FDI and economic growth in Central and Eastern Europe: Is there a link?

Katarina Bačić  
The Institute of Economics, Zagreb, Croatia  
kbacic@eizg.hr

Domagoj Račić  
The Institute of Economics, Zagreb, Croatia  
& University of Cambridge, UK  
dracic@eizg.hr

Amina Ahec–Šonje  
Zagreb School of Economics and Management  
amina@arhivanalitika.hr

Mailing address: The Institute of Economics, Trg J.F.Kennedy 7, HR- 10000 Zagreb, Croatia  
Phone: ++385 1 233 5700, fax ++385 1 233 5165

Abstract: Economic literature on economic growth and FDI (foreign direct investment) implies that FDI can facilitate growth of recipient economy via capital inflow instantly and via positive spillovers and inclusion into international productive and innovative networks ex post. In this paper the role of FDI is examined by using bi-variate Granger causality test for growth, merchandise exports and imports, and by modeling growth equation with FDI as one of the explanatory variables in pool regression for 11 transition economies in CEE. Granger causality test is done additionally for each economy in the sample individually, which later enables better interpretation of pool regression results. The final results of the quantitative analysis imply that FDI cannot account for higher growth of the observed economies. FDI appears insignificant for growth. The finding can be explained by the fact that FDI have not contributed to the capital formation strongly because they have dominantly flown in as brownfield investments into services. Market-orientation of FDI coupled with the use of home country suppliers’ or parent company’s goods and services might have helped to annul the positive effects of FDI.

Keywords: Foreign direct investment, economic growth, Central and Eastern Europe, spillover, competitive effect, enterprise restructuring, industrial networks, absorptive capacity.
1. Introduction

FDI inflows in CEEC have been given vast political and economic attention since the beginning of the 1990es. It has been argued that, among many benefits, foreign investors would transfer the newest technology and thus improve productivity, product quality and accelerate exports in the recipient economies, which would eventually spur growth. These attitudes have been described and put in benign concept of FDI in economic literature (Moran, 1998). However, the scientific evidence and research on the links between FDI and economic growth have shed some doubt on the validity of those arguments, at least in the Central and Eastern Europe (CEE). So far, not enough evidence has been given to support either benign or malign (Moran, 1998) concept of FDI. We find only a few studies researching the link and the possible effect that FDI might have had in CEE using quantitative approach from a macroeconomic perspective (Fabry, 2001, Mencinger, 2003). Perhaps that can be explained with the difficulties that researchers encounter with the consistency of the macroeconomic data in the observed region, as well as a limited availability of the uniform data for the whole region. Although more evidence is present from the results of microeconomic studies, they are mostly confined to case studies of a single recipient country or to case studies of a single foreign investing country. Microeconomists encounter the same problems with data as macroleconomists and that is why we find that their studies using quantitative approach have been based on their own data (collected through survey of firms). Those evidence and the results have been most helpful for interpretation of our own results and for better understand of the nature of foreign investment enterprises (FIE) in CEE.
Our approach to researching the connection between FDI and growth in CEE is embodied in two major parts of the paper. In the first part of the paper, we give an overview of a theoretical base to studying the link between FDI and growth and then move on to providing an empirical overview of the evidence and interpretations of the link in CEE given by different authors. The primary intention of the first part of the paper is to better explain the possible “dual” (benign vs. malign) nature of FDI as opposed to inclining to one concept. Secondly, an overview of both macroeconomic and microeconomic evidence from CEE has been written with the intention to encompass the multifaceted nature of FDI, as the main theory of FDI - the eclectic theory of FDI - is built on both branches of micro- and macroeconomic theory. Finally, the results of microeconomic studies and the case studies would help us better understand the results of our quantitative research.

The second part of the paper is concerned with quantitative examination of the link between FDI and growth. Bivariate Granger causality test is done for each of the countries in the samples of 11 CEE countries and used to find out whether changes in the FDI inflows precede changes in the level of quarterly GDP, merchandise exports and imports. When the test results show that changes in FDI precede the changes in other variables, we complement the result with cross correlation coefficient to establish the sign of the connection.

By having an overview of these possible connections, we are able to better interpret the results of a growth model. We then move on to testing a growth equation that was used on a sample of 8 countries in CEE by Mencinger (2003). Pool regression is used to test the equation, which is insignificantly altered with the omission of one of the explanatory variables (country dummy variable) used by Mencinger.
2. Starting points: links between economic growth and foreign direct investment in theories, models and empirical work

As a component of capital, FDI\(^1\) can together with labour and technology compose the production function in the neoclassical growth model (Solow, 1956), but in the long run increase in FDI will result in decreasing returns. The neoclassical theory assumes there is no interdependence or relations between capital, labour and technology – all variables are exogenous. On the other hand, should FDI provoke technological progress (although there is no explanation how this may happen), they may indirectly affect long term economic growth.

The next group of models, known as endogenous growth models considered technological progress an endogenous variable (Romer, 1986, 1990). In those models technological progress stems from the activity of individuals or firms. Growth theorists also allowed for the possibility of increasing returns and the expansion of the definition of (financial) capital to human and physical capital. There are two ways – a direct and an indirect way - for capital to influence growth. Firstly, increase of capital per capita will result in the rising productivity, which will increase growth. And secondly, foreign investors may be creators of technological progress, on which impetus to growth is based. Externalities are additionally introduced in the model as a route to spilling over of technological progress (for example, from the foreign investment enterprise) unintentionally to other agents in the economy. Learning from others, training at work, knowledge and experience of others are freely available to all.

\(^1\) The purist definition by which FDI is only considered in financial terms is not surprising as neoclassical growth model has arisen in 1950es. A new, expanded definition of FDI was proposed by Hymer (1976). His definition of what he referred to as “international operations”, besides capital also includes the transfer of knowledge, skills and technology.
Models based on research and development models of endogenous growth (also known as Neoschumpeterian models) are considered more realistic than previous models because of their assumption that markets are imperfect (Grossman and Helpman, 1990, 1991; Aghion and Howitt, 1992). This assumption implies that technology is no longer available freely and therefore firms with market power have an incentive to innovate and protect their innovations via patenting. Innovators-leaders can capture extra profits while their followers, to which innovators can sell their technology, earn lower profits. However, the knowledge that has resulted from innovating can be spilled over and thus is still available freely.

Indeed, in his theory of international business operations, Hymer (1976) recognizes that market power is as the heart of international businesses. Multinational organizations achieve their market power as a result of their specific advantage embodied in their unique assets and not vice versa – their market power is not the cause of existence of their proprietary advantage over other firms because the inefficiency stemming from monopoly power would not make the maintenance of extra profits possible in the long run (Dunning, 1988). With extra profits earned by owning the proprietary advantage, new investments and breakthrough into foreign markets are possible.

Lastly, Akamatsu’s “Flying geese” model of development explains how a less developed economy can catch-up with more developed economies through international trade (Dunning, 1988; Kojima, 2000). Import of more sophisticated goods than the less developed economy is producing, gradually gives an opportunity to the less developed economy to start the

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2 This advantage pertains to monopoly power and can be accomplished on final product markets or input markets or can it be a result of economies of scale, diversification of risk or government support (Blough, 1970: 1258). Hymer (1976) outlines few routes through which proprietary advantages are realized: a. obtaining lower-priced inputs, b. knowing how to produce more efficiently and/or strict overseeing of production and c. successful distribution and/or differentiated product.
production of sophisticated products and, with time, to start exporting them. The levels of
technological complexity of production as well as the levels of sophistication of the products
increase with time. Kojima (2000) adds a new dimension to the model with the inclusion of
FDI in the development process. For him, foreign investments must be oriented towards trade.
In other words, foreign investor country will move its production to another country to
strengthen its comparative advantage that has previously been deteriorating in the home
country. As a consequence, the host country’s economy will grow because it has received new
technology and capital with the purpose to be employed in the growth of production and
exports. The result of the foreign investment is beneficial for both home and host country
because comparative advantages of both countries are enhanced.

Authors of empirical work in the area of growth and FDI mostly rely on endogenous growth
models as a theoretical starting point and use cross country regression analysis to prove the
link.

Some of the most prominent authors found the influence of FDI on host economy to be
dependent on the country’s internal conditions and setting\(^3\). Borensztein, De Georgio and Lee

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\(^3\) Moran (1998: pp. 19-20) summarizes different perspectives of FDI into two dominant views. FDI not only
brings in additional capital, but also brings along know-how, technology, managerial skills, new resources, all of
which, *according to the benign concept of FDI*, can be spilled over to the host economy. Benign concept of FDI
stipulates that due to foreign investment into capital-labor ratio, labor productivity can be enhanced, which can
then lead to higher wages. That concept is relevant only if two conditions are satisfied: the industry that the
foreign investors’ activity belongs to, must have (almost perfect) competition on the global level and free
competition in that industry must exist in the host economy. Highly developed economies have better chances of
capturing all of the benefits coming from FDI because their markets are functioning efficiently – with developed
systems of suppliers and subcontractors, modern telecommunication networks, national systems of innovation,
specialized human resources and strong domestic competition. When these conditions of perfect and fee
competition are not satisfied, *the malign conception of FDI*, which criticizes behavior of multinational
enterprises, emerges. The malign conception recognizes that FDI may have negative effects on host economy
because foreign investor firm is a monopoly or oligopoly on the global level and/or market structure of the host
economy is imperfect. The critique of multinational enterprises also asserts that these enterprises are able to
achieve competitive advantages on the global scale because in some developing countries, due to their
negotiating skills and economic strengths they are able to circumvent health and safety standards, environmental
laws and legislated minimum wages. The institutional and innovative infrastructure that is either missing or is
(1998) show that foreign investments are more important for growth than domestic investments (due to the transfer of technology, productivity spillovers etc.) in developing economies but only if there is an adequate absorptive capacity within the country, which enables efficient reception, transmission and diffusion of new technologies. Absorptive capacity thus facilitates the absorption of technology and knowledge spilled over from the foreign investment by the domestic agents. It is determined by the accumulated human capital of the economically active population in the host country, i.e. on the levels and structure of knowledge and skills\(^4\).

On the contrary, De Melo (1999), using a sample of OECD members and non-members, finds the influence of FDI to be more significant in countries that are technological laggards i.e. developing economies. He asserts that the existing domestic technology and foreign technology that is introduced are complementary, which occurs because: a. new technology is used less efficiently in countries that are technological laggards and/or b. foreign technology and knowledge are not more productive or modern than those existing in the host economy.

There have not been many studies focusing specifically on the links between economic growth and FDI for CEE, but many researchers did try to identify the factors, amongst them FDI, that explain economic growth in the region. Havrylyshyn, Izvorski and van Rooden being built in some developing economies, make the potential spillovers improbable. Due to their cost advantages over local firms, multinational enterprises are able to keep market concentration in the host economy high.

\(^4\) The term “absorptive capacity“ may be expanded from human capital to social capital, but not without methodological difficulties. Putnam (1995: p. 67) defines social capital as “features of social organization such as networks, norms and social trust that facilitate co-ordination and co-operation for mutual benefit”. The inclusion of social capital is intuitively plausible, because knowledge diffusion and technology transfer crucially depend on networks of individuals and institutions that create and reproduce social capital. However, modeling social capital in growth equation using cross-country regression is yet impossible because of measurement problems and the lack of consistent and/or comparable data, especially on regional and global levels.
(1998) conclude on their sample of 25 transition economies, including those in Central and Eastern Europe (CEE), that the key determinants of growth in the transition period were macroeconomic stabilization, structural reforms and lowering public expenditures. FDI has influence on growth only when reforms index is excluded from the model, but that influence is less significant than that of reforms. Havrylyshyn et al. (1999) make another attempt to find the reasons behind different growth patterns across transition economies, again including CEE. The main finding is that initial conditions, economic policies along with the institutional, legal and political framework are significant factors of growth in the region. By employing qualitative approach authors estimate that FDI accounted for economic growth of Estonia, Hungary, Poland and Slovenia – countries that attracted the highest portion of FDI in CEE and economies of which were on average growing by 4 percent or more. In their conclusion, authors speculate that FDI may have an effect on growth after conditions pertaining to growth have been achieved (after implementing economic stabilization and reforms).

Papers focusing specifically on the link between FDI and growth in CEE have started to emerge since the early 2000. Fabry (2001) tries to identify the existence of a link between FDI, growth and exports by using bi-variate Granger causality testing for ten host countries. She detects Granger causality from FDI to economic growth in the case of Albania and Russian Federation, while the opposite direction i.e. causality from economic growth to FDI is found in the case of Hungary, Poland and Romania. However, Fabry’s conclusion is that exports seem to boost growth more than FDI, and in her research it appears that Granger causality from FDI to exports simply does not exist. Mencinger (2003) writes a paper with the same objective for a sample of eight CEE countries, which joined the EU in 2004. He also uses Granger causality test to prove the connection between FDI, economic growth and trade
deficit, but with the purpose to use them as a complement to the results of cross-country regression growth model based on the Solow’s approach. It appears that the relationship between FDI and growth indeed does exist, but it is negative, implying that FDI retards economic growth. The author explains that this is caused by takeovers as the main mode of entry of foreign investors, as well as the fact that the capital used for buying the firms was later directed into consumption and imports, thus failing to raise efficiency. Additionally, the negative “competitive” effect, seen as elimination of local competitors because of their inability to compete with foreign investment enterprise, might have prevailed. Mencinger also regards the sectoral breakdown of FDI as unfavourable – FDI in CEE predominantly flowed into (local market oriented) services sector, mostly retail and banking, which might have hindered productivity spillovers in smaller economies. Lastly, he attributes the widening of current account deficit in the countries to FDI.
3. Stylised facts and findings related to FDI in Central and Eastern Europe during the period of transition

It is not surprising that most of the CEE countries attempt to attract FDI (over other forms of complementing insufficient domestic savings such as foreign debt). Apart from representing new capital with a package of management skills, know-how and technology, it has been proven that FDI is more stable during economic shocks than other forms of capital such as portfolio investment (Ahec-Šonje et al., 2002). Additional benefits from FDI may include increase of employment, human resources training, transfer of technology and higher exports. Thus, the effects of FDI may substitute some economic and social policy interventions. Additionally, foreign investor can help CEE firms raise their competitiveness and integrate into the single European market by including local firms into their industrial networks. At the moment, many researchers consider that the process of economic integration is not developing in the desired direction i.e. that the process of divergence (and not convergence) of CEE with the EU is underway (Gristock et al., 2003).

Inflows of FDI have been uneven across the countries in the region with the bulk of the value flowing towards the former EU candidates – mostly the Czech Republic, Hungary and Poland. The main reason behind the uneven distribution of flows may be modes of privatization in those countries that allowed foreign capital to enter in early stages of transition (Hunya, 2002), which stimulated mergers and acquisitions as the dominant mode of entry into CEE. Hungary’s model of privatisation has attracted foreign investors more then privatization models in other countries because of its effort to attract strategic investors.
Since the late 1990es numerous studies, which attempt to reveal the factors determining why foreign investors have invested in a certain location/country in the CEE region by using cross-country regression analysis, have appeared (Resmini, 2000; Babić and Stučka, 2001; Campos and Kinoshita, 2003; Bačić, 2004). What most of them had in common is the finding that agglomeration\(^5\) is important for new investments. New foreign investors seem to have been realizing their projects in locations where favourable conditions\(^6\) have been made by the presence of their counterparts. Bačić (2004), by using a regression analysis, finds that FDI in CEE was also motivated by the positive rates of economic growth and by the international trade openness of the countries. That is not surprising: it indicates that foreign investors’ interests are twofold. On the one hand, they want to maximize profits and they base their expectations on the potential of the prospective markets (usually approximated by purchasing power or the size of population in models), and on the other hand, the foregoing exports to the host country must be large enough to validate the investment (thereby regarding the cost aspect). The finding that the growth rate may influence the flow of investment has an implication for the analysis of influence of FDI on economic growth. It indicates the potential presence of endogenous determination of variables, suggesting that both the dependent (rate of economic growth) and independent variable (FDI) may influence each other or may be influenced by the same factors, may be present. That is why the results of the forthcoming analysis must be interpreted with reasonable caution.

Another conclusion stemming from these results is that two types of foreign investors dominate the region – the market-oriented investors and efficiency-oriented (i.e. cost-oriented) investors. Identification of the two types of investors makes it possible to tackle the

\(^5\) The stock of FDI already accumulated or number of foreign investors already present in a location. These locations are, in principle, concentrated in the capitals or big urban centers in the observed economies.

\(^6\) These may be pools of educated human resources, accesses to certain markets, sharing of information etc.
assumptions about the possible effects of FDI on growth and the economies. The market-oriented investors may develop links with the local suppliers so to minimize costs and familiarize themselves with the new market. It is characteristic for this type of investors that they prefer to settle in locations where foreign investors are already present because of the security that they have created.

The market-oriented investors’ presence may enhance the level of local competition by raising the standards of quality and likewise by empowering consumers’ expectations about product quality. On the contrary, should the local competition be too weak in terms of catching-up with the foreign investor’s enterprise (FIE), it could get completely eliminated from the market.

Hunya (2002) stresses the fact that some evidence from the region suggests that local entrepreneurs are facing difficulties in obtaining bank loans, so financing of the catching-up with FIE in reality might have proven cumbersome. Bačić’s analysis (2004) dismisses the geographic diversification of risk (approximated by home country growth rates) as motivation for investment into the observed region. In theory, foreign firms may decide to invest abroad to overcome the economic troughs that they may be facing at home – but in CEE, economic growth is highly dependent on the economic developments in the EU-15 as their key export market.

Technological upgrading, considered one of the main advantages of FDI, might have occurred in lesser intensity than thought – although this cannot be confirmed because data on transfer of technology throughout the region has so far not been collected. If high economic growth in the host economies allowed foreign investors to orientate on local markets exclusively,
technological upgrading might have been overlooked because of the low levels of technological capability of local competitors, at least at the beginning of transition. Requirements for higher quality of products were probably more important to foreign investors who were export-oriented (Hunya, 2002). In literature, export-oriented investors are those who started their business as greenfield projects, while in CEE most of investment fall into the (privatization-related) brownfield category. Regardless of the type of investment, FIEs are more prone to importing or exporting goods and services than local firms because of the nature and structure of multinational enterprises.

Evidence from Hungary shows that FIEs’ contribution to the Hungarian current account deficit has been decreasing due to the increasing merchandise exports. Quite the opposite happened in Poland, where current account deficit has been widening together with the rising share of FIEs in exports and imports (Hunya, 2002).

Breakdown of FDI by activity illustrates a very similar structure in both countries – most of FDI flowed into the manufacturing industry, wholesale and retail, transportation, telecommunication and financial intermediation - and therefore cannot explain the difference in international trade patterns of FIE in Hungary and Poland. Perhaps the difference lies in the fact that Hungary attracted more investments that were greenfield, and by definition more export-oriented than those in Poland.
Table 1: FDI stock breakdown by activities, December 2002, shares in percent

<table>
<thead>
<tr>
<th>National classification of activities</th>
<th>Bulgaria</th>
<th>Croatia</th>
<th>Czech R.</th>
<th>Hungary</th>
<th>Poland</th>
<th>Romania</th>
<th>Slovak R.</th>
<th>Slovenia</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>0.3</td>
<td>0.3</td>
<td>0.2</td>
<td>1.1</td>
<td>0.4</td>
<td>0.8</td>
<td>0.3</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Industry, total</td>
<td>38.8</td>
<td>37.3</td>
<td>45.4</td>
<td>51.8</td>
<td>38.7</td>
<td>53.7</td>
<td>50.3</td>
<td>44.3</td>
<td>45.0</td>
</tr>
<tr>
<td>Mining and quarrying</td>
<td>1.2</td>
<td>3.0</td>
<td>1.7</td>
<td>0.3</td>
<td>0.3</td>
<td>.</td>
<td>0.5</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>36.7</td>
<td>33.0</td>
<td>37.6</td>
<td>46.1</td>
<td>35.8</td>
<td>.</td>
<td>37.1</td>
<td>43.3</td>
<td>38.5</td>
</tr>
<tr>
<td>Electricity, gas and water supply</td>
<td>0.9</td>
<td>1.2</td>
<td>6.1</td>
<td>5.4</td>
<td>2.6</td>
<td>.</td>
<td>12.7</td>
<td>1.0</td>
<td>4.3</td>
</tr>
<tr>
<td>Construction</td>
<td>2.8</td>
<td>1.1</td>
<td>1.5</td>
<td>1.4</td>
<td>2.6</td>
<td>2.7</td>
<td>0.6</td>
<td>0.1</td>
<td>1.6</td>
</tr>
<tr>
<td>Wholesale, retail trade, repair of motor vehicles</td>
<td>15.0</td>
<td>5.7</td>
<td>15.1</td>
<td>10.6</td>
<td>17.1</td>
<td>16.1</td>
<td>10.7</td>
<td>14.5</td>
<td>13.1</td>
</tr>
<tr>
<td>Hotels and restaurants</td>
<td>1.8</td>
<td>4.2</td>
<td>0.7</td>
<td>1.2</td>
<td>0.6</td>
<td>2.1</td>
<td>0.5</td>
<td>0.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Transportation and telecommunications</td>
<td>13.5</td>
<td>26.3</td>
<td>10.4</td>
<td>11.8</td>
<td>10.4</td>
<td>8.5</td>
<td>10.0</td>
<td>4.4</td>
<td>11.9</td>
</tr>
<tr>
<td>Financial intermediation</td>
<td>19.4</td>
<td>22.9</td>
<td>14.8</td>
<td>10.6</td>
<td>21.3</td>
<td>.</td>
<td>24.2</td>
<td>18.8</td>
<td>18.9</td>
</tr>
<tr>
<td>Real estate, renting &amp; business activities</td>
<td>4.1</td>
<td>1.8</td>
<td>11.4</td>
<td>10.6</td>
<td>7.5</td>
<td>.</td>
<td>2.9</td>
<td>15.2</td>
<td>7.6</td>
</tr>
<tr>
<td>Public admin., defence, comput. soc. sec.</td>
<td>.</td>
<td>0.2</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Education</td>
<td>0.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>0.0</td>
<td>0.1</td>
</tr>
<tr>
<td>Health and social work</td>
<td>0.0</td>
<td>.</td>
<td>0.2</td>
<td>0.1</td>
<td>.</td>
<td>.</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Oth. community, social &amp; personal serv.</td>
<td>0.9</td>
<td>0.2</td>
<td>0.4</td>
<td>0.8</td>
<td>.</td>
<td>.</td>
<td>0.4</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Oth. not elsewhere class. activities</td>
<td>2.9</td>
<td>0.0</td>
<td>.</td>
<td>.</td>
<td>1.4</td>
<td>16.1</td>
<td>0.0</td>
<td>1.7</td>
<td>3.7</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total, USD mn</td>
<td>4.454</td>
<td>5.256</td>
<td>27.092</td>
<td>22.203</td>
<td>41.247</td>
<td>8.939</td>
<td>7.580</td>
<td>4.081</td>
<td>120.852</td>
</tr>
</tbody>
</table>


Škudar (2002) finds that shares of FIEs in both exports and imports of goods in Croatia are about the same, but below the CEE average. However, considering that Croatia’s merchandise import is twice the size of its exports, he postulates that FIE by performing their international trade activities, contribute to the widening of current account gap. Moreover, FIEs in Croatia have recorded rising revenues from exports, while revenues from exports of local firms seem to falling. Peculiarity of FDI that has flown into Croatia is that almost 50 percent of total FDI has gone into the service sector – transportation and telecommunication, and financial intermediation. In other observed economies, this share on average stands at 31 percent. In the
Croatian case, it seems that FDI into services have prompted intense links with suppliers and subcontractors from the country of investment’s origin more than from the local firms. That has possibly hindered productivity spillovers as well as raising the abilities and quality of local firms. The other explanation is that FIE in Croatia might have manipulated transfer pricing in order to repatriate profits to a larger extent than in other countries. Profit may instead of “outflow of income” be transferred abroad as loan repayment (to parent company), payment of services and goods (to home country suppliers or parent company), etc. By doing this, FIE will be charged with less tax, which gives FIE cost advantage over local firms. Šonje and Vujčić (2001) demonstrate in their model that the welfare of the host country will increase even if profit is 100 percent repatriated only if the value of exports created from FDI is greater than the repatriated profit.

Market structure and strength, as well as and activity breakdown of FDI are important for determinants of competing between local firms and FIEs. According to the data on FDI stock in CEE in December 2002, on average 38.5 percent of the stock is invested in the manufacturing industry. Financial intermediation, falling into the category of services, attracted by far the most of FDI with almost 19 percent share in total, followed by whole- and retail-sales (13.1 percent) and transportation and telecommunication (11.9 percent). It is exactly these activities that have been growing most strongly during the transition period. Possible explanation for that situation may be that foreign investors have entered prospective firms and activities. Alternatively, foreign investors might have spurred growth of the activities they entered or propulsive sectors underwent expansion and were targeted by foreign investors simultaneously. Apart from noticing the progressiveness of FIE activities, it is noticeably that foreign investors have entered some bigger monopolistic or oligopolistic firms-in particularly the telecommunication (in some of its segments) and the banking sector.
Some capital-demanding privatisations have been planned and carried out separately from the ongoing privatisation processes. Apart from thereby trying to maintain social consensus (with the goal to keep the employment high), many governments also decided to sell off big firms to help cover budget deficit with the revenues from the sales. Often in those separate processes with government acting as the seller, the highest offer was the main criterion, while the future business plans made by prospective buyer came secondary. The result of those sales may be delay of restructuring or lower capital investments in general. Hunya (2002) might have referred to those sales or sales of monopolistic firms when he wrote about the «hot» opportunities that foreign investors seized. When firms that had previously not been restructured were being sold, their price might have been underestimated. Those are, in particular, firms with often obsolete technology and managerial issues usually facing problems of illiquidity or insolvency that require immediate investments. The potential of those firms normally lies in their access to certain market or markets.

Generally, automobile and electronics industry received by far the most of FDI across the region (except in Croatia and Bulgaria) – UNCTAD in 2003 reports that these investments continue to grow mostly contributing to the restructuring of activities toward higher value added. Products of these industries are launched globally. The FDI into the automobile industry in the Czech Republic has created a web of subcontractors and spinning off in local firms. Locating of these industries in CEE is vitally important for receiving countries because of the possibility of FIE helping integrate local firms into international industrial networks. Additionally, those industries are by definition more export-oriented than other types of FDI.
Krkoska (2001) reports that restructuring of firms taken over by foreign owners has been more frequent than in firms owned by residents. In more than 70 percent of cases, FIE upgraded their technology, which must have improved firm's efficiency. In comparison, local firms upgraded their technology on average in less than 55 percent of cases. That is why it is not surprising that indicators of firms' success such as profitability for FIEs are double to three times that of local firms (Konings, 2001; Hunya, 2002; Škudar, 2002). The only decision made both by FIE and local firms that is equally frequent is the decision about reducing the number of employees - a decision that is least demanding in respect to other business decisions such as upgrading of technology or managerial practices (Krkoska, 2001).

Figure 1: Cumulative USD value of FDI per capita (x) in the period 1993-2002 and firm restructuring in 2003 (EBRD index)

![Graph showing the relationship between FDI per capita and firm restructuring index. The graph includes data points for various countries and a trend line. The equation for the trend line is given: EBRD index of enterprise restructuring = 2.5151 + 0.0006x. The correlation coefficient r is 0.7978, and the p-value is 0.0000006.](image)

Source: Authors calculations made after figure from Krkoska (2001: p. 9). Data was taken from UNCTAD CD-ROM, 2003 and EBRD, 2003.
Data on employment in FIEs in several CEE in the years 1998 and 1999 reveals that FIEs’ share in total employment was 2.5 and 2.7 percent, respectively. Interestingly, employment in FIEs between those years rose regardless of ongoing recessions in host economies (in the midst of the “Russian crisis”) and the global economic turbulence coupled with the fact that total employment in half of those economies fell. That situation must have been a result of FIEs’ strong competitive position in the host country market or exporting markets. If that was the case, it might support the idea of the existence of enclaves i.e. a group of progressive firms, more successful than the rest of the economy, and in this case, composed of FIEs\(^7\).

Halpern and Kőrösi (2001) present evidence from Hungarian manufacturing industry asserting that FIE are in a better position to exploit market imperfections and earn extra profit. They see differences in corporate efficiency as an explanation because it can influence the ability to exploit market imperfections. Zukowska-Gagelman (2000) tackles the issue of rising of two-tier economy in Poland, where FIE are dominating the economy while domestic enterprises are only trying to catch-up. Similar occurrence is marked in Hungary by Hamar (2001) who reports of the signals of dual economic development first noted in 1996. Since then local firms have improved their exporting capabilities and productivity, but the gap between local firms and FIEs’ performance in 1999, Hamar writes, has not vanished but, in fact, has widened.

The arrival of multinational enterprises into transition countries has led to some integration of local firms into global production networks (Linden, 1998; Van Tulder and Ruigrok, 1998; Kaminski and Smarzynska, 2001). However, the benefits of multinationals-centred networks

\(^7\) An additional assumption about enclaves is that they no not interact with local firms, and restrict themselves to the use of local resources only where necessary.
accruing to domestic enterprises have often been narrow. The networks being built are often restricted to the multinational firms’ subsidiaries with limited local subcontracting (cf. Radosevic, 2002). Integration into international networks, upgrading of quality and efficiency are perceived as main goals of local firms when cooperating with FIEs. The integration of local suppliers into the multinational enterprises’ global production networks has so far been mostly limited to low-value added activities (Linden, 1998; Van Tulder and Ruigrok, 1998; Dunin-Wasowitz, Gorzynsky and Woodward, 2002). Capability enhancements and technology transfer benefits accruing to domestic companies partnering with multinational enterprises on innovative projects is limited (Sadowski, 2001), and usually restricted to FIE (cf. Biegelbauer, Griebler, and Leuthold, 2001).

Hungary - as a small open economy with high inflows of FDI since the onset of transition is a good example for identifying various types of cooperation between local firms and FIEs. Szanyi (2002) writes that in the Hungarian case, cooperation between local firms and FIEs began in the early stage of transition and that its nature and intensity depended on FIEs’ parent company global strategy. An estimate was made that FIEs cooperated with 10-20 percent of local medium sized firms with the purpose to service local and foreign markets. It is due to this cooperation that local value-added increased. Local firms were mostly confined to the production of intermediary products (components production and subcontracting). Szanyi also provides an extensive overview of different authors’ points of view according to which the cooperation between local firms and FIEs has negative consequences for those local firms. According to those views, subcontractors become isolated from the rest of the national economy and FIE and/or do not transfer enough technology. There is also the possibility that subcontractors may lose their R&D functions and thereby neglect their own product
development. This is not the case with local firms that act as suppliers and manufacture their own products.

Effects of FDI on productivity spillovers in Bulgaria, Poland and Romania for 5000 firms in the period of 1993-1997 were explored by Konings (2001). He finds that FIE are more successful than local firms only in Poland, while he explains the lack of success over local firms in Bulgaria and Romania by the fact that FIE devoted that period to restructuring. The author did not find evidence of positive spillovers in any of the economies. However, he did find negative spillovers in Bulgaria and Romania due to the prevalence of competitive effect over positive technological or productivity spillover. Spillovers from FIEs to local firms are also researched by Smarzynska (2002), but for Lithuania. While she finds that there were positive productivity spillovers in downstream production (suppliers, contractors), she finds none horizontally-in the industry that FIE belonged to. Productivity spillovers were associated with (host country) market-oriented FIEs and not with export-oriented FIEs. Zukowska-Gagelman (2000) finds that in Poland, FIEs’ share in employment, ownership structure and invested capital have strengthened in nearly all industries. Rise in labor productivity in FIE was higher than the rise in overall productivity. Zukowska-Gagelman estimates that FIEs are twice more productive than local firms, and explains that there is trend of shrinking that gap in productivity because of laying off in local firms. In cases where competing with FIEs has provoked restructuring of local firms, that restructuring was mostly defensive and short-term. Overall, higher presence of FIE in an industry seems to affect local firms negatively. The author detected a negative impact of FIEs on local firms’ performance in highly competitive

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8 FIEs’ effort to crowd out local competition. The attempt may prove possible because of local firms’ inability to compete with FIEs-technologically, in financing, in efficiency or managerial practices.
industries, while in the least productive state firms in low competition industries, the effects on productivity is positive.

It seems that, at the level of stylized facts, the extent of spillovers from FIE onto local firms that would spur economic growth in CEE has been limited. That may have occurred due to competitive advantages and strategic behaviour of FIE, as well as to the limited capacity of host countries to utilize the opportunities provided and spread them throughout the domestic economy. For example, problems with transmission and application of knowledge remain widespread even in the most advanced CEE countries (cf. Mickiewicz and Radosevic, 2002). In the next section, we undertake a quantitative analysis to explore the relationship between FDI and growth in CEE.
4. Quantitative Analysis of Effects of FDI on Economic Growth in CEE

4.1. Data, sample and statistical indicators

The sample of countries for analysis of importance of FDI for growth consists of 11 transition economies in CEE: eight countries that have integrated into the EU in May 2004 (the Czech Republic, Poland, Hungary, Latvia, Lithuania, Estonia, Slovenia and Slovakia) and three countries of the second wave of accession to the EU (Bulgaria, Croatia and Romania). Period under observation is 1994-2002 because between those years all of the economies have started to recover from the “transition shock” and have started to record positive rates of economic growth. That, along with simultaneous inflow of FDI into the region and similar economic structures, makes the sample homogenous.9

Slovenia, among the countries in the sample, exhibits the most persistently high growth rate of 4.1 percent with only 0.9 percent of deviation from its average value. That is not case with average FDI inflows into Slovenia –they are not above the sample’s average, and their deviation from the average inflow is significant. Nonpersistent FDI inflows into Slovenia may be the first sign that in the course of the observed period high and robust rates of economic growth cannot directly be credited to FDI inflows. Low correlation coefficient for economic growth and FDI confirms that doubt. Bulgaria, on the other hand, stands out as the country with the least persistent growth rate (on average 0.9 percent) with high deviation from its average value. Bulgaria has on average received more FDI inflows than Slovenia, which were also more stable than the ones flowing into Slovenia. The most obvious outstanding candidate

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9 Some differences in the level of development among countries are more obvious when the level of GDP per capita is taken into consideration. Majority of those countries (8 of them) belong to medium income range (2000-4999 USD per capita), while Slovenia (upper higher income 5.000-19.999), and Romania and Bulgaria (lower income 500 1.999 USD) do not fall into that category.
for determining the existence of relationship between growth and FDI is Latvia because of its positive rates of growth and persistent inflows of FDI. That is why its correlation coefficient for economic growth and FDI is high (0.9). However, the high value of correlation coefficient may point to the problem of endogenous determination of variables. FDI itself may be influenced by innovations and other factors characteristic for processes that provoke economic growth (USITC, 1997).

Table 2: Time series with annual data for real rate of economic growth (rGDP) and FDI inflows (FDI, USD millions)

<table>
<thead>
<tr>
<th></th>
<th>Est</th>
<th>Slo</th>
<th>Lit</th>
<th>Lat</th>
<th>Cro</th>
<th>Slk</th>
<th>Bul</th>
<th>Hun</th>
<th>Czk</th>
<th>Rom</th>
<th>Pol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average FDI inflow</td>
<td>236</td>
<td>201</td>
<td>114</td>
<td>139</td>
<td>182</td>
<td>199</td>
<td>61</td>
<td>212</td>
<td>391</td>
<td>42</td>
<td>137</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>107</td>
<td>283</td>
<td>85</td>
<td>51</td>
<td>119</td>
<td>235</td>
<td>42</td>
<td>104</td>
<td>273</td>
<td>25</td>
<td>56</td>
</tr>
<tr>
<td>Average growth</td>
<td>4.2</td>
<td>4.1</td>
<td>2.2</td>
<td>4.0</td>
<td>4.3</td>
<td>4.3</td>
<td>0.6</td>
<td>3.6</td>
<td>2.1</td>
<td>1.2</td>
<td>4.5</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>3.7</td>
<td>0.9</td>
<td>5.5</td>
<td>3.3</td>
<td>2.3</td>
<td>1.8</td>
<td>5.6</td>
<td>1.4</td>
<td>2.8</td>
<td>4.8</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Value of correlation coefficient 1992-2002

<table>
<thead>
<tr>
<th></th>
<th>Growth, FDI</th>
<th>FDI (t-1)</th>
<th>Growth (t-1), FDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992-2002</td>
<td>0.4</td>
<td>-0.1</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>0.3</td>
<td>0.8</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>0.9</td>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>0.3</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>0.6</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>0.6</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>-0.3</td>
<td>-0.2</td>
<td>-0.1</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.3</td>
<td>-0.2</td>
</tr>
<tr>
<td></td>
<td>-0.2</td>
<td>-0.4</td>
<td>-0.1</td>
</tr>
<tr>
<td></td>
<td>-0.4</td>
<td>-0.8</td>
<td>-0.2</td>
</tr>
</tbody>
</table>


In the table 1 countries are positioned by the size of its population. Within the observed sample, in smaller countries, correlation coefficients for economic growth and FDI are positive, while it is opposite for larger countries (Hungary, Romania and Poland) – with the exception of the Czech Republic where correlation is weak.
Table 3: Main statistical indicators of FDI (million, USD per capita) and countries’ GDP growth rates in cross section

<table>
<thead>
<tr>
<th></th>
<th>Average FDI inflow</th>
<th>Standard deviation</th>
<th>Average real rate of GDP</th>
<th>Standard deviation</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>60,2</td>
<td>46,6</td>
<td>1,9</td>
<td>4,5</td>
<td>-0,02</td>
</tr>
<tr>
<td>1995</td>
<td>111,3</td>
<td>132,7</td>
<td>4,4</td>
<td>2,6</td>
<td>-0,25</td>
</tr>
<tr>
<td>1996</td>
<td>98,1</td>
<td>65,3</td>
<td>3,0</td>
<td>4,8</td>
<td>0,27</td>
</tr>
<tr>
<td>1997</td>
<td>129,7</td>
<td>63,3</td>
<td>3,7</td>
<td>5,8</td>
<td>0,57</td>
</tr>
<tr>
<td>1998</td>
<td>196,6</td>
<td>111,6</td>
<td>2,7</td>
<td>3,4</td>
<td>0,08</td>
</tr>
<tr>
<td>1999</td>
<td>191,6</td>
<td>163,1</td>
<td>0,9</td>
<td>3,0</td>
<td>-0,16</td>
</tr>
<tr>
<td>2000</td>
<td>208,2</td>
<td>131,4</td>
<td>4,3</td>
<td>1,7</td>
<td>-0,18</td>
</tr>
<tr>
<td>2001</td>
<td>234,2</td>
<td>154,4</td>
<td>4,3</td>
<td>1,7</td>
<td>-0,30</td>
</tr>
<tr>
<td>2002</td>
<td>337,0</td>
<td>346,5</td>
<td>3,5</td>
<td>0,8</td>
<td>-0,10</td>
</tr>
<tr>
<td>1994 – 02</td>
<td>174,1</td>
<td>135,0</td>
<td>3,2</td>
<td>3,2</td>
<td>-0,01</td>
</tr>
</tbody>
</table>


Cross section data (table 2) do not provide a clearer picture of the observed relationship. After the recovery from the transition shock, positive rates of economic growth begin to slowdown towards 1999, when most of the economies from the sample are hit by the Russian financial crisis. Since then, rates of economic growth have stabilized at precrisis level and their nonpersistence weakens. The year 1999 marks a turning point in the relationship between FDI and economic growth. In the period 1996-1998, countries with higher growth rates were at the same time countries that attracted higher inflows of FDI, suggesting that foreign investors were more attracted to countries that grew progressively. On the other hand, those countries’ growth can be a result of effects of FDI.
Result of a simple regression with average growth rates (of 27 transition economies) as dependent variable and average FDI inflows (in USD) as explanatory variable, shows that on average countries grew by 2.4 percent (the constant) and that nearly 2 percent of variation in growth can be explained by the difference in FDI flows. Dollar value of FDI increases
growth, but not strongly since its coefficient is close to zero. If the sample is narrowed to the 11 economies under observation plus Macedonia, almost identical result is obtained, but only with higher percentage in variation of growth attributed to changes in FDI – 11.4 percent.

4.2. Testing of causality

Although the question “does a change in one variable cause a change in another variable in a relationship founded in economic theory?” has implicitly been posed, the answer has yet not been given because it must be found in determining existence of causality. Additionally, strength of the relationship may be examined with correlation coefficient. Fabry (2001) and Mencinger (2003) try to find the answer to the relevant question for FDI and rate of economic growth by using Ganger causality test. They use annual data for the transition period with lagged FDI. Fabry (2001) uses annual data with lagged FDI for countries individually, while Mencinger (2003) uses cross section data for 8 eight countries that have integrated into the EU in May 2004 and tests the causality for the whole sample. Although Fabry produces results for individual countries, a low number of her observations may be problematic. Mencinger’s approach assumes the same pattern of causality for the whole sample, but his test results appear more reliable.

The general weakness of Granger causality test is that it does not produce the sign (positive vs. negative) of the relationship between variables, and Fabry (2001) solves this problem by introducing correlation coefficient to complement the findings of the test. Granger causality is tested for two variables, where if the second variable provides information about the first variable in the presence of lagged first variable, then “the second variable Granger causes the first variable”. Causality is tested in both directions, from first to the second variable direction and in the opposite direction.
In order to Granger test the countries from the sample, quarterly FDI, merchandise exports (MG) and imports (XG) and nominal GDP (all in USD) data for the period 1993-2002 is used, thus making series of 35-38 observations on average. Bivariate causality is tested for each country individually, with lags (signified by “p”) varying from 2-8 (i.e. from 6 to 24 months). The wide range of lags allows for the possibility that the effects of FDI in various economies may disperse unequally fast/slow, as well as the possibility to capture the effects of FDI might have not been registered promptly in the official statistics. The dependant variable is also included in the equation as a lagged variable in order to capture the systematic changes in the series. Of the hypothesis Ho is rejected, then Granger causality is present.

Equation specifications:

\[ GDP_t = c_1 + \sum_{i=1}^{p} \alpha_i GDP_{t-i} + \sum_{i=1}^{p} \beta_i FDI_{t-i} + u_t \]

\[ H_0 : \beta_1 = \beta_2 = ... = \beta_p = 0 \]

\[ MG_t = c_1 + \sum_{i=1}^{p} \alpha_i MG_{t-i} + \sum_{i=1}^{p} \beta_i FDI_{t-i} + u_t \]

\[ H_0 : \beta_1 = \beta_2 = ... = \beta_p = 0 \]

\[ XG_t = c_1 + \sum_{i=1}^{p} \alpha_i XG_{t-i} + \sum_{i=1}^{p} \beta_i FDI_{t-i} + u_t \]

\[ H_0 : \beta_1 = \beta_2 = ... = \beta_p = 0 \]

The goal of the testing is to explain whether changes in FDI inflows cause changes in level of GDP, merchandise exports and imports. FDI directly complements fixed capital formation if it comes in the form of greenfield investment, and may indirectly affect growth if it changes
exports and imports—and it should as theory and empirical evidence suggest that. Reverse causality in the test will help to find out whether the problem of endogenous determination of variables is present. That problem is in regression (that is to follow) normally solved by using lagged FDI values, logarithmic values of GDP and by introducing more explanatory variables in the equation (USITC, 1997).

Table 4: Granger bivariate causality test results for FDI as an explanatory variable

<table>
<thead>
<tr>
<th>Countries</th>
<th>Presence of causality (3) and the sign of cross correlation coefficient</th>
<th>Lags at which causality is present</th>
<th>Presence of causality (3) and the sign of cross correlation coefficient</th>
<th>Lags at which causality is present</th>
<th>Presence of causality (3) and the sign of cross correlation coefficient</th>
<th>Lags at which causality is present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Croatia</td>
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<tr>
<td>The Czech R.</td>
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<td></td>
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<tr>
<td>Bulgaria</td>
<td>+</td>
<td>3–6</td>
<td>+</td>
<td>2–5</td>
<td>+</td>
<td>2–7</td>
</tr>
<tr>
<td>Slovenia</td>
<td>–, +</td>
<td>3–6</td>
<td>+</td>
<td>2–5</td>
<td>+</td>
<td>2–7</td>
</tr>
<tr>
<td>Slovak</td>
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<td></td>
<td></td>
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<tr>
<td>Estonia</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>+</td>
<td>3</td>
<td>+</td>
<td>2–6, 8</td>
<td>+</td>
<td>2–5</td>
</tr>
<tr>
<td>Latvia</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Hungary</td>
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<td>Poland</td>
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<tr>
<td>Romania</td>
<td></td>
<td>n.a.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No. of countries with established presence of causality</td>
<td>3</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Table 5: Granger bivariate causality test results for GDP, merchandise exports and imports as explanatory variables

<table>
<thead>
<tr>
<th>Variable lagged at t-2, ..., t-8 ( \rightarrow ) (explanatory variable)</th>
<th>GDP</th>
<th>Merchandise exports</th>
<th>Merchandise imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable at ( t ) ( \rightarrow ) (dependant variable)</td>
<td>Presence of causality (∃) and the sign of cross correlation coefficient</td>
<td>Lags at which causality is present</td>
<td>Presence of causality (∃) and the sign of cross correlation coefficient</td>
</tr>
<tr>
<td>Countries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Croatia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Czech R.</td>
<td>∃+</td>
<td>3</td>
<td>∃+</td>
</tr>
<tr>
<td>Bulgaria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slovenia</td>
<td>∃+</td>
<td>2–3</td>
<td></td>
</tr>
<tr>
<td>Slovakia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estonia</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Lithuania</td>
<td>∃+</td>
<td>2–5</td>
<td>∃+</td>
</tr>
<tr>
<td>Latvia</td>
<td>∃+</td>
<td>4, 6–8</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Romania</td>
<td>n.a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of countries with established presence of causality</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: Quarterly data from IFS IMF-CDROM, web-sites of central banks and national statistical offices. Remark: data for Polish exports and imports include services.

The test results presented in table 3 show that lagged FDI (by 9-15 months) Granger caused changes in GDP levels of Slovenia, Slovakia and Lithuania. The established link is most robust in Lithuania because of positive and high correlation coefficient, whereas in Slovenia it is positive, but at the same time low. Slovakia’s results are inconclusive because the established relationship on lags 5-7 carries both negative and positive signs, and coupled with that, the link is not strong. The results in table 4 point to the possible existence of the problem of endogenous determination of variables because apart from “FDI Granger causing GDP”, results show that “GDP Granger causes FDI”. All thee economies with the established relationships are opened and rather small which opens the possibility that the effects of FDI
may be stronger in smaller economies with possibly less diversified or complex economic structure.

FDI Granger causes changes in international trade flows in Slovenia, Estonia, Latvia and Hungary, and in all cases the relationship is positive. The problem of endogenous determination of variable emerges in the Estonian case. However, Granger causality stemming from FDI to merchandise imports is most strongly present, having been established in eight countries, implying that FIE have been strongly using their parent companies’ or home country suppliers services or products and were probably strongly contributing to the widening of current account deficit.

No causality stemming from FDI was found in Croatia and Poland’s case, but there was the opposite causality – coming from international merchandise flows to FDI. Merchandise imports (which strongly correlate with merchandise exports) have Granger caused FDI in 7 countries and those high imports may be interpreted as a cost argument for market-oriented investors to invest in the observed countries.

4.3. Production function

Results of the Granger causality test will supplement the results of production function of similar to the one used by Mencinger (2003) in his research with general specification:

\[ r\text{GDP} = f (pc\text{GDP}, r\text{INV}, r\text{EMP}, \text{FDI}, r\text{EU}), \]

where \( r\text{GDP} \) signifies rates of economic growth, \( pc\text{GDP} \) initial conditions, \( r\text{INV} \) rate of domestic investments, \( r\text{EMP} \) rate of employment, and \( r\text{EU} \) rate of growth of EU-15. The difference between Mencinger’s model and the one used in this paper is that there are no
country dummy variables in the outlined model. Method used to test the equation is pool regression with cross section weights (CSW). CSW should allow for a better fit of the regression.

Table 6: Results of regression of production function for the period 1994-2002

<table>
<thead>
<tr>
<th></th>
<th>Basic model</th>
<th>Model-1</th>
<th>Model-2</th>
<th>Model-3</th>
<th>Model-4</th>
<th>Model-5</th>
<th>Model-6*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const.</td>
<td>1.8 (3.17)</td>
<td>0.9 (1.05)</td>
<td>1.79 (3.21)</td>
<td>0.93 (1.14)</td>
<td>1.79 (3.34)</td>
<td>0.71 (0.90)</td>
<td>3.77 (3.37)</td>
</tr>
<tr>
<td>pcGDP</td>
<td>6.64E-05 (0.85)</td>
<td>9.17E-05 (1.05)</td>
<td>6.89E-05 (0.87)</td>
<td>8.71E-05 (1.12)</td>
<td>-3.58E-06 (-0.05)</td>
<td>2.25E-05 (0.31)</td>
<td>-0.0001 (-1.54)</td>
</tr>
<tr>
<td>rINV</td>
<td>0.16 (8.83)</td>
<td>0.16 (8.94)</td>
<td>0.16 (8.81)</td>
<td>0.16 (8.85)</td>
<td>0.14 (7.2)</td>
<td>0.13 (7.27)</td>
<td>0.09 (3.87)</td>
</tr>
<tr>
<td>rEMP</td>
<td>0.25 (2.64)</td>
<td>0.25 (2.77)</td>
<td>0.25 (2.67)</td>
<td>0.26 (2.81)</td>
<td>0.21 (2.29)</td>
<td>0.22 (2.40)</td>
<td>0.34 (2.67)</td>
</tr>
<tr>
<td>EUgrowth</td>
<td>-</td>
<td>0.33 (1.49)</td>
<td>-</td>
<td>0.32 (1.45)</td>
<td>-</td>
<td>0.37 (1.80)</td>
<td>0.32 (1.32)</td>
</tr>
<tr>
<td>FDI (-1)</td>
<td>0.0001 (1.22)</td>
<td>0.0001 (1.3)</td>
<td>-</td>
<td>-</td>
<td>3.02E-05 (0.39)</td>
<td>1.19E-05 (0.09)</td>
<td>-0.0005 (-2.34)</td>
</tr>
<tr>
<td>FDI</td>
<td>-</td>
<td>-</td>
<td>0.0001 (1.37)</td>
<td>0.0001 (1.45)</td>
<td>-</td>
<td>3.73E-05 (0.31)</td>
<td>-</td>
</tr>
<tr>
<td>rGDP(-1)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.22 (3.27)</td>
<td>0.22 (3.34)</td>
<td>-</td>
</tr>
<tr>
<td>R^2 R^2 adj.</td>
<td>0.72 (0.71)</td>
<td>0.74 (0.72)</td>
<td>0.73 (0.71)</td>
<td>0.74 (0.73)</td>
<td>0.77 (0.76)</td>
<td>0.79 (0.77)</td>
<td>0.82 (0.87)</td>
</tr>
</tbody>
</table>

* Sample composed of countries in which «FDI Granger cause GDP or merchandise exports»: Lithuania, the Slovak Republic, Slovenia, Estonia and Hungary.
Remark: T-statistics are within brackets.

In the basic model, the constant equals long-term average growth rate of 11 economies in the sample – and is significant in the specifications where its value is above 1. The main result of the analysis is that changes growth can be explained by the rise in domestic investments and employment, and these variables are robust in all specifications of the equation. Lagged FDI, initial conditions and growth in EU-15 turn out insignificant. When the sample is reduced to the economies identified as those where FDI has Granger caused either growth or exports or both (Model 6*), lagged FDI becomes significant and has negative influence on growth, but
its strength is negligible (because its coefficient is close to zero). Though the sample is too small for the results to be reliable, the results are consistent with the results of the basic model – with the constant, domestic investments and employment remaining the significant explanatory variables.

5. Conclusion
Overview of the recent empirical evidence together with pool regression results strongly suggests that the role of FDI in capital formation was negligible. Had FDI complemented host countries’ fixed investments more strongly, the results would have reflected in higher rate of economic growth (see regression models 2, 3 and 5). That finding supports the fact that most of FDI has flown in the region in the form of brownfield investments. If those FDI inflows had come in the form of greenfield investments, the results on the economy would have automatically been visible in higher growth rate. More importantly, presence of positive indirect effects of FDI after the initial year of investment is not confirmed for the whole sample (see basic model and models 4 and 5). However, the results of Granger causality test, which enable individual approach to economies, imply that the growth rates of three open and small economies - the Slovak Republic, Slovenia and Lithuania – have been positively influenced by FDI. Perhaps the explanation to this influence lies in their economic structures that are probably less complex and less diversified than those in big economies simultaneously more receptive to spillovers. When the sample (see regression model 6) is restricted to five economies in which presence of FDI influence on growth and exports was established, influence of lagged FDI on growth appears, and is negative. Although the restricted sample is too small to provide any conclusive results, a cautious conclusion may still be made. The indirect negative effects of FDI achieved through trade and competing with
local firms seems to overweight the positive direct effect on capital formation in those countries.

Furthermore, influence of FDI is strong in international trade of the observed economies, and mostly so in rising merchandise import levels. Evidence of FIEs’ activity contributing to the goods exports is less present in the sample. That is why these results confirm the notion that FIEs are contributing to the widening of current account deficit widening in several of the observed economies. High shares non-export oriented FDI, mostly flown into the services sector, can account for that development. Those results also imply that FIEs were probably extensively using their home country suppliers’ and/or parent company’ services or goods. By doing so, apart from limiting cooperation with local firms, transfer-pricing manipulation as a mechanism of retrieving pre-taxed profits was more likely to occur. Positive spillovers in the form of productivity enhancement on the level of FIEs’ activity, in downstream and upstream production were more likely to occur in larger economies, economic structure of which probably had more local competition and a wider choice of local suppliers and subcontractors. However, those effects are probably less significant on the level of the whole economy, with no consequences on the growth rate. Empirical literature suggests that productivity enhancements were narrowed to FIEs mostly. Likewise, technological upgrading of both FIEs and local suppliers and subcontractors might have only occurred in the economies that received the high shares of FDI in export-oriented international activities such as electronics or automobile production. In other dominant FDI shares such as retail trade or finance, competing with local firms was more pronounced. The available findings that confirm that FIEs in few of the observed economies were more successful than local firms imply that those host economies have already become two-tier economies.
a. Data sources

- IMF International Finance Statistics 2003, CDROM.
- The Vienna Institute for International Economic Studies (WIIW) Database, CDROM.
- UNCTAD Handbook of Statistics 2003, CDROM.
- Transition Report Update 2002: Economic Transition in central and eastern Europe, the Baltic States and the CIS, European Bank for Reconstruction and Development (May).
- Organisation for Economic Co-operation and Development (http://www.oecd.org/home/).

b. References


Mickiewicz, T. and Radosevic, S. (2002). Innovation Capabilities of the Six EU Candidate Countries: Comparative Data Based Analysis. London: School of Slavonic and East European Studies, University College London.


Appendix 1.

Table 7: Results of Granger causality test

**Hungary**

<table>
<thead>
<tr>
<th>FDI and merchandise exports (XG), hypothesis:</th>
<th>Lag</th>
<th>F-Statistic</th>
<th>Probability</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI does not Granger Cause XG</td>
<td>2</td>
<td>1.83551</td>
<td>0.17415</td>
<td>Accept</td>
</tr>
<tr>
<td>XG does not Granger Cause FDI</td>
<td></td>
<td>0.07980</td>
<td>0.92347</td>
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</tr>
<tr>
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<td>1.54176</td>
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</tr>
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<td>0.13084</td>
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<td>FDI does not Granger Cause XG</td>
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<td>0.03783</td>
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</tr>
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</tr>
<tr>
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</tr>
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</tr>
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</tr>
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<td>0.42935</td>
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<td>1.45404</td>
<td>0.24152</td>
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</tr>
<tr>
<td>XG does not Granger Cause FDI</td>
<td></td>
<td>0.60855</td>
<td>0.75928</td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>FDI and merchandise imports (MG), hypothesis:</th>
<th>Lag</th>
<th>F-Statistic</th>
<th>Probability</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI does not Granger Cause MG</td>
<td>2</td>
<td>1.30011</td>
<td>0.28499</td>
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</tr>
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<td>0.00296</td>
<td>0.99704</td>
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<td>FDI does not Granger Cause MG</td>
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<tr>
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</tr>
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<tr>
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</tr>
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<td>0.86081</td>
<td>0.56515</td>
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</tr>
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<table>
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<th>F-Statistic</th>
<th>Probability</th>
<th>Results</th>
</tr>
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<td>FDI does not Granger Cause FDI</td>
<td>2</td>
<td>2.05056</td>
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<td>3</td>
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<tr>
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</table>

**Bulgaria**

<table>
<thead>
<tr>
<th>FDI and merchandise exports (XG), hypothesis:</th>
<th>Lag</th>
<th>F-Statistic</th>
<th>Probability</th>
<th>Results</th>
</tr>
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<tbody>
<tr>
<td>XG does not Granger Cause FDI</td>
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<th>F-Statistic</th>
<th>Probability</th>
<th>Results</th>
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<td>0.01440</td>
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<td>Hypothesis</td>
<td>F-Statistic</td>
<td>Probability</td>
<td>Result</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>-------------</td>
<td>--------</td>
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### The Czech Republic

**FDI and merchandise exports (XG), hypothesis:**

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### Estonia

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The Slovak Republic

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FDI and merchandise exports (XG), hypothesis:

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FDI and merchandise imports (MG), hypothesis:

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FDI and GDP, hypothesis:

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Table 8: Cross correlation coefficients for established Granger causality

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<tr>
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<td>Correlation coefficient</td>
</tr>
<tr>
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<td>-------------------------</td>
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<tr>
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<td>3</td>
<td>0.27</td>
</tr>
<tr>
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<td>4</td>
<td>0.18</td>
</tr>
<tr>
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<td>5</td>
<td>0.22</td>
</tr>
<tr>
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<td>6</td>
<td>0.27</td>
</tr>
<tr>
<td>FDI Granger causes merchandise exports</td>
<td>2</td>
<td>0.36</td>
</tr>
<tr>
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<td>3</td>
<td>0.24</td>
</tr>
<tr>
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<td>4</td>
<td>0.13</td>
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<tr>
<td>FDI Granger causes merchandise exports</td>
<td>5</td>
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<td>2</td>
<td>0.22</td>
</tr>
<tr>
<td>FDI Granger causes merchandise imports</td>
<td>2</td>
<td>0.36</td>
</tr>
<tr>
<td>FDI Granger causes merchandise imports</td>
<td>3</td>
<td>0.24</td>
</tr>
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<td>FDI Granger causes merchandise imports</td>
<td>4</td>
<td>0.13</td>
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<td>FDI Granger causes merchandise imports</td>
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<td>0.29</td>
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<tr>
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<tr>
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<td>7</td>
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<td>2</td>
<td>0.52</td>
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<tr>
<td>Merchandise imports Granger causes FDI</td>
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<td>0.31</td>
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<tr>
<td>Merchandise imports Granger causes FDI</td>
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<td>0.48</td>
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<tr>
<td>Merchandise imports Granger causes FDI</td>
<td>8</td>
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</table>
Appendix 2.

Table 9: Basic model results
Dependent Variable: (?RGDP)
Method: GLS (Cross Section Weights)
Date: 02/01/04   Time: 20:48
Sample: 1994 2002
Included observations: 9
Number of cross-sections used: 11
Total panel (unbalanced) observations: 87

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.801029</td>
<td>0.566724</td>
<td>3.177963</td>
<td>0.0021</td>
</tr>
<tr>
<td>(?PCGDP)</td>
<td>6.61E-05</td>
<td>7.75E-05</td>
<td>0.852766</td>
<td>0.3963</td>
</tr>
<tr>
<td>(?RINV)</td>
<td>0.161909</td>
<td>0.018329</td>
<td>8.833285</td>
<td>0.0000</td>
</tr>
<tr>
<td>(?REMP)</td>
<td>0.248286</td>
<td>0.094035</td>
<td>2.640358</td>
<td>0.0099</td>
</tr>
<tr>
<td>(?FDI(-1))</td>
<td>0.000100</td>
<td>8.19E-05</td>
<td>1.224506</td>
<td>0.2243</td>
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</tbody>
</table>

Weighted Statistics
- R-squared: 0.720596
- Adjusted R-squared: 0.706966
- S.D. dependent var: 4.761940
- S.E. of regression: 2.441572
- Sum squared resid: 488.8244
- Durbin-Watson stat: 1.838022
- Prob(F-statistic): 0.000000

Unweighted Statistics
- R-squared: 0.415783
- Adjusted R-squared: 0.387285
- S.D. dependent var: 3.150575
- S.E. of regression: 2.632247
- Sum squared resid: 566.8641
- Durbin-Watson stat: 1.664576

Table 10: Model 1 results
Dependent Variable: (?RGDP)
Method: GLS (Cross Section Weights)
Date: 02/01/04   Time: 20:52
Sample: 1994 2002
Included observations: 9
Number of cross-sections used: 11
Total panel (unbalanced) observations: 87

<table>
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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.896176</td>
<td>0.851752</td>
<td>1.052156</td>
<td>0.2959</td>
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<tr>
<td>(?PCGDP)</td>
<td>8.50E-05</td>
<td>7.81E-05</td>
<td>1.088441</td>
<td>0.2796</td>
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<tr>
<td>(?RINV)</td>
<td>0.161356</td>
<td>0.018047</td>
<td>8.940868</td>
<td>0.0000</td>
</tr>
<tr>
<td>(?REMP)</td>
<td>0.254493</td>
<td>0.091843</td>
<td>2.770969</td>
<td>0.0069</td>
</tr>
<tr>
<td>(?FDI(-1))</td>
<td>0.000112</td>
<td>8.09E-05</td>
<td>1.381857</td>
<td>0.1708</td>
</tr>
<tr>
<td>REU-15</td>
<td>0.338356</td>
<td>0.226251</td>
<td>1.495486</td>
<td>0.1387</td>
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</tbody>
</table>

Weighted Statistics
- R-squared: 0.740226
- Adjusted R-squared: 0.724191
- S.D. dependent var: 4.863857
- S.E. of regression: 2.440557
- Sum squared resid: 482.4618
- Durbin-Watson stat: 1.765626
- Prob(F-statistic): 0.000000

Unweighted Statistics
- R-squared: 0.421593
- Adjusted R-squared: 0.385889
- S.D. dependent var: 3.150575
- S.E. of regression: 2.632247
- Sum squared resid: 561.2267
- Durbin-Watson stat: 1.627804
### Table 11: Model 2 results

**Dependent Variable:** (?RGDP)

**Method:** GLS (Cross Section Weights)

**Date:** 02/01/04  **Time:** 20:53

**Sample:** 1994 2002  
**Included observations:** 9  
**Number of cross-sections used:** 11  
**Total panel (unbalanced) observations:** 87

<table>
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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.798447</td>
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<td>3.216371</td>
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<tr>
<td>(?PCGDP)</td>
<td>6.71E-05</td>
<td>0.866682</td>
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</tr>
<tr>
<td>(?RINV)</td>
<td>0.159613</td>
<td>0.810409</td>
<td>0.0000</td>
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</tr>
<tr>
<td>(?REMP)</td>
<td>0.249759</td>
<td>2.674867</td>
<td>0.0090</td>
<td></td>
</tr>
<tr>
<td>(?FDI)</td>
<td>0.000106</td>
<td>1.372006</td>
<td>0.1738</td>
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</table>

**Weighted Statistics**

- R-squared: 0.725106
- Mean dependent var: 4.789201
- S.D. dependent var: 4.529781
- S.E. of regression: 2.432214
- Sum squared resid: 485.0845
- Durbin-Watson stat: 1.802138
- Prob(F-statistic): 0.000000

**Unweighted Statistics**

- R-squared: 0.413186
- Mean dependent var: 3.150575
- S.D. dependent var: 3.358948
- S.E. of regression: 2.635092
- Sum squared resid: 564.3205
- Durbin-Watson stat: 1.647180

### Table 12: Model 3 results

**Method:** GLS (Cross Section Weights)

**Date:** 02/01/04  **Time:** 20:53

**Sample:** 1994 2002  
**Included observations:** 9  
**Number of cross-sections used:** 11  
**Total panel (unbalanced) observations:** 87

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<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.930587</td>
<td>0.814002</td>
<td>1.143224</td>
<td>0.2563</td>
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<td>(?PCGDP)</td>
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<td>7.79E-05</td>
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<td>0.2667</td>
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<td>(?RINV)</td>
<td>0.158651</td>
<td>0.017935</td>
<td>8.845814</td>
<td>0.0000</td>
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<td>0.091556</td>
<td>2.806578</td>
<td>0.0063</td>
</tr>
<tr>
<td>(?FDI)</td>
<td>0.000113</td>
<td>7.71E-05</td>
<td>1.461511</td>
<td>0.1477</td>
</tr>
<tr>
<td>REU-15</td>
<td>0.323417</td>
<td>0.222383</td>
<td>1.453424</td>
<td>0.1497</td>
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</table>

**Weighted Statistics**

- R-squared: 0.741812
- Mean dependent var: 4.879230
- S.D. dependent var: 4.643840
- S.E. of regression: 2.431374
- Sum squared resid: 478.8381
- Durbin-Watson stat: 1.724521
- Prob(F-statistic): 0.000000

**Unweighted Statistics**

- R-squared: 0.418405
- Mean dependent var: 3.150575
- S.D. dependent var: 3.358948
- S.E. of regression: 2.639492
- Sum squared resid: 564.3205
- Durbin-Watson stat: 1.612056
Table 13: Model 4 results
Dependent Variable: (RGDP)
Method: GLS (Cross Section Weights)
Date: 02/01/04   Time: 20:54
Sample: 1994 2002
Included observations: 9
Number of cross-sections used: 11
Total panel (unbalanced) observations: 87

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<tr>
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<th>Std. Error</th>
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<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.787608</td>
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<td>(?PCGDP)</td>
<td>-3.58E-06</td>
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<tr>
<td>(?RINV)</td>
<td>0.135128</td>
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<tr>
<td>(?FDI(-1))</td>
<td>3.02E-05</td>
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</tr>
<tr>
<td>(?RGDP(-1))</td>
<td>0.221257</td>
<td>0.067679</td>
<td>3.269226</td>
<td>0.0016</td>
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</tbody>
</table>

Weighted Statistics

| R-squared | 0.775338 | Mean dependent var | 5.123191 |
| Adjusted R-squared | 0.761470 | S.D. dependent var | 4.893138 |
| S.E. of regression | 2.389785 | Sum squared resid | 462.5968 |
| F-statistic | 55.90840 | Durbin-Watson stat | 2.178790 |
| Prob(F-statistic) | 0.000000 |

Unweighted Statistics

| R-squared | 0.460616 | Mean dependent var | 3.150575 |
| Adjusted R-squared | 0.427321 | S.D. dependent var | 3.358948 |
| S.E. of regression | 2.541903 | Sum squared resid | 523.3628 |
| Durbin-Watson stat | 2.064781 |

Table 14: Model 5 results
Dependent Variable: (RGDP)
Method: GLS (Cross Section Weights)
Date: 02/01/04   Time: 20:55
Sample: 1994 2002
Included observations: 9
Number of cross-sections used: 11
Total panel (unbalanced) observations: 87

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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
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<tbody>
<tr>
<td>C</td>
<td>0.708706</td>
<td>0.786609</td>
<td>0.900963</td>
<td>0.3703</td>
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<tr>
<td>(?PCGDP)</td>
<td>2.25E-05</td>
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<tr>
<td>(?RINV)</td>
<td>0.134677</td>
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<td>7.272241</td>
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<tr>
<td>(?REMP)</td>
<td>0.216679</td>
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<tr>
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<td>3.73E-05</td>
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<td>REU(-1)</td>
<td>0.373665</td>
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<tr>
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Weighted Statistics

| R-squared | 0.791387 | Mean dependent var | 5.194385 |
| Adjusted R-squared | 0.772902 | S.D. dependent var | 5.002404 |
| S.E. of regression | 2.383886 | Sum squared resid | 448.9502 |
| F-statistic | 42.81299 | Durbin-Watson stat | 2.070011 |
| Prob(F-statistic) | 0.000000 |

Unweighted Statistics

| R-squared | 0.473609 | Mean dependent var | 3.150575 |
| Adjusted R-squared | 0.426967 | S.D. dependent var | 3.358948 |
| S.E. of regression | 2.542689 | Sum squared resid | 510.7560 |
| Durbin-Watson stat | 2.029312 |
Table 15: Model 6 results

Dependent Variable: (?RGDP)
Method: GLS (Cross Section Weights)
Date: 02/01/04   Time: 20:56
Sample: 1994 2002
Included observations: 9
Number of cross-sections used: 5
Total panel (unbalanced) observations: 38

<table>
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<th>Prob.</th>
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<td>-0.000130</td>
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<td>-1.353335</td>
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<tr>
<td>(?RINV)</td>
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<td>(?REMP)</td>
<td>0.263817</td>
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<td>(?FDI)</td>
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<td>0.1861</td>
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</table>

Weighted Statistics

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<tbody>
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<td>Durbin-Watson stat</td>
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</table>

Unweighted Statistics

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<th>Value</th>
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</thead>
<tbody>
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<tr>
<td>Adjusted R-squared</td>
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<tr>
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<tr>
<td>Durbin-Watson stat</td>
<td>2.520946</td>
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