

THE CREDIT CHANNEL OF THE TRANSMISSION MECHANISM IN THE REPUBLIC OF CROATIA*

Marijana Ivanov, Ph.D.
Vladimir Čavrak, Ph. D.

Abstract

The influence of monetary trends on real movements is manifested through several channels of transmission mechanism. The interest rate channel, exchange rate channel and asset channel reflect broad spectrum of impacts, interrelations and opposite effects by which monetary expansion or restriction influence national economy. Credit channel of transmission mechanism represents indirect flow of these impacts. Its intensity and effectiveness is determined by existing monetary framework and whole macroeconomic environment as well as by the degree of the national financial system development.

This paper's topic will be the analysis of the credit channel functioning in the Republic of Croatia in the period from gaining monetary independence until today. The analysis of economic consequences of the current banker's credit allocation system will be brought to special attention. The analysis shows quite clearly how much more banks prefer to grant credits to households than they do to business sector. Implications of these monetary-credit flows on economic activity in the Republic of Croatia can be observed on the strong growth of personal consumption component of the GDP as well as on growth of imports of goods and services. In this way, deformations in the financial funds allocation system and to them related crowding out effects (on the investments' side) due to growth of personal and government consumption are mostly to blame for the insufficient growth of the private sector investments. This paper will examine if it's possible to use monetary credit mechanism in the above mentioned conditions to trigger economic growth, especially one based on growing investments and commodity exports as well as the reduction of external indebtedness.

Starting hypotheses of this study are based on the opinion that the existing credit mechanism in the Republic of Croatia is not in function of economic growth and development sufficiently, i.e. the connection between monetary and real phenomenon of economy is not adequate. The purpose of this work is consequently to point out the necessity of greater affirmation in directing the credit mechanism and its effects on national economy but with preserving medium-term price stability as a structural category closely related to credit mechanism.

Key words: transmission mechanism, credit, national economy

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Introduction

Central banks employ various instruments to increase or decrease the money supply and to fulfil the most frequent goal of monetary policy nowadays, which is medium-term price stability. Any change in the quantity of money in the economy has a direct influence on changes in market interest rates, prices of various forms of assets, foreign exchange rates, levels of consumption of all sectors in the economy, the money demand and series of other nominal and real variables. The system of functionally related variables which explains the influence of interrelations and responses brought about by changes in the money supply and/or money demand on non-monetary variables and on the reestablishment of monetary balance is called the transmission mechanism of monetary policy. An analysis of the transmission mechanism of monetary policy and several channels of its activity can determine the following: the impact of monetary policy measures on the economy, the extent to which the effects of monetary changes on real variables are under control of the central bank and where, why and when monetary effects turn into an autonomous flow on which the central bank can have little influence. The channels through which the effects of monetary transmission are reflected include the interest rate channel, the foreign exchange rate channel, the asset prices channel and certain derived channels such as the credit channel. The subject matter of this paper deals with the credit channel and its functioning in the Republic of Croatia.

The credit channel of monetary transmission

According to the Keynesian IS-LM model, changes in interest rates play a central role in the process of monetary transmission. The interest rate channel shows how expansionary monetary policy leads to a fall in real interest rates which in turn lower the costs of capital, causing a rise in investment spending and thereby leading to an increase in the aggregate demand and a rise in output. In contrast, higher interest rates increase borrowing costs. For businesses, that means reducing the profits and increasing the required return from new investment projects. This way, higher interest rates generally reduce the rate of business investments. Since changes in investments and income influence the demand for money, the system regains monetary equilibrium.

The credit mechanism represents a derived channel of monetary influences on interest rates and other variables. Unlike traditional interpretations of transmission effects through interest rate changes, the credit channel especially emphasises the role of bank loans in affecting the level of aggregate spending. Namely, traditional views assumed that the influences of the interest rate channel were not different if the borrowers were financed on auction markets (through issues of commercial papers and corporate bonds) or through bank loans. These views implied that all non-money assets were included together in bonds. In addition, it made no difference whether bank assets were in the form of loans or government securities. Therefore, even if the traditional view includes the analyses of interest rate changes by sectors, it is not primarily focused on the demand for loans and loan supply and on the effects of bank loans on different sectors.

The operating mechanism of the interest rate channel, and the credit channel which is derived from it, is based on the liquidity effect (an increase or decrease in the liquidity level of the banking system and the economy). The liquidity effect can result from expansive or restrictive measures implemented by monetary policy or from changes in the level of deposit and other

sources of financial funds. According to the general theoretical model, a fall in bank excess reserves (bank credit potentials) leads to a decrease in bank loans which in turn lower investment spending, causing a fall in output. According to this traditional view, this channel operates through decisions made by businesses regarding investment spending, but it also includes consumers' decisions on housing and consumer durable expenditure as investment decisions financed by loans.

The demand for loans (L^d) (of all sectors) is a simplified function of interest rates on loans and income. An increase in interest rates, as the price of money, reduces the demand for money. With the growth of income, as the main determinant of credit-worthiness of borrowers, the demand for loans increases. Income, as the basic determining factor of the transaction demand for money and thereby the demand for loans can be viewed both as current income and permanent income. The introduction of the term permanent income is related to the behaviour of rational borrowers and their subjective assessment of their own ability to repay a medium-term or a long-term loan. The introduction of this term is also related to conditions and ability to obtain a bank loan since banks assess borrowers' credit-worthiness. Credit worthiness of individuals and businesses alike is thus not defined only by current income but its average level which can be assessed as permanent. The importance of the current income itself (not taking into account its future oscillations) as a determinant of the demand for loans comes in full effect when individuals and businesses accumulate short-term debt in order to overcome short-term lack of liquidity or to finance current purchases.

Apart from income (y), as the primary determinant, and interest rate on loans (i), as the price of money, the demand for loans is also determined by some other variables: interest rate on bonds (p), expectations (e) and ability and conditions of obtaining the loan (z). Thus in an extended form the demand for loans can be shown as a function:

$$L^d = L(i, p, y, e, z). \quad (1)$$

The loan supply function (L^s) can be derived from a simplified commercial bank balance sheet in which the side of assets contains reserves (R), loans (L) and securities such as bonds, treasury bills etc. (S^b), while the side of liabilities contains deposits (D). The level of bank reserves depends on the level of their deposits (D), the required reserves ratio (q), the minimum liquid reserves ratio (r) and their excess reserves (E): $R = qD + rD + E$.

Therefore, we have a constraint: $E + L + S^b = D(1 - q - r)$. This means that any increase in deposits as a basic source of bank assets affects the growth of excess reserves while increasing the bank's credit potential enables bigger investments in the form of loans or investments in securities.

The loan supply includes granted loans and possible new loans (the possibility of making new loans is determined by the level of excess reserves): Thus, $L^s = L + E$.

Therefore, the loan supply function is as follows: $L^s = D(1 - q - r) - S^b$. Its main determinants are interest rates on loan, interest rates on bonds and the level of bank reserves. If we suppose that the current amount of securities in bank assets is zero ($S^b = 0$) and if we include some other important elements, the loan supply function is as follows:

$$L^s = \lambda(i, p, d, w, e, f) D(1 - q - r). \quad (2)$$

It depends on the level of domestic deposit (D), possibilities of borrowing from the central bank at official interest rates (d)¹, possibilities of borrowing on world financial markets (w),

¹ The possibility of inter-bank borrowing is not included because the loan supply is implied for all banks in the national monetary system.

the required reserves ratio (q), the minimum liquid reserves ratio (r), current interest rates on loans (i), interest rates on bonds (p), expectations (e) and bank preferences (f).
The clearing condition for equilibrium on the loan market is $L^d = L^s$. This implies:

$$L(i, p, y, e, z) = \lambda(i, p, d, w, e, f) D(1 - q - r). \quad (3)$$

The mentioned equilibrium is established in the intersection of the loan supply curve and the loan demand curve at a certain balanced level of the amount of loans and interest rates. Under the presumption *ceteris paribus*, the balanced level of interest rates on bank loans is a function of income (y), as the main determinant of the demand for loans, and the level of bank reserves (R) which determine the level of the bank loan supply. The interest rate on bank loans is positively correlated with the size of income and negatively correlated with the level of bank reserves:

$$i = i(y^+, R^-). \quad (4)$$

Interest rates on bank loans certainly represent a significant determinant of the demand for loans and the loan supply on which they have a different impact. In general, a fall in interest rates on the loan market increases the demand for loans and reduces the readiness of banks to grant loans due to lower rates of net return. However, in concrete situations the levels of the demand for loans and the loan supply can be determined to a greater extent by other variables shown in equation (3) than by the price of money on the market. In situations where the demand for loans permanently exceeds the loan supply, the demand for loans depends more on the possibilities to obtain a loan and less on the level of interest rates. In that case, the loan demand curve is very inelastic. The lack of elasticity of the loan demand curve can relate to the total demand for loans of all sectors or to the partial demand for loans by individual sectors.

Determinants of shifts on the Croatian loan market

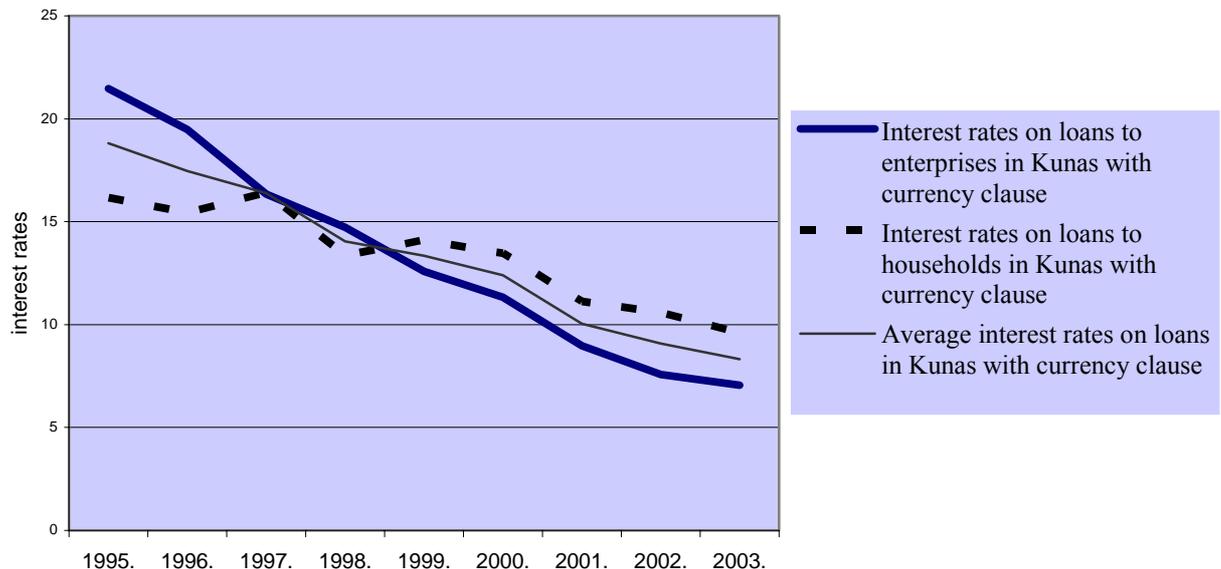
Determinants of the demand for bank loans and their supply reflect possible influences of various variables on the level of loans and interest rates which help re-establish equilibrium on the loan market. Although there are certain laws which generally determine the direction of influences of particular determinants specified in equation (3), various countries exhibit differences and specific features in that respect. The analysis which follows is primarily focused on the determinants which have an impact on the loan demand and supply in the Republic of Croatia, which is why we put more stress on the determinants that we think exert crucial influence on the credit mechanism of Croatian banks and on the establishment of equilibrium on the credit market.

One of the characteristics of the credit market in the Republic of Croatia is a ten-year long situation in which the demand for loans exceeds the loan supply. This situation was especially critical from mid 1995 until the end of 1996. Namely, due to the problem of small savings and lack of liquidity of the banking sector (to a great extent caused by restrictive monetary policy of the central bank), the credit potential of the banking sector in the said period was significantly reduced. At the same time, the Croatian economy was characterised by the presence of moral hazard, difficult functioning of the legal system and the occurrence of debtor-creditor crisis and bankruptcy procedures of a number of companies which were long-term bank clients. In addition to that, the problem of the lack of liquidity spread from the banking sector into the real sector. Therefore, critical problems of the banking sector included

inability to collect due debt (as well as security – primarily from the business sector) and significant growth of the share of bad bank assets in total assets.

The banks found themselves in a situation where high risk for their activities was accompanied by their intention to collect part of debts arising from the previously accumulated bad investments. In addition, generally high costs of non-market operations as well as inefficient banking operations demanded a response from banks which came in the form of passive policy which supported unrealistic growth of active interest rates. Average interest rates on short-term bank loans in the mentioned period were 23% per year and interest rates on long-term loans were 12%. In some months, interest rates on short-term loans to enterprises were even 30%. What followed as a spontaneous reaction to such a situation was the growth of unofficial loan trading outside the banking sector. The interest rates on the “underground” financial market were higher than the interest rates offered by banks, which again shows how the loan demand highly exceeded the loan supply on the institutionalised credit market. To be even more concrete, the interest rates on this illegal market were 45% per year which shows that the demand for bank loans in that period was determined more by borrowing possibilities than by interest rates

Graph 1: Average interest rates on bank loans in Kunas with currency clause



* relates to short-term and long-terms bank loans

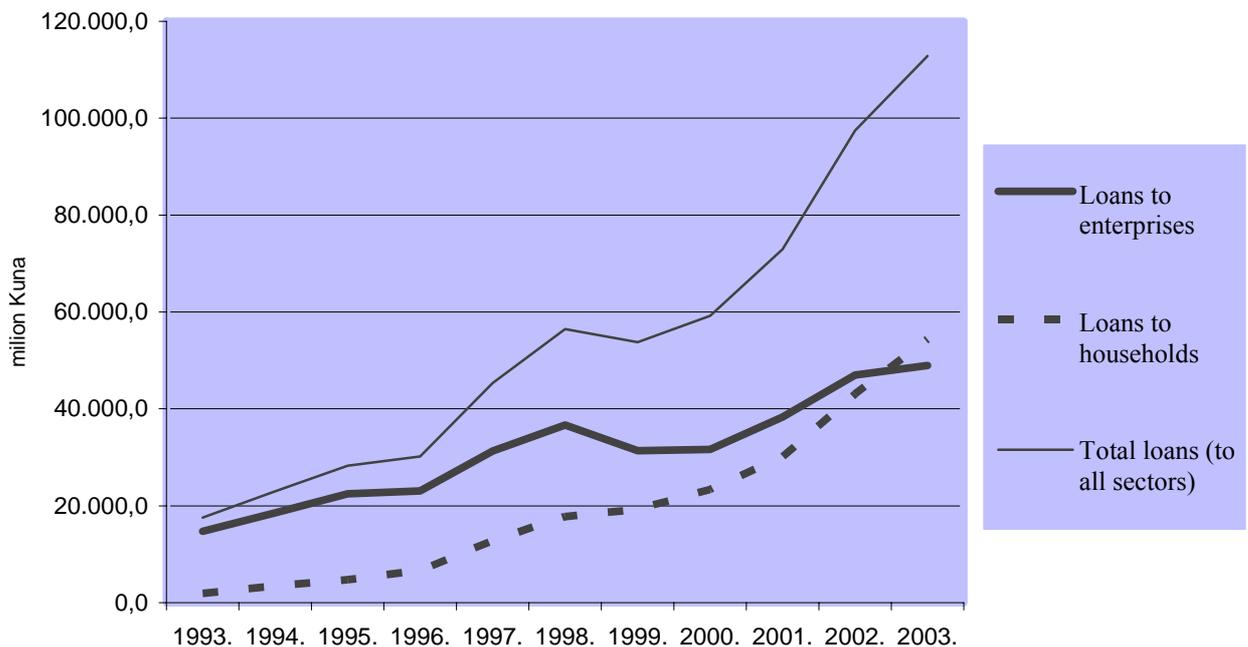
Source: Croatia National Bank, Monthly Report, January 2004.

In the past four years the excess of the demand for loans has been significantly decreased and this is confirmed by significant decreases in average interest rates on bank loans in Kunas (and foreign currency) since the second half of 1999 up to present day (see graph 1). In addition, this was accompanied by credit expansion visible in graph 2. The significant growth of the amount of loans has been present since 1997, with a short-term slow-down in 1999 (due to low levels of bank liquidity and banking crises throughout 1998). Since 2000 until present day the total amount of loans has almost doubled, which together with the trend of falling interest rates represents significant positive features of the Croatian credit market. However, parallel with these positive trends for the Croatian economy, another unfavourable phenomenon occurred. Namely, the speedy growth of loans to households in comparison to the growth of loans to enterprises has been characteristic for the period which started in 1996 and which lasts even today. The share of loans to enterprises in total bank loans fell from 78%

in 1995 to 68% in 1997. In the same period (1995-1997), the share of loans to households increased from 16% to 28%. (See graph 2.)

In the following years, the structure of bank loans increasingly reflected the disproportionate growth of these two loan groups. In 2000 loans to enterprises made up 52 % of total bank loans and loans to households made up 38%. In 2002, the share of loans to enterprises fell to only 48% of total loans and the share of loans to households increased to 44 %. At the end of the period analysed in this paper (November 2003) bank loans to households (with percentage share of 48% in total loans) exceeded the amount of loans approved to the sector of enterprises (43%).²

Graph 2: Loans to enterprises and households in the Republic of Croatia from 1993 until 2003



* Amounts of loans shown in the graph include loans in Kunas and foreign currency. In accordance with the methodology of the Croatian National Bank, the term loan includes acceptance credit, financial leasing, executed payments based on guarantees and other warranties and purchased receivables.

** The enterprise sector includes public and private enterprises.

*** The household sector also includes craftsmen.

Source: Croatian National Bank, Monthly Report, January 2004.

The registered structure of loans in Croatian banks indicates a paradox in the system of forming and allocating savings. Namely, the household sector is at the same time the main agent of money surplus (savings in the form of bank deposits) and according to the data for November 2003, it is also the main agent of money deficit. It can be concluded that the Croatian financial sector, from the point of view of positive national economic and development policies, generates unfavourable loan allocation. The monetary credit mechanism finances a great part of personal consumption as well as import by the household sector while on the other hand it finances the growth of investments to a much lesser extent.

² The category of loans to households includes loans to craftsmen who make up cca 2-4% of loans to households. Furthermore, a small segment of loans to households includes loans to citizens, although their basic purpose is financing entrepreneurial activity.

This is confirmed by data showing the shifts in GDP and contributions to total growth of its particular components. In 2002, the growth of real GDP became dynamic, with a rate of 5.2%. In contrast, according to preliminary data for the first three trimesters of 2003, the growth of real GDP is estimated at 4.6%. Domestic consumption of the household sector played a crucial role in this process with its contribution to growth of 4 percentage points. At the same time, investments contributed to growth by mere 2.3% percentage points, within which a special contribution was made by the growth of investments in fixed capital which can be connected with significant investments by the state in the traffic infrastructure. In the first three trimesters of 2003, the contribution of consumption by the household sector was significantly reduced to 2.6 percentage points but at the same time the contribution of import increased (from -4.8 percentage points in 2002 to -5.7 percentage points in 2003). The contribution of import is mainly financed through borrowing from domestic banks by households but also through other kinds of borrowing by other economic sectors. Positive shifts reflect a high contribution of investments of 4.2 percentage points, within which special contribution is made by the category of investments in fixed capital related to construction activity in the area of road building and partly related to the construction of houses and flats. The other paradox of the Croatian financial system is seen in the phenomenon of currency substitution or a high share of deposits in foreign currencies, which make up about 80 % of deposits owned by the household sector, or 64 % of total bank deposits of all sectors. Since commercial bank loans are mainly granted in Kunas (of course, with a currency clause) a greater share of foreign currency deposits means greater exposure of banks to foreign exchange risk. This in turn generates pressure on the growth of the share of foreign assets in the balance of the central bank, which makes it increasingly difficult to implement monetary policy. Since deposits are the main determinant of the level of credit potential of banks (the loan supply), it should be mentioned that deposits have a continually growing trend in the Republic of Croatia. Moreover, recent trends show that deposits in Kunas are on the increase so that it is becoming obvious that along with the general growth of confidence in the banking system, trust in the domestic currency has been growing, too. Since 1999 until present day the amount of deposits has more than doubled, which is accompanied by the already mentioned doubled figures regarding granted bank loans.

On the side of the loan supply, apart from the already mentioned interest rates on bank loans and levels of deposit as a source of mobilised financial funds (savings), important determinants also include measures of monetary policy which the central bank uses to impact the liquidity of the banking system and the strength of the credit channel. A gradual decrease in the required reserve ratio (from 28.5 % to 19 %) and a decrease in official interest rates at which the central bank grants loans to commercial banks, as seen since mid 2000 until present day, enabled the investment of a great share of bank reserves, which through an increased level of liquidity contributed to a decrease in interest rates and growth of the loan supply. However, in the earlier period, especially from 1995 until the first half of 2000, a higher required reserve ratio, on average 31%, constrained to a great extent the credit activity of banks, which was also caused by a lack of readiness of the Croatian National Bank to grant loans to banks from primary issue.³ One of the measures undertaken by the central bank which has had a significant impact on the Croatian credit market since the beginning of 2003 is the administrative limitation of the of investment rate growth, due to which in the first eleven months of 2003 loans grew at the rate of 15.8% (compared to the rate of loan growth in 2002 of 33.6%). The reasons behind this measure can be interpreted in different ways but one thing is certain: without it (and given the past trend), the credit expansion of Croatian banks would be much bigger. Such expansion would then increase the money supply and the

³ Bank loans from primary issue make up only 3% of the assets on central bank balance whereas the remaining 97 % is made up of net foreign assets

purchasing power of all economic sectors, which could in turn worsen price stability. The other important reason lies in the low motivation of banks (daughters⁴) to accumulate debt abroad (from the bank mother). However, since the decision of the Croatian National Bank to limit investment growth is linear and relates to all banks and all forms of investments, we are willing to believe that this decision is also one of the factors due to which the level of loans to households in 2003 exceeded the level of loans to enterprises.

All the above-mentioned facts make it clear that a strong increase in the liquidity of the banking system is an important factor of stimulating growth of credit investments and decreasing active banking interest rates. However, increases in banking liquidity represent only a necessary, but definitely not a sufficient condition for fulfilling the said goals. The example of the Republic of Croatia in the period 1999-2003 proves that growth in the number of banks on the market and the strengthening of the competitive business environment (the presence of foreign banks on the Croatian financial market helped develop such environment) may have a stronger effect on decreasing interest rates and improving credit conditions and the loan supply than expansive central bank measures. The reason for that lies in the fact that the level of interest rates offered on the market represents an autonomous right and a free choice of commercial banks.

In relation to the level of liquidity of the banking sector, a further determinant of the loan supply in Croatia is the possibility of banks to accumulate debt abroad. In a situation where domestic interest rates are higher than interest rates on the world financial market, motivation of banks to increase the source of funds from foreign sources is quite clear because domestic banks thus obtain additional financial funds while foreign countries find a profitable opportunity for investment. The effect of increasing liquidity of the banking system and the credit channel of monetary transmission in that case is the same as if the banks had borrowed from the central national bank according to its refinancing policy. However, there are important differences between these two alternative forms of financing. First of all, they differ in their effect on the foreign debt of a country. Extensive accumulation of debt abroad has been present in the Republic of Croatia for the past couple of years. Thus, external bank debt in 2002 increased by 74.8% in relation to the preceding year and in 2003 it increased by 49.7%. This led to a further growth and negative structure of external debt in which national debt makes up 37.7%, bank debt 21.8%, debt of other sectors 25.6% and direct investments make up only 8.4% of total external debt.

Other factors of the credit mechanism in the Republic of Croatia

In developed financial systems, apart from interest rates on bank loans, the shifts in interest rates on securities (bonds) represent a significant determinant of the loan demand and supply. The reason for that is in the fact that a bank loan and the issuance of securities (bonds, cash notes) represent to borrowers alternative forms of financing and to banks they represent alternative forms of investing. Therefore, a rise in interest rates on securities increases the demand for loans and decreases the loan supply on the market. These alternative borrowing possibilities for enterprises barely exist in Croatia; or rather they exist only for the state⁵ so that interest rates on securities do not have a significant impact on the price of loans and the loan demand and supply.

⁴ The term bank daughter in Croatian banking practise is related to the ownership structure of banks in which banks in majority ownership of foreign capital (bank mother) make up 90.5% of assets of the total banking system.

⁵ Securities of central government make up 7.9% and securities of enterprises make up 1.7 % of commercial bank assets.

Economic expectations constitute an important factor of the loan demand and supply. On the side of the demand for loans, borrowers' expectations include predicting future income, expected profits, future shifts in interest rates (in case of borrowing at a variable interest rate), changes in the foreign exchange rate, changes in the level of prices and other variables which can have an impact on their credit-worthiness. On the side of the loan supply, expectations according to which banks form their business policy are determined by expectations of banks regarding the shifts in future inflation rates, foreign currency exchange rate, medium-term and long-term interest rates, shifts in the prices of securities on financial markets, shifts in the prices of physical property such as real-estate, expectations about the future character of monetary policy and a series of other economic and political circumstances which influence domestic and world financial markets.

Bank expectations combined with expected profits and assessments of clients' earned trust can have a great impact on the portfolio of commercial banks, which includes their allocation of loans according to sectors. In the free market system which must exist in order for the financial mechanism to achieve efficient investment of mobilised funds (savings), commercial banks autonomously decide who they shall grant loans to and on what conditions, are it the sector of households, enterprises or the state. Apart from respecting the necessary criteria for good investments (which include profitability, liquidity and safety), the bank loan supply is formed according to the market demand and principles of efficient and profitable banking. However, each loan has to be allocated so that banks, by granting money to some entities and denying it to others, actually decide on the direction and dynamics of development of the national economy. That is why preferring one category of clients (households, enterprises or the state) from the point of view of the national economy can represent a negative process. An explicit tendency by banks to prefer one category of clients to another is common even in stable and developed market economies. However, in a situation where the system of market competition is still not developed and where there are numerous institutional limitations (e.g. the unregulated legal system etc.) as well as high business risks, it is realistic to expect a spontaneous development of bank preferences. In such circumstances, bank preferences appear as a constituent part of risk management in banking in accordance with present and future market expectations. Thus, explicit readiness of banks to grant loans to the household sector in the Republic of Croatia is not necessarily related to the ownership structure in which 90.5% total bank assets today are in majority foreign ownership, although the correlation coefficient is positive.⁶ This can be corroborated by figures which show higher levels of growth in loans to households relative to the level of growth of loans to enterprises in the period between 1995 and 1998, which means even before the ownership structure was changed.⁷ That is why we can conclude that preferring to finance households is a spontaneous process which banks use to protect themselves against business risks.

From the point of view of risk management, making a preference, e.g. granting housing loans to the sector of households as a "good" debtor, represents to banks a relatively profitable and low risk form of investment. In this type of loans, the credit risk is relatively low, even with a realistic assumption that one part of debtors will not settle their debt on time and in a due manner. The bank may collect due payments relatively easily by means of administrative bans and the system of guarantors. Furthermore, a housing loan is granted with a mortgage on the housing facility, which means that banks may collect debt by means of the mortgage on the property whose value is 30-40% higher than the loan debt. In accordance with that, the share of housing loans (and

⁶ The correlation coefficient in the mentioned relation is 0.799, but only 63% of this phenomenon can be explained statistically with very poor results of econometric tests.

⁷ The share of banks in majority foreign ownership in 1998 was 6.7%, in 1999 39.3%, in 2000 84.1% and by 2002 it was 90.2%. For the sake of comparison, loans to households in 1997 were 28% of total bank assets, in 1998 31%, in 1999 35% and in 2000 they grew to 38%.

mortgage loans) in total bank assets will be greater if banks expect that the prices of real-estate will not fall (or that they will rise) in the future and that liquidity of these forms of receivables will be high. Also, a housing loan represents a personal (family) liability and a long-term contractual relationship through which a loan user solves existential issues. That is why a decrease in bank credit risk is influenced by psychological factors which include debtors' efforts to repay the loan and to secure their family's future.

Preferring real estate as an instrument of security in a housing loan (decreasing the credit risk) is related to liquidity risk management. The greater the chance that receivables will turn into money without loss in a short period of time, the liquidity risk is smaller. Since the marketability level and the level of housing liquidity is far bigger than in production plants or shopping malls for example, bank preferences for housing loans are quite understandable.

Finally, portfolio diversification is a very important element in risk management in the credit business and therefore an important factor in preferences in the loan supply and allocation of loans according to sectors. It implies that bank assets should contain numerous and different loans granted to numerous and different entities (enterprises, households and state). Since loans to households actually include a number of "small" loans granted to numerous borrowers, by preferring to grant loans to households, banks achieve greater risk dispersion. Unlike individual small amounts of loans to households, loans to enterprises are granted at big amounts, which is in itself a bigger credit risk.

That is why, given the interest rates on various financial forms, the level of deposits and liquidity limitations defined by the measures of monetary policy, expectations and preferences are a very important determinant of the loan supply. In contrast, on the side of the demand for loans, there is a category of possibilities and conditions of obtaining a loan which due to bank preferences may be different from one category of bank clients to another.

Econometric testing of selected variables

In order to assess the effects of individual determinants on the Croatian credit market, we provide a table with econometric analysis of the impact of selected variables on shifts in the total amount of loans, loans to households and loans to enterprises.

The results of the regression analysis of various variables of the credit channel in Croatia point to a conclusion that bank deposits are the strongest variable of the shifts in all selected categories of loan, which complies with theoretical expectations. Loan variations correlate with deposit variations in 95.1 % to 97.5% cases and this firm link is confirmed by extremely high levels of t-indicator and F-indicator which are much higher than the critical ones ($t = 2.896$; $F = 11.3$; on the level of 1% significance). The correlation here is almost linear and extremely firm, but it is the weakest in relation to loans to enterprises.

The impact of changes in interest rates on shifts in the amounts of loan is also very strong because total loans in more than 92%-94% cases correlate with a change in interest rates (t-value is -6.6 to -8.4; F-value is 44.1-71.0, which is far above the critical values). However, a significant difference between the effects of interest rates on loans to enterprises and interest rates on loans to households is established. The correlation between interest rates and loans to households is significantly higher than the correlation between interest rates and loans to enterprises. This conclusion is confirmed by significantly different t and F values (these values are significantly lower for loans to enterprises). Consequently, this shows a poor elasticity of loans to enterprises on the level of interest rates, which can be interpreted by the fact that enterprises place more importance on possibilities and conditions of obtaining credit than the price of money.

Accumulation of external bank debt is positively correlated with the growth of all loan categories, but due to the dominant impact of deposits on the level of bank credit potential, the impact of this category is relatively weaker and shows a relatively weaker correlation. The impact of restrictive monetary policy instruments on required bank reserves depicts a lower correlation with the amounts of all loan categories, with an acceptable level of explicability and assessment tests.

Table 1: Econometric testing of the relationship between variables on the Croatian credit market

Y	X	MODEL	Se	r	R ²	t	F
A	R	Y=134642-2419X	15683,63	-0,865863	0,7497187	-4,895318	23,964
A	J	Y=137159-5952X	12284,32	-0,920028	0,8464515	-6,640862	44,100
A	H	Y=209529-11097X	9975,43	-0,948024	0,8987495	-8,426852	71,011
A	F	Y=6107,66+3,14X	16509,36	0,850100	0,72267	4,565794	20,846
A	E	Y=9516+0,8X	6948,96	0,975124	0,9508668	12,442758	154,822
B	R	Y=58726-812,8X	5623,369	-0,851182	0,7245108	-4,586853	21,039
B	J	Y=58638-1926,4X	5230,82	-0,872714	0,7616297	-5,055816	25,561
B	E	Y=16802+0,2679X	3281,57	0,951936	0,9061821	8,790425	77,271
C	R	Y=64833-1364,5X	9134,65	-0,858760	0,7374687	-4,740521	22,472
C	P	Y= -26703+17,765X	6884,2	0,922437	0,85089	6,756621	45,651
C	H	Y=108047-6330X	5512,98	-0,950986	0,9043744	-8,698296	75,659
C	F	Y= -8304+1,8124X	9027,8029	0,862313	0,7435837	4,816566	23,199
C	E	Y= -5907,3+0,455X	4111,15	0,973049	0,9468244	11,93491	142,444

NOTE:

A – total bank loans
B – loans to enterprises
C – loans to households
E – bank deposits
F – external bank debt

H – average interest rates on loans to households
J – average interest rates on loans to enterprises
P – nominal wages
R – weighted average required reserve ratio (including other required bank deposits with the Croatian National Bank – minimal reserve for liquidity and required registered treasury bonds).⁸

Source: Data by Croatian National Bank, Monthly Report, January 2004.

Conclusion

The foregoing analysis shows that the mechanism in the Republic of Croatia is not sufficiently geared to economic growth and development of businesses and enterprises. The monetary credit mechanism exhibits a greater tendency to finance personal consumption and import in the household sector and to a lesser extent it shows the growth of investments by enterprises which the Croatian economy needs. Due to the paradox in the allocation of financial funds (the household sector has the greatest deposits and the highest money deficit at the same time), the adequate link between the monetary and real sector of the economy is not present. In those circumstances, it is difficult to employ the monetary-credit mechanism to exert influence on increases in investments, export of goods and decreases in external debt of the Croatian economy.

⁸ Other determinants on the credit market are not stated here because they show poor statistic and econometric tests or because they cannot be stated precisely quantitatively.

Therefore, alternative possibilities should be put in use which would contribute to further development of the Croatian financial market (state development banks, investment funds, issuance of company securities, issuance of state securities by means of adequate institutions whose sale would finance ear-marked crediting of businesses etc.) This would replace the insufficient orientation of the present banking system on the sector of enterprises and it would additionally stimulate the development of the still shallow financial market in Croatia.

References

- Bean, C; Larsen, J. and Nikolov K. (2002), *Financial Frictions and the Monetary Transmission Mechanism: Theory, Evidence and Policy Implications*, European Central Bank, Working Paper, No.113, January 2002, pp.3-59
- Cobham, D., (1998), *Macroeconomic Analysis an intermediate text*, Longman, London and New York
- Croatia National Bank, (2004), *Monthly Report*, January
- Azali, M. (1998), "The Roles of Money and Credit in the Monetary Policy Transmission Mechanism: Preliminary Evidence Using Malaysian Quarterly Data", *Asian Economic Review*, Vol. 40(3), pp 395-405
- Stiglitz, E. J., Greenwald, B., (2003), *Towards a New Paradigm in Monetary Economics*, Cambridge University Press