYSE Euronext.com). Additionally, the Swedish stock exchange of Stockholm, which has co-operated with the London stock exchange and formed the EDX derivatives exchange, counts 310 listed companies (omxnordiceexchange.com). The Spanish stock exchange, known as BME, has been formed by the stock exchanges of Barcelona, Bilbao, Madrid and Valencia. Until now it has 190 listed companies. Finally, on the Athens stock exchange of Greece there are 307 listed companies.

In total, there are 12,325 listed companies in the United Kingdom, The Netherlands, Germany, France, Sweden, Spain, and Greece. From this population, 1,500 companies were chosen randomly, and e-mail invitations were sent to them to respond to our questionnaire. E-mail invitations were sent during July 2007 and reminder e-mails were sent in August 2007. Finally, from the total 1,500 questionnaires sent,
there were 148 replies with the questionnaire answered; thus, the response rate was 9.8 per cent. Two of these questionnaires were invalid and therefore 146 were finally used for the statistical analysis.

### 4.2. XBRL adoption in the seven countries

Apart from the determinants that had motivated European companies to adopt a reporting schema such as XBRL, this study aims to discover the level of XBRL adoption. By asking specific questions through the questionnaires, companies were classified among those that have already adopted XBRL and those that were aware of it, and are willing to adopt it in the future. Part of the XBRL adopters were considered to be those companies that were about to adopt XBRL within a period of two years (Zhu et al 2003). The study revealed a low adoption rate across the seven European countries examined, but a high degree of willingness in adopting XBRL in the near future.

#### Table 4.1 XBRL adoption

<table>
<thead>
<tr>
<th></th>
<th>Adopters</th>
<th>Non adopters</th>
<th>Willing to adopt</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>3</td>
<td>7</td>
<td>11</td>
<td>21</td>
</tr>
<tr>
<td>Germany</td>
<td>4</td>
<td>7</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>France</td>
<td>3</td>
<td>7</td>
<td>11</td>
<td>21</td>
</tr>
<tr>
<td>Sweden</td>
<td>2</td>
<td>10</td>
<td>9</td>
<td>21</td>
</tr>
<tr>
<td>Spain</td>
<td>2</td>
<td>10</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Greece</td>
<td>2</td>
<td>12</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>21</strong></td>
<td><strong>58</strong></td>
<td><strong>67</strong></td>
<td><strong>146</strong></td>
</tr>
</tbody>
</table>

Analytically, from the twenty UK respondents, were five companies reported that they were already implementing XBRL, ten companies were interested in adopting it, and five non-adopters. Twenty-one Dutch companies answered the questionnaires and among them there were three adopters, eleven companies willing to adopt XBRL, and 7 non-adopters. Among German companies, four XBRL adopters were found, ten with a willingness to adopt it and seven non-adopters. Concerning French companies, there were three adopters, eleven companies willing to adopt it and seven non-adopters. Among companies located in Sweden, there were only two adopters and nine willing to adopt it, whilst the non-adopting numbered ten. In the same sense, among Spanish respondents there were two adopters found, eight willing to adopt and ten non-adopters. Finally, only two Greek companies have already adopted XBRL and eight are willing to adopt it. Twelve companies reported that they are not XBRL adopters and are not willing to adopt it. Table 4.1 above summarises the findings of the XBRL adoption research presented above.
4.3. Instrument validation

To empirically examine the constructs theorised in the methodology section, we conducted a factor and reliability analysis using SPSS (Statistical Package for Social Sciences) for Windows v.16.0. There were two constructs to be examined. The first one was the level of technological competence, which is a second order construct, structured by IT infrastructure, internet skills, and on-line reporting know-how. Each one of the three items was examined by a number of questions in the questionnaire. Figure 3.2 in the methodology section depicts this relationship.

4.3.1. Construct validity and reliability analysis

Primary evidence of the sample adequacy is the proportion of model’s variables to the sample size. This ratio is 18:1, which means that there were eighteen responses for each variable (Parasuraman et al 1988). From the factor analysis it was revealed that the Kaiser-Meyer Olkin (KMO) measure of sampling adequacy is .668, which is considered to be satisfactory (Hutcheson and Sofroniou, 1999), and Bartlett’s test of sphericity is .000. Therefore, it is proved that the data is appropriate for factor analysis. Table 4.2 below summarises the sampling adequacy indicators.

<table>
<thead>
<tr>
<th>Table 4.2 Sampling Adequacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>KMO and Bartlett’s Test</td>
</tr>
<tr>
<td>Kaiser-Meyer-Olkin Measure</td>
</tr>
<tr>
<td>of Sampling Adequacy</td>
</tr>
<tr>
<td>Bartlett’s Test of Sphericity</td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
</tr>
<tr>
<td>Df</td>
</tr>
<tr>
<td>Sig.</td>
</tr>
</tbody>
</table>

Since the sample was adequate, we conducted a principal component factor analysis to the first-order construct, using VARIMAX rotation with Kaiser normalisation, in order to extract the three second order variables of the level of technology competence construct (IT infrastructure, internet skills, and on-line reporting know-how). Rotation was converged in three iterations and only two factors were extracted with strong loadings for each one. Therefore, the internet skills variable was dropped and only IT infrastructure and on-line reporting know-how were taken into account for the second order construct. Moreover, three of the six items of the IT infrastructure factor were dropped since one had zero variance and the other two were extracting low communalities of .302 and .310 respectively. Table 4.3 below summarises the item loadings to each of the two factors extracted.
Afterwards, we assessed the reliability of the model in order to examine whether items are free from random error and yield consistent results. According to Chau (1999) Cronbach’s α is the most accepted measure for assessing reliability. Therefore, Cronbach’s α for the endogenous constructs were extracted. IT infrastructure and on-line reporting know-how extracted .825 and .947 Cronbach’s α respectively. Following this, the average scores of IT infrastructure and on-line reporting know-how were used to create the second order construct. Principal component analysis with varimax rotation yielded the factor of the level of technology competence. This factor score is going to be used as an independent variable in the logit regression discussed below.

### 4.4. Logit regression analysis

Since the dependent variable is dichotomous, we conducted a logit regression analysis. XBRL adopters were considered by both the adopting companies and those companies that are willing to adopt in the future. Binary logit regression is used instead of linear regression in order to predict the probability of XBRL adoption (Hair et al 1998). The dependent variable was scored 1 for adopter and 2 for non-adopter. The logit regression model discussed in the methodology chapter is presented below:

\[
\text{XBRL}_{\text{adoption}} = \alpha + \beta_1 \text{TCOMP} + \beta_2 \log \text{FSIZE} + \beta_3 \text{FSCOPE} + \beta_4 \text{INTP} + \\
+ \beta_5 \text{TPI} + \beta_6 \text{DSCENV} + \varepsilon
\]

The six variables used in the logit regression model are the level of technology competence (TCOMP), firm size (FSIZE), firm scope (FSCOPE), internet penetration (INTP), trading partner influence (TPI), and the national disclosure environment (DSCENV). Testing each one of the six hypotheses is equivalent to checking whether the coefficients \(\beta_1\) to \(\beta_6\) are non zero. Table 4.4 below summarises the variables used in the logit regression.

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITI1</td>
<td>-0.809</td>
<td></td>
</tr>
<tr>
<td>ITI2</td>
<td>0.805</td>
<td></td>
</tr>
<tr>
<td>ITI3</td>
<td>0.778</td>
<td></td>
</tr>
<tr>
<td>RNH1</td>
<td></td>
<td>0.773</td>
</tr>
<tr>
<td>RNH2</td>
<td></td>
<td>0.769</td>
</tr>
</tbody>
</table>
Table 4.4 Variables used in the logit regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Content</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XBRL adoption</td>
<td>Adopters and companies willing to adopt XBRL</td>
<td>Dummy variable. 1 Adopter, 2 non adopter</td>
</tr>
<tr>
<td>Independent variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCOMP</td>
<td>Level of technology competence</td>
<td>Average score of the second-order construct formed in CFA</td>
</tr>
<tr>
<td>FSIZE</td>
<td>Firm size</td>
<td>Logarithm of number of employees</td>
</tr>
<tr>
<td>FSCOPE</td>
<td>Firm scope</td>
<td>Number of establishments</td>
</tr>
<tr>
<td>INTP</td>
<td>Internet Penetration</td>
<td>Classification according to Eurostat</td>
</tr>
<tr>
<td>TPI</td>
<td>Trading partner influence</td>
<td>Firm reports concerning partner’s XBRL adoption</td>
</tr>
<tr>
<td>DSCENV</td>
<td>National disclosure environment</td>
<td>Country classification according to Nobes (1998)</td>
</tr>
</tbody>
</table>

The logit regression was performed using the enter method and the output proved a significant model which explains the 66.3 per cent (R^2 = .663) of the variation of the dependent variable (XBRL adoption). Table 4.5 below presents the model summary. Besides, the value of 1.772 of Durbin-Watson indicates that there is no auto-correlation between the constructs.

Table 4.5 Model summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.814</td>
<td>.663</td>
<td>.648</td>
<td>.291</td>
<td>1.772</td>
</tr>
</tbody>
</table>

Table 4.6 below presents the model’s analysis of variance. The F statistic is used to test the hypothesis that the slopes b_1, b_2, b_3, b_4, b_5, and b_6 are zero. The value of the F statistic in our model is 45.489. Moreover, sig. value is .000 (below .01), indicating that the test is strongly significant at a 1 per cent confidence level. Therefore, it is proved that the variables used are appropriate to test the model.

Table 4.6 ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>23.163</td>
<td>6</td>
<td>3.860</td>
<td>45.489</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>11.796</td>
<td>139</td>
<td>.085</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34.959</td>
<td>145</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.7 below summarises both the non-standardised and standardised coefficients extracted from the logit regression analysis performed. The constant in the equation is 1.171 and all six variables have positive and significant non-standardised B prices. Analytically, firm size and level of technology competence were found to
have the most significant B prices of .872 and .743 respectively. This means that XBRL adoption is mostly affected by these two variables. Moreover, the number of establishments variable had a relatively high B of .548 while level of internet penetration, national disclosure environment, and trading partner influence had .260, .173 and .121 respectively. Therefore, the logit regression model becomes as follows: 

$$\text{XBRL adoption} = 1.171 + .743 (\text{TCOMP}) + .872 (\text{FSIZE}) + .548 (\text{FSCOPE}) + .260 (\text{INTP}) + .121 (\text{TPI}) + .173 (\text{DSCENV})$$.

**Table 4.7 Coefficients**

<table>
<thead>
<tr>
<th>Constructs</th>
<th>XBRL adoption</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.171</td>
<td>.349</td>
<td>3.358</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of technology competence</td>
<td>.743</td>
<td>.159</td>
<td>.342</td>
<td>4.675</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Trading partner influence</td>
<td>.121</td>
<td>.076</td>
<td>.121</td>
<td>2.116</td>
<td>.018</td>
<td></td>
</tr>
<tr>
<td>Level of internet penetration</td>
<td>.260</td>
<td>.050</td>
<td>.235</td>
<td>2.209</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>National disclosure environment</td>
<td>.173</td>
<td>.067</td>
<td>.192</td>
<td>2.198</td>
<td>.011</td>
<td></td>
</tr>
<tr>
<td>Number of establishments</td>
<td>.548</td>
<td>.087</td>
<td>.298</td>
<td>3.229</td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>.872</td>
<td>.210</td>
<td>.423</td>
<td>5.267</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.8 of collinearity statistics presents the tolerance and variance inflation factor figures for the six variables of our model. Concerning tolerance scores, the closer they are to zero, the stronger the relationship is with the other variables of the model. All variables have satisfactory tolerance figures, since the lower figure is .229 (National disclosure environment). In the same sense, high VIF\(^3\) values signal collinearity among variables. All six variables have VIF values of below 5 and therefore, there are no collinearity between them.

**Table 4.8 Collinearity statistics**

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Collinearity Statistics</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance</td>
<td>VIF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of technology competence</td>
<td>.453</td>
<td>2.209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trading partner influence</td>
<td>.417</td>
<td>2.399</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of internet penetration</td>
<td>.419</td>
<td>2.388</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National disclosure environment</td>
<td>.229</td>
<td>4.359</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of establishments</td>
<td>.270</td>
<td>3.708</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>.488</td>
<td>2.051</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^3\) The price of VIF is calculated as follows: VIF=1/tolerance
4.5. Hypotheses test

In the methodology section, a set of six hypotheses was developed concerning the determinants of XBRL adoption. In order to test these hypotheses, Pearson’s correlation coefficients were employed. Each coefficient’s value indicates the degree of independence between the variable and XBRL adoption.

The first hypothesis is about the level of technology competence. This hypothesis is strongly supported by the output of the statistical analysis, since Pearson’s correlation coefficient score is .743 and it is significant at the 1 per cent confidence level. These figures illustrate that a company’s level of technology strongly affects its decision to adopt XBRL.

The second hypothesis is also supported by the analysis, since the correlation coefficient’s value is .872 and is significant at the 1 per cent confidence level. Therefore, the most significant determinant of a company’s decision to adopt XBRL is its size. Larger firms are more willing to adopt XBRL than their smaller peers.

The third hypothesis is also supported by the data, at the 1 per cent level, as the coefficient’s score is .548. Therefore, it was correctly hypothesised that firms with a geographic spread of their establishments are more likely to adopt XBRL.

The fourth hypothesis developed is supported by the analysis, although the coefficient’s score is relatively low (.260). This score also proves that XBRL adoption is affected by the level of internet penetration in the country where the company is located.

Further, the fifth hypothesis on partner’s influence was the least supported by the output of our analysis (.121). Therefore, it was proved that the partners’ influence does not affect a company’s decision to adopt XBRL.

Finally, the sixth hypothesis is also supported, although the coefficient’s value is relatively low (B=.173). This means that the national disclosure environment where a company is established has a small impact on its decision to adopt XBRL.

4.6. Discussion

The first finding extracted from this study concerned the level of XBRL adoption across the seven European countries examined. The study indicates a relatively low XBRL adoption level across the UK, The Netherlands, Germany, France, Sweden, Spain, and Greece.

Analytically, 25 per cent of UK responding companies reported that they are already using XBRL. The similar rate in Germany falls to 19 per cent, while Dutch XBRL adopters totalled 14 per cent of total respondents. XBRL adoption was also 14 per cent for French companies, but it falls to 9.5 per cent for Swedish companies. Finally, the XBRL adoption rate in Spain and Greece was 10 and 9.5 per cent respectively. On the other hand, a large proportion of the respondents reported their willing-
ness to adopt XBRL in the future. Therefore, companies willing to adopt XBRL were 50 per cent of respondents in the UK, 52 per cent in The Netherlands, 48 per cent in Germany, 52 per cent in France, 43 per cent in Sweden, 40 per cent in Spain, and 36 per cent in Greece. The above results indicate that a large proportion of European companies are interested in adopting a new technology promising to revolutionise internet financial reporting.

Moreover, the statistical analysis conducted pointed out that firm size, firm scope and level of technology competence are the most significant determinants of XBRL adoption and XBRL adoption willingness. On the other hand, level of internet penetration, national disclosure environment and trading partner influence are less significant, but still affect the adoption decision. These findings are similar to the findings of Zhu et al (2003) concerning electronic business adoption. Zhu et al (2003) also proved that firm size, firm scope and technology competence are significant adoption drivers. Although, in addition to our research their analysis indicated that firm scope is the most significant determinant of e-business adoption. Furthermore, our results are also supported by Premuroso and Bhattacharya (2007), who found an association between firm performance factors and XBRL filling decision. Specifically, they found firm size (measured by total assets) and financial leverage to be the most significant XBRL adoption determinants among 20 US companies.

Firm size and level of technology were also found to be important internet financial reporting facilitators consistent to Debreceny et al (2002). They also proved that the national disclosure environment is an important driver of IFR adoption, in contrast to our research where the national disclosure environment provided limited explanatory power to the model. Besides, our study empirically validates the qualitative study of Doolin and Troshani (2007), which recognised technological level, organisational readiness and trading partner influence as major XBRL adoption factors.

5. Concluding remarks

Our Study was triggered by the question of what drives a company’s decision to adopt an emerging innovation such as the eXtensible Business Reporting Language. Furthermore, the aim of the study was to identify the tendency of XBRL adoption and XBRL adoption willingness across seven European countries (United Kingdom, The Netherlands, Germany, France, Sweden, Spain, and Greece).

In order to achieve the above objectives, we identified a set of six determinants that could potentially influence a company’s decision to adopt XBRL. These are: (a) firm size, (b) firm scope, (c) level of technology competence, (d) internet penetration, (e) trading partner influence, and (f) national disclosure environment. The above determinants constituted the variables in a logit regression model with the XBRL
adoption being the dependent variable. Through an analysis of a sample of 146 listed companies from the countries mentioned it was revealed that all six variables affect a company’s decision to adopt XBRL, although firm size, level of technology competence and firm scope were the most significant drivers of XBRL adoption decision. Moreover, our analysis demonstrated a relatively low XBRL adoption level across the seven European countries examined. On the other hand, high XBRL adoption willingness was identified – a finding that signals a strong XBRL uptake in Europe in the future. The empirical results are consistent with those revealed by the studies of Debreceny et al. (2002), Zhu et al. (2003), Premuroso and Bhattacharya (2007), and Doolin and Troshani (2007).

Although our analysis provided useful findings concerning the determinants of XBRL adoption, consistent with the findings of similar studies, some limitations also exist. As was stated, XBRL adoption by corporations across Europe is at an early stage. At the moment, a small fraction of European listed companies are filling their financial statements in XBRL format. Therefore, our research was expanded to those companies which plan to use XBRL and those which are willing to adopt it in the future. At a later phase of the XBRL adoption, before XBRL implementation becomes mandatory, the outcomes of such a research would be much safer. Additionally, due to the current limited XBRL adoption and its early phase, there were not many companies willing to participate in a survey about XBRL adoption and complete the relevant questionnaire. For this reason, from the 1,500 companies that were asked to participate in our research, only 146 companies replied (response rate 9.86 per cent). A more expanded sample would have generated more robust results.

As XBRL is a new technology in its early stages, there are numerous opportunities for further research. These could be: (a) to examine the XBRL implementation process and find out whether it is an easy and quick procedure or a cost and time-consuming task; (b) its effects on a company’s internal reporting processes (Premuroso and Bhattacharya, 2008); (c) to investigate whether, and to what degree, XBRL influences firm performance, whether it is a value adding activity and to what extent. Debreceny et al. (2005) pose the question of whether XBRL adopting firms have measurable benefits. Premuroso and Bhattacharya (2007) suggest that there truly are measurable benefits, though these have to be revealed and proved; (d) the effect that XBRL has on a company’s cost of capital. According to Debreceny et al. (2005) there are no empirical findings proving this outcome. On the other hand, Pinsker and Li’s (2008) findings indicated that XBRL can decrease a company’s cost of capital, due to the increase in transparency that it incurs and (e) to scrutinise the effect that XBRL will have from the users’/investors’ perspective. A study about the benefits of XBRL adoption to the investor and how investors will use it is vital.

Moreover, we used the TOE framework and proved that it is suitable for the study of XBRL adoption. Therefore, it can be used for the study of the adoption of
similar suites at future studies. Another suggestion for further research could be the incorporation of other variables in order to examine the determinants of XBRL adoption. These could be performance variables (organisational) such as profitability and liquidity ratios, and environmental variables such as the auditing firm.

As a concluding remark, it is proposed to the local XBRL jurisdictions of European countries and the rest of the world, to support and encourage XBRL adoption, along with the adoption of International Financial Reporting Standards (IFRS) to achieve the desired convergence and transparency of accounting standards.

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*Sydney Morning Herald*


Michael Burrow¹ and Ron P. McIver²

DEcision-maker characteristiCs and smaLL BuSIness export ActiVity

1. Introduction

For a number of years researchers have examined policies of national and local governments to encourage small businesses to undertake, develop and increase export activity (Dichtl, Leibold et al., 1984; Hardy, 1986; Malekzadeh and Nahavandi, 1984; Moen, 1999). This has particularly been the case for economies facing intensified competition due to the globalisation of markets (Julien et al., 1994; Julien et al., 1997; Keegan, 2002). The significant deterioration in the financial position of many large corporations due to the recent global financial/economic crisis may be expected to spur a renewed attention of policy makers on the foreign income and employment generation capacity of small business (Commonwealth of Australia, 2008).

An important underpinning for effective implementation of this policy focus is identification of the characteristics of small business decision makers that can either enhance or hinder the initiation, development and performance of small business export activity (Evans et al., 2000; Kalantaridis, 2004; Leonidou et al., 1998; Leonidou, 2000; Leonidou, 2004; Moini, 1997; Wolff and Pett, 2000). Accordingly, the purpose of this paper is to identify the characteristics of the decision-makers of small business that have been recognised as having a positive influence on small business export activity and performance.

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2. Why focus on small business export activity?

An examination of the national export income data for many countries shows that their small exporting firms contribute a relatively low proportion of total national export income. For example, Canadian small and medium sized exporters are estimated to have generated only nine per cent of total Canadian export income in 1992 (Calof, 1995). Similarly, relatively recent statistics show that Australian small businesses that exported goods and/or services generated approximately only two per cent of the total value of the country’s goods and services exports (Australian Bureau of Statistics, 2007).

However, a different picture of the role of small business in a nation’s export activity is apparent from statistics on the number of small firms involved in exporting. For example, more than half of all exporting firms in the United States were estimated to have less than 100 employees (Birch, 1988) and in Canada approximately 94 per cent of all firms that were engaged in exporting were classified as small or medium size as they had sales of less than $C50 million per year (Calof, 1995).

Similarly, recent data for Australia has estimated that nearly 90 per cent of firms exporting goods and 65 per cent of firms exporting generated export sales revenue of less than $A1 million per year (Australian Bureau of Statistics, 2007).

In addition to the significant percentage of exporting businesses being of small size, a part of the interest in the potential for small businesses to initiate and develop export activity can be explained by the fact that small firms are likely to employ a significant proportion of the nation’s workforce. For example, in the United States, over 88 per cent of all firms have been estimated to employ fewer than 20 people with almost half of the United States workforce employed by firms with fewer than 500 employees (Fiegenbaum and Karnani, 1991, p.101). In the United Kingdom it was estimated that in 1989, 97 per cent of businesses employed less than 20 people, provided 35 per cent of total non government employment and contributed 17 per cent of national output (Burns and Dewhurst, 1996, p. 2). Similarly, in Australia, nearly 97 per cent of all non-agricultural private sector businesses are classified as small and are estimated to employ around 47 per cent of the that non-agricultural workforce and generate approximately 15 per cent of gross domestic product (Commonwealth of Australia, 2004).

Additionally, small and medium sized enterprises have been cited as the source of innovation and employment growth within an economy. For example, in the United States, small firms have been credited with providing many of the 20 million new jobs added to the economy from 1977 to 1991 and with producing much of the technological innovation over that period (Byrne 1991, p. 84). Similarly, in the United Kingdom, small businesses employing fewer than 10 people were estimated to have created about 1 million new jobs between 1987 and 1989, which was almost the same
number as provided by large firms over the same period (Burns and Dewhurst 1996, p. 2). More recently, in Australia 58 per cent of the growth in national employment from 1996–97 to 2000–01 has been attributed to small businesses (Commonwealth of Australia, 2004).

Consistent with these statistics, many researchers (Bacas, 1989; Birch, 1979; Davidsson et al., 1996; Ewer and Williams, 1998; Jones, 1995; Kirschhoff, 1991; Kirschhoff, 1995; Moini, 1998; Reynolds, 1996; Weaver et al., 1998) have attributed the potential for small enterprises to be involved in export activity and to provide growth in a nation’s export income to the:

• number of small businesses in the economy;
• innovative characteristics which some small businesses possess;
• extent of the export activity currently undertaken by small business; and
• characteristics of small business exporting firms.

Small-sized firms have been identified as having higher export intensity than larger firms (Bonaccorsi, 1992). Export intensity is the proportion of a firm’s export sales from total sales and it has been proposed that when small firms undertake exporting they generate more export income per dollar of domestic sales than larger firms (Calof, 1995).

Also, when compared to larger firms, small firms are generally regarded as having a more flexible operating structure, being more able to implement niche strategies to take advantage of changes in the business environment, and as having lower overhead costs. These characteristics are argued to provide small firms with a competitive advantage over larger firms in export markets (Ali and Swiercz, 1991; Calof, 1995).

For many economies, the export potential of small business is magnified by large manufacturing companies only being able to compete for foreign sales by locating production facilities in low labour cost overseas countries. Consequently, their export activity is likely to provide only relatively small increases in direct domestic employment. On the other hand, the attainment of foreign sales for most small businesses is by way of the direct export of goods or services which has the effect of generating direct export income and the potential to increase domestic employment (Craig and Yetton, 1994).

Consequently, given a desire of government to increase national export income and domestic employment, the small business sector appears to be an appropriate target for government policies designed to encourage more small businesses to undertake exporting. However, to be able to formulate effective policies it is necessary to understand small firm “export behaviour” (Bell, 1995; Bilkey, 1978; Chetty and Hamilton, 1993; Miesenbock, 1988) with a focus on the:

• processes by which small firms initiate and develop export activity; and
• factors that are required for a small firm to achieve export performance/success.
3. The development of small business export activity

A traditional view of the development of small business export activity was that firms would only commence exporting after they had reached maturity and saturation in their home market and were looking to increase sales revenue (Caves, 1982; Porter, 1990). Alternatively, this development can be represented as an incremental process whereby firms progress through a number of distinct stages, these being from no export activity to the final stage as an active, experienced and committed exporter (Aharoni, 1966; Anderson, 1993; Barkema, 1996; Bilkey and Tesar, 1977; Cavusgil, 1980; Crick, 1995; Czinkota, 1982; Czinkota and Johnston, 1981; Johanson and Wiedersheim-Paul, 1975; Joynt and Welch, 1985; Kotabe and Czinkota, 1992; Mehran and Moini, 1999; Reid, 1981; Stopford and Wells, 1972; Tesar and Moini, 1998; Vozikis and Mescon, 1985). This model is referred to as the stages model of internationalisation.

Under the stages model of internationalisation a small business can commence exporting by receiving an unsolicited order from overseas. By filling this order, the firm commences a learning process about foreign markets which has the potential to give it the capacity to progress to become an active exporter (Johanson and Vahlne, 1977) and ultimately develop an international division or become a fully integrated global enterprise (Newbould et al., 1978).

Although there is no general agreement amongst researchers as to the number and components of the development stages, Figure 1, which provides four alternative models, illustrates the degree of commonality of the export development stages in the models.

Although each of the above models has variations in the number of stages and the components of each stage, Leonidou and Katiskeas (1996) have identified three broad common phases of small business export development.

1. Pre-emergent phase: Firms that are active in their domestic market but not involved in exporting.
2. Initial phase: Firms engaged in sporadic or experimental exporting that are evaluating future export opportunities.
3. Advanced phase: Firms that are actively and consistently engaged in exporting.

However, there is growing evidence of small firms that avoid the early stages of export development, with some firms even beginning exporting immediately after their start up (Andersson and Victor, 2003; Bonaccorsi, 1992; Brush, 1992; Cavusgil, 1984a; Christensen, 1991; Hedlund and Kverneland, 1985; Korhonen et al.; 1996; McDougal, Shane et al., 1994; McDougal, Oviatt et al., 2003; McKinsey & Company and Australian Manufacturing Council, 1993; Reuber and Fisher, 1997; Rialp et al., 2005; Sullivan and Bauerschmidt, 1990; Vernon, 1966; Welch and Luostarinen, 1988; Wiedersheim-Paul et al., 1978; Young 1987). A major characteristic of the decision-
makers of these “born global” firms is that from the outset they view the world as the firm’s market place (McKinsey & Company and Australian Manufacturing Council, 1993).

Figure 1: Alternative stages models of the development of export behaviour

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1</strong></td>
<td>Management is not interested in exporting; would not even fulfil an unsolicited export order</td>
<td>Stage 1</td>
<td>Domestic marketing: the firm sells only to the home market</td>
</tr>
<tr>
<td>No regular export activities</td>
<td><strong>Stage 2</strong></td>
<td>Management is willing to fill unsolicited orders, but makes no effort to explore the feasibility of exporting</td>
<td>Stage 2</td>
</tr>
<tr>
<td><strong>Stage 2</strong></td>
<td>Export via overseas agents</td>
<td><strong>Stage 3</strong></td>
<td>The completely uninterested firm</td>
</tr>
<tr>
<td><strong>Stage 3</strong></td>
<td>Establishment as an overseas sales subsidiary</td>
<td>Experimental involvement; the firm starts exporting on a limited basis to some psychologically close countries</td>
<td>The partially interested firm</td>
</tr>
<tr>
<td><strong>Stage 4</strong></td>
<td>Overseas production manufacturing</td>
<td>Active involvement; exporting to more new countries – direct exporting – increase in export volume</td>
<td>The exploring firm</td>
</tr>
<tr>
<td><strong>Stage 5</strong></td>
<td>The firm as an experienced exporter to that country and adjusts exports optimally to changing tariffs etc.</td>
<td>Experimental involvement; the firm sells only to the home market</td>
<td>The experimental exporter</td>
</tr>
<tr>
<td><strong>Stage 6</strong></td>
<td>Management explores the feasibility of exporting to other more psychologically-distant countries</td>
<td>Active involvement; exporting to more new countries – direct exporting – increase in export volume</td>
<td>The experienced small exporter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Committed involvement: management constantly makes choices in allocating limited resources between domestic and foreign markets</td>
<td>The experienced large exporter</td>
</tr>
</tbody>
</table>

Source: Adapted from Ford and Leonidou, 1991, p. 16.

One explanation of why some firms progress through the various stages of export development whereas other firms are born global is the nature of the firm’s industry. Firms in mature industries with minimal environmental change are more likely to progress through a series of sequential stages whereas firms in fast growing and changing industries are more likely to be born global (Andersson, 2004).
Another explanation is the impact of the characteristics of the small business decision-maker on:
- the export learning process and commitment to exporting; and
- psychic-distance and foreign market orientation.

4. The export learning process and commitment to exporting

A major factor in the explanation of small business export activity is the progressive learning process undertaken by the decision-maker(s) of the firm (Johanson and Vahlne, 1977, 1990). As decision-makers obtain greater knowledge and experience about foreign markets their commitment to exporting increases. This can either be a gradual process with the firm moving sequentially through the various stages of export development (Andersen, 1993; Bilkey and Tesar, 1977; Burpitt and Rondinelli, 1998; Burton and Schlegelmilch, 1987; Cavusgil, 1982; Cavusgil, 1984a; Cavusgil and Nevin, 1980; Kedia and Chhokar, 1986; Rao and Naidu, 1992; Weaver and Pak, 1990), or it can be the creation by an entrepreneur of a “born global” firm to seize perceived international opportunities (Davidsson and Wiklund, 2001; Moran & Ghoshal, 1999, Zahra et al., 2001).

Thus, the learning process that underlies a firm’s export activity is significantly influenced by the:
- intentions and level of commitment of the decision-maker to exporting (Cavusgil and Nevin, 1981; Czinkota and Johnston, 1981; Schlegelmilch, 1986; Walters and Samiee, 1990); and
- firm’s past performance (Axinn et al., 1995).

Consequently, the shift of a firm to a new stage in the export process can be explained by changes in attitudes, commitment and experience of the firm’s decision-maker(s) (Calof, 1993; Czinkota and Johnston, 1981; Johnston and Czinkota, 1982; Li et al., 2004).

The various stages of the export development process depicted in the four models detailed in Figure 1 can also be differentiated by the level of resources that are devoted to exporting, such as: management time; personnel; and export market development funds. Firms in the later stages of export development have been identified as committing a higher proportion of the firm’s resources to support the export activity (Cavusgil, 1982; Groke and Kreidle, 1967; Johanson and Wiedersheim-Paul, 1975).

In support of the learning process underlying the stages of development of export activity, other research has found that the decision-makers in firms in the early stages have a more conservative view of the potential costs and revenues of exporting compared to more experienced decision-makers in firms that are further along the export development process (Brooks and Rosson, 1982; Kedia and Chhokar, 1986).
Thus, it can be expected that as decision-makers learn more about a foreign market they become more confident about the financial viability of that market and are more willing to enter new and unfamiliar markets.

Conversely, when decision makers have limited export experience they can be expected to feel insecure about exporting and can be expected to trade with markets that have a low psychic-distance for them (Johanson and Vahlne, 1977).

5. Psychic distance and foreign market orientation

Psychic-distance is the term given to the combination of factors associated with a foreign market that prevent the flow of information to the firm, such as language differences, business practices, culture, education, etc. (Child et al., 2002; Dow and Karunaratna, 2006; Dichtl and Kondo, et al., 1984; Evans and Mavondo, 2002; Evans et al., 2000; O’Grady and Lane, 1996; Shenkar, 2001; Tihanya et al., 2005; Welch et al., 2001). The decision-maker of the firm may feel insecure and express high levels of uncertainty about the success of exporting to a foreign market that has a high psychic-distance.

The extent of psychic-distance of export markets is considered to influence the decision-maker’s learning process and thus the development of the small firm’s export activity. It can be expected that firms in the early stages of export development will trade with countries with low psychic-distance, while more export experienced firms will be prepared to enter markets in more psychic-distant countries (Calof, 1993).

The major determinant of the psychic-distance of an export market is the foreign market orientation of the small firm decision-maker (Dichtl and Kondo et al., 1984) which reflects the following characteristics of the decision-maker:

- age of the decision maker;
- number of years of education of the decision maker;
- amount of travel to foreign countries undertaken by the decision maker;
- decision-maker’s attitude towards exporting as a firm strategy; and
- number of foreign of languages able to be spoken by the decision maker.

Decision makers who have a high degree of foreign market orientation are more likely to engage the firm in export activity and will be more willing to trade in markets that have a high psychic-distance (Dichtl and Koeoglmyr et al., 1990, Armario et al., 2008). Conversely, decision-makers that possess low levels of foreign market orientation will be unlikely to initiate exporting or will only export to markets with low psychic distance. (Dichtl and Koeoglmyr et al., 1990)
6. Decision-maker characteristics and the initiation of export activity

Given the forgoing, the decision by a small business to initiate export activity is influenced by the characteristics of the firm’s decision-maker (Holzmüller and Kasper, 1990; Naidu and Prasad, 1994) which in the model detailed in Figure 2 are represented by “interest and incentive”.

A substantial component of the research that has focussed the characteristics of small firm decision-makers who initiate export activity has concentrated identifying differences in the characteristics of the decision-makers of exporting firms (exporters) and of non exporting firms (non-exporters) (Barrett and Wilkinson 1986; Cavusgil 1982; Cavusgil 1984a; Cavusgil and Nevin 1981; Czinkota and Johnston 1981; Grip-srud 1990; Joynt and Welch 1985; McConnell 1979; Roy and Simpson 1981; Simpson and Kujawa 1974, Tesar and Mohini 2008).

Figure 2: The export initiation process

These characteristics can be divided into two broad groups: observable characteristics; and perceptions. Each group is outlined briefly below.
(a) Observable characteristics
The observable characteristics of exporters that differentiate them from non-exporters include the:
• type and level of their education (Brooks and Rosson, 1982; Garnier, 1982);
• ability to speak foreign languages (Brooks and Rosson, 1982; Dichtl and Kondo et al., 1984; Joynt and Welch, 1985; Seringhaus, 1993);
• frequency of travel to foreign locations (Dichtl and Koeglmayr et al. 1990; Karafakioglu 1986); and
• quality and dynamism of management (Bilkey and Tesar, 1977; Groke and Kreidle, 1967; Ogram, 1982; Reuber and Fisher, 1997).

(b) Decision-maker’s perceptions
The second group comprises psychological attributes of the decision-maker. Some of these attributes are tautological, such as exporters having a more positive attitude to exporting than non-exporters (Dichtl and Kondo et al., 1984).

However, other psychological attributes can help to explain why some firms initiate exporting whereas others do not. For example, the decision-makers of exporting firms have been found to perceive the risks and costs of exporting as being of less significance than do the decision-makers of non-exporting firms (Brooks and Rosson, 1982; Cavusgil et al., 1979; Cavusgil and Nevin, 1981; Cavusgil and Noar, 1987; Dichtl and Kondo et al., 1984; Roy and Simpson, 1981; Schlegelmilch, 1986; Simpson and Kujawa, 1974;Tesar and Tarleton, 1982).

Similarly, the decision-makers of exporting firms expect a higher profit will result from exporting than is perceived by the decision-makers of non-exporting firms (Cavusgil, 1984b; Czinkota and Johnston, 1983; Ogram, 1982; Sullivan and Bauerschmidt, 1989).

Also, decision-makers of exporting firms possess a higher level of foreign market orientation and have lower psychological barriers to trading with psychic distant markets than will the decision-makers of non-exporting firms (Cavusgil and Nevin, 1980; Kaynak and Kothari, 1984; Sharkey et al., 1989; Wiedersheim-Paul et al., 1978).

Conversely, the decision-makers of non-exporting firms, who have low foreign market orientation, feel that the differences between domestic markets and foreign markets are a sufficient barrier to inhibit them from initiating export activity (Dichtl and Kondo et al., 1984; Leonidou, 1995a).

Summarising this research into the export initiation process Ford and Leonidou (1991, p. 7), concluded that small firms are more likely to initiate export activity in response to export stimuli if the firm’s decision makers have:
• high foreign market orientation;
• high management quality and dynamism;
• perception of the risks and costs of an export market as being lower than the domestic market;
• perception of the profits from an export market as being higher than the domestic market;
• better type and level of education; and
• a foreign country origin and foreign language proficiency,

An alternative strand of research into the decision-maker characteristics associated with export initiation has focused on the export motivation patterns of decision-makers in firms possessing no export experience. It is expected that decision-makers who exhibit a strong intention to export are the most likely to initiate export activity (Andersen and Ryming, 1994; Jaffe and Pasternak, 1994; Yang et al., 1992). However, these studies have been criticised for having relatively weak operationalisation of the intention construct, and are of little assistance in explaining how small firms initiate export activity (Morgan and Katsikeas, 1997).

In addition to the influence of the decision-maker’s characteristics, the characteristics of the firm and its environment impact on the ability of a small firm to respond to export stimuli (Leonidou, 1995b; Morgan, 1997) and to handle the problems associated with exporting (Bilkey and Tesar, 1977).

7. Decision-maker characteristics and small business export performance/success

The terms “performance” and “success” are often used interchangeably to reflect the same dimension. One definition and measure of export performance/success is the fact that a firm is exporting. On the basis of this classification, identification of differences in the characteristics of exporting and non exporting firms has been used to identify the factors influencing export performance/success (Burton and Schlegelmilch, 1987; Cavusgil and Nevin, 1981; Christensen et al., 1987; Yaprak, 1985). This approach has been criticised because it groups all exporters into one category and thereby implicitly assumes that the characteristics exhibited by “poor” exporters are as relevant as those observed for “good” export performers (Aaby and Slater, 1989).

In an attempt to overcome this problem, export performance/success has been defined as being represented by one or more of the following measures (Aaby and Slater, 1989; Beamish et al., 1993; Calof, 1993; Cooper and Kleinschmidt, 1985; Madsen, 1987; Moini, 1995; Reid, 1981; Shoham and Albaum, 1994):

1. **Export intensity** measured by firm’s export sales as a percentage of its total sales, with sales being in units of value or volume.
2. **Export profitability** measured by firm’s export profit value as a percentage of its total profit value.
3. **Export growth** as measured by the percentage per annum rate of growth in the firm’s export sales, with sales being in units of value or volume.
Thus, a firm that is classified as achieving export performance/success would have a high percentage of export sales to total sales and/or a high percentage of export profit to total profit and/or a high percentage per annum growth rate in export sales.

Using these measures to discriminate between firms, successful exporting firms in general have been found to primarily export medium to high technology industrial, intermediate and consumer goods to markets that are physically proximate and psychologically close (Bilkey, 1978).

Another strand of research has been to identify the firm and managerial factors that are associated with small businesses that achieve export success (Aaby and Slater, 1989; Bijmolt and Zwart, 1994; Cavusgil and Nevin, 1981; Cavusgil and Noar, 1987; Christensen et al., 1987; Kau and Tan, 1989; Madsen, 1994; Moen, 1999; Moini, 1992; Reid, 1981).

The level of decision-maker commitment to exporting has a positive relationship with export performance/success, with firms achieving higher levels of export intensity when the decision-maker has realistic but ambitious export performance expectations (Bauerschmidt et al., 1985; Bello and Williamson, 1985; Cavusgil, 1984b; Cavusgil et al., 1979; Gronhaug and Lorenzen, 1982; Kirplani and MacIntosh, 1980; Rosson and Ford, 1982). Conversely, a lack of commitment to exporting will have a negative impact on export performance (Cavusgil and Nevin, 1981).

In addition, the perceptions of the firm’s decision-maker towards a number of aspects of exporting such as competition, market potential, risk and profit have been identified as one of the most important determinants for export performance/success (Aaby and Slater, 1989). For example, a perception by the decision-maker that the risk of exporting is acceptable is positively related to export performance (Cavusgil, 1984b). Similarly, export performance/success is related to a positive decision-maker expectation that the export activity will generate profits (Cavusgil et al., 1979; Cavusgil and Nevin, 1981).

On the other hand, if the decision-maker has negative perceptions about the risks of exporting then substantial barriers are created to the firm achieving export success (Bauerschmidt et al., 1985; Kaynak and Kothari, 1984; Kaynak and Stevenson, 1982).

The perceptions of the decision-maker of the domestic market situation also significantly influence the small firm’s export performance/success. Accordingly, decision-makers who perceive the domestic market as offering large opportunities, or perceive their firm as having difficulty in supplying the domestic market, are less likely to export and have poorer export performance/success (Cooper and Kleinschmidt, 1985; Kaynak and Stevenson, 1982; McConnell, 1979; Rabino, 1980; Sullivan and Bauerschmidt, 1989).

Although other characteristics of the small firm decision-maker, such as age, level of education and ability to speak foreign languages have been identified as important
for the initiation of a small firm’s export activity, it has been found that these same characteristics are not significant factors in explaining the export performance/success of firms (Moini, 1995). However, the amount of export experience possessed by a decision-maker has been identified as being positively related to small firm export success with more experienced decision-makers having a more realistic perception of the expected profitability from an export opportunity than is perceived by new exporters (Cavusgil, 1984a; Kirplani and MacIntosh, 1980). Also, more experienced decision makers are more willing than new exporters to accept limited profits to increase export sales (Bilkey, 1978).

Also impacting on export performance/success is the ability of decision-maker to organise the resources of the firm to facilitate exporting (Aaby and Slater, 1989) which includes the ability to:

- apply appropriate technology to export markets;
- establish the necessary commitment to exporting;
- acquire international knowledge;
- institute consistent and realistic export objectives;
- develop an export policy;
- establish necessary management control systems; and
- skilfully manage the financial resources of the firm.

The implementation by the decision-maker of a process to systematically explore, analyse and plan for export activity is a powerful discriminator between successful exporting and non-exporting small businesses (Aaby and Slater, 1989).

8. Conclusion

A consistent finding from the literature examined in this review is that the characteristics of the decision-maker are significant variables influencing small business export activity.

The general conclusion that emerges from this review is that the initiation, development and performance of small business export activity is significantly influenced by a decision-maker who:

- has high foreign market orientation;
- has better type and level of education;
- has a foreign country origin and foreign language proficiency;
- has high management quality and dynamism;
- has favourable perceptions and attitudes towards exporting and is committed to exporting as a business activity;
- perceives the risks and costs of an export market as being lower than the domestic market;
- perceives the profits from an export market as being higher than the domestic market;
- manages the resources and other characteristics of the firm to support the exporting activity; and
- implements an export strategy that meets the needs of the foreign market.

Accordingly, the challenge for government is to implement policies that encourage the acquisition and development of these characteristics in small business decision-makers. One area of policy focus is for the education system to facilitate the acquisition of foreign language skills and to enhance knowledge and familiarity of foreign countries and cultures. Similarly, there needs to be small business sector policies that encourage and facilitate travel and the interaction of small-business decision-makers with foreign markets.

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1. Introduction

The theory of efficient market hypothesis (EMH) proposed by Fama (1965) was a ‘water shed event’ in capital market research. Fama (1970) defined a market as being efficient if prices fully reflect all available information. In the broadest terms of EMH, there are three forms of market efficiency. First, in weak form efficiency, security prices fully reflect only the history of prices or returns themselves. Second, in semi-strong form efficiency, security prices reflect all publicly available information. Finally, in strong form efficiency, security prices reflect all public and private information. The implication of stock market efficiency is that in an efficient market, future stock prices cannot be predicted using any past, present or future information and hence no strategy can be formulated to make abnormal profit, based on past prices. In an efficient market, security prices follow a ‘random walk’ meaning that period-to-period price changes should be statistically independent. The early works to test the random walk were conducted by Fama (1965) and Samuelson (1965), in which they concluded that most of the evidence seems to have been consistent with the efficient market hypothesis (EMH). Other studies in the US, with similar findings, included those of Sharpe (1966), Friend et al (1970), and Williamson (1972).

Although the EMH is divided into three forms of efficiency, depending on the information set to which share prices adjust, it is usually believed that the markets in developing and less developed countries are not efficient in semi-strong form or strong form and so it is very convenient to test the weak-form of efficiency in such a market. Significant levels of inefficiency have been found in developing and emerging markets in Asia, Europe, Latin America and Africa (See, for instance, Whorington and Higgs, 2005, 2003a&b, Simons & Laryea, 2005). Inefficiency has also been found in markets such as Singapore, India, Nigeria, Mauritius and Greece and Ghana, among
others; the inefficiency often arising from the size of markets, thinness of trading and quality of information disclosure (Keane, 1983; Mlambo, 2003). DSE is an emerging market characterised by low depth and liquidity with a high level of volatility and market concentration. It is generally argued that the weak form inefficiency is linked with the newer, small capitalisation markets with low levels of liquidity and turnover with which DSE seems to be a perfect match. Only a few studies have looked at the behaviour of security prices of DSE. The present study seeks evidence of weak form of efficiency in DSE.

2. Market micro structure of DSE

The stock market history of Bangladesh refers back to 28 April, 1954 when the East Pakistan Stock Exchange Association Ltd was established. Formal trading began on the bourse in 1956. The trading was suspended during the liberation war of Bangladesh in 1971. Operations resumed again in 1976 with the change in government policy. During 1976, there were only 9 listed companies with a total paid up capital of Tk.0.138 billion and market capitalisation of Tk.0.147 billion, which was 0.138 per cent of GDP (Khan, 1992). Since then the stock exchange continued its journey of growth. The second stock exchange of the country, the Chittagong Stock Exchange (CSE) was established in December 1995. In order to control operation of the stock exchanges and trading of stocks of listed companies, the government of Bangladesh established the Securities and Exchange Commission (SEC) of Bangladesh on 8th June, 1993 under the Securities and Exchange Commission Act, 1993. The mission of the SEC is to protect the interests of securities investors, develop and maintain fair, transparent and efficient securities markets, and ensure proper issuance of securities and compliance with securities laws.

From its inception, the stock market of the country was growing at a slow pace. There was a large surge in the stock market in the summer and fall of 1996 evidenced by a 197.43 per cent, 372.30 per cent and 370.51 per cent increase in market capitalisation, total annual turnover and daily average turnover respectively in DSE and 506.63 per cent, 210.2 per cent and 615.15 per cent increase in market capitalisation, total annual turnover and daily average turnover in CSE. The DSE general index increased from 832 in January 1 1996 to 3567 in November 14, 1996 while that of CSE grew from 409.4 in 1995 to 1157.9 in 1996. The market, however, crashed in December of 1996 and the index began to decline significantly from then, with the index of DSE assuming a value of 507.33 as of November 1999, resulting in a cumulative decline of 83.44 per cent from 1996 to 1999 with an annual rate of 27.82 per cent. Investors’ confidence was significantly damaged because of excessive speculations, allegedly aggravated by widespread irregular activities. The government of Bangladesh un-
dertook the Capital Market Development Program (CMDP) supported by the ADB on 20 November 1997. The CMDP aimed at (i) strengthening market regulation and supervision, (ii) developing the stock market infrastructure, (iii) modernising stock market support facilities, (iv) increasing the limited supply of securities in the market, (v) developing institutional sources of demand for securities in the market, and (vi) improving policy coordination. Central Depository Bangladesh Limited (CDBL) was incorporated as a public limited company on 20th August 2000 to operate and maintain the Central Depository System (CDS) of Electronic Book Entry, recording and maintaining securities accounts and registering transfer of securities; changing the ownership without any physical movement or endorsement of certificates and execution of transfer instruments and to ensure risk-free and cost-effective settlement. The CDBL also aimed at other investor services, including providing a platform for the secondary market trading of Treasury Bills and Government Bonds issued by the Bangladesh Bank. CDBL went live with the Electronic Treasury Bills registry of Bangladesh Bank on 20th October, 2003 and thereafter started equity market operations on 24th January, 2004. Before the establishment of CDBL, the delivery, settlement and transfer procedures were handled manually and were plagued by lengthy delays, risks of damage, loss, forgeries, duplication and considerable investment in time and capital. Besides, both the CSE (July 1998) and the DSE (August 1998) have automatic trading services.

After all these reform initiatives, the DSE still remain at the early stage of development, with 273 listed companies and market capitalisation to GDP ratio of 16 per cent as of November 2007. In the total market capitalisation, the share of the banking sector, share of the largest 5 sectors and share of the largest 5 companies being 58.8 per cent, 87.41 per cent and 22.37 per cent respectively, the market is highly concentrated. The value traded to GDP ratio and the turnover ratio of the market is 4.05 per cent and 17.5 per cent respectively. Of the total turnover, 81.36 per cent comes from the largest 4 sector while 48.45 per cent comes from the banking sector alone which, once again, reinforces the market concentration (Bepari and Mollik, 2008).

Trading is carried out through an automated on-line system every day except Friday and other government holidays. For clearing and settlement purposes, all the listed instruments are divided into 5 groups and the market is divided into 4 types. The four markets in the system are: (1) Public Market: Only trading of market lot share is carried out here through automatic matching. (2) Spot Market: Spot transactions are carried out here through automatic matching, which must be settled within 24 hours. (3) Block Market: A place where bulk quantities of shares are traded through a pick and fill basis. (4) Odd Lot Market: Odd lot scripts are traded here based on a pick and fill basis. A, B, G, N & Z are five groups of instruments. Transactions of all groups of shares except group Z, in public, odd and block market, after netting, are cleared and settled through the DSE Clearing House on a T+1 and T+3 basis,
calculated from date of trading. In the spot market, T+0 and T+1 are the clearance
and settlement basis. The instrument of group Z traded in public, odd and block
markets are cleared and settled on a T+3 & T+7 basis whilst that of the spot market
are cleared and settled on a T+0 & T+1 basis. Brokerage fees are 1 per cent on trade
(0.5 per cent buying and 0.5 per cent selling). However, the price discovery process
has not yet become visible in the DSE (Mazumder, 2008). The micro-structure of DSE
is also characterised by limited provision to information of a firm’s performance to
market participants as most firms fail to hold regular annual general meetings and
to provide audited financial statements on time to its shareholders. Moreover, there
is a lack of a professional financial community which can analyse stock market data
for the investors. The processing of new information in DSE is rather weak, due to
the persistence of a large number of non-actively traded instruments, limited role of
mutual funds and a lack of professionally managed pension funds and investment
and broker houses.

3. Literature review

Apart from the US market, an ever-increasing number of studies have examined
random walks in other developed markets. These include studies of random walks in
the United Kingdom (Poon 1996), Korea (Ryoo and Smith 2002), Hong Kong (Che-
ung and Coutts 2001), Spain (Regúlez and Zarraga 2002), the Czech Republic (Hajek
2002), and Turkey (Zychowicz et al 1995). Groenewold and Kang (1993) found the
Australian market to be semi-strong form efficient.

The research findings of weak-form efficiency in the developing and emerging
markets are controversial. Studies finding a weak form of efficiency in developing and
emerging markets are Ojah and Karemera 1999, (on the four Latin American countries’
market), Dickinson and Muragu, 1994 (on the Nairobi Stock Exchange), Chan, Gup
and Pan, 1992, (in major Asian markets) and Branes, 1986, (on the Kuala Lumpur
Stock Exchange). Magnusson and Wydick (2000) test the random walk hypothesis
for a group of African countries and find that African markets are efficient in weak
form. Alam, Hasan and Kadapakkam (1999) test the random walk hypothesis for
Bangladesh, Hong Kong, Sri Lanka and Taiwan. They find that all the stock indexes
except the Sri Lankan stock index follow a random walk.

Studies with evidence that developing and less developed markets are not efficient
in a weak-sense are also abounding. A World Bank study by Claessens, Dasgupta and
Glen (1995), reports significant serial correlation in equity returns from 19 emerging
markets and suggest that stock prices in emerging markets violate the weak form
EMH. Nourrindentine Kababa (1998) examine the behaviour of stock prices in the
Saudi Financial market, seeking evidence for weak-form efficiency and find that the
market is not efficient in weak-form. He explains that the inefficiency might be due to a delay in operations and high transaction costs, thinness of trading and illiquidity in the market. Poshakwale S. (1996) finds evidence of non-random stock price behaviour in the Indian market. Al-Loughani (1995) suggests statistical techniques for the Kuwaiti market index and concludes that the series exhibit stationarity but do not conform to the random walk model. Almost all of these studies tested the random walk hypothesis and thereby weak form of efficiency. Methodologies used in these studies are also in consensus, in that most of the studies use run tests, autocorrelation tests, ADF tests, Phillip-Perron (PP) tests, variance ratio tests, and multiple variance ratio tests.

Studies on the weak form of efficiency in DSE are few, but their findings are conflicting. Rahman et al (2004) applied the unit root test on the monthly return series of DSE for the period 31/01/1990 – 31/09/2003 and found support for unit root in the DSE return series, suggesting the existence of weak-form of efficiency in the DSE. Islam and Khaled (2005) applied the heteroscedasticity- robust Box-Pierce test to the DSE daily and monthly index. Their findings suggested that typical rejection of weak form market efficiency by the usual autocorrelation tests may be reversed by a heteroscedasticity-robust test. Rahman and Hossain (2006) applied both non-parametric tests (Kolmogrov-Smirnov goodness of fit test and run test) and parametric-tests (Autocorrelation coefficient test and ARIMA (0, 1,0)) for testing the random walk model in the daily return series of DSE and found no evidence of weak-form efficiency. Mobarek, and Keasey (2000), examined the daily return series of the DSE general index for the period 1988 to 1997 using parametric and non-parametric tests. They concluded that the DSE return series do not follow a random walk, and hence, the market is not efficient in weak form. Overall the empirical evidence on the weak-form efficiency in the DSE return series are mixed. However, since stock market behaviour may change over time, this study provides new evidence using different data sets for different (i.e. current) time periods.

4. Data analysis and results

The paper aims at a comprehensive analysis of the distributional and time series properties of stock returns of DSE to investigate the weak form efficiency of the DSE. Both non-parametric and parametric tests are used. The study attempts to document random walk in the return series of fine DSE and thereby, the weak form of efficiency. The DSE General daily price index (consisting of all traded shares in DSE) and the DSE 20 daily price index (consisting of 20 mostly blue chip companies) for the period of January 1, 2002 to December 31, 2007 are analysed. In the vein of Affleck-Graves and Money (1975), the natural log of the relative price is computed
for the daily intervals to produce a time series of continuously compounded returns, \( R_t \), which is the one period return in period \( t \), is therefore measured as

\[
R_t = \ln (P_t) - \ln (P_{t-1})
\]

One of the basic problems in analysing the time series data of the stock market is thin trading. Stoll and Whaley (1990) suggested the residuals from an ARMA (p,q.) regressions as a proxy for the true index. Bassett, France and Pliska (1991) used the Kalman filter to estimate a distribution of the true index. Miller, Muthuswamy and Whaley (1994) proposed to remove the effects of thin trading by using moving averages, which reflect the number of non-trading days, and then returns are adjusted accordingly. Kalluniki et al (1997) estimated the returns for the missing days and then ‘lumped’ these returns and assigned them to the day when trade finally took place and set the returns for all the non-trade days to zero. The lumped returns approach, however, does not prevent false autocorrelation, which is caused by the prevalence of zeros during the non-traded periods. In this paper, we control the thin trading by methodology suggested by Mlambo et al (2003). \( R \), when thin trading is present, is therefore measured by the expression,

\[
\frac{1}{k} (\ln(P_t) - \ln(P_{t-k})) , \text{ where } k \text{ is the number of days trading was absent.}
\]

*The normality test*

One of the basic assumptions underlying the random walk theory and, therefore, EMH is that if the stock prices are random, then its distribution should be normal.

Table 1. Descriptive statistics of the daily market return (log of the market returns) for DSE General Index and DSE 20 index (from January 2002 to December 2007)

<table>
<thead>
<tr>
<th>Variable</th>
<th>St.dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Jarque-Bera statistics (JB)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSE gen.</td>
<td>0.0105</td>
<td>-0.0736</td>
<td>0.0576</td>
<td>-0.1637</td>
<td>5.1167</td>
<td>298.76**</td>
<td>.00000</td>
</tr>
<tr>
<td>DSE 20</td>
<td>0.0109</td>
<td>-0.0747</td>
<td>.0613</td>
<td>-0.2180</td>
<td>5.6450</td>
<td>532.62**</td>
<td>.00000</td>
</tr>
</tbody>
</table>

***: Normality is rejected at 1% significance level.

From the result presented in table 1, the normality assumption is rejected for both the DSE general index return series and DSE 20 index return series. Both the return series are negatively skewed, indicating a greater probability of large decreases in returns than increases. The kurtosis or degree of excess, for both the indexes is large, thereby indicating leptokurtic distributions with many extreme observations. For both the return series tested, none had a skewness value of less than 0.1 and none had a kurtosis of less than four; thus they were all leptokurtic; they are more peaked relative to normal. Both the index returns had probabilities of zero that their Jarque-
Bera statistic exceeds the observed value, meaning that the return series in DSE do not follow a normal distribution pattern and thereby do not follow a random walk.

**Non-parametric tests:**

The study uses two different types of non-parametric tests; one (Kolmogrov-Smirnov Goodness of fit test) is to examine if the distribution is normal and the other (run test) is to prove if the daily return series follows the random walk model.

**Kolmogrov Smirnov goodness of fit test**

Kolmogrov Smirnov Goodness of fit test (K-S test) is a non-parametric test. It is used to determine how well a random sample of data fits a particular distribution (uniform, normal and Poisson). The one sample K-S test compares the cumulative distribution function for a variable with a uniform or normal distribution and tests whether the distribution is homogeneous. This study uses both normal and uniform parameters to test the distribution.

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Absolute</th>
<th>Positive</th>
<th>Negative</th>
<th>K-S Z</th>
<th>Z tailed P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>.241</td>
<td>.237</td>
<td>-.241</td>
<td>9.532</td>
<td>.0000</td>
</tr>
<tr>
<td>Uniform</td>
<td>.410</td>
<td>.317</td>
<td>-.410</td>
<td>16.223</td>
<td>.0000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Absolute</th>
<th>Positive</th>
<th>Negative</th>
<th>K-S Z</th>
<th>Z tailed P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>.078</td>
<td>.068</td>
<td>-.078</td>
<td>3.088</td>
<td>.0000</td>
</tr>
<tr>
<td>Uniform</td>
<td>.390</td>
<td>.275</td>
<td>-.390</td>
<td>15.413</td>
<td>.0000</td>
</tr>
</tbody>
</table>

Results from Tables 2 and 3 (K-S test) show a 0.0000 probability for the Z for DSE general and DSE 20 index, which may be interpreted to mean that the frequency distribution of the daily price index of the Dhaka Stock Exchange does not fit by either normal or uniform distribution.

**(i) Run test**

The run test has been performed to check the random-walk model because this test ignores the properties of distribution of the series. The null hypothesis is that the observed series is a random series. The number of runs is computed as a sequence of the price changes of the same sign (such as; ++, --, 0 0). When the expected number of run is significantly different from the observed number of runs, the test rejects
the null hypothesis that the daily returns are random. The run test converts the total number of runs into a Z statistic. For large samples, the Z statistics give the probability of difference between the actual and expected number of runs. If the Z value is greater than or equal to ±1.96, the null hypothesis is rejected at 5 per cent level of significance (Sharma and Kennedy, 1977).

Table 4. Result of the run test on the DSE General daily index and DSE 20 daily index return series for the period 2002 to 2007

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total number of runs</th>
<th>Z</th>
<th>Asymp sig (2 tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSE general daily return</td>
<td>455</td>
<td>-6.764*</td>
<td>.000</td>
</tr>
<tr>
<td>DSE 20</td>
<td>614</td>
<td>-8.526*</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 4 shows the run test result for both the DSE General daily return series and DSE 20 daily return series. The Z statistics of the run test of the daily market return series are greater than ±1.96 and negative, which means that the observed number of runs are fewer than the expected number of runs with observed significance level. According to Gujarati, this actually shows positive autocorrelation within the residuals (1995). In other words, the prices change too seldom and therefore trends in price changes of the DSE can be identified (which in turn means the possibility to design profitable trading strategies). Furthermore, if, in an application, it is found that the number of runs is equal to or less than 9 or equal to or greater than 20, one can reject (at the 5 per cent level of significance) the hypothesis that the observed sequence is random (Gujarati, 1988). The number of runs greater than 20 for both the index returns implies the return series do not follow the assumption of the independent relationship of the random walk model. Therefore, we can reject the null hypothesis that the return series on the DSE follow a random walk pattern.

**Parametric tests:**

(i) **Autocorrelation test**

An autocorrelation test is a reliable measure for testing either dependence or independence of random variables in a series. This test provides evidence of whether the correlation coefficients are significantly different from zero or not. For a large sample, the Ljung—Box statistic follows the chi-square distribution with m degrees of freedom, m being the number of lags. In this research ρₖ (Auto-correlation coefficient) is calculated for up to 20 lags. The hypotheses tested are

H₀ : ρₖ = 0 (Efficient market)
H₁ : ρₖ ≠ 0 (Inefficient market)
Table 5. Results of Autocorrelation (Log of the daily market returns for 2002 to 2007)

<table>
<thead>
<tr>
<th>Lags</th>
<th>Autocorrelation</th>
<th>Ljung-Box Statistics(20 degrees of freedom)</th>
<th>Probability</th>
<th>Lags</th>
<th>Autocorrelation</th>
<th>Ljung-Box Statistics(20 degrees of freedom)</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.144*</td>
<td>20.384**</td>
<td>.000</td>
<td>1</td>
<td>.173*</td>
<td>46.615**</td>
<td>.000</td>
</tr>
<tr>
<td>3</td>
<td>.021</td>
<td>22.210**</td>
<td>.000</td>
<td>3</td>
<td>.067*</td>
<td>53.623**</td>
<td>.000</td>
</tr>
<tr>
<td>4</td>
<td>.045</td>
<td>25.339**</td>
<td>.000</td>
<td>4</td>
<td>.058*</td>
<td>58.875**</td>
<td>.000</td>
</tr>
<tr>
<td>9</td>
<td>.044</td>
<td>31.967**</td>
<td>.000</td>
<td>9</td>
<td>.057*</td>
<td>66.724**</td>
<td>.000</td>
</tr>
<tr>
<td>12</td>
<td>.032</td>
<td>36.715**</td>
<td>.000</td>
<td>12</td>
<td>.051*</td>
<td>74.063**</td>
<td>.000</td>
</tr>
</tbody>
</table>

*significant autocorrelation at two standard error limits
** LB statistics significant at 1% level of significance

For DSE, general autocorrelation is significant at lag 1 and for DSE 20 the autocorrelation coefficient is significant at first, third, fourth, ninth and twelfth lags (Table 5). The presence of non-zero autocorrelation coefficients in the lag of the market returns series clearly suggests that there is a serial dependence between the values. The null hypothesis of no serial correlation is rejected at the 1 per cent significance level for both the indexes. The significance of the autocorrelation coefficient indicates that the null hypothesis of weak-form market efficiency may be rejected. Positive autocorrelation coefficients for both the index indicates persistence (predictability) in returns, with persistence being higher for DSE 20 than DSE general. The observed significant positive autocorrelation also suggests that the security prices in the DSE have a tendency of under-reaction to new information. In terms of the runs tests, the negative z-values for both the index, DSE General and DSE 20, indicate that the actual number of runs falls short of the expected number of runs under the null hypothesis of return independence at 1 per cent level of significance. These again indicate positive serial correlation. The non-zero autocorrelation of the series associated with Ljung–Box Q statistics, which are jointly significant at 1 per cent level at 12 degrees of freedom (lags), suggest that the return series do not follow a random walk.

However, one conflicting finding that needs some explanation here is that the DSE 20 has a much longer series of significant lagged values influencing the future movements of this index than that of DSE General (Table 5). Moreover, the autocorrelation coefficients during the first and the second lags are obviously higher in the case of DSE 20 than DSE General. Given that the DSE 20 comprises twenty most liquid stocks, it should have much more rapidly adjust to the new information than DSE General, which comprises many thinly traded stocks of small firms. The non-synchronous trading hypothesis states that new information is reflected to highly trade stock prices earlier than thinly traded ones. When we analyse index returns in this context, inclusions of that have different information reflection speed causing lagged
positive autocorrelation in their returns. Thus DSE Gen should have a much longer series of significant lagged values influencing the future movements of this index than that of DSE 20 if non-synchronous trading was the only reason behind autocorrelation. Under the paradigm of behavioural finance, a feedback trader bases his decision on the past prices of stocks. If a large number of traders implement the feedback trading strategy, current prices become correlated to the lagged prices and correlation occurs. Koutmos (1997) analyses several stock markets and finds support for positive feedback trading in high frequency stock return data. Hence, the feedback trading hypothesis may play a role in explaining the high correlation of a lagged return of DSE 20. This is an empirical issue for future research on efficiency of DSE.

**(ii) Unit root test: ADF test and PP test:**

We conducted an ADF test and PP test to see whether DSE return series have unit root. Test results are reported in Table 6.

<table>
<thead>
<tr>
<th></th>
<th>ADF test statistics, level</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 lag</td>
<td>with constant and trend</td>
<td>5 lags</td>
<td>with constant but no trend</td>
</tr>
<tr>
<td>DSE General</td>
<td>-1.217 Prob. 0.224</td>
<td>1.146 Prob. 0.252</td>
<td>-1.068 Prob. 0.286</td>
<td>0.964 Prob. 0.335</td>
</tr>
<tr>
<td>DSE 20</td>
<td>-1.422 Prob. 0.155</td>
<td>0.292 Prob. 0.770</td>
<td>-1.550 Prob. 0.121</td>
<td>0.017 Prob. 0.987</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PP test statistics level</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>intercept and 1 lag in error process</td>
<td>intercept and 5 lags in error process</td>
<td>intercept and 1 lags in error process</td>
<td>intercept and 5 lags in error process</td>
</tr>
<tr>
<td>DSE General</td>
<td>1.237 Prob. 0.168</td>
<td>1.128 Prob. 0.168</td>
<td>-33.590 Prob. 0.000</td>
<td>-33.584 Prob. 0.000</td>
</tr>
<tr>
<td>DSE 20</td>
<td>0.459 Prob. 0.539</td>
<td>0.251 Prob. 0.539</td>
<td>-37.291 Prob. 0.000</td>
<td>-37.494 Prob. 0.000</td>
</tr>
</tbody>
</table>

ADF critical values with an intercept and no trend are: –3.435, –2.863 and –2.567 at 1%, 5% and 10% levels; with and intercept and trend are: –3.966, –3.414 and –3.129 at 1%, 5% and 10% levels.
PP critical values are: \(-3.435, -2.863\) and \(-2.567\) at 1%, 5% and 10% respectively. In case of an ADF and PP test, the null hypothesis of a unit root is tested against the alternative of a no unit root (stationary). If the time series exhibit a stationary pattern, they do not follow random walk. At levels (natural logarithms of price) the ADF and PP statistics do not allow to reject the null hypotheses of a unit root at the 5 per cent level of significance or lower, thereby indicating that the logarithms of the price series examined are non-stationary. However, at difference (the return series generated by differentiating the natural log of price series) both ADF and PP test statistics are statistically significant implying that the DSE General and DSE 20 return series do not contain a unit root, and therefore, they are stationary. Thus the DSE return series do not follow a random walk. These findings are similar to the findings of Whorington and Higgs (2005, 2003a\&b) for Emerging markets of Asia, Latin America, Europe.

(iii) Auto regression test:

An auto-regression co-efficient significantly different from zero indicates the predictability of share return from past information. The results presented in Table 7 for the DSE general index daily return shows an auto-regression coefficient AR1 (.3819) significantly different from zero during the sample period 2002 to 2007. The auto-regression coefficients at first and second lags, significant at 1 per cent level of significance, prove that the series are not independent and the market is not efficient in weak form. The null hypothesis that the return series are not independent is rejected in all cases.

<table>
<thead>
<tr>
<th>Variables in the model</th>
<th>Coefficients</th>
<th>SEB</th>
<th>t-Ratio</th>
<th>Approx. Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR1</td>
<td>.3819*</td>
<td>.0680</td>
<td>5.6167</td>
<td>.0000</td>
</tr>
<tr>
<td>LNRMTLAG 1</td>
<td>-.2409*</td>
<td>.0251</td>
<td>-9.6078</td>
<td>.0000</td>
</tr>
<tr>
<td>LNRMTLAG2</td>
<td>-.1458*</td>
<td>.0251</td>
<td>-5.8127</td>
<td>.0000</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>.0011</td>
<td>.0004</td>
<td>2.6661</td>
<td>.0078</td>
</tr>
</tbody>
</table>

* Indicates significant at one per cent level

<table>
<thead>
<tr>
<th>Variables in the model</th>
<th>Coefficients</th>
<th>SEB</th>
<th>t-Ratio</th>
<th>Approx. Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR1</td>
<td>.4979*</td>
<td>.0387</td>
<td>12.8644</td>
<td>.0000</td>
</tr>
<tr>
<td>LNRMTLAG 1</td>
<td>-.3388*</td>
<td>.0228</td>
<td>-14.8537</td>
<td>.0000</td>
</tr>
<tr>
<td>LNRMTLAG2</td>
<td>-.2259*</td>
<td>.0228</td>
<td>-9.9029</td>
<td>.0000</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>.0005</td>
<td>.0005</td>
<td>1.0830</td>
<td>.2790</td>
</tr>
</tbody>
</table>

* Indicates significant at one per cent level.
The results presented in Table 8 for DSE 20 index daily return show an auto-regression coefficient AR1 (.4979) significantly different from zero during the sample period 2002 to 2007. In this case, too, the auto-regression coefficient at first and second lags, significant at 1 per cent level of significance, proves that the series are not independent. The rejection of the null hypothesis that the return series are independent may be interpreted to mean that the market is not efficient in weak form.

(iv) ARIMA (auto-regressive-integrated-moving average) model:

The first step in the Box-Jenkins methodology is to examine the autocorrelation and partial autocorrelation properties of the time series at hand. In diagnostic checking of auto-correlation and partial autocorrelation histograms, each of the return series displays a significant time-series correlation. In other words, observations of past excess returns are correlated with one another. Since the series appear to be stationary, no differencing is required. Thus, we will be pursuing an ARIMA model of the form \((p,0,q)\), where \(p\) is the order of the autoregressive process and \(q\) is the order of the moving-average process. The study also employs the ARIMA model to examine if the stock return series depend not only on its past values of the return series but also past and current disturbance terms. Theoretically the weak-form efficiency of the market persists when we cannot predict the share prices from their historical price information. That is, the stock price is not a function of its past values or the current and/or past values of the disturbance term. The coefficients significantly different from zero suggest dependency of the series, which violates the assumption of the random walk model, and therefore, weak-form efficiency.

Akaike’s information criterion (AIC) is used to identify the most appropriate models. Under the AIC, ARIMA (1,0,2) seems to be best fit for DSE General and ARIMA (3,0,0) seems to be the best fit for DSE 20.

Table 9. DSE General: results of ARIMA (0, 1,0) for the daily price index series; ARIMA (2,0,1) and ARIMA (1,0,0) models for the daily return series: (01/01/2002 to 31/12/2007)

<table>
<thead>
<tr>
<th>ARIMA (1,0,0)</th>
<th>Coefficients</th>
<th>SE</th>
<th>t-Ratio</th>
<th>Approx. Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR1</td>
<td>.13222849*</td>
<td>.02508865</td>
<td>5.2704503</td>
<td>.00000016</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>.00082374*</td>
<td>.00030322</td>
<td>2.7166608</td>
<td>.00666724</td>
</tr>
<tr>
<td>ARIMA(1,0,2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR1</td>
<td>-.8997502*</td>
<td>.06546873</td>
<td>-13.743206</td>
<td>.0000000</td>
</tr>
<tr>
<td>MA1</td>
<td>-1.0445660*</td>
<td>.07135338</td>
<td>-14.639334</td>
<td>.0000000</td>
</tr>
<tr>
<td>MA2</td>
<td>-.1054992*</td>
<td>.03219603</td>
<td>-3.276776</td>
<td>.0010730</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>.0008237*</td>
<td>.00029711</td>
<td>2.772497</td>
<td>.0056290</td>
</tr>
</tbody>
</table>

* Indicates significant at 1 per cent level
Table 10. DSE 20: results of ARIMA (0,1,0) for the daily price index series; ARIMA (2,0,1) and ARIMA (1,0,0) models for the daily return series:

<table>
<thead>
<tr>
<th>ARIMA (1,0,0)</th>
<th>Coefficients</th>
<th>SE</th>
<th>t-Ratio</th>
<th>Approx. Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR1</td>
<td>.17254965*</td>
<td>.02493945</td>
<td>6.9187426</td>
<td>.00000000</td>
</tr>
<tr>
<td>CONSTANt</td>
<td>.00053847</td>
<td>.00032800</td>
<td>1.6416973</td>
<td>.10085418</td>
</tr>
</tbody>
</table>

ARIMA(3,0,0)

| AR1          | .18109215*   | .02526421 | 7.1679315 | .00000000     |
| AR2          | -.04760665** | .02565101 | -2.8559365| .01554000     |
| AR3          | .07578779*   | .02527628 | 2.9983765 | .0000013      |
| CONSTANt     | .00053891    | .00034222 | 1.5747353 | .2864923      |

* Indicates significant at 1 % level; **Indicates significant at 5% level.

Results of the ARIMA analysis presented in Tables 9 and 10 suggest that the price series and return series are not following the random walk model. For the DSE General return series ARIMA (1, 0, 2) is found as the best fitted model with AR1 coefficient (-.8998); MA1 (-1.0446); and MA2 (-.1055) significant at 1 per cent level of significance. For the DSE 20 return series ARIMA (3,0,0) is found as the best fitted model with AR1 coefficient (.18109215); and AR3 coefficient (.07578779) significant at 1 per cent level of significance and AR2 coefficient (-.04760665) significant at 5 per cent level of significance. The diagnostic checking for both the return series shows that there is no significant residual autocorrelation in the return series and residuals seemed to be white noise series, with no discernable time-series pattern embedded.

Moreover, ARIMA (1, 0, and 0) for the whole period is calculated for both the indexes to examine if the auto-regression coefficient is equal to one. But, the results presented in the Table show that the coefficient is only .1322 for DSE general return series with a t-ratio of 5.2705 and significant at 1 per cent level of significance and the coefficient is .1725 for DSE 20 with a t- ratio of 6.9187 and significant at 1 per cent level of significance. This evidence may be interpreted to mean that the changes in the return series are not due to the current disturbance terms (random-walk model) and DSE is not efficient in weak form. However, whether past price series can be used to predict the future prices and/or future returns in DSE to make above abnormal profit remains an empirical issue for future research.

(v) Modelling volatility clustering and persistence in DSE return series:

In this section we model the volatility clustering and persistence in the DSE return series. We apply the ARCH and GARCH models. In the ARCH model we regress the return $r_t$ on only explanatory variable intercept(c). We then obtain the residuals from the regression and estimate the ARCH model. The results are presented in Table 11.
As we can see, there is quite a bit of persistence in the volatility for both the return series as the volatility in time $t$ depends on the volatility of the preceding number of days. Since the coefficients of the lagged terms are highly significant (at 1 per cent level), it seems volatility clustering is present for both the return series. Error variances in the DSE return series are correlated, which violates the assumption of the random walk hypothesis that the error terms are independent. Thus the return series in DSE does not follow a random walk.

Next we specify the GARCH (1, 1) model for both the return series. The mean equation in the GARCH model includes an intercept term and one period lagged return ($r_{t-1}$) as independent variables.

Table 12 reports the parameter estimates of conditional volatility under the GARCH (1,1) model for both the return series of DSE. Significant parameters in the mean equation indicate that the current period’s return for both the indexes depends on lagged values of returns. For both indices, the sum of ARCH and GARCH coefficients is very close to one, indicating that volatility shocks are quite persistent. News about volatility from the previous period can be measured as the lag of the squared residual from the mean equation (ARCH term). The coefficient of lagged squared errors is positive and statistically significant for both the index returns. We conclude that GARCH effects are apparent for both the index returns. Also, the coefficient of lagged conditional variance (GARCH term) is significantly positive and less than one, indicating that the impact of old news on volatility is significant and persistent. The magnitude of the coefficient of the GARCH term is high for the DSE Gen index, indicating a long memory in the variance of DSE Gen return than that of DSE 20. This evidence supports the non-synchronous trading hypothesis, which states that
new information is reflected to highly traded stock earlier than thinly traded stocks. Turnover in the DSE being highly concentrated to the stocks of only a few companies, the DSE Gen index consists of a number of thinly traded stocks. For this reason, the DSE Gen index adjusts to new information more slowly than the DSE 20 index, which consists of blue chip companies.

5. Conclusions

In applying both parametric and non-parametric tests, this study provides evidence that the DSE return series is not normally distributed and does not follow a random walk. Significant auto-correlation persists in the DSE return series at various lags. Volatility clustering is high and persistent. Hence, the study concludes that DSE is not efficient in weak form. A future study should investigate whether non-synchronous trading or feedback trading results in autocorrelation into a lagged return of DSE. It should also explore the issue of formulating an investment strategy to make above abnormal profit.

References


Miller, Merton H., Jayaram Muthuswamy and Robert E. Whaley (1994), Mean Reversion of Standard and Poor’s 500 Index Basis Changes: Arbitrage-Induced or Statistical Illusion, The Journal of Finance, XLIX (2), June


Chart 1: DSE General daily return series

Chart 2: DSE 20 daily return series
1. Introduction

Business failure (including bankruptcy and firm reorganisation) is a topic that has been studied in depth by different authors for decades. To guarantee an efficient legal framework, these themes have also been in the interests of different governments. Business failure aspects become especially topical during an economic crisis, as many firms face difficulties and have to make decisions about their future existence – this situation has also occurred in various countries throughout the world since 2008–2009. In most of the developed economies the option of a firm’s reorganisation instead of going bankrupt has been introduced into various laws for quite some time (i.e. the UK, USA, France and Germany), whereas in Estonia, this topic has only transpired in recent times. On 26.12.2008 the reorganisation law came into force in Estonia but previously, the procedure had, to some extent, been possible through the bankruptcy law introduced in 1992.

The process of creating the law had already begun in 2007 and the author had the opportunity to measure the economic impact of the law for the Estonian Ministry of Justice. The study was concluded in the autumn of 2008 and for this purpose, material, including information about all bankrupt firms in previous years, was used. The objective of the current paper is based on this study and it attempts to quantitatively measure the economic impact of introducing a reorganisation law from the viewpoint of Estonia as a state. Additionally, the impact on other parties influenced by the law is listed but not measured. Also, several interviews with lawyers and trustees were carried out, to determine the different aspects of the necessity to introduce such a law together with opinions about its possible economic impact (and its measurement).

The current study contains several innovative and important aspects. First, previous studies have mainly considered the reorganisation legislation’s effectiveness in different countries, but there are no major studies to forecast the economic
impact of introducing the reorganisation law or comparing such a law’s introduction in comparison with other countries. The paper provides a possible methodology for future research. Second, the entire number of Estonian bankrupt firms was used for the analysis, but in different previous studies only samples have been used, which has definitely narrowed the possibility to arrive at a conclusion. Third, the nature of the research allows the checking of results some time after the introduction of the law and that is why the results of the current paper do not remain purely hypothetical.

2. Theoretical background

Failure has been common in business as long as business has been at all active. Business failure has been defined differently by different authors and in different laws. According to Altman and Hotchkiss (2006) business failure included “businesses that cease operation following assignment or bankruptcy; those that cease with losses to creditors after such actions or execution, foreclosure, or attachment; those that voluntarily withdraw, leaving unpaid obligations, or those that have been involved in court actions such as receivership, bankruptcy reorganisation or arrangement, and those that voluntarily find a compromise with creditors”. Using the previous definition, the most important aspect is that business reorganisation is broadly considered (also in this paper) as a procedure that is at least, to some extent, forced and agreed upon with parties outside a firm, be it a court, creditor or government etc. Situations where firms voluntarily decide to make changes in their business process to raise higher profits or avoid losses in the future are definitely not covered by this term.

Failure procedures are written into the reorganisation and bankruptcy laws, which in some countries form a single document and in others, separate documents. No matter if both those aspects form a unified legal framework in case of firm failure. In the USA, for instance, there are six types of failure procedures under the Bankruptcy Code (see United States Code): chapter 7 – liquidation; chapter 9 – adjustments of debts of municipalities; chapters 11, 12 and 13 – reorganisation; chapter 15 – cross-border insolvency. The USA case of multiple laws is also common to France, Switzerland, Finland and other countries. In Germany there is one law for bankruptcy and reorganisation – Insolvenzordnung.
An important question in case of failure is what the possible ways are to proceed. Figure 1 summarises the major options according to different laws to go through the failure process. Basically there are two options for every firm in case of failure (or bankruptcy threat) – to be submitted to reorganisation or a liquidation procedure. When this is the basic for every country, then the procedures and conditions falling under
those two categories can vary remarkably and that is why data comparison problems might often arise in different studies.

Statistics for different countries show varying survival rates in a failure situation. This is of course, a country, time and calculation specific feature. Couwenberg (2001) found in his study the following rates: USA 18%, UK 20%, and France 6%. Brouwer (2006) notes in her study that the confirmation rate of USA Chapter 11 is about 20%, which means reorganisation emerges in about 5% of all USA bankruptcy cases; she also points out that the European figures are remarkably lower.

The routes given in figure 1 can all have different impacts on the parties concerned. That is why choosing the right procedure at the right time is crucial in maximising the value of economic impact. Herewith, it is important to consider which parties are involved in the reorganisation procedure and the major possible economic impacts on them. Table 1 lists the possible impacts, which the author finds to be most important, but definitely some others could also be noted. The central question is how to measure different impacts, as many of them cannot be put in quantitative form.

<table>
<thead>
<tr>
<th>Party in reorganisation process</th>
<th>List of possible impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Tax income from reorganised firms, less burden on the social system (unemployment support, managing support etc.), no effect of chain bankruptcies, avoiding social catastrophe (for instance in mono-functional towns), less burden on different offices (courts, trustees, law-enforcement officers etc.).</td>
</tr>
<tr>
<td>Creditors</td>
<td>Payment of debt and avoiding difficulties due to money receipt, carrying on co-operation.</td>
</tr>
<tr>
<td>Clients</td>
<td>In case of prepayment, the supply of goods or services, re-establishing good flows (especially in the case of the failed firm being the only provider).</td>
</tr>
<tr>
<td>Personnel (incl. management)</td>
<td>Retaining jobs, avoiding self-responsibility for economic problems.</td>
</tr>
<tr>
<td>Owners</td>
<td>Avoiding loss of invested capital, restoring dividend payments.</td>
</tr>
<tr>
<td>Competitors</td>
<td>Competition stronger – can have a negative or positive influence.</td>
</tr>
</tbody>
</table>

Source: Composed by author

The author looked at a large selection of business failure studies, but the majority of them considered the following topics: the efficiency of reorganisation laws in a juridical sense, reorganisation rates in different countries and bankruptcy and reorganisation law comparisons (see for instance Wang (2006), Osterkamp (2006)). The author could find no studies specifically focusing on the methodology to measure reorganisation law impact, although there were several which looked at the impact of introducing or changing other laws, for instance environmental, criminal etc. Still the measurement side in all cases remained direct – what result the introduction had, not what the value was of that result.
As no specific and single methodology was available from previous studies, the author decided to build one, which is described in the following section.

3. Data, methodology and empirical findings

This part of the paper begins with the clarification of data available for research, then data choice has been viewed and in the end, the economic impact measurement methodology and results are presented.

The extent of firm failure in Estonia was reviewed in 2005–2008 (2008 partially, up until 9th April) to give an overview of the firms that could be submitted to a reorganisation procedure. Choosing data from the previous four years was because of changes in different laws, that could influence the results, but also because of the common economic growth cycle for those years in Estonia. For analysis purposes, the central database of the Estonian Business register was used. There are also other databases, which list payment difficulties, tax debt and other data, but they were not used for the current analysis as they do not provide any additional valuable information.

The database lists the failure procedure, but unfortunately it does not give any insight into the reasons for the failure. An additional aspect to consider is the time lag between the last submitted economic annual report and failure time – in many cases it can be over a year. For this reason, the last official report might not be the best indicator of a pre-failure situation, but at the same time, due to the previous absence of a reorganisation procedure, entrepreneurs have allowed problems to develop uncommonly far. Different stages of failure are listed in the database and they are: bankruptcy procedure start time, timing of the bankruptcy procedure ending due to the absence of assets, the time of the bankruptcy declaration and the time of deleting a bankrupt firm from the database. The ending of a bankruptcy procedure means that the amount of assets is too small to even cover bankruptcy costs (Estonian bankruptcy law).

In the period 2005–2007, Estonian courts began 485 bankruptcy cases; the number of bankruptcy declarations was 484, but that figure does not include the ending of a bankruptcy procedure due to the absence of assets. The figures in Table 2 show that in the period 2005–2007, there were no major changes in the bankruptcy procedures and there has even been a decrease in bankruptcy declarations, which is obviously the result of the favourable economic environment, but the 2008 statistics at the beginning of the year have already shown some increase. Taking into account the situation during the composition of the article, those figures have worsened in Estonia and worldwide.
Table 2. Bankruptcy declarations and bankruptcy procedure start-ups in the database of the Estonian Business Register

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008 (up to 09.04)</th>
<th>Total 2005–2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankruptcy declarations</td>
<td>210</td>
<td>171</td>
<td>167</td>
<td>52</td>
<td>484</td>
</tr>
<tr>
<td>Bankruptcy procedure start-ups</td>
<td>147</td>
<td>170</td>
<td>168</td>
<td>59</td>
<td>485</td>
</tr>
</tbody>
</table>

In the period 2005–2008 (up until 09.04.2008) 261 companies began a bankruptcy process, which resulted in declaring the companies bankrupt – there is also an important number of previous bankruptcy process completions contained in those figures (that means those bankruptcies began prior to 2005). At the same time, there are several cases where the process has started but not ended in the viewed period. The aforementioned points to a serious time shift from starting to actually declaring bankruptcy.

As the object of reorganisation is a firm with a future vitality potential, only the bankrupt firms’ group was used for analysis and the group where procedures ended due to the absence of assets was abandoned. It can be argued that in the abandoned group there are also vital firms, but as no single cases were studied specifically, such generalisation seemed to be reasonable. This, in turn, raises an important point for future quantitative analysis – considering the immaterial side (competence, knowledge, relationships, image etc.) not listed in the balance sheet of a firm, might have some importance in obtaining more precise results.

The bankrupt firms from 2005–2008 have been viewed for this analysis. Most of the firms had their juridical address in the Estonian capital, Tallinn, which also corresponds to the share of firms registered in the capital. However, the juridical address is not always the firm’s actual place of business. There was no connection between bankruptcy and the founding time of a firm – the founding times’ distribution did not have any extremes from the beginning of the 1990s.

The business fields of firms that have a representation of over 10 firms have been viewed in Table 3. Still, it must be noted that again, official registration in one field does not specifically mean activities in that field only and, in some cases, the official registration was confusing.

The results in Table 3 are similar to the overall distribution of Estonian firms – a comparison is given with 1st January, 2009 data of all firms registered in Estonia. To some extent, it is surprising that there are more building sector firms than trade firms, but obviously this is connected to the fact that building firms demand larger investments and turnover is higher, which, in turn, makes them more open to bankruptcy procedures due to the limit of 2555 EUR claims to begin bankruptcy procedures in Estonia. At the same time, this correlates with the real estate boom in Estonia, because the sector was very attractive beginning from the period 2004–2005.
Table 3. Major business fields of bankrupt firms.

<table>
<thead>
<tr>
<th>Business field</th>
<th>Number of bankrupt firms</th>
<th>Share of business field from total number of Estonian firms (01.01.2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>54</td>
<td>11,4%</td>
</tr>
<tr>
<td>Wholesale</td>
<td>38</td>
<td>23,6% (with retail)</td>
</tr>
<tr>
<td>Logistics on roads</td>
<td>31</td>
<td>7,3% (with warehousing)</td>
</tr>
<tr>
<td>Retail (food, drinks, tobacco)</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Forestry</td>
<td>20</td>
<td>11,1% (with agriculture and fishery)</td>
</tr>
<tr>
<td>Wood products</td>
<td>12</td>
<td>7,3% (all manufacturing industry)</td>
</tr>
</tbody>
</table>

When beginning to assess the amount of reorganisable firms, then it is important to leave aside those firms working ineffectively for a long time. The easiest option was to remove firms with negative equity from the population. Those firms should be submitted to liquidation according to Estonian business law; also, negative equity normally reflects lengthy ineffective action and is not connected to sudden payment difficulties. Other selection methods (for instance using the number of workers, different financial ratios etc.) were also considered, but they did not prove to be as good as the aforementioned. As discussed previously, the last submitted financial year report can have a time lag, but it must also be accounted for; the reorganisation procedure would have begun well before the firm went into bankruptcy, so this aspect was not considered problematic for the analysis.

Using the previously mentioned methodology, the sample of firms that went bankrupt in 2005–2007 is given in Table 4 – this sample has also been used for the following impact assessments. As the previous world practice shown in the theoretical background gives varied reorganisation rates, then additional calculations have been made on the assumption that only 5% of failed firms could be reorganised.

Table 4. The number of firms suitable for reorganisation used for analysis

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of firms suitable for reorganisation</td>
<td>80</td>
<td>65</td>
<td>44</td>
</tr>
<tr>
<td>Number of bankrupt firms (incl. ending process due to absence of assets)</td>
<td>436</td>
<td>419</td>
<td>352</td>
</tr>
<tr>
<td>Share from total number of bankrupt firms</td>
<td>18,3%</td>
<td>15,5%</td>
<td>12,5%</td>
</tr>
<tr>
<td>Number of firms suitable for reorganisation using coefficient 5%</td>
<td>22</td>
<td>21</td>
<td>18</td>
</tr>
</tbody>
</table>

Following the economic indicators, the means, medians and total of firms used for analysis have been given. It can be stated that firms used in the analysis, on average, are small firms (the median figures for the firms that went bankrupt in 2007 are the following – number of workers 5, total assets 138 thousand EUR, net sales 297 thousand EUR). However, there are firms in the sample that have more than 100 workers per firm. In total there were 629 workers in firms that went bankrupt in 2007 – they will be
unemployed after bankruptcy or have to find another job. The total net sales of those firms were about 44 million EUR and total assets 30 million EUR. Unemployment insurance payments in a bankruptcy situation have been given in Table 6.

Table 5. Characteristics of reorganisable firms (EUR)

<table>
<thead>
<tr>
<th>Bankruptcy year of firms</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets (average)</td>
<td>303 379</td>
<td>333 110</td>
<td>686 916</td>
</tr>
<tr>
<td>Total assets (median)</td>
<td>92 862</td>
<td>213 610</td>
<td>137 996</td>
</tr>
<tr>
<td>Total assets (total)</td>
<td>24 270 313</td>
<td>21 652 142</td>
<td>30 224 310</td>
</tr>
<tr>
<td>Equity (average)</td>
<td>98 370</td>
<td>59 883</td>
<td>139 617</td>
</tr>
<tr>
<td>Equity (median)</td>
<td>20 120</td>
<td>22 921</td>
<td>19 456</td>
</tr>
<tr>
<td>Equity (total)</td>
<td>7 869 627</td>
<td>3 892 388</td>
<td>6 143 154</td>
</tr>
<tr>
<td>Net sales (average)</td>
<td>618 405</td>
<td>524 761</td>
<td>999 739</td>
</tr>
<tr>
<td>Net sales (median)</td>
<td>234 586</td>
<td>381 001</td>
<td>297 104</td>
</tr>
<tr>
<td>Net sales (total)</td>
<td>47 617 220</td>
<td>33 059 918</td>
<td>43 988 526</td>
</tr>
<tr>
<td>Net profit (average)</td>
<td>-11 127</td>
<td>-34 957</td>
<td>53 365</td>
</tr>
<tr>
<td>Net profit (median)</td>
<td>-541</td>
<td>0</td>
<td>201</td>
</tr>
<tr>
<td>Net profit (total)</td>
<td>-878 995</td>
<td>-2 272 235</td>
<td>2 348 072</td>
</tr>
<tr>
<td>Number of workers (average)</td>
<td>11</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Number of workers (median)</td>
<td>9</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Number of workers (total)</td>
<td>799</td>
<td>774</td>
<td>629</td>
</tr>
</tbody>
</table>

Table 6. Unemployment insurance payments paid by the unemployment fund (million EUR)

<table>
<thead>
<tr>
<th>Bankruptcy year of firms</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment subsidy</td>
<td>2,21</td>
<td>1,72</td>
<td>0,97</td>
</tr>
<tr>
<td>Social tax</td>
<td>0,73</td>
<td>0,57</td>
<td>0,32</td>
</tr>
<tr>
<td>Total</td>
<td>2,94</td>
<td>2,29</td>
<td>1,28</td>
</tr>
</tbody>
</table>

The calculation mechanism for the economic impact of introducing the reorganisation law is the following. We would assume, in all reorganised firms, that:

1. All jobs will be preserved and the state can therefore earn tax income. The average Estonian salary in that specific year has been taken into account, from which personal income tax, social tax and unemployment insurance tax have been calculated.
2. No unemployment subsidies must be paid in the case of the reorganised firms.
3. Firms will pay value added tax to the state, which is 10% of the value added tax paid by the firm.
4. For debt to creditors, 10% can be paid out as dividends which results in dividend income tax payments.
The assumptions listed previously are, to some extent, hypothetical. Because of the absence of a previous reorganisation practice in Estonia, there is no possibility to check those figures. For that reason, the analysis does not take into account VAT income to the state from purchases by workers using their salaries.

Summing up the aspects in the previous list, the economic impact to the state can be shown (Table 7), taking into account the number of firms on the first row in Table 4. In the case where we account for world practice, then the number of firms should be smaller (last row in Table 4) and total impact figures corresponding to that situation have been given in Table 8.

<table>
<thead>
<tr>
<th>Bankruptcy year of firms</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel taxes</td>
<td>2 545 257</td>
<td>2 683 646</td>
<td>2 495 892</td>
<td>2 574 932</td>
</tr>
<tr>
<td>Unemployment subsidies</td>
<td>538 008</td>
<td>354 646</td>
<td>160 578</td>
<td>351 077</td>
</tr>
<tr>
<td>VAT</td>
<td>857 110</td>
<td>595 079</td>
<td>791 793</td>
<td>747 994</td>
</tr>
<tr>
<td>Income tax from creditors</td>
<td>393 616</td>
<td>408 474</td>
<td>529 785</td>
<td>443 959</td>
</tr>
<tr>
<td>Total impact</td>
<td>4 333 992</td>
<td>4 041 844</td>
<td>3 978 049</td>
<td>4 117 962</td>
</tr>
</tbody>
</table>

Table 8. Impact of reorganisation to the state calculating reorganisable firms as 5% of all bankrupt firms (EUR)

<table>
<thead>
<tr>
<th>Bankruptcy year of firms</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total impact</td>
<td>1 191 848</td>
<td>1 305 827</td>
<td>1 627 384</td>
<td>1 375 019</td>
</tr>
</tbody>
</table>

When measuring the impact in comparison to the Estonian national budget in the years given in the previous table we obtain the following results.

<table>
<thead>
<tr>
<th>Bankruptcy year of firms</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of state budget (impact from Table 7)</td>
<td>0,14%</td>
<td>0,12%</td>
<td>0,10%</td>
<td>0,12%</td>
</tr>
<tr>
<td>Share of state budget (impact from Table 8)</td>
<td>0,04%</td>
<td>0,04%</td>
<td>0,04%</td>
<td>0,04%</td>
</tr>
</tbody>
</table>

The impact measurement did not take into account the fact that those firms that survived in a specific year will also create tax income in the future – that is why the results can be summed up in order to arrive at the adjusted impact. Still, such calculations can lead to the wrong conclusions, because in case of bankruptcy, workers would find a job in one year and the personnel tax income to the state would be restored anyway. Table 10 takes into account the previously mentioned chain-effect with an annual discount factor of 10% for the tax income and the results show an important improvement in those circumstances.
Table 10. Economic impact share to state budget in years 2005–2007 taking into account the reorganised firm’s vitality over one year

<table>
<thead>
<tr>
<th>Bankruptcy year of firms</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of state budget (impact from Table 7)</td>
<td>0,14%</td>
<td>0,24%</td>
<td>0,29%</td>
</tr>
<tr>
<td>Share of state budget (impact from Table 8)</td>
<td>0,04%</td>
<td>0,07%</td>
<td>0,10%</td>
</tr>
</tbody>
</table>

Additional difficulty measurable effects could be introduced, but this would not really change the results. In conclusion, it can be said that the Estonian example shows that the introduction of a reorganisation law has visible, but quite low impact, on the state budget. At the same time, the introduction of such a law has an important role in guaranteeing an advanced and modern juridical environment.

Acknowledgements

The article is based on a study ordered before the introduction of a reorganisation law by the Estonian Ministry of Justice. The author is grateful to the Ministry of Justice for their financial and data support. The author would also like to thank the DoRa programme for its financial support with regard to presenting the paper at a foreign conference.

Sources


1. Introduction

It is a widely acknowledged fact that a vast number of papers dealing with stock exchange movements have been based on experiences from those countries which have a very long tradition in both: application of the investment theory and the implementation thereof. In accordance with this, it is quite logical that a possibility of applying the above mentioned theoretical-methodological experiences to developing capital markets is being raised. One such approach is the Efficiency Market Hypothesis (hereinafter EMH).

The applicability of this hypothesis to undeveloped capital markets will be a subject of discussion in this paper. As for the EMH, it can be said that this hypothesis is indeed a very attractive approach for capital market investors, because even those who do not have time for business analysis of capital market movements may still, to some extent, be sure that the trading will be done in a certain period of time and at fair value, which is considered a market price. Therefore, changes in stock prices, if they indeed reflect expectations and information of all capital market participants, are highly unpredictable. On the other side, bearing in mind that the EMH concept, if viewed within the context of the above mentioned theoretical frameworks, is not applicable and definitely cannot be applied within the context of real capital market processes, the EMH concept was therefore needed to be made more flexible, based on which three efficiency forms of the capital market can be distinguished, i.e. weak-form efficiency, semi-strong-form and strong-form efficiency level.

In weak-form efficiency all historic data have been incorporated into a capital market stock exchange price. In semi-strong efficiency all expectations about the future life of a corporation have already been incorporated into a capital market price of a stock exchange, while in strong-form efficiency, which is said to be extreme efficiency form, a capital market price reflects all kinds of information, i.e. past information, expected information and those which are known as insider-information. In accord-
ance with the above mentioned, the following question is being raised: *are capital markets efficient or not?* It can be said that „capital markets are efficient or inefficient depending on circumstances” [Minich (2005), p. 9]. In order to explain this within the context of undeveloped capital markets, in this paper, the following goals have been defined: (1) to conduct an univariate analysis of time series of stock exchange indices in the context of descriptive statistics parameters analysis and a serial correlation in return research; (2) to test weak-form efficiency of capital markets of the Western Balkan countries; (3) to analyse integration between the Western Balkan countries capital markets.

In this paper, the following indices time series were observed: S&P 500 (USA), BELEX (Serbia), BIRS (Republic of Srpska) and SASX-10 (Federation of Bosnia and Herzegovina), CROBEX (Croatia), MBI10 (Macedonia), MOSTE (Monte Negro) and SBI20 (Slovenia).

Research limitations are as follows:
- Short financial time series.
- Due to the phenomenon of asynchronous trading and low liquidity on examined capital markets, financial time series were formed following these criteria:

\[(x_i, y_i) = \begin{cases} 
  y_i > 0 & \Rightarrow \text{estimation} \\
  y_i = 0 & \Rightarrow \text{data is leftover}
\end{cases}\]

2. Preestimation Analysis

Following a graph representation of stock exchange indices time series of observed capital markets\(^1\), a preliminary index classification has been made. Figure 1 illustrates a typically complex nature of index movement values for an observed period between 4 April 2007 – 4 April 2008, indicating also a lack of stationarity. Therefore, for the purpose of modelling, instead of original index values data, very often, certain transformations, i.e. daily returns are being used.

Figure 1. A comparative illustration of stock exchange indices movements

In order to create a better insight into a specificity of observed financial time series, some basic parameters of descriptive statistics are given in Table 1.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BELEX</th>
<th>BIRS</th>
<th>CROBEX</th>
<th>MOSTE</th>
<th>MBI10</th>
<th>SBI20</th>
<th>SASX10</th>
<th>S&amp;P500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>-0.002086</td>
<td>-0.003196</td>
<td>-0.000411</td>
<td>-0.002134</td>
<td>0.000623</td>
<td>0.000308</td>
<td>-0.003025</td>
<td>-0.000153</td>
</tr>
<tr>
<td>Median</td>
<td>-0.001721</td>
<td>-0.002551</td>
<td>-0.000063</td>
<td>-0.003706</td>
<td>0.001057</td>
<td>0.001211</td>
<td>-0.002279</td>
<td>0.000641</td>
</tr>
<tr>
<td>Modus</td>
<td>Multiple</td>
<td>Multiple</td>
<td>Multiple</td>
<td>Multiple</td>
<td>Multiple</td>
<td>Multiple</td>
<td>Multiple</td>
<td>Multiple</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.076822</td>
<td>-0.050090</td>
<td>-0.053663</td>
<td>-0.042698</td>
<td>-0.087688</td>
<td>-0.063509</td>
<td>-0.088401</td>
<td>-0.032519</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.108302</td>
<td>0.060232</td>
<td>0.039770</td>
<td>0.084890</td>
<td>0.066612</td>
<td>0.055620</td>
<td>0.081976</td>
<td>0.041535</td>
</tr>
<tr>
<td>Variance</td>
<td>0.000318</td>
<td>0.000240</td>
<td>0.000170</td>
<td>0.000241</td>
<td>0.000402</td>
<td>0.000179</td>
<td>0.000454</td>
<td>0.000148</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.017846</td>
<td>0.015478</td>
<td>0.013052</td>
<td>0.015535</td>
<td>0.020044</td>
<td>0.013368</td>
<td>0.021297</td>
<td>0.012182</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.384923</td>
<td>0.268662</td>
<td>-0.397209</td>
<td>1.512637</td>
<td>-0.238884</td>
<td>-0.536992</td>
<td>0.010839</td>
<td>-0.043763</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>8.023018</td>
<td>1.739638</td>
<td>1.882532</td>
<td>6.702248</td>
<td>2.766204</td>
<td>3.614226</td>
<td>3.253685</td>
<td>0.850795</td>
</tr>
</tbody>
</table>

Based on the analysis of results given in Table 1, it can be concluded that skewness \((\alpha_3)\) points out that partly asymmetric distribution is typical for BELEX, BIRS, CROBEX, MBI10, SASX10 and S&P500 variables, while variables MOSTE and SBI20 have respectively a positive, i.e. negative asymmetry. Furthermore, kurtosis \((\alpha_4)\) points out that the curve flatness which is less than normal is typical for BELEX, MOSTE, SBI20 and SASX10 variables, while the curve flatness which is above normal is typical for other variables taken into consideration (BIRS, CROBEX, MBI10 and S&P 500).

Also, financial return time series of all observed stock exchange indices have been stationary in its original value \((a \ zero \ differentiation)\), which has additionally been confirmed by the Augmented Dickey-Fuller test of unit roots, bearing in mind
that statistics of the test in its absolute form is higher than theoretically-critical values for all three significance levels.

2.1. Analysis of Serial Correlation in Returns

The following Table depicts $Q$-Stat and associated probabilities for five lags. The probabilities refer to the possibility that the null hypothesis ($H_0$: there is no serial correlation at lag $k$) is true.

<table>
<thead>
<tr>
<th>Stock Exchange Index</th>
<th>Lag 1</th>
<th>p-value</th>
<th>Lag 2</th>
<th>p-value</th>
<th>Lag 3</th>
<th>p-value</th>
<th>Lag 4</th>
<th>p-value</th>
<th>Lag 5</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELEX</td>
<td>46.872</td>
<td>0.000</td>
<td>47.308</td>
<td>0.000</td>
<td>56.901</td>
<td>0.000</td>
<td>60.856</td>
<td>0.000</td>
<td>63.812</td>
<td>0.000</td>
</tr>
<tr>
<td>BIRS</td>
<td>65.085</td>
<td>0.000</td>
<td>66.248</td>
<td>0.000</td>
<td>73.369</td>
<td>0.000</td>
<td>81.254</td>
<td>0.000</td>
<td>86.524</td>
<td>0.000</td>
</tr>
<tr>
<td>CROBEX</td>
<td>10.795</td>
<td>0.001</td>
<td>11.976</td>
<td>0.003</td>
<td>15.440</td>
<td>0.001</td>
<td>16.296</td>
<td>0.003</td>
<td>20.168</td>
<td>0.001</td>
</tr>
<tr>
<td>MOSTE</td>
<td>35.534</td>
<td>0.000</td>
<td>35.631</td>
<td>0.000</td>
<td>37.973</td>
<td>0.000</td>
<td>38.013</td>
<td>0.000</td>
<td>39.465</td>
<td>0.000</td>
</tr>
<tr>
<td>MBI10</td>
<td>58.779</td>
<td>0.000</td>
<td>59.349</td>
<td>0.000</td>
<td>67.057</td>
<td>0.000</td>
<td>69.599</td>
<td>0.000</td>
<td>69.611</td>
<td>0.000</td>
</tr>
<tr>
<td>SBI20</td>
<td>19.897</td>
<td>0.000</td>
<td>23.091</td>
<td>0.000</td>
<td>27.555</td>
<td>0.000</td>
<td>29.695</td>
<td>0.000</td>
<td>30.108</td>
<td>0.000</td>
</tr>
<tr>
<td>SASX10</td>
<td>43.410</td>
<td>0.000</td>
<td>47.756</td>
<td>0.000</td>
<td>65.743</td>
<td>0.000</td>
<td>72.156</td>
<td>0.000</td>
<td>72.915</td>
<td>0.000</td>
</tr>
<tr>
<td>S&amp;P500</td>
<td>6.970</td>
<td>0.008</td>
<td>7.222</td>
<td>0.027</td>
<td>7.374</td>
<td>0.061</td>
<td>9.539</td>
<td>0.049</td>
<td>10.027</td>
<td>0.074</td>
</tr>
</tbody>
</table>

Bearing in mind that $p$-values are lower than 0.05 (significance level), it can be concluded that in case of all stock exchange indices (except for the third and the fifth lag of the S&P 500) there is a strong serial return correlation for all five lags. The same conclusion can be made for the significant level of 0.01, except for the second and the fourth lag of the S&P 500 index.

2. TESTING OF WEAK EFFICIENCY FORM OF CAPITAL MARKETS OF THE WESTERN BALKAN COUNTRIES

In order to test efficiency of capital markets of the Western Balkan countries, the USA capital market has been selected as a benchmark. It is important to outline that there are two basic groups of tests for proving weak efficiency on capital markets, i.e.: [Reilly, Brown (1997), p. 212]: (1) statistical tests of independence and (2) tests of trading rules. In this paper, weak efficiency of capital markets was tested by using statistical tests of independence in combination with autoregression model. The estimated coefficient of the autoregression model AR(5) for observed variables and appropriate $p$-values are shown in Table 3.

Grey coloured $p$-values indicate significant estimation at level 0.05.
Table 3. AR(5) Model for Daily Returns on Indices

<table>
<thead>
<tr>
<th>Indices</th>
<th>BELEX</th>
<th>BIRS</th>
<th>CROBEX</th>
<th>MOSTE</th>
<th>MB110</th>
<th>SBI20</th>
<th>SASX-10</th>
<th>S&amp;P 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent variable</td>
<td>Parameter</td>
<td>p-value</td>
<td>Parameter</td>
<td>p-value</td>
<td>Parameter</td>
<td>p-value</td>
<td>Parameter</td>
<td>p-value</td>
</tr>
<tr>
<td>$r_{t-1}$</td>
<td>0.498361</td>
<td>0.000000</td>
<td>0.640991</td>
<td>0.000000</td>
<td>0.197376</td>
<td>0.002347</td>
<td>0.437304</td>
<td>0.000000</td>
</tr>
<tr>
<td>$r_{t-2}$</td>
<td>-0.095316</td>
<td>0.179596</td>
<td>-0.183511</td>
<td>0.016744</td>
<td>-0.004210</td>
<td>0.949103</td>
<td>-0.101640</td>
<td>0.152880</td>
</tr>
<tr>
<td>$r_{t-3}$</td>
<td>-0.210125</td>
<td>0.002918</td>
<td>-0.115197</td>
<td>0.134729</td>
<td>0.099954</td>
<td>0.128184</td>
<td>-0.075880</td>
<td>0.286327</td>
</tr>
<tr>
<td>$r_{t-4}$</td>
<td>0.119302</td>
<td>0.093803</td>
<td>0.060838</td>
<td>0.426037</td>
<td>-0.007876</td>
<td>0.905395</td>
<td>0.046311</td>
<td>0.514278</td>
</tr>
<tr>
<td>$r_{t-5}$</td>
<td>-0.095237</td>
<td>0.137263</td>
<td>-0.053349</td>
<td>0.407553</td>
<td>0.110191</td>
<td>0.090717</td>
<td>0.067196</td>
<td>0.303483</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>3.09%</td>
<td>7.64%</td>
<td>1.67%</td>
<td>5.32%</td>
<td>19.41%</td>
<td>4.95%</td>
<td>7.82%</td>
<td>0.70%</td>
</tr>
</tbody>
</table>
By a comparative analysis of variability of daily returns on stock exchange indices of capital markets of the Western Balkan countries, it can be concluded that CROBEX (a representative of movement on the Croatian capital market) with 1.67% variability of daily returns, explained by historical returns and in the context of testing the weak efficiency, is the closest in its value to the previously selected benchmark, S&P 500 index, with only 0.70% of daily return variability explained by historical return.

On the other side, other capital markets are characterised by the much larger impact which historical returns have on variability of daily returns, in comparison to the selected benchmark. In line with this, 3.09%, 7.64%, 5.32%, 19.41%, 4.95%, 7.82% of variability of daily returns on stock exchange indices BELEX, BIRS, MOSTE, MBI10, SBI20, SASX-10 are explained by historical return respectively.

* * *

Apart from the discussion on (in)efficiency of observed capital markets, this paper will also discuss integration between selected capital markets. However, before the discussion begins, the necessity to analyse integration and capital market efficiency (in parallel) is briefly explained in the following Table.

In accordance with this and under the assumption that a developed capital market is efficient, the following table illustrates a matrix of investment decisions which depends on (in)efficiency and existence/lack of existence of capital market integration.

| Table 4. Matrix of Investment Decisions depending on (In)efficiency and Existence/Lack of Existence of Capital Market Integration |
| --- | --- |
| There is integration between developed and undeveloped capital markets | There is no integration between developed and undeveloped capital markets |
| Efficient undeveloped capital market | Return above average cannot be realised. Small impact in terms of international portfolio diversification. |
| Inefficient undeveloped capital market | Return above average can be realised. Small impact in terms of international portfolio diversification. |
| Return above average cannot be realised. Potentially large impact in terms of international portfolio diversification. |

3. Testing The Western Balkan Countries Capital Markets Integration

In order to test integration of capital markets, various bi- and multivariate methods can be used, such as: Contingency Analysis, Correlation and Regression Analysis, Vector Auto-regression (VAR) etc.
Table 5 shows a correlation matrix which illustrates a mutual dependence of daily returns of stock exchange indices which have been considered in this paper.

<table>
<thead>
<tr>
<th></th>
<th>BELEX</th>
<th>BIRS</th>
<th>CROBEX</th>
<th>MBI10</th>
<th>MOSTE</th>
<th>SASX-10</th>
<th>SBI20</th>
<th>S&amp;P 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELEX</td>
<td>1</td>
<td>0.018</td>
<td>0.226**</td>
<td>0.067</td>
<td>0.198**</td>
<td>0.155*</td>
<td>0.086</td>
<td>0.074</td>
</tr>
<tr>
<td>BIRS</td>
<td>1</td>
<td>-0.001</td>
<td>-0.059</td>
<td>-0.025</td>
<td>0.449**</td>
<td>0.106</td>
<td>-0.049</td>
<td></td>
</tr>
<tr>
<td>CROBEX</td>
<td>1</td>
<td>0.119</td>
<td>0.254**</td>
<td>0.098</td>
<td>0.236**</td>
<td>0.300**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBI10</td>
<td>1</td>
<td>0.233**</td>
<td>-0.016</td>
<td>0.039</td>
<td>-0.019</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOSTE</td>
<td>1</td>
<td>0.087</td>
<td>0.153*</td>
<td>0.133</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SASX-10</td>
<td>1</td>
<td>0.235**</td>
<td>-0.100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBI20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is different from significant at the 0.05 level (2-tailed)
** Correlation is different from significant at the 0.01 level (2-tailed)

Based on the analysis of the correlation matrix, it can be concluded that there is no significant correlation in terms of movement of stock exchange index S&P 500 and indices SASX-10, MBI10, MOSTE, BELEX and BIRS. However, during the observation period, it has been noted that there is a significant correlation in the movement of S&P 500 index and CROBEX and SBI20 indices.

It was very interesting to note that there is also a significant correlation in movements of CROBEX, BELEX and MOSTE, SASX-10, BELEX, BIRS and SBI20, as well as, movements of MBI10 and MOSTE indices.

Furthermore, the values of these coefficients, irrespective of their respective significance, still do not exceed the level of 0.5, which leads us to the conclusion that correlation between selected variables is *not visible*.

**Testing the interdependence by vector autoregression**

Based on preliminary testing, we opted for the vector autoregression model, i.e. VAR(2) model, after which the Granger causality test was applied.

As for selection of the VAR model, we were using AIC information criteria. Also, it is important to outline that all estimations have been made by using the *STATA*™ 10.0 software. The final results are given in Table 6.

Grey coloured *p*-values point put the area of the null hypothesis ($H_0$: $x$ Granger does not cause $y$) acceptance for 0.05 (significance level).
Table 6. Granger Causality Test

<table>
<thead>
<tr>
<th>Equation</th>
<th>Excluded variables</th>
<th>p-value</th>
<th>Equation</th>
<th>Excluded variables</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELEX</td>
<td>BIRS</td>
<td>0.032</td>
<td>BELEX</td>
<td>S&amp;P 500</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>CROBEX</td>
<td>0.196</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOSTE</td>
<td>0.912</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MBI10</td>
<td>0.075</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SBI20</td>
<td>0.884</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SASX10</td>
<td>0.148</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S&amp;P 500</td>
<td>0.141</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALL</td>
<td>0.049</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BELEX</td>
<td>0.750</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CROBEX</td>
<td>0.553</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOSTE</td>
<td>0.237</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MBI10</td>
<td>0.418</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SBI20</td>
<td>0.300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SASX10</td>
<td>0.345</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S&amp;P 500</td>
<td>0.976</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALL</td>
<td>0.769</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BELEX</td>
<td>0.004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CROBEX</td>
<td>0.420</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOSTE</td>
<td>0.500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MBI10</td>
<td>0.754</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SBI20</td>
<td>0.370</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SASX10</td>
<td>0.002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S&amp;P 500</td>
<td>0.858</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>ALL</td>
<td>0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BELEX</td>
<td>0.159</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BIRS</td>
<td>0.033</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CROBEX</td>
<td>0.326</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOSTE</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MBI10</td>
<td>0.428</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SBI20</td>
<td>0.058</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SASX10</td>
<td>0.561</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALL</td>
<td>0.052</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Granger causality test shows whether variable $x$ causes variable $y$, based on which it can be concluded to what extent a current value of variable $y$ is affected by its respective recent values, and whether the equation can be improved by adding recent values of variable $x$. In general, a time series $x$ is said to cause $y$ by Granger, if future values of $y$ can be estimated more precisely, based on previously known values of $x$ (instead of no data at all), and under the assumption that all other information remains the same. *Vice versa*, $x$ does not cause $y$ if a previous movement of $x$ does not improve estimation quality for $y$, which can be realised and based only on its own previous movement.
Therefore, based on the results of the Granger Causality test application for 0.05 (significance level), the following conclusions can be made: (1) BIRS Granger causes BELEX, while other variables (CROBEX, MOSTE, MBI10, SBI20, SASX10, S&P 500) Granger does not cause BELEX; (2) BELEX, CROBEX, MOSTE, MBI10, SBI20, SASX10, S&P 500 Granger does not cause BIRS; (3) BELEX and SASX10 Granger causes CROBEX, while other variables (BIRS, MOSTE, MBI10, SBI20, S&P 500) Granger does not cause CROBEX; (4) BIRS and MOSTE Granger causes SASX10, while other variables (BELEX, CROBEX, MBI10, SBI20, S&P 500) Granger does not cause SASX10; (5) BELEX and SASX10 Granger causes MOSTE, while other variables (BIRS, CROBEX, MBI10, SBI20, S&P 500) Granger does not cause MOSTE; (6) SASX10 Granger causes MBI10, while other variables (BELEX, BIRS, CROBEX, MOSTE, SBI20, S&P 500) Granger does not cause MBI10; (7) BELEX, BIRS, CROBEX, MOSTE, MBI10, SBI20, SASX10, S&P 500 Granger does not cause SBI20; (8) BELEX, BIRS, CROBEX, MOSTE, MBI10, SBI20, SASX10, SBI20 Granger does not cause S&P 500. To conclude, the Granger Test has proven to be, first of all, a logical test, because, in the light of the Granger, no index causes the index S&P 500. In addition to this, by testing causality it has been proven that capital markets of the Western Balkan countries cannot be observed as a single unit, i.e. a unique capital market, which also has been confirmed by a previously presented correlation analysis.

4. Conclusion

Bearing in mind the given results, it can be concluded that the previously formulated hypothesis that capital markets of the Western Balkan countries are of weak efficiency form has not been confirmed. In addition to this, a relatively low correlation coefficient level points out that these capital markets cannot be observed as a unique capital market, which has been additionally confirmed by the Granger causality test.

References:


**Web sites:**

http://www.transfer-biro.hr; April 2008.
http://www.belex.co.yu; April 2008.
1. Introduction

The perception of securitisation has changed very rapidly over the last two years. Previously welcome as a valuable financial innovation, providing a broader financial base for crediting activity, and moreover on lower cost, it became evil, guilty of bringing about the recent financial crisis. It will certainly continue to be an element of the financial market, but there is also a puzzling question as to what degree its shortcomings in terms of risk generation may be mitigated.

Poland, as with many countries at medium development level, is a latecomer to the world of securitisation. Even if it was admitted in 2004, it could not yet develop, at least in a way worthy of its name. It was, nevertheless, used in a biased way, by agents profiting from the incoherencies of legislation and adapting this possibility to their current needs.

Being a latecomer is not always a bad thing. At least, as in this case, underdevelopment of securitisation protected Poland from a sub-prime crisis and offered an opportunity to learn from the errors of the others.

The present paper aims to analyse the contemporary framework of securitisation in Poland. It takes into account the dynamics of demand for mortgage loans, the need for their financing and the types of agents providing them (universal and mortgage banks). With respect to securitisation as one of the sources of loan refinancing, we discuss the interplay between the state of legislation and the needs and interests of the

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1 Warsaw School of Economics and the European Commission; this contribution expresses exclusively the personal opinion of its author and does not, in any case, bind the European Commission.

2 Ph.D. student, Warsaw School of Economics
agents potentially interested. On the basis of this discussion, we evaluate the prospects of development of securitisation in Poland after the financial crisis.

The paper is structured as follows. Section 1 describes the process of securitisation, summarises its advantages and its shortcomings, together with the currently proposed regulatory solutions. Section 2 discusses the rising demand for mortgage loans in Poland and the organisational structures under which these are now granted (universal and mortgage banks). Section 3 discusses the legal framework of securitisation in Poland and its implications on the way in which it is currently used. Section 4 concludes with the prospects of this manner of raising funds in Poland.

1. Securitisation and its role

Up until very recently, securitisation was considered a valuable financial innovation, enabling the lowering of costs of loans to borrowers and opening up new possibilities for earnings for the banks (Hubbard, 2002, p.50, 369–370).

Securitisation of dues means basically a transfer of non-liquid assets, giving a right to future cash flows (interests, loan repayment) to a dedicated unit called a special purpose vehicle, which then issues securities backed by those assets (Gorton, 2008). The originator is paid by the proceeds acquired from the purchasers of those securities. Assets subject to securitisation should be separate from the activity of the originator (to avoid the risk of his bankruptcy impacts on the quality of securities). Traditionally, securitisation was backed by mortgage loans, but this pool was step by step extended to other dues, such as those on credit cards, loans for cars and even the future flows of regular payments (e.g. telecommunication services). The securities should be issued in trenches of different risk exposure and their risk should be assessed by rating agencies. Additionally, securities were often insured by specialised companies. High ratings of securitised assets enabled banks to receive high revenues on their sale. Perceived as both promising a high return and low risk, asset-backed securities were willingly purchased.

Transfer to the special purpose vehicle could be a “true sale” (without the future responsibility of the originator for default). Nevertheless, even in this case, the originator often agreed to “enhance” the quality of securities, for example by promising to grant a loan in case of a cash flow default. There exists, nevertheless, different securitisation formulas which do not require the writing off of assets from the balance sheet of the originator and the only risk is transferred to the investors (as in the case of so-called synthetic securitisation).

The originator may still use the pool of loans and perceive income on this title.

Securitisation has a number of advantages for banks. First, in initiating securitisation, they can change their asset portfolio and control the level of risk. If they behave
according to the principle Originate-and-Distribute, they can rid themselves of the risk of loans they have granted (thus dispersing the risk on the investors). Securitisation helps to diversify risk and to limit concentration of loans in sectors and in regions.

It may help adjusting the maturities of assets and liabilities by ridding the balance sheet of the assets with the longest maturities. It thus reduces the pressure of liquidity requirement, more and more present in the situation of shrinking household savings deposited in banks.

Securitisation in the form of “true sale” enables credit expansion. The originator sells existing loans for cash and is thus able to extend new loans. He loses interest income, but keeps the non-interest proceeds already perceived and may also acquire new cash flows due to servicing. To earn the highest possible return on equity, banks tend to hasten their Originate-and-Distribute activity (Shin, 2009).

Also, the regulations concerning capital adequacy may encourage securitisation (Zombirt, 2002). In the case of the “true” sale of assets, the bank may eliminate from the balance sheet those assets engaging a portion of regulatory capital and in exchange acquires cash. Thus it either reduces the regulatory capital required, or, under the same level of capital, extends the possibility for the granting of new loans. Even if they are sold on their turn, the bank earns on commissions.

Securitisation may also, nevertheless, be a source of cost and risk. Engaging in securitisation for the first time involves high overhead costs. If the assets securitised are of high quality, their sale deteriorates the quality of the remainder of the asset portfolio. If any recourse to the originator exists (for example under the form of promises to help SPV in the case of deterioration of cash flows generated by assets) the risk may return to the originator. In practice, this is often the case (Gary and Souleles, 2003).

The generally enthusiastic assessment of securitisation changed dramatically with the beginning of the sub-prime crisis in 2007/2008 (Brunnermeier, 2009; Greenlaw et al 2008; Keys et al., 2008).

First, in the securitisation process itself, a number of risks and information asymmetries were found (Ashcraft, Schuermann, 2008). The information asymmetry existed between the originator of a loan and the other parties of the process (including the rating agency). The mortgagor may reveal unfair behaviour – stop paying insurance and taxes and thus allow the value of the mortgage to fall. The servicer could artificially delay foreclosure of a non-performing loan to perceive proceeds on service for as long as possible. The investor, unable to formulate an investment strategy himself, has to rely on external advice. The most striking was the risk connected to the role of rating agencies, systematically underestimating the risk of asset backed

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3 It should be underlined, that according to Basel II provisions and Directive 2006/48/EU on securitised assets these should comply with certain requirements to be accepted as written off the balance sheet of the bank. Namely, the originator (Bank) cannot bear any responsibility for the default of the loans it submitted to securitisation.
securities. The reason could be a conflict of interests (the revenues of those agencies relied on proceeds from the assessment of securities and they were paid by originators and not investors), but also procedural insufficiencies of risk assessment (for example underestimating the possible transfer of risks from originators to a special purpose vehicle, due to the non-fulfilment of enhancement obligations).

Second, the basic process of securitisation was subject to “creativity” (Containing, ch.2). The products of securitisation were re-securitised and pooled with other financial instruments, making the final products unclear and their risk particularly difficult to assess. The other kind of “creativity” came into being with structured investment vehicles (SIV) and SIV-lites as their more risky version. They were sponsored by the banks, even if they were separate from their balance sheets. Their functioning was based on borrowing short-term and investing in longer-term securities, very often asset backed. Such structures, very highly leveraged, were highly profitable, but very sensitive to any financial market disturbances, when renewal of the short-term debt was disabled.

In some way, increasing the possibilities to extend loans, thanks to securitisation, was at the origin of a supply pressure on credit. When the prime borrowers’ sector was saturated, the lenders turned to the sub-prime sector (Shin, 2009). Thus, profit seeking enabled by increasing leverage, deteriorated the quality of assets that were the basis of securitisation.

Financial innovations, securitisation included, will continue to expand, as stated in a recent speech by Ben Bernanke. However, the recent crisis has provided knowledge about the risk those instruments may imply and enabled the design of better regulation tools (Rajan, 2005).

In the European Union, securitisation is already covered by Directive 2006/48/EC, relating to the taking up and pursuit of the business of loan institutions and Directive 2006/49/EC on the capital adequacy of investment firms and loan institutions. They were already taking into account securitisation in capital requirements to banks. Nevertheless, the capital adequacy regulation was criticized as pro-cyclical and unable to flexibly react to the changing situation of the financial agent. An alternative method, of holding insurance for adverse events, was also proposed (Kashyap, Rajan and Stein, 2008).

The critics from the de Larosière group (The high Level, 2009) revealed different deficiencies of regulation and supervision in financial markets.

The regulation did not cover the activity, for example, of hedging funds or of rating agencies. In certain cases, no precise regulation could be imposed (such as the choice of portfolio by financial investors); only the obligation of due diligence and transparency could be formulated.

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4 Speech at the Federal Reserve System’s Sixth Biennial Community Affairs Research Conference on 17 April 2009 (http://www.federalreserve.gov/newsevents/speech/bernanke2090417a.htm)
On the basis of these critics, different proposals concerning regulation and supervision were formulated. As to capital requirements, it was pointed out that the broader scope of risks should be taken into account (as risk of maturity mismatches) and reliance on the unrealistic internal risk model was criticised. It was proposed to tighten up liquidity norms and capital requirements, in particular in case of off-balance sheet vehicles. It was also proposed to extend the supervision of rating agencies, insurance and pension institutions, hedge and investment funds.

Bearing in mind that securitisation is always a potential source of risk, it was proposed to oblige issuers of securitisation to retain a meaningful amount of risk in their balance sheets. With respect to investors, it was underlined that external ratings cannot replace an understanding of the products by investors and due diligence.

Those proposals are still being discussed.

2. Mortgage loans in Poland – recent rise and problem of financing

a. Evolution of mortgage loans in Poland in the past 10 years

In recent years, Poland lived through a housing boom and a boom of credit granted for housing purposes. The value of loans for housing purposes was steadily growing by at least 40 per cent a year.

<table>
<thead>
<tr>
<th>Period</th>
<th>PLN mln</th>
<th>Index of growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1996</td>
<td>1072,6</td>
<td>X</td>
</tr>
<tr>
<td>12.1997</td>
<td>1826,4</td>
<td>1.703</td>
</tr>
<tr>
<td>12.1998</td>
<td>3004,8</td>
<td>1.645</td>
</tr>
<tr>
<td>12.1999</td>
<td>5881,7</td>
<td>1.957</td>
</tr>
<tr>
<td>12.2000</td>
<td>9631,2</td>
<td>1.637</td>
</tr>
<tr>
<td>12.2001</td>
<td>14115,4</td>
<td>1.466</td>
</tr>
<tr>
<td>12.2002</td>
<td>20 030,4</td>
<td>1.419</td>
</tr>
<tr>
<td>12.2003</td>
<td>29 575,8</td>
<td>1.476</td>
</tr>
<tr>
<td>12.2004</td>
<td>35 807,2</td>
<td>1.211</td>
</tr>
<tr>
<td>12.2005</td>
<td>50 425,1</td>
<td>1.408</td>
</tr>
<tr>
<td>12.2006</td>
<td>77 705,6</td>
<td>1.541</td>
</tr>
<tr>
<td>12.2007</td>
<td>116 840,7</td>
<td>1.504</td>
</tr>
<tr>
<td>12.2008</td>
<td>192 612,4</td>
<td>1.648</td>
</tr>
<tr>
<td>01.2009</td>
<td>203 238,2</td>
<td>1.055</td>
</tr>
<tr>
<td>02.2009</td>
<td>211 722,1</td>
<td>1.042</td>
</tr>
</tbody>
</table>

One reason for this was the unsaturated demand for houses and apartments by the Polish population (it is estimated that there is a lack of about 1.5 mln apartments), but also, recently, the impact of high growth of revenues and investments in the housing sector by foreign investors (in particular after accession to the European Union). Demand for housing brought about a rise in the prices of houses and apartments, that increased credit needs and further boosted demand (in expectation of a further increase in prices) (Łaszek, 2006).

Most of the loans for housing to households were granted as mortgage loans. However, some categories of housing loans (such as those for work in apartments not registered in mortgage books, or secured by other collateral) make a difference between the two. The Table below shows the growth of mortgage loans since 1996.

Nevertheless, loans for housing in Poland barely constitute 12 per cent of the value of national income, while in the countries of Western Europe, they amount to 17–98 per cent of GDP (Finansowanie, 2007, p.10). As reported by the financial authorities in 2007, the value of loans for housing constituted 33.4 per cent of all the dues of Polish banks from the non-financial sector (Finansowanie, 2007, p.10). There is therefore room for further development of this sector of loans.

<table>
<thead>
<tr>
<th>Date</th>
<th>PLN mln</th>
</tr>
</thead>
<tbody>
<tr>
<td>02.2002</td>
<td>6 208,0</td>
</tr>
<tr>
<td>12.2002</td>
<td>13 143,3</td>
</tr>
<tr>
<td>12.2003</td>
<td>24 956,8</td>
</tr>
<tr>
<td>12.2004</td>
<td>34 896,1</td>
</tr>
<tr>
<td>12.2005</td>
<td>46 133,0</td>
</tr>
<tr>
<td>12.2006</td>
<td>70 264,6</td>
</tr>
<tr>
<td>12.2007</td>
<td>102 936,6</td>
</tr>
<tr>
<td>12.2008</td>
<td>151 120,7</td>
</tr>
<tr>
<td>01.2009</td>
<td>162 286,2</td>
</tr>
<tr>
<td>02.2009</td>
<td>171 407,5</td>
</tr>
</tbody>
</table>


b. Universal banks as the principal player on the Polish mortgage loans market

Loans for housing purposes are granted in Poland mostly (according to the data of the Finance Supervising Commission, in more than in 97 per cent of cases) by universal banks. The market is dominated by the largest banks. At the end of 2007, three of them (PKO Bank Polski SA, Bank BPH SA and Bank Millennium SA) had
41 per cent of all the housing loans issued by 56 of the banks. The other banks followed: BRE Bank SA – 6.4 per cent, Kredyt Bank SA, Bank Polska Kasa Opieki SA, GE Money Bank SA – each 5 per cent (Finansowanie, 2007, p.10). The offer of loans for housing (the most frequently granted as mortgage loans) is in the offer of an overwhelming majority of universal banks in Poland.

Granting loans for housing by universal banks is quite convenient for borrowers. They can address the banks holding their account, but they can also choose any other provider. Due to competition between the banks, the terms of lending became more lenient regarding interest rates and creditworthiness requirements (while no real sub-prime mortgage sector appeared in Poland).

Loans for housing purposes are also a profitable and convenient product for the banks. They do not need a substantial amount of work once granted and assure interest revenues for a very long time. Up until now, the business of granting housing loans was not risky (according to recent data, the proportion of non-performing loans of this type does not exceed 2 per cent (Report, 2008, Annex, tab. 3.4), but, it is true, with the crisis and recession implying an increase in unemployment, it may worsen). Lack of concentration of those loans in a limited number of banks also had the advantage of dispersing the risk.

Granting loans for housing by universal banks has, nevertheless, some shortcomings. One of them is a maturities mismatch (long-term assets financed by much shorter deposits). In 2004, the Banking Supervision Commission announced its intention to put a limit on mortgage loans proportion, without actually imposing it.\footnote{Interview of the Polish Press Agency with the General Inspector of Bank Supervision of 12.03.2004 published at the webpage www.money.pl}

The universal banks were also particularly exposed to problems with recovering non-performing loans. One reason is that mortgages with the universal bank were in a subordinated position regarding claims on a mortgage on the same real estate in the case of foreclosure. Claims from a universal bank pass after the Treasury and after the mortgage banks (who hold a privileged position in this respect). The other risk comes from the strong protection of inhabitants of the property paying the mortgage. In Poland, due to the law protecting tenants, it is almost impossible to get rid of the inhabitants if the bank wishes to sell a property.

Another problem looming before Polish universal banks was the shrinking finance base coming from deposits and disposable for credit granting. In other words, in parallel with a rise in housing loans, the growth of deposits in the banking system as a whole was fading.
Table 3. Deposits in monetary institutions, PLN mln

<table>
<thead>
<tr>
<th>Period</th>
<th>Households</th>
<th>Companies</th>
<th>Total</th>
<th>Index of growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1996</td>
<td>87 096,4</td>
<td>23 664,8</td>
<td>110 761,2</td>
<td>X</td>
</tr>
<tr>
<td>12.1997</td>
<td>117 795,0</td>
<td>28 936,3</td>
<td>146 731,3</td>
<td>1.325</td>
</tr>
<tr>
<td>12.1998</td>
<td>147 193,5</td>
<td>38 643,3</td>
<td>185 836,8</td>
<td>1.266</td>
</tr>
<tr>
<td>12.1999</td>
<td>167 498,4</td>
<td>47 671,7</td>
<td>215 170,1</td>
<td>1.158</td>
</tr>
<tr>
<td>12.2000</td>
<td>201 175,7</td>
<td>47 072,9</td>
<td>248 248,7</td>
<td>1.154</td>
</tr>
<tr>
<td>12.2001</td>
<td>224 457,0</td>
<td>54 810,4</td>
<td>279 267,3</td>
<td>1.125</td>
</tr>
<tr>
<td>12.2002</td>
<td>216 947,5</td>
<td>55 749,9</td>
<td>272 697,3</td>
<td>0.976</td>
</tr>
<tr>
<td>12.2003</td>
<td>212 617,9</td>
<td>69 470,3</td>
<td>282 088,1</td>
<td>1.034</td>
</tr>
<tr>
<td>12.2004</td>
<td>209 845,0</td>
<td>86 032,1</td>
<td>295 877,1</td>
<td>1.049</td>
</tr>
<tr>
<td>12.2005</td>
<td>220 839,3</td>
<td>100 684,4</td>
<td>321 523,7</td>
<td>1.087</td>
</tr>
<tr>
<td>12.2006</td>
<td>239 366,0</td>
<td>126 646,3</td>
<td>366 012,3</td>
<td>1.138</td>
</tr>
<tr>
<td>12.2007</td>
<td>262 805,4</td>
<td>144 469,4</td>
<td>407 274,8</td>
<td>1.112</td>
</tr>
<tr>
<td>12.2008</td>
<td>332 001,1</td>
<td>151 271,7</td>
<td>483 272,8</td>
<td>1.186</td>
</tr>
<tr>
<td>01.2009</td>
<td>341 820,4</td>
<td>147 079,1</td>
<td>488 899,5</td>
<td>1.012</td>
</tr>
<tr>
<td>02.2009</td>
<td>351 372,8</td>
<td>144 842,2</td>
<td>496 215,0</td>
<td>1.015</td>
</tr>
</tbody>
</table>


The figures from Table 3 cannot be directly compared with those in Tables 1 and 2, which cover only part of the loans. Nevertheless, it can easily be seen that, in particular, over the years 2001–2005, the household deposits were stagnant. The gap was partly compensated by growing company deposits.

This was due to the growing popularity of investment funds with the Polish population. A return of deposits to banks began only after the financial crisis, undermining the profitability of those funds. Also, the universal banks, in search of liquidity due to confidence problems and interbank loans falling during the financial crisis, were aggressively competing for deposits, sometimes offering extremely high interest rates.

Whilst prior to 2008 there was no general liquidity problem in the Polish banking system, access to deposits was different from one bank to another. The more traditional banks, serving mostly households (as PKO BP SA, PeKaO SA, BPH), had a surplus of deposits without being able to transform them into loans and the others, more specialised in serving companies (Citibank Handlowy, BRE) were in shortage. Nevertheless, there were no signs of any illiquidity of the banking sector. The banks were aggressively offering loans at still lower interest rates. This was thanks to boosting interbank loans, and also loans contracted on the foreign financial markets. According to the data from the supervisory authority, interbank loans were quickly increasing in 2007 up to 14.4 per cent of the balance sheets total and for 17 banks, big and middle-sized banks, they were the major source of finance – above 50 per cent of the total of the balance sheet (Synteza, 2007, 13).
Thus, consciousness was growing on the need for an alternative source of financing for the banking sector, matched with a growing demand for securities emanating from the population through investment intermediaries, insurance and pensions funds (the Polish pensions system is just switching to one based on financial investment). This demand for securities could be met either by covered bonds issued by mortgage banks, or by securitisation of assets of universal banks. We will briefly discuss the development of both of these in Poland.

c. Mortgage banks – marginal provider of mortgage loans

In Poland, the activity of mortgage banks has been enabled by the Mortgage Banks Act of 29th August 1997. The legislation was based on German practices. According to Polish legislation, the mortgage bank is supposed to finance its crediting activity by issuance of covered bonds, based on mortgage-backed loans or on loans not mortgage-backed but granted or guaranteed by the State or central banks of European countries. Issuance of those securities may take place only after an amount of loans has been granted, initially out of own financial sources of the bank.

Thanks to the possibility of issuance of covered bonds with very long repayment deadlines, the mortgage banks could preserve the adequacy of maturities. The mortgage banks were granted some privileges regarding their claims on mortgages. They were given priority against the other claimants, even over liabilities to State Treasury.

The activity of Polish mortgage banks is subject to a number of substantial constraints, for example:

– Each real estate potentially subject to crediting should be evaluated according to very restrictive standards and in a labour-consuming and costly procedure; the value of each loan should not exceed this (which is often, due to strict risk assessment, substantially below the market value of the real estate)

– the value of covered bonds refinancing loans cannot exceed 60 per cent of the total value of real estate credited,

– the total value of covered bonds cannot exceed 40 times the equity of the mortgage bank; also, the revenues on those loans should be higher than interests on securities,

– the mortgage bank cannot acquire shares in other companies for more than 10 per cent of its equity,

– mortgage banks can only finance the purchase of property and perpetual tenancy of land, and not, for example, the co-operative right to an apartment (which covers around 40 per cent of real estate in Poland).

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6 Dz. U. 1997, No 140, item 940 (with later amendments)
Those constraints were supposed to assure the high security of the operations of the banks and of the covered bonds they issued. Nevertheless, this made their activity costly and in particular, competition with other banks extremely difficult.

The initial contents of the Mortgage Banks Act were amended in 2002. For example, taking into account the very long procedure of registering a mortgage with the relevant court, the possibility to temporarily secure a loan through insurance was provided. The amendment also enabled a broader service to the developers and their customers.

Constraints imposed on mortgage banks make the sale of loans from universal to mortgage banks almost impossible. Initially, the universal banks intended to sell some of their loans to mortgage banks and to indirectly use the funds raised by the latter through issuing covered bonds. They hoped to use this method as a substitute to securitisation. Nevertheless, it proved almost impossible. The first reason is that the universal banks can extend loans, for example, for the purchase of an apartment which is a co-operative property, which cannot be financed by mortgage banks. Next, universal banks can extend loans for the purchase of a property which has no mortgage record, i.e. not admitted to mortgage banks (except in the case of a developer’s investment, when the mortgage register is constituted when the investment is completed). Next, and most important, to be able to sell loans to mortgage banks, the universal banks should use the same system of evaluation of a property. As this manner of evaluation is very restrictive, it would allow for a much smaller value of loan to be granted. Moreover, the process of evaluation is costly. For these reasons, the universal banks only in very rare cases practice it, and it excludes loans granted under another manner of evaluation from sale to mortgage banks. Additionally, the sale of loans from universal to mortgage banks would imply fiscal problems (Tułodziecka, 2005).

The other barrier to the development of mortgage banks in Poland was the time necessary for the constitution of a liquid market of covered bonds and low return on those securities issued up until now (similar to deposits). It was hampering the development of demand for covered bonds issued in Poland. As a matter of fact, the first packages of covered bonds were taken over by the mother banks of mortgage banks (Łaszek, 2004, 340).

In late 1990, it was hoped that there would be a development of mortgage banks in Poland. The experts were adamant that in Poland, 6 large mortgage banks could operate. In fact, due to the restrictions enumerated above, up until now, only 3 mortgage banks exist in Poland. They are:
- Bank Rozwoju Eksportu Mortgage Bank,
- Bank Przemysłowo-Handlowy Mortgage Bank,
- Śląski Mortgage Bank (within the group ING).

At the end 2002, the Nykredit Mortgage Bank was created, having as its sole shareholder Nykredit A/S from Copenhagen. Finally, it became a branch of Copenhagen Nykredit A/S.
Even if in 2007 the loan dues of mortgage banks increased by 13.3 per cent, their share in mortgage loans barely amounted to 2.6 per cent (Finansowanie, 2007, 10).

Mortgage banks in Poland are specialised in high value loans and lend mostly to companies (81 per cent of loans). Their favourite customers are developers. They loan mostly non-residential real estate, contrary to universal banks, crediting mostly residential investment.

The mortgage banks in Poland were created by large universal banks. Due to the long and costly procedures needed to establish these banks, it is very improbable that the new mortgage banks will come into being in the coming years. They have already their specificity and particular market niches in which they are more visible. In any case, they may take over some demands for mortgage loans if their mother institutions are unable to meet them. Another substantial rise in the percentage of those banks in a loan portfolio would nevertheless need the development of a demand for covered bonds. Up until June 2007, their value amounted to 2 703 mln PLN (compared with 78.291 mln PLN of mortgage loans to individual borrowers and 7.280 mln PLN to institutional borrowers). The future development of demand for those securities will depend on the availability of other investment opportunities and on the trade-off between the return and risk they present.

3. State of development of securitisation in Poland

a. Legislation of securitisation in Poland

In Poland, securitisation was enabled by amendments to the Banking Act of 2004 and by the Act on Investment Funds of 2004. Nevertheless, a single law dedicated to securitisation is still lacking, after a draft was proposed in 2003 but never voted. In particular, there is no single definition of securitisation and of the requirements it should fulfil. For example, the requirement that, as an outcome of securitisation, at least two trenches of securities should be issued, is not clearly spelled out in the legislation.

Securitisation is subject to different pieces of Polish legislation, often in an incoherent way.

The definition of securitisation is provided in the Regulation No 1 of 13 March 2007 of the Polish Commission of Banking Supervision. This regulation transposes Directive No 2006/49/EC of the European Communities. The definition of securi-

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7 Information provided by Krzysztof Pietraszkiewicz, the President of the Association of Polish Bank, after the data of the National Bank of Poland, for The Internet Securities Businesswire (www.bankier.pl of 09.02.2008)
8 Official Journal of the European Union of 30.06.2006
Securitisation is provided for the aim of calculation of capital adequacy requirements of the banks. This definition covers traditional securitisation, based on the “true sale” of loans to a special purpose vehicle (for the definition of which the Regulation addresses the Banking Law) together with sub-participation (passing through only cash flows from assets) and synthetic securitisation (based on derivatives covering risk exposure). The definition requires the issue of securities to be split into trenches of different risk exposures. The definition of the process of securitisation distinguishes the bank-initiator and bank-sponsor of the issue of securities, mentions enhancement of securities, instruments enhancing liquidity and the role of rating agencies. It is thus broader than in the other Polish laws dealing with securitisation, but its relevance is limited to securities backed by dues of the banks and to capital requirements’ calculation. It is nevertheless potentially important, because it formulates the conditions under which the securitised assets may be eliminated from the risk-weighed assets, constituting a basis for capital required from the bank.

The banks may securitise their dues according to Article 92a of the Banking Law. This article indicates the potential special purpose vehicles of securitisation of two types of agents, securitisation funds and commercial companies. Those types of agents have neither the same rights, nor standing. The securitisation fund is created by a society of investment funds, which is supervised by the Commission of Financial Supervision. On the contrary, the company which is the special purpose vehicle is not supervised by any financial supervisor. The ways in which the bank may securitise dues through one or another of those agents are not the same. Broader possibilities are given to the securitisation fund, to which both the dues themselves may be sold, or only the cash flows generated by those dues (the securitisation formula called sub-participation). On the contrary, when the special purpose vehicle is a company, the dues may only be sold and the sale of cash flows alone is not provided for. The Banking Law requires from the agent of securitisation to be independent from the bank-originator (to have neither organisation links, nor property) and to have securitisation as its only activity. The bank-originator is not allowed to carry any responsibility for the liabilities of the securitisation vehicle. It cannot repurchase dues, except after all the obligations due to the securities issuance are satisfied, and dues are normally performing.

The Investment Funds Act regulates further the functioning of securitisation funds. Two forms of securitisation funds are distinguished: standardised and non-standardised. The reason for this distinction was not spelled out. Both funds may acquire from originators both dues or cash flows from dues (sub-participation). The standardised securitisation fund may have a number of sub-funds, and each should serve as a single issue of securities and be based mostly on a homogenous pool of assets or rights to cash flows. On the contrary, the non-standardised fund should not

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9 Dz.U. 2004 no 91 item.870
10 Dz.U.2004 no 146 item 1546
have sub-funds. The securities issued by this type of securitisation fund may be based (up to 25 per cent) on securities. The law enables securitisation funds to issue securities (investment certificates), giving different rights to revenues and bearing different risks in case of default, without obliging them to issue trenches (only sub-funds of a standardised securitisation fund play a similar role). The Act provided for different activities the fund may fulfil. The fund may sign contracts with other parties for rating dues, for servicing loans (in principle, with a bank) and for guaranteeing issued securities. The law did not restrain the pool of initiators of securitisation to banks; on the contrary, it indicated local governments, organisations which are not legal persons and, finally, companies as potential initiators.

Securitisation is also mentioned in the Law on Taxes on Legal Persons. Namely, in the transaction of the sale of dues to a special purpose vehicle, the bank-originator enjoys the fiscal privilege to account as costs, the loss due to sale. This privilege is nevertheless reserved only to special purpose vehicles in the form of securitisation funds, not companies. This regulation is a very interesting incentive for banks holding non-performing loans. In the case of selling those loans to an agent which is not a securitisation fund, the banks are taxed on the whole nominal value of loans which makes all transactions inefficient. On the contrary, the sale of those loans to a securitisation fund is interesting, because the bank gets rid of non-performing loans without incurring fiscal costs (Paczuski, Kalawa, 2002). It is important to note that, first, this regulation paves the way to a very specific role of securitisation (sale of non-performing loans) and, next, excludes special purpose vehicles in the form of companies, from this business.

It appears that the legislator privileged the special purpose vehicles in the form of a securitisation fund. This inequality may be quite accidental, due to the lack of a homogenous act on securitisation. Nevertheless, it should not be overlooked, that the privileged form of a special purpose vehicle and a securitisation fund, is controlled by the Commission of Financial Supervision and its constitution is complicated (it should be constituted by a society of investment funds). This potentially gives grounds for the more prudent functioning of securitisation in Poland, but also hampers development of this business. It is also meaningful, that the Investment Funds Act distinguished standardised funds (with a structure of homogenous sub-funds, thus more transparent) and non-standard, without this requirement and enabled more risky operations, such as issuing securities backed (partly) by other securities. Moreover, the Act did not oblige all securitisation funds to issue investment certificates in a public offering, reserved for large value issuance, requiring careful preparation, professional evaluation and the consent of the Commission Supervising Securities and Stock Exchange. Such a formula, safe, it is true, is quite expensive. The securitisation fund could use a non-public offering, much cheaper but less safe.

11 Dz.U. 1992, No 21, item 86
In practice, securitisation in Poland is subject to different others caveats. The regulations of the Banking Act require the bank-originator to obtain the consent of the borrower to have his loan sold to a third party (also to a special purpose vehicle) and to accept the execution of dues by this agent. In the case of mortgage loans, their sale implies re-attributing all the mortgages to another party (special purpose vehicle). This process takes ages in the Polish mortgage registers. Moreover, from the legislation it is not clear either, if the securitisation transaction is or is not subject to value added tax. According to the general rule, the transactions of financial organisations are exempt from value added tax, but, the general law on securitisation is still lacking, and it is not clear if a special purpose vehicle for securitisations has such a status.

b. Actual applications of securitisation in Poland

Due to the difficulties and unclear character of regulation, the operations of securitisation in Poland to date were rare and they have taken a somewhat biased form. In principle, it was not used at all as backed by mortgage loans. The way in which securitisation is now used in Poland was driven by fiscal legislation. Namely, the banks were willing to get rid of their balance sheets of the completely non-performing loans in another way than by the usual sale, implying income tax on the whole value of the loan. In the case of securitisation, and only in the case of a sale to the securitisation fund, the loss incurred in the operation could be accounted for as the cost of the operation, thus clearing the tax requirement. In this case, securitisation was not conform to the standard definition in the Regulation on capital adequacy, in the sense that it did not provide trenches of different risk exposure. Nevertheless, in this case, risk was total and loss of the due sure, so the conditions stipulated by the Regulation could be bypassed.

The other partners in the game, actively interested in this biased form of securitisation, were debt-vindicating firms. They actively promoted sales in the form of securitisation carried out as a non-public issue of securities, in one trench and sold to a sole purchaser (the debt-vindicating firm itself) at a very low value. They were hoping to recover part of the dues from the collateral.

Up until now, a dozen securitisation funds are registered in Poland. None of them are standardised. They were created with the participation of debt collecting companies. Their operation is based on small scale non-public offerings of certificates purchased by those firms who, in fact, take over non-performing loans and then collect the debt.

The first securitisation transaction in Poland was carried out by PROKURA Investment Fund, an outcome of co-operation between the biggest Polish vindication firm, KRUK S.A., with the Society of Investment Funds of the Bank BPH. The transaction was completed in February 2006 and amounted to 136 mln PLN (about
30 mln Eur) and the PROKURA Fund has taken over the outstanding dues of ING Bank Śląski. Also, the other bank, PKO BP SA, sold its outstanding loans to a similar fund. Up until now, securitisation of loans in Poland was a kind of sale of non-performing loans. There were also some marginal cases of securitisation of regular loans (such as Dominet Bank SA) and of leasing dues (such as Reiffeisen Leasing Polska) (Zawiślak, 2007).

The securitisation responding to the classical requirements (at least two trenches of different risk exposure) did not develop, even if it was possible on the basis of the Investment Funds Act. The first reason could be institutional. Securitisation, and in particular under the form of a securitisation fund, would be costly, due to the requirements the functioning of the fund is subject to, adding up to the necessary scale of efficient securitisation (assessed as around 100 mln USD in public offering) due to the costs of rating and the necessary enhancements. Taking into account the lack of experience in securitisation in Poland, the costs of first issuances would be prohibitive.

The other formula of a special purpose vehicle, a company, was theoretically admitted by the Banking Act, but due to fiscal uncertainties, was not feasible. Maybe, luckily, as this form was not subject to any public supervision and its functioning might be very risky.

The other reason for the non-development of securitisation in Poland was the weakness in demand for additional financial resources from the banks to date. It is true, increase in deposits was dropping, but liquidity in the banking sector as a whole was still sufficient, due to interbank internal and international loans. And the demand for mortgage loans was restrained by limits on the supply side of housing business (scarcity of sufficiently equipped land, length of administrative procedures for building permissions, long cycle of construction). The recent financial crisis, pushing out investors interested mostly in raising the prices of property, came in time to stop any excessive demand for mortgage loans.

4. Conclusion – prospects for securitisation in Poland

Is there a need and possibility for securitisation of dues in the proper sense of this term in Poland?

In the short term it is probably unlikely. The principal reason is the spoiled reputation of securities and, in general, of financial investments, due to the global financial crisis. Even if, because of lack of securitisation, the sub-prime crisis was not the case in Poland, the losses incurred by investment funds make massive purchases of the products of securitisation in Poland rather improbable in the short-term. It is true that banks recently suffered from liquidity problems, even after a shift of deposits from investment funds. Moreover, due to confidence problems and the international market
crunch, interbank loans ceased to be a certain renewable source. This is why banks tried to gain new deposits by offering high interest rates. But it does not mean that they would risk launching a process of securitisation of dues now. Doing it without sufficient experience would be costly and, in the current situation, the risk of being left with offers unsold would be too big. In a recent report of the National Bank of Poland there was even an announcement that some banks wished to issue bonds, but up until now there is no evidence of substantial cash flows from this source (Raport, 2008, 31).

Nevertheless, in the long run, securitisation will probably be helpful to the Polish financial system. The universal banks will, most probably, for a long time prevail over mortgage banks. If the legal barriers to the development of mortgage banks still exist, their development will be only step-wise. Moreover, they will be unable to provide additional finance to universal banks due to constraints on the purchase of loans. Thus, once the demand for loans recovers, the problems of sources of finance of universal banks will appear.

With recovery after the crisis, investment funds will take over a part of deposits. The financial market will replace, to some degree, any intermediation by the banks. Thus, there will emerge a demand for securities. Demand for mortgage loans will resurge and the banks, willing to develop alternative sources of finance, would look for perceiving cash, either through the sale of loans to mortgage banks (which will be marginal), or through securitisation. Additionally, the supervisors will be more sensitive to maturity mismatch, thus simple financing of long-term loans, with shorter term deposits, will be less tolerated. If the confidence problem and squeeze of financial markets continue after the crisis, the pressure on additional sources of finance on Polish banks will be even stronger.

Moreover, there will be another need to sell future cash flows through securitisation, for example to receive financial resources for pre-financing of substantial future proceeds from Structural Funds of the European Union, or for investment of local governments, secured by their future fiscal dues.

For a sound and safe securitisation, regulatory changes will be necessary. To improve the image of securitisation it would be helpful to limit Polish “biased” securitisation of non-performing loans. This may be carried out by eliminating the legislative gaps in fiscal regulations and by accepting sale at a loss of those dues to agents other than securitisation funds (for example, directly to debt-collecting firms).

To assure a broader and safe development of securitisation, Polish legislation should develop its clear and homogenous framework. The unique definition of securitisation should be formulated, covering the process, all the agents involved and their situation, including from a fiscal point of view. In particular, the situation of the special purpose vehicles not being securitisation funds should be cleared up, and also the use of different formulas of securitisation funds (standardised and non-standardised). All the agents involved in the securitisation process should be covered by financial supervision.
As the necessary scale of securitisation is a problem, in particular to begin with, and the need of finance will probably emanate from smaller debt originators, the possibility of joint undertakings of groups of initiators should be allowed.

Some regulatory changes concerning securitisation would emanate from the common European initiatives to better regulate financial markets, such as the previously mentioned regulation of rating agencies, broader competencies and obligations of national supervisors and obligations of transparency of public investors. It is not clear what the scope will be of the European regulation and when it might enter into force. Polish national legislation may be revised even earlier, to extend supervision to the agents potentially involved in securitisation and to tighten requirements as to the transparency of activities of financial agents and to the professionalism of due diligence. Such an extension, even beyond European regulations, would be adequate in the Polish context, of both less-developed activities and competencies.

References:


1. Introduction

Nowadays, advances in network technology and the globalisation of markets and business processes have created a revolution in business and information systems (Calderon, Chandra and Cheh, 2006). The well-known term “business” is converted to “e-business” (“e-” refer to various technology-enabled business activities) upgrading its main infrastructure. The main infrastructure for e-business consists of corporate computer networks which compose the backbone of distributed financial information systems (Prabhu and Raghavan, 1996). Nevertheless, Bertolotti et al (2007) underlined that computer networks are exposed to serious security threats (attacks from hackers, malicious users or even cyber-terrorists who use hi-tech abuse techniques and methods to commit computer fraud) that can even have catastrophic consequences from both the economy points of view and safety. Throughout history, successful business relationships have been fundamentally based on trust, so naturally a secured, comprehensive and trusted infrastructure is essential to the future success of the firm. However, how secure, reliable, consistent and valid are the distributed financial information systems? A survey in several large private enterprises and public organisations in Greece sheds light on the hidden points of view of security in distributed financial information systems (FIS). The observation of the technical network specifications, as well as the analysis of the security policies of the examined enterprises, are the main targets of the current study.

In spite of the fact that computer networks offer many worthy of remark services and advantages, many expanded threats appear to the FIS and eventually to the whole enterprise. A computer-system threat has various types and effects. It is remarkable that the number of threats is increasing while the technology is developing (Allen et al 2000). Therefore, system security is a very important issue, which the Chief

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Information Officers (CIO), system administrators, supervisors and managers ought to take into serious consideration. System security also consists of many and various components. A user name and a password is only one of the known safety measures against expanded threats. Furthermore, there are many other types of security, such as data encryption, routing verification procedures, intrusion detection etc. Consequently, security issues deserve caution by any serious organisation and especially, the security of FIS. That is why a survey takes place in order to examine specific factors that seriously affect the security of distributed FIS of several large enterprises. The password policy, audit trails events, the use of Kerberos system and CIO’s/system administrator’s graduated studies are examined in this work. Throughout this survey, primary data were gathered from fifty large private industrial plants and public national organisations in Greece (several interviews and observations took place).

2. Theoretical Background

2.1. Financial Information Systems (FIS)

The main obligation of FIS is to keep updated and under control not only the revenue, the expenditure, the production and the human resources/payroll cycle of a firm, but also the general ledger and the reporting system (Romney and Steinbart, 2003). Thus, financial information systems offer: operational assistance to a firm (keeping track of transactions), knowledgeable support (using computerised tools for quick and easy support in investments), managerial aid (controlling financial resources) and strategic development of the organisation (establishing long-term investment goals and providing long-range forecasts of the firm’s financial performance). The above features of FIS are achieved and integrated with the use of enterprise resource planning (ERP) system applications. ERP systems integrate all the operational aspects of a firm with the traditional accounting-financial functions. The corporate data are kept in databases and a database management system (DBMS) is responsible for the data exploitation and sharing. Romney and Steinbart (2003, p. 335) mentioned that “in response to the Y2K issue, many large organisations replaced their disparate stand-alone legacy systems with integrated information systems, such as enterprise resource planning (ERP) systems”. Nowadays, it has been observed that there is a wide use of ERP systems by most of the contemporary enterprises.
2.2. *Computer fraud and the necessity of information system security*

The Securing Proprietary Information Committee of the American Society of Industrial Security observed that the value of a company’s future lies not in its tangible assets, but in the “intellectual capital” of the business (Carter and Katz, 1997). In most businesses today, intellectual property is kept in computers by means of data, information and computerised processes. As a consequence, the computer has become the target – and many times the instrument – of e-crimes. Romney and Steinbart (2003) mentioned that many computer frauds go undetected and only 5 to 20 per cent of computer crime is detected. The reason for the above mentioned finding is the existence of many different kinds of computer threats using various and modern techniques. Trojan horses, virus hoaxes, adware, spyware, remote access programs, diallers, hack tools, e-mail threats, e-mail forgery, e-mail bombs, e-mail spamming, trap door, data diddling, data leakage, logic time bomb, round-down and salami technique are only a few of the well-known computer frauds and abuse techniques. That is why Allen et al (2000) mentioned that while experienced intruders are getting smarter – as demonstrated by the increased sophistication in the types of attacks – the knowledge required on the part of novice intruders to copy and launch known methods of attack is decreasing (Figure 1).

![Figure 1. Attack Sophistication vs. Intruder Technical Knowledge (Allen et al., 2000).](image_url)

Nevertheless, studies revealed that most employees do not even give a minute per hour of their workday for IT security (Luzwick, 2004). Most enterprises employ system administrators, information system security officers (ISSOs), physical security, operations security or other security professionals only when their network or applications do not respond. Looking at the facts, Microsoft’s Millennium Edition was cracked
before it was released; Microsoft Outlook was exploited, and without executable files in attachments, also Adobe Acrobat, Netscape Navigator, Microsoft’s Internet Explorer, Word, Excel, Access and Cisco’s gigabit Ethernet router family were exploited too. Consequently, it is really wise and important for every company to organise security policies and use the proper security tools and techniques for achieving the integrity, reliability, availability and accuracy of its information systems.

2.3. Secure password policies

Crume (2004) cited that according to a survey by Barron McCann, 92 per cent of IT managers prefer to use passwords as protection from possible data thieves. This means that information systems are only as secure as the weakest password (Schneier, 2000, p. 139). Hacking or cracking can be slowed down significantly or even defeated through the use of strong passwords. According to Microsoft Security Guidance Kit (2004) and to SANS Institute Password Policy (2005), a strong password is a password that includes characters from at least three of the five groups in the character classes table (Table 1). In addition, the longer the password the more difficult it is to break. Crume (2004, p. 1) stated that “a 4-digit numeric password could be cracked on a modest PC in 0.02 seconds – faster than you can blink your eyes”. However, the longer the passwords are the more difficult it is for the users to remember them (Warkentin, Davis and Bekkering, 2004; Schneier, 2000). Furthermore, the length of a password depends also on the operating system. The maximum password size on many UNIX systems is eight characters and some newer versions of UNIX support 16-character passwords (Cooper et al 1995). In Windows NT 4.0 or earlier, Windows 2000, Windows XP, and Windows Server 2003, passwords up to fifteen or more characters are supported (Microsoft Security Guidance Kit, 2004). Consequently, creating passwords with both complexity and length makes them the most difficult of all to break.

<table>
<thead>
<tr>
<th>Group</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowercase letters</td>
<td>a, b, c, ...</td>
</tr>
<tr>
<td>Uppercase letters</td>
<td>A, B, C, ...</td>
</tr>
<tr>
<td>Numerals</td>
<td>0, 1, 2, 3, 4, 5, 6, 7, 8, 9</td>
</tr>
<tr>
<td>Non-alphanumeric (symbols)</td>
<td>( ) ~ ! @ # $ % ^ &amp; * + =</td>
</tr>
<tr>
<td>Unicode characters</td>
<td>€, □, ¢, $, and ?</td>
</tr>
</tbody>
</table>

Choosing a secure password is mainly a matter of individual responsibility and training, too (Cooper et al 1995; Charoen, Raman and Olfsman, 2005). Thus, a couple of secure password techniques have been developed in order to help end-users and system administrators keep their passwords safe. One of the best secure password
techniques is the use of smart cards (Hancock, 1999). These smart cards generate a new and unique password every minute. The information system uses the same algorithm and generates the same passwords, because it is time-synchronised with the smart cards. The specific password procedure requires a user to enter a value obtained from a smart card when asked for a password by the computer. Even though it is a better way of dealing with authorisation than with the traditional password approach, it is more expensive and maybe a little bit inconvenient to carry the smart card. Moreover, an alternative password technique which is based on the confidentiality of the systematically repeated change of passwords is the password age. The system administrators ought to adjust properly the maximum password age (in days). This adjustment determines how many days a password can be used before the user is required to change it.

2.4. Audit trails

Another security technique, which has been developed for financial information systems since the inception of computers, is audit trails (Allinson, 2001). Although in the beginning, the audit trails were used in accounting for the checking of the financial reliability of a business, nowadays it has become a process of recording a series of specific events occurred in an information system. Cooper et al (1995) defined audit trails as any file that records the time users log in, from where they log in, what they try to do, and any other action a CIO might want to save for later analysis. In other words, audit trails can provide a CIO with valuable information in tracking security violation and break-in attempts. Therefore, audit trails seriously contribute to a process verification of an information system, as well as to fraud prevention. Despite the important contribution of audit trails to information system security, an Australia-wide survey in the Australian Commonwealth and State Governments revealed that most organisations approach audit trails inconsistently and incomprehensively (Allinson, 2001).

It is also worth mentioning that most of the current computer and network operating systems offer audit trails utilities. The UNIX network operating system provides a large number of auditing and logging tools and utilities. Most of them are enabled by default system configuration and some others must be turned on and configured by the administrator. Some common UNIX logs are: lastlog (keeps track of each user’s most recent login time and each user’s originating destination), UTMP (keeps track only of online users), WTMP (keeps track of logins, logouts and normal system shutdowns, reboots), syslog (is a very powerful message-logging facility which keeps track of a variety of programmes) and history (keeps a record of recent commands entered by user). In addition, Cooper et al (1995) noticed that some UNIX versions include sniffing utilities such as tcpdump or snoop, which belong to Ethernet sniffer
programs (they log all activity over the local Ethernet segment). On the other hand, Windows stores its log files in a special format that can be read using the Event Viewer Application from the Administrative Tools programme group.

### 2.5. Data encryption

Due to the extraordinary growth of the Internet and technology-enabled business activities, many organisations rely on encryption to protect sensitive information transmitted over the Internet and other networks. In the field of on-line applications and client/server computing, where the communications medium is TCP/IP, Kerberos protocol is commonly used (the name comes from Greek Mythology). Kerberos is an authentication system that is part of project Athena at the Massachusetts Institute of Technology – MIT (MiUen et al 1987). Pfleeger (2000) mentioned that Kerberos is a system that supports authentication in distributed information systems. The basis of Kerberos is a central server (authentication server-AS) that knows the passwords of all users and stores these in a centralised database; it also provides authenticated tokens, called tickets, to requesting applications. Thus, the user of a Kerberos enabled distributed FIS has the facility to log in once and uses a variety of services during a specific session, without the inconvenience of explicitly authenticating (Neuman and Ts’o, 1994). Kerberos has been adopted by many enterprises, universities and organisations, and implementations are available for all major operating systems (Butler et al 2006).

### 3. Methodology

Taking into consideration the above mentioned theoretical and empirical background, an integrative survey was designed and took place in fifty Greek large private industrial plants and public national organisations. The main purpose of the survey is firstly, to examine thoroughly the infrastructure of each industrial plant and organisation, and then, to focus on the specific security issues of the observed distributed FIS, individually.

The survey was conducted by in-depth interviews with the CIO and/or system administrators and afterwards by several observations on the spot. Thus, a first contact type of e-mail with an attached automated-electronic form was sent to many CIOs, system administrators and IT consultants in Greece. The particular electronic form informed the receivers about the subject, the questions and the purpose of the interview. Then, each enterprise and organisation filled the form and sent it back to the author by e-mail. After the first data gathering by e-mail, several interviews (some of them by telephone communication, due to the large distances) with the CIO of the firms/
organisations were arranged, in order to illuminate every obscure corner of the study. In addition, in some cases, the final verification of the corporate data was achieved by the author through observation of the current distributed network infrastructure of the examined FIS. Eventually, all the collected data (gathered by e-mails, interviews and observations) were structured, tabulated and encoded by two different statistical software applications.

The content of the above data gathering was orientated into two sections. In the first section, the technical specifications of the observed computer networks were identified in order to ensure the existence and the operational conditions of a distributed FIS. Thus, the geographical scope of the network, the network topology, the type of data communication cables, the nominal data network speed, the type of router, the number of corporate servers, the type of servers and clients depended on, the CPU (Central Processing Unit(s)) and the NOS (Network Operating System) of the servers, the CPU and the OS (Operating System) of the clients were examined. In the second section of the collected data, a security approach of the above defined distributed FIS took place. Hence, the first factor that was investigated was the type of password the users choose for accessing FIS resources. A sample of 30 per cent of the users within the examined organisations participated in this survey (more than adequate for statistical analysis). Four types of password authentication were checked: simple passwords (insecure passwords, which have small length and homogeneous characters), complex passwords (passwords with both complexity and length), complex passwords with specific expiration date and the use of smart cards (one of the best modern password techniques). The second examined security issue was the audit trail events of the FIS. According to Allinson (2001), five significant parameters were examined in this survey – the audit trail generation, the audit trail retention, the audit trail storage, the existence of enhanced security mechanisms and the responsibility for audit trails. Another examined security parameter was the use of Kerberos protocol in the FIS network and the relation of CIO’s/system administrator’s graduated studies with the Information Technology field. In point of the later parameter, it is noticeable that in some of the examined enterprises and organisations the CIO and the system administrator were the same person; and in other cases, there was only a system administrator.

4. Results and Discussion

The research modelling appealed to fifty Greek large private companies and public organisations that used distributed FIS. Twenty-five private firms of the sample were large industrial plants and the rest of the sample consisted of public national organisations (Appendix 1). The main criterion of the sample selection was the FIS of
every Greek large enterprise or organisation to be based upon a distributed computer network, which consists of a switched Ethernet type of local area network (LAN) with a gateway to the Internet (Figure 2). Thus, the first section of data gathering (concerning technical network specifications) took place in order to ensure that the sample follows the requirements of the study. According to the first section of data gathering, it was found that apart from the corporate LAN, ten of the fifty firms used also a wide area network (WAN) or a metropolitan area network (MAN). Nevertheless, the above isolated cases used separated gateways, which were dedicated for WAN or MAN use. Therefore, the above phenomenon did not affect the current survey. Though there was useful outcoming information from the technical network specifications of the examined industrial plants and national organisations (first section of the survey), the main scope of this research paper is not computer science, but the security approach of distributed FIS (second section of the survey).

Figure 2. Network infrastructure of the examined distributed FIS.

The first examined security factor of the distributed FIS was the reliability of the password authentication, which was used by 30 per cent of the users within the examined firms and organisations. The results revealed that 32 per cent of the sample used simple passwords, 48 per cent used complex passwords and only 20 per cent of the sample used complex passwords with specific expiration dates (Figure 3). It is worth mentioning that 5 per cent of those who used simple passwords claimed that they knew how to make complex passwords, but they were afraid of forgetting them; and the remainder of them (15 per cent) claimed that they had never been trained to use “strong passwords”. Another important finding was that 42 per cent of those who used complex passwords did not use password age, because this option had been disabled by the system administrator; and the other 6 per cent disabled it themselves for facility reasons. The lack of users’ training and the lack of time of the IT support
department to occupy itself with expired passwords are in line with the theoretical background (Warkentin, Davis and Bekkering, 2004; Schneier, 2000; Charoen, Raman and Olfman, 2005). Furthermore, Table 4 (Appendix 2) shows that there is a significant statistical association between the IT graduated studies of CIOs/system administrators and the level of security of users’ passwords $[\chi^2(2)=9.48, p<.01]$. For instance, 87.5 per cent of the users, who used simple passwords, work in companies or organisations with non-IT graduates CIO/system administrators and 60 per cent of the users, who used complex passwords, worked in companies or organisations with IT graduates CIO/system administrators. The above observation reflects the fact that the users of the examined firms and organisations, whose CIO/system administrators were IT graduates, used more secure passwords than the users of the companies and organisations with non-IT graduates CIO/system administrators. Unfortunately, none of the examined enterprises or organisations used smart cards for password authentication; most of them believed that it was too excessive, expensive and also a complicated technique.

Figure 3. Type of password protection.

Audit trail was the next examined variable in the security of a distributed FIS. Five important parameters of audit trails were examined in this survey (Allinson, 2001). The generation of audit trails by the companies and the proper attention to them was the first examined parameter. In other words, how many companies and organisations wittingly not only generate audit trails by the use of software tools, but also study them. According to Table 3 (Appendix 1) only 28 per cent of the companies and organisations generated audit trails and paid proper attention to them. Many CIO/system administrators stated that they cannot undertake all the security-related duties they want to due to the overwhelming daily FIS obligations. The next examined parameters (Table 3, Appendix 1) referred only to those companies and organisations
that generate audit trails (i.e. 28 per cent of the initial sample). Thus, 50 per cent of the companies and organisations that generated audit trails retained them for up to 2 years and the remainder of them for more than 2 years. Most of them (50 per cent) kept the audit trails on the file server with the other corporate data, 42.9 per cent used peripheral storage devices for audit trails retaining and only 7.1 per cent used a separate server for audit trails. Moreover, most of the firms and organisations (71.4 per cent) did not use security mechanisms (password authentication or data encryption) for protecting the audit trails from unauthorised access; and only 28.6 per cent used password protection for accessing the folder of audit trails. The responsibility and the control for audit trails from a security perspective belonged equally to the information system department (35.7 per cent) and to system administrator (35.7 per cent); the responsibility for the audit trails of the remaining percentage belonged to the business owners, while neither firm nor organisation had established an audit department. Comparing the results of the companies and organisations that generated audit trails with the IT graduated studies of their CIO/system administrators there is a significant relationship \[x^2(1) = 5.93, p<.05\]. This seems to represent the fact that based on the odds ratio

\[
\text{odds ratio} = \frac{\text{odds}_{\text{non-IT graduated doesn't use AT}}}{\text{odds}_{\text{IT graduate uses AT}}} = \frac{12}{4} = 5 \] (Field, 2005)

CIO/system administrators were 5 times more likely not to be IT graduates if they did not use audit trails than if they used audit trails.

Based upon the results of the above security factors, it is easily understandable that IT graduated studies of the CIO/system administrators play a significant role in the security level of a distributed FIS. A CIO/system administrator ought to stand not only upon his/her experiences, but also upon his/her educational provision. In addition, a cross-tabulation of the sector (public or private) of the companies and organisations with IT graduated studies of their CIO/system administrators (Table 6, Appendix 2) revealed that there is a significant statistical association \[x^2(2) = 5.19, p<.05\]. For example, 72 per cent of the CIO/system administrators who worked in the public sector were non-IT graduates and 60 per cent of the CIO/system administrators who worked in the private sector were IT graduates.

Pedestal on the odds ratio

\[
\text{odds ratio} = \frac{\text{odds}_{\text{non-IT graduate belong to public sector}}}{\text{odds}_{\text{IT graduate belong to private sector}}} = \frac{2.57}{0.67} = 3.84 \], it seems to
Pedestal on the odds ratio seems be a sign of the fact that CIO/system administrators were 3.84 times more likely not to be IT graduates if they belonged to the public sector than if they belonged to the private sector.

Another important examined security factor of the distributed FIS was the adaptation of the Kerberos authentication system by Greek private industrial plants and national organisations. However, in spite of the fact that Kerberos is a system that supports authentication in distributed systems, only 12 per cent of the examined sample used it. It seems that Kerberos is not a popular system in Greece and most of the firms did not use it because they did not know it. Consequently, though the name Kerberos comes from Greek Mythology, the Greek private industrial plants and public national organisations did not prefer to use the Kerberos authentication system in their FIS.

5. Conclusions

Taking everything into consideration, several useful and remarkable conclusions could be drawn from the current survey. The lack of users’ training and the lack of time of the IT support department to occupy themselves with expired passwords are the main reasons that make users of a distributed FIS use simple and insecure passwords. Moreover, the overwhelming daily FIS obligations force CIO/system administrators to be inadequate in their stern security-related duties such as audit trails’ generation and study. In addition, IT graduated studies of the CIO/system administrators play a significant role in the security level of a distributed FIS. On the other hand, smart cards for password protection and the Kerberos authentication system are not popular systems in Greece and most of the examined companies and organisations did not use them because they did not even know them. Consequently, Greek enterprises need to realise and take seriously the fact that security is not something extra, but a normal part of performing business. A better allocation of the information system department’s duties and also, the development of new IT departments that would be dedicated to specific duties, such as audit trails, would alleviate the CIO/system administrators’ burden and make them more productive and efficient. Hence, it is really wise for every company and organisation to develop security policies and use the proper security tools and techniques for achieving integrity, reliability, availability and accuracy to its financial information system.
References


## Appendix 1. Frequency tables

Table 2. Frequency table of Password, Kerberos Use, IT Graduate and Sector security variables of the FIS.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Password</th>
<th>Kerberos Use</th>
<th>IT Graduate</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>N valid</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Missing</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Password

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
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<td>32.0</td>
<td>32.0</td>
</tr>
<tr>
<td>Complex</td>
<td>24</td>
<td>48.0</td>
<td>80.0</td>
</tr>
<tr>
<td>Complex with date</td>
<td>10</td>
<td>20.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

### Kerberos Use

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>44</td>
<td>88.0</td>
<td>88.0</td>
</tr>
<tr>
<td>Yes</td>
<td>6</td>
<td>12.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

### IT Graduate

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>28</td>
<td>56.0</td>
<td>56.0</td>
</tr>
<tr>
<td>Yes</td>
<td>22</td>
<td>44.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
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</tbody>
</table>

### Sector

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
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<td>50.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Private</td>
<td>25</td>
<td>50.0</td>
<td>100.0</td>
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<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Frequency table of the five parameters of Audit Trails security variable.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Audit trail generation</th>
<th>Audit trail retention</th>
<th>Audit trail storage</th>
<th>Enhanced security mechanisms</th>
<th>Responsibility for audit trails</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit trail generation</td>
<td>Frequency</td>
<td>Percent</td>
<td>Cumulative Percent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>36</td>
<td>72.0</td>
<td>72.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>14</td>
<td>28.0</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audit trail retention</td>
<td>Frequency</td>
<td>Percent</td>
<td>Cumulative Percent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>7</td>
<td>50.0</td>
<td>50.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;2Yrs</td>
<td>7</td>
<td>50.0</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audit trail storage</td>
<td>Frequency</td>
<td>Percent</td>
<td>Cumulative Percent</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>42.9</td>
<td>42.9</td>
<td></td>
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</tr>
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<td>92.9</td>
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<td></td>
</tr>
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<td>100.0</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhanced security mechanisms</td>
<td>Frequency</td>
<td>Percent</td>
<td>Cumulative Percent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
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<td>71.4</td>
<td>71.4</td>
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<td></td>
</tr>
<tr>
<td>Not used</td>
<td>4</td>
<td>28.6</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsibility for audit trails</td>
<td>Frequency</td>
<td>Percent</td>
<td>Cumulative Percent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Admin</td>
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<td>35.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
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<td>35.7</td>
<td>71.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information system Dept.</td>
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<td>35.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business owner</td>
<td>4</td>
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<td>100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
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</table>
### Appendix 2. Cross-tabulations – chi square analysis

Table 4. Cross-tabulation and X² analysis of variables: “IT graduated studies of CIO/system administrator” and “Password”.

<table>
<thead>
<tr>
<th>Password</th>
<th>Simple</th>
<th>Complex</th>
<th>Complex with date</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Graduate</td>
<td>Count</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>% within IT Graduate</td>
<td>50.0%</td>
<td>35.7%</td>
<td>14.3%</td>
<td>100.0%</td>
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<tr>
<td>% within Password</td>
<td>87.5%</td>
<td>41.7%</td>
<td>40.0%</td>
<td>56.0%</td>
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<tr>
<td>Count</td>
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<td>14</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>Yes</td>
<td>% within IT Graduate</td>
<td>9.1%</td>
<td>63.6%</td>
<td>27.3%</td>
</tr>
<tr>
<td>% within Password</td>
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<td>44.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
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<td>10</td>
</tr>
<tr>
<td>% within IT Graduate</td>
<td>32.0%</td>
<td>48.0%</td>
<td>20.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% within Password</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

\[(X^2=9.48, \text{DF}=2, p=0.009)\]

Table 5. Cross-tabulation and X² analysis of variables: “IT graduated studies of CIO/system administrator” and “Audit trails”.

<table>
<thead>
<tr>
<th>Audit trail generation</th>
<th>No</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Graduate</td>
<td>Count</td>
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<td>4</td>
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<tr>
<td>No</td>
<td>% within IT Graduate</td>
<td>85.7%</td>
<td>14.3%</td>
</tr>
<tr>
<td>% within Audit trail generation</td>
<td>66.7%</td>
<td>28.6%</td>
<td>56.0%</td>
</tr>
<tr>
<td>Count</td>
<td>12</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Yes</td>
<td>% within IT Graduate</td>
<td>54.5%</td>
<td>45.5%</td>
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<tr>
<td>% within Audit trail generation</td>
<td>33.3%</td>
<td>71.4%</td>
<td>44.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
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<td>14</td>
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<tr>
<td>% within IT Graduate</td>
<td>72.0%</td>
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<td>100.0%</td>
</tr>
<tr>
<td>% within Audit trail generation</td>
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<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

\[(X^2=5.93, \text{DF}=1, p=0.015)\]

Table 6. Cross-tabulation and X² analysis of variables: “IT graduated studies of CIO/system administrator” and “Sector”.

<table>
<thead>
<tr>
<th>Sector</th>
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<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Graduate</td>
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<td>10</td>
</tr>
<tr>
<td>No</td>
<td>% within IT Graduate</td>
<td>64.3%</td>
<td>35.7%</td>
</tr>
<tr>
<td>% within Sector</td>
<td>72.0%</td>
<td>40.0%</td>
<td>56.0%</td>
</tr>
<tr>
<td>Count</td>
<td>7</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>Yes</td>
<td>% within IT Graduate</td>
<td>31.8%</td>
<td>68.2%</td>
</tr>
<tr>
<td>% within Sector</td>
<td>28.0%</td>
<td>60.0%</td>
<td>44.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
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<td>25</td>
</tr>
<tr>
<td>% within IT Graduate</td>
<td>50.0%</td>
<td>50.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% within Sector</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

\[(X^2=5.19, \text{DF}=2, p=0.023)\]
1. Introduction

The Capital Assets Pricing Model (CAPM) is a well-known and widely used model for financial and physical assets’ evaluation. Its roots are based on Sharpe’s (1964) and Lintner’s (1965) papers. It is a model that has raised a wide discussion in the finance field. In literature we find opinions against (Fama and French, 1992; Roll, 1977) and for (Wang and Jagannathan, 1993); (Clare, Priestley et al, 1998). Because of the discussion, many enhancements have been proposed and new versions have emerged (e.g. the Fama-French Three-factor model). However, in practice, none of these alternative versions is as commonly used as the standard version.

Among the CAPM applications are the determination of discount rates for evaluation purposes. For example, to compute the Weighted Average Capital Cost (WACC), the analyst needs to know the cost of equity. Thus, at a practical level, CAPM is used to compute the cost of equity to be applied according to the WACC formula, and if

\[
WACC = (Ke \times We) + (Kp \times Wp) + (Kd \times (1-t) \times Wd)
\]

Ke – Equity cost (i.e. the expected return according to CAPM)
We – cost of equity weight (%) in the capital structure (at market value)
Kp – Preferred equity cost (preferred shares)
Wp – weight (%) preferred equity in the capital structure (at market value)
Kd – Cost of Debt before tax
a company finances all of its assets with equity resources, then the cost of equity will be equal to WACC.

The aim of this study is not to discuss any theoretical issue about the model; it is simply to investigate if CAPM, considering the main differences to estimate betas and according to a specific materiality level, can provide a proper discount rate to compute a reliable value in use. Therefore, four renowned entities, Bloomberg, Value Line, Baseline and Ibbotson, have been analysed on how they estimate the betas. The most important differences in computing betas arise from the type of returns used (daily or monthly), the index used as a proxy for the market portfolio and the estimate period (5 years, 2 years or 1 year). In this study, the focus will be on the last difference mentioned.

When searching literature, various studies can be found, for instance Ehrhardt (1994) and Pratt (2002), analysed the consequences of using different estimate periods, however, not considering the materiality relevance in an accounting perspective.

The effect of the estimate period on CAPM results and the restriction of an appropriate materiality level raises the main research question “Is the CAPM a proper method to be used in the process of computing the value in use?”

To answer the question, we structured the study in four main parts. First, we describe some practical aspects in using CAPM. Second, we expose the data and method. Third, we define and establish a materiality level. Finally, we present the results and then the conclusions.

2. CAPM – some practical aspects

The trade-off between risk and return requires a particular judgment that depends on the investor’s behaviour; some are risk averse, others are not. The CAPM model allows investors to relate risk and return. CAPM formula states the following:

\[ E[R_{it}] = R_f + \beta_i (E[R_m - R_f]) \] (1)

The component \( \beta_i \) (the beta) measures the sensitivity of the security return to the variations in the market return. If beta is greater than one, it means that the variation in the security return is greater than the variation in the market return. On the contrary, if beta is smaller than one, the variation in the security return is less than the variation in the market. Beta is the covariance between the security return and market return, divided by the variance market return; nonetheless, in practice, the most common way to estimate beta is using the Ordinary Least Squares (OLS) method.

\[ t \] – tax rate
\[ Wd \] – Weight (%) of debt in the capital structure (at market value)
The expected return (E[R_{it}]) from the above equation is also affected by the risk-free rate and the equity risk premium (ERP), which is equal to E[R_{m} - R_{f}]. As well as beta, the risk-free rate and the equity risk premium could lead to an extensive discussion; nevertheless, it is not the aim of this study.

To estimate beta, the use of excess returns over the risk-free rate is, from a theoretical point of view, recommended. The regression equation is:

\[(R_{it} - R_{ft}) = a_i + \beta_i \times (R_{mt} - R_{ft}) + \epsilon_{it}\] (2)

- \(R_{it}\) – Return in period t
- \(R_{ft}\) – Risk-free rate in period t
- \(R_{mt}\) – Return on the market in period t
- \(\epsilon_{it}\) – Regression residual in period t
- \(a_i\) – Regression intercept
- \(\beta_i\) – Slope of the regression, that is, the estimate of beta

However, in practice, the rule is to use only the returns, because as Ehrhardt demonstrated «It does not make much difference whether one takes into account the free risk rate. That is, it does not matter if we use the market model equation or the excess returns model equation, the beta estimate is similar» (Ehrhardt, 1994, p. 57). Then, if we take into account only the returns, the regression equation, known as the market model, would be:

\[R_{it} = a_i + \beta_i \times R_{mt} + \epsilon_{it}\] (3)

To perform the regression, at a practical level, the Ordinary Least Squares (OLS) is commonly used. The security is considered to be a dependent variable and one market index should be chosen and used as an independent variable. Regarding the proxy for the market portfolio, it is usual to use the S&P 500 index, although some entities allow users to choose any market index. According to theory, the index to be used as proxy for the market portfolio should include as many components as possible. Therefore, some sector indexes appear to be inappropriate. If we analyse the correlation between the S&P 500 index with the market variation, it seems almost perfect; consequently, the use of S&P 500 appears to be the right choice. The slope of regression gives beta, the component that captures the security variation caused by the market variation.

After collecting the risk-free rate, the beta and the ERP, it is only necessary to use the CAPM formula to obtain the E[R_{it}] (or Ke), that is, the discount rate to be used to compute the present value, in order to achieve the assets value in use.

---

3. Data and Method

3.1. Sample selection

The sample includes public companies from the NYSE and NASDAQ stock markets. To test the CAPM to compute reliable discount rates, we chose components from the Amex Internet index, which consist of 45 companies. The dotcom company quotes are among the most volatile in the stock market; therefore, they can be used as a “stress test” for the CAPM. That is, if CAMP results were reliable for dotcom companies, then it would be possible to obtain reliable results for the majority of listed companies. Otherwise, the CAPM use should not be considered or allowed for highly volatile securities.

To simplify the study, considering the capital structure of each company, we kept only those securities that have a capital structure (at market values and debt only) based on 100 per cent equity. Accordingly, the sample was reduced to 15 companies. The sample can be seen in the following table:

<table>
<thead>
<tr>
<th>Ticker</th>
<th>Company</th>
<th>Website</th>
<th>Stock market</th>
<th>Quotes available after:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRCM</td>
<td>Broadcom Corporation</td>
<td><a href="http://www.broadcom.com">www.broadcom.com</a></td>
<td>NASDAQ</td>
<td>01-May-98</td>
</tr>
<tr>
<td>CSCO</td>
<td>Cisco Systems, Inc.</td>
<td><a href="http://www.cisco.com">www.cisco.com</a></td>
<td>NASDAQ</td>
<td>02-Jan-96</td>
</tr>
<tr>
<td>EBAY</td>
<td>eBay Inc.</td>
<td><a href="http://www.ebay.com">www.ebay.com</a></td>
<td>NASDAQ</td>
<td>01-Oct-98</td>
</tr>
<tr>
<td>FDRY</td>
<td>Foundry Networks, Inc.</td>
<td><a href="http://www.foundrynetworks.com">www.foundrynetworks.com</a></td>
<td>NASDAQ</td>
<td>01-Oct-99</td>
</tr>
<tr>
<td>MACR</td>
<td>Macromedia, Inc.</td>
<td><a href="http://www.macromedia.com">www.macromedia.com</a></td>
<td>NASDAQ</td>
<td>02-Jan-96</td>
</tr>
<tr>
<td>MFE</td>
<td>McAfee, Inc.</td>
<td><a href="http://www.nai.com">www.nai.com</a></td>
<td>NYSE</td>
<td>02-Jan-96</td>
</tr>
<tr>
<td>QCOM</td>
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<td>NASDAQ</td>
<td>02-Jan-96</td>
</tr>
<tr>
<td>RIMM</td>
<td>Research In Motion Limited</td>
<td><a href="http://www.rim.net">www.rim.net</a></td>
<td>NASDAQ</td>
<td>04-Feb-99</td>
</tr>
<tr>
<td>SEBL</td>
<td>Siebel Systems, Inc.</td>
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<td>NASDAQ</td>
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</tr>
<tr>
<td>SONE</td>
<td>S1 Corporation</td>
<td><a href="http://www.s1.com">www.s1.com</a></td>
<td>NASDAQ</td>
<td>03-Jun-96</td>
</tr>
<tr>
<td>VRSN</td>
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<td>NASDAQ</td>
<td>02-Feb-98</td>
</tr>
<tr>
<td>WBSN</td>
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<td>NASDAQ</td>
<td>03-Jul-00</td>
</tr>
<tr>
<td>WEBM</td>
<td>webMethods, Inc.</td>
<td><a href="http://www.webmethods.com">www.webmethods.com</a></td>
<td>NASDAQ</td>
<td>01-Mar-00</td>
</tr>
<tr>
<td>WEBX</td>
<td>WebEx Communications, Inc.</td>
<td><a href="http://www.webex.com">www.webex.com</a></td>
<td>NASDAQ</td>
<td>02-Aug-00</td>
</tr>
<tr>
<td>YHOO</td>
<td>Yahoo! Inc.</td>
<td><a href="http://www.yahoo.com">www.yahoo.com</a></td>
<td>NASDAQ</td>
<td>01-May-96</td>
</tr>
</tbody>
</table>

3.2. Data collection

Yahoo (YHOO) was listed in 1996, when the internet and e-commerce boom began. After 1996, many other companies began their Initial Public Offering (IPO). The last column of the previous Table shows the date at which quotes became available for each company. Hence, the period for data begins in 1996 and ends in 2004.

Therefore, after collecting the quotes for the period 1996–2004, we computed the monthly returns for all securities.

To analyse the capital structure of all 45 companies, we collected all financial statements, from 10K, from 1996 to 2004. Based on the obtained results, the companies showing debt in their capital structure composition were dropped. 15 companies were then selected, according to their capital structure, based on market value and debt absence. For those companies, the cost of equity is equal to WACC.

3.3. Beta estimation

The estimation of beta can be reached in several ways. As we have mentioned previously, we intend to focus on the effect of the estimate period over CAPM results (i.e. discount rates).

The assumptions to perform the regressions were:
- Monthly returns
- Estimate periods:
  - 5 years
  - 2 years
  - 1 year
- S&P 500 index as a proxy for the Market portfolio

Based on the monthly returns and the market model, to compute the betas, we performed a regression of the securities returns against the S&P 500 index returns. We computed monthly betas, although only the annual betas were used. For betas based on estimated periods of 5 years, we obtained betas available at the end of 2000 and onwards; for estimate periods of 2 years, we obtained betas available at the end of 1997 and onwards; for 1 year, we obtained betas at the end of 1996 and onwards.

3.4. CAPM results

To compute CAPM results we need two more inputs – the risk-free rate and the equity risk premium. Considering the practice point of view, we used a risk-free rate based on the Treasury Bonds (the most used in practice). In particular, we used treasury bonds – 10 years (TNX -10YR). The values for the Equity Risk Premium
were collected from the Ibbotson “Risk Premium Over Time Report 2005” (Ibbotson, 2005). The CAPM results were obtained using the equation (1).

3.5. Materiality level

To look at the reliability of the CAPM, we have to decide if the impact over the value in use has material relevance or not, and then we can establish an acceptable materiality level. In other words, we can accept some magnitude of discount rate variation because of the use of different estimate periods (5 years, 2 years or 1 year). Thus, to deal with this issue, we follow guidance regarding materiality stated in the International Accounting Standard Board (IASB) and Financial Accounting Standard Board (FASB) standards.

According to IASB’s ‘Framework for the Preparation and Presentation of Financial Statements’, “to be useful, information must also be reliable”. Information has the quality of reliability when “it is free from material error and bias and can be depended upon by users to be that which it either purports to represent or could reasonably be expected to represent.” and completes the requirements for reliability with more attributes: Faithful Representation, Substance Over Form, Neutrality, Prudence and Completeness. On the other hand, in relation to the meaning of material, the IASB framework (paragraph 30) states “information is material if its misstatement could influence the economic decisions of users taken on the basis of financial statements”. Materiality depends on the size of the item or error judged in the particular circumstances of its omission or misstatement. Thus, materiality provides a threshold or cut-off point rather than being a primary qualitative characteristic which information must have if it is to be useful.” (IASB, 2004, p. 29).

Materiality is defined by FASB (1980) – SFAC 2 as “The magnitude of an omission or misstatement of accounting information that, in the light of surrounding circumstances, makes it probable that the judgment of a reasonable person relying on the information would have been changed or influenced by the omission or misstatement”.

In order for appraisers, accountants and auditors to perform their duties, they need to make materiality judgements. Those judgements are quantitative in nature. Thus, deciding on what has material relevance or not depends on the circumstances; the magnitude by itself is not important. For example, an error of 100,000 € may not be materially relevant in the financial statements of a company showing total assets of 100,000,000 €, but it would be materially relevant if the total assets amount was 1,000,000 €. In line with the previous, SFAC 2 refers “Almost always, the relative rather than the absolute size of a judgment item determines whether it should be con-

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sidered material in a given situation. Losses from bad debts or pilferage that could be shrugged off as routine by a large business may threaten the continued existence of a small one. An error in inventory valuation may be material in a small enterprise for which it cut earnings in half, but immaterial in an enterprise for which it might make a barely perceptible ripple in the earnings”.

To deal with the issue, SFAC 2 provides some guidelines about what could be considered materially relevant or not, denoting some empirical investigations about the matter in its Appendix C. Appendix C, mentions that each Statement of Financial Accounting Standards establishes “the provisions of this statement need not be applied to immaterial items”. It also denotes the rule 3–02 of the SEC Regulation S-X concerning “Form and Content of Financial Statements” which states that if an “amount which would otherwise be required to be shown with respect to any item is not material, it need not be separately set forth”. Afterwards, it clarifies that those statements are not definitions of materiality. Thus, it refers to “case law” and some research about the subject, presenting some examples. Below are the examples and the studies mentioned about materiality.

The empirical studies regarding the current practice mentioned are: Woolsey (1973), Frishkoff (1970), Patillo (1976), O’Connor and Collins (1974), and Boatsman and Robertson (1974). The first mentioned, “investigated the factors that entered into judgments about the materiality of an error and found that the primary factor was the ratio of the error to current income before tax”. The error took on special significance if it changed the trend in income». The second “examined a sample of audit reports to try to determine the factors that caused auditors to render qualified opinions when there was an accounting change. The effect on net income (as a percentage) was found to be the only significant variable, but there was little uniformity among auditors about when an accounting change was material”. The third “conducted for the Financial Executives Research Foundation, examined several kinds of materiality judgments. Perhaps its principal conclusion was that a “rule of thumb” of 5–10 per cent of net income is widely used as a general materiality criterion”.

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8 Regarding this matter, paragraph 131 states: «Some hold the view that the Board should promulgate a set of quantitative materiality guides or criteria covering a wide variety of situations that preparers could look to for authoritative support. That appears to be a minority view, however, on the basis of representations made to the Board in response to the Discussion Memorandum, Criteria for Determining Materiality. The predominant view is that materiality judgments can properly be made only by those who have all the facts. The Board’s present position is that no general standards of materiality could be formulated to take into account all the considerations that enter into an experienced human judgment». 
When considering the guidance from IASB and FASB, we can conclude that materiality always involves judgment. IASB does not indicate any value for materiality. Although FASB presents materiality as a judgment according to the circumstances, it provides some examples with values for guidance. The values of 1 per cent, 3 per cent, 5 per cent and 10 per cent, according to the specific situation are mentioned. For the aim of this study, and obviously taking into account the IASB and FASB, we established two materiality levels: 5 per cent and 10 per cent. In other words, to determine the value in use amount, we assume an impact over the asset value in use to a maximum of 5 per cent (+/-) and 10 per cent (+/-). In our opinion, variations in value in use up to 5 per cent should be acceptable; variations in the value in use greater than 5 per cent up to 10 per cent, in our opinion, seem excessive; variations in the value in use greater than 10 per cent would be unacceptable. Now, we need to determine the 5 per cent and 10 per cent of materiality levels expressed in discount rate (per cent) variations. To set up a maximum percentage variation in the discount

<table>
<thead>
<tr>
<th>Subject</th>
<th>Authority</th>
<th>Materiality Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilution of earnings per share (EPS)</td>
<td>APB Opinion No. 15</td>
<td>Reduction of EPS of less than 3% in the aggregate – not material.</td>
</tr>
<tr>
<td>Separate disclosure of balance sheet items</td>
<td>SEC Accounting Series Release No. 41</td>
<td>If 10% or more of their immediate category or more than 5% of total assets.</td>
</tr>
<tr>
<td>Receivables from officers and stockholders</td>
<td>SEC Regulation S-X, Rule 5–04</td>
<td>Disclose details of receivables from any officer or principal stockholder if it equals or exceeds $20,000 or 1% of total assets.</td>
</tr>
<tr>
<td>Segmental reporting: recognition of reportable segment</td>
<td>Statement of Financial Accounting Standards No. 14</td>
<td>Revenue equals or exceeds 10% of combined revenues, etc.</td>
</tr>
<tr>
<td>Gross rental expense under leases</td>
<td>SEC Accounting Series Release No. 147</td>
<td>Disclose total rental expense, etc., if gross rents exceed 1% of consolidated revenue.</td>
</tr>
<tr>
<td>Information on present value of lease commitments under non-capitalised financing leases</td>
<td>SEC Accounting Series Release No. 147</td>
<td>Disclose if present value is 5% or more of total long-term debt, stockholders’ equity, and present value of commitments, or if impact of capitalisation on income is 3% or more of average net income for the most recent 3 years.</td>
</tr>
<tr>
<td>Proved oil and gas reserves</td>
<td>SEC Accounting Series Release No. 258</td>
<td>Disclose quantities of proved oil and gas reserves and historical financial data unless, for each of the two most recent years, revenues and income from oil and gas producing activities and certain oil and gas capital values do not exceed 10% of the related company totals.</td>
</tr>
</tbody>
</table>

Source: FASB (FARS 2003 – Academic version)
rate we have used some examples (such as Mard Hitchener et al (2002))\(^9\). We found that a 1 per cent of variation in the discount rate results in 5 per cent of variation in the present value (*value in use*), and 2 per cent of variation in the discount rate results in 10 per cent of variation in the present value (*value in use*). Consequently, we set up in 1 per cent and 2 per cent the maximum limit for the variation of the discount rate, respectively. Thus, if the results provided by CAPM, using different estimate periods, have differences greater than 1 per cent, the CAPM use should be rethought because the results seem to be untrustworthy.

3.6. **Statistics**

Table 3 shows some descriptive measures for monthly returns. As can be seen, the S&P 500 index, which represents the market proxy, shows small values for mean, median, standard deviation and variance. The min and max values are also low (Min from:

-14.58 per cent in 1998 to –2.74 per cent in 2003; Max from 3.86 per cent in 2004 to 9.67 per cent in 2000). On the other hand, if we look at the dotcom companies we can find, in general, higher values for mean, median, standard deviation and variance. Regarding the min and max value, we can see dramatic monthly return variations in one day (for example, MFE had lost more than half of its stock market value – 67.77 per cent), particularly in 2000 when the *dotcom bubble* blew up and affected all stock markets across the world. Therefore, if we compare the monthly return variations of the S&P 500 index with any daily returns variation of dotcom companies, we conclude that they are extremely volatile.

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\(^9\) See appendix A
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Lopes: The “Value in Use”, the Discount Rate, the CAPM and Volatile Quotation

Table 3: Descriptive statistics for monthly returns
date
31-12-2004
Mean
Median
Standard deviation
Variance
Min
Max

sp500

brCm

CsCo

ebay

fdry

maCr

mfe

sebL

sone

vrsn

Wbsn

Webm

WEBX

yhoo

0,74%
1,21%
2,09%
0,04%
-3,43%
3,86%

0,51%
-0,60%
14,04%
1,97%
-24,12%
20,22%

-1,60%
-0,31%
7,56%
0,57%
-11,73%
6,98%

5,32%
4,89%
7,97%
0,64%
-14,79%
15,50%

-4,14%
-1,32%
18,82%
3,54%
-34,19%
27,82%

5,62%
3,55%
14,04%
1,97%
-17,72%
35,16%

6,00%
4,40%
9,50%
0,90%
-12,89%
20,40%

qCom
4,03%
5,81%
5,38%
0,29%
-5,76%
10,17%

rimm
8,91%
7,26%
16,40%
2,69%
-9,91%
37,70%

-1,66%
-1,70%
12,12%
1,47%
-24,20%
25,93%

1,48%
2,99%
10,53%
1,11%
-16,80%
17,67%

6,90%
4,68%
12,93%
1,67%
-12,01%
34,96%

5,10%
7,00%
9,45%
0,89%
-17,02%
18,46%

0,36%
-1,33%
21,21%
4,50%
-44,34%
30,26%

2,27%
0,50%
13,91%
1,93%
-24,52%
30,79%

4,94%
4,28%
11,21%
1,26%
-15,38%
21,38%

31-12-2003
Mean
Median
Standard deviation
Variance
Min
Max

2,02%
1,38%
3,29%
0,11%
-2,74%
8,10%

8,88%
4,29%
21,27%
4,53%
-18,63%
44,86%

5,45%
5,65%
6,65%
0,44%
-7,15%
16,08%

5,64%
4,30%
5,22%
0,27%
-3,18%
15,64%

12,88%
9,36%
15,13%
2,29%
-9,36%
40,40%

6,53%
4,68%
23,30%
5,43%
-23,67%
58,58%

-0,05%
-2,11%
10,71%
1,15%
-17,23%
23,19%

3,77%
4,26%
9,25%
0,86%
-11,40%
21,05%

15,32%
14,58%
14,37%
2,07%
-2,74%
46,32%

5,75%
5,42%
9,13%
0,83%
-7,20%
28,37%

6,42%
1,73%
19,31%
3,73%
-14,06%
60,20%

6,99%
2,41%
15,05%
2,26%
-10,15%
41,99%

3,75%
5,90%
15,44%
2,39%
-26,45%
32,87%

1,82%
-3,74%
15,13%
2,29%
-15,31%
36,13%

3,71%
4,72%
15,75%
2,48%
-32,53%
25,34%

9,10%
8,42%
8,44%
0,71%
-4,83%
23,52%

31-12-2002
Mean
Median
Standard deviation
Variance
Min
Max

-2,03%
-1,82%
5,95%
0,35%
-11,00%
8,64%

-4,63%
-8,00%
28,03%
7,85%
-35,23%
63,19%

-1,18%
-0,34%
17,89%
3,20%
-27,93%
33,45%

0,56%
-1,30%
10,07%
1,01%
-11,86%
19,77%

1,99%
7,04%
25,88%
6,70%
-37,37%
41,44%

-0,53%
-0,40%
24,74%
6,12%
-60,05%
45,02%

-1,38%
0,81%
23,40%
5,48%
-36,95%
49,48%

-1,59%
-0,15%
15,47%
2,39%
-24,52%
24,96%

-2,81%
-10,20%
20,62%
4,25%
-36,29%
32,70%

-7,91%
-17,32%
23,47%
5,51%
-33,92%
30,89%

-6,83%
-3,48%
25,83%
6,67%
-46,01%
40,72%

-6,43%
-14,93%
32,70%
10,69%
-65,74%
59,41%

0,56%
-3,42%
30,85%
9,52%
-37,86%
73,90%

-1,48%
-5,89%
30,33%
9,20%
-44,74%
49,69%

0,10%
2,65%
28,71%
8,24%
-54,30%
44,05%

1,48%
-7,43%
23,26%
5,41%
-22,00%
56,07%

31-12-2001
Mean
Median
Standard deviation
Variance
Min
Max

-1,01%
-0,28%
5,73%
0,33%
-9,23%
7,68%

1,32%
-2,53%
38,77%
15,03%
-55,20%
69,51%

-3,61%
-3,81%
22,46%
5,04%
-36,73%
38,92%

8,30%
5,72%
23,22%
5,39%
-22,43%
49,70%

4,90%
3,93%
47,97%
23,01%
-51,06%
98,00%

-5,50%
-11,78%
29,87%
8,92%
-46,09%
48,40%

19,70%
23,52%
29,66%
8,80%
-18,68%
80,43%

-2,91%
1,78%
14,30%
2,04%
-34,79%
19,54%

-5,73%
-4,23%
29,02%
8,42%
-43,23%
54,46%

-1,56%
-1,21%
35,04%
12,28%
-42,32%
67,59%

14,98%
5,86%
37,43%
14,01%
-29,82%
91,62%

-3,47% 12,53%
-2,21%
9,95%
20,59% 41,07%
4,24% 16,87%
-35,12% -39,07%
44,70% 122,94%

-6,55%
-13,19%
36,95%
13,65%
-51,44%
71,71%

5,61%
1,81%
31,54%
9,95%
-38,68%
68,31%

-0,63%
0,03%
27,77%
7,71%
-36,23%
43,01%

31-12-2000
Mean
Median
Standard deviation
Variance
Min
Max

-0,78%
-1,82%
4,94%
0,24%
-8,01%
9,67%

1,09%
-0,04%
32,43%
10,51%
-56,16%
68,34%

-1,84%
-0,13%
14,11%
1,99%
-20,11%
20,73%

-3,45%
-6,22%
19,12%
3,66%
-33,39%
24,00%

-11,80%
-18,17%
34,94%
12,21%
-59,33%
74,44%

-0,54%
-4,86%
14,96%
2,24%
-20,88%
26,30%

-10,02%
-9,73%
25,42%
6,46%
-67,77%
34,86%

-4,18% 13,52%
-2,67% 21,42%
19,53% 44,42%
3,81% 19,73%
-38,79% -60,09%
23,24% 105,66%

6,64%
-0,17%
24,80%
6,15%
-33,42%
51,28%

-16,93%
-22,76%
23,54%
5,54%
-55,97%
15,91%

-3,78%
-8,43%
29,06%
8,44%
-40,91%
56,77%

-4,05% 18,26%
-14,37% -22,49%
42,04% 85,68%
17,68% 73,41%
-62,71% -40,21%
87,98% 165,23%

-13,80%
-18,60%
16,06%
2,58%
-35,56%
9,57%

31-12-1999
Mean
Median
Standard deviation
Variance
Min
Max

1,56%
2,85%
3,79%
0,14%
-3,23%
6,25%

15,64%
13,74%
23,86%
5,69%
-16,64%
52,12%

7,75%
8,52%
11,03%
1,22%
-12,33%
20,54%

6,67%
13,74%
25,34%
6,42%
-35,47%
51,63%

34,26%
28,31%
14,13%
2,00%
24,07%
50,40%

8,50%
2,61%
22,33%
4,99%
-12,84%
57,63%

-3,64%
-1,77%
25,19%
6,34%
-56,83%
37,90%

34,94%
25,13%
31,46%
9,90%
-2,77%
94,45%

16,43%
17,31%
23,74%
5,63%
-19,09%
64,78%

19,74% 28,90%
10,10% 30,77%
37,59% 38,11%
14,13% 14,52%
-35,53% -25,32%
98,85% 105,51%

15,14%
8,91%
33,70%
11,36%
-20,78%
103,37%

31-12-1998
Mean
Median
Standard deviation
Variance
Min
Max

2,18%
4,47%
6,20%
0,38%
-14,58%
8,03%

14,46%
12,26%
23,71%
5,62%
-18,36%
44,05%

8,41% 81,34%
5,79% 84,04%
10,51% 57,92%
1,11% 33,55%
-14,47% 22,11%
23,14% 137,86%

14,04%
18,48%
19,71%
3,88%
-23,27%
42,37%

6,78%
6,74%
16,81%
2,83%
-32,38%
30,23%

1,33%
3,68%
12,22%
1,49%
-29,51%
15,93%

7,66%
5,67%
28,69%
8,23%
-30,92%
53,10%

18,12%
20,30%
34,49%
11,89%
-47,25%
68,32%

20,68%
19,48%
30,09%
9,05%
-24,19%
87,82%

31-12-1997
Mean
Median
Standard deviation
Variance
Min
Max

2,37%
4,40%
4,60%
0,21%
-5,75%
7,81%

3,16%
2,11%
13,95%
1,95%
-20,26%
30,96%

-4,45%
-9,71%
19,49%
3,80%
-38,22%
31,85%

2,73%
-3,82%
16,55%
2,74%
-21,25%
32,39%

3,72%
0,61%
20,19%
4,07%
-25,38%
40,60%

5,35%
4,33%
18,93%
3,59%
-35,31%
44,69%

-0,54%
-10,31%
25,05%
6,28%
-20,00%
69,27%

19,79%
13,24%
32,69%
10,68%
-12,46%
98,59%

31-12-1996
Mean
Median
Standard deviation
Variance
Min
Max

1,59%
1,61%
3,13%
0,10%
-4,57%
7,34%

4,85%
4,50%
8,33%
0,69%
-8,59%
17,75%

-5,82%
-4,51%
22,84%
5,22%
-48,66%
40,38%

7,60%
5,98%
11,80%
1,39%
-9,42%
32,48%

0,19%
-2,23%
14,45%
2,09%
-18,27%
40,35%

11,65%
10,76%
21,81%
4,75%
-17,65%
38,38%

-16,99%
-17,75%
11,66%
1,36%
-37,61%
1,94%

-6,11%
-6,76%
11,46%
1,31%
-24,79%
9,33%

19,65%
15,76%
22,18%
4,92%
-9,88%
66,58%

10,41%
12,23%
25,09%
6,30%
-17,02%
53,63%

-6,15%
-13,46%
24,65%
6,08%
-33,22%
26,99%


**t-statistic**

For each beta, if we compare the *t-value* with the selected value of *alpha*, according to their *p-values*, we conclude that the coefficient is always statistically significant (i.e. we can reject the null hypothesis and say that the coefficient is significantly different from zero). In other words, a statistically significant relationship exists between security return variations and the equity risk premium (ERP) variations. A simple average of the *t-values*, despite its statistical meaningless, shows that the estimate period of five years leads to greater *t-values* than estimated periods of 2 years or 1 year (see Figure 1).

![Figure 1: t-statistic results](image)

However, the *t-values* are significantly weaker than if daily returns were used, for each different estimation period (5 years, 2 years and 1 year).

**R² values**

On the other hand, for estimate periods of 5 years, Figure 2 shows lower values for the coefficient of determination (*R²*)\(^\text{10}\). *R²* values should be interpreted as the percentage of the variation in the securities about its mean that is explained by the regression model. For example, *R²*= 0,27 (in 2004), that is to say, about 27 per cent of the variation in security returns about its mean, is explained by variations in the market index (i.e. ERP).

\(^{10}\) In practice, lower values are common.
Comparing this value to those we found when daily returns were used, we find higher $R^2$ values, for every security.

4. Results

**WACC Results**

The results obtained show that the fixed materiality level is violated if different estimate periods are used (5 years, 2 years, 1 year). The next figure shows that 100 per cent of securities (considering the majority of years) violate the materiality levels of 2 per cent and 1 per cent.
In contrast to the use of daily returns, the use of monthly returns results in the violation of both materiality levels for all securities. That is, the assets value in use varies more than 10 per cent only because of the use of different estimate periods to compute betas.

**Sensitivity analysis**

The sensitivity analysis is grounded on confidence intervals of 95 per cent. Figure 4 shows the min value for the difference between upper and lower values, for years 2001, 2002, 2003, and 2004. The first remark is that confidence intervals provided by estimate periods of five years are smaller.

As we mentioned previously, we used OLS to estimate betas, thus, an important note is that the confidence intervals are only reliable if no autocorrelation and heteroskedasticity are detected. To assure the reliability of confidence intervals, for an autocorrelation analysis we used the Durbin-Watson test (using STATA) and the results have shown that, in general, there are no auto-correlated errors. In appendix B, we present the regressions where autocorrelation was detected. For the heteroskedasticity analysis, we used the White’s test, and the regressions have shown, in general, no heteroskedasticity. Only a few regressions seem to be affected by heteroskedasticity (see Appendix B). From Table 4, Table 5 and Table 6 it may be seen that, in general, the difference between the upper and lower limits for Ke is greater than 1 per cent, therefore, it is not in accordance with the fixed materiality level. We can also observe that the greater the estimate period, the tighter the confidence intervals.
### Table 4: Sensitivity analysis using betas computed using 5 years

<table>
<thead>
<tr>
<th>Sensitivity Analysis (5 years)</th>
<th>BRCM</th>
<th>CSNO 31</th>
<th>EBAY</th>
<th>FBHY</th>
<th>MACR* 31 Mar</th>
<th>MFE</th>
<th>QCOM 30 Sep</th>
<th>RIMM* 29 Feb</th>
<th>SEBL</th>
<th>SONE</th>
<th>VRSN</th>
<th>WBSN</th>
<th>WEBX</th>
<th>YHOO</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-01-2000 11-12-2002</td>
<td>42.38%</td>
<td>23.95%</td>
<td>22.80%</td>
<td>44.18%</td>
<td>25.96%</td>
<td>29.20%</td>
<td>18.04%</td>
<td>33.81%</td>
<td>34.10%</td>
<td>28.20%</td>
<td>32.95%</td>
<td>19.70%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-01-1999 11-12-2001</td>
<td>40.39%</td>
<td>24.56%</td>
<td>22.91%</td>
<td>26.72%</td>
<td>25.38%</td>
<td>25.02%</td>
<td>35.00%</td>
<td>33.35%</td>
<td>38.96%</td>
<td>35.15%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-01-1998 11-12-2002</td>
<td>22.30%</td>
<td>14.60%</td>
<td>26.72%</td>
<td>26.37%</td>
<td>10.47%</td>
<td>10.60%</td>
<td>21.40%</td>
<td>8.44%</td>
<td>20.80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-01-1997 11-12-2001</td>
<td>23.90%</td>
<td>15.17%</td>
<td>28.49%</td>
<td>26.69%</td>
<td>9.17%</td>
<td>10.28%</td>
<td>34.27%</td>
<td>32.80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-01-1996 31-12-2000</td>
<td>21.65%</td>
<td>13.30%</td>
<td>27.20%</td>
<td>26.33%</td>
<td>9.71%</td>
<td>8.54%</td>
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### Table 5: Sensitivity analysis using betas computed using 2 years

<table>
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<tr>
<th>Sensitivity Analysis (2 years)</th>
<th>BRCM</th>
<th>CSNO 31</th>
<th>EBAY</th>
<th>FBHY</th>
<th>MACR* 31 Mar</th>
<th>MFE</th>
<th>QCOM 30 Sep</th>
<th>RIMM* 29 Feb</th>
<th>SEBL</th>
<th>SONE</th>
<th>VRSN</th>
<th>WBSN</th>
<th>WEBX</th>
<th>YHOO</th>
</tr>
</thead>
<tbody>
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<td>50.59%</td>
<td>18.91%</td>
<td>7.66%</td>
<td>4.19%</td>
<td>49.35%</td>
<td>27.48%</td>
<td>35.06%</td>
<td>35.06%</td>
<td>23.59%</td>
<td>39.00%</td>
<td>24.46%</td>
<td>24.34%</td>
<td>21.28%</td>
<td></td>
</tr>
<tr>
<td>01-01-2002 11-12-2001</td>
<td>39.23%</td>
<td>15.33%</td>
<td>13.18%</td>
<td>7.39%</td>
<td>16.14%</td>
<td>1.52%</td>
<td>10.52%</td>
<td>8.44%</td>
<td>25.72%</td>
<td>19.02%</td>
<td>7.44%</td>
<td>10.86%</td>
<td>22.67%</td>
<td></td>
</tr>
<tr>
<td>01-01-2001 11-12-2002</td>
<td>45.33%</td>
<td>29.09%</td>
<td>26.36%</td>
<td>52.05%</td>
<td>34.14%</td>
<td>38.47%</td>
<td>21.74%</td>
<td>35.32%</td>
<td>42.60%</td>
<td>40.07%</td>
<td>38.99%</td>
<td>20.81%</td>
<td>31.95%</td>
<td></td>
</tr>
<tr>
<td>01-01-2000 11-12-2002</td>
<td>35.48%</td>
<td>41.51%</td>
<td>13.36%</td>
<td>25.59%</td>
<td>26.32%</td>
<td>17.06%</td>
<td>25.94%</td>
<td>9.08%</td>
<td>17.71%</td>
<td>15.81%</td>
<td>21.95%</td>
<td>3.79%</td>
<td>22.23%</td>
<td></td>
</tr>
<tr>
<td>01-01-1999 11-12-2001</td>
<td>31.04%</td>
<td>35.74%</td>
<td>64.08%</td>
<td>32.93%</td>
<td>42.10%</td>
<td>21.61%</td>
<td>46.56%</td>
<td>46.62%</td>
<td>42.25%</td>
<td>30.93%</td>
<td>39.59%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-01-1998 11-12-2000</td>
<td>53.78%</td>
<td>28.04%</td>
<td>33.74%</td>
<td>29.19%</td>
<td>7.10%</td>
<td>7.62%</td>
<td>2.72%</td>
<td>1.55%</td>
<td>2.85%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 6: Sensitivity analysis using betas computed using 1 year

<table>
<thead>
<tr>
<th>Sensitivity Analysis (1 year)</th>
<th>BRCM</th>
<th>CSNO 31</th>
<th>EBAY</th>
<th>FBHY</th>
<th>MACR* 31 Mar</th>
<th>MFE</th>
<th>QCOM 30 Sep</th>
<th>RIMM* 29 Feb</th>
<th>SEBL</th>
<th>SONE</th>
<th>VRSN</th>
<th>WBSN</th>
<th>WEBX</th>
<th>YHOO</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-01-2001 11-12-2002</td>
<td>62.18%</td>
<td>33.45%</td>
<td>34.68%</td>
<td>36.88%</td>
<td>26.72%</td>
<td>51.80%</td>
<td>51.80%</td>
<td>42.11%</td>
<td>54.48%</td>
<td>38.06%</td>
<td>56.85%</td>
<td>35.90%</td>
<td>38.86%</td>
<td></td>
</tr>
<tr>
<td>01-01-2002 11-12-2001</td>
<td>58.55%</td>
<td>26.85%</td>
<td>16.14%</td>
<td>39.11%</td>
<td>32.92%</td>
<td>21.04%</td>
<td>22.19%</td>
<td>39.30%</td>
<td>25.07%</td>
<td>30.47%</td>
<td>44.44%</td>
<td>40.19%</td>
<td>24.06%</td>
<td></td>
</tr>
<tr>
<td>01-01-2001 11-12-2000</td>
<td>42.69%</td>
<td>29.44%</td>
<td>17.68%</td>
<td>40.99%</td>
<td>36.86%</td>
<td>37.49%</td>
<td>25.66%</td>
<td>33.36%</td>
<td>37.63%</td>
<td>36.44%</td>
<td>50.86%</td>
<td>47.92%</td>
<td>48.17%</td>
<td></td>
</tr>
<tr>
<td>01-01-2000 11-12-2000</td>
<td>46.23%</td>
<td>40.40%</td>
<td>41.51%</td>
<td>80.81%</td>
<td>50.10%</td>
<td>50.10%</td>
<td>27.23%</td>
<td>50.84%</td>
<td>59.57%</td>
<td>60.88%</td>
<td>36.92%</td>
<td>59.12%</td>
<td>63.27%</td>
<td></td>
</tr>
<tr>
<td>01-01-2000 11-12-2000</td>
<td>23.75%</td>
<td>14.04%</td>
<td>20.58%</td>
<td>30.04%</td>
<td>7.93%</td>
<td>8.29%</td>
<td>9.06%</td>
<td>10.06%</td>
<td>3.48%</td>
<td>9.62%</td>
<td>10.26%</td>
<td>3.39%</td>
<td>7.85%</td>
<td></td>
</tr>
</tbody>
</table>
As previously mentioned, only a small minority of the regressions (those in Appendix B) are affected by autocorrelation and heteroskedasticity, thus the confidence intervals seem to be reliable and consequently, also the sensitivity analysis.

5. Conclusion

The effect of the estimate period, when using monthly returns, leads to CAPM results significantly different, and consequently to considerably different discount rates. Furthermore, a sensitivity analysis based on confidence intervals of 95 per cent shows, for each estimate period, unacceptable Ke values, and subsequently unacceptable discount rates according to the materiality level of 5 per cent and 10 per cent, that is to say, 1 per cent or 2 per cent as a maximum limit for discount rate changes. Consequently, 100 per cent of the securities violate both materiality levels (1 per cent and 2 per cent). Moreover, if we compare the sensitivity analysis between all three estimate periods, we conclude that the limits of 1 per cent and 2 per cent for variations allowed in the discount rate values are also violated.

Therefore, the use of a discount rate computed using CAPM could lead to significant differences in an asset value in use. Thus, it appears that for reliable asset (or group assets) evaluations, namely for impairment tests, we should not trust discount rates computed using the CAPM. This evidence suggests that more attention should be paid when using the CAPM in the financial accounting field (nevertheless its impeccable logic), namely when used by companies with quotes that are highly volatile.
Appendix A

Discount rate change and its impact over the value in use (fair value)

<table>
<thead>
<tr>
<th>WACC</th>
<th>Fair value</th>
<th>1% of change</th>
<th>2% of change</th>
<th>27% of change (max)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>reduction</td>
<td>increase</td>
<td>reduction</td>
</tr>
<tr>
<td>30%</td>
<td>80,524,027 €</td>
<td>-3.35%</td>
<td>3.46%</td>
<td>-6.68%</td>
</tr>
<tr>
<td>29%</td>
<td>83,313,422 €</td>
<td>-3.44%</td>
<td>3.57%</td>
<td>-7.06%</td>
</tr>
<tr>
<td>28%</td>
<td>86,284,782 €</td>
<td>-3.54%</td>
<td>3.67%</td>
<td>-7.25%</td>
</tr>
<tr>
<td>27%</td>
<td>89,453,182 €</td>
<td>-3.64%</td>
<td>3.78%</td>
<td>-7.46%</td>
</tr>
<tr>
<td>26%</td>
<td>92,835,081 €</td>
<td>-3.75%</td>
<td>3.88%</td>
<td>-7.66%</td>
</tr>
<tr>
<td>25%</td>
<td>96,448,579 €</td>
<td>-3.85%</td>
<td>4.01%</td>
<td>-7.87%</td>
</tr>
<tr>
<td>24%</td>
<td>100,313,538 €</td>
<td>-3.96%</td>
<td>4.13%</td>
<td>-8.09%</td>
</tr>
<tr>
<td>23%</td>
<td>104,451,789 €</td>
<td>-4.07%</td>
<td>4.25%</td>
<td>-8.31%</td>
</tr>
<tr>
<td>22%</td>
<td>108,887,359 €</td>
<td>-4.19%</td>
<td>4.37%</td>
<td>-8.54%</td>
</tr>
<tr>
<td>21%</td>
<td>113,646,671 €</td>
<td>-4.30%</td>
<td>4.50%</td>
<td>-8.77%</td>
</tr>
<tr>
<td>20%</td>
<td>118,758,908 €</td>
<td>-4.42%</td>
<td>4.63%</td>
<td>-9.00%</td>
</tr>
<tr>
<td>19%</td>
<td>124,256,236 €</td>
<td>-4.55%</td>
<td>4.76%</td>
<td>-9.24%</td>
</tr>
<tr>
<td>18%</td>
<td>130,174,194 €</td>
<td>-4.67%</td>
<td>4.89%</td>
<td>-9.49%</td>
</tr>
<tr>
<td>17%</td>
<td>136,552,980 €</td>
<td>-4.80%</td>
<td>5.04%</td>
<td>-9.74%</td>
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<tr>
<td>16%</td>
<td>143,433,393 €</td>
<td>-4.93%</td>
<td>5.18%</td>
<td>-9.99%</td>
</tr>
<tr>
<td>15%</td>
<td>150,866,335 €</td>
<td>-5.06%</td>
<td>5.33%</td>
<td>-10.24%</td>
</tr>
<tr>
<td>14%</td>
<td>158,904,378 €</td>
<td>-5.19%</td>
<td>5.48%</td>
<td>-10.50%</td>
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<tr>
<td>13%</td>
<td>167,606,904 €</td>
<td>-5.33%</td>
<td>5.63%</td>
<td>-10.77%</td>
</tr>
<tr>
<td>12%</td>
<td>177,039,934 €</td>
<td>-5.47%</td>
<td>5.78%</td>
<td>-11.03%</td>
</tr>
<tr>
<td>11%</td>
<td>187,276,953 €</td>
<td>-5.61%</td>
<td>5.94%</td>
<td>-11.30%</td>
</tr>
<tr>
<td>10%</td>
<td>198,399,849 €</td>
<td>-5.75%</td>
<td>6.10%</td>
<td>-11.57%</td>
</tr>
<tr>
<td>9%</td>
<td>210,499,983 €</td>
<td>-5.89%</td>
<td>6.26%</td>
<td>-11.85%</td>
</tr>
<tr>
<td>8%</td>
<td>223,679,403 €</td>
<td>-6.04%</td>
<td>6.43%</td>
<td>-12.13%</td>
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<tr>
<td>7%</td>
<td>238,052,239 €</td>
<td>-6.18%</td>
<td>6.59%</td>
<td>-12.41%</td>
</tr>
<tr>
<td>6%</td>
<td>253,746,286 €</td>
<td>-6.33%</td>
<td>6.76%</td>
<td>-12.69%</td>
</tr>
<tr>
<td>5%</td>
<td>270,904,824 €</td>
<td>-6.48%</td>
<td>6.93%</td>
<td>-13.06%</td>
</tr>
<tr>
<td>4%</td>
<td>289,688,703 €</td>
<td>-6.64%</td>
<td>7.11%</td>
<td>-13.43%</td>
</tr>
<tr>
<td>3%</td>
<td>310,278,728 €</td>
<td>-6.81%</td>
<td>7.30%</td>
<td>-13.80%</td>
</tr>
<tr>
<td>Average</td>
<td>158,795,634 €</td>
<td>-4.87%</td>
<td>5.13%</td>
<td>-9.48%</td>
</tr>
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</table>
Appendix B

Results for Durbin-Watson and White tests
(using S&P 500 index & Monthly Returns)
(Regressions showing autocorrelation and/or heteroskedasticity)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Start Date</th>
<th>End Date</th>
<th>Heteroskedasticity</th>
<th>Durbin-Watson d-statistic(2, 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMZN</td>
<td>01/01/2000</td>
<td>31/12/2000</td>
<td>7.45</td>
<td>1.470505</td>
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<tr>
<td></td>
<td>01/01/2001</td>
<td>31/12/2001</td>
<td>5.49</td>
<td>0.0241</td>
</tr>
<tr>
<td></td>
<td>01/01/2002</td>
<td>31/12/2002</td>
<td>10.38</td>
<td>0.0644</td>
</tr>
<tr>
<td></td>
<td>01/01/2003</td>
<td>31/12/2003</td>
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</tr>
<tr>
<td>ASKJ</td>
<td>01/01/2003</td>
<td>31/12/2004</td>
<td>5.35</td>
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</tr>
<tr>
<td></td>
<td>01/01/2004</td>
<td>31/12/2004</td>
<td>8.57</td>
<td>0.0138</td>
</tr>
<tr>
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<td>1.144679</td>
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<td>31/12/1998</td>
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<td>5.82</td>
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<td>31/12/1999</td>
<td></td>
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</tr>
<tr>
<td>CNET</td>
<td>01/01/2000</td>
<td>31/12/2000</td>
<td>13.11</td>
<td></td>
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| SEBL       |                    |                            |          
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| 01/01/1997 | 31/12/1997         | 1.142638                    | (2, 12) =
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| 01/01/2002 | 31/12/2003         | 5.06                        | 2 0.0796 |
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1. Introduction

The aim of this paper is to investigate whether there is a relationship between market concentration in banking markets and market concentration in industrial sectors in transition countries. Specifically, we would like to empirically find out if the fact that a country has a more concentrated banking market indicates that the manufacturing sectors in that country are also more monopolised or not. This question has many implications for the banking regulation policy, especially regarding the number of banks allowed to operate in a particular territory, competition policy and the allowed mergers and acquisitions in the banking markets. The effects that banking markets have on product markets should be taken into account also when considering the trade-off between financial stability and competition in banking markets. Also, there is more and more empirical evidence for the large contribution of firm dynamism (entry and exit), concentration and competition to productivity growth in manufacturing industries (see, for example, Geroski, 1995; Caves, 1998; Sutton, 1997; Nickell, 1996; Pakes & Ericson, 1998; Bartelsman & Doms, 2000; Davis & Haltiwanger, 1999; Bartelsman et al., 2004; Aghion & Howitt, 2005). Furthermore, since product market structure and competition also affect innovation (see, for example, Aghion et al., 2005; Geroski, 1990), banking market structure could also be viewed as an instrument for promoting or abating innovation.

Previous empirical studies of the relationship between product market and banking market concentration have been carried out only for developed countries (Cetorelli, 2001, 2004; Cetorelli & Strahan, 2006). They have all found a positive relationship between both market concentrations. Taking into consideration the mechanisms that have been offered as explanations for the identified relationship and the specifics of

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the transition process that created banking and product markets in transition countries, we believe that this relationship is not the same as in developed countries. Besides, the rapid processes of entry and consolidation in transition banking markets could help us add to the knowledge about the evolution of the relationship between both market structures, in general.

In the following paragraphs we will first present a review of literature, which is followed by a description of the evolution of banking markets in transition countries. After that, we present the methodology and the econometric model used. We draw on the model developed by Cetorelli (2001, 2004) and since the scope of this paper is explorative in nature, we aim to see if the results of his studies can also be confirmed for transition countries. Next, we present the data used in the estimation and the results obtained. The discussion section concludes a paper with a commentary on results and points out further research needed to overcome some of the weaknesses of the approach used in this paper.

2. Literature review


Another extensive strand of literature that contributes to the question of the relationship between banking and product market structures is concerned with the role of financial markets in explaining economic growth. For example, studies from Demirgüç-Kunt and Maksimovic (1998), Rajan and Zingales (1998), Levine et al (2000) show that more developed financial markets promote economic growth (see also a survey by Levine, 1997). Pagano (1993) theoretically finds that banking market power has a negative effect on economic growth. On the other hand, Petersen and Rajan (1995) empirically confirm their theoretical model where banks with market
power are more willing to finance young firms. Similarly, Hellman and DaRin (2002) theoretically and empirically find that to act as catalysts for industrialisation and promote new industries, banks have to be large, with market power.

However, there is not much specific literature about the relationship between two market structures, especially one linking two markets as different as banking markets and the markets of manufacturing sectors. The first one to research this question was Cetorelli in his two papers (2001, 2004). The question appeared as a side branch of the literature dealing with the effects of financial markets on economic growth. Cetorelli (2001) was the first who attempted to collect and interpret the existing scattered literature and historical evidence.

The key to the question “Why should there be any link between product and banking market concentration?” lies in the bank-firm relationship, which is an obvious condition for the existence of such a link. Bank behaviour affects firm behaviour and can thus have an influence on product market structure. Existing literature, however, does not provide a unified answer about the nature of this relationship or about the causal mechanisms that drive it. Historical, theoretical and empirical evidence support explanations of a positive, as well as a negative, relationship.

When the relationship is positive, more concentrated banking markets create more concentrated product markets. Two hypotheses for this direction of causation are offered by Cetorelli (2001, 2004). Both studies confirm empirically that banking concentration leads to higher average firm size in manufacturing sectors, which indicates a positive relationship, but do not study which of the explanations is most plausible.

According to the first one, banks prefer to finance incumbent firms over entrants, in order to shield incumbents’ profits and thereby increasing their own profits. If banks have more market power, they are supposed to be more inclined to behave in this manner. The contributions that provide theoretical frameworks consistent with this explanation are Cestone and White (2003) and Spagnolo (2000). The second explanation for a positive relationship is bank manager behaviour. Since incumbent firms establish close relationships with bank managers, the latter grants credit to incumbents based not only on sound financial criteria. Managers in banks with more market power can get away with more ‘friendly credits’ since the competitive pressure is less intense. Evidence for this explanation is historical and includes cases from the late nineteenth century in England, Italy, and Mexico (Lamoreaux, 1986; Cohen, 1967; and Haber, 1991, respectively). Rosen (2004) argues that greater financing obstacles are typical for more concentrated banking markets and prevent the entry of new firms, which is the third possible explanation for a positive relationship between banking and product market concentration. Empirical evidence for this explanation comes from Beck et al (2004) and Cetorelli and Strahan (2006). The latter study the U.S. markets and empirically confirm that more intensive competition (small concentration) in bank-
ing markets is associated with a greater number of firms and lower average firm size, where the effect of banking competition is particularly strong for the smallest firms and practically non-existent for large companies.

If the relationship is negative, more concentrated banking markets create more fragmented product markets. The first hypothesis behind the negative relationship is related first and foremost to information asymmetry between firms and banks, which is larger for unknown entrant firms. Since entrant firms are more risky for banks, they will finance them only if they are able to recover the cost of greater risk at later stages. This inter-temporal smoothing is possible when banks have market power (Petersen and Rajan, 1995). Greater banking concentration (more market power) thus induces more firm entry and more fragmented product markets. The second hypothesis is related to the innovation potential of entrants. Entrant firms bring innovative technologies and higher returns on projects, therefore banks in concentrated banking markets which are able to smooth interest rates continuously favour entrant firms over incumbents (Cetorelli, 2004). Empirical studies consistent with the negative relationship between product and market concentration are Petersen and Rajan (1995) and Cetorelli and Gambera (2001). There is also historical evidence provided by Hellman and DaRin (2002) for the cases of Belgium, Germany, Italy, Russia and Spain, demonstrating that large banks with market power are needed to finance new industry in emerging markets.

3. Banking Markets in Transition Countries

Banking markets in transition countries differ somewhat from banking markets in developed countries. Their characteristics stem from the process by which they were created. In command economies of most transition countries there was only one bank (also called the monobank in some cases) which had basically only one purpose in distributing (and printing) money to firms according to production plans. These banks combined some functions of monetary policy that are typically performed by central banks, but they were also providing firms with credit, where they lacked, above all, any credit risk assessment. In the process of transition, these banks were transformed, often by breaking them up into banks more similar to the ones in market economies, but with serious deficiencies in tangible and intangible resources. Besides banks that were created in this way, there were also a number of new banks established due to a liberal licensing policy at the beginning of the transition process. This process was most typical in Russia, Bulgaria, Croatia, Serbia, Poland and Hungary. The genesis of banking markets in transition countries was thus characterised partly by transformation of old state-owned banks, partly by the separation of monobanks and formation of individual banks, and partly by market induced formation of newly established banks.
There were several problems with these banks. First, they suffered from bad loans. The transformed banks inherited bad debts, but they also accumulated bad debt by granting loans after restructuring. However, since they did not have proper credit risk assessment skills, the quality of assets was low, business clients often had yet to be privatised, and the system of bank regulation was poorly developed. The problems continued even after initial transformation and also in newly established banks (Berglof & Bolton, 2002). Schnitzer (1999) argues that bad loan situations were likely aggravated by too many banks entering the market.

Second, transition banks lacked proper information technology skills and the equipment that was becoming essential in the banking business globally and were also advancing at a rapid pace.

Third, the services offered were bad and expensive. The market for loans did not grow as fast as one would expect, given the lack of funds common for firms in these countries. It is a well-established fact that the majority of firms finance their projects by using retained earnings first and by seeking external finance after that. The problem faced by transition countries was that firms did not accumulate sufficient profits to generate internal funds, whilst capital markets were (and still are) poorly developed and banks did not manage to overcome hindrances to greater financial intermediation (Rovcanin, 2006; Rovcanin & Grzinic, 2008). Rother (1999) believes that financial intermediation is lower in transition countries because of concentration in the banking sector, while McNulty and Harper (2001) think the deficient legal system is the primary cause for this. Hainz (2003) shows that in more concentrated markets, banks demand more collateral if liquidation of collateral is costly and not symmetric -- both prominent characteristics of transition banking markets because of poor legal provisions -- and this leads to credit rationing.

Finally, the macroeconomic situation was difficult in all transition countries in the initial period of transition. Inflation, severe credit crunches, unstable fiscal policies, and lack of payment discipline were some of the factors that made banking crises even worse.

Since most transition countries aspired to become members of the European Union (EU), they had to adopt banking regulations in line with those prescribed to developed countries already in the EU. Since the Second Banking Coordination Directive in 1993, there has been a lot of activity in the area of banking regulation in all transition countries that were aiming for EU membership. This has certainly helped countries to focus better, advance the reform process and implement the regulation faster than would be done otherwise, as demonstrated by slower processes in countries which joined the EU recently (Romania and Bulgaria) or are not EU members (yet). Mamatzakis et al (2005) investigate seven South-eastern European countries in the period 1998–2002; among them, only Romania and Bulgaria are presently members of the EU, and find results that strongly support the view that structural reforms make
banking more competitive. They believe potential accession to the EU is thus one of the conditions that may enhance market contestability.

Extensive deregulation and liberalisation of banking regulation, that was also introduced in transition countries in the process of EU accession, enabled banks from mainly European developed countries, to actively penetrate credit markets in transition countries. This was done either by setting up their own subsidiaries or by acquiring domestic banks. Foreign banks accounted for more than 50% of the market in some countries (e.g. in 2000 in Hungary, the Czech Republic, Poland, Bulgaria, and Baltic countries). Under these circumstances it is difficult to talk about national financial systems and domestic banking markets.

Berglof and Bolton (2002) note that although different transition countries decided to take different paths towards more market-oriented economies, they ended up with surprisingly convergent basic financial architectures. Countries had different policies with respect to restructuring bad loans, privatisation strategies, foreign banks’ entry, regulatory barriers to entry, and strategies to develop capital markets. However, they have become characterised by mainly commercial banks, with a large share of them being foreign owned and with government bonds representing a large share of their assets portfolio. Stock markets are not an important source of external finance for firms, since they are highly volatile and illiquid. Instead, long-term finance comes mainly from foreign direct investment. Ownership structures are thus, in general, fairly concentrated.

Turning away from general conditions of banking markets in these countries and moving towards market structure issues, we note that after the initial scarce number of banks (one monobank in extreme cases) transition countries first saw a huge increase in the number of banks. However, price competition did not strengthen because markets were still dominated by a few large banks (Schnitzer, 1999). Later periods saw a consolidation of the market, as many banks were not fit enough to survive in the market economy, and especially not fit enough to survive the conditions faced by banks in general in that period. Consolidation in mature banking markets was encouraged by globalisation, information technology advancements, and deregulation. As previously mentioned market consolidation in transition countries involved much more intensive foreign banks’ participation than in developed countries. Gelos and Roldós (2004) report that in Poland, Hungary and the Czech Republic, consolidation (measured by the number of banks) in the period 1994–2000 did not increase concentration; in fact, the standard measures for concentration (concentration ratios and HHI index) were even lower and there was no decline in competitive pressure. They explain this with lower barriers to entry, particularly in the form of foreign banks’ entry. Foreign banks increased the competitive pressures in domestic markets which compensated for the higher consolidation. Empirical studies, using the so-called H-statistic (see Panzar & Rosse, 1987), have generally shown that banking markets in transition countries were mainly characterised as monopolistic competition, where
the degree of competitiveness has gradually increased (or at least it did not decrease) (Gelos & Roldós, 2004, for three Central European countries in 1994–2000; Yildirim & Philippatos, 2007, for fourteen Central and Eastern European countries in 1993–2000; Mamatzakis et al, 2005, for seven Southeastern European countries in 1998–2002). Prices (in terms of loan-deposit spreads) have generally decreased, but through the 1990’s they remained higher than those in developed financial markets. Yildirim and Philippatos (2007) find that competitive conditions have increased, especially after 1996, when privatisation was in its concluding phases, the presence of foreign banks was becoming more significant and new banking regulation was being adopted in order to join the European Union.

Empirical evidence demonstrates that the traditionally used structure-conduct-performance (SCP) paradigm does not seem to be confirmed in the case of banking markets in transition countries in the 1990’s. SCP postulates that banks with larger market shares have more market power and are more profitable since they can charge higher loan rates and offer lower deposit rates. Consolidation would therefore be associated with increased concentration and less intensive competition. Although transition countries had more concentrated banking markets than developed countries, it seems that consolidation in transition countries did not universally increase concentration and the degree of competitiveness generally was not lowered. On the contrary, empirical studies seem to find confirmation for the contestable markets theory (CM). This theory claims that incumbent banks will behave competitively (and will not exercise market power) if new banks can enter the market without large entry costs and can operate in the market with similar cost functions, even if these new potential rivals do not actually enter the market. In other words, a concentrated banking market can be competitive, despite being dominated by a few large banks. Since explanations of the positive link between banking market structure and industry market structure in Cetorelli (2001, 2004) implicitly assume that the SCP theory is correct for banking markets, we do not expect to find such a robust positive relation for transition countries as it was documented for OECD countries. Moreover, some studies show that the relationship between market concentration and market power seem to become weaker in advanced banking markets (Berger et al, 1999; Canoy et al, 2001; Hannan, 1997; Radecki, 1998), while Jansen and DeHann (2003) claim there is no connection between concentration and market competition.

4. Methodology and Econometric Model

We use panel data analysis to empirically estimate the size and magnitude of the relationship between banking and product market structures. The scope of research in this phase is explorative in nature, thus we follow Cetorelli’s (2004) reduced form
approach in econometric estimation, which in turn follows Rajan and Zingales (1998). Our aim in this paper is to apply this approach on data for transition countries and compare the conclusions.

The econometric model is identified by exploiting sectoral differences. The idea is that if banking market concentration has an effect on product market concentration this effect should be larger for industrial sectors that are more dependent on external financing. Due to the lack of proper data, concentration in product markets is proxied by average firm size. Cetorelli (2001) defends the benefits of this approach, mainly because there is not much other data available at sector level, but also because this has been a frequently used approach in industrial organisation empirical work. Larger average firm size indicates more concentrated industries and smaller average firm size indicates less concentrated industries. Banking market concentration is measured yearly for each country and an interaction term with external financial dependency of sectors is used to identify its effect.

We use the within (fixed effects) approach to estimate the econometric model, which can be done either by including dummies for each dimension of the panel or by performing the within transformation on data. Thus we control time-invariable characteristics that could produce biased estimates when OLS is used. Sectoral characteristics that might affect the average firm size are the technical nature of production process and economies of scale. Country fixed effects might be related to its size, the extent of international trade, tax regulation, conditions for the establishment of firms, economic policies targeting small and medium companies etc. Time fixed effects could be related to general economic conditions which are the same for all industries. Cetorelli (2004) combines the country and time effect into one interaction and estimates the following model:

\[
\text{Average firm size}_{ijt} = \delta_{ijt} \text{Dummy}_{ijt} + \delta_{i} \text{Dummy}_{i} + \alpha_{ijt} \text{BankConc}_{jt} \times ED \times \text{ED}_i + \beta_{ijt} \text{ShareVA}_{ijt} + \epsilon_{ijt}
\]  

(1)

where:

- \(\text{Average firm size}_{ijt}\) is measured as the natural logarithm of the value added per firm in sector \(i\), country \(j\) and year \(t\). Firm size is measured in value added terms in the benchmark model, but other specifications, using total revenues and employment are also tested.

- \(\text{BankConc}_{jt} \times ED_i\) is the interaction term between banking concentration for country \(j\) in year \(t\) and external financial dependency for sector \(i\) (\(ED_i\)). Banking concentration is alternatively measured by concentration ratios and Herfindahl’s index (\(HHI\)). External financial dependency is measured as the fraction of capital expenditures not financed with cash flows from operations for mature U.S. listed companies and it is taken from Cetorelli (2001) who, in turn, takes it from Rajan and Zingales (1998). Cetorelli argues that we should expect larger average firm size in industries where “old, incumbent firms are still in need of external finance” for countries with
more concentrated banking markets, if the effect of banking concentration is positive (coefficient $\alpha$ positive). If the effect of banking concentration is negative (coefficient $\alpha$ negative), we should observe smaller average firm size in industries where mature firms need external financing for countries with more concentrated banking markets. Alternatively, the indicator for external financial dependency $EDI$ is used instead of $ED$. The indicator $EDI$ is equal to 1 for sectors that have above-median level of dependency and equal to 0 for sectors with below-median level of dependency. It is interacted with banking concentration and the coefficient on this interaction term was found to be significantly positive and very robust in Cetorelli (2001, 2004) and Cetorelli and Strahan (2006).

$ShareVA_{ijt}$ represents the share of the manufacturing sector $i$ in total manufacturing value added. This variable controls for factors that influence the market structure of a particular sector in a particular country. Industry’s life cycle theory predicts that a sector that has grown substantially should experience less new firm entry. A larger sector should therefore have larger average firm size and the coefficient $\beta$ should be positive.

$Dummy_{ijt}$ is the country-time specific fixed effect, $Dummy_{2i}$ is the sector specific fixed effect, and $\varepsilon_{ijt}$ is the error term.

5. Data Description

We use EUROSTAT’s data between 1995 and 2004 for industry sectors for 10 transition European countries. Industrial data include manufacturing sectors at 4-digit NACE Rev 1.1 level. EUROSTAT’s data classified by NACE code were matched with ISIC 2 code to allow the use of data on external financial dependency of industrial sectors. This procedure produced data for 34 manufacturing sectors. EUROSTAT’s database also provides information about the number of firms in individual sectors which was used to calculate average firm size.

Data for banking markets’ concentration ratios are taken from BANKSCOPE September 2006 and October 2007 CD’s. They range from 1997 to 2006. Concentration ratios $CR3$ ($CR5$) are calculated as the share of the three (five) largest banks’ total assets. Herfindahl’s index ($HHI$) is calculated as:

\[ HHI = \sum_{i=1}^{n} \left( \frac{T_A}{T_A} \right)^2 \]  

where:

- $n$ is the number of commercial, savings and cooperative banks in the country,

2 Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Slovakia, Slovenia, Poland, and Romania

3 Sectors 353 (Petroleum Refineries) and 351 (Industrial chemicals) are not included in the dataset, because it was impossible to identify the necessary data in NACE 1.1. and translate it to ISIC 2
$TA_i$ is total assets by individual bank $i$, and $TA$ is the sum of $n$ individual banks’ total assets.

Savings and cooperative banks are included in the concentration measures because in several countries some of the top three (five) largest banks are categorised in BANKSCOPE as savings and cooperative banks. Additionally, we use concentration ratios ($CR3$) from Cetorelli (2004), which in turn uses data from Demirgüç-Kunt and Levine (2004), for the period between 1990 and 1997.

The measure of external financial dependence is taken from Rajan and Zingales (1998). They observe that technological differences between industrial sectors generate different needs for external funds. Their external financial dependence measures the average share of capital expenditure that is not financed by cash from operations, for mature listed companies in the United States in the period 1980 – 1990. Rajan and Zingales measure the need for external funds for U.S. manufacturing sectors because demand, rather than supply, of funds is of interest and therefore it had to be estimated in a country with a well-developed financial market and small financial constraints. They present four reasons for external dependence of U.S. firms being a good proxy for the demand for external funds in other countries: i) in a steady-state equilibrium, much of the demand for external funds originates from worldwide technological shocks that increase investment opportunities for firms, ii) the ratio of cash flow to capital is determined by factors that are similar worldwide (e.g. demand for a certain product, stage in the product’s life cycle, product’s cash harvest period), iii) there is a high correlation between external dependence measured for the 1980’s and 1970’s in the U.S., and a high correlation between external dependence measured on Canadian and U.S. data; both imply that sectors in other countries (including less developed countries) have similar needs for external funds, and iv) a significant interaction between external dependence and financial development was found in spite of a measure for external dependency that would create bias against finding such interaction.

For the robustness check section, we use the following institutional variables controlling for general economic and financial markets’ conditions: domestic credit provided by the banking sector, domestic credit to the private sector, market capitalisation of listed companies, gross domestic product per capita, and loans to non-banks provided by foreign banks. The data source for the latter is the Joint BIS-IMF-OECD-WB External Debt Hub (on www.jedh.org), whilst data for other variables come from the World Development Indicators database (World Bank, April 2007).

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4 We would like to thank Nicola Cetorelli (Federal Reserve Bank of New York) for kindly providing his data.

5 Mature companies are companies that are present more than 10 years after listing.
Table 1 provides a summary of statistics for main variables whilst Table 4 and Table 5 (Appendix) provide data describing the pattern of industry structure and banking concentration across countries and across sectors.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln VA per firm</td>
<td>-1.235</td>
<td>1.535</td>
<td>-5.063</td>
<td>5.238</td>
<td>1678</td>
</tr>
<tr>
<td>Ln turnover per firm</td>
<td>1.015</td>
<td>3.278</td>
<td>-5.465</td>
<td>13.9</td>
<td>1681</td>
</tr>
<tr>
<td>Ln average num. of employees</td>
<td>3.393</td>
<td>1.175</td>
<td>-0.319</td>
<td>7.083</td>
<td>1702</td>
</tr>
<tr>
<td>Ext. dependence</td>
<td>0.013</td>
<td>0.306</td>
<td>-1.33</td>
<td>0.394</td>
<td>1980</td>
</tr>
<tr>
<td>Share of VA in total manufacturing</td>
<td>0.029</td>
<td>0.031</td>
<td>0</td>
<td>0.204</td>
<td>1736</td>
</tr>
<tr>
<td>CR3</td>
<td>0.625</td>
<td>0.16</td>
<td>0.394</td>
<td>0.989</td>
<td>1980</td>
</tr>
<tr>
<td>CR5</td>
<td>0.736</td>
<td>0.13</td>
<td>0.547</td>
<td>1</td>
<td>1980</td>
</tr>
<tr>
<td>HHI</td>
<td>0.196</td>
<td>0.133</td>
<td>0.083</td>
<td>0.59</td>
<td>1980</td>
</tr>
<tr>
<td>Domestic credit (% of GDP)</td>
<td>37.42</td>
<td>14.95</td>
<td>12.99</td>
<td>62.93</td>
<td>1980</td>
</tr>
<tr>
<td>Private credit (% of GDP)</td>
<td>28.56</td>
<td>12.28</td>
<td>7.17</td>
<td>55.73</td>
<td>1980</td>
</tr>
<tr>
<td>Market capitalisation (% of GDP)</td>
<td>16.49</td>
<td>10.58</td>
<td>2.45</td>
<td>55.19</td>
<td>1980</td>
</tr>
<tr>
<td>Foreign loans (% of GDP)</td>
<td>5.04</td>
<td>2.09</td>
<td>1.44</td>
<td>11.01</td>
<td>1980</td>
</tr>
<tr>
<td>GDP p.c. (US$)</td>
<td>4493.223</td>
<td>2268.285</td>
<td>1456.37</td>
<td>11008.84</td>
<td>1980</td>
</tr>
</tbody>
</table>

The average total market share of the three largest banks (CR3) was 44 per cent in the least concentrated country, which was Poland. The highest average concentration was in Estonia, where the market share of three largest banks reached close to 100 per cent of the market.

The scatter plot of average concentration ratio CR3 against average firm size for the EUROSTAT data set shows Bulgaria as having extremely low average firm size and Estonia having extremely high average banking concentration, indicating these countries could be potential outliers. A possible additional outlier here is Slovakia with extremely high average firm size.

Pairwise correlation of coefficients shows there is a small negative correlation between average firm size and two of the three concentration measures (CR3 and CR5), which is statistically significant at 5 per cent (Table 3, Appendix). CR5 appears to have the strongest correlation and HHI the weakest. This suggests that on average, countries with more concentrated banking markets have smaller firms.

The sector with mature companies least dependent on external finance is 323 (Leather industry) and the one with the most dependent mature companies is 3832 (Radio, TV and Communication equipment). A scatter plot of external financial dependency against average firm size per sector shows there are three candidates for outliers: sectors 323, 324 (Footwear), and 314 (Tobacco).

The control variable SHVA represents the fraction of value added in total manufacturing for individual sectors. Pairwise correlation shows there is no statistically
significant correlation between the fraction of value added in total manufacturing and concentration ratios. This implies that our explanation variables can be considered as independent. Additional control variables for domestic credit \((Dom\_cre)\), domestic credit to private sector \((Priv\_cre)\), market capitalisation of listed companies \((Mar\_cap)\) and foreign loans to non-banking organisations \((Floans)\) are included in the robustness check section. Pairwise correlation coefficients verify a low and statistically significant positive correlation between average firm size and all these institutional variables, implying that more developed economies have on average larger firms.

6. Results

We first present the results of the benchmark model and then perform robustness checks in the next subsection.

6.1. The benchmark model

The benchmark model (Table 2) is the same as in Cetorelli (2004), except for the use of external financial dependency \((ED)\) instead of the indicator variable \(EDI\). The latter is used in the robustness check section. We use the EUROSTAT dataset for the period 1995–2004 for this estimation, while Cetorelli (2004) uses UNIDO data for OECD countries in the period 1987–1997. Product market structure (proxied by average firm size) is measured as the logarithm of value added per enterprise, while banking market concentration is measured by \(CR3\). The dummy variables for industry and country-time effects are included, but not reported, since their purpose is only to purge the estimation of fixed effects and their own effects are not identified. Standard errors are heteroskedasticity robust. The panel is unbalanced because of missing values.

The estimation confirms a statistically and economically significant effect of the share of value added in total manufacturing that was also found in Cetorelli (2001, 2004), although it has a larger effect here. Sectors with larger shares have larger average firm size. Contrary to Cetorelli (2001, 2004) though, our estimation shows a negative effect of banking market concentration on average firm size for transition countries, but the effect is statistically insignificant. This implies that more concentrated banking markets could be at best associated to less concentrated product market structures in transition countries, but the evidence is not strong.
Table 2: Estimation results

Dependent variable = Average firm size, measured in:

<table>
<thead>
<tr>
<th></th>
<th>Value added</th>
<th>Turnover</th>
<th>Num. employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHVA</td>
<td>17.718***</td>
<td>15.249***</td>
<td>10.728***</td>
</tr>
<tr>
<td></td>
<td>(0.922)</td>
<td>(0.867)</td>
<td>(0.659)</td>
</tr>
<tr>
<td>CR3*ED</td>
<td>-0.193</td>
<td>-0.532</td>
<td>-0.116</td>
</tr>
<tr>
<td></td>
<td>(0.384)</td>
<td>(0.490)</td>
<td>(0.286)</td>
</tr>
<tr>
<td>N</td>
<td>1678</td>
<td>1676</td>
<td>1672</td>
</tr>
<tr>
<td>R²(adj.)</td>
<td>0.556</td>
<td>0.945</td>
<td>0.547</td>
</tr>
<tr>
<td>F</td>
<td>41.876</td>
<td>710.456</td>
<td>42.567</td>
</tr>
<tr>
<td>SHVA</td>
<td>17.719***</td>
<td>15.262***</td>
<td>10.735***</td>
</tr>
<tr>
<td></td>
<td>(0.922)</td>
<td>(0.868)</td>
<td>(0.660)</td>
</tr>
<tr>
<td>CR5*ED</td>
<td>-0.237</td>
<td>-0.801</td>
<td>-0.232</td>
</tr>
<tr>
<td></td>
<td>(0.494)</td>
<td>(0.587)</td>
<td>(0.357)</td>
</tr>
<tr>
<td>N</td>
<td>1678</td>
<td>1676</td>
<td>1672</td>
</tr>
<tr>
<td>R²(adj.)</td>
<td>0.556</td>
<td>0.945</td>
<td>0.547</td>
</tr>
<tr>
<td>F</td>
<td>41.873</td>
<td>710.158</td>
<td>42.520</td>
</tr>
<tr>
<td>SHVA</td>
<td>15.222***</td>
<td>10.710***</td>
<td>17.707***</td>
</tr>
<tr>
<td></td>
<td>(0.865)</td>
<td>(0.658)</td>
<td>(0.921)</td>
</tr>
<tr>
<td>HHI*ED</td>
<td>-0.275</td>
<td>0.126</td>
<td>-0.072</td>
</tr>
<tr>
<td></td>
<td>(0.579)</td>
<td>(0.297)</td>
<td>(0.395)</td>
</tr>
<tr>
<td>N</td>
<td>1676</td>
<td>1672</td>
<td>1678</td>
</tr>
<tr>
<td>R²(adj.)</td>
<td>0.945</td>
<td>0.547</td>
<td>0.556</td>
</tr>
<tr>
<td>F</td>
<td>711.119</td>
<td>42.359</td>
<td>41.821</td>
</tr>
</tbody>
</table>

*** 1 % significance level, ** 5 % significance level, * 10 % significance level
NOTE: The benchmark model is indicated by the shaded area.

We estimate the same model with different measures for average firm size (logarithm of average turnover per enterprise, logarithm of average number of employees per enterprise) and banking concentration (CR5 and HHI) (Table 2). The results from these regressions universally show a positive and significant effect of the share of value added. Overall, the model shows there is no effect of banking concentration on the product market structure in transition countries. This finding is robust to alternative specifications of banking market structure and to alternative specifications of average firm size measure. If anything, the market structures seem to be negatively correlated and not positively, as found by Cetorelli for OECD countries. These results support, to a certain extent, the negative explanation for the banking concentration effect. Sectors that are more dependent on external financial sources have smaller average firm size and a less concentrated product market structure in transition countries with more concentrated banking markets.
6.2. Robustness checks

To verify the results of the previous subsection, we perform a number of additional robustness checks for the model. We first check if the estimates are related to individual observations. Then we check if the results show the effect of general economic and financial development of countries instead of banking market concentration effect, as well as if there are any market size effects involved. Since the effect of banking concentration is likely to show a lag, we check whether our estimates change substantially when allowing for a delayed effect of banking concentration. Finally, we use the differential approach and estimate the model using the indicator variable EDI instead of external financial dependency.

6.2.1. Outliers

The first observations checked are from countries with the lowest and highest banking concentration – Poland and Estonia, respectively. Excluding these two countries from estimation does not change results substantially; the coefficient on $CR3$ is smaller, but still negative and insignificant. When we exclude the top 10 per cent of observations with the highest banking concentration, the coefficient becomes significantly negative. Then we check outliers in the average firm size dimension. Dropping Bulgaria and Slovakia, countries with the smallest and largest average firm size, we find the coefficient on $CR3$ practically unchanged. However, excluding the top and bottom 5 per cent (and also 10 per cent) of observations in the distribution of average firm size produces a positive coefficient on banking concentration, but it is insignificant and small. These estimates suggest that the banking concentration effect is not very robust, yet there is again more evidence for a negative relationship in transition countries than for a positive one.

Next, we check sectors that could represent influential observations. We first drop the two sectors that have the smallest and largest dependence on external funds: 323 (Leather) and 3832 (Radio, TV communication). The results now show a positive, but statistically insignificant relationship, between industry market structure and banking market structure. The coefficients are otherwise of a similar magnitude as in the benchmark model. When we exclude sectors with smallest and largest average firm size (390-Other industries and 354-Petroleum and coal products, respectively), we obtain similar results as in the benchmark model with a smaller coefficient on $CR3$.

Excluding three years with most of the missing data (1995, 1996, and 1997) again produces negative coefficients, but statistically insignificant and smaller than in the benchmark model.

Overall, the benchmark results seem fairly robust to outliers. The effect of banking concentration is, in most cases, not significant, the sign of the relation between
both market structures is more likely negative than positive which contrasts sharply with the findings of Cetorelli.

6.2.2. Institutional variables

The relationship between average firm size and banking market concentration could be affected by the general economic and financial development of the countries. Therefore we check this possibility by including interaction terms of external dependency and several measures of financial development. The estimates are presented in Table 7 in the Appendix.

Sectors that are more dependent on external funds would have more firm entry and hence, lower average firm size, if banks are more developed. We check this factor of influence by including in the analysis the interaction of external financial dependency with domestic credit provided by banks (column (1)) and with domestic credit to the private sector (column (2)). Both control variables have a significant negative coefficient as expected. The coefficient on the banking concentration term is practically unchanged when domestic credit is included and it is slightly larger when private credit is included, with respect to the benchmark model. Again, it looks like there is no banking concentration effect in transition countries.

We also consider the influence of stock market capitalisation on average firm size and banking concentration effect (column (3)). The argument is the same as above, implying that the coefficient on this interaction term should be negative. However, the coefficient for market capitalisation turns out to be positive but close to zero and insignificant. The coefficient for banking concentration remains negative; it is larger, but still insignificant. This shows that the fact that firms are able to obtain funds from the stock market is important only in more developed countries, while it has a negligible effect on industry concentration, specifically on average firm size, or the banking concentration effect in transition countries.

Controlling for economic development (column (4)) reduces the banking concentration effect, and keeps its sign negative and insignificant.

Finally, we consider the influence of another possible source of funding: borrowing abroad (column (5)). If firms are able to borrow abroad, there should be more entry into sectors that are more dependent on external finance in countries that have more foreign loans in the economy. The expected coefficient on the interaction term between foreign loans and external financial dependency indicator is therefore negative. Moreover, a significant effect of foreign banking loans on industry structure would imply that it is actually banking market contestability and not banking market concentration that affects industry market structure. We base this conclusion on the assumption that domestic banks are behaving more competitively, if firms are able to borrow abroad than if not. If this is true, borrowing abroad affects domestic bank-
ing market competition (or market contestability), but not domestic banking market concentration. Of course, if we could define relevant banking markets for sectors in each country more precisely than just as domestic (national) banking markets, there would be less difference between banking market concentration and competition in this respect.

It transpires that the interaction term with foreign loans for transition countries is indeed negative, statistically significant and large in comparison to banking concentration and other interaction effects so far included in the model. Also, its addition in the model reduces the coefficient on banking concentration, which remains negative but statistically not significant. These results imply that in transition countries, the extent of borrowing abroad affects industry market structure and average firm size more than banking concentration does (if it does).

6.2.3. Delayed effects and correlation vs. causation

Rosen (2004) argues that using the same year for banking and industry concentration indicates only correlation between the two concentrations, but not causation. In some cases, the correlation could be explained, for example, by merger waves. We check the model with one-year lagged and preceding three-year average banking concentration (Table 8, Appendix). In both cases, the results do not change our conclusion. Although the coefficients are mostly larger than in the benchmark model, the banking concentration effect remains mostly negative and it is always insignificant. This confirms our previous results and suggests there is no causal relationship between banking concentration and industrial markets concentration in transition countries.

Another possibility to test for causation is the differential approach. Instead of using the continuous external financial dependency measure, we divide the sectors into highly and lowly dependent on external finance. If banking concentration affects average firm size, it should affect predominantly the firms in highly dependent sectors and not firms in other sectors. Instead of interacting the concentration measures with external dependency, we interact it with an indicator variable $EDI$. $EDI$ is equal to 1 for sectors with above median external dependency and it is equal to 0 for others. A significant coefficient on this interaction term is evidence of a causal effect of banking concentration on average firm size. The results uniformly show insignificant coefficients, which are positive when average firm size is measured in terms of value added or number of employees, but negative when measured in terms of turnover (Tables 9 and 10, Appendix).
7. Conclusion and further research

The estimations in this paper were conducted mainly to verify the results of Cetorelli (2001, 2004) for the case of transition countries and to provide further insight into empirical findings about the relationship between banking market structure and industrial market structure. The analysis of transition banking markets’ evolution, based on existing theoretical, descriptive and econometric studies, indicated that his findings could be rejected in the case of transition countries. Therefore, the aim of the paper was to estimate the relationship between both market structures by using the same research methodology as in Cetorelli (2004) and find some starting points for further research of this link. The main conclusions from our study are the following.

Our study does not show much confirmation that the effect of banking market structure on product (industrial) market structure is positive in general, as claimed by Cetorelli (2001, 2004) and Cetorelli and Strahan (2006). The analyses generally show much more support for the negative effect of banking market structure. This indicates that the positive effect found by Cetorelli might be circumstantial and linked to some specific countries (OECD) and time periods (around 1995–1997).

The relationship between both market structures is clearly different in transition countries; however, it is not clear if banking market structure has an effect on product market structure at all in transition countries. Our results generally show a small and rarely significant negative effect for these countries. This may be a result of two opposite effects cancelling each other out or simply evidence of no such effect present.

Cetorelli, in his studies, assumes that the SCP theory is true and therefore argues that a more concentrated banking market has banks that exploit their market power and this behaviour has consequences for real market structure in the form of a negative or positive effect. Empirical studies of banking markets generally do not find convincing evidence of SCP being true, instead it appears that banking markets are behaving accordingly to contestable markets theory. This means that even if banking markets are concentrated, banks do not necessarily abuse market power because of a constant threat of entry by new competitors. Since it is the abuse of market power (in the form of bank managers’ behaviour or pricing policy) that has effects for product market structure in Cetorelli’s explanations, this link between both concentrations does not hold anymore. If there was a credible threat of entry into a banking market, banks in more or less concentrated banking markets would probably react in a similar manner and the effect on product market structure would not be different between them. It is premature to say that there is no link between both market structures (or concentrations), but if this explanation holds, it is not via the abuse of market power by banks and we need an alternative explanation.

Our results showed a considerate effect of foreign loans to non-banks on the relationship between both market structures. This variable had a larger and statisti-
cally more significant effect on product market structure than banking concentration had in transition countries. Assuming that the extent of borrowing abroad affects domestic banking market competition (or market contestability), but not domestic banking market concentration, this finding further reassures the conclusion that it is really the competitive (or anticompetitive) behaviour of banks that has effects for the real market structure and not concentration *per se*.

Because of globalisation, deregulation and liberalisation in the banking industry, the problem of defining the relevant market is severely aggravated in studies of this industry. The assumption that national banking markets can proxy for relevant domestic banking markets has become much weaker in the last decade than it was previously. The significant effect of foreign loans demonstrates that the relevant banking market is, in fact, broader than national markets for most countries, especially transition. Further empirical studies need to consider this problem much more carefully and find a feasible solution for a better proxy.

References:


### Appendix

Table 3: Pairwise Correlations

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<tr>
<th></th>
<th>LNVA</th>
<th>SHVA</th>
<th>CR3</th>
<th>CR5</th>
<th>HHI</th>
<th>Dom_cre</th>
<th>Priv_cre</th>
<th>Mar_cap</th>
<th>Gdp_pc</th>
<th>Floans</th>
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<tr>
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<td>Gdp_pc</td>
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<td>0.0313</td>
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NOTE: * denotes 5% significance level
Table 4: External financial dependency (Rajan and Zingales, 1998)

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<tr>
<td>324</td>
<td>Footwear</td>
</tr>
<tr>
<td>314</td>
<td>Tobacco</td>
</tr>
<tr>
<td>3513</td>
<td>Synthetic Resins</td>
</tr>
<tr>
<td>352</td>
<td>Other chemicals</td>
</tr>
<tr>
<td>313</td>
<td>Beverages</td>
</tr>
<tr>
<td>355</td>
<td>Rubber products</td>
</tr>
<tr>
<td>311</td>
<td>Food</td>
</tr>
<tr>
<td>390</td>
<td>Other Manufacturing</td>
</tr>
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<td>Petroleum Refineries</td>
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<tr>
<td>322</td>
<td>Wearing Apparel</td>
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<td>Drugs and Medicines</td>
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<tr>
<td>362</td>
<td>Glass and products</td>
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<tr>
<td>3841</td>
<td>Shipbuilding and repairing</td>
</tr>
<tr>
<td>381</td>
<td>Metal Products</td>
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<tr>
<td>372</td>
<td>Non-ferrous metals</td>
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<td>3511</td>
<td>Basic industrial chemicals</td>
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<td>371</td>
<td>Iron and Steel</td>
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<td>341</td>
<td>Paper and products</td>
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<tr>
<td>3843</td>
<td>Motor vehicles</td>
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<tr>
<td>3411</td>
<td>Pulp, paper and board</td>
</tr>
<tr>
<td>342</td>
<td>Printing and Publishing</td>
</tr>
<tr>
<td>321</td>
<td>Textiles</td>
</tr>
<tr>
<td>369</td>
<td>Non-metallic products</td>
</tr>
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<td>354</td>
<td>Petroleum and Coal Products</td>
</tr>
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<td>384</td>
<td>Transport Equipment</td>
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<tr>
<td>361</td>
<td>Pottery, China etc.</td>
</tr>
<tr>
<td>385</td>
<td>Professional Goods</td>
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<tr>
<td>382</td>
<td>Non-Electrical Machinery</td>
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<td>383</td>
<td>Electrical machinery</td>
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<td>331</td>
<td>Wood products</td>
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<td>3825</td>
<td>Office and computing machines</td>
</tr>
<tr>
<td>332</td>
<td>Furniture and Fixtures</td>
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<tr>
<td>3832</td>
<td>Radio, TV and Comm. Equipment</td>
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<tr>
<td>356</td>
<td>Plastic Products</td>
</tr>
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</table>

NOTES:

* This sector was not included in the benchmark analysis, because it was not possible to accurately translate it from NACE.

Shaded sectors have above median external financial dependency.
Table 5: Pattern of Industry Structure and Banking Concentration across Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean(CR3)</th>
<th>Mean(CR5)</th>
<th>Mean(Nbanks)</th>
<th>Mean(Nfirms)</th>
</tr>
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<tbody>
<tr>
<td>BG</td>
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<td>EE</td>
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<td>HU</td>
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<td>LT</td>
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<tr>
<td>SI</td>
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<td>17.17</td>
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<tr>
<td>SK</td>
<td>63.21</td>
<td>-0.24</td>
<td>15.50</td>
<td>4983.67</td>
</tr>
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</table>

NOTE: CR3 is the concentration ratio of the three largest banks in the banking market. It is measured as the market share of the three largest banks in terms of total assets. The mean (CR3) refers to the average CR3 in the period 1997–2004. LNVA is the logarithm of value added per enterprise and the mean is calculated as the simple average LNVA in the period 1995–2004 by country. Mean (Nbanks) and Mean (Nfirms) denote the average number of banks and firms, respectively, in the period 1997–2004 by country.
Table 6: Pattern of Financial Dependence and Industry Structure across Sectors

<table>
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<th>ISIC 2</th>
<th>Mean (Ext_dep)</th>
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<td>311</td>
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<td>-1.47</td>
</tr>
<tr>
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<td>-0.15</td>
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<tr>
<td>314</td>
<td>-0.38</td>
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</tr>
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<td>312</td>
<td>0.14</td>
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<tr>
<td>322</td>
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NOTE: Mean (Ext_dep) is the average external financial dependency for American mature firms in the 1980’s. The measure is taken from Rajan and Zingales (1998). LNVA is the logarithm of value added per enterprise and the mean is calculated as the simple average LNVA in the period 1997–2004 by sector.
Table 7: Institutional variables

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<td>17.798***</td>
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<td>(1.648)</td>
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NOTE: *** 1 % significance level, ** 5 % significance level, * 10 % significance level

Table 8: Lagged and average concentration measures

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<td>Lagged CR5*ED</td>
<td>0.036</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>(1.349)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagged HHI*ED</td>
<td></td>
<td>-1.370</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(2.671)</td>
<td></td>
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<td></td>
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<tr>
<td>Average CR3*ED</td>
<td></td>
<td></td>
<td>-3.939</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(4.324)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average CR5*ED</td>
<td></td>
<td></td>
<td></td>
<td>-0.663</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3.546)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average HHI*ED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-5.505</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>(7.188)</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.666</td>
<td>0.666</td>
<td>0.667</td>
<td>0.637</td>
<td>0.632</td>
<td>0.636</td>
</tr>
<tr>
<td></td>
<td>(1.652)</td>
<td>(1.654)</td>
<td>(1.648)</td>
<td>(3.134)</td>
<td>(3.118)</td>
<td>(3.141)</td>
</tr>
<tr>
<td>F</td>
<td>59.411</td>
<td>59.013</td>
<td>58.580</td>
<td>48.431</td>
<td>48.809</td>
<td>49.389</td>
</tr>
<tr>
<td></td>
<td>1459</td>
<td>1459</td>
<td>1459</td>
<td>909</td>
<td>907</td>
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</tr>
</tbody>
</table>

NOTE: *** 1 % significance level, ** 5 % significance level, * 10 % significance level
### Table 9: Estimation results – EDI

Dependent variable = Average firm size, measured in:

<table>
<thead>
<tr>
<th></th>
<th>Value added</th>
<th>Turnover</th>
<th>Num. employees</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHVA</strong></td>
<td>17.691***</td>
<td>15.207***</td>
<td>10.706***</td>
</tr>
<tr>
<td></td>
<td>(0.918)</td>
<td>(0.862)</td>
<td>(0.656)</td>
</tr>
<tr>
<td><strong>CR3*EDI</strong></td>
<td>0.178</td>
<td>-0.045</td>
<td>0.194</td>
</tr>
<tr>
<td></td>
<td>(0.240)</td>
<td>(0.256)</td>
<td>(0.195)</td>
</tr>
<tr>
<td>R² (adj.)</td>
<td>0.556</td>
<td>0.945</td>
<td>0.547</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>41.774</td>
<td>713.782</td>
<td>42.222</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>1678</td>
<td>1676</td>
<td>1672</td>
</tr>
</tbody>
</table>

**NOTE:** *** 1 % significance level, ** 5 % significance level, * 10 % significance level

### Table 10: Institutional variables – EDI

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHVA</strong></td>
<td>17.925***</td>
<td>17.922***</td>
<td>17.704***</td>
<td>17.814***</td>
<td>17.800***</td>
</tr>
<tr>
<td></td>
<td>(0.935)</td>
<td>(0.936)</td>
<td>(0.921)</td>
<td>(0.929)</td>
<td>(0.938)</td>
</tr>
<tr>
<td><strong>CR3*EDI</strong></td>
<td>0.177</td>
<td>0.117</td>
<td>0.219</td>
<td>0.232</td>
<td>0.237</td>
</tr>
<tr>
<td></td>
<td>(0.240)</td>
<td>(0.237)</td>
<td>(0.268)</td>
<td>(0.241)</td>
<td>(0.245)</td>
</tr>
<tr>
<td><strong>Dom_cre*EDI</strong></td>
<td>-0.007***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Priv_cre*EDI</strong></td>
<td>-0.009***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mar_cap*EDI</strong></td>
<td></td>
<td>-0.002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.004)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gdp_pc*EDI</strong></td>
<td></td>
<td></td>
<td>-0.000***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Floans*EDI</strong></td>
<td></td>
<td></td>
<td></td>
<td>-3.651**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1.656)</td>
<td></td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>0.558</td>
<td>0.559</td>
<td>0.556</td>
<td>0.560</td>
<td>0.557</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>41.662</td>
<td>41.478</td>
<td>41.009</td>
<td>40.634</td>
<td>41.082</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>1678</td>
<td>1678</td>
<td>1678</td>
<td>1678</td>
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</tr>
</tbody>
</table>

**NOTE:** *** 1 % significance level, ** 5 % significance level, * 10 % significance level
1. Introduction

Most of the earlier empirical studies show that feedback trading has asymmetric effects in up and down markets (Altay, 2006; Koutmos and Saidi, 2001; Bohl and Reitz 2002). Koutmos et al (2006), however, document positive feedback trading in an emerging market, the Cyprus Stock Exchange, with little evidence that market declines are followed with higher volatility than market advances, the so-called ‘leverage effect’, that has been observed in almost all developed stock markets. This paper examines the effect of feedback trading in DSE and provides new evidence that feedback trading can be symmetric in its effects in up and down markets.

Following Fama (1965), there has been a spur of research in line with efficient market hypothesis (EMH) in developed and emerging markets. However, behavioural finance has posed multi-pronged challenges to the validity of EMH. Serial autocorrelation in stocks returns is one of the anomalies against EMH. There are theoretical explanations for return autocorrelation, such as time-varying expected returns (Conrad and Kaul, 1988), non-synchronous trading (Lo and MacKinlay, 1990) and transaction costs (Mech, 1993). Sluggish adjustment of stock prices to information is also attributed to other factors such as firm size (Hamid and Kusnadi, 2006), analyst coverage (Brennan, et al 1993 & Hong et al 2000), institutional ownerships and trading volume (Chordia & Swaminathan, 2000). However, the empirical evidence demonstrates that the degree of daily aggregate return autocorrelation is too large to be explained by these arguments. For example, Mech (1993), McQueen et al (1996), Ogden (1997), Pierdzioch (2004), and Pierdzioch & Schertler (2005) provide little empirical support for time-varying risk premiums as the underlying cause of return autocorrelation. Similarly, Lo and MacKinlay’s (1988, 1990) non-synchronous trading and Mech’s (1993) transaction costs hypothesis cannot completely account for the observed autocorrelation. Against this backdrop, feedback trading hypothesis provides a theoretical rationale for the well-documented autocorrelation in stock returns. Feedback trading
means trading based on historical data, while positive feedback trading implies “buy when prices rise; sell when they fall” and negative feedback trading means “sell when prices rise; buy when they fall”. The presence of a sufficiently large number of feedback traders in the stock market is reflected in the autocorrelation of returns. Feedback trading overshoots stock prices beyond fundamentals and results in excess volatility which may destabilise stock prices (DeLong et al, 1990).

Characterised by a smaller number of investors, lower level liquidity, and a high level of volatility, Dhaka Stock Exchange (DSE) has been found to be inefficient in weak form (see, for example, Rahman & Hossain, 2006; Mobarek & Keasey, 2000; Mollik & Bepari, 2008). A significant level of autocorrelation has been found in the DSE return series. This paper investigates the autocorrelation structure in the DSE return series in the framework of feedback trading hypothesis. The study was motivated by the fact that, although a significant level of autocorrelation has been found in the DSE return series, no such study has, thus far, been conducted on DSE to investigate the underlying causes of its autocorrelation structure. Particularly, there has been no empirical study on the presence of feedback trading as a possible force in determining the properties of returns on the DSE. This study will provide a possible explanation for the causes of observed autocorrelation structure in DSE. Since feedback traders rely on noisy information other than fundamentals, this study will also provide evidence on noise trading in DSE. Thus the present paper contributes to the literature by providing new empirical evidence on positive feedback trading in an emerging stock market. In doing so, the second section of the paper provides a review of literature. Section three provides an introduction to the microstructure of DSE, while section four explains the empirical models of feedback trading and volatility along with the methodology used in this paper. The section that follows discusses the findings of the present study while the last section concludes.

2. Literature review

In finance literature, there are various hypotheses for explaining the autocorrelation structures in the stock return. Boudoukh et al (1994) summarises these hypotheses into three basic schools of thought. The first school, loyalist, assumes an efficient stock market and puts forward the concept of non-synchronous trading and transaction cost (Mech, 1993) as a reason for autocorrelation. The concept of ‘non-synchronous trading’ first proposed by Fisher (1966) and subsequently developed by Lo and MacKinlay (1990) assumes that the new information is reflected in highly traded stock prices earlier than in thinly traded stock prices. Once new information affects highly traded stock prices, a time lag occurs when the thinly traded stock prices are affected, resulting in autocorrelation. When index returns are analysed in this context, inclusion of
thinly traded stocks in the index causes positive autocorrelation in the index returns. The second school of thought, revisionists, also assumes efficient market and suggests time varying risk premiums as the reasons for autocorrelation in index return. The third school of thought, heretics, is against the validity of efficient market hypothesis. In terms of behavioural finance, this school assumes the psychological factors to be responsible for autocorrelation in stock returns. Some investors seek trends in past stock prices and base their portfolio decisions on the expectation that such trends will persist. In terms of behavioural finance, this type of investor is usually called a noise trader or a feedback trader. If a large number of traders implement the feedback trading strategy, current stock prices become correlated to the previous prices, resulting in autocorrelation in the index returns. Positive feedback trading should result in negative autocorrelation of returns because it gives rise to a short-run over-reaction of stock market prices to new information. Negative feedback trading, in contrast, should result in positive autocorrelation of returns (Sentana and Wadhani, 1992).

The failure of the non-synchronous trading hypothesis and transaction cost hypothesis to fully explain the autocorrelation in stock returns (see, for instance, Perry, 1985; Boudoukh et al, 1994; Berlung & Liljeblom, 1998; Pierdzioch, 2004; and Pierdzioch & Schertler, 2005) diverts academic attention to the feedback trading hypothesis. There are a number of studies related to the investigation of positive feedback trading and stock return autocorrelation on the stock markets of different countries. Sentana and Wadhani (1992) find the existence of positive feedback trading in the US stock market. In doing so, they combine an empirical model in mean equation (part of it following from Shiller, 1984) with EGARCH models for conditional variance equation, which provides testable implications of positive and negative feedback trading and their relation with the volatility and stock market autocorrelation. Koutmos (1997), on the contrary, using the symmetric GRACH model (which does not allow conditional volatility to respond asymmetrically to positive and negative news) investigates daily data on stock market indices of six developed countries (Australia, Belgium, Germany, Italy, Japan, UK), and concludes that the positive feedback trading causes negative autocorrelation in stock returns. Koutmos and Saidi (2001) investigate six emerging Asian stock markets viz. Hong Kong, Malaysia, Philippines, Singapore, Taiwan, and Thailand. Conditional variance of the returns is modelled using the Threshold GARCH process. They find that the negative innovations influence volatility more than positive ones (leverage effect). While Bohl and Reitz (2002) using the EGARCH model show strong evidence of leverage effect in the German market, Bohl and Siklos (2004) study the feedback trading behaviour in emerging markets (Czech Republic, Hungary, Poland & Russia) and in mature markets (Germany, the UK and the US). Their results suggest that positive and negative feedback trading strategies exist in both types of markets but are more pronounced in emerging stock markets than in mature markets. Hence, non-fundamental trading
strategies seem to play a more important role in emerging relative to mature stock markets. Yet another paper by Bohl and Siklos (2005), based on daily data on the Dow Jones Industrial Average index from 1915 to 2004, investigates trading behaviour during stock market downturns and finds that there is evidence of positive feedback trading during episodes of stock market crashes. They attribute the stock market crash to feedback trading. Nofsinger and Sias (1999) study the feedback trading behaviour of institutional investors versus individual investors and find that either institutional investors in the positive-feedback trade more than individual investors or institutional herding impacts prices more than herding by individual investors. Kallinterakis and Ferreira (2006), using data from the Portuguese PSI-20 market index, test for herd and positive feedback trading and find the presence of statistically significant herding and positive feedback trading. They also conclude that herding tends to rise when the market exhibits a definitive direction and tends to decline when the market experiences fluctuations. Altay (2006), studies the autocorrelation structure in the Istanbul Stock Exchange, and finds evidence of positive feedback trading which is more pronounced in down market than in up market. On the contrary, Koutmos et al (2006) document positive feedback trading in an emerging market, the Cyprus Stock Exchange, with little evidence that market declines are followed by higher volatility than market advances, the so-called ‘leverage effect’, that has been observed in almost all developed stock markets.

While the behavioural finance literature provides a number of theoretical models of feedback trading (see, for instance, Shiller, 1984; DeLong et al, 1990; Kirman, 1991, 1993; Campbell and Kyle, 1993; Shleifer, 2000), almost all of these studies are based on the Shiller-Sentana-Wadhwani (SSW) model in terms of EGARCH and TGARCH. One important reason for the wide application of the SSW model is that in addition to the hypotheses for the index return autocorrelation mentioned above, the model has the testable implication that during periods of low volatility, returns are positively autocorrelated and during periods of high volatility, return autocorrelation turns negative. The reversal in the sign of return autocorrelation is consistent with the presence of positive feedback traders in the stock market. The relationship between return autocorrelation and volatility is the major difference between the SSW approach and the alternative hypotheses for index return autocorrelation. We use this specific characteristic to provide empirical evidence on the presence of positive feedback traders in DSE. Asymmetric GARCH models are combined with the SSW (Shiller, 1984; Sentana and Wadhwani, 1992) theoretical model, which provides a testable implication for feedback trading and is widely used in feedback trading literature.

Besides the SSW-GARCH model, we employ a discreet variant of the Mackey-Glass-GARCH (MG-GARCH) process developed by Kyrtou (2005) and applied in Kyrtou and Serletis (2006). The motivation behind using this model is that due to the heterogeneity in agents’ expectations, simple asymmetric GARCH models can produce
chaotic dynamics. A non-linear chaotic model, buffeted with dynamic noise, with some autocorrelations in returns, but at the same time persistence in squared returns, with slowly decaying autocorrelations, may provide a structural explanation for the unpredictability of stock returns and volatility clustering. It has either negligible or zero autocorrelations in the conditional mean, and a rich structure in the conditional variance. Volatility clustering is treated as an endogenous process. The superiority of this model has been provided in Kyrtsou & Terraza (2003).

In order to test the hypothesis that neither the non-synchronous trading nor the time varying risk premium cause the time varying autocorrelation in the DSE returns series, rather it is due to feedback trading, this study also nests the LeBaron’s (1992) exponential autoregressive (EAR) model with the SSW positive feedback trading model.

3. Market micro structure of DSE

The stock market history of Bangladesh refers back to 28 April, 1954, when the East Pakistan Stock Exchange Association Ltd. was established. Formal trading began on the bourse in 1956. The trading was suspended during the liberation war of Bangladesh in 1971. Operation resumed again in 1976 with the change in government policy. During 1976, there were only 9 listed companies with a total paid up capital of Tk.0.138 billion and market capitalisation of Tk.0.147 billion, which was 0.138 per cent of GDP (Khan, 1992). Since then, the stock exchange continued its journey of growth. The second stock exchange of the country, the Chittagong Stock Exchange (CSE) was established in December 1995. In order to control the operation of the stock exchanges and trading of stocks of listed companies, the government of Bangladesh established the Securities and Exchange Commission (SEC) of Bangladesh on 8th June, 1993 under the Securities and Exchange Commission Act, 1993. The mission of the SEC is to protect the interests of securities investors, develop and maintain fair, transparent and efficient securities markets and ensure the proper issuance of securities and compliance with securities laws.

From its inception, the stock market of the country was growing at a slow pace. There was a large surge in the stock market in the Summer and Fall of 1996, evidenced by a 197.43 per cent, 372.30 per cent and 370.51 per cent increase in market capitalisation, total annual turnover and daily average turnover respectively in DSE and 506.63 per cent, 210.2 per cent and 615.15 per cent increase in market capitalisation, total annual turnover and daily average turnover in CSE. The DSE general index grew from 832 on January 1 1996 to 3567 on November 14, 1996 whilst that of CSE grew from 409.4 in 1995 to 1157.9 in 1996. The market, however, crashed in December of 1996 and the index has declined significantly since then, with the index of DSE
assuming a value of 507.33 as of November 1999, resulting in a cumulative decline of 83.44 per cent from 1996 to 1999 with an annual declining rate of 27.82 per cent. Investors’ confidence was significantly damaged because of excessive speculation, allegedly aggravated by widespread irregular activities. The government of Bangladesh undertook the Capital Market Development Programme (CMDP) supported by the ADB on 20th November 1997. The CMDP aimed at (i) strengthening market regulation and supervision, (ii) developing the stock market infrastructure, (iii) modernising stock market support facilities, (iv) increasing the supply of securities in the market, (v) developing institutional sources of demand for securities in the market, and (vi) improving policy coordination. Central Depository Bangladesh Limited (CDBL) was incorporated as a public limited company on 20th August 2000 to operate and maintain the Central Depository System (CDS) of electronic book entry, recording and maintaining securities accounts and registering the transfer of securities; changing ownership without any physical movement or endorsement of certificates and execution of transfer instruments and to ensure risk-free and cost-effective settlement. The CDBL also aimed at other investor services including providing a platform for the secondary market trading of Treasury Bills and Government Bonds issued by the Bangladesh Bank (the central bank). CDBL went live with the Electronic Treasury Bills registry of the Bangladesh Bank on 20th October, 2003 and thereafter began equity market operations on 24th January, 2004. Before the establishment of CDBL, the delivery, settlement and transfer procedures were handled manually and were plagued by lengthy delays, risks of damage, loss, forgeries, duplication and considerable investment in time and capital. Besides, both the CSE (July 1998) and the DSE (August 1998) have automatic trading services.

After all these reform initiatives, the DSE still remains at the early stages of development with 273 listed companies and market capitalisation to GDP ratio of 16 per cent as of November 2007. In the total market capitalisation, the share of the banking sector, the share of the largest 5 sectors and the share of the largest 5 companies being 58.8 per cent, 87.41 per cent and 22.37 per cent respectively, means that the market is highly concentrated. The value traded to the GDP ratio and turnover ratio of the market is 4.05 per cent and 17.5 per cent respectively. Of the total turnover, 81.36 per cent comes from the largest 4 sectors while 48.45 per cent comes from the banking sector alone which, once again, reinforces the market concentration (Bepari and Mollik, 2008).

Trading is carried out through an automated on-line system every day, except Friday and other government holidays. For clearing and settlement purposes all the listed instruments are divided into 5 groups and the market is divided into 4 types. The four markets in the system are: (1) Public Market: Only the trading of market lot share is carried out here through automatic matching. (2) Spot Market: Spot transactions are carried out here through automatic matching which must be settled within 24 hours. (3) Block Market: A place where bulk quantities of shares are traded through
a pick and fill basis. (4) Odd Lot Market: Odd lot scripts are traded here, based on
the pick and fill basis. A, B, G, N & Z are five groups of instruments. Transactions of
all groups of shares except group Z, in public, odd and block market, after netting,
are cleared and settled through the DSE Clearing House on a T+1 and T+3 basis,
calculated from the date of trading. In the spot market, T+0 and T+1 is the clear-
ance and settlement basis. The instrument of group Z traded in public, odd and block
markets are cleared and settled on a T+3 & T+7 basis while that of the spot market
are cleared and settled on a T+0 & T+1 basis. Brokerage fees are 1 per cent on trade
(0.5 per cent buying and 0.5 per cent selling). However, the price discovery process
has not yet become visible in the DSE (Mazumder, 2008). The micro-structure of DSE
is also characterised by the limited provision of information of a firm’s performance
to market participants, as most of the firms fail to hold regular annual general meet-
ings and provide audited financial statements on time to its shareholders. Moreover,
there is a lack of professional financial community who can analyse stock market
data for investors. The processing of new information in DSE is rather weak, due to
the persistence of a large number of non-actively traded instruments, the limited role
of mutual funds and the lack of professionally managed pension funds and limited
number of investment and broker houses.

4. Modelling Volatility and Feedback Trading Behaviour:

One of the most prominent papers about the development of the model of
feedback trading in the CAPM framework was written by Sentana and Wadhwani
(1992). Their model describes the behaviour of feedback traders and rational inves-
tors, which provide the reasons for correlation in stock returns. This model also
provides arguments for the central role of volatility for stock return autocorrelation.
The Sentana-Wadhwani model captures the behaviour of two distinct types of inves-
tor in the stock market. Feedback traders or trend chasers, as a group, do not base
their asset decisions on fundamental values. Instead, they react to past stock price
changes. Smart money investors, on the other hand, base their investment decisions
on fundamentals. The investment activities of both groups provide the theoretical
prediction about stock returns autocorrelation due to the behaviour of investors dur-
ing stock market movement.

The relative demand for stocks by feedback traders, \( F_t \), is modelled as:

\[
F_t = \gamma R_{t-1},
\]

Where \( R_{t-1} \) denotes the stock return in the previous period. The value of the
parameter \( \gamma \) permits differentiation between the two types of feedback traders. When
0 > γ, this refers to the case of positive feedback traders who buy stocks after a price rise and sell stocks after a price fall. In contrast, 0 < γ indicates the case of negative feedback trading. Unlike a positive feedback trader, the negative feedback trader sells stocks after price increases and buys stocks after price declines.

The proportionate demand for stocks by smart money traders, $S_t$, is determined by a mean-variance model:

$$S_t = \left[ E_{t-1} (R_t) - \alpha \right] / \mu_t, \mu_t = \mu (\sigma^2_t)$$

(2)

Where $E_{t-1}$ denotes the expectation operator and $\alpha$ return on a risk free asset. In this model, $R_t$ is the return of the stocks in time $t$. The risk measure is modelled as a positive function of the conditional variance, $\sigma^2_t$ of stock prices, $\mu_t = \mu (\sigma^2_t)$. Equilibrium in the stock market requires that all stocks are held and the sum of the above stated equations are equal to 1, so that

$$F_t + S_t = 1$$

(3)

Allowing for the presence of both groups in the stock market and substituting equations (1) and (2) in equation (3) yields,

$$\gamma R_{t-1} + \left[ E_{t-1} (R_t) - \alpha \right] / \mu (\sigma^2_t) = 1$$

(4)

When rational expectations are assumed the equation 4 can be rearranged as a regression model:

$$R_t = \alpha + \mu (\sigma^2_t) - \gamma \mu (\sigma^2_t) R_{t-1} + \epsilon_t$$

(5)

As can be seen from equation 5, in a stock market with feedback traders, the return function contains the additional term $R_{t-1}$ indicating that stock returns exhibit autocorrelation of order one. The pattern of autocorrelation in stock returns depends on the type of feedback traders captured by the parameter $\gamma$. The presence of positive feedback traders ($0 > \gamma$) leads to negatively auto-correlated stock returns, while negative feedback trading ($0 < \gamma$) implies positively auto-correlated stock returns. This equation also enables to predict the effect of variance on the auto-correlation by the inclusion of the conditional variance ($\sigma^2_t$). Such an autocorrelation coefficient $[\gamma \mu (\sigma^2_t)]$ includes a conditional volatility term. This structure means that when the volatility is high, the autocorrelation coefficient increases and becomes negative, which can be considered as evidence of feedback trading.

Relying on a linear form of $\gamma \mu (\sigma^2_t) R_{t-1}$, equation 5 can be rewritten as follows:

$$R_t = \alpha + \mu (\sigma^2_t) - (\gamma_0 + \gamma_1 \sigma^2_t) R_{t-1} + \epsilon_t$$

(6)

Following Sentana and Wadhwani (1992), negative feedback trading dominates at low volatility levels and positive feedback trading dominates at high levels of
volatility. At low risk level $\sigma^2_t$, the direct impact of feedback traders is given by the sign of $\gamma_0$. Negative feedback trading $\gamma_0 < 0$, results in positively auto correlated stock returns. With a rising risk level, the influence of a positive $\gamma_1$ increases and might induce negatively autocorrelated stock returns due to the investment activities of positive feedback traders. The sign of the autocorrelation will be determined by the sign of the feedback trading prevalent among the feedback traders. If positive feedback trading prevails, then the autocorrelation will be negative, whilst it will be positive in the presence of more negative feedback traders.

Thus, the model predicts that the interaction of smart money traders and positive feedback traders can induce negative autocorrelation in stock returns during periods of high volatility. Given the well-known phenomenon of higher volatility during downward movements relative to upward stock market price movements, the theoretical model predicts negative autocorrelation in periods of financial distress. In contrast, during calm periods, the autocorrelation in stock returns is positive.

In finance literature, different versions of equation 6 are used to test the feedback trading hypothesis. Recognising the differences in the feedback trading behaviour during the up and down market, Koutmos (1997) uses the following GARCH (1, 1) model in order to test feedback trading hypothesis in an up and down market:

$$ R_t = \alpha + \gamma_0 (\sigma^2_t) - (\gamma_1 + \gamma_2 \sigma^2_t) R_{t-1} + \gamma_3 |R_{t-1}| + \epsilon_t $$

$$ \sigma^2_t = \omega + \delta_0 \epsilon^2_{t-1} + \delta_1 \sigma^2_{t-1} + \mu_t, \quad |R_{t-1}| $$

here, $|R_{t-1}|$ is the absolute value of one period lagged index return which provides the opportunity to analyse the possible differences in feedback trading behaviour in up and down markets and testing the asymmetric structure.

Bohl and Siklos (2004), constructed a TGARCH (1,1) model, along with the SSW model, which differentiates the effect of good news and bad news on conditional variance and provides the opportunity to test the feedback trading behaviour after the good news and bad news enter the market.

The TGARCH (1, 1) model follows:

$$ \sigma^2_t = \omega + \delta_0 \epsilon^2_{t-1} + \delta_1 I_{t-1} \epsilon^2_{t-1} + \delta_2 \sigma^2_{t-1} + \mu_t, \quad I_t = \begin{cases} 1, & \text{if } \epsilon_{t-1} < 0 \\ 0, & \text{if } \epsilon_{t-1} \geq 0 \end{cases} $$

Here, $I_{t-1}$ is the news entering in the market in time $t-1$. Equation 9 shows that the effect of good news ($\epsilon_{t-1} \geq 0$) on the conditional variance is $\delta_0$, and the effect of bad news ($\epsilon_{t-1} < 0$) is $(\delta_0 + \delta_1)$. This means that a statistically significant $\delta_1$ coefficient is evidence in favour of an asymmetric effect of good news and bad news on conditional variances.

A popular alternative of TGARCH (1,1) model is Nelson’s (1991) EGARCH (1, 1) model.
\[ \ln (\sigma^2_t) = \omega + \delta_0 \frac{e_{t-1}}{s_{t-1}} + \delta_1 \left( \frac{e_{t-1}}{s_{t-1}} \right) + \delta_2 \ln \sigma^2_{t-1} \]  

(10)

Here, \( \delta_1 < 0 \) implies leverage effect while \( \delta_1 \neq 0 \) implies asymmetric impact.

Taking the complex behaviour in stock markets into account, we think it is more robust than the traditional stochastic approach to model the observed data by a nonlinear chaotic model disturbed by dynamic noise. We employ a Mackey-Glass-GARCH (MG-GARCH) process developed by Kyrtou (2005) and applied in Kyrtou and Serletis (2006). It has either negligible or zero autocorrelations in the conditional mean, and a rich structure in the conditional variance. Volatility clustering is treated as an endogenous process. This model permits us to capture volatility-clustering phenomena.

\[
R_t = \gamma_0 \frac{R_{t-1}}{1 + R_c} - \gamma_1 R_{t-1} + \epsilon_t
\]

(11)

\[
\sigma^2_t = \omega + \delta_0 \epsilon^2_{t-1} + \delta_1 \sigma^2_{t-1} + \mu_t
\]

(12)

The optimal \( c \) and \( \tau \) are chosen on the basis of Log Likelihood and Schwarz criteria. In this case \( c = 2 \) and \( \tau = 1 \) are selected. The main characteristic of the nonlinear trading strategy in the mean equation of the above model is that it can take into account dynamics produced by both positive and negative feedback traders. The coefficients \( \gamma_0 \) and \( \gamma_1 \) vary over time. If \( \gamma_0 + \gamma_1 > 0 \), we observe positive feedback behaviour, while \( \gamma_0 + \gamma_1 < 0 \) reveals negative feedback (Kyrtou and Labys, 2007). Its advantage over simple GARCH and AR-GARCH alternatives has been shown in Kyrtou and Terraza (2003) and Kyrtou and Karanasos (2006).

While SW hints at the relationship between return autocorrelation and volatility, in that low volatility is associated with positive autocorrelation, and high volatility is associated with negative autocorrelation, LeBaron (1992) provides us with a model which helps to test if the autocorrelation in stock returns is time varying, more specifically, if there is an inverse relationship between volatility and autocorrelation. The functional form suggested by LeBaron follows:

\[
R_t = \alpha + \gamma_0 (\sigma^2_t) + (\gamma_1 + \gamma_2 \exp \{-\sigma^2_{t-1}\}) R_{t-1} + \epsilon_t
\]

(13)

Here the autocorrelation of the returns is an exponential function of the conditional variance, implying that autocorrelation is high during calm periods and low during volatile periods. When the conditional variance tends to infinity, auto correlation tends to \( \gamma_1 \) and when the conditional variance tends to zero, the autocorrelation tends to \( \gamma_1 + \gamma_2 \). To provide for the testable implication that time varying autocorrelation in the DSE return series is due to positive feedback trading rather than for non-synchronous trading and time varying risk premium we nest LeBaron (1992) EAR model with SSW
positive feedback trading model to form the following equation (see, for instance, Koutmos et al 2006):

\[ R_t = \alpha + \gamma_0 (\sigma^2_t) - (\gamma_1 + \gamma_2 \sigma^2_t) R_{t-1} + \gamma_3 \exp (-\sigma^2_{t-1}) R_{t-1} + \epsilon_t \] (14)

This model implies that as volatility approaches zero return autocorrelation approaches $\gamma_1 + \gamma_3$ whereas during high volatility the autocorrelation becomes $\gamma_1 + \gamma_2$. If $\gamma_3 = 0$ and $\gamma_2 < 0$ then it can be concluded that positive feedback trading is driving the time-varying autocorrelation.

5. Data and Research Findings

The DSE General daily price index (consisting of all traded shares in DSE) and the DSE 20 daily price index (consisting of 20 most blue chips company) for the period of January 1, 2001 to December 31, 2007 are analysed. The natural log of the relative price is computed for daily intervals to produce a time series of continuously compounded returns,

\[ R_t, \text{ which is the one period return in period } t, \text{ is therefore measured as} \]

\[ R_t = \ln (P_t) - \ln (P_{t-1}) \] (15)

Descriptive statistics for the DSE Gen and DSE 20 daily returns are provided in Table 1. The statistics reported are the mean, the standard deviation, measures for skewness, kurtosis, and Jarque-Bera statistics. Both series have negative skewness, which implies that the distribution has a long left tail. The kurtosis of both the series is higher than three, so the distribution is peaked (leptokurtic) in comparison with normal. The skewness and kurtosis measures indicate departures from normality. As a result, the Jarque-Bera test rejects the null hypothesis of normality.
Rejection of normality can be partially attributed to temporal dependencies at moments of the series, especially second-moment temporal dependencies.

It is common to test for such dependencies using the Ljung–Box (LB) test statistics (Bollerslev et al, 1994). The Ljung–Box (LB) test statistics applied to returns (testing for first moment dependencies and squared returns), (testing for second moment dependencies) are provided. The hypothesis that all autocorrelations up to 15th lags are jointly zero is rejected for both the returns and the squared returns in both cases.

This provides evidence of temporal dependencies at the first moment of the distribution of returns, due to, perhaps non-synchronous trading or market inefficiencies. Autocorrelation of the squared returns provides evidence of time-varying second moments. However, the LB-statistic is not capable of detecting any sign reversals in the autocorrelations, due to positive feedback trading. It also fails to explain whether volatility and autocorrelation are linked because of the presence of positive feedback trading. It simply provides an indication that first moment and second moment dependencies are present and justifies the use of the ARCH-type specification for the variance.

The GARCH (1, 1) model parameter estimations (Table 2) of daily returns present statistically significant one-day lagged autocorrelations for both the DSE Gen and DSE 20 index return series. The one-day lagged autocorrelation parameter (\( \rho \)) for both the indexes is positive and statistically significant at the 1 per cent level. These findings can be considered as evidence in favour of non-synchronous trading and/or feedback trading hypothesis. As explained in Campbell, Lo and MacKinlay (1997), non-synchronous trading would imply negative autocorrelation in index returns, but we observe positive autocorrelation in the Dhaka stock exchange. Thus at this point, the evidence is not clear as to whether non-synchronous trading or feedback trading
is the cause of autocorrelation in return series. Dividing the total autocorrelation into two parts; constant autocorrelation and autocorrelation depending on the variability of returns, may provide information about the reasons for the autocorrelation.

Table 2: Autocorrelation estimation of GARCH (1, 1) model

<table>
<thead>
<tr>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_t = \alpha + \rho R_{t-1} + \epsilon_t$</td>
</tr>
<tr>
<td>$\alpha$</td>
</tr>
<tr>
<td>p-value</td>
</tr>
<tr>
<td>$\rho$</td>
</tr>
<tr>
<td>p-value</td>
</tr>
<tr>
<td>$\sigma_t^2 = \omega + \delta_0 \epsilon_{t-1}^2 + \delta_1 \sigma_{t-1}^2 + \mu_t$</td>
</tr>
<tr>
<td>$\omega$</td>
</tr>
<tr>
<td>p-value</td>
</tr>
<tr>
<td>$\delta_0$</td>
</tr>
<tr>
<td>p-value</td>
</tr>
<tr>
<td>$\delta_1$</td>
</tr>
<tr>
<td>p-value</td>
</tr>
<tr>
<td>Durbin-Watson stat.</td>
</tr>
<tr>
<td>F statistics</td>
</tr>
<tr>
<td>Log likelihood</td>
</tr>
<tr>
<td>Akaike info criterion</td>
</tr>
<tr>
<td>Schwarz criterion</td>
</tr>
<tr>
<td>DSE Gen</td>
</tr>
<tr>
<td>0.0003*</td>
</tr>
<tr>
<td>0.0000</td>
</tr>
<tr>
<td>0.1864***</td>
</tr>
<tr>
<td>0.0000</td>
</tr>
<tr>
<td>1.02E–06***</td>
</tr>
<tr>
<td>0.0001</td>
</tr>
<tr>
<td>0.1734***</td>
</tr>
<tr>
<td>0.0000</td>
</tr>
<tr>
<td>0.8362***</td>
</tr>
<tr>
<td>0.0000</td>
</tr>
<tr>
<td>2.0862</td>
</tr>
<tr>
<td>5.1729</td>
</tr>
<tr>
<td>5209.091</td>
</tr>
<tr>
<td>-6.5574</td>
</tr>
<tr>
<td>-6.5326</td>
</tr>
<tr>
<td>DSE 20</td>
</tr>
<tr>
<td>-0.0002</td>
</tr>
<tr>
<td>0.3569</td>
</tr>
<tr>
<td>0.2053***</td>
</tr>
<tr>
<td>0.0000</td>
</tr>
<tr>
<td>9.19E–06***</td>
</tr>
<tr>
<td>0.0000</td>
</tr>
<tr>
<td>0.2221***</td>
</tr>
<tr>
<td>0.0000</td>
</tr>
<tr>
<td>0.7146***</td>
</tr>
<tr>
<td>0.0000</td>
</tr>
<tr>
<td>2.1207</td>
</tr>
<tr>
<td>5.4404</td>
</tr>
<tr>
<td>5905.492</td>
</tr>
<tr>
<td>-6.4601</td>
</tr>
<tr>
<td>-6.4214</td>
</tr>
</tbody>
</table>

* Significant at 10% level; ***Significant at 1 % level.

Table 3 provides the maximum likelihood estimation results of the Koutmos (1997) version of the GARCH (1, 1) model which allow for the testing of the feedback trading hypothesis in up and down markets. For both DSE Gen and DSE20 return series, $\omega$, $\delta_0$ and $\delta_1$ parameters in the conditional variance equation are statistically significant at the 1 per cent level, which means the conditional variance is affected by the last information arrival into the market, as well as the one-day lagged conditional variance. In the mean equation, coefficient $\gamma_0$, a measure of impact of the rational investors on returns, is not statistically significant for both the return series. It implies that the conditional variances ($\sigma_t^2$) do not have a statistically significant effect on index returns and thus investors are not compensated with higher returns for taking a higher risk in DSE. When the expected volatility rises, rational investors influence prices negatively, and in such a case $\gamma_0$ would be negative. Thus positive and statistically insignificant $\gamma_0$ for both the return series in our analysis (Table 3) may mean that the rational traders do not influence prices significantly when the volatility changes. Statistically significant autocorrelation coefficient $\gamma_1$ supports the hypothesis of feedback trading. However, the constant part of the autocorrelation coefficient ($\gamma_1$)
can include the effect of both feedback trading and non-synchronous trading. Statistically significant $\gamma_2$ parameters for both the return series supports the feedback trading hypothesis and negates the time-varying risk premium or the non-synchronous trading effect in the auto-correlation coefficient. Negative autocorrelation in returns series suggests positive feedback trading, which increases with the increase in volatility. Negative and statistically significant (at the 5 per cent level for DSE Gen & at 1 per cent level for DSE 20) $\gamma_2$ parameter in the daily return series for both the indices is important evidence of positive feedback trading in DSE.

Table 3: Parameter estimations of Koutmos version of SSW- GARCH (1,1) model for testing feedback trading hypothesis

<table>
<thead>
<tr>
<th>Parameters</th>
<th>DSE Gen</th>
<th>DSE 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_t = \alpha + \gamma_0 (\sigma^2_t) - (\gamma_1 + \gamma_2 \sigma^2_t) R_{t-1} + \gamma_3 \left</td>
<td>R_{t-1} \right</td>
<td>+ \epsilon_t$</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>-0.0001</td>
<td>-0.0011***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.5590</td>
<td>0.0001</td>
</tr>
<tr>
<td>$\gamma_0$</td>
<td>3.3981</td>
<td>1.3803</td>
</tr>
<tr>
<td>p-value</td>
<td>0.3764</td>
<td>0.7669</td>
</tr>
<tr>
<td>$\gamma_1$</td>
<td>-0.2425***</td>
<td>-0.2846***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>$\gamma_2$</td>
<td>365.1448**</td>
<td>389.6968***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0212</td>
<td>0.0002</td>
</tr>
<tr>
<td>$\gamma_3$</td>
<td>0.0538</td>
<td>0.1538***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.1825</td>
<td>0.0007</td>
</tr>
<tr>
<td>$\sigma^2_t = \omega + \delta_0 \epsilon^2_{t-1} + \delta_0 \sigma^2_{t-1} + \mu_t$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\omega$</td>
<td>1.03E-06***</td>
<td>8.66E-06***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>$\delta_0$</td>
<td>0.1726***</td>
<td>0.2221***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>$\delta_1$</td>
<td>0.8368****</td>
<td>0.7195***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>Durbin-Watson stat.</td>
<td>1.9672</td>
<td>1.9789</td>
</tr>
<tr>
<td>F statistics</td>
<td>7.2836</td>
<td>12.1344</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>5217.439</td>
<td>5923.475</td>
</tr>
<tr>
<td>Akaike info criterion</td>
<td>-6.5594</td>
<td>-6.4702</td>
</tr>
<tr>
<td>Schwarz criterion</td>
<td>-6.5332</td>
<td>-6.4536</td>
</tr>
</tbody>
</table>

***Significant at 1 % level; **Significant at 5% level.

The sign of $\gamma_3$ indicates the asymmetry of feedback trading in up and down markets. A statistically significant positive $\gamma_3$ coefficient implies a stronger feedback effect in the down market while a negative $\gamma_3$ coefficient implies a stronger feedback effect in the up market. While the $\gamma_3$ parameter for DSE Gen daily return series is not
statistically significant, it is statistically significant at the 1 per cent level and positive for DSE 20 daily return series. These findings imply that feedback trading has the same effect on DSE Gen return series in both the up and down market. In case of DSE 20, positive feedback trading effects are greater in a falling market relative to up markets.

Table 4 provides the results of the SSW-TARCH (1, 1) and SSW-EGARCH (1, 1) models. The findings also support the result of the Koutmos version of the SSW-GARCH (1,1) model. The $\gamma_0$ parameter which implies the effect of conditional volatility on index returns is statistically insignificant for DSE Gen under both methods. Although the $\gamma_0$ parameter is statistically significant for DSE 20 return series under both models, its sign is positive. When the expected volatility rises, rational investors influence prices negatively, and in such a case $\gamma_0$ would be negative. Hence, the findings of our analysis may be interpreted to mean that rational traders do not influence prices when the volatility changes in DSE. Statistically significant (at the 1 per cent significant level) $\gamma_1$ parameters and their negative sign for both the return series indicate positive autocorrelation arising from non-synchronous trading. Whereas the statistically significant $\gamma_2$ parameters (at the 10 per cent significant level for DSE Gen, and at 1 per cent significant level for DSE 20) and their positive sign for both the return series implies positive feedback trading in DSE. Hence, positive feedback trading is an important reason for short-term movements in DSE. Positive feedback traders cause negative autocorrelation in returns and, as a result, higher predictability of returns which may imply a weak form of efficiency in DSE.
Table 4: Parameter estimation of SSW-TARCH (1,1) and SSW –EGARCH(1,1) model

<table>
<thead>
<tr>
<th>Parameters</th>
<th>SSW-TGARCH(1,1)</th>
<th>SSW-EGARCH(1,1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>DSE Gen</td>
<td>0.0005***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0031</td>
<td>0.8770</td>
</tr>
<tr>
<td>γ0</td>
<td>3.2400</td>
<td>9.0099***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.2572</td>
<td>0.1266</td>
</tr>
<tr>
<td>γ1</td>
<td>-0.1980***</td>
<td>-0.2807***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>γ2</td>
<td>266.5684*</td>
<td>393.9232***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0677</td>
<td>0.0000</td>
</tr>
<tr>
<td>ω</td>
<td>7.80E-07</td>
<td>8.20E-06***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.5753</td>
<td>0.0000</td>
</tr>
<tr>
<td>δ0</td>
<td>0.1984***</td>
<td>0.2326***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>δ1</td>
<td>0.0253</td>
<td>-0.0426</td>
</tr>
<tr>
<td>p-value</td>
<td>0.2593</td>
<td>0.1392</td>
</tr>
<tr>
<td>δ2</td>
<td>0.7930***</td>
<td>0.7325***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>(δ0 + δ1) / δ0</td>
<td>1.13</td>
<td>0.82</td>
</tr>
<tr>
<td>δ0 + δ2</td>
<td>0.99</td>
<td>0.97</td>
</tr>
<tr>
<td>Akaike info criterion</td>
<td>-6.5894</td>
<td>-6.4805</td>
</tr>
<tr>
<td>Schwarz criterion</td>
<td>-6.5632</td>
<td>-6.4437</td>
</tr>
<tr>
<td>Durbin-Watson stat.</td>
<td>1.9392</td>
<td>1.9622</td>
</tr>
<tr>
<td>F statistics</td>
<td>7.0692</td>
<td>11.0559</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>5197.003</td>
<td>5918.598</td>
</tr>
</tbody>
</table>

***Significant at 1 % level; ** Significant at 5% level; * Significant at 10% level

In the conditional variance equation, parameters δ0 + δ2 is close to one in the case of TGARCH while in the case of EGARCH, the sum is greater than one. Thus, volatility is persistent. The parameter which is of greater importance at this point is δ1, which shows the asymmetric effect of information on conditional variance. A statistically significant and positive δ1 parameter in the case of the TGARCH model implies a leverage effect in the market. In other words, bad news has greater influence on the conditional variance than good news. In the case of the EGARCH model, for the leverage effect to be positive, δ1 should be negative and statistically significant. In our analysis, δ1 parameter is not statistically significant and does not have the expected sign for both DSE Gen and DSE 20 return series under both models. All the parameters in the variance equation are positive (for the TGARCH model), thus non-negativity restriction of conditional variance is fulfilled. (δ0 + δ1) / δ0 is positive but not significantly high for both the indexes δ0 > δ1. These findings may be interpreted to
mean that there is no leverage effect in the DSE return series, therefore, bad news and good news have the same magnitude of impact. Statistically significant and positive \( \delta_2 \) parameter for both the indexes under the EGARCH model indicates a high level of volatility clustering, implying that positive stock price changes are associated with further positive changes and vice versa.

Table 5 shows the parameter estimation under the MG-GARCH (1, 1) model. For both the index \( \gamma_0 > 0 \) and \( \gamma_1 < 0 \) both the parameters are statistically significant. Besides, \( \gamma_0 + \gamma_1 > 0 \) for both indexes. These findings support the existence of positive feedback trading in DSE. All the parameters in the variance equations are statistically significant and the sum of the ARCH term and GARCH coefficient is close to one for both return series.

Parameter estimations of MG-TGARCH and MG –EGARCH models are presented in Table 6. The coefficients in the mean equation are statistically significant for both the return series under both models. \( \gamma_0 > 0 \) and \( \gamma_1 < 0 \) along with \( \gamma_0 + \gamma_1 > 0 \) in all cases imply positive feedback trading in DSE. However, the statistically insignificant parameter \( \delta_1 \) in the variance equation in all cases means that the news impact on volatility is not asymmetric in DSE. All other parameter estimations in the mean equations are also similar to those of the SSW –TGARCH and SSW-EGARCH models.
Table 6: Parameter estimation of MG –TGARCH (1,1) and MG-EGARCH(1,1) model

<table>
<thead>
<tr>
<th>Parameters</th>
<th>MG –TGARCH (1,1)</th>
<th>MG-EGARCH(1,1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DSE Gen</td>
<td>DSE 20</td>
</tr>
<tr>
<td>$\gamma_0$</td>
<td>182.1949***</td>
<td>141.3493***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0027</td>
<td>0.0016</td>
</tr>
<tr>
<td>$\gamma_1$</td>
<td>181.9399***</td>
<td>141.0786***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0027</td>
<td>0.0016</td>
</tr>
<tr>
<td>$\omega$</td>
<td>9.77E-07***</td>
<td>8.80E-06***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0009</td>
</tr>
<tr>
<td>$\delta_0$</td>
<td>0.1619***</td>
<td>0.2187***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>$\delta_1$</td>
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<td>-0.0224</td>
</tr>
<tr>
<td>p-value</td>
<td>0.4050</td>
<td>0.7341</td>
</tr>
<tr>
<td>$\delta_2$</td>
<td>0.8405***</td>
<td>0.7281***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>$(\delta_0 + \delta_1) / \delta_0$</td>
<td>1.0926</td>
<td>0.8976</td>
</tr>
<tr>
<td>Akaike info criterion</td>
<td>-6.6761</td>
<td>-6.4638</td>
</tr>
<tr>
<td>Schwarz criterion</td>
<td>-6.6555</td>
<td>-6.4457</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>5220.026</td>
<td>5917.089</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>1.9186</td>
<td>1.991739</td>
</tr>
</tbody>
</table>

***Significant at 1 % level

Finally, Tables 7 and 8 provide the result of the LeBaron (1992) model and LeBaron-SSW nested model in TGARCH and EGARCH specifications. As can be seen from Table 7, when the conditional mean is modelled as an exponential process of order, one of the conditional variances, both $\gamma_1$, the constant part of the autocorrelation and $\gamma_2$, the parameter that links autocorrelation to volatility become statistically insignificant for three specifications out of four. This evidence may be interpreted to mean that volatility and autocorrelation in the DSE return series are not inversely related. Specifically, we cannot say that during periods of high (low) volatility, the magnitude of the autocorrelation is low (high). However, unlike the earlier findings of this study, the coefficient $\gamma_2$, which implies the risk return relationship, is significant across the specifications.
### Table 7: Parameter estimation for LeBaron-TGARCH and EGARCH model

<table>
<thead>
<tr>
<th>Parameters</th>
<th>LeBaron-TGARCH(1,1)</th>
<th>LeBaron-EGARCH(1,1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>α</td>
<td>DSE Gen</td>
<td>DSE 20</td>
</tr>
<tr>
<td>p-value</td>
<td>0.9242</td>
<td>0.0131</td>
</tr>
<tr>
<td>γ₀</td>
<td>5.3542*</td>
<td>8.5409**</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0920</td>
<td>0.0130</td>
</tr>
<tr>
<td>γ₁</td>
<td>-95.7303</td>
<td>-291.9306</td>
</tr>
<tr>
<td>p-value</td>
<td>0.6863</td>
<td>0.3774</td>
</tr>
<tr>
<td>γ₂</td>
<td>95.9249</td>
<td>292.1526</td>
</tr>
<tr>
<td>p-value</td>
<td>0.6857</td>
<td>0.3770</td>
</tr>
<tr>
<td>ω</td>
<td>1.04E-06***</td>
<td>8.04E-06***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>δ₀</td>
<td>0.1781***</td>
<td>0.2366***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>δ₁</td>
<td>-0.0093</td>
<td>-0.0402</td>
</tr>
<tr>
<td>p-value</td>
<td>0.6540</td>
<td>0.1551</td>
</tr>
<tr>
<td>δ₂</td>
<td>0.8355***</td>
<td>0.7312***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>Akaike info criterion</td>
<td>-6.6632</td>
<td>-6.4591</td>
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<tr>
<td>Schwarz criterion</td>
<td>-6.6358</td>
<td>-6.4350</td>
</tr>
<tr>
<td>Durbin-Watson stat.</td>
<td>2.0617</td>
<td>2.0089</td>
</tr>
<tr>
<td>F statistics</td>
<td>3.7865</td>
<td>7.9545</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>5208.67</td>
<td>5911.64</td>
</tr>
</tbody>
</table>

***Significant at 1 % level; ** Significant at 5% level; * Significant at 10% level

Turning to the results of the nested model provided in Table 8, the feedback parameter, γ₂ is negative and statistically significant, while the LeBaron parameter, γ₃ is not statistically significant across specifications. The constant part of the autocorrelation γ₁ is not statistically significant for DSE 20, while it is significant for DSE Gen only at a 10 per cent level. The clear implication of these findings is that positive feedback trading is the underlying cause of auto-correlation in the DSE return series. The relationship between autocorrelation and volatility in the DSE return series is not inversed; instead, a higher level of volatility induces incremental positive feedback trading which reinforces negative autocorrelation in DSE return series.
### Table 8: Parameter estimation for LeBaron-SSW-TGARCH and EGARCH model

<table>
<thead>
<tr>
<th>Parameters</th>
<th>LeBaron-SSW-TGARCH(1,1)</th>
<th>LeBaron-SSW-EGARCH(1,1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>α</td>
<td>5.50E-05</td>
<td>-3.32E-06</td>
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<tr>
<td>p-value</td>
<td>0.8023</td>
<td>0.9870</td>
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<tr>
<td>γ₀</td>
<td>4.5806</td>
<td>5.1588**</td>
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<tr>
<td>p-value</td>
<td>0.1337</td>
<td>0.0460</td>
</tr>
<tr>
<td>γ₁</td>
<td>-1080.310*</td>
<td>-889.9664*</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0638</td>
<td>0.0880</td>
</tr>
<tr>
<td>γ₂</td>
<td>998.7686**</td>
<td>1013.5311***</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0121</td>
<td>0.0025</td>
</tr>
<tr>
<td>γ₃</td>
<td>-1080.096</td>
<td>-889.7261</td>
</tr>
<tr>
<td>p-value</td>
<td>0.1139</td>
<td>0.1081</td>
</tr>
<tr>
<td>ω</td>
<td>9.72E-07</td>
<td>-0.5106</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td>0.0000</td>
</tr>
<tr>
<td>δ₀</td>
<td>0.1714</td>
<td>0.3086</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
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<tr>
<td>δ₁</td>
<td>-0.0095</td>
<td>0.014</td>
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<tr>
<td>p-value</td>
<td>0.6342</td>
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<tr>
<td>δ₂</td>
<td>0.8418</td>
<td>0.9709</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>Akaike info criterion</td>
<td>-6.6722</td>
<td>-6.6732</td>
</tr>
<tr>
<td>Schwarz criterion</td>
<td>-6.6413</td>
<td>-6.6423</td>
</tr>
<tr>
<td>Durbin-Watson stat.</td>
<td>1.9648</td>
<td>1.9332</td>
</tr>
<tr>
<td>F statistics</td>
<td>11.1850</td>
<td>10.2427</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>5216.66</td>
<td>5916.73</td>
</tr>
</tbody>
</table>

***Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

The validity of these empirical findings depends on the correct specification of the model. A minimum requirement is that the standardised residuals are zero-mean and unit-variance i.i.d. processes. Correct specification of the models is ensured by the diagnostic checking of conditional variance equations, in order to test the hypothesis that the normalised estimated residuals are i.i.d. The GARCH models are estimated using robust standard errors under the assumption of normality. The LB-Q statistics are not significant for up to 15 lags of squared standard error for all specifications, thus the residuals of the estimated models are white noise with no serial dependence. The Lagrange multiplier (LM) test for the presence of the ARCH effect in the residuals (r-values ranging from 0.2766 to 1.826 with probability ranging from 0.5989 to 0.1765 and F-statistics ranging from 0.2763 to 1.8263 with probability ranging from 0.5991 to 0.1767) reveals no such effect for the models used. Thus the residuals do not exhibit conditional
autoregressive heteroskedasticity. All models are correctly specified with the best model specification being LeBaron-SSW-EGARCH (1, 1).

Thus, considering the SSW-GARCH models and MG-GARCH models together, this study concludes that positive feedback trading exists in DSE. Joint hypothesis testing, nesting the LeBaron (1992) EAR model with SSW-GARCH model also leads to the same conclusion. All models are in broad agreement with the findings that bad news and good news does not have an asymmetric impact on the conditional variance and therefore, feedback trading has a symmetric effect on the DSE return series in both up and down markets. These findings are consistent with the findings of Koutmos et al (2006) wherein positive feedback trading is documented in an emerging market, the Cyprus Stock Exchange, with little evidence of asymmetric feedback trading in up and down markets. However, a high degree of feedback trading induced autocorrelation and hence predictability does not necessarily imply excess profits, because the higher volatility (risk), the harder it is for rational risk averse investors to exploit the predictable pattern of stock prices.

6. Conclusions

This paper examined the autocorrelation structure of the DSE return series in the framework of behavioural finance to test the feedback trading hypothesis. The findings imply significant autocorrelation in the DSE return series, suggesting the existence of positive feedback trading. The analysis of the asymmetric character of feedback trading in up and down markets and asymmetric effect of good news and bad news on conditional volatility, reveal that bad news and good news has the same magnitude of effect on the conditional variance of the DSE return series, and therefore, the effect of feedback trading in up and down markets is symmetric in DSE, unlike other developed and emerging markets. Therefore, this study documents new evidence of the symmetric effects of feedback trading, opening up an opportunity for further research into the causes of the symmetric effects of feedback trading in some markets and asymmetric effects in others.

References


HOW TO STRESS TEST CREDIT RISK FOR ECONOMIES AND CREDIT PORTFOLIOS EVIDENCE FOR THE CZECH REPUBLIC AND GERMANY

1. Introduction

In quantitative terms, credit risk is the most important risk in banking books. This has recently been shown clearly again in the US subprime crisis. Moreover, the crisis occurred despite various improvements in credit risk management, for example progress in the field of credit risk analysis applied by banks on the portfolio level – spurred by Basel II⁴ – as well as the increasing availability of a wide range of instruments that make credit risk more liquid, for example securitisation and credit derivatives. Hence, credit risk remains a major threat to financial stability in the globalised financial world, where cross-border contagion of crises particularly threatens countries with weak banking sectors.

Credit risk analysis for the financial sector as a whole can be seen as a crucial means of preventing financial instability. This can be realised by means of a regular

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3 The data analysis for this paper was generated using Base SAS and SAS/STAT software, Version 9.1.3. of the SAS System for Windows. Copyright © 2002–2003 SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA.

The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and do not represent the views of any of the authors' institutions. We thank Miroslav Singer, Michal Hlaváček, Vladimír Pikora, Thilo Liebig, Christoph Memmel and Pierre Tychon for their valuable comments and support. The financial support provided for this project by the Czech National Bank is gratefully acknowledged.

4 See BCBS (2006), European Commission (2006) and the national transpositions of Basel II.
robustness test on a country’s banking sector against credit risk, for example by means of stress tests carried out by supervisory bodies and central banks, providing hints for detecting financial system fragility.\footnote{In many authorities, stress tests have been introduced in the course of the Financial Sector Assessment Programs (FSAPs) conducted by the IMF and the World Bank.}

Within the framework of credit risk modelling and stress testing, this study investigates and compares two countries, a new EU member state – the Czech Republic – and the largest EU economy – Germany. We seek to provide answers to various questions, notably: which macroeconomic variables are the most important for explaining credit risk; whether there are country-specific differences; and what impact unfavourable macroeconomic circumstances can have on the macro and micro (portfolio) level.

The data employed in this study cover a period of eight years from 1998 to 2006 for the Czech Republic and twelve years from 1994 to 2006 for Germany. The investigated time period covers multiple periods of severe macroeconomic stress, namely the consequences of the Asian crisis in 1997 and the Russian crisis in 1998, as well as the crisis in the financial markets after 11 September 2001.

When it comes to credit risk analysis for the central and eastern European transition economies (and also for many other transformation economies and developing countries), a key limitation is the availability of data, as the time series are usually (still) relatively short and have various structural breaks. Accordingly, the data in this study were selected very carefully to prevent misinterpretation.\footnote{We draw on the findings of the analysis carried out by Jakubík (2007a and 2007b).} In order to arrive at a meaningful comparison between the Czech Republic and Germany, equivalent data was sought.

We investigate both the corporate sector and the household sector and find that credit risk for corporates can be modelled based on similar macroeconomic variables for both countries, despite fundamental differences in the default rate (time) pattern. Credit risk modelling for the household sector turns out to be more challenging for both countries, as there are apparently other variables than solely economic ones explaining the default rate pattern. These findings do, in general, confirm previous studies.

In the second step, we use the outcome of our credit risk modelling for macro stress testing purposes. In the third step, we translate the outcome of the macro stress tests into a Basel II-type micro stress test of a hypothetical, but realistic credit portfolio. We find that the impact of the macroeconomic shocks we study is substantially higher in the Czech Republic than in Germany, on both the macro and micro levels. For a stress test of medium severity, we find an increase in aggregate corporate default rates of more than 100% and a rise in the Basel II internal ratings-based (IRB\footnote{Credit Portfolio Risk in this study is measured based on the Basel II minimum capital requirements, which closely resemble the Credit Value-at-Risk figures. We refer to the internal ratings-based (IRB) approach – see BCBS (2006), para. 272.}) minimum
capital requirements on the credit portfolio level of up to 60% in the Czech case within one year. The figures for Germany are an increase in corporate default rates of 40% and an augmentation of the IRB minimum capital requirements of roughly 30% for the same credit portfolio. For the household sectors of both countries, the impact is much less pronounced compared to corporates, with a higher impact in the German case, but the outcome is less robust and therefore has to be interpreted carefully.

Our contribution to the literature is two-fold: first, we provide a comprehensive framework for stress testing; second, we directly compare a new EU member state with one of the large “old” EU economies. While there is no directly comparable study in the literature, we confirm the finding of previous studies that stress events have a more material effect in less developed economies.

The paper is organised as follows. Section 2 provides an overview of related studies. Section 3 describes the model used to analyze credit risk for the corporate and household sectors. In Section 4, the underlying data are presented. Next, the corporate and household models are calibrated for the Czech Republic and Germany in sections 5 and 6 respectively. Section 7 is devoted to stress testing. Finally, section 8 provides conclusions.

2. Related Literature

Closely linked to the Basel II framework established in 2006 and financial stability analysis in the context of the Financial Sector Assessment Programme of the IMF and the World Bank established in the late 1990s, our focus is on the investigation of business cycle effects on the credit risk of two aggregation levels: first, the aggregate default rate of corporate and household credit (referred to as the macro level in this study) and second banks’ capital requirements for credit risk (micro level).

On the micro level, a comprehensive survey of the literature dealing with cyclical effects on the major credit risk parameters, namely the probability of default (PD), loss given default (LGD) and the exposure at default (EAD), has been provided by Allen and Saunders (2004). Accordingly, all three credit risk parameters are found to be highly exposed to cyclical effects, implying a considerable impact on portfolio credit risk and capital requirements. In a recent study carried out by Düllmann et al (2008), this has also been demonstrated to hold true for credit correlations.

8 The study by Catarineu-Rabell et al (2003), for example, was an early one to show that the choice of a Point-in-Time (PIT) rating system can evoke procyclicality of capital requirements, whereas Through-the-Cycle (TTC) rating systems are more neutral. Through a comparison of PIT rating systems and TTC systems, Löffler (2004) finds that the differences are mainly driven by cyclical components of default risk. Bangia et al (2002) and Trück and Rachev (2005), for example, have shown that there is a substantial impact of default probabilities and rating transitions on portfolio credit risk.
As stress testing credit risk is an integral part of the Basel II framework, both in terms of Pillar I (IRB-cyclicality tests) and Pillar II (capital adequacy tests), various efforts by banks are underway. However, no common industry practice has emerged yet, which is also documented by the very limited contributions to stress testing of (real) credit portfolios in the literature to date, particularly due to the limited data that is publicly available. Among the few contributions are Peura and Jokivuolle (2004) and Rösch and Scheule (2007).  

Stress testing is commonly used by central banks and regulatory bodies to identify vulnerabilities of the financial sector overall or to determine specific risks for individual institutions. A recent overview on authorities’ approaches to stress test credit risk can be found in Foglia (2008), with a focus on the link between the macro and micro perspective. Authorities use two different macro stress testing methods, namely top-down and bottom-up frameworks. In the first case, aggregate macroeconomic data is used to model stress events for economies, specific sectors and single financial institutions. This is done as follows: first, macroeconomic stress scenarios are derived based on structural econometric models (i.e. those used for economic forecasts), vector autoregressive methods or pure statistical approaches. Second, the macroeconomic scenarios are translated into a measure of credit risk, which can then be broken down to different aggregation levels (i.e. the economy, sectors, and single institutions). In terms of the dependent variable representing loan performance, loan loss provisions (LLPs), non-performing loans (NPLs) and historical default frequencies are referred to. Depending on the country, credit risk (loan performance) is explained by two to five macroeconomic factors, such as GDP, interest rates, exchange rates and inflation. It has been found that the use of sector-specific explanatory variables increases the goodness-of-fit (Boss et al 2006). For corporate credit risk, GDP growth and interest rates have been found to be highly relevant, but also corporate indebtedness, inflation, industrial production, real wages, the stock index and oil prices (Virolainen, 2004). Hence, a relatively limited number of macroeconomic factors permit credit risk for the corporate sector to be explained in a meaningful way, including at times of finan-

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9 For an overview of stress tests applied by German banks, see Deutsche Bundesbank (2004) and Deutsche Bundesbank (2007).

10 Macro stress tests are also carried out by the regulatory bodies of the two countries analyzed in this study, the Czech National Bank and the Deutsche Bundesbank. In the Czech case, the stress testing framework has been gradually elaborated since 2004 by Čihák (2004) and Čihák et al (2007). Based on a forecast of the macroeconomic environment in terms of historical worst-case scenarios, credit risk models as developed by Jakubík (2007) are applied. The Deutsche Bundesbank uses both a top-down approach as well as bottom-up approach (Deutsche Bundesbank, 2007). In the first case, which is similar to the current study, the Bundesbank uses a macro module to define macroeconomic stress events via macroeconomic variables, which are then fed into a microeconomic module (the so-called banking module) to assess which banks would run into difficulties. Bottom-up stress testing is assessed based on survey data.

cial turbulence.\textsuperscript{12} For the household sector, empirical evidence is more limited, with unemployment and interest rates being among the most relevant variables referred to (see e.g. Danmarks Nationalbank 2007).

In the bottom-up case, information collected from single institutions via credit registers and surveys is used to assess downturn events on various levels (see Deutsche Bundesbank, 2007, for example). In this case, credit risk is estimated based on individual borrower data, such as PDs (e.g. the Expected Default Frequency provided for by Moody’s KMV) and LGDs. This is typically done based multi-factor credit portfolio models, whereby one can generate credit loss probability distribution functions. Sorge and Virolainen (2006) were the first to use a multi-factor credit portfolio model, Credit Portfolio View\textsuperscript{TM} as proposed by Wilson (1997a, 1997b), to generate an overall system-wide credit loss probability distribution function. The same model is used by the Austrian Central Bank (OeNB) in their stress testing model, for example. The advantage of the bottom-up approach is that the specific risk characteristics of the portfolios can be taken into account – provided that they are available, which is the key challenge for bottom-up stress tests.

The current study is the first empirical study providing for an explicit cross-country comparison and enclosing both the macro and the micro level.

3. Credit Risk Modelling with Macroeconomic Variables

In this study, we use a top-down framework and refer to a statistical approach, namely the loaded one-factor credit risk model, which is also the basis for calculating the Basel II capital requirements for credit risk (Gordy, 2003) and has been used for credit risk modelling by other authors, for example Hamerle et al (2004), Rösch (2005) and Jakubík (2007). The aim is to model aggregate credit risk conditional on the macroeconomic environment, whereby the model becomes a quasi multi-factor model while keeping its conceptual simplicity. Due to its non-linearity, the model allows capturing the highly complex relationships of economies, which are hardly linear in the real world, particularly in stress situations. Subsequently, it will be outlined how the model is used for credit risk modelling.

A random variable with a standard normal distribution is assumed for the standardised logarithmic asset returns of firm $i$ at time $t$:

$$R_{it} = \sqrt{\rho} F_t + \sqrt{1 - \rho} U_{it}$$

(1)

where $R_{it}$ denotes the logarithmic asset return for each firm $i$ of an economy at time $t$, and $F_t$ corresponds to the logarithmic asset return of the economy at time $t$, which

\textsuperscript{12} See Borio et al (2001), for example.
is assumed to be a random variable with a standard normal distribution. This variable represents the part of the asset return which is not firm-specific and can thus denote the general economic conditions for the profitability and creditworthiness of firms in the economy. $U_{it}$ denotes the firm-specific asset return, which is again assumed to be random with a standard normal distribution. The two random variables are assumed to be serially independent. The portion of risk that is systematic is defined by $\rho$, the correlation of the firm’s asset return with the systematic factor $F_i$.

Given these assumptions, the logarithmic asset return of firm $i$ at time $t$ is also standard normally distributed. The model is based on the Merton model, according to which a default occurs if the return on a firm’s assets falls below a certain barrier $T$, the default threshold. Formally,

$$P(Y_{it} = 1) = P(R_{it} < T),$$  \hspace{1cm} (2)

where $Y$ denotes a binary random variable with two potential states, borrower $i$ defaults (1), or does not default (0), at time $t$ and $T$ is the default threshold.

In order to model aggregate credit risk by means of different macroeconomic indicators, it is further assumed – unlike in the case of Gordy’s Basel II one-factor-model (Gordy, 2003) – that the value of the default threshold $T$ depends on the economic cycle. This is modelled by taking a linear combination of macroeconomic variables $(x_{ij})$ to represent the value of the default threshold $T$.

The final form of the macroeconomic one-factor credit risk model used in this study is shown in equation (3), where $\Psi$ denotes the distribution function of the standard normal distribution that represents the impact of changes in the macroeconomic indicators, $\beta_0$ is a constant and $\beta_j$ are the coefficients of the macroeconomic variables, $x_{ij}$:

$$p_{it} = P(R_{it} < T) = P(\sqrt{\rho F_t} + \sqrt{1 - \rho} U_{it} < \beta_0 + \sum_{j=1}^{K} \beta_j x_{jt}) = \Psi(\beta_0 + \sum_{j=1}^{K} \beta_j x_{jt}) \hspace{1cm} (3)$$

The default probability conditional on the realisation $F_t$ of a random unobservable factor representing the state of the economy at time $t$ corresponding to the default probability (3) is given by formula (4).

$$p_t(f_t) = P(U_{it} < \frac{\beta_0 + \sum_{j=1}^{K} \beta_j x_{jt} - \sqrt{\rho} f_t}{\sqrt{1 - \rho}}) = \Psi\left(\frac{\beta_0 + \sum_{j=1}^{K} \beta_j x_{jt} - \sqrt{\rho} f_t}{\sqrt{1 - \rho}}\right)$$  \hspace{1cm} (4)

If we furthermore assume a homogeneous portfolio of firms in the economy whose asset returns follow process (1), the default rate in the economy is – based
on the law of large numbers – equivalent to the firm’s default probabilities, whereby the model can be applied to homogeneous sub-sectors of the economy such as the corporate sector and the household sector.

Accordingly, the specification of the model resulting from (3) is as follows:

$$df_t = \psi(c + \sum \beta_j \cdot x_j)$$  \hspace{1cm} (5)

where $df_t$ denotes the dependent variable of the model (the default rate), $\beta$ is the coefficient vector, $x$ is the vector of the macroeconomic variables and $c$ is a constant.

Due to recalculation by the cumulative distribution function of a normal distribution, the coefficients of equation (5) cannot be interpreted as the commonly used elasticities of the impacts of the relevant macroeconomic factors on credit risk. Rather, the joint effect of a change in a different dimension is measured.\(^{13}\)

In order to estimate model (3), a relationship with a conditional number of defaults of firms depending on the realisation of random variable $F$, the latent factor $f_t$ is used. This number is, under the given assumptions, again random and has a binomial distribution with the conditional probability $p_t(f_t)$ given by equation (4) and the number of firms $N_t$:

$$D(f_t) \approx Bi(N_t, p_t(f_t))$$  \hspace{1cm} (6)

The model is then calibrated by maximizing a likelihood function. To ensure that it is robust, and in particular to avoid calibration bias, the residuals obtained are tested for autocorrelation and heteroscedasticity.

4. Data

Next, the composition of the dependent variable, the inflow of non-performing loans (NPLs), and the macroeconomic indicators will be outlined for both the Czech Republic and Germany. The data are generally annual observations derived from one-year sliding windows on quarterly data.

\(^{13}\) For this reason, we cannot calculate the elasticities of the macroeconomic factors employed by the final specification of the model. The impact of these indicators on the sectoral default probability can only be evaluated conditional upon the other factors. By consequence, the effect of the change of the selected factor is different according to the level of the other macroeconomic indicators incorporated into the model.
4.1. Data for the Czech Republic

In the case of the Czech Republic, the inflow of the NPLs was not separately available for the household and corporate sectors. Moreover, the original raw data taken from the Czech National Bank (CNB, 2007) were quarterly sectoral NPL stocks. In order to obtain sectoral NPL flows, the NPL stocks were adjusted for write-offs, sales and the enforcement of such exposures in the banks’ books. Accordingly, the total annual NPL flows were split into corporate, household and other credit. This was done based on expert judgment, facilitated by robustness checks based on credit register data, where the actual monthly data have been available since November 2002. Finally, the annual NPL flows (henceforth also default rates) used as the dependent variable of this study were calculated.

The relatively volatile time patterns of the corporate and household default rates for the Czech Republic are shown in Figure 1 and Figure 3 respectively.

The macroeconomic data for the Czech Republic were taken from the time series archives of the Czech National Bank (ARAD). In line with the existing literature (see section 2), we considered the annual growth rate of real GDP of the Czech economy and its most important trade partner economies (Germany, EU-12, EU-15, EU-25), the level of real exchange rates, nominal and real interest rates (PRIBOR1M, PRIBOR3M, PRIBOR6, PRIBOR1Y\textsuperscript{14}), inflation, the unemployment rate and the ratio of corporate loans to GDP for the corporate model. For the level of real exchange rates, nominal and real interest rates and inflation we used seasonally adjusted data.\textsuperscript{15} Descriptive statistics on the macroeconomic variables included in the final corporate model for the Czech Republic are shown below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Notation</th>
<th>Mean</th>
<th>StD(%)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Exchange Rate</td>
<td>$E$</td>
<td>0.934</td>
<td>0.07</td>
<td>0.805</td>
<td>1.046</td>
</tr>
<tr>
<td>Inflation (%)</td>
<td>$\pi$</td>
<td>2.70</td>
<td>2.44</td>
<td>-0.40</td>
<td>12.00</td>
</tr>
<tr>
<td>Real GDP Growth Czech Republic (%)</td>
<td>$gdp$</td>
<td>3.59</td>
<td>1.89</td>
<td>-0.38</td>
<td>6.66</td>
</tr>
<tr>
<td>Corporate Credit to GDP (%)</td>
<td>$\text{debt}$</td>
<td>23.82</td>
<td>11.99</td>
<td>16.51</td>
<td>50.24</td>
</tr>
</tbody>
</table>

For the household model, the unemployment rate, nominal and real interest rates, inflation, the interest rate gap, the real GDP growth rate, the output gap, the ratio of loans to GDP, and the ratio of interest paid to income or disposable income were considered.\textsuperscript{16}

---

\textsuperscript{14} PRIBOR denotes Prague InterBank Offered Rate; 1M denotes one month, 3M three months, 6M six months and 1Y one year.

\textsuperscript{15} i.e. deflated by the consumer price index (CPI) and the production price index (PPI).

\textsuperscript{16} Disposable income was modelled using average wages and household consumption. Interest paid was modelled as the product of the credit volume and the annual PRIBOR plus a specific interest rate spread paid by households according to CNB data.
The macroeconomic variables for the corporate model were available from 1998 Q3 and thus shorter than the dependent variable, so the model was estimated for the time period from 1998 Q3 to 2006 Q4 (see Table 3). For the household sector, the dataset used for the calibration of the model spans the period from 1997 Q3 to 2006 Q4 (see Table 3).

4.2. Data for Germany

For the German economy, the availability of data is, in general, more favourable than for the Czech Republic, although the time series have been impacted by German re-unification and by the introduction of the Euro. However, data for the dependent variable, NPLs, were available only fairly recently for regulatory purposes, spurred by the stress testing framework of the IMF and the World Bank. Overall, the rationale for the German case was to attempt at referring to analogous variables as in the Czech case, in order to enable a meaningful comparison.

The NPL inflows for the German economy used in this study are based on the data reported to the Deutsche Bundesbank in the framework of regulatory reporting since 1994. In order to arrive at quarterly data, the annual amounts were interpolated and then divided by the sum of the corporate and household credit volumes for the given quarter. The NPLs were again not available separately for corporates and households. The disaggregation was realised as follows: first, the shares of household and corporate credit in the total non-bank credit volume in Germany for the relevant quarter were taken. Next, these shares were combined with the insolvency rate to disentangle the ratio into corporate and household NPLs. In this way, the quarterly NPLs for German corporates and households were available for the period from 1994 to 2006.

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17 These data were compiled from the figures reported by the German banks in the framework of banking supervision and are not publicly available.

18 This was done by taking the reported NPLs for the relevant period as the reference value for the second quarter. Subsequently, the figures for the other periods were interpolated and extrapolated for the data in the first and last year respectively.

19 Corporate debt is thus referred to both as corporate debt and the debt of self-employed persons, amounting to 37% and 17% respectively of the total debt to non-banks in 2007.

20 Given that the insolvency rate for the household sector is only available since its introduction in 1999, the insolvency rate of 1999 was also used for 1994 to 1998. The generally very low level of household insolvencies at this time can justify this approach. For the period after 1999, the annual insolvencies recorded by CreditReform were referred to and were subsequently interpolated to arrive at quarterly data. For the corporate sector, annualised quarterly insolvency rates recorded by the German statistical office were used.

21 In the same way as for the Czech Republic, the NPL inflows were adjusted for the public sector and entrepreneurs.
The NPLs for German corporate loans remain approximately on the same level during the 1990s, then there is a steady increase until 2002 and a substantial and continuous decrease afterwards (Figure 2). For the NPLs of household credit, we observe a steady increase over the whole observation period. This is reflected in a rapid and continuous increase in the insolvency rates for households, although the default level remains relatively low.

The macroeconomic data for Germany were taken from the time series archives of the Deutsche Bundesbank and Eurostat. For corporates, various indicators were taken into account, namely the level of nominal interest rates, real GDP growth, the change in the real effective exchange rate, the inflation rate, the unemployment rate, the development of industrial production, the inflow of order bookings in industry and the corporate credit to GDP ratio. Like in the Czech case, we generally used annualised quarterly data that have been adjusted for seasonality. Descriptive statistics on the macroeconomic variables included in the final model for Germany are shown below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Notation</th>
<th>Mean</th>
<th>Std(%)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Interest Rate (%)</td>
<td>ir</td>
<td>4.49</td>
<td>2.14</td>
<td>2.08</td>
<td>9.70</td>
</tr>
<tr>
<td>Real GDP Growth (%)</td>
<td>gdp</td>
<td>1.72</td>
<td>1.65</td>
<td>-1.96</td>
<td>7.69</td>
</tr>
<tr>
<td>Industrial Production (%)</td>
<td>indprod</td>
<td>1.30</td>
<td>3.54</td>
<td>-8.89</td>
<td>6.95</td>
</tr>
<tr>
<td>Corporate Credit to GDP</td>
<td>debt</td>
<td>56.64</td>
<td>3.19</td>
<td>51.49</td>
<td>62.01</td>
</tr>
</tbody>
</table>

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22 A private insolvency code was only introduced in 1999. One of the reasons for the increase in the private default rate may also have been that this opportunity was only gradually “discovered” by the population.

23 The relatively low level of household default rates for Germany reflects the very benign economic development of the German economy after the Second World War, at least until German re-unification, as well as the economic model followed, namely the social market economy (“Soziale Marktwirtschaft”). This economic model has brought forward a very solid middle-class population participating in growth and a comparably minor low social class, further facilitated by a low level of unemployment and a strong role of social systems. Given that the market for securitisation in Germany is relatively limited, it can also be ruled out that household defaults were “hidden” in the securitisation data and thus not captured in the credit register data.

24 We took the GDP values from the Eurostat archive and the remaining time series from the Deutsche Bundesbank.

25 Until 1999, we used one-month annual German interbank rates and afterwards we used one-month annual EURIBOR rates.

26 We used the real effective exchange rate with the EER-44 group.

27 We referred to the amount lent to non-banks as reported in the monthly report of the Deutsche Bundesbank.

28 For data of monthly frequency we referred to the mean value in the relevant quarter.
For the household sector, five indicators were considered, namely the unemployment rate, the nominal and real interest rate (EURIBOR), the household credit to GDP ratio, net household income in nominal terms and the household savings rate.

The table below provides an overview of the time span of the data available for the two models and two country specifications. As shown in the table, the time series for Germany date back three to four years longer than in the Czech case.

<table>
<thead>
<tr>
<th>Model</th>
<th>Czech Republic Households</th>
<th>Czech Republic Corporates</th>
<th>Germany Households</th>
<th>Germany Corporates</th>
</tr>
</thead>
</table>

5. A Credit Risk Model for the Corporate Sector

The models with the best fit were shown in Table 4. For both countries, the model contains four variables, two of which are the same for both countries with the same time lags.

For the Czech Republic, the model comprises the real exchange rate (e), inflation (π), GDP (gdp), and the indebtedness of the corporate sector as a proportion of gdp (debt), with the time lags as shown below:

\[ df_t = \psi(c + \beta_2 e_{t-2} + \beta_3 \pi_{t-1} + \beta_4 gdp_t + \beta_5 debt_{t-4}) \]  

(7)

In order to take into account that the time period considered constitutes a transition period for the Czech economy, we also explicitly controlled for potential structural breaks. This was done by recursively running the model and consecutively including longer time periods in the estimation. Accordingly, we analyzed whether the coefficients were stable. We found that the coefficients exhibit a relatively high instability by the end of 2003 and beginning of 2004, which points to the presence of a structural break at that time.29 The model’s performance improved when a dummy defined as 1 for the period until the third quarter of 2003 and 0 otherwise was added as shown below:30

\[ df_t = \psi(c + \beta_2 e_{t-2} + \beta_3 \pi_{t-1} + \beta_4 gdp_t + \beta_5 debt_{t-4} + \beta_6 dum_t) \]  

(8)

29 This was confirmed by Chow tests, which rejected the hypothesis of no structural break at a confidence level of less than 1%.

30 No further structural break was identified. This was confirmed by additional Chow tests.
Hence, the Czech economy seems to have moved towards being a low risk post-transition economy by that time, driven by the default of inefficient firms and bank privatisations.

For Germany, the final model looks as follows:

\[ df_t = \psi (c + \beta_1 ir_{t-1} + \beta_4 gdp_t + \beta_4 indprod_{t-3} + \beta_5 debt_{t-4}) \]  

The German model comprises the nominal interest rate \((ir)\), GDP \((gdp)\), industrial production \((indprod)\) and the debt to GDP ratio \((debt)\). It is striking that the lag for the two variables included in both models, GDP and the debt ratio, turned out to be the same.

| Variable | Notation | Czech case | | German case | |
|----------|----------|------------| | | |
| Constant | \(c\) | -3.060*** | 0.358 | -2.6997*** | 0.07141 |
| Nominal Interest Rate \((\beta_1)\) | \(ir\) | NA | | -1 | 2.2194*** | 0.4919 |
| Real Exchange Rate \((\beta_2)\) | \(e\) | -2 | 1.062*** | 0.323 | NA |
| Inflation \((\beta_3)\) | \(\pi\) | -1 | -4.850*** | 0.636 | NA |
| GDP \((\beta_4,1)\) | \(gdp\) | 0 | -4.609*** | 1.079 | 0 | -3.3677*** | 0.3280 |
| Industrial Production \((\beta_4,2)\) | \(indprod\) | NA | | -3 | -0.8215*** | 0.1464 |
| Credit-to-GDP Ratio \((\beta_5)\) | \(debt\) | -4 | 3.006*** | 0.246 | -4 | 1.0871*** | 0.1213 |
| Dummy Variable \((\beta_6)\) | \(dum\) | 0 | 0.238*** | 0.043 | 0 | 0.0400*** | 0.0125 |

Significance level: **: Significant at 5% level; ***: Significant at 1% level.

As shown in the table, the outcome of our empirical analysis demonstrates a substantial influence of the real exchange rate on corporate credit risk in the Czech Republic. This effect is in line with our expectations, as it particularly applies to export-oriented countries.\(^{31}\) We used the real effective exchange rates of the Czech koruna deflated by the consumer price index (CPI) lagged by two quarters. The sign of the coefficients indicates, as expected, that a stronger real exchange rate of the domestic currency affects corporate credit risk positively, i.e. the default rate increases with appreciation of the koruna.

31 The reason is as follows. An appreciated exchange rate raises the prices of domestic goods in foreign currency so that firms become less competitive outside the country of origin. Given that, in general, the price of goods in foreign currency in the world market is highly determined by the cost/profit ratio of firms, appreciated exchange rates ultimately tend to result in higher default rates in the corporate sector. This effect can be assumed to be substantially higher for Czech firms than for German firms, the main reason being that German firms benefit in this context from the “domestic” Euro area, where most of the German exports are located. The negative correlation for the Czech Republic has been empirically found by CNB (2007), for example.
The negative impact of inflation\textsuperscript{32} on firms’ default rate, being less evident than the effect of other variables, was also confirmed. The reasoning for this is as follows. While companies can also be negatively affected by the increase in the prices of their inputs, an increase in the market prices of firms’ outputs will, by contrast, affect firms in the opposite way. From a debtor’s point of view, the increase in the price level in the economy corresponds to a decrease of the real value of a credit obligation. Although permanent inflation leads to additional costs and harms the economy, inflation tends to improve the financial situation of debtors in the short run and \textit{ceteris paribus} leads to a decrease of companies’ default rates.

An economic boom will definitely influence default rates in the corporate sector as the demand for goods and services produced by non-financial firms increases. Consequently, the profit of companies increases and corporate default rates decrease. Perhaps not surprisingly, therefore, the outcome of the regression shows that the corporate default rate in the Czech economy depends negatively on the growth rate of real GDP\textsuperscript{33} over the previous year.

The vulnerability of the corporate sector would be expected to depend on the extent of its indebtedness. The size of the effect would be expected to depend on how much higher financial leverage increases default probabilities, which will particularly occur in the case of an unexpected macroeconomic shock, denoted by the corporate debt to GDP ratio (\textit{credit-to-GDP}). As regards this indicator, we found that a lag of four quarters turned out to be the best specification, with a positive effect on the corporate default rate.\textsuperscript{34}

Moreover, it turned out that neither real and nominal interest rates, nor the real GDP growth rate in the EU-15, EU-25, EA-12 and Germany, nor the unemployment rate were among the most important explanatory variables. Although some of them had significant univariate prediction power for the corporate default rate, they did not contribute to the prediction power of the multivariate model in a meaningful way, as they were correlated with other variables included in the model specification. This applies particularly to nominal interest rates, which were not included in the Czech model as expected due to the correlation with the exchange rates.

For Germany, the nominal \textit{interest rate}\textsuperscript{35} is found to be a key macroeconomic variable.\textsuperscript{36} There are several reasons for that, one notably being that traditional long-term financing via bank debt plays an important role in the German economy. This

\textsuperscript{32} As given by the 4-quarter change in the consumer price index (CPI).
\textsuperscript{33} We consider the growth of GDP compared to the same quarter in the prior year.
\textsuperscript{34} Debt is defined as total outstanding bank loans to the non-financial corporate sector.
\textsuperscript{35} Until 1999, we used one-month annual German interbank rates and afterwards we used one-month annual EURIBOR rates.
\textsuperscript{36} The level of interest rates has a substantial effect on corporate credit financing, especially for credit with short-term duration, constituting a substantial portion of newly granted credit particularly in the Czech Republic, but also in Germany.
particularly applies to German SMEs (the “Mittelstand”), which often have a close relationship with one or a small number of house bank(s). An increase in interest rates results in a prompt increase in the funding rates of corporates and thus to a worsening of firms’ ability to meet their financial obligations due to more expensive financial resources. Unlike in the case of the Czech Republic, neither the real exchange rate nor the inflation rate was among the most significant variables. In the first case, the introduction of the Euro seems to have made an important contribution to reducing foreign exchange rate dependency for German firms. Similarly, given that economic growth in Germany was relatively low during the period considered, inflation was generally relatively low and thus not significant.

In the same way as for the Czech Republic, the unlagged real GDP growth rate significantly contributed to explaining the German corporate default rate. In addition, the industrial production variable contributed as a cyclical indicator to the explanation of the default rate. Unlike all the other macroeconomic variables considered in this study, the latter indicator has the specific characteristic of being forward looking. However, it turned out that this variable resulted in autocorrelation, so it was not considered for the final specification.

Also, the corporate credit-to-GDP ratio with a lag of four quarters was included in the final specification for Germany. This clearly indicates that the aggregated level of corporate indebtedness plays a crucial role in the prediction of corporate default rates.

Figure 1 demonstrates the performance of the estimated model for the Czech corporate sector. The figure clearly shows the decrease of the corporate NPL-based default rate from a very high level of around 20% at the end of the 1990s to a level of 10% from 2000 to 2002, before the NPL rate decreased to an intensity of 3% from 2004 on, the time pattern being captured by the model in a meaningful way. The decline in the historical high levels of the default rate was caused by privatisation of the banks and the subsequent improvement in their credit risk management methods. Most of the banks implemented rating models at the beginning of the new millennium. In addition, after the currency crisis in May 1997 and consecutive banking crisis they started lending in a very careful way.

37 We used annual changes of the index value relative to the quarter in the year before.
Figure 1: Performance of the model for the Czech corporate sector

![Figure 1: Performance of the model for the Czech corporate sector](image)

Figure 2 shows the equivalent outcome of the model calibration for Germany. The NPL inflow rate for German corporates fluctuates around 2% until 2000, reaches a peak of around 3% in 2002 and decreases again to the previous level and then further to 1.5% afterwards. As shown in the graph, the model is able to explain the increase in the default rate and the subsequent decrease. In addition, the model predicts some slight increases, particularly around the time of the Asian and Russian crises in 1998/1999, which, however, cannot be seen in the corporate default rate in Germany.

Figure 2: Performance of the model for the German corporate sector

![Figure 2: Performance of the model for the German corporate sector](image)

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38 The default rate denotes the non-performing loan inflow rate.
The robustness of the specifications was ensured by means of three tests: first, a likelihood test (chi-square test); second, a test of autocorrelation in the residuals; third, a test of heteroscedasticity in the residuals. All these tests were also a means of verifying the assumptions made. Accordingly, it was found that the corporate models are relatively robust for both countries. More specifically, the likelihood test was performed to evaluate the quality of the model. For both countries, the test rejected the null hypothesis at a confidence level of less than 1%. In addition, the non-linearity of the model was taken into account by investigating the pseudo-coefficients suggested by Estrella (1998), Cragg-Uhler (1970) and Veall-Zimmermann (1992), yielding values of close to one and thus supporting the quality of the model. The test of autocorrelation of the model was done by using the Q-statistics. Autocorrelation in the residuals is absent at the 5% confidence level. Moreover, potential heteroscedasticity was investigated by means of the Breusch-Pagan test. For both countries, the presence of heteroscedasticity was not indicated, implying that both models can be assumed to be unbiased.

In the last step, we investigated whether how the models perform out-of-sample. This was done by using the data until 2004 to calibrate the models and more recent data to test the forecasting ability of the models. Accordingly, the models’ forecast bias, standard forecast error and mean square forecast error were compared with a random walk model. The outcome shows that the models also perform relatively well in an out-of-sample context, as shown in Table 5.

<table>
<thead>
<tr>
<th>2004 1Q – 2006 4Q</th>
<th>Czech case</th>
<th>German case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecast bias</td>
<td>0.000439</td>
<td>0.000033</td>
</tr>
<tr>
<td>Standard forecast error</td>
<td>0.003441</td>
<td>0.002113</td>
</tr>
<tr>
<td>Mean square forecast error</td>
<td>0.000012</td>
<td>0.000005</td>
</tr>
</tbody>
</table>

6. A Credit Risk Model for the Household Sector

For the analysis of credit risk for households, we refer to the same aggregate top-down model as in the case of the corporates.

In general, a financial crisis for households usually occurs as follows: if disposable household income falls below a certain threshold, households have to sell their assets. If there are no assets left to be sold, a default event occurs.

From the set of variables considered for households (see the data section), two macroeconomic variables were included in the models for the Czech Republic and for Germany. However, the variables included were different as shown in Table 6.
For the Czech model calibrated for the time period from 1997 Q3 to 2006 Q3, it was found that both the unemployment rate ($u$) and the real interest rate ($r$) have a positive effect on household default rates. For Germany (1994 Q1 – 2006 Q4), the two most significant variables were the household income ($inc$) and the household debt to GDP ratio ($debthouse$) with, respectively, a negative and positive effect on the private default rate.

Table 6: Macroeconomic credit risk model for Czech and German households

<table>
<thead>
<tr>
<th>Variable</th>
<th>Notation</th>
<th>Czech case</th>
<th>German case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lag</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td>-2.224***</td>
<td>0.071</td>
</tr>
<tr>
<td>Household Income ($\beta_1$)</td>
<td>$inc$</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Credit-to-GDP Ratio ($\beta_2$)</td>
<td>$debthouse$</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Unemployment Rate ($\beta_3,1$)</td>
<td>$u$</td>
<td>-4</td>
<td>3.695***</td>
</tr>
<tr>
<td>Real Interest Rate ($\beta_3,2$)</td>
<td>$r$</td>
<td>-3</td>
<td>1.808**</td>
</tr>
</tbody>
</table>

Significance level: **: Significant at 5% level; ***: Significant at 1% level.

The most important macroeconomic driver for household default is the unemployment rate, as it significantly affects households’ income. If the key breadwinner of a heavily indebted household loses his/her job, for example, the household is not usually able to compensate for this deficit, so default becomes highly likely. In the Czech case, the unemployment rate was found to be relevant with a lag of four quarters, which corresponds to the lagged impact on payment discipline in the event of loss of employment. In the case of the real interest rate, the statistically best results were achieved for a lag of three quarters – apparently the duration of an altered interest rate fixing on household defaults. The real interest rate was calculated by deflating the annual PRIBOR by annual changes in the CPI. The relevance of real interest rates is highly driven by the fact that a substantial portion of household debt is based on floating interest rates. In addition, the use of this variable allows the impacts of interest rates and inflation to be captured simultaneously. It is worth noting that the National Bank of Denmark uses the same variables as found for the Czech Republic (Danmarks Nationalbank, 2007). The other variables considered, such as nominal interest rates, inflation, the interest rate gap, the real GDP growth rate, the output gap and the ratio of interest paid to income or disposable income, were not significant.

39 The quarterly time series of the annual default rate was generated from the monthly series of the annual default rate calculated using relationship (2) by averaging the three monthly figures corresponding to the relevant quarter. Although the default rate obtained using equation (2) was available from 1994, the time series on which the model was estimated had to be shortened as a result of some lags in the model and due to the shorter series of the other macroeconomic indicators included in the model.

40 The loan is initially repaid from savings or the redundancy payment; payment discipline is affected only after that.
The development of the Czech household default rate is shown graphically below. It exhibits a much less volatile time pattern than the corporate default rate for the country.

Figure 3: Performance of the model for the Czech household sector

For Germany as well, the calibration of the model turned out to be less straightforward than for the corporate case. In the German case, the credit-to-GDP ratio, i.e. the aggregate level of household debt relative to GDP, had by far the strongest effect on the household default rate, being the only ratio that reflects the immense and continuous increase in the household default rate in Germany during the last ten years. It is important to highlight at this point that an official household default code has existed only since 1999, and that its existence has become known only fairly recently, so the increase in the default rate may be partially driven by more and more people becoming aware of this opportunity. Hence, the results for the German household sector have to be interpreted with caution.

Moreover, the decent economic development in Germany during the last decade was also partially reflected in household income. Household income constitutes the primary source of financing of credit, so it plays a crucial role in household default.41

The other structural economic indicators that were considered, for example the savings rate and interest rate levels, did not reflect the general development and therefore were not included in the model.

41 More specifically, the income to installment ratio is relevant, given that this ratio is usually relatively stable over time, as households typically have a regular income in the form of a salary or pension. In addition, households often possess financial assets, for example real estate or personal assets, which can be liquidated in the case of a financial shortcoming.
To sum up, the outcome for both countries reveals that the aggregate household models were less successful in explaining household default compared to the corporate case, and there were apparently less similarities across countries. An important reason could be that there were apparently developments beyond the economic sphere explaining the evolution of the household default rate, these being of a socio-economic nature. In the German case, for example, there was, similar to other western European countries, a tendency toward a decline in the welfare of many private households, particularly in the case of unemployment, notably also due to a reduction of social contributions combined with a change in family structures, namely an increasing level of single-person households and migration into larger cities, where rents were increasing, etc.

It was found that the household models were less robust, which has to be taken into account when it comes to stress testing. More specifically, the absence of autocorrelation can be confirmed for the Czech case at the 5% significance level, while this is not possible for the German case. In the latter case, this means that the model may be biased and that the dependent variable may not be properly explained by the considered macroeconomic indicators only. In addition, a test for the presence of heteroscedasticity in the residuals shows that the estimated standard errors of the coefficients may be biased.
7. Stress Testing

Next, the credit risk models are used for stress testing.

7.1. Macro Stress Tests for Czech and German Corporates

The key challenge for stress testing is the choice of scenarios.\textsuperscript{42} We will use both historic simulation-based scenarios and expert judgment-based scenarios to arrive at appropriate macro stress tests.\textsuperscript{43}

For all four models, we simulate a stress test based on end-2006 data (2006 Q4) for the end-2007 situation. Accordingly, an inflation rate of 2.9%, a real effective exchange rate of 1.046, a real GDP growth rate of 5.81% and a corporate credit-to-GDP ratio of 17.69% yield a model-inferred default rate of 3.5% for Czech corporates at the end of 2006, very close to the actual value.

Next, we define two quantile-based stress scenarios of a moderate and more severe intensity, which are used for all four models and thus allow for meaningful comparisons. We assume that the quantiles of all macroeconomic variables change by 10 percentage points (moderate stress scenario, HS 10%) and 20 percentage points (severe stress scenario, HS 20%), respectively, in the unfavourable direction. In two cases where the highest historical levels applied, we did not apply full adjustment of the parameter (i.e. a 10% and 20% increase or decrease), but used the 100% quantile value for the HS 10% scenario and rounded the parameter up for the HS 20% scenario. Descriptive statistics of the historical values for all variables included in the Czech corporate model are shown in Table 1. In the moderate stress scenario (HS 10%), for example, the real effective exchange rate remains at 1.046 given that this is the maximum observed historical value, inflation decreases to 2.5%, GDP growth decreases to 4.27% and the credit-to-GDP ratio increases to 19.67%. In addition, we add an expert-based scenario which takes into account the recent development of the variables. The stress parameter values used for the three scenarios are displayed below.

\textsuperscript{42} For an overview of the stress tests applied by German banks see Bundesbank (2004). A meaningful contribution as to how to apply stress testing has been provided by Čihák (2007).

\textsuperscript{43} In the latter case, one could use the macroeconomic forecast of the relevant central banks, for example, in the Czech case the CNB’s quarterly macroeconomic forecast (CNB, 2003) and in the German case the macroeconomic forecast of the Deutsche Bundesbank and the European Central Bank, and then add some additional stress at one’s discretion.
Table 7: Macro stress tests applied to Czech corporates

<table>
<thead>
<tr>
<th></th>
<th>Real effective FX rate</th>
<th>Inflation (%)</th>
<th>GDP growth (%)</th>
<th>Credit-to-GDP (%)</th>
<th>Corporate Default rate</th>
<th>Relative to 2006 Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Q4 value</td>
<td>1.046</td>
<td>2.90%</td>
<td>5.81%</td>
<td>17.69%</td>
<td>3.5%</td>
<td>NA</td>
</tr>
<tr>
<td>(quantile, %)</td>
<td>(100.0)</td>
<td>(54.5)</td>
<td>(81.8)</td>
<td>(33.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS 10% scenario</td>
<td>1.046</td>
<td>2.50%</td>
<td>4.27%</td>
<td>19.67%</td>
<td>5.5%</td>
<td>+57%</td>
</tr>
<tr>
<td>HS 20% scenario</td>
<td>1.1</td>
<td>2.30%</td>
<td>3.88%</td>
<td>28.46%</td>
<td>10.6%</td>
<td>+204%</td>
</tr>
<tr>
<td>Expert-based</td>
<td>1.1</td>
<td>2.50%</td>
<td>4.00%</td>
<td>23.00%</td>
<td>8%</td>
<td>+128%</td>
</tr>
</tbody>
</table>

Note: HS 10% (20%) represents a moderate (severe) stress test scenario in which the quantiles of all macroeconomic variables change by 10 (20) percentage points in the unfavourable direction.

As shown in Table 7, the Czech corporate default rates increase substantially for all three stress scenarios, by 57% in the HS 10% case (to 5.5%), by 128% in the expert-based scenario and by 204% in the HS 20% scenario. For the historical quantile-based scenarios, it is particularly the credit-to-GDP ratio that accounts for a very high increase in the default rate. Given that the level of this variable has constantly been below 20% since the second quarter of 2003, the corresponding historical-based value of the HS 20% scenario (28.46%) seems to be relatively high, so the expert-based value was chosen in a less conservative way. While the HS 20% scenario may be regarded as a rather unlikely severe scenario, it shows the volatility of the corporate default rate for Czech corporates in an illustrative way.

The outcome of the corresponding stress tests for Germany is shown below.

Table 8: Macro stress tests applied to German corporates

<table>
<thead>
<tr>
<th></th>
<th>Nominal interest rate (%)</th>
<th>GDP growth (%)</th>
<th>Industrial production change (%)</th>
<th>Credit-to-GDP (%)</th>
<th>Corporate default rate</th>
<th>Relative to 2006 Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Q4 value (quantile, %)</td>
<td>3.54%</td>
<td>3.95%</td>
<td>3.92%</td>
<td>53.45%</td>
<td>1.4%</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>(41.5)</td>
<td>(95.3)</td>
<td>(79.6)</td>
<td>(9.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS 10% scenario</td>
<td>3.83%</td>
<td>3.34%</td>
<td>2.96%</td>
<td>54.18%</td>
<td>1.6%</td>
<td>+13%</td>
</tr>
<tr>
<td></td>
<td>(79.6)</td>
<td>(95.3)</td>
<td>(79.6)</td>
<td>(9.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS 20% scenario</td>
<td>4.25%</td>
<td>2.59%</td>
<td>2.05%</td>
<td>54.46%</td>
<td>1.9%</td>
<td>+29%</td>
</tr>
<tr>
<td>Expert-based</td>
<td>4.50%</td>
<td>2.00%</td>
<td>3.00%</td>
<td>55.00%</td>
<td>2.0%</td>
<td>+38%</td>
</tr>
</tbody>
</table>

Note: HS 10% (20%) represents a moderate (severe) stress test scenario in which the quantiles of all macroeconomic variables change by 10 (20) percentage points.

44 This value was used because the quantile value for the current scenario is already at 100%.

45 For the 20% scenario, we assumed that the level of the real effective exchange rate would increase to 1.1, taking into account the very high level of the variable, and so we did not stick strictly to the quantile rule.

46 If the quantile rule had been strictly applied, the default rate would have been 11.6% and the respective increase 233%.
As the table shows clearly, the impact of the scenarios on the default rate of German corporates is much lower than in the Czech case, the increase remaining below 30% for the historical scenarios (even for the HS 20% scenario), while the expert-based scenario, which was chosen in a slightly more conservative way (especially in the case of GDP growth), yields an increase of 38%.

The outcome that the multivariate impact of the stress test is much more severe for the Czech Republic can also be seen in the resulting stress values of each of the macroeconomic variables of the two corporate models: in the German case, they do not diverge too far from the actual value when stressed by 10% or 20%, while the stress level in the Czech case results in more substantial differences. Nevertheless, the full range of the historical values for Germany does also show that a more severe stress event could potentially yield a more substantial increase in the corporate default rate. If one applies a stress level of 30% (HS 30%) and 40% (HS 40%) to further investigate whether the stress effect tends to be non-linear, the resulting increase in the default rate by 44% and 66% respectively shows that the impact remains relatively moderate compared to the Czech case, so this is not the case.

7.2. Macro Stress Tests for Czech and German Households

For the stress tests of the household sector, one first has to take into account that the performance of the model was considerably weaker than for the corporate sector, so the stress testing exercise will be less precise and one is more likely to over- or under-estimate the effect of a stress event. Taking a conservative stance, one may add some cushion to the actual outcome in both directions. Hence, we will only apply the same historical, quantile-based scenarios for households without additionally using an expert-based scenario, also in order not to stretch the use of household models too much.

The outcome of the stress tests applied to Czech households is displayed below. The result of an increase in the default rate of only 4% for the HS 10% scenario and 6% for the HS 20% scenario suggests a relatively low sensitivity of the household default rate to changes in the economic variables. As pointed out before, not all effects shown in the empirical default rates are fully captured in the model, so the result has to be interpreted with care.

The outcome of the macro stress test for German households is displayed below. The increase in the default rate is higher than for the Czech case, with 11% for the HS 10% scenario and 28%\(^{47}\) for the HS 20% scenario. It is worth noting that the size of the default rate increase for the two stress scenarios is very similar to the case for German corporates. While this outcome may be striking at first glance, it again reflects the continuous and rapid increase in German household default rates in recent years.

\(^{47}\) If the 100% quantile had been applied to the credit-to-GDP ratio (45.20% as for the HS 10% scenario), the default rate would have increased by only 21%.
Again, one should take into account that the model specification is less robust than for the corporate case.

Table 9: Macro stress tests applied to Czech households

<table>
<thead>
<tr>
<th>Unemployment Rate (%)</th>
<th>Real Interest Rate (%)</th>
<th>Household Default Rate</th>
<th>Relative to 2006 Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Q4 value (quantile, %)</td>
<td>7.77% (43.2)</td>
<td>-0.47% (0.0)</td>
<td>2.59%</td>
</tr>
<tr>
<td>HS 10% scenario</td>
<td>8.02%</td>
<td>0.01%</td>
<td>2.69%</td>
</tr>
<tr>
<td>HS 20% scenario</td>
<td>8.19%</td>
<td>0.15%</td>
<td>2.75%</td>
</tr>
</tbody>
</table>

Note: HS 10% (20%) represents a moderate (severe) stress test scenario in which the quantiles of all macroeconomic variables change by 10 (20) percentage points.

Table 10: Macro stress tests applied to German households

<table>
<thead>
<tr>
<th>Household Income Change (%)</th>
<th>Credit-to-GDP (%)</th>
<th>Household Default Rate</th>
<th>Relative to 2006 Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 Q4 value (quantile)</td>
<td>1.09% (50.8)</td>
<td>45.13% (98.3)</td>
<td>0.115%</td>
</tr>
<tr>
<td>HS 10% scenario</td>
<td>0.62%</td>
<td>45.20%</td>
<td>0.128%</td>
</tr>
<tr>
<td>HS 20% scenario</td>
<td>0.15%</td>
<td>45.50%</td>
<td>0.148%</td>
</tr>
</tbody>
</table>

Note: HS 10% (20%) represents a moderate (severe) stress test scenario in which the quantiles of all macroeconomic variables change by 10 (20) percentage points.

7.3. Stress Test Applied to a Hypothetical Bank Portfolio

In the Basel II framework (BCBS, 2006), banks are asked, in a broader sense, to analyze possible future scenarios that may threaten their solvency. In the case of credit risk, this includes in particular an assessment of economic or industry sector-specific downturn events, which must be chosen in a “meaningful” and “reasonably conservative” way and thus represent at least “mild recession scenarios”, but not necessarily a “worst-case scenario” (BCBS, 2006, para. 435). In order to keep the stress tests flexible and thus match the specific requirements of each bank, the challenging task of choosing stress scenarios is at the discretion of banks and has to be justified to the supervisory body.

Within the Basel II framework, a stress test on credit risk would comprise all IRB credit risk parameters, namely the Probability of Default (PD) (those of both...
borrowers and guarantors), the Loss Given Default (LGD) and the Exposure at Default (EAD).\footnote{Basel II-type microeconomic stress testing is also applied in supervisory bodies. In the Deutsche Bundesbank, for example, Basel II-type microeconomic stress tests are carried out in two different forms: first, in terms of sensitivity analysis to simulate macroeconomic effects on specific credit risk parameters, carried out in the framework of the Quantitative Impact Studies (QIS); and second, in terms of scenario analysis, based on a stochastic multi-factor model using data from the German credit register, for example to arrive at further insights into sectoral concentrations. For further information see Deutsche Bundesbank (2007, p. 102f.).}

We use the outcome of the macro stress testing exercise in a top-down manner for Basel II-type micro stress testing based on a hypothetical credit portfolio.\footnote{We sought to make the portfolio as realistic as possible. This was supported by expert judgment in various dimensions, so that the values are meaningful for both countries. It is important to highlight that a real portfolio would be non-homogeneous in terms of PD and EAD (but also in terms of LGD and, if the data allow for that, in credit correlations), which would alter the results. The direction of the changes depends on the actual portfolio, namely whether it contains mostly SMEs with similar risk characteristics or a mixture of large, medium-sized and small corporates, the industry-sector distribution, etc.} The portfolio comprises 6,000 loans, with 50\% of the credit exposure being granted to corporates and 50\% to households. This decomposes into 462 loans made to corporates and 5,538 to households, with a relative exposure size of corporate exposures to retail (household) exposures of 12:1.\footnote{This size ratio was revealed as follows. We calculated the average corporate credit by dividing the total corporate credit volume in Germany by the number of corporate firms in 2007 and then assumed that the firms’ credit is spread equally over two banks. For the household sector, we similarly took the total household credit volume in Germany and divided it by the number of German households. The resulting absolute numbers were 209,000 EUR for the corporate sector and 17,000 EUR for the household sector. In terms of size ratio, we thus assume that 12/13 (n=5538.5) of the loans are granted to households and 1/13 (n=461.5) to corporates. See Deutsche Bundesbank (2007), p. 54/55.}

In terms of the credit portfolio risk measure, we refer to the Basel II minimum capital requirements under the IRB approach. In this way, the regulatory capital requirements – in their role as a Value-at-Risk ratio for a one-year horizon and a confidence level of 99.9\% – are used as an indicator of the inherent credit risk in the portfolio. For the corporate loans, we apply the Basel II IRB formula for corporates (BCBS, 2006, para. 272) based on four inputs, namely PD, LGD, EAD and Maturity (M). For loans to households, the formula for other retail exposure (BCBS, 2006, para. 330) is applied, so the maturity is not needed.

In order to allow for a meaningful comparison between the two countries, we use the two historical, quantile-based macroeconomic stress scenarios elaborated in the last section (HS 10\%, HS 20\%) as the basis for portfolio stress testing (i.e. for a stress on the PD) and measure the relative effect for the two countries for the same credit portfolio.

We further assume that the portfolio is homogeneous in terms of PDs and exposures within the corporate and household sectors respectively. In the first case (1), the
LGD is fixed at 45% and the maturity at 2.5 years as foreseen under the Foundation IRB approach for senior unsecured debt.\textsuperscript{53} Second (2), the LGD will be increased by 20\% in relative terms (from 45\% to 54\%) in order to take into account a potential positive correlation between the PD and the LGD.

The resulting Herfindahl-Hirshmann-Index (HHI) of 0.00059 indicates that the credit portfolio referred to is granular in terms of EAD\textsuperscript{54}, implying that there is only minor name concentration. Furthermore, it is assumed that the corporate portfolio is also diversified across industries and geographical sectors, so the basic assumptions for the use of the Basel II one-factor model are fulfilled. While these assumptions facilitate the use of the Basel II IRB model, the resulting credit risk requirements thus tend to be a lower bound for the actual portfolio credit risk.

The regulatory IRB capital requirements for this hypothetical credit portfolio are displayed in the table below, listing the outcome for the two stress tests without and with LGD stress for the two countries.\textsuperscript{55} The capital requirements are measured relative to the portfolio exposure and are highlighted in bold.

The table shows various results. First, the unstressed minimum capital requirements are 7.82\% of the exposure in the Czech case, compared to 4.66\% in the German case, implying that the portfolio credit risk in the Czech Republic exceeds the portfolio credit risk in Germany by a considerable 68\% due to higher default rates.\textsuperscript{56} Second, the table also shows that the impact of a univariate macroeconomic stress on default probabilities (when keeping recovery rates at the same level, i.e. case 1) is much higher for the Czech portfolio, yielding an increase in the capital requirements of 10.7\% compared to 4.5\% for Germany in the case of stress scenario HS 10\% and 32.6\% versus 9.2\% for the more severe stress scenario HS 20\% (case 2). This outcome shows that the impact of a macroeconomic stress event for default rates translates into a 2.4 times (HS 10\%) and 3.5 times (HS 20\%) higher impact on capital requirements in the Czech case, driven mostly by the higher volatility of default rates in the corporate sector.

\textsuperscript{53} In some jurisdictions, the effective maturity is used in the same way as in the case of the AIRB and is thus not fixed at 2.5 years.

\textsuperscript{54} In the study of Gordy and Lütkebohmert (2007), an average HHI of 0.001 was determined for credit portfolios of large German banks based on data from the German credit register.

\textsuperscript{55} It is worth noting that we assume that the same levels of stress (i.e. HS 10\% and HS 20\%) occur simultaneously for households and corporates in each case.

\textsuperscript{56} Although we focus on the relative impact of the stress tests, it is worth noting that the ratio is below the loaded 8\% level in both cases, reflecting the fact that the portfolio quality is above average overall based on the end-2006 parameters.
Table 11: Impact of macro stress tests on IRB minimum capital requirements (CR) for a hypothetical portfolio: Comparison for the Czech Republic and Germany (CR are measured in % of exposure)

<table>
<thead>
<tr>
<th>Stress Scenario</th>
<th>Parameter</th>
<th>End-2006 portfolio (unstressed)</th>
<th>Forecasted 2007 stress portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Corporate-PD (%)</td>
<td>Household-PD (%)</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>HS 10%</td>
<td>3.50</td>
<td>2.59</td>
</tr>
<tr>
<td></td>
<td>LGD (%)</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Capital Requirements (%)</td>
<td>7.82</td>
<td>8.66 (+10.7%)</td>
</tr>
<tr>
<td></td>
<td>Corporate-PD (%)</td>
<td>3.50</td>
<td>10.60</td>
</tr>
<tr>
<td></td>
<td>Household-PD (%)</td>
<td>2.59</td>
<td>2.75</td>
</tr>
<tr>
<td></td>
<td>LGD (%)</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Capital Requirements (%)</td>
<td>7.82</td>
<td>10.37 (+32.6%)</td>
</tr>
<tr>
<td></td>
<td>Corporate-PD (%)</td>
<td>1.43</td>
<td>1.63</td>
</tr>
<tr>
<td></td>
<td>Household-PD (%)</td>
<td>0.115</td>
<td>0.128</td>
</tr>
<tr>
<td></td>
<td>LGD (%)</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Capital Requirements (%)</td>
<td>4.66</td>
<td>4.87 (+4.5%)</td>
</tr>
<tr>
<td></td>
<td>Corporate-PD (%)</td>
<td>1.43</td>
<td>1.85</td>
</tr>
<tr>
<td></td>
<td>Household-PD (%)</td>
<td>0.115</td>
<td>0.148</td>
</tr>
<tr>
<td></td>
<td>LGD (%)</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Capital Requirements (%)</td>
<td>4.66</td>
<td>5.09 (+9.2%)</td>
</tr>
</tbody>
</table>

Third, if one adds a potential stress level of the LGD of 20%\(^{57}\) in order to arrive at a more comprehensive impact of the capital requirements for the credit portfolio (case 2), then the increase in the capital requirements is around 33% (HS 10%) and 59% (HS 20%) for the two stress cases on the Czech portfolio and 25% and 31% for the German portfolio. In a study based on a large European corporate credit portfolio for a similar time period, Düllmann et al (2008) find a maximum increase in the IRB minimum capital requirements of 34% on an annual basis, which is in the same range as for the German case. However, for an economic capital model additionally taking into account the variation of credit correlations, the authors find that the economic capital increase may be more than twice as high as for the IRB capital. If this was translated into the outcome of the current study, then a credit portfolio in the Czech Republic may be exposed to an increase in (economic) capital requirements of more than 100%, despite the “smoothing” effect of Czech households.

To sum up, macro stress scenarios translated into micro stress tests may lead to a considerable increase in capital requirements even for a homogeneous and well-diversified portfolio that reflects the average macroeconomic conditions of the

\(^{57}\) From a methodological perspective, an increase in the LGD has a linear effect on the Basel II capital requirements, implying that the impact is higher than for the PD.
economy as in the underlying case. Hence, the effect can be assumed to multiply for a concentrated, heterogeneous portfolio with a higher ratio of corporate credit as in the underlying case, so that the increase in default rates and recovery rates are higher than for the average bank portfolio.

8. Conclusion

In this study, macroeconomic credit risk modelling for the corporate sector and the household sector was applied to both the Czech and the German economies. In the first step, reliable and comparable data were generated, yielding a time frame of eight years from 1998 to 2006 for the Czech Republic and 12 years from 1994 to 2006 for Germany based on annualised quarterly data. Furthermore, it was ensured throughout the study that the results for the two countries were comparable in order to work out and explain potential differences.

Next, a Merton-type one-factor credit risk model was used to estimate aggregate corporate and household default rates based on non-performing loans. We found that modelling was meaningful for the corporate sector, while this was not entirely the case for the household sector. Moreover, the outcome that similar variables can explain the default rates for two economies with a different default rate and volatility pattern suggests that corporate credit risk can obviously be explained by a limited set of similar variables for different economies. By contrast, further research seems to be necessary in order to better explain the time pattern of household default rates.

Subsequently, macro stress testing was applied, indicating that there can be a substantial increase in the corporate default rate (more than 100% for the Czech Republic; up to 40% for Germany) in the case of a relatively minor change of the macroeconomic environment in historic terms, particularly for the Czech corporate sector. For Germany, the impact of macroeconomic shocks is apparently much less pronounced, at least for the period considered. However, the sensitivity of the corporate sector default rates for the Czech Republic was driven by the high volatility of the macroeconomic indicators during the transition period of the late 1990s, so the results have to be interpreted carefully. For households, sensitivity to the macroeconomic environment is less pronounced, unlike what the recent US subprime crisis might suggest. This outcome, which also holds true for the credit portfolio level, has to be interpreted with caution, as the robustness of the household model is substantially lower than that for the corporate sector, but it might also be seen as an indication that both economies are more robust to shocks in the household sector. The latter assumption seems to be reflected in the fact that the financial crisis has not had a considerable effect on the Czech and German household sectors.
In the third step, the outcome of macro stress testing was used for top-down Basel II-type micro stress testing of the same hypothetical credit loan portfolio for both countries. It turned out that the increase in portfolio risk induced by a macroeconomic shock is more than twice as high for the Czech Republic as for Germany. Based on the regulatory IRB capital requirements, the portfolio credit risk of an average bank would increase by up to 60% in the Czech case and by roughly 30% for Germany. In the case of portfolios concentrated in names or sectors and/or when using an economic capital model that additionally takes into account potential variations of credit correlations, the increase in capital requirements could be much higher.

To sum up, it has been clearly shown how important a comprehensive analysis of credit risk is in order for regulatory bodies to be able to take measures to safeguard financial stability. Besides the numerical results of this study for the two underlying countries, we provided a template for investigating the credit risk environment of an economy. In this way, the underlying study can serve as a starting point for other countries to monitor credit risk in their financial systems and thus contribute to the detection of potential fragility of the banking sector as a means of preventing financial crises. Given that central banks and supervisory bodies usually have data on the credit portfolios of domestic banks (for example via a credit register), macroeconomic stress scenarios can be readily translated in a top-down manner for micro stress testing, in particular for those banks that are relevant from a systemic perspective. For the industry, the framework elaborated may contribute to the introduction of Basel II-type micro stress testing.

In any case, future research is needed on the highly complex issues discussed in this paper. There are various approaches by different regulatory bodies pointing in the same direction from a methodological viewpoint. However, the most fundamental issue is to ensure reliable databases with a long-term horizon, which are not available in most countries. Improvements are also needed particularly for the household sector, where the modelling turned out to go beyond the economic dimension.

9. Bibliography


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Appendix

Figure 5: Out-of-sample test for the Czech and German corporate credit risk model

Czech case

German case
1. Introduction

A dynamic and healthy stock exchange is considered a crucial factor of a country’s economy. In a stock exchange, stockbrokers and traders trade stocks and other securities. Some of the roles that a stock exchange can play in an economy are the raising of capital for businesses or the creation of investment opportunities for small investors. The operations of a stock exchange can transform an investor’s money into investment. If this investment is profitable, it may give investors the opportunity for further investments. Thus, besides the contribution of the stock exchange in a country’s national economy, there is also a contribution to the investors individually (Elton et al 2003). During the last decades, an increasing number of emerging markets have substantially developed their financial structures, including their stock markets, but when they are compared to more developed markets, they are still characterised by lower levels of financial development and stock market transactions (Tsouma, 2009). In our study, we try to explore the relationship between a number of stock market indices based on their economic situation, as well as their geographical position. We study their individual characteristics, as well as the relationship between them. The study is organised as follows: Section 2 presents the literature review, using co-integration analysis; section 3 presents methodology that is followed with the examination of the main models of the analysis. Furthermore, section 4 presents the data collection process, with an introduction to the indices used in the tests. Section 5 and its sub-sections, present the empirical results and, finally, section 6 concludes the study.
2. Literature Review on Co-integration Analysis

In the present section, we present a number of studies mainly based on co-integration analysis for the examination of the long-term relationship between financial or macroeconomic indices. Muradoglu and Metin (1996) investigated a semi-strong form of the efficient market hypothesis in Turkey. The long-term relationship between stock prices and inflation was investigated and the results presented the inefficiency of the Turkish stock market as stock prices can be forecasted. In our study, the efficiency of the ASE index is one of the goals of our study, using co-integration analysis. He (1997) investigated the relationship between four security sub-markets of Hong Kong. The results exhibited a stable, long-term, linear relationship among these sub-markets. Moreover, all four sub-markets played a major role in the process of price discovery and, more specifically, that price changes in one sub-market have a significant impact on the other sub-markets under examination. Kanas (1998) investigated possible co-integration links between the US and six European equity markets during the period 1983–1996. The results exhibited evidence of the absence of co-integration between the US and the European markets, a result which contradicted previous findings. The main conclusion was that the absence of co-integration gives the opportunity to investors to diversify in the US and the European stock markets.

Knif and Pynnonen (1999) examined the impact of the leading markets, that is the US and Japan, on small markets, such as Finland and Norway. The results of the tests showed that US price changes had an impact on all the other markets in the analysis. Finally, price changes on the Asian-Pacific markets had a direct effect on the price changes of European countries, but not on the price changes of the US market. Choi et al (1999) examined the interactions between stock markets and macroeconomic variables, and their results suggested that stock markets help predict industrial production in the US, UK, Japan and Canada out of the G7. Nasseh and Strauss (2000) examined the same phenomena, where not only domestic, but also international, macroeconomic variables enter the co-integration vectors to share long-term relationships with stock prices. Pan stockbrokers (1999) applied the Johansen (1988) and the Johansen and Juselius (1990) co-integration test and a modified co-integration test with generalised autoregressive conditional heteroscedastic (GARCH) effects in order to investigate the relationship between the United States and five Asian-Pacific stock markets during the period between 1988 and 1994. The GARCH co-integration test examined the possible common time-varying volatilities between the series. While the results showed a strong integration between the six stock markets through their second moments (variances), the results were different through their first moments (means). The aim of their study was to investigate whether international stock markets have long-term, common time-varying volatility. The results of the study exhibited the presence of ARCH effects in most of the stock price series, which meant that, when
testing for co-integration, one needs to account for time-varying volatility. The main conclusions suggest that volatility transmissions among international stock markets exist not only in the short-term, which refers to the volatility spillovers, but also in the long-term, something which is explained by the common time-varying volatility of the series under examination.

Moreover, Kwon and Shin (1999) investigated if the economic activities in Korea explained stock market returns using co-integration and causality tests. They found that co-integration is evident between stock market indices and macroeconomic variables, which are the production index, the exchange rate, the money supply and the trade balance. It should be noted here that, even though the stock market index and the production index affect each other, the stock market index is not a general leading indicator for economic variables.

Gilmore and McManus (2002) examined the relationship between the US market and three Central European markets, the markets of the Czech Republic, Poland and Hungary. The results showed that the markets are not strongly correlated and the (co-integration) tests for long-term relationship were weak. Finally, the causality tests were not significant between European markets and the US, suggesting possible benefits from international diversification. Hassan (2003) investigated the possible relationships between share prices in the gulf region and specifically, between weekly share price indices in the Kuwait, Bahrain and Oman stock markets for the period 1994–2001. The results of the tests showed that there is one co-integrated vector that relates the Kuwait and the Bahrain stock market, which means that there exists a stable, long-term equilibrium relationship between the markets. This relationship between the two markets means that potential investors can benefit in the long-term from the information that exists in the Bahrain stock market and vice versa. Aggarwal and Kyaw (2005) examined for integration and co-integration links between three equity markets before and after the 1993 North American Free Trade Agreement (NAFTA), based on daily, weekly, and monthly data. The results of the unit root tests for the overall 1988–2001 period and for the two sub-periods (1988–1993 and 1994–2001) showed that, while stock prices were non-stationary, stock returns exhibited stationarity for all three markets and for all the periods of the analysis. The co-integration tests showed, for daily, weekly, and monthly data, that the prices of stocks are co-integrated only for the post-NAFTA period. The main conclusion of the analysis was that the increased integration and co-integration between the markets after NAFTA presents less opportunity for international portfolio diversification. This is evidence for the need of new strategy developments among investors and managers.

Syriopoulos (2006) examined developed and emerging Central European stock markets for possible dynamic links and the effects of time-varying volatilities. He found that there was one co-integration vector between the variables, which presented long-term market co-movements. Specifically, the Central European markets
presented strong links with the developed markets under examination. Moreover, the application of an asymmetric EGARCH model presented a time-varying volatility effect for these emerging stock markets. The main conclusions were that international portfolio diversification is not the best solution across these co-integrated markets, as risk is not so easy to be reduced and the returns present volatilities to international and domestic innovations. Furthermore, Tsouma (2009) examined the relationships between stock returns and economic activity in developed and emerging markets. The study employed co-integration and causality tests during the period between 1991 and 2006. Specifically, the tests confirmed the existence of a strong relationship running from stock returns to future economic activity, while the relationship running from economic activity to future stock returns was not significant, confirming the forecasting ability of stock returns. The results were not the same between developed and emerging markets. Specifically, the relationship running from stock returns to economic activity was less strong for the emerging ones.

In the following section we present the methodology that is followed, so as to examine the properties of each index and test their relationship.

3. Methodology

The steps that are followed so as to examine the relationship between the series begin with the presentation of each index in its level, logarithmic level and logarithmic return. In this way we can observe that the range of the volatility of each series is reduced and that there are possible signs of volatility clustering. After the presentation of the series we present their respective descriptive statistics, in order to examine the characteristics of each index. Moreover, we present the correlation matrix between the returns of the series, so as to examine any possible correlation between them.

The study continues with the autocorrelation tests for each index and, in case there is dependence on the lags of a series, we construct a specific model for each index in order to run a linear regression test (OLS). Based on the regression model, we test the residuals of the series for possible heteroscedasticity (with the ARCH LM test). In case there are heteroscedastic effects, we employ a specific GARCH model – the EGARCH-M model – so as to measure the conditional volatility of the series and examine if there are any asymmetry effects caused by positive and negative shocks.

Finally, we proceed to a series of unit root (stationarity) tests on the indices in order to achieve stationarity and continue with the co-integration analysis by employing Johansen’s (1988; 1991) VAR model. In this way, we can observe whether there is a long-term relationship between specific groups of variables/indices. Specifically, based on prior studies (Hondroyannis and Papapetrou, 2001; Maysami *stockbrokers*, 2004; Tsouma, 2009): 1) we examine the existence of a unit root in each one of the
series that will be used in the analysis of co-integration; 2) if there is a unit root in the series, which means that the series is not stationary, based on the Augmented Dickey-Fuller – ADF (1979; 1981) procedure, we examine the first differences of the series; 3) subsequently, we employ again the ADF (1979; 1981) test in order to examine the first differences of the series – if the series is integrated in order 1(I(1)); 4) If the tests show that the series is I(1) we proceed to co-integration analysis so as to examine if there is at least one linear combination between the series (the series is co-integrated) and 5) if there is at least one linear combination between the series it means that there is at least one long-term relationship that connects the variables of the analysis. More specifically, after we see that the variables under examination are I(1) we investigate whether there is any relationship in specific groups based on their economic and geographic position during the period between 1997 and (early) 2009.

The following sub-sections present the ARCH and the EGARCH-M model, the ADF unit root model and Johansen’s VAR model.

3.1. The ARCH and the EGARCH-M Model

The ARCH model is employed in modelling the volatility of the time series (variables) under investigation. This means that the conditional variance of the series affects the conditional mean, which gives rise to a regression model for the mean that includes some function of the conditional variance. That is, if an investor holds a financial asset and wants to model the respective returns of this asset, the conditional variance is not likely to remain constant over time. This might be due to small or even large shocks (change in government, stock market crash), which may affect the returns of the asset to a significant degree.

The problem of modelling volatility, so that it can respond to time-varying shocks, was solved with the development of the Autoregressive Conditional Heteroscedasticity (ARCH) model developed by Engle (1982).

In case there is a conditional mean equation of one variable:

$$y_{it} = a_{it} + b_{it} y_{i,t-1} + \varepsilon_{it}$$  \hspace{1cm} (1)

then the ARCH model needed to capture the information from the time-varying volatility will have the following form:

$$\sigma_i^2 = a_0 + a_1 \varepsilon_{i,t-1}^2$$  \hspace{1cm} (2)

where $\sigma_i^2$ is the conditional variance of the residuals $\varepsilon_{it}$ from equation (1) and $\varepsilon_{i,t-1}^2$ are the past values of $\varepsilon_{it}$ at time $t-1$. As $\sigma_i^2$ is a variance it should not be negative and is mostly positive, otherwise the model is rejected according to Engle (1982).
More specifically, the need for non-negativity leads to the following assumptions regarding the validity of ARCH model:

1) \(a_0 \geq 0\). In case \(a_j = 0\) then the conditional variance \(\sigma_i^2\) is \(a_0 = 0\), which means that this coefficient must be non-negative. 2) \(a_1 \geq 0\). Because \(\varepsilon_{t-1}^2\) is always non-negative, \(a_j\) should be equal or larger that zero so as \(a_j \varepsilon_{t-1}^2\) to be non-negative.

3) \(a_1 < 1\). In case \(a_j\) is larger than 1, then the process cannot be covariance stationary (non-stationarity of ARCH effects).

Based on the theory of the ARCH model, Nelson (1991) developed the EGARCH model, and along with the measurement of the conditional volatility, examined for possible asymmetry phenomena in the time series. Furthermore, in order to examine, along with the modelling of conditional volatility, the influence of the volatility on the mean of the series, we employed the EGARCH-in-Mean (EGARCH-M) Model (Chortareas stockbrokers, 200000):

\[
R_t = \varphi_0 + \varphi_1 R_{t-1} + \gamma \sqrt{h_t} + \varepsilon_t \tag{3}
\]

\[
\log h_t = a_0 + \alpha_1 \left[ \frac{\varepsilon_{t-1}}{h_{t-1}^{1/2}} \right] + \beta \log(h_{t-1}) + \frac{\delta \varepsilon_{t-1}}{h_{t-1}^{1/2}} \tag{4}
\]

According to the equations presented above, the \(a, \beta, \gamma, \delta\) and \(\varphi\) are the parameters for estimation. Specifically, the parameter \(a_j\) measures the impact of the innovation (shock) in equation (3) on the conditional volatility at time \(t\). The parameter \(\beta\) is an autoregressive term on lagged conditional volatility, reflecting the weight given to the previous period’s volatility in the volatility at time \(t\). The parameter \(\gamma\) expresses the influence of volatility on the mean of the series. Moreover, the parameter \(\delta\) expresses the asymmetric response of the conditional volatility on shocks of different sign. Finally, \(\varphi_1\) is a first-order autoregressive parameter (AR(1)) of the mean equation.

### 3.2. The Dickey-Fuller/Augmented Dickey-Fuller Test and Johansen’s VAR model

The presence of a unit root can be presented using a first-order autoregressive process:

\[
y_t = l + k y_{t-1} + \varepsilon_t, \varepsilon_t \sim N(0, \sigma_e^2) \tag{5}
\]

where \(l\) is a constant of the equation, \(k\) is the coefficient of the first difference of \(y_t\) and \(\varepsilon\) is the error term which has a mean of zero and variance \(\sigma_e^2\). The Dickey-Fuller (DF) test (Dickey and Fuller, 1979; 1981) can be written as:
\[ \Delta y_t = l + (k - 1)y_{t-1} + e_t = l + py_{t-1} + e_t \]  \hspace{1cm} (6)

after the subtraction of \( y_{t-1} \) from both sides of equation (5). In this test the null hypothesis says that there is a unit root in the time series, which means that \( H_0: p = 0 \), while \( H_1: p < 0 \), which is the alternative hypothesis and means that there is no unit root in the time series. Equation (6) gives the simplest case of a DF test where the residual is white noise. In fact, the residuals exhibit serial correlation most of the time and \( \Delta y_t \) can be rewritten as:

\[ \Delta y_t = l + py_{t-1} + \sum_{i=1}^{k} f_i \Delta y_{t-i} + e_t \]  \hspace{1cm} (7)

Equation (7) is the equation for the Augmented Dickey-Fuller (ADF) test. This is the improved version of the Dickey-Fuller test as it accommodates higher-order autoregressive processes in \( e_t \) (Greene, 2003).

Furthermore, in case there is a vector \( y_t \) of first-order integrated variables which can be expressed by an unrestricted vector autoregressive (VAR) model, based on the studies of Johansen (1988; 1991) and Johansen and Juselius (1990), involving up to \( k \) lags of \( y_t \):

\[ y_t = A_1 y_{t-1} + ... + A_k y_{t-k} + e_t \]  \hspace{1cm} (8)

where \( A_1, ..., A_k \) = the matrices of the parameters of the model and \( e_t \) = the vector of the residuals of the system that has a mean equal to zero, constant variance and its values are not serially correlated. The VAR model has been used in order to estimate dynamic relationships among jointly endogenous variables without imposing strong \textit{a priori} restrictions – such as particular structural relationships. The VAR model comprises a system of equations where each variable in \( y_t \) is regressed on the lagged values of itself and on the other variables of the system.

4. Data Collection

The study examines the monthly return series of a number of stock market indices during the period between 1997 and (early) 2009. The data was obtained from an international databank, which comprises financial, as well as macroeconomic, indices. Specifically, the data set is 147 months. All the indices had a complete price history, which means that they had no missing values (with the exception of Russia for the first nine months) for this specific period of analysis because of missing data. The monthly returns of each stock index were calculated using the logarithmic approximation:

\[ R_{t,t} = \log \left( \frac{P_{t,t}}{P_{t,t-1}} \right) \]  \hspace{1cm} (9)
where $P_{i,t}$ is the closing price of month $t$ for index $i$ (Coutts stockbrokers, 2000; Chortareas stockbrokers, 2000).

4.1. The Selection of Variables

Based on prior studies (Tsouma, 2009; Gilmore and McManus, 2002), a number of financial indices were employed for the employment of unit root and co-integration tests. In this section, we briefly present the variables/indices of the analysis. As in the case of prior studies using VAR or VECM models (Tsouma, 2009; Gilmore and McManus, 2002), or even financial models such as the CAPM and the APT model, we employ representative stock market indices of 16 countries in order to proceed to unit root and co-integration analysis and examine the long-term relationship between them.

Specifically, we employ for America: The market index of the United States (the Dow Jones Industrial Average) which is the second-oldest U.S. market index and computed from the stock prices of 30 of the largest and most widely held public companies in the United States, and the market index of Mexico, which is the second largest stock exchange in Latin America, the stock index of Brazil, which is the fourth largest stock exchange in America in terms of market capitalisation – behind NYSE, Nasdaq, and the Toronto Stock exchange -, the stock index of Argentina, which is the most important index of the Buenos Aires Stock Exchange, the stock index of Venezuela, and the stock index of Chile, which is a market capitalisation-weighted index that measures price variations of the majority of the exchange’s listed stocks, classified by sector, according to its activity and revised annually.

Furthermore, we employ for Europe: The stock index of France (CAC 40), which is a stock market index that comprises the 40 largest French stocks based on market capitalisation on the Paris Bourse (stock exchange) and it is the most commonly used index that represents the overall level and direction of the market in France; the index of Germany (DAX index), which is a blue chip stock market index consisting of the 30 major German companies trading on the Frankfurt Stock Exchange; the market index of Italy (Milan MIB30), which is a market capitalisation-weighted index of the 30 top Italian companies trading on the Milan Stock Exchange; the index of the United Kingdom, which is an index made up of the 100 largest (according to market capitalisation) UK firms listed on the London stock exchange; the stock index of Greece, which comprises the 60 largest companies of the Athens Stock Exchange; the index of Poland (Warsaw Stock Exchange – WSE) which lists 311 companies; the index of Hungary (from the Budapest Stock Exchange – BSE); the index of the Czech Republic, which is the second largest stock exchange in Central and Eastern Europe, and the market index of Russia (from the Moscow Interbank Currency Exchange – MICEX – which is one of the largest universal stock exchanges in the Russian Federation and East Europe.)
Finally, for Asia: the stock index of Japan, which is an important stock market index of the Tokyo Stock Exchange and comprises stocks from different sectors of the Japanese economy, such as the food, construction and banking sector.

5. Empirical Results

5.1. Descriptive statistics and Correlation of the indices

Table 1 presents the descriptive statistics of the indices of the developed markets used in the analysis. The returns of the indices were calculated as presented in equation (9). It can be seen from the normality (Jarque-Bera) results and the respective probability statistics at the 5 per cent level of significance, that none of the indices follow the normal distribution. This result will be helpful in the estimation of the conditional volatility using the EGARCH-M model later in the tests. Table 1 also shows that the index of Japan has the greatest kurtosis, which is a sign that the return volatility in this market is greater in comparison to other developed markets. Respectively, Table 2 shows that none of the indices of the emerging markets follow normal distribution and, in this case, the index of the Czech Republic presents the greatest kurtosis. The phenomenon of volatility clustering (heteroscedasticity) in the indices of Japan and the Czech Republic is verified by the tests for ARCH effects presented in Table 5. Generally, by taking into consideration the statistics examined above, as well as the standard deviation of the indices (as in the case of Brazil), the results seem to be consistent with those of Huang stockbrokers (2000) and Bekaert and Harvey (1995) that the volatility in emerging markets is greater than the volatility in developed markets.

Table 1: Descriptive statistics of the developed markets

<table>
<thead>
<tr>
<th>Statistics</th>
<th>FRANCE</th>
<th>GERMANY</th>
<th>GREECE</th>
<th>ITALY</th>
<th>JAPAN</th>
<th>UK</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.000752</td>
<td>0.001727</td>
<td>0.002949</td>
<td>-0.000910</td>
<td>-0.006145</td>
<td>-0.000988</td>
<td>0.000111</td>
</tr>
<tr>
<td>Median</td>
<td>0.003731</td>
<td>0.0012546</td>
<td>0.0013023</td>
<td>0.0011416</td>
<td>0.001749</td>
<td>0.006651</td>
<td>0.006646</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.180349</td>
<td>0.174764</td>
<td>0.318831</td>
<td>0.183354</td>
<td>0.157153</td>
<td>0.155655</td>
<td>0.137384</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.253775</td>
<td>-0.309750</td>
<td>-0.497191</td>
<td>-0.357166</td>
<td>-0.452328</td>
<td>-0.223714</td>
<td>-0.237232</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.065782</td>
<td>0.074512</td>
<td>0.092412</td>
<td>0.071840</td>
<td>0.068275</td>
<td>0.053283</td>
<td>0.053884</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.015047</td>
<td>-1.209534</td>
<td>-0.831503</td>
<td>-1.397114</td>
<td>-1.959013</td>
<td>-1.114774</td>
<td>-1.132027</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>63.05466</td>
<td>96.06488</td>
<td>222.2253</td>
<td>213.3520</td>
<td>860.7405</td>
<td>83.72779</td>
<td>108.5143</td>
</tr>
<tr>
<td>Probability</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
</tbody>
</table>
Moreover, Tables 3 and 4 present the correlation using the Pearson correlation statistic between the two groups of variables. Specifically, it can be observed that both for the developed markets and the emerging markets there is significant correlation at the 1 per cent level of significance. The fact that the time series of the variables is strongly correlated may be due to their common characteristics as developed or emerging markets respectively. Prior studies such as the one by Pan stockbrokers (1999) showed that the correlation was not so strong between stock markets. The strong correlation between the indices may be based on the increased integration of the markets. Swanson (1987) suggested that as time passes, financial markets are becoming more integrated than before. This suggestion is verified by the co-integration results between the indices presented in Tables 9 to 14.

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Table 4: Correlation matrix of the emerging markets

<table>
<thead>
<tr>
<th></th>
<th>BRAZIL</th>
<th>ARGENTINA</th>
<th>VENEZUELA</th>
<th>MEXICO</th>
<th>CHILE</th>
<th>CZECH</th>
<th>RUSSIA</th>
<th>HUNGARY</th>
<th>POLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRAZIL</td>
<td>1.000</td>
<td>0.694**</td>
<td>0.303**</td>
<td>0.778**</td>
<td>0.701**</td>
<td>0.491**</td>
<td>0.518**</td>
<td>0.662**</td>
<td>0.606**</td>
</tr>
<tr>
<td>ARGENTINA</td>
<td>0.694**</td>
<td>1.000</td>
<td>0.367**</td>
<td>0.698**</td>
<td>0.586**</td>
<td>0.535**</td>
<td>0.520**</td>
<td>0.590**</td>
<td>0.555**</td>
</tr>
<tr>
<td>VENEZUELA</td>
<td>0.303**</td>
<td>0.367**</td>
<td>1.000</td>
<td>0.400**</td>
<td>0.362**</td>
<td>0.181*</td>
<td>0.336**</td>
<td>0.251**</td>
<td>0.294**</td>
</tr>
<tr>
<td>MEXICO</td>
<td>0.778**</td>
<td>0.698**</td>
<td>0.400**</td>
<td>1.000</td>
<td>0.684**</td>
<td>0.579**</td>
<td>0.596**</td>
<td>0.656**</td>
<td>0.686**</td>
</tr>
<tr>
<td>CHILE</td>
<td>0.701**</td>
<td>0.586**</td>
<td>0.362**</td>
<td>0.684**</td>
<td>1.000</td>
<td>0.527**</td>
<td>0.591**</td>
<td>0.561**</td>
<td>0.625**</td>
</tr>
<tr>
<td>CZECH</td>
<td>0.491**</td>
<td>0.535**</td>
<td>0.181*</td>
<td>0.579**</td>
<td>0.527**</td>
<td>1.000</td>
<td>0.572**</td>
<td>0.743**</td>
<td>0.748**</td>
</tr>
<tr>
<td>RUSSIA</td>
<td>0.518**</td>
<td>0.520**</td>
<td>0.336**</td>
<td>0.596**</td>
<td>0.591**</td>
<td>0.572**</td>
<td>1.000</td>
<td>0.591**</td>
<td>0.583**</td>
</tr>
<tr>
<td>HUNGARY</td>
<td>0.662**</td>
<td>0.590**</td>
<td>0.251**</td>
<td>0.656**</td>
<td>0.561**</td>
<td>0.743**</td>
<td>0.591**</td>
<td>1.000</td>
<td>0.741**</td>
</tr>
<tr>
<td>POLAND</td>
<td>0.606**</td>
<td>0.555**</td>
<td>0.294**</td>
<td>0.686**</td>
<td>0.625**</td>
<td>0.748**</td>
<td>0.583**</td>
<td>0.741**</td>
<td>1.000</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 1 per cent level.
*Correlation is significant at the 5 per cent level.

5.2. ARCH and EGARCH-M Results

Tables 5 and 6 below present the results from the tests for ARCH effects on each of the indices. The first column of each table shows if there is an ARCH effect at the residuals of each time series, while the second and third columns show a) if the asymmetry effect can be explained by the application of the EGARCH-M model and b) whether the conditional volatility has any direct influence on the mean of the series. The results show that the ARCH effect is verified in six out of the sixteen indices. Moreover, for four of the indices, the coefficients of the asymmetry effect is significant (except in the case of Japan and the Czech Republic), which means that there is a difference in the impact of negative and positive shocks on the time series of the indices. More specifically, the coefficients of the four indices are also negative, a sign that negative shocks generate more volatility than do positive shocks on the time series under examination (Tables 5 and 6). In the case where the coefficients are insignificant this might mean that the shocks are either of the same magnitude (no asymmetry effect found), or the model is only partially capable of capturing the asymmetry effect. As far as the “in-mean factor” is concerned, as explained in equation (3), we can observe from both Tables that it was statistically insignificant for all the indices, which might mean that there are different variables which influence the mean of the series except from volatility.
Table 5: ARCH and EGARCH-M on the indices of developed markets

<table>
<thead>
<tr>
<th>INDEX</th>
<th>ARCH EFFECT</th>
<th>ASYMMETRY EFFECT</th>
<th>IN-MEAN EFFECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITALY</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GERMANY</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>FRANCE</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>UK</td>
<td>YES (up to 10 lags)</td>
<td>-0.3898</td>
<td>0.6492</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0183*</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>JAPAN</td>
<td>YES (up to 10 lags)</td>
<td>-0.0204</td>
<td>0.2522</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8662</td>
<td></td>
</tr>
<tr>
<td>GREECE</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 5 per cent level.

Table 6: ARCH and EGARCH-M on the indices of emerging markets

<table>
<thead>
<tr>
<th>INDEX</th>
<th>ARCH EFFECT</th>
<th>ASYMMETRY EFFECT (Probability value)</th>
<th>IN-MEAN EFFECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRAZIL</td>
<td>YES (up to 10 lags)</td>
<td>-0.3887 0.0112*</td>
<td>0.5825</td>
</tr>
<tr>
<td>ARGENTINA</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>VENEZUELA</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MEXICO</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CHILE</td>
<td>YES (up to 10 lags)</td>
<td>-0.2113 0.0120*</td>
<td>0.1232</td>
</tr>
<tr>
<td>CZECH</td>
<td>YES (up to 10 lags)</td>
<td>0.1218 0.4140</td>
<td>0.3488</td>
</tr>
<tr>
<td>RUSSIA</td>
<td>YES (up to 10 lags)</td>
<td>-0.4570 0.0014*</td>
<td>0.8470</td>
</tr>
<tr>
<td>HUNGARY</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POLAND</td>
<td>NO (up to 10 lags)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 5 per cent level.

The following section presents the results of unit root and co-integration analysis.

5.3. Unit Root and Co-integration Analysis Results

Tables 7 and 8 present the unit root (stationarity) results for all the indices. By employing a number of specific unit root tests, based on the studies of Dickey and Fuller – ADF (1979; 1981) we can see that the variables are stationary (do not have a unit root) in their first differences. Specifically, Tables 7 and 8 present only the indices in their first differences (the results in their levels are available upon request) and it can be verified that all the indices have become stationary – are integrated of
order 1(l(1)) at a 5 per cent level of significance. Next to the name of each variable the respective ADF test statistics are presented by applying the models without a constant and a trend, then only with a constant and, finally, both with a constant and a trend. If we recall, based on the Augmented Dickey-Fuller (ADF) test, the acceptance of the null hypothesis means that there is a unit root in the series. These results can lead us to a series of co-integration tests for both groups of variables.

Table 7: The ADF unit root results of the indices in their first differences (developed markets)

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF</th>
<th>Const</th>
<th>const/trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔITALY</td>
<td>-10.3979*</td>
<td>-10.3633*</td>
<td>-10.8528*</td>
</tr>
<tr>
<td>ΔGERMANY</td>
<td>-10.0817*</td>
<td>-10.0475*</td>
<td>-10.1245</td>
</tr>
<tr>
<td>ΔFRANCE</td>
<td>-10.0710*</td>
<td>-10.0336*</td>
<td>-10.2641*</td>
</tr>
<tr>
<td>ΔUK</td>
<td>-11.6555*</td>
<td>-11.6206*</td>
<td>-11.7670*</td>
</tr>
<tr>
<td>ΔUS</td>
<td>-10.9896*</td>
<td>-10.9500*</td>
<td>-11.2143*</td>
</tr>
<tr>
<td>ΔJAPAN</td>
<td>-11.1599*</td>
<td>-11.1983*</td>
<td>-11.2135*</td>
</tr>
<tr>
<td>ΔGREECE</td>
<td>-11.0862*</td>
<td>-11.0487*</td>
<td>-11.3956*</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 5 per cent level.

Table 8: The ADF unit root results of the indices in their first differences (emerging markets)

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF</th>
<th>Const</th>
<th>const/trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔBRAZIL</td>
<td>-9.5620*</td>
<td>-9.6337*</td>
<td>-9.5997*</td>
</tr>
<tr>
<td>ΔARGENTINA</td>
<td>-10.0237*</td>
<td>-9.9899*</td>
<td>-9.9554*</td>
</tr>
<tr>
<td>ΔVENEZUELA</td>
<td>-9.6216*</td>
<td>-9.7180*</td>
<td>-9.7013*</td>
</tr>
<tr>
<td>ΔMEXICO</td>
<td>-10.5706*</td>
<td>-10.5382*</td>
<td>-10.5094*</td>
</tr>
<tr>
<td>ΔCHILE</td>
<td>-10.1975*</td>
<td>-10.2646*</td>
<td>-10.2689*</td>
</tr>
<tr>
<td>ΔCZECH</td>
<td>-10.5286*</td>
<td>-10.4935*</td>
<td>-10.4707*</td>
</tr>
<tr>
<td>ΔRUSSIA</td>
<td>-8.4724*</td>
<td>-8.5214*</td>
<td>-8.5295*</td>
</tr>
<tr>
<td>ΔHUNGARY</td>
<td>-9.5579*</td>
<td>-9.5619*</td>
<td>-9.6870*</td>
</tr>
<tr>
<td>ΔPOLAND</td>
<td>-10.5706*</td>
<td>-10.5382*</td>
<td>-10.5094*</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 5 per cent level.

Furthermore, Tables 9 to 14 present the results of co-integration analysis. We separated the whole period into two equal sub-periods based on economic and geographical reasons in order to see the differences in the level of co-integration between the variables. The best form of Johansen’s model was selected, based on the Schwarz (1978) criterion (its value for the selected model should be algebraically the smallest compared to the values of all the other models). Specifically, the first sub-period
extends from January 1997 to December 2002 and the second from January 2003 to March 2009. As markets are becoming more integrated, it is interesting to mention that Bernard (1991) suggested that if there are a number of \( k \) variables, a complete integration would exist if there were \( k-1 \) co-integrated vectors between the indices. We should mention that in case the p-value (last column) is less than 0.05, the null hypothesis of no co-integration is rejected. Moreover, as there are small differences between the results of the maximum eigenvalue and the trace statistic, which are both statistics-indicators of the existence of co-integration or not, we select the trace statistic as it shows more robustness to skewness and kurtosis in the residuals (Cheung and Lai, 1993; Maysami stockbrokers, 2004), and this is the main reason why it is the only statistic that is depicted in the Tables below. We have employed a number of co-integration tests so as to see any difference in the behaviour of specific markets between the two time periods. More specifically, in Tables 9 to 12 we took into consideration the dependent variable of the tests of the general index of the Greek stock exchange. The main conclusion was that Greece, as it can be regarded nowadays as a developed market, is becoming more integrated as a market and this can be verified by the fact that a) when it is compared with other developed markets, the co-integration vectors are increasing from the first to the second sub-period (from Tables 9 to 10) and b) when it is compared to a number of emerging markets the vectors are non-existent (from Tables 11 to 12). The same procedure was followed having as a dependent variable the US stock index. The results, presented in Tables 13 and 14, show that as the countries of Latin America are developing through the years, their relationship with developed markets such as the US increases (from Tables 13 to 14). Generally, the existence of co-integration presented in Tables 9 to 14 are similar to those of prior studies, such as the one by Bruner stockbrokers (2008) a fact that verifies the common trend of financial indices.

<table>
<thead>
<tr>
<th>Table 9: Johansen’s co-integration test between Greece, Italy, Germany, France, UK and the US (1997–2002)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Statistic</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>( R = 0^* )</td>
</tr>
<tr>
<td>( R \leq 1 )</td>
</tr>
<tr>
<td>( R \leq 2 )</td>
</tr>
<tr>
<td>( R \leq 3 )</td>
</tr>
</tbody>
</table>

*Indicates significance at the 5 per cent level.
Table 10: Johansen’s co-integration test between Greece, Italy, Germany, France, UK and the US (2003–2009)

<table>
<thead>
<tr>
<th>Null</th>
<th>Trace Statistic</th>
<th>Critical Values (at 5%)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R = 0^*$</td>
<td>145.4904</td>
<td>103.8473</td>
<td>0.0000</td>
</tr>
<tr>
<td>$R \leq 1^*$</td>
<td>86.8846</td>
<td>76.9727</td>
<td>0.0072</td>
</tr>
<tr>
<td>$R \leq 2$</td>
<td>45.8761</td>
<td>54.0790</td>
<td>0.2190</td>
</tr>
<tr>
<td>$R \leq 3$</td>
<td>17.0464</td>
<td>35.1927</td>
<td>0.8843</td>
</tr>
</tbody>
</table>

*Indicates significance at the 5 per cent level.

Table 11: Johansen’s co-integration test between Greece, Czech Republic, Russia, Hungary and Poland (1997–2002)

<table>
<thead>
<tr>
<th>Null</th>
<th>Trace Statistic</th>
<th>Critical Values (at 5%)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R = 0^*$</td>
<td>96.7803</td>
<td>76.9727</td>
<td>0.0007</td>
</tr>
<tr>
<td>$R \leq 1^*$</td>
<td>64.1012</td>
<td>54.0790</td>
<td>0.0050</td>
</tr>
<tr>
<td>$R \leq 2^*$</td>
<td>35.4881</td>
<td>35.1927</td>
<td>0.0465</td>
</tr>
<tr>
<td>$R \leq 3$</td>
<td>16.4599</td>
<td>20.2618</td>
<td>0.1540</td>
</tr>
</tbody>
</table>

*Indicates significance at the 5 per cent level.

Table 12: Johansen’s co-integration test between Greece, Czech Republic, Russia, Hungary, and Poland (2003–2009)

<table>
<thead>
<tr>
<th>Null</th>
<th>Trace Statistic</th>
<th>Critical Values (at 5%)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R = 0^*$</td>
<td>92.2621</td>
<td>76.9727</td>
<td>0.0022</td>
</tr>
<tr>
<td>$R \leq 1^*$</td>
<td>59.0280</td>
<td>54.0790</td>
<td>0.0170</td>
</tr>
<tr>
<td>$R \leq 2$</td>
<td>32.0962</td>
<td>35.1927</td>
<td>0.1040</td>
</tr>
<tr>
<td>$R \leq 3$</td>
<td>11.6558</td>
<td>20.2618</td>
<td>0.4801</td>
</tr>
</tbody>
</table>

*Indicates significance at the 5 per cent level.

Table 13: Johansen’s co-integration test between the US, Mexico, Argentina, Brazil, Chile, Venezuela and Japan (1997–2002)

<table>
<thead>
<tr>
<th>Null</th>
<th>Trace Statistic</th>
<th>Critical Values (at 5%)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R = 0$</td>
<td>91.2295</td>
<td>111.7805</td>
<td>0.4721</td>
</tr>
<tr>
<td>$R \leq 1$</td>
<td>64.1186</td>
<td>83.9371</td>
<td>0.5507</td>
</tr>
<tr>
<td>$R \leq 2$</td>
<td>38.4007</td>
<td>60.0614</td>
<td>0.7753</td>
</tr>
<tr>
<td>$R \leq 3$</td>
<td>24.4359</td>
<td>40.1749</td>
<td>0.6806</td>
</tr>
</tbody>
</table>

*Indicates significance at the 5 per cent level.
Table 14: Johansen’s co-integration test the US, Mexico, Argentina, Brazil, Chile, Venezuela and Japan (2003–2009)

<table>
<thead>
<tr>
<th>Trace Statistic</th>
<th>Critical Values (at 5%)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R = 0^* )</td>
<td>160.8088</td>
<td>125.6154</td>
</tr>
<tr>
<td>( R \leq 1^* )</td>
<td>109.5869</td>
<td>95.7536</td>
</tr>
<tr>
<td>( R \leq 2 )</td>
<td>68.6905</td>
<td>69.8188</td>
</tr>
<tr>
<td>( R \leq 3 )</td>
<td>40.6521</td>
<td>47.8561</td>
</tr>
</tbody>
</table>

*Indicates significance at the 5 per cent level.

6. Conclusions

The results of the relationship between a number of developed and emerging markets presented in this study show that current situations exist that might lead to strong relationships between the markets. These are the phenomenon of globalisation, which leads to an increase in freedom of transactions between the markets and their direct co-operation in economic issues. These phenomena lead to even more increasing common trends between their indices. The indices seem to be influenced by their past prices as well as the past prices of other indices, as can be seen by the co-integration tests, which is a sign that contradicts the (weak-form) efficient market hypothesis – EMH. The investors expect to be informed appropriately so as to be able to make the right choice and invest wisely. Other reasons that might justify the (partial) inefficiency of markets are the lack of a proper technical organisation in several countries, which could lead to a spread of information reflected in stock prices (Dockery and Kavussanos, 1996). Other reasons are possible delays of news on stock market prices as well as psychological factors that influence the decision of investors (Niarchos and Alexakis, 2000).

Furthermore, although a sufficient sample period has been used, an even larger sample with the examination of more sub-periods would lead to a more complete examination of the markets with their respective changes through the years. Additionally, the examination of the indices for possible diagnostic problems such as stationarity, normality, autocorrelation (available upon request) and heteroscedasticity, could lead to a more clear view regarding the data that is used in the tests and the characteristics of each index, which can help to avoid any potential spurious regressions during the analysis (Phillips, 1986). Furthermore, the results regarding ARCH effects showed that some time series are characterised by conditional volatility which necessitates the use of specific tools so as to measure this volatility such as the EGARCH-M model. The existence of co-integration between the markets undermines the benefits from international diversification. As more markets transition to developed markets, the benefits will be
even less evident. However, the actions and motivations of each investor depend on the risk that he/she is willing to take with his/her individual preferences and choices. Financial institutions should develop their own models with their respective parameters to aid their investment decision-making process. Generally, the findings of the tests have important applications for investors’ portfolio formation and performance evaluation, as most investors care about long-term security returns and this is the main reason that co-integration analysis was employed in the study. By adding the fact that there is not a solid theoretical background on these relationships, as most of them are the results of statistical analysis, we tried to employ an adequate number of variables/indices so as to arrive at some inferences regarding the way the markets are related.

References


THE IMPROVEMENT OF BUDGETING PROCESSES IN THE LATVIAN AMBULANCE MEDICAL SERVICES

0. Introduction

The growing dissonance between the increasing demand for the efficient and competent provision of pre-hospital emergency medical care and a serious lack of qualified emergency medicine specialists to meet the growing needs of the population determines the relevance of the topic of this research. In 2005, the Cabinet of Ministers adopted basic guidelines on the ‘Development of Human resources in healthcare’. According to this programme, in 2007 the ambulance services should have been provided with 223 ambulance teams [17]; however, at the end of 2007 only 175.5 teams had been registered [6]. In 2007, only 86.7% of ambulance calls were executed [12]. In 2008, in Latvia, 426,709 ambulance calls were registered, which were provided by 176.5 ambulance teams [8]. Riga Ambulance Station, which in 2008 handled 46.2% of the total number of emergency calls nationwide, is suffering from the most severe medical personnel shortage.

The analysis of limited published data confirms insufficient attention paid by the Latvian state and public to the development of this sphere of medical care. At the same time, the official statistics of disaster medicine show that SDR indicators (per 100 000 inhabitants) in Latvia are more than double that of the European average. For instance, SDR, due to transport accidents was 22.66 in Latvia (average in the EU – 11.6); SDR due to ischemic heart disease – 291.58 (average in the EU – 105.76) [11], [17].

The ambulance services are experiencing serious financial difficulties, as well as facing internal problems caused by the personnel shortage and low employee motivation. The reason for these problems is not only the lack of state funds, but also the system of distribution of the financial resources. The ambulance services need an approach to be developed that would allow determining a justified amount of required financial resources. A well-prepared budget could solve this problem.

The purpose of this article is to assist with recommendations on the improvement of the budgeting process and calculation of ambulance services costs. The recommendations are based on the results of the study into current practice of state
financing of the ambulance services as well as on the investigation and overview of international practices.

The major objectives to be accomplished are outlined below:

• Reveal the drawbacks of the current practice of financing the ambulance services;
• Justify the choice of a unit of cost to be used to determine the amount of financing;
• Develop recommendations on short-term budget preparation;
• Develop recommendations on determining the cost of call according to the degree of its complexity.

The methodology underpinning this research comprises a number of widely used scientific research methods, such as site investigation, data collection, questioning, assessment, comparison, forecasting, calculation, as well as observation (observing dispatchers and ambulance teams at work).

The results of this research were presented at a meeting of the Association of Ambulances and Disaster Medicine of the Republic of Latvia.

1. Ambulance services financing procedure

The ambulance service is a healthcare organisation, irrespective of ownership form and activity type, which provides twenty-four hour emergency medical care to people in critical health or life-threatening situations by means of mobile ambulance teams [3]. There are two types of ambulance teams: paramedic (feldsher or medical assistant) teams and intensive therapy teams.

The following is necessary to assure the operation of the ambulance services:

– ambulance vehicles;
– dispatcher service;
– necessary premises;
– teams of qualified personnel;
– medical materials and medicines.

All the above elements form a structure of costs necessary to provide emergency medical care and therefore are objects of financing.

The procedure for financing the ambulance services specifies the following:

– budgetary financing of costs according to their types [4];
– labour costs strictly regulated by the state with an ambulance team being a calculation unit [2];
– other expenses related to the provision of ambulance services are covered;
– use of budget estimates to finance capital expenditures.
As mentioned earlier, the ambulance services are experiencing a deficit of medical staff. In practice, Taraskin’s and Komorov’s [23] methods are used to determine the required number of ambulance teams. These methods are based on calculating the number of calls for ambulance teams during twenty four hours and measuring the duration of these calls. For instance, in 2007, Riga Ambulance Station was short of 150 members of medical staff, or 27.8% of the totally required staff [10]. According to experts of Health Statistics and Medical Technologies State Agency (HSMTSA), there will be a 560 to 584 shortage of emergency doctors by 2010 [5].

The personnel shortage means that the existing teams will have to make extra efforts to accomplish the actual amount of work. The paradox is that these extra efforts required from the team members are not paid, as this is not allowed under the financing rules in force.

As noted by other Latvian researchers, along with the causes of organisational and administrative nature, a lack of medical vehicles and equipment, as well as an ineffective cost policy, are the obstacles to the development of the emergency medical services in Latvia [11].

The author of this article believes that, under current practice, state financing of the ambulance services according to the number of ambulance teams aims to compensate costs associated with keeping ambulance service personnel. It is illogical for the following reasons:

1) the current financing practice clearly condemns an ambulance station to a lack of financial resources, a shortage of medical staff and, consequently, an insufficient number of ambulance teams to perform the required amount of work;
2) the financing allocated to a team does not provide economic stimulus to medical staff as it does not take into account the degree of complexity of the work performed;
3) this model of financing does not allow the developing of a budget for an ambulance station, which would be aimed at ensuring the quality of service provided to consumers, as it includes, besides labour costs, other necessary costs, the amount of which depends on a specific case.

2. The essence of the proposed method

This part of the article provides a description of the new approach to developing a budget for an ambulance station. In order to develop a quality, easy-to-manage budget, which would allow the state to decide on the amount of financing to be allocated to an ambulance station, it is necessary to determine a unit of calculation, which would serve as a basis for forming the cost of ambulance services. In this case a team is not a source of costs.
2.1. Justification of the choice of calculation unit of cost

Taking into account the fact that provision of emergency medical care to the population is the principal activity of an ambulance station, it would be more logical to appoint an ambulance call (a call for an ambulance team), but not the team itself, “provokes” costs and is a ‘cost driver’. The amount of services provided by an ambulance station could be expressed through:

– the number of ambulance calls per 1000 inhabitants per year;
– the average number of ambulance calls per 1 inhabitant per year.

These indicators could be used, not only to plan the budgets of the ambulance services, but also could be considered as national public health indicators [17].

Thus, the author proposes that the number of ambulance calls lies at the heart of the budgeting method for an ambulance station. The following preliminary questions need to be answered:

1) How can call accounting be organised so that it would facilitate cost accounting?
2) How can the cost of each ambulance call be determined?

2.2. Ambulance call accounting

The new method proposes the introduction of call systematisation following certain parameters. Each ambulance call is given a code. All ambulance calls are coded using a specially designed scheme. The code consists of a set of figures, each of which characterises the nature of resources necessary to provide a service in the case of each call. The number of figures in the code depends on the number of parameters (resources). For instance, the following parameters could constitute a 3-character code:

– ambulance team code (paramedic, psychiatric, cardiology, intensive care);
– territory code (distance to a particular destination);
– medical care code.

In fact, the resources listed above are the sources of direct costs of providing a particular medical service, e.g.:

– ambulance team code – labour costs;
– territory code – transport costs depending on destination;
– medical care code – costs of medicines and use of medical equipment.

It is possible to introduce additional codes, for instance, a code to characterise special conditions under which medical care is provided, etc.

Thus, a dispatcher classifies a call at the moment of its registration and gives it a corresponding code. Introduction of the coding system will allow improving information flows within an ambulance station and facilitating accounting of expenses. It is also a basis for the introduction of Information Technologies to the ambulance system.
2.3. **Emergency call costs**

In order to determine the cost of an ambulance call, it is necessary to have a clear understanding of what makes up a medical service. As a rule, it is a set of operations (actions) performed by ambulance team members and considered standard for a specific case. Analysis of practice would allow divulging, generalising and systematising such specific cases.

Application of a call coding system permits the identification of calls of the same type, i.e. calls which would use a standard set of resources. It is possible to develop a system of standard use of resources necessary to provide a medical service of a certain call category. For example, one could calculate the average time needed to provide a medical service and determine a standard cost per unit of time, e.g. per minute.

The system of call coding and the system of standard costs according to established codes provide the basis for developing a budget for an ambulance station.

Any budget for a service company presupposes setting standard costs for each type of resource used (operations, work), which in total make up the cost of the service provided.

In each particular case the actual costs may differ from those which were planned. One more document – a call card – should be added to the system of call coding and standard costs. The call card issued by a dispatcher and given to an ambulance team is to be filled in at the place where the medical service is provided. This document has two functions: 1) it is a report of an ambulance team on the medical service provided and actual expenses occurred; 2) at the same time it is an individual bill issued to a client for an ambulance call. Following the logic of the proposed budgeting method, the use of a personalised bill to pay for an individual ambulance call is considered a necessary condition for the development of economic stimulus to motivate the ambulance staff. Who pays these bills? The answer to this question goes beyond the proposed budgeting method for an ambulance station; it is a global question concerning the general organisation of the system of financing of medical services in the country and closely linked with social and health insurance systems.

3. **Budget model**

During the research process, a conceptual model of ambulance station budgeting has been developed, including:
- the budget structure;
- guidelines developing each section of the budget;
- recommended document proformas;
- recommendations for staff remuneration methods (M.Rurane);
recommendations for accounting and allocation of total overheads;
- the format of the general ambulance station budget for financing purposes;
- the format of the general ambulance station budget for managerial accounting purposes (to determine service tariffs);
- the methodology to be used to determine the price of medical services according to the category of call complexity.

The proposed budget model is based on the Rural Ambulance Budget Model recommended by the U.S. Department of Health and Human Services [18]. This model has been adapted to the real operating conditions of ambulance stations in Latvia. The ambulance station budget developed for one year includes the following sections:

- Information on the station
- Vehicles
- Building
- Other Capital
- Labour expenses
- Medicines
- Education and further training
- Other expenses
- Revenue and expense budget.

Labour costs are the most problematic items of the budget. Ambulance team members and dispatchers are remunerated on the basis of official fixed labour costs to which a system of supplementary payments and bonuses is applied. Employee remuneration is subject to the Cabinet of Ministers Regulation № 980 ‘On work payment to medical staff’ [2].

European countries’ experience shows that labour costs can also be calculated on the basis of the set hourly tariffs and actual hours worked. Application of hourly tariffs requires developing a system of qualification coefficients for each category of staff and introducing a system of working time accounting. This system of remuneration can be considered in the future.

The analysis of international practice shows that a number of payments which, in Latvia, are included in the labour cost structure (associated with risk, qualification upgrade and education), are independent items of ambulance budgets, for instance, in the UK [16], Sweden [15], and the USA [18].

In Latvia, supplementary payments for risk, qualification upgrade and education are considered compensation payments and are included in the salary and, therefore, come under the burden of the social tax paid by an employer, this way increasing the expenses part of the budget. Nevertheless, payments for risk, qualification upgrades and education are directly connected to the process of providing an ambulance service; are a required component of this process, and can be considered as independent
types of expenses on medical insurance (life insurance) of the ambulance staff and their qualification upgrades.

**General budget of an ambulance station**

The theory of managerial accounting considers a budget to be an instrument to manage a business so that it succeeds in accomplishing the goals set. The ambulance services could develop two types of budget: for financing purposes and for managerial accounting purposes.

**Budget for financing purposes**

The purpose of this budget is to determine the total amount of financing required for the forthcoming period. The budget is based on the classification of costs depending on the type of activity and Activity Based Costing method.

The budget form is presented in such a way that the costs of ambulance station activities are grouped together: provision of services to patients, dispatcher service and administration. Total overheads and capital investment expenditures are shown separately. This form of budget may be further used to determine costs and calculate prices of ambulance services.

**Budget for managerial accounting purposes**

The calculation of ambulance service prices and tariffs is a task for internal managerial accounting. Calculation of the price is based on the service cost, i.e. the total sum of all expenses needed to provide a service. In Latvia, the following formula is used to calculate the ambulance service tariff [4]:

\[ T = TC + P, \quad \text{where} \]

\[ T \quad - \quad \text{ambulance service tariff}, \]
\[ TC \quad - \quad \text{total costs of providing a medical service}, \]
\[ P \quad - \quad \text{profit (development expenses)}. \]

The calculation of prices and tariffs is necessary to create economic stimulus for ambulance stations.

For the purposes of managerial accounting, it is necessary to transform the budget for financing purposes into the expense budget, showing all costs associated with the provision of services, including amortisation. To transform the budget it is necessary to:
1) Allocate total overheads according to activity types;
2) Exclude the budget of capital expenditures since these are assets not expenses;
3) Include the sum of fixed assets depreciation applicable to this reporting period.

4. Methodology to calculate ambulance station service tariffs

The methodology used to calculate ambulance service tariffs is the logical outcome of the proposed budgeting method, which is based on the calculation of the number of calls for an ambulance team. The proposed method of tariff calculation is based on the actual budget of costs and number of handled calls during a reporting period.

The purpose of this method is to determine the cost of a service unit, in other words, the cost of one call according to the degree of its complexity.

As a result, the actual cost of the provided service can be determined. Knowing this cost, future prices can be planned.

The recommended method for calculating the cost of an ambulance service involves consecutive completion of the following stages:

1) Classification of calls according to the degree of their complexity;
2) Availability of information on the number of calls of each category of complexity over a reporting period;
3) Expert assessment of the degree of call complexity;
4) Calculation of direct costs of providing a service;
5) Allocation of indirect overheads, including depreciation;
6) Allocation of dispatchers service costs;
7) Allocation of administrative costs;
8) Service tariff calculation.

(I) Classification of calls according to the degree of their complexity

Calls can be classified as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>Calls classified by law as ineffectual</td>
</tr>
<tr>
<td>Category 2</td>
<td>Transportation of patients who require hospitalisation</td>
</tr>
<tr>
<td>Category 3</td>
<td>Providing emergency medical care in case of trauma — first aid provided at the place of an accident</td>
</tr>
<tr>
<td>Category 4</td>
<td>Serious traumas, numerous traumas, poisoning, mental diseases — intensive therapy</td>
</tr>
<tr>
<td>Category 5</td>
<td>Serious cases requiring resuscitation</td>
</tr>
</tbody>
</table>
(2) Call accounting (with call classification) should be provided at an ambulance station.

(3) Assessment of the complexity of each call category (expert assessment is a task for the Association of Ambulances and Disaster Medicine of the Republic of Latvia); calculation of the proportion of each call category in the total number of calls and calculation of the average call complexity coefficient.

(4) Calculation of direct service costs

Direct costs include:
- labour costs (remuneration of team personnel)
- cost of medicines and materials
- other direct costs.

All indirect costs (items 5, 6 and 7) can be allocated to the cost of services of different complexity categories using various allocation principles. Direct costs can serve as the basis for allocating overheads.

(8) Thus, the formula for calculating ambulance service cost tariffs can be expressed as follows:

\[ TC = DC + IC + DI + AD + P \]  

TC – an ambulance service total cost 
DC – direct costs 
IC – indirect costs (related to providing a service)
DI – dispatcher service costs 
AD – administrative costs 
P – profit (station development expenses).

5. Conclusions

On the basis of the results of the research into the ambulance services financing practice presented in this article, the following conclusions can be drawn:

1. The approaches currently used to determine the budget of financial resources neither provide medical staff economic stimulus to work nor do they help retain highly qualified personnel.

2. The labour costs include compensation payments for risk, qualification upgrades and education, thus increasing the social tax paid.
3. Determining the amount of financing in accordance with the number of ambulance teams does not take into account the category of ambulance call complexity.

4. There is a growing shortage of ambulance medical personnel; by 2010 the situation may become critical. The above allows drawing a general conclusion that the current practice of financing ambulance services requires immediate attention and improvement.

5. The analysis of international practice of financing ambulance services has shown that many countries use the number of calls as a basis to determine the volume of financial resources. Each individual call for an ambulance forms the costs of providing a medical service. Thus, it is a question of applying Activity-Based Costing method (ABC) for the calculation of costs and preparation of a budget for the ambulance services.

6. The article contains recommendations on short-term budget preparation: forming the budget structure, the structure of particular types of costs and directions for budget use.

7. The proposed method of calculating a medical service cost according to the degree of call complexity is an integral part of the budgeting process and forms a sound basis, through which efficient management of financial resources flows of the ambulance services can be achieved.

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EDUCATIONAL ATTAINMENT, OCCUPATIONAL CHOICE AND POVERTY: A GENDER PERSPECTIVE FROM PAKISTAN

1. Introduction

Development should, in general, reflect the quality of people’s lives, creating opportunities and options for shaping their own future. In such a perspective, growth seems irrelevant if it is not pro-poor. Moreover, the trickledown effect must not simply be in the form of reduction in the population below the poverty line, drawn on the basis of caloric intake, but it must also ensure that essential capabilities of life vis à vis a long healthy life, education and participation in the lives of the community are enhanced (Kemal, 2003). There is a strong positive effect of economic growth on enabling the environment for poverty reduction through enhanced provision of direct and indirect employment opportunities, social welfare, and infrastructure development that can potentially benefit the poor. However, there is a dominant view that economic growth increases the labour demand and reduces poverty. But poverty is also reduced by increasing the productivity of the poor, either by increased access to education or to physical and financial capital.

An analysis of the various factors that affect the income distribution in Pakistan is long overdue. Available estimates indicate that inequality in Pakistan is high and very little is known of the causative factors. The changes in the structure of earnings in the labour force occur for a number of reasons. Income distortions arise from education patterns as well as the way the labour market compensates the educated class. Another important determinant, which adds to income inequality, is gender disparity. It is a common observation that the female labour force earns significantly less than the male, which is generally justified by the argument that women tend to work in low-paying occupations. Moreover, women are not allowed to pursue higher

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or professional education and discrimination can cause women to drop out of school
or abstain from participating in the workforce.

The situation in the workplace also contributes towards gender disparity and
income inequality. In most countries, rural areas exhibit higher inequality as compared
to urban areas. The logic once again is the lower educational level of rural workers as
well as a lack of infrastructure, coupled with large family size. The aforementioned
determinants of income differential are mere assertions, which need to be verified by
empirical evidence. This paper discusses the changes in income distribution using
household data, disaggregated by education, gender and location. It focused on several
aspects that affect the distribution of income across households.

The increasing return to education implies a widening wage gap between work-
ners with different levels of education. The wage differential, in turn, implies a more
unequal distribution of earnings at individual and household level. The occupational
choices also have an important bearing on the way income is distributed. It is com-
monly believed that an important determinant of earning differential is differences in
human capital (i.e. educational attainment). Therefore, it is a researchable question
to trace out the level of education that gives greater returns and to which segment
of the society. Even if the innate ability of students is randomly distributed, children
from richer backgrounds tend to go further through education. These distributional
effects are often compounded by the skewed allocation of resources between basic
and higher education. In order to find the level of education that provides better re-
turns to the household, this study has focused on estimation of the earning function.
Moreover, occupational choices depict to what extent skills and education will aug-
ment the earnings of a household and which category of earners can be made more
productive. This, in turn, will be instrumental in lowering the inequality and hence
reducing poverty. Thus, it seems imperative to estimate the earning functions for the
whole range of earners, self-employed, employers and unpaid family workers. This
study estimates the gender wage differentials in the labour market and also estimates
the determinants of the probability of being poor to provide econometric evidence
on the importance of key socio-economic factors that determine the relative welfare
of individuals and households. The contents of this paper are as follows. Section 2
discusses the theoretical framework; section 3 describes the data and methodology;
results are discussed in section 4, and section 5 contains the conclusions and policy
recommendations.
2. Theoretical Framework

The Human Capital model in this study is an extension of the Becker (1962) and Mincer (1974) models in order to quantify the returns to investment in education. Since education is the main source of human capital development, a large number of studies have estimated the returns to education for different countries [(Psacharopoulos, 1980, 1985, and 1994); (Psacharopoulos and Chu Ng, 1992)]. These studies mostly used binary variables instead of continuous variables. There were only a few studies available in Pakistan that used the Mincerian Earnings Function approach to examine the return to education (e.g. Shabbir and Khan, 1991), (Shabbir, 1994), (Nasir and Nazli, 2000). The previous studies estimated the earning function only for wage earners, whereas this study provides estimates for earning functions of all employed groups (employers, self-employed, wage earners, unpaid family workers) by using the most recent data sets available in Pakistan. The Mincerian earning function was based on the assumption of uniform rates of return for all schooling.

Occupational choice determines current earnings, as well as future earnings of individuals, which are closely linked with household consumption, health, and general status in society [Harper and Haq (1997) and Freeman (1971)]. The major factors which can affect the decision of occupational choices are educational levels, experience in particular fields and training.

3. Data and Methodology

We have used the PIHS 1998–99 and 2001–02 in this study. The sample size for the 1998–99 PIHS was 16,305 households, approximately one-third of which was urban. A total of 1,150 PSUs were selected. The survey covered all four provinces, including Azad Jammu and Kashmir, Northern Areas and FATA.

The sample size of the 1998–99 PIHS survey was large enough to obtain estimates for each province and region (urban/rural). A two-stage, stratified random sampling strategy was adopted for each of the surveys. At the first sampling stage, a number of Primary Sampling Units (PSUs) were selected from the different strata. The enumerators then compiled lists of all households residing in the selected PSUs. At the second sampling stage, these lists were used to select a sample of households from each PSU randomly. In all, twelve households were selected in each urban PSU, and sixteen in each rural PSU.
A sample size of 16,400 households was taken to provide reliable estimates of key characteristics. The entire sample of households (SSUs) was drawn from 1150 Primary Sampling Units (PSUs) out of which 500 were urban and 650 were rural. In this survey, 90 sample households were not covered, due to non-response/closed/non-contact and non-cooperation from the respondents in this Survey.

A multinomial logit regression analysis was applied for occupational choices. The rationale was to highlight how investment in education transformed a less productive worker into a more productive worker and thus led to more equal distribution of income.

Most econometric analyses do not test to see whether the underlying data permit the pooling over time and across gender, province and region. These analyses therefore, violate a basic assumption for their analysis that the underlying disaggregated function is similar. Pooling dissimilar disaggregated functions violates the econometric requirements necessary to obtain generalised and, hence, unbiased results from the data. These results lead to the ‘one size fits all’ type of policy prescriptions that more often than not fail because these are not based on a realistic representation of real life.

Hence, in view of the above, statistical tests for similarity of function across time, regions, province, and gender are conducted. These tests confirmed that the functions were dissimilar in all the cases tested. It is therefore incorrect to run regressions at the aggregate level without taking these differences explicitly into account. We had two choices. One was to run the regressions using dummy variables and obtain the required estimates at the disaggregated level, or as in this case where degrees of freedom is not really a binding constraint, to run the estimations separately for the disaggregate categories. Hence, regressions were run separately by time and gender.
Table 1.1: Profile of the 1998–99 and 2001–02 PIhS samples.

<table>
<thead>
<tr>
<th>Province</th>
<th>1998–99 PIhS</th>
<th></th>
<th>2001–02 PIhS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>URBAN</td>
<td>RURAL</td>
<td>OVERALL</td>
<td>URBAN</td>
</tr>
<tr>
<td>Punjab</td>
<td>220</td>
<td>238</td>
<td>458</td>
<td>220</td>
</tr>
<tr>
<td>Sindh</td>
<td>128</td>
<td>136</td>
<td>264</td>
<td>128</td>
</tr>
<tr>
<td>NWFP</td>
<td>72</td>
<td>116</td>
<td>188</td>
<td>72</td>
</tr>
<tr>
<td>Balochistan</td>
<td>52</td>
<td>88</td>
<td>140</td>
<td>52</td>
</tr>
<tr>
<td>AJK</td>
<td>16</td>
<td>28</td>
<td>44</td>
<td>16</td>
</tr>
<tr>
<td>Northern areas</td>
<td>12</td>
<td>20</td>
<td>32</td>
<td>12</td>
</tr>
<tr>
<td>FATA</td>
<td>-------</td>
<td>24</td>
<td>24</td>
<td>-------</td>
</tr>
<tr>
<td>Overall</td>
<td>500</td>
<td>650</td>
<td>1150</td>
<td>500</td>
</tr>
<tr>
<td>HOUSEHOLDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punjab</td>
<td>2590</td>
<td>3791</td>
<td>6381</td>
<td>2599</td>
</tr>
<tr>
<td>Sindh</td>
<td>1536</td>
<td>2176</td>
<td>3712</td>
<td>1534</td>
</tr>
<tr>
<td>NWFP</td>
<td>859</td>
<td>1852</td>
<td>2711</td>
<td>857</td>
</tr>
<tr>
<td>Balochistan</td>
<td>612</td>
<td>1404</td>
<td>2016</td>
<td>623</td>
</tr>
<tr>
<td>AJK</td>
<td>192</td>
<td>448</td>
<td>640</td>
<td>192</td>
</tr>
<tr>
<td>Northern areas</td>
<td>143</td>
<td>319</td>
<td>462</td>
<td>144</td>
</tr>
<tr>
<td>FATA</td>
<td>-------</td>
<td>383</td>
<td>383</td>
<td>-------</td>
</tr>
<tr>
<td>Overall</td>
<td>5932</td>
<td>10373</td>
<td>16305</td>
<td>5949</td>
</tr>
<tr>
<td>INDIVIDUALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punjab</td>
<td>16758</td>
<td>24619</td>
<td>41377</td>
<td>17143</td>
</tr>
<tr>
<td>Sindh</td>
<td>10052</td>
<td>15099</td>
<td>25151</td>
<td>11048</td>
</tr>
<tr>
<td>NWFP</td>
<td>6610</td>
<td>14923</td>
<td>21533</td>
<td>6504</td>
</tr>
<tr>
<td>Balochistan</td>
<td>5045</td>
<td>10875</td>
<td>15920</td>
<td>5056</td>
</tr>
<tr>
<td>AJK</td>
<td>1298</td>
<td>2939</td>
<td>4237</td>
<td>1361</td>
</tr>
<tr>
<td>Northern areas</td>
<td>1188</td>
<td>2453</td>
<td>3641</td>
<td>1089</td>
</tr>
<tr>
<td>FATA</td>
<td>-------</td>
<td>3137</td>
<td>3137</td>
<td>-------</td>
</tr>
<tr>
<td>Overall</td>
<td>40951</td>
<td>74045</td>
<td>114996</td>
<td>42201</td>
</tr>
</tbody>
</table>

Source: PIhS 1998–99 & 2001–02

In order to find out the effect of different forces on distribution of income, this study used earning functions and the occupational choice model. Let $Y_{mt}$ represent the income of household $m$ at time $t$. Where $t = (t_1, t_2)$. Household income is the sum of labour earnings in wage employment, in self-employment, and other income, summed up over all members, all at time $t$:

$$Y_{mt} = \sum_{i \in m} Y_{it}$$

(1)
The income function of household $m$ observed at time $t$ may be expressed as

$$Y_{mt} = Y(X_{mt}^{SD}, X_{mt}^{PA}, Y_{mt}^{O}, E_{mt}; \alpha_t, \beta_t)$$  \hspace{1cm} (2)

Where $Y_{mt}$ is the income and other income received by the household and $m$ at time $t$, while $X_{mt}^{SD}$ and $X_{mt}^{PA}$ are vectors of socio-demographic characteristics (such as education, experience, experience square, and location etc) and productive assets owned by household $m$ at time $t$. $E_{mt}$ is equal to $\left[ U^w_i, U^Se_i, V^w_i, V^Se_i \right]$ which is the error terms in earning equations and occupational choice equations, $\alpha_t = (\alpha^w_t, \alpha^Se_t)$ are the regression coefficients in earning equations and $\beta_t = (\beta^w_t, \beta^Se_t)$ is the multinomial logit coefficient in the occupational choice equations.

For the overall distribution of household income at time $t$ we can write equation 2 as follows;

$$Dt = D\left[ X_{t}^{SD}, X_{t}^{PA}, Y_{t}^{O}, E_{t}; \alpha_t, \beta_t \right]$$  \hspace{1cm} (3)

$X_{t}^{SD}$ and $X_{t}^{PA}$ factors are regrouped into two overlapping sets that determine labour earnings ($X$) and occupational positions ($Z$).

Thus, the distribution of household income at time $t$ may be rewritten as follows:

$$Dt = D\left[ X_{t}, Z_{t}, Y_{t}^{O}, E_{t}; \alpha_t, \beta_t \right]$$  \hspace{1cm} (4)

In order to parameterise these relationships we use two basic equations; system of occupational-choice equation and earning equation.

**System of occupational-choice equation**

At time $t$, each individual is classified into only one occupational position that is; employer, wage employee, self-employed workers, or unpaid family workers. Multinomial logit equation used is of the following form;

$$\text{Prob} \ (i = \text{Employer})_t = \Delta (\beta_j E_{t} Z_{ijt} + V_{ijt})$$  \hspace{1cm} (5)

$$\text{Prob} \ (i = \text{self employed worker})_t = \Delta(\beta_j se Z_{ijt} + V_{ijt})$$  \hspace{1cm} (6)

$$\text{Prob} \ (i = \text{wage employee})_t = \Delta(\beta_j wt Z_{ijt} + V_{ijt})$$  \hspace{1cm} (7)

In each year, occupational position equations are estimated separately for men and women.
Earning Equation

Let $\ln Y_{ijt}$ denote the log earnings of individual $i$ if he or she works in sector $j$ at time $t$. Mincerian earning functions will be used separately for each sex and occupational position in each year.

$$\ln Y_{ijt} = \alpha_{jt} X_{ijt} + U_{ijt}$$  \hspace{1cm} (8)

Where as $X_{ijt}$ includes, for each individual, an education, experience, square of experience, and the occupation.

The estimation method will be least square weighted by survey sampling weights. In addition to this we also find out the impact of different levels of education on poverty reduction by using the logit model and, for that purpose, we have used the probability of being poor as a dependent variable, and we used experience and different levels of education such as middle, matric etc. as independent variables.

3. Results and Discussion

3.1. Earning Function

Gender analysis is considered as the predominant theme for any development policy while the elaborative analysis of gender earnings is often missing in the policy framework. In this study, a comprehensive analysis of the Gender Earning Function was obtained in a developing country (Pakistan) context where gender plays an important role in deciding professions. The explanatory variables of the earning function comprised year of schooling (education), experience (age minus year of education minus school starting age), experience square, and a dummy variable for gender (male = one, zero otherwise).

The regression results were obtained in Table 1 for the overall sample, male and female respectively, for the years 1998 and 2001. All coefficients had the expected sign, significant ($p >0.05$) and consistent with prevailing economic wisdom. The coefficient of the education ($0.105$) showed that a 10.5 per cent increase in earnings resulted from one extra year of school in the year 1998–99 whereas in 2001–02 it was ($0.093$) which showed a 9.3 per cent increase in earnings, accompanied by a one-year increase in schooling. The coefficient of experience was positive, as expected, however the parameter of $(\text{Exp})^2$ indicated a negative coefficient, implying concavity of the earning function and at some threshold level, and the impact of experience begins to be negative.
Table 1: Regression results of the earning function for Pakistan (overall, Male and Female) for the years 1998–99 and 2001–02

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Overall Pakistan</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>Coefficient</td>
<td>Coefficient</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Constant</td>
<td>4.713***</td>
<td>5.320***</td>
<td>6.400***</td>
</tr>
<tr>
<td>(188.915)</td>
<td>(186.681)</td>
<td>(294.558)</td>
<td>(260.237)</td>
</tr>
<tr>
<td>Experience</td>
<td>0.065***</td>
<td>0.069***</td>
<td>0.069***</td>
</tr>
<tr>
<td>(54.173)</td>
<td>(50.197)</td>
<td>(59.064)</td>
<td>(52.515)</td>
</tr>
<tr>
<td>(Experience)^2</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
</tr>
<tr>
<td>(-35.572)</td>
<td>(-35.227)</td>
<td>(-39.461)</td>
<td>(-37.225)</td>
</tr>
<tr>
<td>Education</td>
<td>0.105***</td>
<td>0.093***</td>
<td>0.093***</td>
</tr>
<tr>
<td>(75.265)</td>
<td>(60.374)</td>
<td>(68.426)</td>
<td>(57.139)</td>
</tr>
<tr>
<td>Dummy (Male)</td>
<td>1.699***</td>
<td>1.363***</td>
<td>-</td>
</tr>
<tr>
<td>(104.094)</td>
<td>(72.966)</td>
<td>(72.966)</td>
<td>(72.966)</td>
</tr>
<tr>
<td>Adj R^2</td>
<td>0.49</td>
<td>0.36</td>
<td>0.27</td>
</tr>
<tr>
<td>F-statistics</td>
<td>5312.993</td>
<td>2994.104</td>
<td>2394.012</td>
</tr>
</tbody>
</table>

*** Showed that the coefficient is significantly different from zero at 0.01 probability level and t-ratios are in parenthesis.

The positive coefficient on the gender dummy (Male) in the overall sample was indicative of the gender gap in labour market earnings. Being a male increases income by 169.9% more than a female. Males earned significantly more relative to their female counterparts. But the separate analysis for male and female showed that females enjoyed a higher return of 18.1 per cent and 13.2 per cent to education, due to a narrow base of income in 1998 and 2001 respectively. These results were consistent with the results of Atlas and Bourguignon (2004) in the case of Indonesia, as well as that of Fields and Soares (2004) for Malaysia, and Asadullah (2005) for Bangladesh. The coefficient of experience showed a substantial increase in wages with each additional year spent in the labour market for both male and female workers. The results for the year 1998 showed that five years’ experience earned 35 per cent higher wages for male workers and 32 per cent higher wages for female workers compared to those with no experience.

Similar results were revealed for the year 2001 where five years’ experience earned 37.9 per cent higher wages for male workers and 32.5 per cent higher wages for female workers compared to male and female counterparts with no experience. These results were consistent with prior studies in Pakistan (see for example; Khan and Irfan, 1985; Shabbir, 1991; Ashraf and Ashraf, 1993 and Nasir, 1999).
3.2. Earning Function with various levels of Education by Gender

Many studies indicated substantial differences in earnings across school levels in various countries. Van der Gaag and Vijverberg (1989) noted that an increase of one year in elementary, high and university education showed an increase of 12 per cent, 20 per cent, and 22 per cent in earnings respectively. Nasir & Hina (1999) showed that an increase of one year in education at middle level increased the earning by 9.8 per cent for Male workers and 2.9 per cent for female workers.

Table 2: Regression results of the earning function equation with the level of education in Pakistan (Overall, Male and Female)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Over all Pakistan</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Coefficient</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Constant</td>
<td>4.987</td>
<td>5.537***</td>
<td>6.729***</td>
</tr>
<tr>
<td></td>
<td>(183.933)</td>
<td>(183.338)</td>
<td>(290.227)</td>
</tr>
<tr>
<td>Experience</td>
<td>0.059***</td>
<td>0.065***</td>
<td>0.065***</td>
</tr>
<tr>
<td></td>
<td>(48.805)</td>
<td>(47.034)</td>
<td>(54.986)</td>
</tr>
<tr>
<td>(Experience)^2</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
</tr>
<tr>
<td></td>
<td>(-33.148)</td>
<td>(-34.464)</td>
<td>(-38.074)</td>
</tr>
<tr>
<td>urban</td>
<td>0.032**</td>
<td>-0.161</td>
<td>-0.034**</td>
</tr>
<tr>
<td></td>
<td>(2.462)</td>
<td>(-11.238)</td>
<td>(-2.645)</td>
</tr>
<tr>
<td>Punjab</td>
<td>-0.066***</td>
<td>0.015</td>
<td>-0.075***</td>
</tr>
<tr>
<td></td>
<td>(-4.698)</td>
<td>(1.021)</td>
<td>(-5.441)</td>
</tr>
<tr>
<td>NWFP</td>
<td>-0.204***</td>
<td>0.097***</td>
<td>-0.236***</td>
</tr>
<tr>
<td></td>
<td>(-9.960)</td>
<td>(4.052)</td>
<td>(-11.575)</td>
</tr>
<tr>
<td>Balochistan</td>
<td>0.183***</td>
<td>-0.061</td>
<td>0.181***</td>
</tr>
<tr>
<td></td>
<td>(6.431)</td>
<td>(-1.733)</td>
<td>(6.663)</td>
</tr>
<tr>
<td>Male</td>
<td>1.783***</td>
<td>1.436***</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>(107.585)</td>
<td>(76.246)</td>
<td>-------</td>
</tr>
<tr>
<td>Middle</td>
<td>0.506***</td>
<td>0.442***</td>
<td>0.487***</td>
</tr>
<tr>
<td>Matric</td>
<td>0.759***</td>
<td>0.727***</td>
<td>0.705***</td>
</tr>
<tr>
<td></td>
<td>(39.928)</td>
<td>(34.459)</td>
<td>(38.883)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1.035***</td>
<td>1.006***</td>
<td>0.925***</td>
</tr>
<tr>
<td></td>
<td>(35.188)</td>
<td>(31.200)</td>
<td>(32.304)</td>
</tr>
<tr>
<td>BA</td>
<td>1.337***</td>
<td>1.264***</td>
<td>1.210***</td>
</tr>
<tr>
<td></td>
<td>(40.727)</td>
<td>(35.291)</td>
<td>(37.853)</td>
</tr>
<tr>
<td>Professional</td>
<td>1.758***</td>
<td>1.653***</td>
<td>1.560***</td>
</tr>
<tr>
<td></td>
<td>(43.232)</td>
<td>(40.152)</td>
<td>(38.849)</td>
</tr>
<tr>
<td>Adj R^2</td>
<td>0.48</td>
<td>0.36</td>
<td>0.26</td>
</tr>
<tr>
<td>F-statistics</td>
<td>1690.036</td>
<td>982.230</td>
<td>612.262</td>
</tr>
</tbody>
</table>

*** Showed that the coefficient is significantly different from zero at 0.01 probability level and t-ratios are in parenthesis.
The results obtained in Table 2 above revealed that returns to each year of education for Male workers at Matric level were 1.4 times; 1.9 times for inter, 2.5 times for BA & 3.2 times and higher for professionals compared to the middle. Similarly, for female workers, the results at matric level were 1.5 times, 2 times for inter, 2.5 times for BA & 3.1 times higher for professionals, compared to the worker with middle class qualifications. These results were similar to previous studies (see for example; Hamadani, 1977; Haque, 1977; Khan and Irfan, 1985 and Shabbir, 1991) but these results were relatively lower than the results of Nasir and Hina, 2000). The author showed that returns to each year of education for male workers at matric level were three times; six times for degree education and approximately seven times higher for professional education than those of middle school years. Likewise for female workers the results were four times higher for matric; eight times higher for inter; thirteen times higher for BA and twenty times higher for professional degree holders compared to the return for middle class. It can safely be said that workers with an increased number of educational years, equipped with skills, will definitely add to their earnings, and a person with more professional education and training is more likely to produce innovative ideas, hence receive a promotion and increased income. The difference was perhaps due to the dependent variable (only wage earners). In the year 2001, returns to each year of education for Male workers at Matric level were 1.66 times, 2.2 times for inter, 2.67 times for BA and 3.5 times higher for professional, compared to the returns of workers with middle class schooling. The analysis showed that those who have professional degrees received the highest returns followed by BA. These results were again in line with other studies in Pakistan, mentioned earlier.

This study analysed the different dimensions of labour income inequality and discussed education’s central role in explaining these differences. An overall analysis showed that females were receiving lesser rewards compared to their male counterparts. Experience has also appeared as major contributor towards wage differential and showed a substantial increase in wages with each additional year of work experience. However, a return to experience concerned men more than women. Estimates showed that each year of schooling increased the earnings of individuals almost from one to three per cent.

### 3.3. Probability of being poor

A logistic regression model was estimated for the ‘probability of being poor’ on experience and different levels of education. The results are reported in Table 3.

The multivariable logistic regression model was estimated to determine the statistical association of probability of being poor and the independent variables were: gender (male=1, Female=0), experience (in years), experience square, Middle, Matric, Inter, BA, and Professional were introduced as dummies for different levels of education.
Table 3: Logistic regression model of being poor with different levels of education
(overall Pakistan)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>β</td>
<td>Odds ratio</td>
<td>β</td>
<td>Odds ratio</td>
<td>β</td>
<td>Odds ratio</td>
<td>β</td>
</tr>
<tr>
<td>Constant</td>
<td>3.86</td>
<td>47.75</td>
<td>2.92</td>
<td>18.51</td>
<td>1.12</td>
<td>1.14</td>
</tr>
<tr>
<td>Experience</td>
<td>-0.05</td>
<td>0.96</td>
<td>-0.05</td>
<td>0.95</td>
<td>-0.05</td>
<td>0.94</td>
</tr>
<tr>
<td>Middle</td>
<td>-0.86</td>
<td>0.45</td>
<td>-0.79</td>
<td>0.45</td>
<td>-0.85</td>
<td>0.42</td>
</tr>
<tr>
<td>Matric</td>
<td>-1.60</td>
<td>0.20</td>
<td>-1.53</td>
<td>0.21</td>
<td>-1.48</td>
<td>0.23</td>
</tr>
<tr>
<td>Intermediate</td>
<td>-2.23</td>
<td>0.11</td>
<td>-2.20</td>
<td>0.11</td>
<td>-1.97</td>
<td>0.139</td>
</tr>
<tr>
<td>BA/B.Sc</td>
<td>-3.38</td>
<td>0.03</td>
<td>-3.51</td>
<td>0.03</td>
<td>-2.99</td>
<td>0.05</td>
</tr>
<tr>
<td>Professional</td>
<td>-5.12</td>
<td>0.01</td>
<td>-4.7</td>
<td>0.01</td>
<td>-4.28</td>
<td>0.01</td>
</tr>
<tr>
<td>Male</td>
<td>-2.77</td>
<td>0.1</td>
<td>-2.92</td>
<td>0.05</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The odds ratio were defined as just two odds that are compared to determine whether one group has higher or lower odd ratios of binary outcome. A number greater than one indicates a positive association between an independent and dependent variable, whilst a number between zero and one indicates a negative association. (John P. Hoffmann, 2004) said that the odds ratio of a high chance of being poor amongst females was about 0.054 times the odd ratios of being poor amongst males. The results depicted that there was a negative relationship between the probability of being poor and different levels of education. It means that higher levels of education gradually reduce the probability of being poor. Hence, the education level has an important bearing on reducing poverty in the country.

3.4. Occupational Choices

In order to find out the factors determining the occupational choices, a multinomial logit regression model was applied. The results of the regression are presented in Table 4 below.

The analysis of the model for the year 1998–99 showed that males were more likely than females to work as employers, self-employed or wage earners, relative to unpaid family workers. The odd ratios of males working as employers relative to unpaid family workers were about 2.950 times (or 195 per cent higher) than the odd ratios of females reporting to employers relative to unpaid family workers.

The odds ratio of males working as self-employed relative to unpaid family workers was estimated to be 2.25 times (or 125.4 per cent higher) than the odds ratio of females reporting to be self-employed, relative to unpaid family workers. The odds ratio of males working as wage earners relative to unpaid family workers was about
1.850 times (or 85 per cent higher) than the odds ratios of females reporting wage earners relative to unpaid family workers.

Thus, one unit increase in education was associated with a 25.7 per cent increase in the odd ratios of working as an employer, relative to unpaid family workers. There was a 15.3 per cent increase in the odd ratios of working as a self-employed relative to working as unpaid family workers. The increase in the odd ratios of 21.8 per cent wage earners was indicated relative to working as unpaid family workers.

The results revealed that one unit increase in experience showed 5.6 per cent increase in the odds of working as employers, relative to the odds of working as unpaid family workers. A similar increase was observed in the odd ratios of self-employed workers corresponding to the odd ratios of unpaid family workers. Likewise, one unit increase in the experience showed a 2.4 per cent increase in the odd ratios of working as a wage earner relative to the odd ratios of unpaid family workers.

The results implied that more education provides an opportunity to people to move out from the unpaid family workers’ category to employer, self-employed and wage earners status by adding to their skills, as well as to their innovative capabilities. Similarly, experience offers people the opportunity to get out of the unpaid family workers’ status to employer, self-employed and wage earners’ categories.

The results, for year 2001, also revealed that males were more likely than females to work as employers, self-employed and wage earners, relative to the unpaid family workers.
Thus, one unit increase in education showed a 27 per cent increase in the odd ratios of working as an employer relative to unpaid family workers. Similarly, there was an increase of 21.5 per cent in the odd ratios of working as a self-employed relative to working as unpaid family workers. Hence, one unit increase in experience depicted a 6 per cent increase in the odd ratios of working as employers relative to the odds of working as unpaid family workers.

Substantially, the results revealed that the odd ratios of employers, self-employed and wage earners were significantly higher than unpaid family workers. The country’s labour force comprising unpaid family workers and their earnings are far below the other categories of workers. This not only adds to income inequality and hence poverty, but also to a low standard of living. Therefore, the education policy must boost an increase up in the education of these unpaid family workers to reduce inequality in earnings. Education should include vocational training, especially of the female labour force.

4. Conclusions and Recommendations

Policy formulation is a continuous process and needs to be revisited in order to take account of evolving differences over time. Moreover, this analysis indicates a clear gender disparity in earnings and in the contribution of the different attributes of the earnings functions. This fact reiterates the need for gender specific policy initiatives for maximising the impact of earnings’ disparities and overall income and expenditure inequality.

This study highlighted that investment in human capital, especially amongst women by providing them better education and skills at all levels, adds significantly to earnings and helps to reduce inequality. There is no tool for making development more effective than the empowerment of women through better education and skills. To increase economic productivity, investment in the female labour force is a policy option facing policy makers. This study also re-enforces the existing findings.

Women are the major part of the unpaid family workers category and by providing them with education and training, this major segment of the labour force can be converted into an active labour force and this will also serve the dual purpose of poverty reduction and inequality reduction. The more technical training available to women, the more likely they are to obtain higher paying jobs, so investment in these avenues will empower our women and will be instrumental in achieving speedy growth and sustainable development. In this regard, development of labour markets, especially for female labour, will greatly facilitate income growth and reduce gender inequality.

Future research implications emerging from the analysis relates to the availability of good data for effective policy analysis. Good quality research requires convenient access to accurate, timely data for analysis. Such data and analysis should serve to inform discussions on policy alternatives and to monitor progress towards strategic goals. Bet-
ter and more recent data can greatly facilitate effective research and helps to formulate better policies for income growth, inequality mitigation and poverty reduction.

References


Introduction

This paper is about the features of assets management in Belarus municipalities. An important underlying notion, which is basic to the process of assets management, is that communal ownership is fixed into Belarus legislation. However, this is only a type of State ownership. In Belarus, therefore, municipalities are functioning within a framework of State ownership. For local government, this means that municipalities are subordinated to a so-called rigid “presidential” vertical function and are far removed from a framework of fiscal decentralisation. Municipalities have no own assets and the State has transferred property to for operative management and economic handling.

How do these municipalities operate? What direction are they taking and where does their independence lie? What should be done to improve assets management in the municipalities? In this paper all these aspects will be considered. The emphasis will be on the independence of local authorities’ activities in the sphere of assets management, without the intervention of the central authority.

1. Content of communal ownership and total scheme of assets management in Belarus municipalities

The concept “communal ownership”, as a substitute for municipal ownership, was introduced by the Belarus legislation with a timeframe of 80–90 years. It was a result of the development of the term “housing and communal services”. The Belarus
Constitution (article 13) determines that ownership can be both state and private (Konstitutsia Respubliki Belarus, 2004). On the other hand, the Constitution (article 121) also determines that the competence of Local Council deputies is to manage and conduct communal ownership within the limits defined by the Law (Konstitutsia Respubliki Belarus, 2004). The concepts of state, private and communal ownership are contained in the Constitution. The Belarus Civil Code (article 215), however, classifies communal ownership as state ownership (Grazhdanski Kodeks Respubliki Belarus, 1998). It seriously confuses the situation in maintaining fundamental relations. However, the aspiration to reduce the number of independent patterns of ownership for both the state and private ownership in the Belarus Civil Code can be seen as a contradiction in terms.

Figure 1. A typical scheme of assets management in Belarus municipalities

Communal ownership management (economic approach)

- Methods of management (legal regime of use) of municipal property
  - Assignation in operational administration
  - Assignation in economic management

- Communal assets (Communal assets ceded to organisations and enterprises)
  - Local budget financial sources
  - Assets (movable and immovable)

- Revenue management
  - Increase of productivity of charges
    - Including social order

- Budget process administration in the municipality
  - Increase of inter-government

- Land recourse management
  - Leasing
  - Concession
  - Guarantees for loans

- Confidential management
  - Gratuitous use
  - Public works repairs / service of the real estate

Source: Own calculations by the author.

In Belarus, so-called municipal ownership can include: state property structures of a corresponding administrative and territorial unit, local budget financial sources, available housing and communal services of the subordinated territory, as well as industry, buildings, agricultural enterprises, trading enterprises, transport and public
consumer services, other enterprises, organisations, establishments of public health services, culture, physical training and sports, social protection and other property, which is deemed necessary for the functioning and development of the territory. We can also include in municipal ownership, property transferred to municipal ownership gratuitously by the state, other proprietors, and also property created by local councils, other local governments, executive committees and local administrations.

However, how are the municipal assets in terms of operative management and economic management being managed? This can be seen in Figure 1.

As Figure 1 shows, the assets transferred to municipalities on a ‘rights’ of operational administration and economic basis are sub-divided into local budget financial sources – material and non-material assets. Management of local budgets’ financial sources includes the ability of municipalities to generate taxes and non-tax revenues. Among the most active local budget financial sources, local authorities can collect local taxes and duties best through generating taxes; granting municipal orders; by influencing the local budgetary process and through the improvement of local budgeting.

The management of material and non-material activities covers public utilities’ administration, granting of guarantees for public utilities, including loan guarantees, confidential management, gratuitous use of assets, public works, repairing works and services for movable assets and real estate.

**Box 1.1**

**Case.** Example from the practice carried out in the Molodechno municipality: There are 44 organisations, of which 22 function under conditions of economic management (self-supporting organisations) and 22 organisations under conditions of operational administration (budgetary organisations). They are under the municipal ownership of the Molodechno municipality.

Source: Own research by the author.

2. New accents in land resources management

Since the beginning of 2007, the basic and primary bodies of local authorities (rayon, urban and rural local authorities) have land selling rights to private ownership for individuals and selling of land rental rights to corporate organisations\(^2\). Thus, the proceeds

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\(^2\) These rights have been presented for local authorities by the Presidential Decrees № 21 from 3 January 2007 and № 667 from 27, December 2007.
from the land operations of local governments go directly to those local budgets where the operations were performed. In 2007, the proceeds from the sale of land and the sale of land rental rights, in total budget revenues of sub-national governments, were less than 1% (Table 1). Our research into the revenue structure of the Minsk oblast local budgets has shown that in the budget tiers of the Minsk oblast, the share of these revenues were more impressive and achieved more than 5% (Table 2). Of all the governmental tiers of the Minsk oblast’s revenues from land operations, most were generated in the rayons and rural settlements. Their share of total land sale revenues was 98.24% and in the sale of land rental rights – 92.13% (Figure 2). Granting rights for land sales and the rights to sell land for rental should be considered as an important step towards the liberalisation of land resource operations and towards increasing local government independence for assets management on their territory.

Table 1. Revenues of Belarus sub-national budgets from land sales and the selling of land rental rights in 2007 and 2008 (in bn. Belarus roubles, equivalent to thousand Euros\(^3\) and in percentages)

<table>
<thead>
<tr>
<th>Indicators:</th>
<th>2007 (preliminary results)</th>
<th>2008 (project)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In national currency</td>
<td>In Euros</td>
</tr>
<tr>
<td>Revenues from land sales</td>
<td>11178.3</td>
<td>3.8</td>
</tr>
<tr>
<td>Revenues from the sale of land rental rights</td>
<td>76188.5</td>
<td>25.7</td>
</tr>
<tr>
<td>Total revenues from land sales and land rental:</td>
<td>87366.8</td>
<td>29.5</td>
</tr>
<tr>
<td>The share of Belarus sub-national budgets from land sales and selling of land rental rights</td>
<td>0.49%</td>
<td>0.68%</td>
</tr>
</tbody>
</table>

Source: Author’s own calculations based on the Ministry of Finance of the Republic of Belarus reports.

Land sales operations to private ownership are mainly carried out on an auction basis. Individuals submit a statement on the acquisition of land and then an auction is held. After the auction, the winner pays the local government budget. The mechanism for the sale of land rental rights is as follows: the investor (corporation) presents an application to the executive committee of the local government to buy the rights on land rental. An executive committee prepares the land site and then puts it up for sale at

\[^3\] Under the calculations of auction land prices the weighted average exchange rate of the Belarusian rouble against the Euro on the foreign exchange market of the Republic of Belarus for 2007 – 2958.91 Belarusian roubles, 2008 – 3045.88 Belarusian roubles, 2009 (January and February) – 3597.95 Belarusian roubles have been used. (see. www.rnb.by/eng/statistics/Rates)
an auction. After the auction, the winner pays the rights, compensates the expenditures for preparing the land and pays the auction expenses to the executive committee.

**Box 2.1**

**Case.** An example from the practice of rural settlements’ local councils of the Molodechno rayon for land sales in private ownership

*According to the Presidential Decree № 667 from 27, December 2007 «About withdrawal and granting of the land areas» rural and urban councils had the opportunity to sell land to individuals and to sell the rights to rent the land to legal bodies. In 2008, the most active in land resource operations were the rural settlement councils of the Molodechno rayon. In 2008, eleven sites or 2.2 hectares were sold into private ownership totalling 134 mil. Belarus roubles and 11 sites or 5 hectares were sold for rent totalling 1245 mil. Belarus roubles.*

<table>
<thead>
<tr>
<th>Rural settlement councils of Molodechno rayon</th>
<th>Size of site exposed at auction (hectares)</th>
<th>Initial (starting) price of land site at auction</th>
<th>Sale (end) price of land site at auction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorodokski rural settlement</td>
<td>0.14</td>
<td>67 thousand roubles</td>
<td>5 million roubles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22</td>
<td>1642</td>
</tr>
<tr>
<td>Krasnenski rural settlement</td>
<td>0.15</td>
<td>487 thousand roubles</td>
<td>32 million roubles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>160</td>
<td>10506</td>
</tr>
<tr>
<td>Myasotski rural settlement</td>
<td>0.17</td>
<td>458 thousand roubles</td>
<td>17 million roubles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150</td>
<td>5581</td>
</tr>
<tr>
<td>Olehnovichiski rural settlement</td>
<td>0.15</td>
<td>822 thousand roubles</td>
<td>1 million roubles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>270</td>
<td>328</td>
</tr>
<tr>
<td>Turlevski rural settlement</td>
<td>0.14</td>
<td>2 million roubles</td>
<td>23 million roubles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>657</td>
<td>7551</td>
</tr>
<tr>
<td>Chistinski rural settlement</td>
<td>0.17</td>
<td>35 thousand roubles</td>
<td>14 million roubles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11</td>
<td>4596</td>
</tr>
</tbody>
</table>

In 2008, land sale auctions to individuals had transactions totalling 92825.2 thousand Belarus roubles (taking into consideration the reimbursement of auction expenses) which have been credited to the local budget accounts of the corresponding local rural and urban councils. The share of revenues from land sales to private ownership into the local budgets of the rural and urban councils of the Molodechno rayon came to a total of 80 to 92% of their local budgets.

Source: Author’s own research
Table 2. A brief description of local taxes, duties and charges (in percentage)

<table>
<thead>
<tr>
<th>Local budgets of Minskaya oblast:</th>
<th>Share of revenues from land sales (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Local budgets of cities with oblast status</td>
<td>0.49%</td>
</tr>
<tr>
<td>• Local budgets of rayons</td>
<td>0.69%</td>
</tr>
<tr>
<td>• Local budgets of cities with rayon status</td>
<td>5.44%</td>
</tr>
<tr>
<td>• Local budgets of urban settlement</td>
<td>5.06%</td>
</tr>
<tr>
<td>• Local budgets of rural settlements</td>
<td>5.35%</td>
</tr>
<tr>
<td>Total Sub-national budget of Minskaya oblast</td>
<td>0.87%</td>
</tr>
</tbody>
</table>

Source: Data calculated by the author based on the financial reports of the Finance Department of Minsk Oblast

Figure 2. Distribution of incomes from land sales and the rights to land rentals among sub-national budgets of the Minsk region (oblast) in 2007 (in percentages)

Source: Data calculated by the author based on financial reports of the Finance Department of Minsk Oblast
3. Local taxes, duties and charges administration

In Belarus, the sub-national governments have the opportunity to levy local taxes, duties and charges on their territories\(^4\) (Table 3). However, the list of local taxes, duties and charges which can be introduced by the local authorities is determined annually by the Budget Law (O Respublikanskom budzhe, 2008) and controlled by the central government.

Table 3. Content of local taxes and duties for sub-national governments permitted by the Budget Law of 2008

<table>
<thead>
<tr>
<th>Types of local taxes and duties</th>
<th>Who levy taxes and duties</th>
<th>Who receives taxes and duties</th>
<th>Tax rate(^5)</th>
<th>Taxpayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sale tax (retail sales tax).</td>
<td>Oblast (Regional) Local council</td>
<td>Rayon local budgets</td>
<td>No more than 5% from sales including VAT. The rate depends on the local authority;</td>
<td>The taxpayers are retail trade business entities engaged in retail activity</td>
</tr>
<tr>
<td>2. Tax on services (tax from services)</td>
<td>Oblast (Regional) Local council</td>
<td>Rayon local budgets</td>
<td>No more than 5% from sales and depends on local authority;</td>
<td>The taxpayers are business entities engaged in delivering services (café, bar services, travel agency services, etc)</td>
</tr>
<tr>
<td>3. Targeted charges (transport charge + infrastructure charge)</td>
<td>Oblast (Regional) Local council</td>
<td>Rayon local budgets</td>
<td>No more than 3% from net profit, for example, 2.45%+ 0.55% or 2.0%+1.0%</td>
<td>The taxpayers are the legal organisations and enterprises located within the territory</td>
</tr>
<tr>
<td>4. User charges</td>
<td>Oblast (Regional) Local council</td>
<td>Rayon local budgets</td>
<td>The rate depends on objects of taxes (parking, dogs and cats, etc)</td>
<td>The taxpayers are the users of services (individuals, entrepreneurs)</td>
</tr>
<tr>
<td>5. Duties from suppliers</td>
<td>Oblast (Regional) Local council</td>
<td>Rayon local budgets</td>
<td>No more than 5% from yield. The rate depends on the local authority;</td>
<td>The taxpayers are the suppliers (individuals)</td>
</tr>
<tr>
<td>6. Resort duty</td>
<td>Rayon local budgets</td>
<td>Rayon local budgets</td>
<td>3.0% from tourism</td>
<td>The taxpayers are the individuals (tourists)</td>
</tr>
</tbody>
</table>

Source: Author’s own calculations

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\(^4\) These local taxes, duties and charges have been introduced by the annual Budget Law in 2009, adopted by the Belarus Parliament and confirmed by the President of the Republic of Belarus.

\(^5\) The local authority may introduce a tax rate lower than prescribed by the Budget Law or the Oblast local Council.
The right to levy local taxes, duties and charges by the local authorities of sub-national governments is permitted, but within limits prescribed by the Budget Law. This characterises the local authorities’ minimum independence from central government in the assets management sphere. However, this does not mean that local governments are unable to manage their financial sources within their territory. There is, however, a positive side to the experience of local tax administration in the municipalities in the Gomel region (Zeljko Ševic, 2008, p. 58).

Nevertheless, local taxes, duties and charges account for an insignificant share in local budgets. This is illustrated by the data in Figure 3. The share of the financial sources in local budgets over the last years has steadily decreased. If, in 2000, the share of local taxes, duties and charges was 15.8%, in 2007, it decreased to 7.35%. This can be explained by the following:

1. Aspirations of central government to centralise financial resources to keep all monetary flows under control.

2. Absence of any stimulus in local authorities to collect these taxes. This is, perhaps, a consequence of the aforementioned. As we saw above, tax bases and tax rates of local taxes, duties and charges are defined by the annual Budget Law, instead of by local governments. For example, tax rates from sales and services are defined by the Budget Law and local governments have the opportunity to levy a tax rate of no more than 5%. This also applies to other local duties and charges.

Figure 3. Dynamics of local taxes, duties and charges in Belarus sub-national budgets (in percentage)

Source: Data calculated by the author based on financial reports of the Ministry of Finance of the Republic of Belarus.
Therefore, local governments still have a very “narrow” corridor for independence in local taxes, duties and charges administration. In fact, it simply does not encourage increasing local tax collection. There is another reason which holds back local authorities from increasing their share of local taxes, duties and charges in their budgets. This is the imperfect system of grant transfers for which their allocation is not dependent on local taxes, duties and charges collected. In this connection, the generation of local taxes, duties and charges is not favourable to local authorities since, in case of shortages, all expenditures needed will be covered by grants and transfers from the higher budgets.

3. Measures of central government to decrease the tax burden for corporate organisations. During the last two years the radical measures for abolishing some taxes, reducing tax rates and unifying some taxes, duties and charges have been introduced by the Ministry of Finance and the Ministry on Taxes and Duties. This also applies to local taxes, duties and charges. For example, earlier, the regional (oblast) authorities could allow a differentiation in sale taxes (retail sales taxes) for municipalities. For one they could make 15 % and for others, 5 %. Now they are established equally. The rates of tax on services (taxes from services) were reduced from 10% to 5% in 2009. Moreover, many regional governments have taken advantage of their right not to levy some local taxes, duties and charges on their territory, which is not in contradiction of the Budget Law. It is obvious that for the stimulation of local taxes, duties and charges’ collections, more freedom should be given to local authorities in the administration of these financial sources. Tax bases and tax rates, providing reasonable limits of taxation in local government jurisdictions should be established; at least, either the right of local governments to establish tax rates or the rights to determine tax bases should be given to them by the central government.

Under conditions of restriction of tax rates by central government, the “flying the flag” decrease in the tax burden became a unique way to increase local taxes, duties and charges, attract investments, the development of small and medium businesses, and the development of the municipal/private partnership which can all fill the local treasury. It is also necessary to create a stimulation system for increasing local taxes, duties and charges in local budgets through the mechanism of grant transfers.

4. Real estate administration in municipalities

In Belarus, local authorities exercise the administration of real estate by maintaining a register of property. In this register are contained the names of organisations, their form of ownership, control authorities, data about the size of the property, data about the land areas attached to the organisation, data on founders, data on isolated structural divisions, and data on non-state legal bodies.
The preservation of the fixed assets of public utilities is part of the municipal ownership, write-offs of fixed assets with unexpired terms of amortisation, revaluation of vehicles via an index method, sale of buildings at auctions or direct to a buyer, deposits, transfer of rental property for state and private enterprises, and reception and assignation of assets into communal ownership can be carried out by the local authorities.

**Box 4.1**

**Case.** Example from the practice of the Molodechno municipality: *In this municipality the real estate sales are made at auctions. The commissions on gratuitous assignation (within the limits of state ownership) are created. If a gratuitous transfer takes place, the assets’ estimation is carried out by the balance cost. If the assets sell at auction, an index method is used and estimated assets using the following formula are calculated:*

\[
\text{Estimated assets costs} = (\text{balance assets cost} - \text{depreciation of assets}) \times \text{an estimated index (from 1 to 2).}
\]

*Source: Author’s own research.*

In Belarus, unfortunately, new and widespread forms of functioning of public utilities, such as sub-contracting, renting, concessions and privatisation have not been developed. There is a list of objects which are not susceptible to privatisation. Among these are public utilities providing public services for the population: water supply companies and waste entities, garbage entities, housing and communal enterprises and educational establishments. These utilities cannot be privatised by law. Meanwhile, this is a serious obstacle to improving public services provision for citizens and to improving their quality. The transformation process of public entities into entities of a commercial type can only occur after a long process of transformation, beginning with a classical socialist understanding of this process when the state (budgetary) enterprises were solely responsible for the maintenance of public services.

The development of market relations in Belarus requires an expansion of the economic rights of local governments and their economic initiatives. In a commercial sense it needs to be more actively engaged in the capital and securities markets. Commercialisation of the social sphere and public services should be extended. The obligatory and delegated functions of municipalities should be supplemented by voluntary functions – first of all, with the industrial and financial activities of enterprises within the territory, irrespective of their patterns of ownership.
5. Management of social and economic development on the territory

Management of social and economic development in the municipalities of Belarus is performed according to a plan of social–economic development for a 5-year period. At present, in municipalities, their activities are based on the developed plans for 2006–2010. The planning of municipal activity is directed in five lines: 1) branches of industrial sphere (industry, transport, communication, consumer services); 2) building construction; 3) public utilities, housing and municipal services; 4) social-cultural [neprozvodstvennye] branches including education, public health, culture, social care; 5) agriculture and agricultural services.

At the same time, municipality planning is performed on the basis of the old socialist methods inherited from the soviet period. Sliding planning is practically non-existent, plans on branches of the social-cultural sphere are not drawn up, and drawing up of municipality balances is not carried out.

To overcome backlogs in the development of tools and methods of territorial planning and forecasting it would be expedient to introduce sliding financial planning in the municipalities. At the heart of this should be a three-year cycle to provide for updating of future municipal budgets. Being a basis to work out the prospects of a financial plan and a base for intermediate budgetary planning, financial planning should be based on three documents: programme of social and economic development on an intermediate prospect basis; basic directions of local authority activity beginning with a scenario of economic operating conditions for an intermediate period and a forecast of social and economic development for the next fiscal year and its intermediate term prospects.

As for the prospects of a financial plan, proceeding from the need to create conditions for the maintenance of a stable budgetary system, subject of budgetary planning, macroeconomic stability, predictability and continuity of a budgetary policy the execution of existing and accepted assignments should be developed. A scenario regarding the financial plan, taking into account operating and accepted budgetary obligations, including the basic macroeconomic indicators, parameters and priorities of social and economic development as an intermediate term prospect, as a rule with two variants (base and expected) should also be used. The perspective for a financial plan’s development is at least 3 years. Thus, the major factors promoting the efficiency of intermediate term planning, should be: predictability and sequence of a central government policy; b) inter-departmental interaction; c) coordination of actions between municipalities at the different levels of administration; d) interaction of executive and legislative powers and e) interaction with the public. The municipality financial planning model is illustrated in Figure 2.

For the improvement of municipality assets management, there must be business planning. It should be performed, not only in housing and municipal services
Figure 4. Comparative characteristics of the existing method of planning and the «sliding» method

The existing method of planning
Definition of a total sum of charges is carried out every fiscal year

Sliding method of planning
Consecutive "sliding" updating

Source: Author’s own work
branches, but also in branches of the social-cultural sphere. Business planning methods and procedures must be maintained, allowing for the improvement of a detailed elaboration of plans for rendering public services which are already developed and used by local authorities in the developed countries. Similar plans not only for public utilities, such as water supply, sewage, garbage collection, public transport, central heating, but also for social and cultural spheres, for example, maintenance of schools, fire service, improvement of welfare services would be especially useful. The business plan, in which the strengths and weaknesses of existing services should be improved and the best way to provide services in the future should be carefully made. For the scheduling of business plans, a list, which would consist of experts in services for a wide range of disciplines, should be created. Experts can give an objective estimate of how current services are rendered and, if necessary, offer innovations. The business plan, as a rule, should consist of 4 sections: introduction; review of the current state of affairs; strategic aspirations and purposes and a plan of action.

With business planning it should be remembered that this is not a static process. The following should be undertaken in order to concentrate on the activity priorities: reporting perfection, stimulation of activity in the decision-making process, definitions of joint understandings, coordination of the work of the personnel in the strategic aspect of an activity, preparing a practicable plan of action/expenses and realising a business plan.

The combination of a local budget administration and balance of municipalities and regions allows defining credit status indicators, estimating the credit status from a position of reliability, the instability or unreliability of the potential borrower, such as a separate municipality or region. Therefore, the municipality balance allows the defining of some important financial indicators such as, return of capital, current ratio, liquidity ratio etc. which are used for credit status estimation.

The drawing up of municipality balances and regional balances also promotes the maintenance of their credit rating. With municipality listings of credit status both the leaders and losers can be seen. Economic information about potential investors who wish to invest in municipality sectors will also be created.

Conclusions

The research conducted allows us to draw the following conclusions:

Real assets management in the Belarus municipalities after legally defining independent municipal ownership, not to be included in state ownership, is possible. Therefore, in the near future, by working from the new local government legislative base, it is necessary to separate municipal ownership from state ownership and give it an independent character. For these reasons it is necessary to change the Belarus
Constitution, Civil Code and other legislative documents, emphasising municipal ownership as separate and independent from state ownership. It should be noted, however, there are “embryos” of municipal assets management in Belarus: land resource operations, local taxes, duties and charges administration, real estate management and management of territorial development.

A serious innovation in the sphere of municipality assets management has become the granting of rights to urban and rural local authorities to sell lands to private ownership for habitation and to sell land rental rights to foreign investors and corporations. This measure has allowed increasing the revenues of rayon rural and local budgets. This should be considered as an important step towards the liberalisation of land recourse operations for sub-national governments. At the same time, many municipalities, having received essential revenues from land operations did not know how to use them due to the absence of sufficient expenditure assignments and functions. As a result, the revenues received by local authorities did not correspond to their expenditure assignments.

There is some independence for municipalities in local taxes, duties and charges administration. Municipalities have the right to levy local taxes, to establish tax rates, and to determine tax bases within the limits prescribed by the annual Budget Law. However, if previously, sub-national governments could differentiate tax rates, now they are established for all municipalities equally, within the limits established by the Budget Law. This measure acts as a restriction to local governments in the collection of local taxes, duties and charges and is the reason why these financial resources are constantly decreasing in sub-national local budgets.

Clearly, for the stimulation of local tax collection, more freedom of action should be given to the local authorities. The right to establish tax rates and tax bases within reasonable limits should be given to them. It is also necessary to stimulate the allocation of grants from the central government, depending on the size of “extracted” local taxes, duties and charges by the municipalities. With central government’s radical measures directed at decreasing the tax burden, the development of municipal and private partnerships, enlargement of small and medium businesses in municipalities and attracting foreign investments is required.

For the evolution of social and economic development in the municipal territories a procedure of “sliding” planning should be introduced. At the heart of the sliding planning process should be a three-year cycle, which would provide the updating of future municipal budgets. There are problems in introducing business planning procedures into organisations in the welfare sphere (education, public health services, culture, and social security). The practice of drawing up municipality balances should also be introduced.

New approaches to the management of public utilities in the municipalities are required. Unfortunately, in Belarus, forms of public utility functioning such as subcon-
tracting, renting, concessions and, not forgetting privatisation, are not developed. It is a serious obstacle for reducing communal fees and improving public services quality. At present, the state monopoly of public utilities is a fact and any competitiveness in the public services sphere is absent. Therefore, it would be expedient to have a circle of public service providers to improve the present system.

The perfection of assets management in municipalities demands new forms of mutual relationships between local authorities and business. Therefore, the development of municipal and private partnerships in the small and medium business spheres is necessary. The basic directions and mutual relations between local authorities and business include complex territorial planning, placing of municipal orders, land and property operations, participation in the capital, budgetary guarantees and licensing and investment agreements. In the long-term, a model municipal and private partnership should include the construction of schools, hospitals, highways, and other municipal objects.

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THE CORPORATE GOVERNANCE STRUCTURES OF GLCS AND NGLCS AND FIRM PERFORMANCE IN MALAYSIA

0. Introduction

Although GLCs have undoubtedly been a major element in socio-economic development of Malaysia, their performance has lagged behind that of the more established NGLCs (Lemmon and Lins, 2003). Indeed, it is typically much poorer and quite a number of them posted huge losses and had to be bailed out by the government.\(^1\) Previous theoretical and empirical studies suggest that the corporate governance structures of GLCs have a detrimental effect on a firm’s performance. Among the empirical studies, Boardman and Vining (1989) analysed the relative performance of the 500 largest non-U.S. mining and manufacturing companies in 1983, to determine whether privately owned firms outperform state-owned (SOEs), mixed state and privately owned firms (MEs). Their findings showed that private corporations are more profitable and efficient (measured as sales per employee and per asset) than either SOEs or MEs. While a longitudinal study by Dewenteur and Malatesta (1997), spanning a twenty-year period, found that when comparing the profitability of GLCs and that of the NGLCs, the government firms display inferior profitability. Another recent study comparing the performance of GLCs to NGLCs in China, found that GLCs performed worse than NGLCs (Wang, 2003).

\(^1\) Examples of these are Malaysian International Shipping Corporation (MISC), Malaysian Airline System (MAS), United Engineers Malaysia (UEM), and Renong, which were ‘too-big-to-fail’ cases with large socio-economics implications (Lemmon and Lins, 2003). Many other GLCs appear to fall short in their financial performance. As an indication, the total return to shareholders of public listed GLCs actually trails behind overall market performance by 21 % over the last five years beginning1997 to 2002 (Bursa Malaysia, 2003). This is a significant loss for the shareholders.
1. Corporate governance development in the context of the economic, political and social background in Malaysia

The historical background of the economic, political and social circumstances in Malaysia has a profound impact on corporate governance practices because the country is made up of various races, religions, creeds, customs and languages (Haniffa, 1999). All races are divided into two main groups; bumiputra and non-bumiputra. After independence in 1957, the economic state of the country was relatively poor. Although the annual real growth in Gross Domestic Product (GDP) was 6.3% in the period 1961–1970, ethnic inequality too had increased in the period, as economic activities were mainly monopolised by the non-bumiputra (Ministry of Finance, 1970). The ratio of non-bumiputra to bumiputra median incomes rose from 1.99:1 in 1957/58 to 2.20:1 in 1967/68 (Gomez and Jomo, 1997). This worsening situation, coupled with frustration over the economic dominance of the non-bumiputra, resulted in ethnic violence in 1969 (Jayasankaran and Hiebert, 1997).

To alleviate the situation, the government embarked on an affirmative action by introducing the New Economic Policy (NEP) in 1970. The launching of the NEP was a turning point, in which the government played a significant role and was actively involved in the establishment of a broad range of productive enterprises (Abdullah, 1992). The NEP had two major objectives: to eradicate poverty regardless of race and to restructure society by eliminating the identification of race with economic function. The ultimate objective is to redistribute wealth more equally among Malaysian society (Hensley et al 1993).

2. Formation of GLCs

Subsequently, to facilitate the NEP’s objective, the government decided to advance bumiputra businesses by establishing public enterprises and joint public-private companies (Bowie, 1988). By the early 1980s, massive governmental intervention in the corporate sector commenced when GLCs were formed through these bodies and through wholly-owned government enterprises and joint ventures with the private sectors. The formation of GLCs was seen as a catalyst to achieve the objectives of the NEP and as a vehicle to galvanise the country’s economic activities. The Treasury Circular (Ministry of Finance, 1993) defined a GLC as one in which the Government controls more than 20% of equity shares of a company through the Khazanah National

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2 Bumiputra means ‘sons of the soil’, which consists of the Malays and indigenous people, while the Chinese and Indians are grouped as non-bumiputra (Torii, 1997).
The formation of GLCs was carried out progressively through the process of privatisation and corporatisation. Many government departments were first privatised and later transformed into separate wholly-owned government companies (Malaysia, 1986). The privatisation policy would speedily achieve the NEP’s goal of providing more avenues for bumiputra businessmen to participate in the economic activities and reduce the government’s burden in providing essential services to the public (for example road construction, health services, energy and power). This would allow the government to have more time and funds to focus efforts on other much more important tasks. Under government patronage, these privatised companies thrived and became very successful. Subsequently, many of them were corporatised through the issuing of a portion of their shares on Bursa Malaysia. As the government maintained substantial ownership in these companies, these corporatised entities have come to be known as Government-Linked Companies or GLCs (Treasury Circular, Ministry of Finance, 1993).

Other than corporatisation exercises, the government also obtained substantial ownership in many PLCs directly or indirectly through its investment holding companies. The government also controls other major institutional funds such as Perbadanan National Berhad (PNB), Employees Provident Fund (EPF), Military Fund Board (LTAT), Pilgrimage Fund Board (TH) and Pensioners’ Fund Trustee Board (KWAP). A panel of supervisory boards manages all these trust funds and all decisions on their investment strategies are under the authority and jurisdiction of the government. They are collectively known as government investment portfolios (Treasury Circular, MOF, 1993). Besides that, all the State Economic and Development Corporation (SEDCs) and other state agencies that have at least a 20% shareholding in PLCs are also considered as GLCs (Treasury Circular, MOF, 1993). Examples of GLCs include Golden Hope Plantations Berhad, Kumpulan Guthrie Berhad⁴, Telekom Malaysia Berhad (TMB), Malaysian Airline System (MAS), and Tenaga National Berhad (TNB).

With all these developments, the business environment and corporate governance development in Malaysia has become somewhat unique. As such, the formation of GLCs via NEP brought many significant changes to the governance of companies in Malaysia (e.g. Thillainathan, 1999a).

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3 For example, Permodalan National Berhad (PNB), Kumpulan Wang Amanah Pencen (KWAP), Bank Negara Malaysia (BNM), Lembaga Tabung Haji (TH), Lembaga Tabung Angkatan Tentera (LTAT).

4 Guthrie Berhad was bought over by the government via PNB on the London Stock Exchange in 1981.
3. Objectives and research questions

This study investigates whether or not there is a relationship between the corporate governance structures and the performances of GLCs and NGLCs in the post-AFC period from 2001 to 2003. Based on the nature of GLCs’ formation, the two groups of companies are expected to have very different corporate governance structures. To take account of this, the first part of the research is to ascertain whether or not there are any significant differences between the corporate governance structures of GLCs and NGLCs. In pursuing this question, the study will explore whether the corporate governance structures of GLCs and NGLCs are significantly different and, if so, will seek to establish whether the relationship between corporate governance structures and performance of the two groups differs.

Therefore, the first research question is:
Are there significant differences in the corporate governance structures of GLCs and NGLCs in the post- AFC period from 2001 to 2003?

The second research question, assuming that there are significant differences between the corporate governance structures of GLCs and NGLCs, is to ascertain whether the impact of corporate governance structures on performance is the same or different for All Companies (the complete sample), GLCs and NGLCs.

Thus, the second research question is:
Is there any significant relationship between the corporate governance structures of All Companies, GLCs and NGLCs and performance from 2001 to 2003?

4. Research design and methodology

The first stage of the research involved conducting a review of the literature relating to corporate governance and firm performance. The objective is to investigate the state of existing research on the relationship, to develop testable hypotheses and identify the data required for the tests. Hypotheses were then developed in relation to corporate governance structures and firm performance of GLCs and NGLCs. The second stage of the research was conducted through interviews with senior officers of the MOF Incorporation. The objectives are to formulate a definition and analyse the corporate characteristics of GLCs.

After identifying the GLCs’ population on the Bursa Malaysia, they were then paired with NGLCs. This approach mirrors the matched-pair design used by Kesner and Johnson (1990) and Daily and Dalton (1997). To meet the first research objective, the first task was to identify whether there were any statistically significant differences for governance variables between GLCs and NGLCs. To carry out the tests, univariate analyses and paired sample-t-tests were conducted on GLCs and NGLCs for 2001,
2002 and 2003. As regards the second research objective, subsequent further univariate tests were conducted for all companies, GLCs and NGLCs to establish whether there is a statistically significant relationship between each independent variable and firm performance measured by either ROA or ROE. Finally, the second research question was additionally addressed by multivariate tests to ascertain whether or not there was a statistically significant relationship between any of the corporate governance structures of all companies, GLCs and NGLCs and firm performance if the effect of the interrelationship between explanatory variables was allowed for.

5. Sample selection and data collection

The population chosen for the study was companies listed on the Bursa Malaysia for the years 2001, 2002 and 2003, which were in one of seven sectors of the economy (construction, consumer products, industrial products, plantations, property, trading/services and technology). The sample companies used in this study included an equal number of GLCs and NGLCs listed on Bursa Malaysia for the years 2001, 2002 and 2003. Table 4.1 details the process of selection of the final sample.

Table 4.1: Stages in arriving at the number of matched-pairs in the final sample

<table>
<thead>
<tr>
<th>Descriptions</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed GLCs identified on Bursa Malaysia including banks and Financial Institutions, PN4 Companies and companies still under restructuring.</td>
<td>111</td>
<td>111</td>
<td>111</td>
</tr>
<tr>
<td>After deduction of Financial Institution, PN4 Companies and companies under restructuring.</td>
<td>89</td>
<td>89</td>
<td>89</td>
</tr>
<tr>
<td>Letters sent to paired GLCs and NGLCs (89*2)</td>
<td>89*2= 178</td>
<td>89*2= 178</td>
<td>89*2= 178</td>
</tr>
<tr>
<td>Annual Reports received (53*2) [Hard and soft-copies]</td>
<td>53*2= 106</td>
<td>53*2= 106</td>
<td>53*2= 106</td>
</tr>
<tr>
<td>After deduction of companies with extremely high profitability or losses (outliers)</td>
<td>49*2= 98</td>
<td>49*2= 98</td>
<td>49*2= 98</td>
</tr>
<tr>
<td>After deduction of companies with negative assets (outliers)</td>
<td>46*2= 92</td>
<td>46*2= 92</td>
<td>44*2= 88</td>
</tr>
</tbody>
</table>

(* denotes multiplied by)

One hundred and eleven GLCs were identified, which decreased to eighty-nine GLCs after the deduction of Banks, Financial Institutions, PN4 companies and com-
panies which were still under government restructuring (after they were hit by the Asian Financial Crisis). Letters of enquiries were sent out to all the identified GLCs and matching NGLCs. By the end of April 2004, fifty-three pairs (one hundred and six companies) had responded (including e-mail responses).

The fifty-three pairs were examined for evidence of outliers. An outlier is a case that differs substantially from the main trend of the data. Outliers can cause a model to be biased because they affect the values of the estimated regression coefficients (Field, 2001). For this purpose, an outlier is defined as a company with abnormally high profitability or losses, or negative net assets. As detailed in Table 4.1, four companies in all the years were found to have extremely high profits or losses and were thus classified as outliers and excluded, as were three companies with negative assets. This resulted in seven pairs (fourteen companies) being excluded. If a company from a pair is excluded; the matched company also has to be taken out.

After considering all these outliers, there were forty-six pairs (ninety-two companies) in the final sample for 2001 and 2002. In 2003, the number of sample companies reduced to forty-four pairs (eighty-eight companies) because two of the GLCs were delisted from the Stock Exchange in 2003. Although they were later replaced with the listing of their subsidiaries, it was considered as a new listing and therefore the two original GLCs together with their pairs were rejected.

6. Operationalisation of the dependent, independent and control variables

This study utilises the two accounting measures (ROA and ROE) as the dependent variables, which are employed as proxies for firm performance. ROA is the average annual realised rate of return measured by dividing earnings after tax by total assets and ROE is the average annual realised rate of return measured by dividing earnings after tax by shareholders equity. A high score for the variables signifies favourable firm performance. These performance measures are consistent with other studies on firm performance and are frequently used by market and financial analysts in assessing a company’s performance (Shrader et al, 1997).

There are fourteen independent variables selected for the current study. All the variables are features of the internal corporate governance system related to the board structure and composition. The fourteen variables are board size (BSZ), board meeting frequency (BMF), role duality (RDU), non-executive directors (NEX), independent directors (IND), directors with accounting and finance qualifications (DAF), women directors (WOM), bumiputra as directors (BUM), senior government officers as directors (SGO), politician as directors (POL), family members as directors (FAM), audit committee size (ACS), audit committee meeting frequency (ACM) and big-four
auditors (AUD). These variables were selected based on the preliminary findings of the pilot study and on literature on corporate governance structures in the Malaysian business environment.

Two control variables; sales and industry-type were also included. The inclusion of these variables in the model avoids firm performance being influenced by other factors. The natural logarithm of annual sales (LSALE) is used as the proxy for size and it is expected to be positively related to performance because larger firms are more profitable than smaller firms as they benefit from economies of scale and are able to spread their risk (Ghosh, 1998). Variations in performance based on industry type were addressed by the creation of dummy variables for each of the seven-industry classifications used by the Bursa Malaysia (constructions, consumer products, industrial products, plantations, property, trading/services and technology).

7. Hypotheses testing

This study develops the following four main hypotheses for the two research objectives as laid out in the earlier section.

| H1 | Corporate governance structures of GLCs are significantly different from those of NGLCs. |
| H2 | There is a significant relationship between corporate governance structures and the performance of Malaysian companies (All Companies) in the post-AFC period from 2001 to 2003. |
| H3 | There is a significant relationship between corporate governance structures and the performance of GLCs in the post-AFC period from 2001 to 2003. |
| H4 | There is a significant relationship between corporate governance structures and the performance of NGLCs in the post-AFC period from 2001 to 2003. |

As mentioned in the previous section, a total of fourteen aspects of governance structures were considered and hypotheses developed as to their probable effect on firm performance. All the variables except three (BUM, POL and SGO) had been commonly employed as independent variables that might be associated with performance in previous governance studies. The three new variables are included because they are important aspects of corporate governance in the Malaysian context following the NEP (1971) and ICA (1975). Such directors are implicitly believed to have considerable links with the government and their appointments are consistent with the resource dependence theory.
8. Summary on the findings of independent variables to firm performance (ROA and ROE)

This section highlights the significant relationships between the independent variables and performance. Table A shows the summary on the relationships of independent variables to ROA and ROE respectively.

Table A: Summary on the findings of univariate tests for a relationship between the independent variables and performance

<table>
<thead>
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<td>_ **</td>
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<td>14. AUD (E)</td>
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</table>

(Note: (A) denotes ROA while (E) denotes ROE)
(Significant at 1%= ***, 5%= ** and 10%= *)
The Table shows that there are hypotheses that are supported (significant correlation in all the three years), partly supported (significant correlation in one and two years) and rejected (not significant in all the years).

8.1. **Supported hypotheses**

Board size (BSZ) is the only consistently supported variable with statistically significant results for one or more of the three groupings in all years. In GLCs, the hypothesis is fully supported in all the three years for both ROA and ROE, while for All Companies, the hypothesis is partly supported in two years for ROA and one year in ROE. In NGLCs, the hypothesis is only supported in one year (ROE).

8.2. **Partially supported hypotheses**

The BMF hypothesis is also reasonably well supported. There is a significant relationship to firm performance (both for ROA and ROE) in two years for All Companies. For GLCs, the hypothesis is partly supported in two years for ROE and a year for ROA. In NGLCs, the hypothesis is supported in two years for ROE.

As regards board composition, the findings are less consistent. For IND, the hypothesis is supported in only a year for All Companies (ROA). For WOM, the hypothesis is supported in two years for ROE and a year in ROA in All Companies. In NGLCs, the hypothesis is supported in two out of the three years both for ROA and ROE. For SGO, the hypothesis is partly supported in NGLCs in 2003 both for ROA and ROE. But for POL, the hypothesis is supported in two years out of the three years.

The hypotheses with respect to audit committees and auditors are also inconsistently supported. For ACS, a statistically significant relationship is found in All Companies and NGLCs in one period (ROA and ROE). But in GLCs, the hypothesis is supported in only a year for ROA. As for AUD, the hypothesis is supported in 2003 for All Companies and GLCs (both ROA and ROE).

8.3. **Rejected hypotheses**

The findings indicate that there are six variables (RDU, NEX, DAF, BUM, FAM and ACM) in which the hypotheses of a significant relationship to performance are rejected.

Thus, results of the univariate analyses and correlations revealed that some hypotheses were supported, some partly supported and some rejected.

9. **Results of the paired sample t-tests on GLCs and NGLCs.**

Based on the results of the paired sample-t-tests that were conducted on GLCs and NGLCs for 2001, 2002 and 2003, it was found that there are significant differences on the governance structures of GLCs and NGLCs in eight independent variables (see Table B). Comparison of GLCs
and NGLCs using paired-samples t-tests shows that there are statistically significant differences in seven variables out of the fourteen governance variables examined. Four of these aspects (NEX, BUM, SGO and FAM) are statistically significant at a 1% confidence level in all the years while the other three aspects are significant at a 5% confidence level (except BSz in 2002 and RDU in 2003 at 1% confidence levels). Analyses on the differences show that there are bigger boards and higher frequency of

Table B: Comparison of the means, t-value and significance on differences between GLCs and NGLCs for 2001, 2002 and 2003

<table>
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<tr>
<th></th>
<th>2001 Mean</th>
<th>2002 Mean</th>
<th>2003 Mean</th>
<th>Sig. (2-tailed)</th>
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<td>72.229</td>
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boards meetings in GLCs than NGLCs. The analyses also show that there is a higher representation of NEX, BUM, and SGO in GLCs compared to NGLCs. On the other hand, there is a lower representation of FAM and less prevalence of RDU in GLCs than NGLCs. The univariate tests results clearly demonstrated that there were statistically significant differences for seven variables representing aspects of the corporate governance structures of GLCs and NGLCs. Other than the seven variables, POL was also statistically significant in two of the periods. Hence, the first hypothesis on the differences between GLCs and NGLCs is clearly supported.

10. Multivariate analysis

Specification of regression models

As it was found that six hypothesised variables were not significant in explaining performance in any of the groupings of the sample or time periods, therefore for clarity in reporting the results, it was decided to limit the multivariate analyses to the eight variables that showed significant relationship to performance in the univariate tests and based on the result of a pilot study conducted at the beginning of the research. Therefore, eight independent variables and two control variables will be adopted in the multivariate regression. Let i represent each firm, for \( i = 1, 2, n \), and the full regression model is shown in Figure 7.1.

Figure 7.1: Specification of the Regression Model

\[
y_i = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + B_9X_9 + B_{10}X_{10} + E_i
\]

where \( y_i \) = the dependent variables: Return on Asset (ROA) and Return on Equity (ROE)

Independent variables:

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<tr>
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<td>role duality</td>
</tr>
<tr>
<td>X4</td>
<td>percentage of non-executive directors</td>
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<tr>
<td>X5</td>
<td>percentage of bumiputra directors</td>
</tr>
<tr>
<td>X6</td>
<td>percentage of government officers as directors</td>
</tr>
<tr>
<td>X7</td>
<td>percentage of family members as directors</td>
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<td>percentage of politicians as directors</td>
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<td>sales (in millions)</td>
</tr>
<tr>
<td>X10</td>
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Multiple linear regression analyses in the above form were run on datasets for the years 2001, 2002 and 2003 for All Companies sample, GLCs and NGLCs using SPSS. Since better results on the relationships between corporate governance variables and performance might be established if the data were transformed (Cooke, 1998), the data were normalised by dividing the distribution into the number of observations plus one region on the basis that each region has equal probability (Cooke, 1998). This method of normalising the data is referred to as the Van Der Waerden approach. The main advantage of transforming data to normal scores is the ability to utilise it in any subsequent tests requiring the normality of data which means: the significance levels can be determined with more confidence; the F-and t-tests may be more meaningful; and the power of the F-and t-tests may be used (Cooke, 1998). Furthermore, the regression coefficients derived using the normal scores approach are able to preserve monotonocity in the relationships of independent and dependent variables and in the case of non-linearity with data concentration, this approach may help to disperse that concentration.

11. Results of the tests on normalised datasets based on groupings and years

Table C discusses and summarises the tests on the normalised datasets based on groupings and years. It also presents the results of the significance tests on independent variables for all groupings and years.

---

6 The Van Der Waerden approach may be summarised as \( r/(n+1) \) and may be calculated using SPSS.
Table C: Multivariate analysis tests results on normalised datasets of All Companies, GLCs and NGLCs based on groupings and years

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</tr>
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</tr>
<tr>
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(Key: ***= statistically significant at 1%, **= statistically significant at 5%, *= statistically significant at 10%)

a) BSZ to performance

For All Companies, there is a positive link between BSZ and firm performance measured by ROA and ROE in all the years. However, statistically significant relationship is only supported for ROE in 2001. For GLCs, there are also consistently positive links between BSZ and performance in all the years. The relationships are statistically significant for ROE in 2001 and 2003 at a 1% and 5% confidence levels respectively. Therefore, the hypothesis of a significant relationship between BSZ and firm performance in GLCs is supported in two of the years. However, for NGLCs, the relationship is positive for 2001 and 2002 but negative in 2003 both for ROE and ROA. The link between BSZ and performance measured by ROE is statistically significant in 2001 (5% level). This indicates that the hypothesis of a significant relationship between BSZ and firm performance in NGLCs has support in only one year and that the direction of any relationship is unstable between years.

Overall, the results are broadly consistent with a positive relationship between BSZ and firm performance. The relationship is not statistically significant for any years for ROA. For ROE, the relationship is statistically significant for one period for All Companies and NGLCs
and for two out of three years for NGLCs. This result is consistent with studies carried out by Chaganti et al (1985), Pearce & Zahra (1992), Dalton et al (1998), and Kiel and Nicholson (2003), who found that BSZ was positively associated with firm performance. Hence, it can be concluded that the hypothesis of a significant relationship between BSZ and performance has limited support for ROE but is rejected for ROA. These variable results between years and groupings are consistent with lack of agreement on the extent and direction of any association between BSZ and performance in the extant literature.

b) BMF to performance

For all groupings of companies and in all years, there are consistently positive association of BMF and firm performance for ROA and ROE except GLCs in 2002 and NGLCs in 2003. For All Companies, the hypothesis of a significant relationship between BMF and firm performance is only supported for ROE in 2001. However, for GLCs, there is no statistically significant relationship and therefore the hypothesis of a significant relationship between BMF and performance is rejected in GLCs. For NGLCs, the relationship is only statistically significant for ROE in 2001. This demonstrates that for NGLCs, the hypothesis of a significant relationship between BMF and performance has limited support.

Overall results suggest that in most years across the three samples there is a positive association between BMF and firm performance. However, the relationship is rarely statistically significant and therefore the support for the hypothesis is limited. The findings are consistent with the extant literature suggesting that the relationship between BMF and firm performance is complex and its direction uncertain (see, for example, Evans et al 2002).

c) RDU to performance

The multiple regression results show that there is a mix of positive and negative relationship between RDU and firm performance (ROA and ROE) in All Companies and NGLCs. As for GLCs, there are consistently negative links. However, none of the relationships are statistically significant. As such, the hypothesis of a significant relationship between RDU and firm performance in All Companies, GLCs and NGLCs is rejected. The overall findings are consistent with the literature, for example, Davidson et al (1996) and Dalton et al (1998) found the relationship to be mixed in signs and not statistically significant.

d) NEX to performance

There is a mix of positive and negative relationships of NEX to firm performance in all groupings of companies in all years. For All Companies, none of the links are statistically significant. For GLCs, the link for ROA in 2003 is statistically significant
at a 10% confidence level. This shows that there is a limited support of the hypothesis of a significant relationship between NEX and firm performance in GLCs. The result for NGLCs show that the only significant relationship is in 2003 (ROA and ROE) in which the confidence levels are at 5% and 1% respectively. The hypothesis of a significant relationship can therefore be accepted for NGLCs in 2003. The hypothesis of a relationship between NEX and performance is rejected in All Companies in all years and for GLCs and NGLCs for 2001 and 2002. The hypothesis is partly supported in GLCs and NGLCs in 2003.

Overall, the findings show that there is limited evidence on either the direction or significance of changes in NEX on performance measured by ROA and ROE. The inconsistencies of relationships of NEX to performance suggest that their presence on Malaysian boards does not correlate to performance. The results indicate that, although NEX is in the majority on the board, they have not significantly influenced firm performance. This is probably due to their lack of business skills and acquaintances to carry out their duties because they are not fully involved in the management of companies (Patton and Baker, 1987). As a result, they are not effective or capable of discharging their duties to enhance performance and this may indicate that their presence on the board of directors merely provides checks and balances rather than business expertise.

The results are consistent with a study by Goodstein et al (1994), which suggested that large numbers of NEX could stifle strategic actions and entail unnecessary monitoring on management, with a consequent reduction in firm performance. The findings are also consistent with Hermalin and Weisbach (1991), and Mehran (1995), who found that there were no significant relationships between NEX and firm performance. However, the significant positive correlations between NEX and performance in 2003 for NGLCs are consistent with the findings from the U.S (Rosenstein and Wyatt, 1990, and Lee, et al 1992, Pearce and Zahra, 1992, and Ezzamel and Watson, 1993), who reported a positive relationship between the proportion of NEX on the board and performance.

e) BUM to performance

For All Companies, there is a mix of negative (2001 and 2003) and positive links (2002) of BUM to performance except for NGLCs, where the relationship was consistently negative. The only statistically significant relationships are negative relationships between ROE and ROA for All Companies and NGLCs in 2003. These relationships are significant in All Companies at a 5% level for both ROE and ROA, at a 5% level for ROA and 1% level for ROE in NGLC. Therefore the hypothesis of a significant relationship between BUM and firm performance in All Companies and NGLCs is supported only in 2003 and the hypothesis of a significant relationship between BUM and firm performance is rejected in GLCs.
Overall results provide little support for the hypothesis of a significant relationship between BUM and firm performance. The results, with most of the directions being negative, suggest that this variable has a depressing impact on performance. This could possibly be due to bumiputra directors focusing on the short-term (Hofstede, 1991) or exhibiting high uncertainty avoidance, which is reflected in their values of non-assertiveness, conflict avoidance and uneasiness in dealing with ambiguities and uncertainties (Abdullah, 1992). As such, their presence on boards might just be window-dressing to maintain good relationships with the government (Gomez and Jomo, 1997). This finding is consistent with previous Malaysian studies on the subject of BUM (Haniffa, 1999).

f) SGO to performance

For All Companies, there is a mix of negative (2001 and 2002) and positive links (2003) between SGO and firm performance. As none of the relationships are significant, the hypothesis of a significant relationship between SGO and firm performance in All Companies is rejected. In GLCs, there is a consistent negative relationship between SGO and performance (both ROA and ROE) in all three years. However, the relationship is only statistically significant (10%) in 2001 for ROA. For NGLCs, there is a mix of positive (2001 and 2003) and negative links (2002) for ROA and ROE. However, only the 2003 link for ROA shows a statistically significant relationship. Therefore, the hypothesis of a significant relationship between SGO and performance in NGLCs is only supported in 2003(ROA).

Overall results show that SGO has a very limited impact on firm performance. Only ROA has a statistically significant relationship in certain groupings and the relationship is not consistent in all years. Other groupings and years showed no relationships between SGO and performance. The negative and positive relationships in GLCs and NGLCs respectively, indicate that SGO in GLCs lowers firm performance, while in NGLCs, performance increases. This suggests that in GLCs, as they are representing shareholders (the government), their decision-making might have been dictated in accordance with government policies in which profits might not be a priority and hence firm performance would be weaker. However, in NGLCs, their role as board members might give the company access to vital networks and sources of information within government, which might enhance performance.

g) FAM to performance

For all groupings of companies, there is a mix of negative and positive associations between FAM and ROA and ROE. None of the links are statistically significant. This indicates that the hypothesis of a significant relationship between FAM to performance in All Companies, GLCs and NGLCs are rejected.
Although not statistically significant, the relationship between FAM and firm performance is more noticeable in NGLCs (four out of six instances compared to two out of six instances). This is consistent with a number of more recent empirical studies in South Korea (Chang et al 2003; Joh, 2003) and Hong Kong (Carney and Gedajlovic, 2002) which show that a controlling family ownership is associated with better performance and a study by Barontini and Caprio (2005), that family control is positively related to firm value and operating performance. However, overall results are consistent with Filatotchkov et al (2005), who found that publicly traded firms that are controlled by a family do not outperform other companies and therefore the hypothesis that FAM is a strong determinant of firm performance in Malaysian firms is rejected.

h) POL to performance

For All Companies, there is a mix of positive (2001 and 2003) and negative links (2002) between POL and firm performance for ROA. Similarly, ROE also has a mix of negative (2001) and positive links (2002 and 2003). None of the associations are statistically significant. This indicates that the hypothesis of a significant relationship of POL and firm performance in All Companies is rejected. In GLCs, a consistent negative association is observed in all years between POL and performance (ROA and ROE). All the links are insignificant except for ROA in 2002 (10% level). This indicates that the hypothesis of a significant relationship between POL and firm performance in GLCs is only supported in ROA for 2002. For NGLCs, there is a consistent positive relationship between POL and performance (ROA) in NGLCs. For ROE, there is a mix of negative (2001) and positive (2002 and 2003) associations. Two of the links (ROA in 2003 and ROE in 2002) are statistically significant at a 10% and 5% confidence level. Hence, the hypothesis is supported for the two periods.

Overall, there are some differences between the results of GLCs and NGLCs. This is because there is a consistent negative link for GLCs but positive link for NGLCs in five out of the six tests. These differences are consistent with the resource dependence theory as politicians are valuable to NGLCs as they provide access to resources and networks within government (Gomez and Jomo, 1997). However, since there are no consistent statistically significant results, the hypothesis of a significant relationship between POL and firm performance proved largely unfounded across all groups and years.

i) LSALE to performance

There is a consistently positive association between company size (proxied by LSALE) and firm performance in all groups of companies for all years. For All Companies, the links are statistically significant for ROA in all the years under study,
while for ROE, the links for 2002 and 2003 are statistically significant at a 1% and 5% confidence level respectively. These results indicate that in All Companies, company size is statistically significant to performance in five out of six tests. In GLCs, three of the links (ROA 2001 and 2002) and ROE (2002) have a statistically significant relationship at 1%, 5% and 1% respectively. These results indicate that in GLCs, company size is statistically significant to performance in three out of six tests. NGLCs also demonstrate a good association, as four of the links (ROA and ROE for 2002 and 2003) have a statistically significant relationship at 1% and 10% respectively. These results indicate that in NGLCs, company size is statistically significant to performance in four out of six tests.

Overall results show that a statistically significant relationship was observed in twelve out of eighteen tests. All the statistically significant results had company size positively linked to performance. Specifically, the results show that seven out of nine tests are statistically significant for ROA and five out of nine tests for ROE. Therefore, it can be concluded that a company’s size is a strong determinant of firm performance in Malaysian firms.

**j) INDUS to performance**

There is a consistently positive association between INDUS and firm performance in All Companies and in all years both for ROA and ROE. However, none of the links is statistically significant. As for GLCs, there is a consistently positive link between INDUS and ROA. Two of the links are statistically significant in 2001 and 2002 (both at 1% levels). For ROE, there is a mix of negative (2001) and positive (2002 and 2003) relationships. The relationship is statistically significant in 2002 (5% level). The positive and statistically significant links show that INDUS is associated to performance in GLCs for the period. These results indicate that in GLCs, INDUS is statistically significant to firm performance. However, for NGLCs, there is a consistently negative association of INDUS to ROA in all the years and for ROE, a mix of positive (2001 and 2003) and negative (2002) association. But none of the links is statistically significant. The results indicate that INDUS is not statistically significant to performance for NGLCs in all years. However, results show that INDUS is a stronger determinant of firm performance in GLCs.

**12. Major findings of the study**

There are eight differences found on the corporate governance structures of GLCs and NGLCs in the preliminary univariate analyses. Therefore, the first hypothesis on the existence of significant differences between the corporate governance structures
of GLCs and NGLCs is supported. The six other variables did not conform to the first hypothesis. However, results of the multivariate analyses show that there is no empirical evidence found for differences in the relationship between corporate governance structures and performance in GLCs and NGLCs. Both groups show no consistency in the presence of statistically significant relationships across the groupings, performance measures of ROA and ROE and in all years. These inconsistent results indicate that there is no stability in statistical relationships throughout the three-year period. The implications of inconsistent results from a three-year view for corporate governance research is that empirical research may reach conclusions based on statistically significant results at a point in time which is only relevant for this historic context and may not persist. Therefore, the findings suggest that notwithstanding the eight differences in governance structures, the observed differences in the performance of GLCs and NGLCs could not be explained in terms of their corporate governance structures. As a result, the relationship between corporate governance structures and performance of GLCs and NGLCs does not differ much in the post-AFC from 2001 to 2003. Hence, the hypothesis stating that there is a significant relationship between corporate governance structures and the performance of GLCs, NGLCs and All Companies in the post-AFC period from 2001 to 2003 is rejected.

These findings are consistent with the ambivalent position on the relationship between performance and corporate governance variables observed by the literature, which exhibits conflicting arguments about the direction of relationships and empirical results that are extremely variable. Since there are no apparent relationships between governance structures of GLCs and NGLCs to performance, the position is consistent with governance mechanisms that had been laid down are not specifically meant to enhance performance, but to monitor the management and regulating companies to be more transparent and accountable in their actions in order to gain investors’ confidence.

The current findings are also consistent with Suto (2003), who suggested that an absence of a clear link between corporate governance structures and the performance of GLCs were caused by weakened governance structures, probably caused by government interference and policies. The problem statement also argued that GLCs in Malaysia are less efficient than NGLCs because GLCs directors are generally appointed from the ranks of SGO, BUM and POL. Since such directors often lack business insight and their investment decisions may be stimulated by social rather than commercial benefits, their appointment was thought to contribute to the low performance of GLCs. However, this study shows that these variables have no statistically significant adverse impact on performance.
13. Limitations of the study

This study has a number of limitations. The first is the mechanism of finding match-pair of GLCs and NGLCs for the sample. Despite there being over nine-hundred companies in Bursa Malaysia, the search for reasonably matched companies greatly restricted the coverage of the sample and means that it is far from truly random. Further, although every effort was made to produce an accurate match-pair, the process inevitably involves compromise. For example, there was no exact pair in terms of paid-up capital. Although the effect on performance is probably minimal, an inaccurate match-pair could jeopardise the mechanism of the sample selection itself. A second limitation is the possibility of omitted variables in the regression model. Such omitted variables could possibly better predict and explain firm performance. Finally, the study examined the relationship of corporate governance structures to firm performance in a three years’ study. A longer study could have produced more comprehensive results. However, in spite of these limitations, this study makes some unique contributions to the growing body of literature on the relationship between corporate governance structures of GLCs and NGLCs and firm performance.

14. Summary

This study has examined the relationship between corporate governance structures and performance of GLCs and NGLCs in Malaysia in the post-AFC period beginning 2001 to 2003. The findings show that out of fourteen independent variables used in the univariate analyses, there were eight statistically significant differences between the corporate governance structures of GLCs and NGLCs in a sample of matched pairs. Therefore, the first hypothesis on the existence of significant differences between the corporate governance structures of GLCs and NGLCs is supported. However, multivariate analysis of the sample, with one exception, did not reveal any consistent statistically significant association between a range of variables related to corporate governance structure and performance measured by ROE and ROA in either GLCs, NGLCs or the combined sample. The exception was BSZ, but this was only with ROE and not ROA. Hence, the second hypothesis stating that there is a significant relationship between corporate governance structures and the performance of GLCs, NGLCs and All Companies in the post-AFC period from 2001 to 2003 is rejected. These results suggest that the observed differences in the performance of GLCs and NGLCs are not explained in terms of their corporate governance structures and that governance structures in GLCs and NGLCs probably provide appropriate monitoring on a company’s management, rather than improving performance.
Although there was no consistent relationship between corporate governance variables and performance across the period, a number of variables had a statistically significant relationship in one period or for ROE or ROA, but not both. This variability and the more general findings are consistent with the contradictory literature on the possibility of an association between corporate governance structures and performance. This study also found that the relatively poor performance of GLCs in Malaysia, which has been associated with government influence on the board structures, such as the appointment of BUM, SGO and POL were basically unfounded because these variables have no statistically significant adverse impact on performance. As such, the under-performance of GLCs in Malaysia could have been caused by other factors.

References


Treasury Circular (1993), Ministry of Finance, Kuala Lumpur


1. Introduction

The global market is progressively moving towards knowledge and technological innovation, seeking methods to boost competitive advantage. For years, intellectual capital (IC) has been synonymous with intangible assets and knowledge capital. In the last two decades, numerous scholars have contributed and analysed the role and the relevance of the IC to the performance and value creation capabilities of the companies (see: Edvinsson and Malone, 1997; Roos et al, 1997; Sveiby, 1997 and 1998; Sullivan, 1998; and Teece, 2000).

A general notion of intangible value was detected, in the early 1980s, where huge IC research movements began. In the mid-1980s the ‘information age’ took into consideration the gap between book value and market value expanding for several companies (see: Bontis, 2001). However, it was only in the late 1980s that specialists and professionals constructed statements of IC measurement models. Moving towards the 1990s, several models were developed to evaluate and report the IC stock of a company to other parties, whilst, in the late 1990s, scholars have adopted IC as a popular subject and extensively discussed it in relevant conferences and other contexts.

The importance of IC has been revealed and discussed by many scholars. Handy (1989) mentioned that intellectual assets are three or four times the tangible book value of a company. Van Burren (1999) suggested that intangible assets represent more than two-thirds of the corporate value, whilst Osborne (1998) indicated that 80 per cent of a company’s value is not tangible. Furthermore, traditional accounting measures are inadequate to determine the real value of the company, in the so-called “knowledge-based society” (see: Stewart, 1991). Thus, valuing IC is vital towards enabling companies to appreciate their exact corporation value.
IC frameworks have been generated for understanding IC. These frameworks classify IC assets, and their elements are categorised and understood. A variety of classification schemes classify IC into four categories: (a) human capital; (b) external (customer-related) capital; (c) internal (structural) capital; and (d) innovation capital. Several studies have been conducted to identify and measure IC, as well as to relate IC with a company’s performance (see: Bontis, 1996, 1998, 1999, 2000; Edvinsson, 1997, 2000, 2002; and Edvinsson and Malone, 1997).

Firms are likely to produce IC performance measures due to the realisation of the importance of IC. The management, based on these measures, should be in place to provide motivation for employees and to behave in a way that will increase the firm’s IC value. Once companies identify particular items of IC, they can categorise and invest in human capital, customer capital, structural and innovation capital and enhance corporate value. The main conclusion lies in the fact that if companies invest in the parameters that were discussed above, they would achieve a higher competitive advantage towards an antagonistic market. If IC steers in the right direction and companies take advantage of its elements, not separately and independently, but as topics linked to each other, they could succeed in business performance.

As for Greece, to our knowledge, no study has, up until now, examined the relationship between these four elements with business performance. This was one of the motivations used to conduct this study in the Greek environment.

The remainder of the paper is structured as follows: The theoretical background and the model development are presented in section two, whilst methodology follows in section three. Section four presents the empirical results, followed by section five with concluding remarks and suggestions for further research.

2. Theoretical Background

Productive scenarios, in the competitive economy, state that conventional tangible resources and financial capital do not support the competitiveness of a company and its systems. On the other hand, sustainable and strong competitive results appear increasingly from the control and exploitation of knowledge resources (Stewart, 1997; Teece et al., 1997, Teece, 2000). Theoretically, some new concepts have been introduced in the economic and management theory to analyse and assess the importance of knowledge resources. In particular, throughout the last decade, several scholars have contributed and analysed the role and the relevance of IC in the performance and value creation of the organisations (Edvinsson and Malone, 1997; Sveiby, 1997; Roos et al., 1997, 1998; Sullivan, 1998; Teece, 2000).

Moreover, the fact that tangible assets are losing control over IC has been revealed by the growing volume of business knowledge (O’Donnell et al., 2000). In this con-
text ‘intellectual capital is emerging as a highly complex and dynamic fuzzy activity set, embracing language, experiences, history, culture, processes, understandings, interactions, interpretations, routines, information, data and knowledge’ (O’Donnell et al., 2000, p. 187).

More recently, literature suggests the value-creation capabilities of other organisational systems, national, regional, local production systems of companies and public organisations to be relevant to such resources (see: Edvinsson, 2002; Bontis, 2004; Tallman et al., 2004; Bounfour and Edvinsson, 2005; Schiuma et al., 2005). On the other hand, several theoretical contributions have underlined the strategic importance of intangible resources for the value creation capabilities at regional systems’ level. That seems to materialise the need: (a) to build approaches and tools more oriented towards projects and management processes; and (b) to enhance, with major empirical evidence, the relationship between knowledge resources, value creation capabilities and competitiveness (see: Bontis, 2004; Bounfour and Edvinsson, 2005; Pulic, 2005).

2.1. The Conceptual Thinkers

In 1987, Itami and Roehl revealed the effect of invisible assets on the management of companies in Japan, while Sveiby (1986) addressed the dimension of human capital in IC. These studies resulted in a rich and exciting view for rating a company based upon the experience and knowledge of its employees. However, according to Sullivan (2000), even though the idea of IC was widely used in literature, it did not become accepted until the late 1990s, since by the mid-1990s notably, work was entirely descriptive without relating the generalised comments to an organisational background (Bontis, 1998).

Sveiby (1986) is the founder of the ‘Swedish Movement’ in knowledge management and IC. Sveiby acknowledged the need to measure human capital, and in 1989, he recommended a theory for measuring knowledge capital by dividing it into three categories: (a) customer capital; (b) individual capital and (c) structural capital. Moreover, St. Onge (1996) is considered as the originator of the concept of customer capital in the field of learning and knowledge management. He was interested in both human and structural capital, and first identified that the first two capitals should focus on customer-related interests, into new capital, namely customer capital. The St. Onge model shows that joining human, structural, and customer capital in one essence creates long-term profits.

Research on intangible assets has been reported in different directions (both theoretical and empirical). Lev and Sougiannis (1996) valued and calculated intangibles and then correlated those values with financial measures. Edvinsson (1997) identified the so-called ‘hidden values’ of a company and developed an IC management model. He was inspired by Sveiby’s (1994) concepts of reporting on external capital,
and re-labelled these intangible assets as IC. The study of Bontis (1998) showed the association between IC and business performance, whilst that of Bontis et al (2000) revealed that human, customer and structural capital have a positive relationship with business performance, apart from industry type (service and non-service organisations). Chen et al (2004) also observed that there is an important association between the four elements (customer, innovation, structural and human capital) of IC and business performance. Furthermore, they proved that there is a remarkable relationship between the elements of IC. Finally, Tseng and Goo (2005) explored the relationship of IC with value creation. They used three financial methods for value creation and analysed the relationship between the four elements of IC (human, structural, customer and innovation) and corporate value. The empirical findings showed that a positive relationship exists between IC and corporate value.

2.2. Definitions of IC

The Organisation for Economic Co-operation and Development (OECD, 1999) categorised intangible assets into two categories: (a) organisational capital; and (b) human capital. Both comprise IC, which is a broad term, considered synonymous with a corporation’s intangible assets. Skandia explains IC as the knowledge, the skills and the technologies that create a competitive advantage and therefore, financial gains. According to Tseng and Goo (2005) there is a common lack of clear definition which would appropriately describe the term IC. However, they seem to adopt Stewart’s (1997) definition, also widely recognised, that IC has been formalised, captured, and enforced, so as to generate an advanced value to the organisation. Moreover, Olve et al (1998) regarded IC as a market premium, and Bontis (1998) considered it as the result of effective experience and knowledge against a company’s data.

IC accounting began reflecting the true value of companies due to their ‘disrespect’ for intangible resources, including ‘human capital’, while, at the same time the traditional financial balance sheets were gradually seen more as inadequate (see: Edvinsson and Malone, 1997; Sveiby, 1997; Petty and Guthrie, 2000).

2.3. Components of IC

IC is not detached. Several scholars allocated IC into four categories: (a) human capital; (b) customer capital; (c) structural capital; and innovation capital (see: Edvinsson and Malone, 1997; Roos et al, 1997; Stewart, 1997; Sveiby, 1997; Chen et al, 2004 and Tseng and Goo, 2005).

Human capital (HC) represents the individual knowledge asset of a company’s employees (Bontis et al, 2001). Roos et al (1997) argued that employees generate IC through their competency, their attitude and their intellectual alertness. Even though
employees are considered the most important corporate asset in a learning organisation, they are not owned by the organisation. Similarly, Hudson (1993) described HC as a combination of four factors: (a) culture; (b) experiences; (c) inheritance; and (d) attitude. Edvinsson and Richtner (1999) supported the view that HC are the skills, relationship ability and standards; the employee works on transforming an individual into a combined know-how and a more long-term organisational capital. In essence, HC is the brainpower of the employee inside a company.

Customer capital (CC) is the knowledge that is developed for the customer-supplier relationship when conducting business. Bontis (1999) represented customer capital as the potential of a company with regard to its customers. Supplementary explanations by Saint-Onge (1996) have included ‘relational capital’, which covers the knowledge, surrounded by all relationships in an organisation from customers, competition, suppliers, associations or the government. Moreover, Edvinsson and Richtner (1999) showed that CC is the value of a customer’s position, customer relationships and customer potential, and finally, Chen et al (2004) argued that CC cannot be achieved without HC.

Structural capital (SC) contains ‘all the non-human storehouses of knowledge in organisations, which include databases, organisational charts, process manuals, strategies, routines and anything whose value to the company is higher than its material value’ (Bontis, 1999, pp. 92). Additionally, Roos et al (1997) defined SC as the knowledge inside a company when employees stop working. In accordance with Bontis (1998), if organisations have inadequate procedures and systems, IC will not reach its prospective peak. Another important feature of SC is its capacity to compose, allowing IC to be calculated and managed, at any stage of an examination, (Bontis, 1998).

Innovation capital (InnC) is defined as the ability to build on previous knowledge and generate new knowledge. According to Tseng and Goo (2005) InnC includes the ability of a company to develop new products, as well as any innovative ideas. In order for a company to retain its competitive advantage, innovation should play a significant role in the company (Chen et al, 2004). Innovation is achieved through a mixture of employees, rational policies, culture and techniques. According to the OECD (1997), innovation is the implementation of a new resolution (for the enterprise, the industry or the world, aiming at enhancing its competitive position, its performance, or its know-how. Innovation could be technological or organisational. In this direction, technological products (goods or services) or process innovation include new technological products and processes and significant technological improvements.
2.4. Research Model and Research Hypothesis

This study separates intellectual capital into four categories: (a) human capital; (b) customer capital; (c) innovation capital; and (d) structural capital. Based on a study by Bontis et al (2000) it develops and explores a conceptual model of the relationship between IC components and business performance (see Figure 1). The value add of this research model is the incorporation of InnC.

Figure 1. Research Model

Model 1 All Listed Industries

Human Capital  \rightarrow  Innovation Capital

Customer Capital  \rightarrow  Structural Capital

H2 (+)  \rightarrow  H4 (+)

H3 (+)  \rightarrow  H5 (+)

Business Performance

Note (+): positive relationship

The scope of this research is to explore the inter-relationships between the independent variables: human capital, customer capital, structural capital, innovation capital and the depended variable which is the business performance, for both service and non-service industries, and to examine if the results are confirmed in the Greek context. The variables’ definition and conceptualisation and the hypotheses’ development have been based on a previous study conducted by Bontis et al (2000).

Thus, the following hypotheses have been structured:

**H1**: Human Capital (HC) is positively associated with Customer Capital (CC).

**H2**: Human Capital (HC) is positively associated with Structural Capital (SC).

**H3**: Customer Capital (CC) is positively associated with Structural Capital (SC).

**H4**: Innovation Capital (InnC) is positively associated with Structural Capital (SC).

**H5**: Structural Capital (SC) is positively associated with business performance (PERF).
4. Empirical Research

4.1. Questionnaire Developing

Relevance and accuracy are the two crucial principles a questionnaire should meet. The questionnaire relevancy ensures that no unnecessary, wrong or irrelevant questions are asked. To avoid an irrelevant questionnaire, and for the purposes of the research, Bontis’ (1997) questionnaire is the basic questionnaire structure in use. Accuracy assures that the information is reliable and valid. In order to avoid inaccuracy, simple, understandable and unbiased questions were designed to obtain accurate answers from respondents. In designing the questionnaire, as Andrews (1984) suggested, a 7-point Likert scale (strongly disagree to strongly agree) was used.

Overall, 67 items were set out in the questionnaire, to satisfy the five constructs (four constructs relating to intellectual capital plus one construct for performance). The items included in the survey were first developed from Bontis (1997), in a past research, but because other concepts were also highlighted through the literature review of the study, items of the questionnaire were re-adjusted and interpolated. See Table 1 for a summary of these items.
Table 1 Summary of survey items

<table>
<thead>
<tr>
<th>Human Capital</th>
<th>Customer Capital</th>
<th>Structural Capital</th>
<th>Innovation Capital</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC1 Competence ideal level</td>
<td>CC1 Customers generally satisfied</td>
<td>SC1 Lowest cost per transaction</td>
<td>IC1 Employees’ average in innovation good</td>
<td>PERF1 Industry leadership</td>
</tr>
<tr>
<td>HC2 Succession training programme</td>
<td>CC2 Reduce time to resolve problem</td>
<td>SC2 Improving cost per revenue</td>
<td>IC2 Good average of sales of new products</td>
<td>PERF2 Future outlook</td>
</tr>
<tr>
<td>HC3 Planners on schedule</td>
<td>CC3 Market share improvement</td>
<td>SC3 Increase revenue per employee</td>
<td>IC3 Firm supports employees’ innovation</td>
<td>PERF3 Profit</td>
</tr>
<tr>
<td>HC4 Employees cooperate in teams</td>
<td>CC4 Market share is highest</td>
<td>SC4 Revenue per employee is best</td>
<td>IC4 Management is supportive to innovation</td>
<td>PERF4 Profit growth</td>
</tr>
<tr>
<td>HC5 No internal relationships</td>
<td>CC5 Longevity of relationships</td>
<td>SC5 Transaction time decreasing</td>
<td></td>
<td>PERF5 Sales growth</td>
</tr>
<tr>
<td>HC6 Come up with new ideas</td>
<td>CC6 Value added service</td>
<td>SC6 Transaction time is best</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC7 Upgrade employee’s skill</td>
<td>CC7 Customers are loyal</td>
<td>SC7 Implement new ideas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC8 Employees are bright</td>
<td>CC8 Customers increasingly select us</td>
<td>SC8 Supports development of ideas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC9 Employees are the finest in industry</td>
<td>CC9 Firm is market-oriented</td>
<td>SC9 Engage more ideas in industry</td>
<td>IC5 Firm is incentive</td>
<td></td>
</tr>
<tr>
<td>HC10 Employees are satisfied</td>
<td>CC10 Meet with customers</td>
<td>SC10 Firm is efficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC11 Employees perform their best</td>
<td>CC11 Customer info disseminated</td>
<td>SC11 Systems allow easy info access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC12 Recruitment programme comprehensive</td>
<td>CC12 Understand target markets</td>
<td>SC12 Procedures support innovation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC13R Big trouble if individuals left</td>
<td>CC13 Capitalise on customer’s wants</td>
<td>SC13 Not too far removed from each other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC14R Rarely think actions through</td>
<td>CC14R Launch what customers don’t want</td>
<td>SC14 At atmosphere is supportive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC15R Act without thinking</td>
<td>CC15 Confident of future with customer</td>
<td>SC15 Do not share knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC16R Individuals learn from others</td>
<td>CC16 Feedback with customer</td>
<td>SC16R Do not share knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC17 Employees express opinions</td>
<td>CC17R Bring down to other’s level</td>
<td>SC17R Do not share knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC18 Get the best out of employees</td>
<td>CC18R Bring down to other’s level</td>
<td>SC18R Do not share knowledge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: R – reverse coded items
4.2. Data collection

A survey was designed to suit the intellectual capital concept as well as business performance within the Greek context. 319 firms took part in the research, including all sections of industries. Given that the study focuses on specific levels of each company, each respondent was required to complete the questionnaire as an employee.

Table 2 Description of respondents

<table>
<thead>
<tr>
<th>Service</th>
<th>Observations</th>
<th>Per cent (%)</th>
<th>Cumulative Per cent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care</td>
<td>2</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Media</td>
<td>10</td>
<td>8.4</td>
<td>10.1</td>
</tr>
<tr>
<td>Travel and Leisure</td>
<td>6</td>
<td>5.0</td>
<td>15.1</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>2</td>
<td>1.7</td>
<td>16.8</td>
</tr>
<tr>
<td>Utilities</td>
<td>6</td>
<td>5.0</td>
<td>21.8</td>
</tr>
<tr>
<td>Banks</td>
<td>4</td>
<td>3.4</td>
<td>25.2</td>
</tr>
<tr>
<td>Insurance</td>
<td>2</td>
<td>1.7</td>
<td>26.9</td>
</tr>
<tr>
<td>Financial Services</td>
<td>6</td>
<td>5.0</td>
<td>31.9</td>
</tr>
<tr>
<td>Technology</td>
<td>9</td>
<td>7.6</td>
<td>39.5</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>47</td>
<td>39.5</td>
<td></td>
</tr>
</tbody>
</table>

| Non-Service              |              |              |                         |
| Oil and Gas              | 1            | 0.8          |                         |
| Chemicals                | 2            | 1.7          | 2.5                     |
| Basic Resources          | 11           | 9.2          | 11.7                    |
| Construction and Materials | 12       | 10.1         | 21.8                    |
| Industrial Goods and Services | 11     | 9.2          | 31.0                    |
| Food and Beverage        | 12           | 10.2         | 41.2                    |
| Personal and Household Goods | 17     | 14.3         | 55.5                    |
| Retail                   | 6            | 5.0          | 60.5                    |
| Sub-Total                | 72           | 60.5         |                         |
| Total                    | 119          | 100.0        |                         |

| Gender                   |              |              |                         |
| Male                     | 87           | 73.1         |                         |
| Female                   | 32           | 26.9         | 100.0                   |
| Total                    | 119          | 100.0        |                         |

| Age                      |              |              |                         |
| Under 30 years           | 33           | 27.7         |                         |
| 31 – 40 years            | 56           | 47.1         | 74.8                    |
| Over 40 years            | 28           | 25.2         | 100.0                   |
| Total                    | 119          | 100.0        |                         |

| Years of experience      |              |              |                         |
| Under 5 years            | 53           | 44.5         |                         |
| 6–10 years               | 45           | 37.8         | 82.3                    |
| Over 11 years            | 21           | 17.7         | 100.0                   |
| Total                    | 119          | 100.0        |                         |
A total of 119 completed questionnaire replies were studied covering the 17 sections of the Athens Stock Exchange (ASE) including: Banks, Basic Resources, Chemicals, Construction and Materials, Financial Services and Technology, Food and Beverage, Health Care, Industrial Goods and Services, Insurance, Media, Oil and Gas, Personal and Household Goods, Retail, Telecommunications, Travel and Leisure, and Utilities. Most of the respondents are leading firms in the different segmentations.

Executives from 119 of the companies returned completed questionnaires. The response rate was 37.3 per cent. A description of the respondents is given in Table 2. About 39.5 per cent of respondents were from service industries (e.g. Health Care, Travel and Leisure, Banks, Financial services, etc.). The remaining 60.5 per cent were from non-service industries (e.g. Constructions and Material, Industrial Goods, Oil and Gas Chemicals, etc.). All respondents were from the ASE.

4.3. Scale reliability and validity

The internal consistency of the questionnaire was assessed by examining the coefficient alpha scores. All Cronbach alpha values were high in each of the constructs (human, structural, customer, innovation capital and performance), ranging (service and non-service) from 0.7521 and 0.7186 in human capital, 0.7948 and 0.8112 in structural capital, 0.8676 and 0.8269 in customer capital, 0.7340 and 0.7653 in innovation capital, and 0.9167 and 0.9374 in performance, respectively. Table 3 highlights each of the constructs tested for reliability and its loading values.
Table 3 Statistical Highlights

<table>
<thead>
<tr>
<th>Human Capital (HC)</th>
<th>Structural Capital (SC)</th>
<th>Customer Capital (CC)</th>
<th>Innovation Capital (IC)</th>
<th>Performance (PERF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>Non-Service</td>
<td>Service</td>
<td>Non-Service</td>
<td>Service</td>
</tr>
<tr>
<td>0.7521</td>
<td>0.7186</td>
<td>0.7948</td>
<td>0.8112</td>
<td>0.8676</td>
</tr>
<tr>
<td>Cronbach’s Alpha test for reliability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.7186</td>
<td>0.7948</td>
<td>0.8112</td>
<td>0.8676</td>
<td>0.7340</td>
</tr>
<tr>
<td>Remaining Items with loading values &gt; 0.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.7948</td>
<td>0.8112</td>
<td>0.8676</td>
<td>0.7340</td>
<td>0.9167</td>
</tr>
<tr>
<td>0.8269</td>
<td>0.7340</td>
<td>0.9167</td>
<td>0.9374</td>
<td></td>
</tr>
<tr>
<td>0.7653</td>
<td>0.7340</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.9167</td>
<td>0.7340</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.9374</td>
<td>0.7340</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HC3 0.7325 HC6 0.8411 SC7 0.7641 SC7 0.8531 CC5 0.8093 CC1 0.7855 IC1 0.7688 IC1 0.8010 PERF2 0.8620 PERF1 0.7962
HC8 0.7932 HC7 0.7402 SC9 0.7419 SC8 0.7120 CC6 0.7181 CC10 0.8651 IC2 0.7986 IC2 0.8364 PERF3 0.8697 PERF2 0.8244
HC10 0.7210 HC10 0.8160 SC10 0.7598 SC9 0.7789 CC7 0.7966 CC11 0.8894 IC3 0.8650 IC3 0.8476 PERF4 0.9174 PERF3 0.9049
HC11 0.7863 HC11 0.8421 SC11 0.8045 SC10 0.7089 CC10 0.7700 CC14 0.7652 IC4 0.8248 IC4 0.8749 PERF5 0.8652 PERF4 0.9247
HC20 0.7855 HC20 0.7238 SC12 0.8352 SC15 0.7331 CC11 0.7049 IC5 0.7422 IC5 0.7661 PERF6 0.8147 PERF5 0.8650
CC14 0.7183 PERF7 0.8632 PERF6 0.8873
CC16 0.8369 PERF8 0.8470 PERF7 0.9533
CC17 0.8158 PERF9 0.8204 PERF8 0.8644
PERF10 0.9066 PERF10 0.8594
4.4. Confirmatory Factor Analysis

To test the structure of the questionnaire, a Confirmatory Factor Analysis (CFA) was performed in order to allocate the quality of adjustment of the model to the data. CFA tests the hypotheses about the data structure that result from the literature review or are justified from earlier researches. CFA evaluates the overall model and the measurement model. The results from this analysis showed that the model fit the data reasonably well (Chi-square $X^2 = 110.98$; $df = 47$; Normed Chi-square $X^2/df = 2.36$; Root Mean Square Error of Approximation (RMSEA) = 0.066; Comparative Fit Index (CFI) = 0.91; Goodness of Fit Index (GFI) = 0.88, in service, and $X^2 = 136.08$; $df = 72$; $X^2/df = 1.89$; (RMSEA) = 0.079; CFI = 0.86; GFI = 0.95, in non-service industries). Both Joreskog and Sorbom (1993) and Kline (2005) state that good Comparative Fit Index and Goodness of Fit Index values should be considered greater than 0.9 (0 equals a poor fit and 1 equals a perfect fit). In this study the values in both service and non-service industries are around 0.9 but relatively close to the preferred values. Zikmund (2003), on the other hand, argues that values of CFI and GFI less than 0.9, do not necessarily mean that the model has a poor fit, because values are close to the preferred value (see Table 4).

Table 4 Overall Fit Measures

<table>
<thead>
<tr>
<th>Measures of Fit</th>
<th>Service Industries</th>
<th>Non-Service Industries</th>
<th>Preferred Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$</td>
<td>110.98</td>
<td>136.08</td>
<td></td>
</tr>
<tr>
<td>Df</td>
<td>47</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>$p$ – value</td>
<td>0.01</td>
<td>0.02</td>
<td>&lt; 0.05 $^a$</td>
</tr>
<tr>
<td>$X^2/df$</td>
<td>2.36</td>
<td>1.89</td>
<td>&lt; 3 $^b$</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.066</td>
<td>0.079</td>
<td>&lt; 0.1 $^c$</td>
</tr>
<tr>
<td>CFI</td>
<td>0.91</td>
<td>0.86</td>
<td>&gt; 0.90 $^d$</td>
</tr>
<tr>
<td>GFI</td>
<td>0.88</td>
<td>0.95</td>
<td>&gt; 0.90 $^d$</td>
</tr>
</tbody>
</table>


For the evaluation of the model, there is a test of the loadings with the use of t-values and the Construct Reliability and the Variance Extracted are calculated. According to Joreskog and Sorbom (2001), if all or some of the variances are ordinal, it is false to estimate the variances or Pearson correlation and it is wrong to be analysed with the Maximum Likelihood or Generalised Least Squares methods. Consequently, as many researchers suggest (Bollen and Long (1993), Hair et al (1995), Joreskog and Sorbom (2001)), for the Confirmatory Factor Analysis, Weighted Least Squares was used. For this study, Confirmatory Factor Analysis was tested for its validity and adjustment of data to each factor separately. The results of the Confirmatory Factor
Analysis for testing the Construct Reliability and Variance Extracted, on each factor of the four constructs separately are presented in Table 5 below:

<table>
<thead>
<tr>
<th>Factors</th>
<th>Human Capital</th>
<th>Structural Capital</th>
<th>Customer Capital</th>
<th>Innovation Capital</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct Reliability</td>
<td>&gt; 0.70</td>
<td>0.8752</td>
<td>0.8870</td>
<td>0.9219</td>
<td>0.8993</td>
</tr>
<tr>
<td>Variance Extracted</td>
<td>&gt; 50%</td>
<td>66.8%</td>
<td>68.9%</td>
<td>64.8%</td>
<td>71.3%</td>
</tr>
<tr>
<td>Construct Reliability</td>
<td>&gt; 0.70</td>
<td>0.8948</td>
<td>0.8712</td>
<td>0.8967</td>
<td>0.9147</td>
</tr>
<tr>
<td>Variance Extracted</td>
<td>&gt; 50%</td>
<td>70.5%</td>
<td>66.2%</td>
<td>76.4%</td>
<td>72.1%</td>
</tr>
</tbody>
</table>

*a Hair et al (1995)

According to Hair et al (1995), the composite reliability is tested with two measurements, construct reliability and variance extracted. The preferred values for reliability is over 0.70, thus, according to Table 5, all values are accepted, because the values fluctuate from 0.8752 to 0.9634 for service industries, and from 0.8712 to 0.9676 for non-service industries. The higher the values of variance extracted, the more representative the price index. This norm is supplemental to the reliability of the model structure and the preferred value is over 50%. For that reason all values are acceptable, since they overcome the 50% rule (see Table 5).

4.5. Structural Equation Model

The Structural Equation Model (SEM) is a common and extremely powerful multivariate statistical analysis technique that includes specialised versions of a number of previous analysis methods as special cases. SEM is employed for building and, more often, testing statistical models. As in all multivariable techniques, the sample size plays a very important role for the estimation and interpretation of the results, as it provides a basis for estimating the error sampling. Generally, it is accepted that the minimum size of the sample that provides the applicability of the use of the technique should overcome 100 units. In this survey the size is 119.

After the tests, the results showed the error variances on each construct, which are presented in Tables 6 and 7. In the same tables, the overall formations of the model are presented, which will be evaluated according to the data that came out of the survey.
Table 6 Path diagram to Service Industries

- Human Capital
  - HC3: 0.4634
  - HC8: 0.3708
  - HC10: 0.4802
  - HC11: 0.3817
  - HC20: 0.383

- Innovation Capital
  - IC1: 0.7688
  - IC2: 0.7986
  - IC3: 0.8692
  - IC4: 0.8248
  - IC5: 0.7422

- Customer Capital
  - CC10: 0.4089
  - CC11: 0.3622
  - CC12: 0.2518
  - CC13: 0.3197
  - CC14: 0.4491

- Structural Capital
  - SC7: 0.4802
  - SC9: 0.3708
  - SC10: 0.3817
  - SC11: 0.4802
  - SC12: 0.7422

- Performance
  - PERF2: 0.8620
  - PERF3: 0.8605
  - PERF4: 0.8649
  - PERF5: 0.8352
  - PERF6: 0.8345
  - PERF7: 0.8345
  - PERF8: 0.8345
  - PERF9: 0.8345
  - PERF10: 0.8345
Table 7 Path diagram to Non-Service Industries
As the rationality and validity of the intellectual capital model has been verified through the research, a path analysis should be performed to indicate the real relationship between the intellectual capital constructs. Consequently, a path analysis was performed to calculate the statistical significance of the path coefficients, which are standardised betas. The results for both service and non-service industries are presented in Table 8.

### Table 8 Structural Equation Model Results

<table>
<thead>
<tr>
<th>Path from</th>
<th>Human Capital</th>
<th>Human Capital</th>
<th>Customer Capital</th>
<th>Innovation Capital</th>
<th>Structural Capital</th>
<th>Average R-Squared for Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>to</td>
<td></td>
<td>Customer Capital</td>
<td>Structural Capital</td>
<td>Structural Capital</td>
<td>Structural Capital</td>
<td>Performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(H1)</td>
<td>(H2)</td>
<td>(H3)</td>
<td>(H4)</td>
<td>(H5)</td>
</tr>
<tr>
<td>Model 1</td>
<td>0.771</td>
<td>0.264</td>
<td>0.421</td>
<td>0.588</td>
<td>0.197</td>
<td>46.35%</td>
</tr>
<tr>
<td>Service Industries</td>
<td>(17.83)</td>
<td>(4.92)</td>
<td>(4.98)</td>
<td>(7.91)</td>
<td>(5.66)</td>
<td></td>
</tr>
<tr>
<td>Model 2</td>
<td>0.701</td>
<td>0.280</td>
<td>0.561</td>
<td>0.573</td>
<td>0.122</td>
<td>40.98%</td>
</tr>
<tr>
<td>Non-Service Industries</td>
<td>(21.86)</td>
<td>(9.17)</td>
<td>(12.33)</td>
<td>(12.87)</td>
<td>(11.35)</td>
<td></td>
</tr>
<tr>
<td>Comparison (see Figure 2)</td>
<td>Similar Values</td>
<td>Almost Identical Values</td>
<td>Service Industries Values</td>
<td>Almost Identical Values</td>
<td>Non-Service Industries Values</td>
<td>Lower</td>
</tr>
</tbody>
</table>

**Notes**

Top numbers are standardised beta coefficient

$t$ – statistic in brackets

*significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

$H1$ tested the association connecting Human Capital and Customer Capital. The end results show a positive relationship, as the beta coefficient indicates a substantive, positive and significant relationship, 0.771 (at $p < 0.01$) for the service sample and 0.701 (at $p < 0.05$) for the non-service sample (similar prices) (see Table 8). Furthermore, $H2$ tested the association between Human Capital and Structural Capital. Finally, the conclusions also illustrate a positive and significant beta coefficient, by 0.264 (at $p < 0.01$) for the service sample and 0.280 (at $p < 0.01$) for the non-service sample (almost identical prices).

Moving on, a positive significant beta coefficient for both the service sample 0.421 (at $p < 0.05$) and non-service sample 0.561 (at $p < 0.05$) (value of service industries lower), confirmed the $H3$ (Customer and Structural Capital relationship). $H4$ tested the relationship between Innovation Capital and Structural Capital, and according to the results in both samples, there is a positive beta coefficient for the service industries 0.588 (at $p < 0.01$) and 0.573 (at $p < 0.01$) for the non-service industries (almost
Finally, $H5$ tested the association between Structural Capital and Business Performance. The results show a positive coefficient of 0.197 (at $p < 0.05$) for the service sample and 0.122 (at $p < 0.10$) for the non-service sample (value of non-service industries lower) (see Table 8).

Furthermore, the explanatory power ($R^2$s) for both models was relatively strong at 46.35 per cent for the service sample and 40.98 per cent for the non-service sample. Figure 2 illustrates the finalised models, service and non-service industries.

**Figure 2** Service and Non-Service models

Model 1 Service Industries ($N=47, 39.5\%$)

Model 2 Non-Service Industries ($N=72, 60.5\%$)

Notes

- Significant at $p < 0.10$
- Significant at $p < 0.05$
- Significant at $p < 0.01$
5. Conclusions

The results of this study are as expected and significantly supportive to the hypotheses developed. The first hypothesis proved that the relationship between HC and CC is positive and therefore important to both service and non-service industries. This relationship is one of the strongest in the overall model as its value is over 0.7 to both industry types. This is an indicator, where senior managers understand the importance of HC, and realise that they should appreciate its dynamic. In other words, as long as companies have proficient and competitive staff, the more the employees would understand the customer’s needs. As Housel and Bell (2001) indicated, employee IC gives a company the power and flexibility to rapidly position new knowledge and generate an ever-changing range of products and services. Therefore, industries invest in developing a strong and loyal relationship, underlying a strong CC.

HC also proved a positive relationship with SC, regardless of the industry type, with almost identical values. This implies that both service and non-service industries have the capability to transform individual employee knowledge into knowledge with structural roots. Paraphrasing, the IC in both industry types absorbs the large capital expenditure. Both models indicate a significant path investing HC and SC, implying that the Greek context is allocating much attention to the employees who contribute to the structure of any organisation. Explicitly, if HC is not effectively managed, it reduces other intellectual ability (Edvinsson and Malone, 1997).

The relationship between CC and SC is lower in service industries as opposed to non-service industries. The results show a positive and relatively significant relationship. These findings imply that non-service industries invest much more in becoming customer focused and market driven, and if companies invest more in this area, they would eventually ‘create efficient organisational routines and processes that service their clientele well’ (Bontis et al., 2000, p. 98).

The results linking InnC with SC show that there is a strong positive relationship. The values exceed 0.5, indicating that there is a strong relationship to both service and non-service industries. In addition, there is a significant relationship for both models. These findings reflect the fact that Greek companies underline the importance of InnC.

Finally, the results relating to the fifth hypothesis show that the relationship between SC and business performance is positive and relatively important to non-service industries. On the other hand, they prove to be less substantive in service industries. These findings imply that if companies aggregate their efforts to unlock the organisational knowledge, finally they will gain a competitive lead. This competitive advantage transforms into higher business performance and corporate value.

The results of this study have similarities and contra-distinctions to previous studies of Bontis et al. (2000), Chen et al. (2004) and Tseng and Goo (2005). In general,
though, the findings appear as cornerstones in the Greek context and more particularly in listed companies. The main footings lay in the fact that if companies invest in the parameters that have been discussed above, they will achieve a higher competitive advantage towards the competitive market.

The results of this study are based on the reports and findings from the listed companies in the ASE. Nevertheless, the findings indicate that there are dissimilarities in the way companies cope with this vital issue. Diverse ideas that create competitive advantages to an organisation, and the creation of new ways for companies to evaluate their performance, with precise results, should drive organisations to undertake crucial activities to exploit and apply new and advanced business performance measurement methods. All these are occasioned by a new factor accompanying these methods, the IC.

Issues that are presented below could allow new insights for further study: (a) where should IC be presented (i.e. annual reports, Balance Sheets, other accounting papers)? (b) in what way should IC be measured? (c) does high IC suggest higher business performance? (d) who are the best members of a company’s staff to measure and manage intellectual capital?

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Hudson, W. (1993), Intellectual capital: How to build it, enhance it, use it, New York: John Willey


1. Introduction

The sustainability and the vulnerability of the financial system, as a significant part of an economic system, depend, to a large extent, on macroeconomic conditions in the country. Factors such as domestic demand, GDP growth rates, GDP per capita, inflation, human resources investment, level of unemployment, debt sustainability, trade, international dependence, environmental effects and natural resources, are all crucial for the analysis of long-term economic growth in general, together with insurance market growth, which is an important part of the financial market.

Understanding the basic economic structure in the country, especially one which is passing through high and difficult structural reforms in every part of the system, should be a basic building block for an economic analysis, complemented by more detailed information about the macroeconomic policies in the country. It is well-known that balance of payments, structure of imports and exports, GDP growth rates, interest rates and government budgets, are important sources of information in analysing the status of the economy and the possibilities it has in terms of growth.

The relationship between the macroeconomic environments in transition countries and financial sector development has widely been discussed in economic literature. There seems to be a general consensus on the existence of a close link between the two; stable macroeconomic conditions play an important role in enhancing the financial sector. Theoretical debate on the sequencing of economic reforms and the experiences of many countries with reforms in the financial sector underscored the importance of attaining macroeconomic stability prior to financial liberalisation. Dornbusch and Reynoso (1993) are of the view that if financial liberalisation is carried out in an unstable macroeconomic set-up, characterised by high and unstable inflation and large

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fiscal and current account deficits, the reforms are likely to increase the adjustment cost and its duration by further destabilising the economy. Macroeconomic stability, if accompanied by high and sustained economic growth, makes it much easier to successfully implement financial sector reforms by reducing the transition period and cost of the process.

Due to law reforms and improved economic conditions in the last couple of years, the insurance market in Montenegro is recognised as a growing market. However, the global turmoil negatively affects the demand for insurance services, terms of raising capital, and volume of investments, as well as the role of insurance companies as institutional investors in financial markets of all countries, including Montenegro. This added to the reasons for analysing the importance of macroeconomic preconditions for the development of the insurance market in Montenegro, stressing specific characteristics of the country going through many structural reforms, on the one hand, and an undeveloped insurance market on the other.

The insurance market in Montenegro has been characterised by significant fluctuations caused by a different economic growth and development rate. The leading place in the insurance market in developed countries, according to total realised insurance premiums, belongs to life insurance. Insufficient economic development in Montenegro, the inadequate level of knowledge, as well as the lack of trust in people, are the main causes for obligatory insurance to have the highest portion of the total portfolio of the insurance market in Montenegro.

Encompassing legal regulations in the insurance sector and the foundation of an independent regulatory institution – The insurance Supervision Agency – strengthening competitiveness through foreign insurance companies’ entrance onto the Montenegrin insurance market, being relatively positive economic trends in the last couple of years, provided a moderate growth and insurance market development in Montenegro in 2008.

2. Overview of macroeconomic indicators in Montenegro in recent times

The macroeconomic environment in every economy is one of the crucial factors for stimulation of economic activity. When analysing the economic situation in Montenegro in the last couple of years, some important macroeconomic movements in a positive direction can be seen: very high GDP growth rate, record FDI inflow, high level of budget surplus, unemployment rate with declining tendency and low inflation etc.

In 2008, Montenegro did not dramatically experience the effects of the global economic crisis, as many economies in transition did. The reasons for this are many; the
most important being an insufficient financial market development, lack of developed
financial instruments, such as sub-prime credits, financial derivates etc. Economic
activity growth continued in 2008 and, according to the Ministry of Finance in Montenego, the estimated effectuated GDP was 3.34 billions euro, which represents 8.1 per
cent of real economic growth, compared to the previous year. Factors that positively
affected GDP growth rate were industrial production growth, increased volume of
activity in construction and architecture, and growth in the service sector.

The following Table presents the main relevant macroeconomic indicators to
describe the economic environment in Montenegro in the last few years.

<table>
<thead>
<tr>
<th>Table 1: Key macroeconomic indicators in Montenegro from 2003 to 2008</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>GDP, millions, euro</td>
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<tr>
<td>GDP per capita, euro</td>
</tr>
<tr>
<td>GDP, real growth, %</td>
</tr>
<tr>
<td>Deficit/Surplus in % of GDP</td>
</tr>
<tr>
<td>Cost of living, % p.a.</td>
</tr>
<tr>
<td>Current account, millions, euro</td>
</tr>
<tr>
<td>Gross external debt, millions, euro</td>
</tr>
<tr>
<td>Net FDI, millions, euro</td>
</tr>
</tbody>
</table>

Source: Monstat, Central bank of Montenegro

The cost of living, in December 2008, increased by 7.2 per cent compared to
December 2007. The inflation measured by the consumer price index amounted to
6.9 per cent at the annual level. The average annual consumer prices rate recorded
a growth of 7.4 per cent. The prices of goods recorded an increase of 7.2 per cent,
while the prices of services rose by 7.3 per cent at the annual level. The highest an-
nual growth had been recorded in June of 2008 (11.4 per cent), and afterwards there
was a gradual decrease in inflation, leading to an annual increase in the cost of living
in December to 8.5 per cent. The annual rate of inflation declined until December
2008, when an increase was recorded because the price of electricity increased. It is
certain that the tendency of decreasing inflation will continue in the following year,
under effects of negative turmoil.

According to preliminary data of the Ministry of Finance, the budget of Montenego with government funds, in 2008 recorded a growth of current revenues which
amounted to EUR 1,282.9 million or 38.4 per cent of the estimated GDP. According
to the plan, these revenues were 2 per cent higher whilst in relation to 2007 they

2 In July 2008, Monstat published the Consumer Price Index (CPI), which is an internationally comparable measurement of inflation.
increased by 13.8 per cent. Consolidated expenditures of the budget and government funds in 2008 amounted to EUR 1,243.9 million or 37.3 per cent of GDP. Compared to the recorded revenues, budgetary expenditure was 3 per cent lower. In 2008, the budget of Montenegro recorded a surplus of EUR 39 million or 1.2 per cent of the estimated GDP. Public debt is still at a low level and amounted to 894.7 million or 28.6 per cent of estimated GDP at the end of year. In the public debt structure, 49 per cent is domestic. The situation with Montenegro, being one of the countries slightly indebted, could be evaluated very favourably under the current circumstances of a global financial crisis, which leaves enough space for the government’s corrective measures and actions if necessary.

The most important characteristics for balance of payment fluctuation in 2008 were the relatively high current account deficit, mainly generated by a goods’ deficit, and extremely large FDI inflow. According to the Central Bank of Montenegro data, the current account deficit amounted to 975.7 million euro or 29.22 per cent of GDP. FDI inflow reached a record amount in 2008. According to preliminary data, net FDI inflow (inflow minus outflow) amounted to EUR 567.6 million in 2008, which is 8.1 per cent more than in the same period of 2007. Besides the global financial crises and prices of shares downfall, the capital and financial account in the previous year recorded a significant inflow of foreign capital, reaching an exceptional level of net FDI inflow about 17 per cent of GDP. Montenegro is in the top south-east European countries, according to its share of FDI in GDP. Under financial crisis pressure a decrease in the current account deficit can be expected, as well as in FDI inflow. Negative global turmoil cannot bypass Montenegro as a small and open economy. Even although they were not generated in Montenegro, some consequences will be perceived.

Montenegro experienced very large increases in deposits, credits, total assets of banks, as well as the participation of low quality assets being at an acceptable level. For example, at the end of December, the total banks’ assets amounted to EUR 3,298.5 million and they recorded a 10.9% increase at the annual level. In relation to the estimated GDP amount for 2008, banks’ assets amounted to 98.8% whilst in 2007, they amounted to 106%. Total deposits amounted to EUR 1,950.9 million in December 2008 and were 6.7% lower in relation to the end of 2007. The maturity structure of total deposits improved in favour of time deposits. At the end of 2008, loans amounted to EUR 2,769 million or 23.3% more in relation to the end of 2007. The loans/deposits ratio at year end 2008 amounted to 1.42, which represents deterioration, in relation to year end 2007 when it amounted to 1.07. The loans to deposits ratio, increased by total borrowing, were more favourable, amounting to 0.97 at year end 2008. Comparing data by sectors, we can see a growth in loans in all sectors, with different growth rates (from 0.7% to 61.7%). Observed by the banks, all banks recorded an increase in loans in relation to December 2007. The increase ranged from 4.9% to 38.8%. However, looking at data at the end of 2008, the real expectation on the deterioration of these indicators is confirmed. The capital market continues in-
creasing its stock indexes tendency. In this area, the crisis appeared before the global financial turmoil, with the influence of many domestic problems making it worse. It is improbable that significant reanimation of the capital market will happen before the global negative turmoil ceases.

A positive growth trend is seen on the labour market. Table 2 gives a synthetic overview of the indicators of the labour market in the period 2004–2008.

Table 2: Employment and wages in Montenegro

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed persons, thousands, average</td>
<td>143.4</td>
<td>144.3</td>
<td>150.8</td>
<td>156.4</td>
<td>166.2</td>
</tr>
<tr>
<td>Unemployed persons, thousands, average</td>
<td>65.1</td>
<td>54.5</td>
<td>43.2</td>
<td>34.3</td>
<td>29.5</td>
</tr>
<tr>
<td>Unemployment rate, in %, average</td>
<td>27.7</td>
<td>30.3</td>
<td>29.6</td>
<td>19.3</td>
<td>18.5</td>
</tr>
<tr>
<td>Average gross monthly wages, Euro</td>
<td>303</td>
<td>326</td>
<td>433</td>
<td>497</td>
<td>609</td>
</tr>
<tr>
<td>Net monthly wages, real, in %</td>
<td>9.1</td>
<td>6.7</td>
<td>12.0</td>
<td>15.0</td>
<td>13.4</td>
</tr>
</tbody>
</table>

Source: Monstat, Employment Agency of Montenegro

The number of employed persons in 2008 amounted to 166,221 on average, which is 6.3% more than the average recorded in the same period in the previous year. The total number of employed persons in December 2008 was 169,160 or 6.2% more in relation to December 2007. According to Employment Agency records, there were 28,366 registered unemployed at year end 2008, which is 9.9% less than in the same month of the previous year. In 2008, the number of registered unemployed reached 29,535 or 14.1% less than in the previous year.

According to Monstat data, the average salary in Montenegro in 2008 was EUR 609 or 22.5% more than the average salary in the previous year. The average salary without taxes and contributions amounted to EUR 416 and was 23.1% higher in relation to the previous year. The average salary in December 2008 recorded a growth of 17.5% in relation to the average salary from December 2007, while salary without taxes and contributions recorded a growth of 17.8% amounting to EUR 443. The highest level of salaries without taxes and contributions are recorded in financial intermediation as being about 850 euro. The highest growth of salaries without taxes and contribution is seen in the education sector – 38.7 per cent, health and social work – 37.8 per cent, public administration and social insurance – 33.5 per cent, which is a consequence of the extremely low basis recorded in the first half of the preceding year, because a considerable improvement in salaries can be seen in the second half of 2007.

All the presented macroeconomic data gave a clear idea on how the economic situation in the last couple of years has been improved, which is an incentive for the

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3 Data on employment and unemployment differ depending on the methodology of collecting data. Presented data is the registered unemployment of the Employment Agency, officially published by the Montenegrin Statistical Office. However, from 2006, Monstat published employment data on the basis of a Labour Force Survey which is distinguishable from that presented.
development of the Montenegrin economy. This was definitely a stimulus for some segments of the financial market to continue their development process expanding their services. The insurance market in Montenegro has definitely routed its activity to exploit that expansive environment, which is a significant precondition for its development.

3. Montenegrin insurance market development in 2008

The Law reforms and relatively improved economic conditions in the last few years in Montenegro have caused the growth and improvement of the insurance market. The trend of the development of the insurance industry primarily depends on economic growth, whilst the strict regulations and other regulatory rules profoundly impact the improvement and development of the insurance market of every country.

The new Insurance Law, published in the Official Gazette of Montenegro in 2006, has precisely set down the conditions and the methods of enforcement for the insurance industry, as well as the supervision of the functioning of the insurance sector. Until 2007, two laws were adopted: The Law on obligatory insurance in traffic and the Law on bankruptcy and liquidation of insurance companies. At the beginning of 2008, and in accordance with the Insurance Law, the Agency for insurance began its operations as a regulatory body, which not only protects the interests of those insured and other users of insurance, but also contributes to a reduction in system risk and uncertainty through respecting international standards, the principle of transparency and business competitiveness. The adoption of sub-legal enactments which regulate the activities of representation and brokerage, actuarial reporting, calculation of mathematical reserves and other technical reserves and fixing solvency margins etc. are prime examples of the efforts being made towards the harmonisation of insurance regulations consistent with EU directions and the principles of the International Association of Insurance Supervisors.

The total effected insurance premiums on the Montenegrin market in 2008 was close to 60.2mil€ i.e. an increase of 18% compared to 2007 (51mil€). On the Montenegrin insurance market in 2008, 11 insurance companies and one reinsurance company were active. As with previous years, the dominant position on the market was held by “Lovcen osiguranje”, which together with the company “Montenegro osiguranje”, achieved close to 80% of the total annual premiums in 2008. The smallest participation in the insurance market was achieved by the “Delta Generali osiguranje” with 0.8% participation of total premiums.

4 Agency for insurance supervision in Montenegro „Report on the insurance market conditions for 2008”
If we look at the fact that the two largest insurance companies in Montenegro had 94% of total gross premiums in 2006, it can be concluded that the Montenegrin insurance market will have a tendency to further expand and develop with the arrival of new companies which will innovate market offers and strengthen its competitiveness.

If we consider the contribution of gross premiums in the gross domestic product, in 2007 it stagnated. The gross premium, as a percentage of GDP in 2007 and 2008 (insurance penetration), is approximately valued at 1.8%. Taking into account that Montenegro has a population of 620,000 citizens, we can conclude that the insurance premium per capita (insurance density) increased in 2007 (when it was 82.3€) i.e. in 2008 its achieved growth was 17.9% and reached 97€. Although the insurance density shows continuous growth in the last few years, it is necessary to point out that the gross premium per capita in Montenegro in the amount of 97€, is far behind the average in EU countries.

![Insurance density graph 2002-2008](image)

Graph 1: Gross premium per capita growth in 2002 – 2008

Life insurance in Montenegro since 2004, when its involvement in the general insurance portfolio was less than 2 per cent, recorded significant growth in both the charged insurance rate and involvement in the entire insurance portfolio. The involvement of life insurance in the entire insurance portfolio in 2008 was nearly 12 per cent, in other words, 7.2 million € was charged in the name of insurance rates. In 2007, the charged rate of life insurance was nearly 6 million €, which indicates a growth

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5 Gross insurance premium per capita in the EU is 2,100 €.
of about 20 per cent in 2008. If we take into consideration the data of total premium in 2007 (51 million €), it can be said that life insurance involvement in 2008 did not change drastically in relation to the previous year.

The standard of living of citizens, the insufficiently developed consciousness about the advantages that life insurance offer in relation to other kinds of available assets’ investment, and the general economic conditions in Montenegro which have recently shown a positive trend, are the main reasons for insufficient participation in life insurance on the Montenegro market. There is also the fact that life insurance premiums per capita in 2008 were only 11.6€ and their involvement in GDP, in the same year, only 0.2 per cent.

Non-life insurance premiums achieved a growth rate of 18 per cent in 2007 and realised a value of nearly 53 million €. Non-life insurance per capita was over 85 € in 2008; in other words the coefficient of non-life insurance density increased to more than 13 € in relation to the previous year, as the non-life insurance premiums per capita was 72€. Non-life insurance premiums represented 1.6 per cent of Montenegro’s GDP in 2008.

Obligatory insurances dominate the entire portfolio of Montenegro non-life insurance. With respect to the previous period, a soft trend reduction with this kind of insurance with an average rate of nearly 2 per cent per year can be seen. Obligatory insurances greatly implicate the insufficient development of insurance in Montenegro. The charged obligatory insurance premium in 2008 was nearly 26 million €. Property insurances achieved a premium of more than 17 million in 2008 whilst from other non-life insurances, especially accident insurance, a premium of 10 million € has been charged.

Relation between life and non-life insurance in Montenegro, 2008

Graph 2: Life and non-life insurance share in total portfolio in 2008
Business activities of the various insurance companies in Montenegro in 2008, according to the life and non-life insurance premiums received, can be seen in the following chart:

Graph 3: Amounts of life and non-life insurance premiums by insurance companies in Montenegro, 2008

The foundation of a company that manages voluntary pension funds “Penzija plus” is an important innovation on the Montenegrin insurance market. In July 2008, the management company of the Voluntary pension fund “Atlas penzija”, received permission from the Agency for Securities for the formation of the fund “Penzija Plus”, whose founders are “Atlas Grupa”, “Unija poslodavaca” (Employers Union) and the “Savez Sindikata Crne Gore” (Union of Montenegrin Syndicates) NLB Montenegro bank and Prvo Penzijsko drustvo (PPD) from Ljubljana. At the beginning of August last year they concluded a contract on the formation of a Joint Stock company for management of the pension fund ‘NLB penzija’

The formation of these companies can be an important stimulus for the further expansion of the insurance market in Montenegro. By the Adoption of the Law on voluntary pension funds in 2006, the citizens of Montenegro have the opportunity, besides safe saving through life insurance, to ensure additional funds through long-term saving for later years.

The indicators mentioned for the Montenegrin insurance market show that the insurance sector achieved significant growth from 2006 to 2008. The participation of life and obligatory insurance in the complete portfolio clearly led to the conclusion
that the insurance market in Montenegro significantly achieved above average results compared not only to developed countries, but also to the neighbouring countries of Slovenia and Croatia. Knowing that the financial crisis will not by-pass Montenegro, there are different opinions about its further prospects.

4. Expected macroeconomic fluctuations in the future and its influence on the insurance market in Montenegro

The Global financial crisis will unfortunately bring a significant slow down in economic growth in the next year, but according to many prognoses a recession is unlikely.

It is definite that the recent high growth was based on high foreign investment inflows. As a consequence, growth expectations have had to be revised, even although the government still expects growth of around 2% in 2009. That expectation is premised on the number of investment projects being implemented, mostly in tourism and hydro-plant construction. If those plans fall down, it is hard to see how recession can be averted6.

It cannot be doubted, however, that the banking sector faces serious problems and challenges, and that it will be reflected in the next period. These problems are due to the drop in the prices of their assets and a lack of investment opportunities in general. In the following year, it is certain that credit supply will be limited, and it will be more expensive. On the one hand, the expenditures of financing the economy will be costly and on the other, it will negatively affect aggregate demand, bringing as a consequence lagging real sector growth. The construction industry will also be an industry to suffer from the negative effects of this crisis. By all accounts there will be less buyers of real estate from abroad, on the one hand, and less domestic buyers on the other, because the most probable outcome will be that there will be less credit for real estate, and it will be more expensive.

The decrease in aggregate demand, availability of loans and foreign capital inflow will consequently bring about a deterioration of liquidity in the economy. This could affect debt servicing causing a delay between firms, as well as toward banks, leading to the bad quality of assets’ growth. Certainly, the government will have to look around very carefully and follow each step of the economy. It probably means that the level of intervention will be higher than that before. Fiscal policy should be adapted to the current situation and should act contra cyclic. Montenegro’s level of debt is at a very low level so there is room for additional borrowing to provide financial support.

The government is in a strong position because it had general budget surpluses over the past couple of years. It thus disposes of some resources with which to address the adjustment problem. Fiscal policy is practically the sole option on account of Montenegro using the euro as its legal tender. Fiscal policy, however, does not have much room for manoeuvre because it offers little scope for spending cuts. Indeed, expenditures will have to increase in order to meet the higher bills for social and welfare transfers. Exports have plummeted owing to the low price of aluminium, the major export item. Imports have also declined for want of credit and foreign financing. In the past few years, the current account deficit was as high as 40% of GDP; it will have to shrink quite dramatically this year and in the medium-term. In that context, the key factor governing the country’s economic prospects is the performance of the tourism sector. If tourism has a bad season and slumps markedly, the economy will have no other resources for growth. If, in addition, the planned foreign investments fail to be achieved, prolonged recession will be quite probable.

The following Table gives forecasting results on the most relevant macroeconomic indicators.

<table>
<thead>
<tr>
<th>Table 3: Predictions on some macroeconomic indicators for 2009–2011</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>2009</td>
</tr>
<tr>
<td>GDP, millions, euro</td>
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<tr>
<td>GDP, real growth, %</td>
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<tr>
<td>Gross fixed capital form, %</td>
</tr>
<tr>
<td>Deficit/Surplus in % of GDP</td>
</tr>
<tr>
<td>Consumer prices, % p.a.</td>
</tr>
<tr>
<td>Current account, millions, euro</td>
</tr>
<tr>
<td>Unemployment rate, average, %</td>
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</tbody>
</table>

Source: WIIW forecast

All the above macroeconomic expectations will have a huge indirect influence on financial market performances, as well as on the insurance market.

The Montenegrin insurance market is not directly affected by the financial crisis as the companies operate in the developed markets. Insurance companies in Montenegro, due to clear regulatory and insufficient development of the financial market, as well as the insufficient competency of financial managers, have a conservative attitude to placements and investments in the capital market. The asset value of insurance companies in 2008 was 97.2 million € and increased by 18% in relation to 2007.

The asset structure of insurance companies in Montenegro, in 2007 and 2008, is shown in the following chart, which clearly shows the domination of non-risk types of assets in total assets:
The most important problems of the insurance industry, due to the existence of the
global crisis, will be the decline in investment yield on the financial market, decrease
in purchasing power of citizens and due to a decrease in the lending activities of the
banks, which will negatively influence the further growth of the insurance market.\footnote{Banks’ credit activity was considered as an important engine of the insurance market, because with the approval of real estate credit, as well as for credit for cars, insurance premiums have been significantly increased (insurance in the case of death, household insurance, AO insurance and all-risk insurance of cars)}

Due to the increase of overall uncertainty, the decrease of personal income of
citizens, the functionality of the financial market and general economic movements,
it is reasonable to expect an increased demand for life insurance policies’ surrender,
difficult payment of premiums and a decrease in total premiums paid for voluntary insurances. In other words, with an optimistic view, due to the decrease in general security, there is a possibility that a certain number of citizens who experienced losses from stock exchange dealings, will turn to secure investments such as, for instance, life insurance.

The position of individuals towards the future, i.e. their concern regarding health protection and their existence during old age, largely depends on the position of the government towards the dynamics and direction of the development of the insurance
industry. The adoption of the Law on Voluntary Pension Funds in 2006 gave the possibility to Montenegrin citizens to obtain, besides secure savings through life insurance, also additional monetary assets through long-term savings for old age.

Moreover, if the long-term development strategies of both compulsory and voluntary insurances are not clearly defined, a change in the position of citizens towards security and protection cannot be expected, nor can significant positive trends of the insurance development.

Surely, a decelerated growth of the insurance industry should be expected in the forthcoming period, bearing in mind the lack of information to citizens, living standards, and macroeconomic movements in the country. Sustainable growth and macroeconomic stability, on the other hand, will have a certain impact on the insurance market growing.

5. Conclusions

Due to the effects of the financial crisis and possible recession, during 2009 it is possible to expect negative economic trends that will be reflected in a complete fall in economic activity, fall in GDP, employment, capital inflow, a fall in budgets’ income and consequently, on the insurance market in Montenegro.

Uninformed citizens, standard of living, and macroeconomic movements in the country, will affect the fall in demand for certain insurance products. Possibilities of additional financing for insurance companies will be limited due to a fall in their shares.

On the other hand, through the introduction of new insurance products on the Montenegro insurance market, reduction in business operation costs, through investing the free resources of insurance companies into safe types of properties, as well as a restrictive control of the entire insurance sector, it is possible to sustain market competitiveness and a moderate growth in total insurance premiums, in other words to provide the protection of the insurance market in Montenegro from the effects of a financial crisis, which would enable its further, moderate improvement. Knowing that the financial balance and position of insurance companies depends on the evaluation of solvency in times of financial turbulence, it is very important that there is an adequate process of management and control of relations between assets and obligations of insurance companies in the coming period.

Considering that life insurance is a type of safe long-term saving, it is possible to optimistically forecast a moderate increase in contributions of life insurance in total insurance premiums (or sustainment at the 2008 level). From the other side, respecting the fact that citizens are no longer in a position to easily borrow money through consumer and mortgage loans, and the fact that the consumer’s capability
will significantly decrease due to the recession, pessimistic forecasts indicate a fall of total insurance premiums and a worsening in the short-term of the basic indicators of the insurance market in Montenegro.

In the end, it can be concluded that the insurance sector is not completely exposed to the crisis and that dramatic changes within the insurance industry are not expected. The global financial crisis should not have a direct negative impact on the insurance market, or on the insurance companies, but an indirect impact that can be identified through a decrease in consumer power and a reduction in banks’ credit activities etc. Stimulation of further growth of the insurance market in Montenegro is possible to accomplish by establishing macroeconomic stability, better education of citizens on the necessity and significance of insurance, as well as the capability of insurance companies to maintain their liquidity and solvency. A regulated, improved and perspective insurance market increases the confidence of citizens and companies, enabling more quality allocation of capital and strengthening of the financial market, which consequently affects the entire economic development of Montenegro.

6. Literature

Swiss Re Sigma study: “World insurance in 2007: emerging markets leading the way”


Agency for insurance supervision of Montenegro: “The report on insurance market conditions for 2008”


B. Marović and V. Njegomir: «World financial crisis and its impact on insurance and reinsurance», 2009


Croatian bank society, HUB analysis: „Subprime“ crisis and dilemmas on financial regulations”, no.12, 2008


Second Quarter Report 2008, Swiss Re, Zurich, Switzerland, 2008


“The Law on voluntary pension fundsZakon o dobrovoljnim penzionim fondovima”, Official Gazette Republic of Montenegro no.78/06, Podgorica, 2006

Insurance Law of Montenegro, Official Gazette Republic of Montenegro no.78/06
1. Introduction

In transition economies the design of institutional structures to create an environment conducive to sustainable long-term growth under a market-oriented economic system is often given precedence. State-owned enterprise (SOE) reform requires sound choices for institutions effecting property rights and the legal and regulatory environment for business to ensure the separation of government from SOE management and successful restructuring in corporate form (Beim and Calomiris, 2001; Zhu, 1999; OECD, 2000; Jevons Lee, 2001). A focus is the forms taken by the corporate control and governance structures of these enterprises.

In China the Company Law of the People’s Republic of China, the Securities Law of the People’s Republic of China, and the Code of Corporate Governance for Listed Companies in China provide the core of the institutional framework for corporate regulation. Given its importance it is unsurprising that China has actively evolved and strengthened its regulatory environment, with over 300 laws and directives being issued that relate to the securities and futures markets since 1992 (Lin, 2004).

The priority given to market-based governance reflects its positive association with productivity improvement and thus real output growth. Its impact on the internal efficiency with which individual firms utilise resources is the focus (Tadesse, 2004). Inappropriate institutional choices may allow former SOEs, now listed and privatised, to engage in corporate governance practices associated with misappropriation or
misuse of state and corporate assets; a perceived problem in the case of China. Questions exist as to the quality and effectiveness of China’s institutional choices. Agency problems have emerged in relation to ownership structure and corporate governance in China following the creation of the Shanghai and Shenzhen stock exchanges in 1990 and 1992, respectively. Weaknesses are evident in the independence of boards of directors, and high levels of ownership concentration impact negatively on minority shareholders (Lin, 2004). The ineffectiveness of listed companies’ supervisory boards is also apparent (Dahya, Karbhari, Xiao and Yang, 2003; Lin, 2004).

This paper develops and tests a set of hypotheses related to the impact of the corporate control and governance characteristics on the quality and independence of corporate policy decision making of listed, non-financial-sector Chinese companies. The first set of characteristics is the level of concentration in and type of ownership. The second set relate to the composition and independence of the board of directors and supervisory board under China’s two-tier board structure. Of interest are the impact in these companies of high levels of ownership concentration, particularly government and foreign ownership, and the expertise and independence of the two boards. The quality and independence of corporate policy decisions is measured in terms of firm bad debt-to-total asset and bad debt-to-receivables ratios. This study addresses a gap in the literature in relation to the corporate governance outcomes in China of: high concentrations in ownership; and board size and composition.

The structure of the paper is as follows. Section 2 provides a brief review of literature on the nature of institutions, and those central to corporate governance in China. It also develops the set of hypotheses to be tested. Section 3 describes the data and outlines the research methodology. Section 4 presents the results of the analysis and the discussion on these results. Section 5 provides a brief conclusion.

2. Literature and hypotheses

The diversity of structures defined as institutions suggests that assessments of institutional effectiveness need to focus on what institutions do—that is, what is achieved is of interest, rather than what is stated as intended (see McIver, 2006). Institutions of corporate governance impact on resource allocation, and thus economic decisions that are the focus of neoclassical economics and agency theory. A review of particular economic outcomes, including outcomes resulting from corporate policy decisions, allows inferences to be drawn regarding the quality or success of specific institutional arrangements in limiting adverse behaviours (or, alternatively, in promoting beneficial behaviours).

Establishment of institutions ensuring the efficient operation of markets is a key factor in the success of transition economy reforms. Their importance is in setting
the boundaries within which multiple goal-oriented economic agents interact and attempt to optimise their utility or welfare. Institutions embody the rules through which society imposes limitations on decision makers’ freedom of behaviour (Redek and Sušjan, 2005). They define the possible set of economic decisions, and therefore outcomes achievable by a specific economic system (North, 1990; Nelson, 2007). As per Williamson (2000), analysis of the outcomes under the institutions of corporate governance is a study of incentives and contractual relations or, the ‘play of the game’. Under consideration are matters such as board structure and compensation, accounting standards, and transparency and disclosure in corporate reporting.

In the case of China, the core of the institutional framework for corporate governance (gongsi zhili) is comprised of the Company Law of the People’s Republic of China (The Company Law) (proclaimed December 1993, revised 2005), the Securities Law of the People’s Republic of China (The Securities Law) (proclaimed December 1998, revised 2005), and the Code of Corporate Governance for Listed Companies in China (The Code) (issued January 2002 by the CSRC and the State Economic and Trade Commission (SETC), revised 2005). Supporting these are a variety of other laws, including the Audit Law (1994) and Accounting Law (1999).

The government document dealing specifically with corporate governance is The Code. Based on the OECD (2004) OECD Principles of Corporate Governance, its intended role is to provide a set of guidelines or “measuring standard” specifying good practice. This allows companies and their investors to conduct a self-evaluation of whether (or not) good corporate governance is in place. Thus, rather than providing a legally enforceable piece of legislation or regulation, it requires all listed companies in China to “act in the spirit of The Code in their efforts to improve corporate governance” (The Code, 2005).

Consistent with the Company Law, The Code outlines a number of requirements relating to the corporate control and governance characteristics of China’s listed companies. Chapter 2 covers the responsibilities of controlling shareholders with respect to the company and other shareholders. Its intent is that controlling shareholders act in the interest of both the company and minority shareholders, and not to advantage themselves at the cost of these parties. Chapters 3 and 4 of The Code deal with matters related to the board of directors and the supervisory board required under China’s two-tiered board structure. Chapter 3 outlines the duties, responsibilities, composition and independence of the board of directors. Chapter 4 reviews the requirements for the supervisory board, including roles, reporting responsibilities, and requisite skill set. Of principle importance are guidelines re the quality of expertise of members of each of the boards, the independence between the board of directors and the supervisory board, and the ability of the supervisory board to monitor the performance of the company and board of directors.

Clearly China has put in place a set of institutional structures demonstrating a desire to establish an institutional environment conducive to good corporate govern-
ance. However, transition economies such as China’s frequently display weaknesses in this environment in the form of deficiencies in institutional capacity. Thus there is potential for institutional failure, leading these institutions to either discharge or undertake their designated functions inappropriately (Šević, 2005). Inadequate clarification of ownership and control rights prevent enforceability of contractual obligations. Underdeveloped accounting standards and a lack of transparency and disclosure in corporate reporting reduce the effectiveness of corporate governance mechanisms in aligning incentives of managers with those of enterprise owners. Poor accounting and disclosure practices allow recognition of financial performance problems to be hidden or deferred (Šević, 2005). Such systemic deficiencies are likely to be particularly problematic for transition economies, as they act to prevent the “low-cost transacting and credible commitment” required to support the creation of efficient markets (North, 1997).

In China’s case a number of potential deficiencies in institutional capacity may be identified with respect to independence of the board of directors, supervisory board performance, and to corporate ownership and control. In China’s listed companies many are caused by direct and indirect government influence on corporate governance matters (Qiang, 2003). Each is recognisable as an aspect of the agency problem. Thus, the failure of corporate governance institutions at these multiple levels implies that agency problems have not been addressed adequately.

2.1. Board independence and expertise

China adopted a two-tier board system in the early 1990s. This choice was made as a means to promote better governance, in part because many enterprises and their directors were perceived to be engaging in questionable related-party transactions. As noted above, Chapters 3 and 4 of The Code give particular attention to two aspects of these boards. First is independence of directors on the corporate board. Second the qualifications and knowledge of members on the supervisory board.

Since 2003 it has been required that at least one-third of directors on the corporate board be independent. Independence is required from both the listed company employing them and its major shareholders. Additionally their role in the listed company must be limited to that of independent director. It may be argued that independence is important due to its behavioural motivations. Independent directors may work in the best interests of minority shareholders so as to maintain their good reputation within society (Fama and Jensen, 1983). Thus as both larger boards and those with a higher proportion of independent directors will have more individuals with these incentives, corporate policy decision-making may be improved. So, our first set of hypotheses is that:
An increase in the number of board members that are independent in listed Chinese firms will be associated with improved corporate policy decisions and performance.

An increase in the size of the board in listed Chinese firms will be associated with improved corporate policy decisions and performance.

However, while independence from the company is defined in The Code, the effectiveness of the corporate board in China may differ from that of Western corporate boards. This reflects the close connection between controlling investors and the central or provincial government. The government may influence director and senior manager appointments, and/or interfere with the decision-making of a listed firm (Firth, Fung and Rui (2007).

The supervisory board has the responsibility of and duty for oversight of both the board of directors’ and senior managements’ performance under China’s two-tier board structure, and is also required to protect the company’s and stakeholders’ rights and interests. Under The Company Law it has the power to investigate its company’s operating status without interference and to report directly to the CSRC and other related regulatory authorities.

Xiao, Yang and Chow (2004) argue that several key characteristics of its members determine the role of the supervisory board. These include the proportion of supervisors who are insiders and shareholders, and the professional knowledge or work experience of the supervisors. With respect to these final characteristics, the professional knowledge and experience of supervisors would be prerequisite to an ability to identify issues related to financial and managerial performance. Dahya, Karbhari, Xiao and Yang (2003) also highlight the importance of the capacity of the supervisory board to its ability to fulfil its stated functions. In doing so they identify four types of behavioural roles that supervisory boards can engage in, depending on the independence and capacity of the board members. This is based on interviews of supervisory board members to gain insights into the behaviour and functioning of supervisory boards in China. These roles are: honoured guest, friendly advisor, censored watchdog, and independent watchdog. If the supervisory board takes on the role of honoured guest, friendly advisor or censored watchdog, its annual supervisory board report is unlikely to provide useful information to minority shareholders and investors. Thus the role of independent watchdog requires that supervisory board members have the necessary capacity in terms of knowledge and experience to act with independence and expertise. Logically those supervisory boards that have a higher number of members with appropriate professional knowledge or work experience should be in better position to improve corporate policy decision making. Larger supervisory boards may also be better able to ensure that they have a combination of members with the requisite set of skills and/or experience. This leads to our second set of hypotheses:
H_{2A}^\text{a}: \text{An increase in the number of supervisory board members with professional knowledge or work experience in listed Chinese firms will be associated with improved corporate policy decisions and performance.}

H_{2B}^\text{b}: \text{An increase in the size of the supervisory board in listed Chinese firms will be associated with improved corporate policy decisions and performance.}

As with the matter of independence of the board as defined in The Code, it must also be recognised that the effectiveness of the supervisory board in China may differ from that of Western supervisory boards. In contradistinction to the two-tier board models adopted in Germany and Japan, it is the board of directors that appoint the supervisory board under China’s two-tier board structure. This may limit the willingness of supervisory board members to act as independent watchdogs.

2.2. Ownership, majority shareholders and corporate control

A “typical” listed company in China has five ownership classes: state shares, legal person shares, employee shares, domestic minority shares, and foreign institutional and/or foreign investor shares (Sun and Tong, 2003; Wei, Xie and Zhang, 2005; Firth, Fung and Rui, 2007; Wei, 2007). In considering the corporate governance impact of these different classes of ownership, key aspects are concentration and composition. Ownership concentration determines the distribution of power. In contradistinction to the view expressed by Berle & Means (1932), the separation of ownership and control in large corporations is problematic because they are managed by controlling shareholders and not their professional managers (La Porta, Lopez-de-Silanes and Shleifer, 1999). Managers’ freedom to take risks, make strategic decisions and take advantage of opportunities may be reduced under concentrated ownership. High concentration in ownership is expected to affect management incentives and corporate policy choices through the pressure that large investors can exert on managers (Brickley, Lease and Smith, 1988; Pound 1988; Bushee 1998). Thus while a group of shareholders with a large total share of the equity might be more effective at monitoring management, their powers must be restrained to prevent them taking advantage of other shareholders (Clarke, 1998). High ownership concentration provides both incentive and opportunity for controlling shareholders and managers to engage in expropriation (Morck, Shleifer and Vishny, 1988; Shleifer and Vishny, 1997; La Porta, Lopez-de-Silanes and Shleifer, 1999).

In China, majority shareholders are typically very strong and individual minority shareholders are weak. In many cases minority shareholders are regarded as speculators with an expectation of gaining a “free ride” based on the performance of the firm (Lin, 2004). Minority shareholders in China are unable to counter the influence of majority shareholders. Thus high ownership concentration will be associated with a negative effect on performance (Gunasekarage, Hess and Hu, 2007). Contrary to The Code, related-party transactions between controlling shareholders may be detrimental
to minority shareholders, and controlling shareholders may act so as to advantage themselves at the cost of minority shareholders. This suggests that China’s corporate governance is potentially relatively ineffective in the matter of protecting minority shareholders’ rights, and the third of our hypotheses:

$$H_3:$$ High levels of concentration in ownership in listed Chinese firms will be associated with poorer corporate policy decisions and performance.

In addition to concentration in ownership, government ownership is a feature of the ownership structure of many listed companies in China. This reflects their history as state owned enterprises prior to being listed (Xiang, 1998). Such state ownership has been associated with a negative impact on firm performance (Wei, Xie and Zhang, 2005; Gunasekarage, Hess and Hu, 2007). In this case agency problems may arise due to the differences in objectives between state and non state shareholders. For example, in the case of the state (central or local), maintenance of employment may take preference over profitability. Thus our fourth hypothesis is that:

$$H_4:$$ High levels of state ownership in listed Chinese firms will be associated with poorer corporate policy decisions and performance.

With respect to corporate policy decisions and performance our final hypothesis deals with the impact of high levels of foreign ownership in these listed Chinese companies. This is:

$$H_5:$$ High levels of foreign ownership in listed Chinese firms will be associated with improved corporate policy decisions and performance.

That a high level of foreign ownership may be a factor in improving corporate governance and, more broadly, accounting standards, reflects that international investors have an incentive to push for improvements in these areas. This is in order to better guarantee their interests (Šević, 2005; Krzywda, Bailey and Schroeder, 1995). Thus we conjecture that this pressure will, on average, have a positive effect on those firms in which foreign investors have significant control.

3. Research Methodology

3.1. Research Schema

The hypothesized relationships between the variables in this study are as follows:

$$\text{Bad debt ratio} = f\left(\text{Board composition} \left\{ \text{INDP, BSIZE, PROFSB, TSB} \right\}, \text{Ownership structure} \left\{ \text{TOP10, STATE|AGE, FOREIGN|AGE} \right\}\right)$$
The theoretical perspective underlying the relationships is agency theory as it relates to the composition of the two boards and ownership structure of listed Chinese companies. The empirical schema for this study identifies these two classes of factors as primary influences of the bad debt ratio (defined as either the bad debts-to-total assets or bad debts-to-accounts receivable ratio). Additionally, the time since listing of the firm (Firm Age) is used as a control for the ownership structure factors.

The choice of Firm Age as a control reflects recognition of several important features present in China’s privatisation process. Prior to listing significant improvements in balance sheet structure and firm performance are required, given requirements for profitability, especially for state-controlled flagship firms. Thus these firms may start in a good balance sheet position in relation to our dependent variable. Problems due to state control/influence may only become apparent with the passage of time. For firms with high levels of foreign ownership, however, this need not be the case. China’s focus on building a set of large, internationally competitive companies, especially in key industries such as telecommunications, energy, transport, etc., may suggest that it has allowed weaker companies to come under foreign control. Thus a concern is that, should foreign ownership exert a positive influence, performance may only be impacted gradually.

The choice of the bad debt ratios as indicators of the quality of corporate policy decisions reflects a number of factors. First is the likelihood that bad debts will be impacted by management decisions. The board of directors, in consultation with management, has ultimate responsibility for decisions on credit policy standards. Thus, with the firm’s management it can determine corporate practice re credit policy, as reflected in initial credit evaluation, ongoing credit monitoring and collection, and forgiveness of delinquency and default. Where problems arise in any of these areas, action would be expected from the supervisory board. Second, as bad debts will be impacted by management decisions (i.e., internal decisions), while there may be common trends/cycles over time, much of the variation in bad debt ratios between different enterprises should largely reflect firm-specific influences and decisions.

3.2. Sample and data

This study focuses on non-financial-sector A-share firms listed on either the Shanghai or Shenzhen Stock Exchanges. In order to test the effects of various ownership types—that is, high levels of state and foreign investor ownership—the sample of companies is divided into three groups: A-share, AB-share, and AH-share companies. A-share companies are companies that have issued A-shares only. A-shares are common stock issued by mainland China firms, subscribed and traded in RMB, listed on the mainland stock exchanges, and reserved for trading by Chinese citizens. AB-share companies are those that have issued both A-shares and B-shares, with an initial A-share offering. B-shares are issued by mainland China firms, traded in foreign curren-
cies, and listed on the mainland stock exchanges. The B-share market was restricted to foreign investors before 19 February 2001. Finally, AH-share companies are those that have issued both A-shares and H-shares. H-shares are securities of companies incorporated in mainland China and nominated by the Chinese Government for listing and trading on the Hong Kong Stock Exchange, being quoted and traded in HKD. There are no restrictions on holdings by international investors.

A sample of 120 companies was selected from companies currently listed in China’s Shanghai SSE180 and Shenzhen SSE100 for the period from 2001 to 2005 through use of a stratified sampling method. The SSE180 and SSE100 indices both serve as performance benchmarks for investment and financial innovation in their respective markets. As shown in Figure 1, 46 companies were randomly selected from the A-share group after removing dual listed companies AB-share or AH-share companies, and 42 companies were randomly selected from the AB-share group. There were only 32 companies listed on both the Hong Kong Stock Exchange and one of the two mainland Chinese stock exchanges so all were selected for our sample.

![Figure 1: Sampling Frame](image)

<table>
<thead>
<tr>
<th>Share Type</th>
<th>No. of Sample</th>
<th>Percentage of Sample</th>
<th>No. of observations</th>
<th>Percentage of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>45</td>
<td>38.46</td>
<td>191</td>
<td>35.37</td>
</tr>
<tr>
<td>AB</td>
<td>42</td>
<td>35.90</td>
<td>210</td>
<td>38.89</td>
</tr>
<tr>
<td>AH</td>
<td>30</td>
<td>25.64</td>
<td>139</td>
<td>25.74</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.00</td>
<td>540</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Finally, as shown in Table 1, the final sample of non-financial-sector companies consists of 117 companies. One company was found to be a financial company and two companies listed after 2005 have been removed. Finally, 45 observations for which the data was incomplete have been excluded, resulting in 540 observations over the 2001 to 2005 period.
3.3. Model Development and Variable Measurement

According to the hypotheses and empirical schema discussed above, the theoretical model to be formed is as follows:

\[
BDRATIO_{it} = \alpha + \sum \beta_p (\text{Board Composition Factors})_{it} + \sum \beta_p (\text{Ownership Structure Factors} \times \text{Moderator})_{it} + \varepsilon_{it},
\]

Table 2: Definition and Measurement of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Acronym</th>
<th>Definition</th>
<th>Expected Sign</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BDTA</td>
<td>The bad debt ratio measured relative to total assets (BDTA) or accounts receivable (BDAR)</td>
<td>N/A</td>
<td>Either</td>
</tr>
<tr>
<td></td>
<td>BDRA</td>
<td>N/A</td>
<td>Either</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Independent:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INDP</td>
<td>Independent directors</td>
<td>-ve</td>
<td>Number of independent directors on the corporate board</td>
</tr>
<tr>
<td></td>
<td>BSIZE</td>
<td>Corporate board size</td>
<td>-ve</td>
<td>Number of directors on the corporate board</td>
</tr>
<tr>
<td></td>
<td>TSB</td>
<td>Supervisory board size</td>
<td>-ve</td>
<td>Number of members of the supervisory board</td>
</tr>
<tr>
<td></td>
<td>PROFSB</td>
<td>Professionalism of the supervisory board</td>
<td>-ve</td>
<td>Number of supervisory board members with professional knowledge or work experience</td>
</tr>
<tr>
<td></td>
<td>TOP10</td>
<td>Overall ownership concentration</td>
<td>+ve</td>
<td>Proportion of total shares held by the top 10 shareholders</td>
</tr>
<tr>
<td></td>
<td>STOP10</td>
<td>State ownership concentration</td>
<td>+ve</td>
<td>Proportion of shares held by the state in those held by the top 10 shareholders</td>
</tr>
<tr>
<td></td>
<td>FORTOP10</td>
<td>Foreign ownership concentration</td>
<td>-ve</td>
<td>Proportion of shares held by foreign owners from those held by the top 10 shareholders</td>
</tr>
<tr>
<td><strong>Control:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AGE</td>
<td>Firm age</td>
<td>N/A</td>
<td>Years since initial listing</td>
</tr>
</tbody>
</table>

Where:

- Bad Debts = total bad debts at the end of a reporting year;
- Receivables = value of accounts receivable at the end of a reporting year;
- Total Assets = book value of total assets at the end of a reporting year;
- \( i \) = sampled company; and
- \( t \) = year.
The panel data regression models to be empirically investigated in this study are stated as follows:

\[
BDRATIO_{i,t} = \alpha + \beta_1 IND_P_{i,t} + \beta_2 BSIZE_{i,t} + \beta_3 TSB_{i,t} + \beta_4 PROFSB_{i,t} \\
+ \beta_5 TOP10_{i,t} + \beta_6 STOP10_{i,t} + \beta_7 STOP10_{i,t} \times AGE_{i,t} \\
+ \beta_8 FORTOP10_{i,t} + \beta_9 FORTOP10_{i,t} \times AGE_{i,t} + \epsilon_{i,t}
\]  

The variables are comprised of three types: one dependent variable, seven independent variables, and one control variable. The definition and measurement for each of the variables in this study are listed Table 2:

4. Results

4.1. Descriptive Statistics

Descriptive statistics in Table 3 provide a profile of the corporate governance characteristics of the companies in our sample. First, with respect to board composition, the mean number of independent directors (INDP) is 2.93, with a range of zero to six. The minimum reflects that appointment of independent directors was rare before the year 2002. However, effective from 2003 CSRC guidelines have required at least one-third of the board directors to be independent. Second, the mean number of supervisory board members with professional knowledge or experience (PROFSB) is 1.86, with a range from zero to five. The lower value of the range reflects the period prior to the 2002 issue of The Code by the CSRC, which requires that supervisors have professional knowledge or work experience in such areas as law and accounting. Third, the mean ownership concentration (TOP10) is 65.5 per cent, with a range of 21.45 per cent to 96.77 per cent. This is consistent with previous studies by Xu and Wang (1999) and Deng and Wang (2006) that show high ownership concentration in listed companies in China. As argued by Deng and Wang (2006) this supports the potential for larger shareholders to dominate listed firms in China. Fourth, the mean concentration of state ownership in the top 10 company shareholders (STOP10) is 64.86 per cent, with a range from zero to 100 per cent. This supports the argument that the state has maintained a dominant role in the operation of many previously state-owned enterprises. Fifth, the mean concentration of foreign ownership in the top 10 company shareholders (FORTOP10) is only 14.08 per cent, with a range from zero to 59.06 per cent.
Table 3: Descriptive Statistics on Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDTA</td>
<td>0.0347</td>
<td>0.0076</td>
<td>0.0000</td>
<td>1.3494</td>
<td>0.1129</td>
</tr>
<tr>
<td>BDAR</td>
<td>0.2609</td>
<td>0.0959</td>
<td>0.0000</td>
<td>13.1147</td>
<td>0.8403</td>
</tr>
<tr>
<td>INDP</td>
<td>2.9259</td>
<td>3.0000</td>
<td>0.0000</td>
<td>6.0000</td>
<td>1.3762</td>
</tr>
<tr>
<td>BSIZE</td>
<td>10.4130</td>
<td>10.0000</td>
<td>5.0000</td>
<td>19.0000</td>
<td>2.4217</td>
</tr>
<tr>
<td>TSB</td>
<td>4.5889</td>
<td>5.0000</td>
<td>2.0000</td>
<td>12.0000</td>
<td>1.6697</td>
</tr>
<tr>
<td>PROFSB</td>
<td>1.8593</td>
<td>2.0000</td>
<td>0.0000</td>
<td>5.0000</td>
<td>1.0385</td>
</tr>
<tr>
<td>TOP10</td>
<td>0.6550</td>
<td>0.6616</td>
<td>0.2145</td>
<td>0.9967</td>
<td>0.1627</td>
</tr>
<tr>
<td>STOP10</td>
<td>0.6486</td>
<td>0.7067</td>
<td>0.0000</td>
<td>1.0000</td>
<td>0.3078</td>
</tr>
<tr>
<td>FORTOP10</td>
<td>0.1408</td>
<td>0.0398</td>
<td>0.0000</td>
<td>0.5906</td>
<td>0.1670</td>
</tr>
<tr>
<td>AGE</td>
<td>6.7259</td>
<td>9.0000</td>
<td>0.0000</td>
<td>14.0000</td>
<td>3.4906</td>
</tr>
</tbody>
</table>

4.2. Multivariate Analysis and Hypothesis Testing

Generalized least squares (GLS) fixed effects methods are used in this study. A panel regression model (see equation (2)) was estimated using the four board composition variables and the three ownership structure variables (with two of them controlled by Firm Age) for each measure of the dependent variable. The possible existence of multicollinearity was tested. Gujarati (2003) argues that correlations between independent variables should not be deemed harmful for multivariate analysis unless they exceed 0.8. As shown in Table 4, there are no correlations that reach this level. However, a certain degree of multicollinearity can still exist even when none of the bivariate correlation coefficients is very large. The reason is one independent variable may have a linear function with a set of several independent variables (Gujarati, 2003). Hence, multicollinearity is also tested for using the Variance Inflation Factor (VIF). Gujarati (2003) suggests there is no evidence of multicollinearity unless the VIF of a variable exceeds 10. The result, not reported below, is that the largest VIF is 1.92 and those of all other independent variables are below 1.86. Thus, no serious multicollinearity problem presents in either regression model.

Table 4: Correlation Matrix for independent variables

<table>
<thead>
<tr>
<th></th>
<th>TSB</th>
<th>PROFSB</th>
<th>BSIZE</th>
<th>INDP</th>
<th>STOP10</th>
<th>FORTOP10</th>
<th>TOP10</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSB</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROFSB</td>
<td>0.6160**</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSIZE</td>
<td>0.4096**</td>
<td>0.2032**</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDP</td>
<td>0.2483**</td>
<td>0.2237**</td>
<td>0.4517**</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STOP10</td>
<td>0.1720**</td>
<td>0.1185**</td>
<td>-0.0116</td>
<td>-0.0655</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FORTOP10</td>
<td>0.0322</td>
<td>0.0830’</td>
<td>0.1953’</td>
<td>0.2018’</td>
<td>-0.3979’</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOP10</td>
<td>0.1857’</td>
<td>0.2721’</td>
<td>0.0855’</td>
<td>0.1535’</td>
<td>0.1252’</td>
<td>0.4396’</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>-0.0627</td>
<td>0.0113</td>
<td>-0.1424’</td>
<td>0.0672</td>
<td>-0.1407’</td>
<td>0.0294</td>
<td>-0.3722’</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Note: * significant at the 5% level; ** significant at the 1% level.
Tables 5 and 6 provide the panel regression results to test the five hypotheses. These reveal a high adjusted-$R^2$ of 0.63 where BDTA as the dependent variable, and an adjusted-$R^2$ of 0.35 for BDAR. The $F$ statistics for each regression model indicate that a statistically significant component of the variation in the chosen measure of the bad debt ratio is explained by variation in the independent variable set. The discussion that follows examines the results in Tables 5 and 6 in terms of the five hypotheses established earlier.

The first set of hypotheses ($H_{1A}$ and $H_{1B}$) argue that the larger the number of independent directors on the board and the larger the corporate board the lower will be the bad debt ratio. The results in Tables 5 and 6 indicate a negative relationship between the alternative bad debt ratio measures and the number of independent directors, supporting the first of this set of hypotheses. This adds weight to the agency argument of Fama and Jensen (1983) that independent directors are motivated to work in the best interests of shareholders in order to maintain their good personal reputation. However, when considering coefficients for board size, we find opposite results to that hypothesised. Rather than having a beneficial impact on the bad debt ratio, it appears that larger boards worsen corporate policy making. While this may reflect that the requirement that at least one-third of board members has only been in place since 2003, an issue for further consideration and research, we must reject the second of our first set of hypotheses.

The second set of hypotheses ($H_{2A}$ and $H_{2B}$) state that the higher the proportion of supervisory board members with relevant professional knowledge or work experience and the larger the supervisory board the lower will be the bad debt ratio. The argument in the first case is that the supervisory board will require high professionalism from its members to effectively carry out its roles of overseeing the performance of the corporate board and management and protecting stakeholders’ rights and interests. However, the coefficients for supervisory board size (TSB) in Tables 5 and 6 are not significant. Additionally, while the coefficient on the skills of the supervisory board is of the hypothesised sign and statistically significant in the case of BDAR this is not true for BDTA. This suggests further research into the matter is required, including consideration of the chosen performance metrics. We thus conclude that based on our results, the effectiveness of supervisory board in improving corporate governance may be questioned. This is consistent with Dahya, Karbhari and Xiao (2002), who find that because of the transitional nature of the Chinese economy supervisory board effectiveness is limited. It may be speculated that supervisory boards of listed companies in China have tended to become “censored watchdogs” in the words of Dahya, Karbhari, Xiao and Yang (2003), during a period when rapid corporate expansion and the dominance of the corporate board has occurred. Thus, given the conflict between the results of our two alternative panel regressions, we reject our second set of hypotheses.
#### Table 5: Panel Regression Results BDTA

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Bad Debt Ratio – BDTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample:</td>
<td>2001 – 2005</td>
</tr>
<tr>
<td>Cross-sections:</td>
<td>117</td>
</tr>
<tr>
<td>Panel obsv:</td>
<td>540</td>
</tr>
<tr>
<td>Adjusted-$R^2$:</td>
<td>0.63</td>
</tr>
<tr>
<td>$R^2$:</td>
<td>0.72</td>
</tr>
<tr>
<td>$F$ significance:</td>
<td>0.00</td>
</tr>
<tr>
<td>$F$-statistic:</td>
<td>8.01**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variables:</th>
<th>Expected sign</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>$t$-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>N/A</td>
<td>-0.0016</td>
<td>0.0216</td>
<td>-0.0744</td>
</tr>
<tr>
<td>Independent directors on the corporate board – INDP</td>
<td>–</td>
<td>-0.0021</td>
<td>0.0005</td>
<td>-4.2001**</td>
</tr>
<tr>
<td>Directors on the corporate board – BSIZE</td>
<td>–</td>
<td>0.0036</td>
<td>0.0016</td>
<td>2.2228*</td>
</tr>
<tr>
<td>Supervisors on the supervisory board – TSB</td>
<td>–</td>
<td>-0.0009</td>
<td>0.0015</td>
<td>-0.6056</td>
</tr>
<tr>
<td>Qualified and experienced supervisors on the supervisory board – PROFSB</td>
<td>–</td>
<td>0.0025</td>
<td>0.0020</td>
<td>1.2572</td>
</tr>
<tr>
<td>Overall ownership concentration – TOP10</td>
<td>+</td>
<td>0.0281</td>
<td>0.0131</td>
<td>2.1411*</td>
</tr>
<tr>
<td>State ownership concentration – STOP10</td>
<td>–</td>
<td>-0.0553</td>
<td>0.0247</td>
<td>-2.2349*</td>
</tr>
<tr>
<td>State ownership concentration moderated by firm age – STOP10*AGE</td>
<td>+</td>
<td>0.0058</td>
<td>0.0021</td>
<td>2.7069**</td>
</tr>
<tr>
<td>Foreign ownership concentration – FORTOP10</td>
<td>+</td>
<td>0.0913</td>
<td>0.0290</td>
<td>3.1519**</td>
</tr>
<tr>
<td>Foreign ownership concentration moderated by firm age – FORTOP10*AGE</td>
<td>–</td>
<td>-0.0161</td>
<td>0.0029</td>
<td>-5.6107**</td>
</tr>
</tbody>
</table>

Notes: * Giving consideration to the arguments associated with the use of the control variable (AGE).

* Statistically significant at the 5% level.

** Statistically significant at the 1% level.

The third hypothesis ($H_3$) states that a higher level of ownership concentration is associated with poor corporate policy decisions and performance (a higher level of the bad debt ratio). This negative effect on firm performance arises from poor corporate policy decisions resulting from the agency conflict between majority and minority shareholders. The ownership concentration measure is assumed to reflect the distribution of power within in a firm. The results of Tables 5 and 6 show a positive relationship between ownership concentration (TOP10) and our alternative measures of the bad debt ratio. This is consistent with the perspective of Shleifer and Vishny (1997), that agency problems involve expropriation from minority by majority shareholders. They refer to this case as “tunnelling”, and determine that it is likely to be a significant problem in emerging market economies. Thus, we find support for the third hypothesis.
Table 6: Panel Regression Results BDAR

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Bad Debt Ratio – BDAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample:</td>
<td>2001 – 2005</td>
</tr>
<tr>
<td>Cross-sections:</td>
<td>117</td>
</tr>
<tr>
<td>Adjusted-$R^2$:</td>
<td>0.35</td>
</tr>
<tr>
<td>$F$ significance:</td>
<td>0.00</td>
</tr>
<tr>
<td>$R^2$:</td>
<td>0.50</td>
</tr>
<tr>
<td>$F$-statistic:</td>
<td>3.30**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variables:</th>
<th>Expected sign</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>$t$-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>N/A</td>
<td>-0.4247</td>
<td>0.2545</td>
<td>-1.6688</td>
</tr>
<tr>
<td>Independent directors on the corporate board – INDP</td>
<td>–</td>
<td>-0.0365</td>
<td>0.0180</td>
<td>-2.0302*</td>
</tr>
<tr>
<td>Directors on the corporate board – BSIZE</td>
<td>–</td>
<td>0.0381</td>
<td>0.0132</td>
<td>2.8932**</td>
</tr>
<tr>
<td>Supervisors on the supervisory board – TSB</td>
<td>–</td>
<td>0.0099</td>
<td>0.0150</td>
<td>0.6604</td>
</tr>
<tr>
<td>Qualified and experienced supervisors on the supervisory board – PROFSB</td>
<td>–</td>
<td>-0.0364</td>
<td>0.0142</td>
<td>-2.5695*</td>
</tr>
<tr>
<td>Overall ownership concentration – TOP10</td>
<td>+</td>
<td>0.7163</td>
<td>0.2407</td>
<td>2.9755**</td>
</tr>
<tr>
<td>State ownership concentration – STOP10</td>
<td>–</td>
<td>-1.0485</td>
<td>0.1705</td>
<td>-6.1502**</td>
</tr>
<tr>
<td>State ownership concentration moderated by firm age – STOP10*AGE</td>
<td>+</td>
<td>0.1517</td>
<td>0.0198</td>
<td>7.6741**</td>
</tr>
<tr>
<td>Foreign ownership concentration – FORTOP10</td>
<td>+</td>
<td>0.3903</td>
<td>0.1954</td>
<td>1.9977*</td>
</tr>
<tr>
<td>Foreign ownership concentration moderated by firm age – FORTOP10*AGE</td>
<td>–</td>
<td>-0.0671</td>
<td>0.0118</td>
<td>-5.6683**</td>
</tr>
</tbody>
</table>

Notes: * Giving consideration to the arguments associated with the use of the moderator variable (AGE).
** Statistically significant at the 1% level.

The fourth hypothesis ($H_4$) implies that where a greater percentage of shares are held by the state sector this is associated with a higher level of the bad debt ratio. This reflects that the corporatisation of former SOEs in China via share issue has not effectively dealt with the agency problems associated with public ownership (Chen, 2004). In the case of higher levels of state control (STOP10) we find that, in contrast to our initial hypothesis, the coefficient is negative. Rather than increase the bad debt ratio higher levels of state ownership appear to reduce it. However, as argued, consideration needs to be given to the financial requirements for SOEs prior to listing in China. Thus, we also focus on the coefficient on the level of state control combined with our control variable (STOP10*AGE). For this variable the coefficient for the impact over time of high levels of state ownership on the bad debt ratio is positive. As newly listed former SOEs will start with a relatively clean bill of financial health, we would expect a relatively low initial level for the bad debt ratio, and thus potentially a negative coefficient on STOP10. Given this good start, it is important to our fourth hypothesis that high levels of state ownership are associated with an increase in the level of the bad debt ratio over time (STOP10*AGE). We therefore find support for
our fourth hypothesis, based on the impact of our control variable, accepting it. This suggests that agency problems still exist within our sample firm set due to a misalignment between shareholder and state objectives for these firms.

The fifth hypothesis \((H_5)\) implies that where there is a greater percentage of shares held by foreign investors \((\text{FORTOP10})\) this will be associated with a lower level of the bad debt ratio. The expectation is that, in the case of China, improving corporate governance and, more broadly, accounting standards, is in the interests of international investors. However, we find that the coefficient on \text{FORTOP10} is positive, suggesting that foreign ownership increases the level of the bad debt ratio. Again, as when considering the impact of high levels of state ownership, we find that when we focus on the share of foreign ownership in the top ten shareholders is controlled for firm age \((\text{FORTOP10*AGE})\), the coefficient has the expected negative sign. This lends support to our fifth hypothesis, which we cautiously accept. This caution recognises that additional information is required to properly explain why firms with high levels of foreign ownership may initially be expected to have higher levels of bad debts relative to total assets. We thus suggest that rather than having an immediate impact on corporate governance, the impact of foreign ownership occurs progressively over time.

5. Conclusions

The paper has argued that the priority given to establishment of institutional structures reflects their importance in establishing an environment appropriate to a market-oriented economic system. Sound institutional choices with respect to the legal and regulatory environment are particularly important to the reform of SOEs, assisting in the separation of government from SOE management, restructuring of SOEs, and thus effectiveness of corporate governance frameworks in the transition economy. Assessment of these institutions requires that we consider whether they assist (or are effective) in producing outcomes consistent with their stated intent.

In the case of China the corporate governance structures shaping corporate decision-making behaviour consist of \textit{The Company Law}, \textit{The Securities Law}, and \textit{The Code} (the last being a code of good practice rather than a legal requirement). Thus a key issue to address in China is whether these corporate governance structures support good corporate governance outcomes or potential deficiencies in the capacity of these institutions may be identified. These outcomes relate to: independence of the board of directors and the quality of their decisions; the performance of the supervisory board in protecting the company’s and stakeholders’ rights and interests; and to corporate ownership and the exercise of control by majority shareholders at the expense of minority shareholders. Failure in any area would suggest that corporate governance structures have not properly addressed an aspect of the agency problem.
In this context this paper has examined the relationship between corporate policy decisions, as measured by our proxies for performance, and the corporate governance and control characteristics of listed, non-financial-sector Chinese companies. Characteristics explored relate to both board structure under China’s two-tiered board system and ownership. With respect to governance characteristics, as reflected in the composition of companies’ boards, there are the matters of board size, expertise and independence, the latter being specific matters dealt with under China’s corporate governance structures. The corporate control characteristics are the level of concentration in and type of ownership, particularly high levels of government and foreign ownership. To represent the quality of corporate policy decisions we chose the bad debt-to-total asset and bad debt-to-receivables ratios. The choice of performance metrics related to bad debts reflect that sampled firms’ boards and management have direct influence over corporate practice re credit policy, as reflected in initial credit evaluation, ongoing credit monitoring and collection, and forgiveness of delinquency and default.

To assess the impact of these characteristics within the Chinese institutional structure we used an unbalanced panel data set covering the years 2001 to 2005 and comprised of a stratified sample of observations for 117 AH, A, and AB non-financial-sector companies listed on the Shanghai and Shenzhen stock exchanges. We hypothesised that high levels of concentration in firm ownership, including state control of enterprises, would be associated with poorer quality corporate decision making and thus higher levels of the bad debt ratio due to agency problems. High levels of foreign ownership, high levels of independent directors on the corporate board, and high levels of skill and experience on the supervisory board were hypothesised to decrease bad debt ratios.

Independence of the board was shown to be a significant factor in reducing the bad debt ratio. However, rather than a larger board leading to improved performance, we find that increases in the size of the board are associated with higher bad debt ratios. We have argued that this may reflect that it is only relatively recently (i.e., 2003) that China’s requirements regarding board independence were established. Thus this warrants further exploration of the panel data set and its properties, and is one of the limitations of this study. Future research in the area should seek to increase the size and scope of the sample utilised, in order to address concerns related to the sample size and the length of period covered.

In common with previous research we have failed to find support for the importance of the size of the supervisory board in corporate policy decision making. However, with respect to the impact of the professionalism of the supervisory board on corporate policy decision making we have conflicting results. While one of our models suggests no statistically significant impact is present, in the other the qualifications and professionalism of the board had a significant and negative effect on the
level of the bad debt ratio. While rejecting support for the importance of this factor, due to the conflict in our results, we recognise this as another limitation of this study. Again we recognise the need to further explore the panel data set, and choice and properties of performance metrics used in this study.

Our results also suggest that concentration of ownership in general, and high levels of state ownership in particular, are associated with an increase in the bad debt ratio. However, in the latter case it is apparent that, rather than state dominated firms starting with a poorer balance sheet position, state influence has a negative impact over an extended period. Such an outcome suggests that in some cases state objectives rather than those of non state shareholders may dominate in the decision making process. Similarly, consistent with the likely objectives of foreign investors, high levels of foreign ownership are found to impact the bad debt ratio over an extended time; in this case, acting to reduce the bad debt ratio.

Overall our results are suggestive of the need for China to continue to address the underlying effectiveness of its corporate governance framework. Given our mixed results we suggest that it must continue to act to ensure that the supervisory board’s effectiveness is enhanced. This is in order that it becomes an independent watchdog (as per Dahya, Karbhari, Xiao and Yang, 2003). Furthermore, it must ensure that its corporate governance model addresses the issue of majority shareholder influences on firm decision making. This is especially the case with the strong links that still appear to remain between the state and formerly state-owned enterprises.

References


Issued by:


FRANCHISING AS A MEANS OF DISTRIBUTING BANKING SERVICES: THE CASE OF GREECE

1. Introduction

Distribution of bank services is a very important, but rather overlooked area, of bank marketing. It could be defined as any means of increasing the availability or convenience of the services that increases their use or the revenues from their use. Although banks use a variety of channels of distribution (bank branches, Automatic Teller Machines, Electronic Funds Transfer at the Point of Sales, Home Banking, Phone Banking, Credit Cards etc.) for their services, the bank branches remain the most important channel of distribution. But, their disadvantage is the high cost to establish and keep them operating. Therefore, some banks have tried to adopt franchising in expanding their network of branches. In the framework of this paper we examine the application of franchising in the Greek banking sector.

In order to have a clear picture on the specific topic we will first point out the particularities of the distribution strategy for banking services; second we will present the characteristics of the franchising network as it was applied in Greece and then we will quote the disadvantages of the network and compare it with the respective applications in other fields. Finally, we will draw some conclusions based on the analysis presented in this paper and interviews with banking officers from the bank involved and the franchisee’s side.

2. Particularities of the Distribution Strategy for Banking Services

The differences between marketing of goods and marketing of services can be depicted more clearly in the area of distribution strategy. These differences have to do with the special characteristics of banking services:

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1 Professor of Economics, Alexander Technological Educational Institution of Thessaloniki, Greece
Due to the intangibility of banking services, there is additional need for communicating the benefits of the services. Therefore, more importance is attributed to personal selling in the case of banking services.

Due to the inseparability of bank services, interfacing of the customer with the staff of the bank is at least partly necessary in spite of the developments of technology.

There are difficulties in standardising the level and the quality of banking services, associated with the heterogeneity of them. The ambience of the branches, the personality of the staff, the length of time required waiting in the queue and many other factors contribute to the heterogeneity of the services.

Banking services cannot be inventoried and so they are perishable. Therefore, problems arise in times of excessively high demand and the use of direct channels is necessary.

The close, personal client relationship required in many transactions (for example private banking) dictates the direct type of channel of distribution.

All the above mentioned characteristics of banking services have led to the dominant role of the branches as a means of distribution.

In the following Table we can see the developments of a branch network in Greece.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Branches</th>
<th>Number of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>2,806</td>
<td>61,052</td>
</tr>
<tr>
<td>1999</td>
<td>2,866</td>
<td>61,731</td>
</tr>
<tr>
<td>2000</td>
<td>3,030</td>
<td>63,330</td>
</tr>
<tr>
<td>2001</td>
<td>3,129</td>
<td>62,726</td>
</tr>
<tr>
<td>2002</td>
<td>3,288</td>
<td>63,407</td>
</tr>
<tr>
<td>2003</td>
<td>3,297</td>
<td>63,611</td>
</tr>
<tr>
<td>2004</td>
<td>3,471</td>
<td>62,611</td>
</tr>
<tr>
<td>2005</td>
<td>3,587</td>
<td>63,040</td>
</tr>
<tr>
<td>2006</td>
<td>3,805</td>
<td>64,677</td>
</tr>
<tr>
<td>2007</td>
<td>3,807</td>
<td>67,113</td>
</tr>
</tbody>
</table>

Source: Hellenic Banks’ Association

The spectacular increase in the number of branches has been accompanied by a moderate increase in the number of staff employed. If we take into account the fact that a considerably increasing number of staff is employed in the centralised departments of the banks, we can draw the conclusion that there is a shift towards smaller branches manned with less staff.
On the other hand, despite the impressive increase in the number of bank branches, the number of inhabitants corresponding to a branch is still higher than most of the countries of the Euro zone, as we can see in Table 2.

Table 2. Number of Inhabitants per Bank Branch

<table>
<thead>
<tr>
<th>Year</th>
<th>1986</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREECE</td>
<td>12,591</td>
<td>3,367</td>
<td>3,340</td>
<td>3,251</td>
<td>3,128</td>
<td>3,005</td>
<td>2,902</td>
</tr>
<tr>
<td>PORTUGAL</td>
<td>6,829</td>
<td>1,939</td>
<td>1,935</td>
<td>1,955</td>
<td>1,946</td>
<td>1,889</td>
<td>1,759</td>
</tr>
<tr>
<td>IRELAND</td>
<td>4,549</td>
<td>4,240</td>
<td>4,319</td>
<td>4,465</td>
<td>4,559</td>
<td>4,549</td>
<td>3,750</td>
</tr>
<tr>
<td>SPAIN</td>
<td>1,191</td>
<td>1,059</td>
<td>1,057</td>
<td>1,051</td>
<td>1,034</td>
<td>1,009</td>
<td>986</td>
</tr>
</tbody>
</table>

The figures depicted in Table 2 show that the number of branches is not necessarily connected with the level of economic growth, but it is rather connected with the geographical structure of the country and sometimes with its population density or specific characteristics of each country.

The number of ATM’s could also play some role in the number of branches as they are distribution channels with a physical presence (Table 3).

Table 3. ATM Network in Greece

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of ATM’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>2,687</td>
</tr>
<tr>
<td>1999</td>
<td>3,081</td>
</tr>
<tr>
<td>2000</td>
<td>3,605</td>
</tr>
<tr>
<td>2001</td>
<td>4,389</td>
</tr>
<tr>
<td>2002</td>
<td>4,961</td>
</tr>
<tr>
<td>2003</td>
<td>5,482</td>
</tr>
<tr>
<td>2004</td>
<td>5,797</td>
</tr>
<tr>
<td>2005</td>
<td>6,258</td>
</tr>
<tr>
<td>2006</td>
<td>6,703</td>
</tr>
<tr>
<td>2007</td>
<td>7,270</td>
</tr>
</tbody>
</table>

Source: Hellenic Banks’ Association

The average Greek prefers direct contact with the bank staff instead of using technology. This can be confirmed in the following Tables 4 and 5.
Table 4. Number of Inhabitants per ATM

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREECE</td>
<td>1,887</td>
<td>1,654</td>
</tr>
<tr>
<td>PORTUGAL</td>
<td>832</td>
<td>721</td>
</tr>
<tr>
<td>IRELAND</td>
<td>1,385</td>
<td>1,287</td>
</tr>
<tr>
<td>SPAIN</td>
<td>771</td>
<td>754</td>
</tr>
</tbody>
</table>


Table 5. Use of Internet Banking

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELGIUM</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>IRELAND</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>GREECE</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>SPAIN</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>POLAND</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>PORTUGAL</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Eurostat

Table 5 shows the percentage of individuals older than 16 who used internet banking at least once in the previous 3 months.

The aforementioned presentation of data concerning the Greek Banks shows that the importance of branches is still increasing. The Greek Commercial Banks consider branches essential for approaching clients and for establishing relationship banking. The experience of countries where the banks cut their branch networks, either due to competition leading to cost-cutting programmes or due to mergers and acquisitions was rather negative.

The development of technology has led to a change in the profile of branches. Standardised services can be offered by electronic means and ATM’s, whereas more complicated services are offered by branches. In this way, banks save resources and serve their customers more effectively.

The high cost of opening new branches leads the banks to look for cheaper ways to distribute their services. However, in Greece, although alternative channels of distribution offer advantages for users, such as comfort, security and efficiency, banks continue to expand by establishing more branches. This strategy shows the rather conservative attitude of the Greek banks as they do not dare use alternative channels of distribution, avoiding the uncertainty of innovations and having as priority a higher profitability in the short run. Of course, we cannot blame the banks exclusively and overlook the existing responsibilities of the Government, the educational system, the monopoly in telecommunications (abolished only a few years ago) and the lack of
a reliable internet connection. A further consideration of the limited use of internet banking has political, economic, sociological and psychological aspects and it is beyond the scope of this paper.

3. The Application of Franchising in the Distribution of Banking Services

The advantages of franchising from the franchisor’s point of view have led to its spectacular spread throughout the world.

– The franchisor increases the number of distribution channels for his products or services without any considerable investment.
– The franchisee will do his best to achieve the maximum profits and therefore he contributes to the success of the franchisor with his personal funds and his personal capabilities.

But, it seems that franchising is not very popular in the supply of banking services. Only one Commercial Bank in Greece (EFG Eurobank-Ergasias SA) has tried to expand its branch network through the use of franchising. EFG Eurobank-Ergasias is one of the largest Commercial Banks of Greece and is one of the faster-growing banking organisations, both in terms of assets and capitalisation. Its management is distinguished for its fast decision-making and flexibility (Tables 6, 7 & 8).

| Table 6. Number of Branches of the Six Biggest Commercial Banks of Greece |
|-----------------------------|-----|-----|-----|-----|-----|
|                            | 1999 | 2001 | 2003 | 2005 | 2007 |
| National Bank of Greece    | 602  | 587  | 588  | 567  | 575  |
| ATE Bank                   | 439  | 441  | 449  | 458  | 470  |
| EFG Eurobank-Ergasias      | 169  | 320  | 301  | 332  | 399  |
| Alpha Bank                 | 214  | 411  | 369  | 363  | 379  |
| Piraeus Bank               | 48   | 195  | 218  | 273  | 319  |
| Emporiki Bank              | 362  | 370  | 373  | 373  | 318  |

Source: HBA

The number of branches of EFG Eurobank-Ergasias, presented in Table 6, does not include the franchisee-branches.
The effort began in 2000 and the objective was the establishment of 120 branches of this kind by the end of 2006. The objective was achieved to a considerable extent in terms of numbers, but unfortunately the whole franchising network, consisting of 110 branches, collapsed by the end of 2008. In order to have a clearer picture of the application of franchising in the Greek banking sector, we will refer to some critical specific characteristics:

- The average amount of the investment requested from the franchisee ranged from 150,000 to 170,000 euro (including VAT and entry fee)
- The size (area) of each branch should be at least 60 square meters.
- The specific branches were aiming at serving the customers’ needs in banking and financial services, quickly, flexibly and efficiently from early in the morning until late in the evening, including Saturdays. Lack of flexibility in industrial relations and the rigidity of working hours, are major problems in the Greek economy and especially in the banking sector where the existence of strong trade unions constitutes a barrier against any effort to make changes. EFG Eurobank-Ergasias SA tried to take advantage of franchising and bypass the resistance of trade unions.
- The franchisees were rewarded with commissions as follows:
  
  100–150 euro per consumer loan, 50–80 euro per credit card (depending on the kind of credit card i.e. Visa, MasterCard etc), 1%-2% per housing loan (depending

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Table 7. Number of Staff of the Six Biggest Commercial Banks of Greece

<table>
<thead>
<tr>
<th>Bank</th>
<th>2003</th>
<th>2005</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Bank of Greece</td>
<td>14161</td>
<td>13175</td>
<td>14327</td>
</tr>
<tr>
<td>ATE Bank</td>
<td>6071</td>
<td>5727</td>
<td>5801</td>
</tr>
<tr>
<td>EFG Eurobank-Ergasias</td>
<td>6809</td>
<td>7015</td>
<td>7695</td>
</tr>
<tr>
<td>Alpha Bank</td>
<td>7277</td>
<td>6949</td>
<td>6960</td>
</tr>
<tr>
<td>Piraeus Bank</td>
<td>3873</td>
<td>4320</td>
<td>4878</td>
</tr>
<tr>
<td>Emporiki Bank</td>
<td>6827</td>
<td>6368</td>
<td>5930</td>
</tr>
</tbody>
</table>

Source: HBA

Table 8. Capitalisation of the Six Biggest Commercial Banks of Greece in million euros (12/04/2009)

<table>
<thead>
<tr>
<th>Bank</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>National Bank of Greece</td>
<td>6963</td>
</tr>
<tr>
<td>ATE Bank</td>
<td>1105</td>
</tr>
<tr>
<td>EFG Eurobank-Ergasias</td>
<td>2849</td>
</tr>
<tr>
<td>Alpha Bank</td>
<td>2671</td>
</tr>
<tr>
<td>Piraeus Bank</td>
<td>2004</td>
</tr>
<tr>
<td>Emporiki Bank</td>
<td>696</td>
</tr>
</tbody>
</table>

Source: Athens Stock Exchange
on the amount of the loan), 1.5%-1.8% per small business loan, 0.8%-2% per deposit account (depending on the kind of deposits and their annual average balance) etc.

- The hiring and the payment of the staff were made by the franchisee. The franchisor (bank) provided the necessary equipment.
- According to the conditions set by the bank, the potential franchisees should have a business spirit, economic studies, previous experience in multinational or other large companies (experience in banks was considered as an extra qualification), organising and commercial skills.
- Franchisees had access to financing, know-how and experience on preparing a business plan, continuous training, guiding and advertising.
- Franchising contracts had a duration of 10–12 years.

4. Disadvantages leading to the failure of the franchising network

It is widely acceptable in the bibliography regarding franchising that the franchisee gives up a considerable part of his independence in favour of the franchisor. In the case of banking, the situation is even worse. The fixed costs are very high and the revenues are strictly determined by the bank. So, in periods of financial crisis, this sort of business could not easily survive.

Now, let’s point out some disadvantages leading to the failure of the franchise network in the case of banking services:

- Excessive dependency on the policy exercised by the franchisor (bank). For example, if the bank wanted to cut its loans in order to improve its liquidity position, the franchisee had to wait until the liquidity of the bank improved. So, it is evident that the franchisee did not make full use of his potential.
- The main source of revenues for an ordinary branch is interest from the loans. On the contrary, the franchisees did not receive any interest – they rely on commissions.
- The commissions mentioned by the interviewed staff were rather low, showing inadequate incentives to increase the turnover of the franchisee.
- The franchisor cannot control the franchisees, as he can with the bank’s own branches. Besides, the interviewed officers confirmed that the relationship between the two sides was rather impersonal and in some cases, we can see even rivalry between the branches and the franchisees. Of course, it is not wise to generalise, but at least the specific case in Greece showed the difficulty in co-operation between the bank and the franchisees.
- The staff of the franchisees was less trained in banking works than the staff of the ordinary branches. Indeed, banking experience was not a must in hiring staff and chances for further training were not frequent.
– The staff of the franchisees was less paid than the staff of the ordinary branches. Their salaries were lower and they never had the feeling of having a permanent job. Besides, the prospects for promotion were not visible.
– In general, the franchisees were acting as intermediaries between the bank and its customers. So, they were not involved in real banking activities and therefore they did not have similar chances to contribute to the profitability of the whole bank.
– The traditional branches were divided into two categories: those in favour of franchising and those against. Interpersonal relations between franchisees and some branch managers were leading to selective collaborations. The branches that could not take advantage of such interpersonal relations were against the franchising network.

5. Comparison with applications of franchising in other fields

In the case of banking, the franchisee is acting as an intermediary, whereas in other fields, he is more directly involved in the supply of products or services and his participation in the total value added is considerably higher. This is confirmed by the relatively low fees of the franchisees involved in banking, compared with the considerably higher profit margins and value added in other fields (for example in fast food shops).

In the case of fast food shops, the franchisee sells the product to his customers and he has full responsibility for supplying the product and collecting the respective value. In the case of banking, the franchisee’s role is limited to just selling the services of the franchisor and the latter will have the responsibility of supplying the services and collecting the respective value. Therefore, it is evident that in the case of banking, the risk undertaken by the franchisors is considerably higher than in other fields of economic activity. On the other hand, the risk undertaken by the franchisees is low and consequently their fees are low, but in this way they cannot survive under conditions of financial crisis, as their fixed costs remain high.

Besides, some of the interviewed officers talked about some franchisees misleading the franchisor by selling services to non-creditworthy customers, just to receive their fees from the bank. Other misleading practices were also reported by the staff interviewed. In this way, it is confirmed that franchising, as it was applied in the banking sector of Greece, was not a reliable alternative solution for expanding the bank’s distribution channels.
6. Conclusions

It seems that, according to the Greek experience, franchising is not a reliable way of expanding the branch network of commercial banks, at least in periods of financial crisis. A franchisee-branch is by no means equivalent to an ordinary branch and besides, it is a very risky business for both the franchisees and the franchisor. Therefore commercial banks had better adopt a slower strategy for expanding their ordinary branch network to make sure that they will have a smoother growth without the aforementioned risks of franchising. Besides, expanding the branch network does not necessarily lead to better results (ATE Bank being the second biggest bank in terms of number of branches, is fifth in terms of capitalisation). The closing of unsuccessful franchisee branches undermines the whole image of the bank, so it is better to anticipate such unfavourable developments.

If banks still want to use franchising, they should ask the franchisee to be completely responsible concerning all banking transactions carried out within the branch. If the franchisee bears the risk of granting loans, he would be more selective in approaching new customers.

References


