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CREDIT RISK, CREDIT AND ECONOMIC CYCLES IN CROATIAN BANKING

ABSTRACT

The purpose of this paper is to investigate the relationship between credit risk and credit cycle on the one hand and economic cycle on the other hand in Croatian banking and economy. Potential threats to correct credit risk management in banks and to stability of the financial system, which result from the influence of different factors, will be identified as well. At the theoretical level there is no agreement on these questions. However, the dependence of the economic cycle towards the credit cycle and risk has been clearly proved in numerous empirical studies. Such researches have not been done in Croatia. The results of our regression analysis have shown, among other things, that credits to enterprises have a greater influence on GDP than credits to households. Statistically, we have identified two credit booms and between them one credit bust. During the first credit bust, which was a result of a bank crisis, the rates of economic growth decreased drastically. Bank crisis was the consequence of poor credit risk management and supervisor's neglect. Everything shows that a new credit bust and a financial crisis could follow. Existing GDP growth rates, mostly based on the growth of consumption stimulated by credits, cannot be sustained. The limitation of deficit and the slowing down of economic activity might make the banks even more vulnerable to credit risk.

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Key words: *credit, risk, cycle, banking, Croatia*

1. Introduction

At the level of theoretical approach there is no agreement in regard to a possible connection between credit risk and credit cycle on the one hand and economic cycle on the other hand. According to the traditional theory of perfect market and rational selection, which is enriched with new findings of the rational anticipation school, money as well as various financing forms is neutral. Crises are explained as a consequence of accidental external shocks such as wars, natural disasters etc. Another approach has also been present for a longer period of time. That approach emphasizes greater or lesser financial instability which is considered inseparable from real economy. Recent numerous theoretical and especially empiric researches have brought to light certain situations in which credit agitates real economy. The credit influence on real economy is explained by different reasons including difficulties in credit and other risks management. To what extent those reasons are relevant in explaining the credit influence on the real flows in Croatian economy - is the question

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that will be answered in this paper. Before that, it is important to note some basic notions on these different approaches.

2. Theoretical Controversies and Experience

The traditional thesis on the neutrality of financial structure is best presented in the Modigliani - Miller theory (1958, p.261-297). According to these authors' propositions, enterprises are indifferent to financing from their own sources, financing through borrowing from banks or through issue of securities. They support their point of view by several assumptions. In the first place, neither research costs nor transaction costs that result from making contracts are generated by access to external financing. Secondly, there is no problem in enterprise control. Thirdly, there is no discriminative tax that would prefer one particular source of financing enterprises to others. Finally, economic entities share identical and perfect situation. Consequently, the way conditions that prevail in financial markets are seen leads to the conclusion that the selection of financing forms should not have any influence on real economy.

However, most assumptions of perfect market as well as the assumption of perfect substitutability of internal and external financing sources have become questionable. Thus, one peculiar theoretical analysis gives a very convincing proof that there is no agreement between desires for debt and desires for borrowing and lending (Gurley and Shaw, 1960). These authors have also subtly explained the connections existing between financial and real flows. Among other things their "Primary Issues - Income Ratio" (p. 97) represents the reciprocal value of Keynesian investment multiplier. They emphasize an essential role of financial intermediaries in the transformation of characteristics of financial assets towards maturity, risk and profitability. In their earlier papers there is the assumption of financial instability in which the behaviour of banks plays an essential role (Minsky, 1964, p.173-380). According to this interpretation there is an interdependence of financial (financing through market and bank credits) and economic fluctuations. Accordingly, these connections are components of endogenous cycle of boom and bust. The renewed theory of financial intermediation, which has given various evidences for banks' advantages in relation to other financing sources of enterprises, includes a study of relation between credit and economic cycle. The essential condition for credit channel functioning is found in the fact that there always are enterprises dependent on banks. This condition is fulfilled in countries where the financing of enterprises through financial markets is the biggest. In the USA for example, between 1970 and 1996, external financing sources of the non-financial corporations were realized through bank credit with about 40%, through credits from other financial institutions with about 15%, through bonds with about 36% and through issues of shares with only 9% (Smidt, 2001; According to Mishkin and Eakins, 2005, p.372). Among various new interpretations of the relation between credit and economic cycle, which emphasize the credit risk management, two of them are often quoted. The first one refers to credit rationing (Stiglitz and Weiss, 1981, p.393-410) and the second one to disaster myopia (Guttentag and Herring, 1986; Herring, 1999, p.63-79). The credit rationing is explained as a consequence of asymmetric information ex ante in the imperfect market. Banks do not have at their disposal any instruments to find out in advance which borrower will not perform its credit obligations. In this way banks are confronted with adverse selection. If they increased interest rate on credit, the best borrowers would refrain from borrowing. Banks could compensate a falling demand by extending credit supply to risky

companies. By changing the structure of credit portfolio in favour of claims towards riskier borrowers, together with higher moral hazard threat, the probability of borrower's non-payment would increase. The increased probability of non-payment would diminish the expected profitability of bank portfolio. Therefore banks should not increase their interest rates despite the fact that credit demand surpasses credit supply at the higher interest rate. In this case, it is said that there is credit rationing. If banks satisfied the credit demand (balance), the cost of capital would turn out to be higher than one noticed in the perfect credit market. So, the credit rationing as well as the increased cost of capital in balance must have an influence on global demand and consequently on consumption, investments and stocks.

In the disaster myopia approach bank managers know that there is a probability of loss realization. Nevertheless, they do not have at their disposal enough information in order to extrapolate that probability. In addition, they systematically tend to judge available information as something that supports superior thinking. During the growing phase of the cycle these subjective probabilities of loss can decrease. That dominant view stimulates banks to loosen the brakes seen in the activities of credit granting to a wider number of borrowers, estimated as very risky in the previous cycle, that is, they can more easily get a credit in the phase of expansion. Accordingly, the quality of credit portfolio can deteriorate and become riskier in the phase of cycle maturity. In the context of disaster myopia, the quality of banks assets deteriorates whether banks have consciously decided to accept a higher level of risk or not. The process continues until it comes to distrust regarding the solvency of a borrower. Then a credit crisis follows, which could be quite fierce. Banks start to behave in a different way and consequently support the formation of systematic risk. In fact, they reduce the credit supply drastically. They do that in an insufficiently selective way and consequently contribute to the growth of debtors difficulties. After dynamics of over-borrowing, the contraction of credits follows. Thus, the credit crisis threatens the real activity and intensifies the economic cycle.

There are some other explanations of bank credit channel functioning, including shocks resulted from monetary policy changes. According to certain interpretations the influences of monetary policy do not only end on liability side (deposits), but adjust bank credit supply as well. These modifications of pro-cyclical nature often have qualification of Credit crunch (Bernanke and Lown, 1992, p.205-239). Numerous empiric researches, also based on asymmetric information between a borrower and a lender, apart from bank market include other credit markets as well (Fazzari et.al., 1988, p.141-195; Gertler and Gilchrist, 1994, p.309-340; Bernanke et al., 1996, p. 1-15). They try to prove that external financing is more expensive than self-financing due to costs of agency, especially in the case of credit without collateral. That difference decreases with the growth of net wealth and increases proportionally with the growth of borrowing. Ill-fated shock which threatens the net wealth of borrowers increases the cost of external financing and restricts their access to external financing. That could inspire them to diminish the costs of equipment, personnel and production.

Finally, the facts from developed and emergent countries have clearly confirmed that markets of credits and assets functioned pro-cyclically and that they contributed to the frequency of bank crises (BIS, 1998, p.117-141; BIS, 2001, p.123-141). Credit cycles and assets prices are often simultaneous and they intensify each other. Rises in prices

of assets stimulate economic activity, and by inflating the value of guarantees they enable easier and cheaper access to financing for the private sector. The accelerated economic growth as well as the growth of credits incite a more intensive rise in price of assets. The interaction between credits and assets can be even stronger when the assets prices decrease and economic conditions become worse. The falling of guarantee value can cause losses to banks and can make them reduce credit supply substantially. The movement of real estate prices, especially real estate of enterprises, has played an important role in the most striking financial cycles. The rise in prices of shares principally goes with the increase of credits, although it is noticed that this connection is weaker in relation to one with real estate prices.

3. Credit and economic cycle: empirical testing

Since the dependence of economic cycle towards credit cycle and risk is theoretically well established and clearly proved in numerous market economies (Bernanke, B.S., 1983, p. 257-276; Bernanke, B.S. and Lown, C.S., 1992, p.205-239; Mishkin, F.S., 1999, p.3-20; Avouyi-Dovi, S. et al., 2006, p.1-9; Cottarelli at all, 2005, p.83-104) , it is logical to presume that it is possible in Croatian economy as well. There are several reasons for this assumption. First, due to a lack of developed self-financing and financing through the issuing of securities, enterprises turn to credit sources. Secondly, the economy is liberalized to a great extent in the country and toward abroad as well. Thirdly, structural reforms of the legal system and privatization have not been completed yet. Furthermore, there are some problems in economic policy managing. Finally, there is a lot of space for development of risk management skills in banks and other business companies. In such circumstances even the changes in the structure of bank credits could function in a pro-cyclic way. We presume that the credits to enterprises (generally bearing a greater risk) should have had more influence on economic activity and results than credits to households (generally bearing a smaller risk). This presumption will be examined statistically further in our work.

3.1. Credits to Enterprises and Industrial Production

In the observed period between January 1995 and July 2005 (monthly observations) we were analysing if there was any dependence of industrial production on credits given to enterprises and how strong it was. We took one-year-shift supposing that at least medium-term credits could not directly have an influence on production. The series of statistical data regarding industrial production are given in basis Indexes (January 2000 = 100). By means of software package SPSS we got the results of a single regression assessed by Least Squares method. The model as a whole and individual parameters turned out to be statistically significant. However, Durbin-Watson (DW) statistics shows that residuals are not mutually interdependent, in other words, DW statistics close to zero (0,059) shows that there is a problem of positive autocorrelation of residuals. In order to check which degree of correlation (first or other levels) of residuals it is, we tested the significance of autocorrelation (ACF) and partial autocorrelation coefficients (PACF) by means of Box-Ljung statistics. Since the ACF decreases and PACF disappears after the first time shift, we have concluded that residuals follow the AR(1) process, so we can describe them by model ARIMA (1,0,0). Therefore, the best thing is to include residuals into the initial model, so that two equations could be assessed simultaneously. In econometric analysis, the most

used method for assessing the parameters of equation systems is Two Stage Least Squares, because the use of Least Squares method would result in inconsistent assessment of parameters. After application of Two Stage Least Squares we have obtained the following system of equations[1]:

$$y_t = 60.5447 + 0.0013 \cdot X_{t-12} + e_t$$
$$e_t = 0.9662 \cdot e_{t-1} + \varepsilon_t$$

The parameter next to the variable X_{t-12} shows that with the growth of credits given to enterprises (with one-year-shift) of 1 million HRK, we can expect the monthly growth of industrial production by about 0.13% in relation to January 2000 (base), supposing that other variables do not change. The model has been essentially improved after application of the Two Stage Least Squares method, not only because of the measures of representative quality but because of DW statistics which shows that there is no problem of autocorrelation.

3.2. Credits to Enterprises and GDP

We have been studying what kind of influence the credits given to enterprises have on GDP (quarterly observations). As in the period between the first quarter of 1997 and the first quarter of 2005 GDP has explicit seasonal character, we have calculated quarterly seasonal indexes, i.e. factors, seasonal adjusted values of GDP by means of multiplicative model of decomposition (non-parametric method). When the seasonal influence is removed, the increasing trend of seasonal adjusted GDP values can easily be noticed. It can be explained by the fact that due to seasonal influence GDP was 7.3% higher in the third quarter (July - September), while in the first quarter (January - March) it was 6.4% lower. Regardless of seasonal character of GDP, we have not formed it by means of ARIMA model, because it turned out that in this case there is no problem of autocorrelation since DW statistics is 2.18. Therefore we used the classic regression model to establish the dependence of seasonal adjusted GDP values. The following results were obtained:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,942[a]	,887	,884	2438,06745	2,180

a. Predictors: (Constant), Loans to enterprises

b. Dependent Variable: Seas adj ser for GROSDOMESTICPRODUCTmarketprices from SEASON, MOD_2 MUL EQU 4

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[1] Since we could not use the Two Stage Least Squares method in the ARIMA model with SPSS, we used EViews. "You can adjust your TSLS estimates to account for serial correlation by adding AR terms to your equation specification. EViews will automatically transform the model to a nonlinear least squares problem, and estimate the model using instrumental variables" (Fair, 1984, p 210-214).

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	9798,903	2043,090		4,796	,000
	Loans to enterprises	,807	,052	,942	15,627	,000

a. Dependent Variable: Seas adj ser for GROSDOMESTICPRODUCTmarketprices from SEASON, MOD_2 MUL EQU 4

The model runs like this: $\hat{Y}_t = 9,798.903 + 0.807 \cdot X_t$ The parameter next to the independent variable shows that we can expect the growth of GDP for 0.807 units if there is no seasonal influence and if the credits to enterprises increase by 1 million HRK quarterly, supposing that other variables do not change.

3.3. Credits to Households and GDP

As in the previous case, we used the classic[2] regression model in order to establish the dependence of seasonal adjusted GDP towards total credits to households (in millions of HRK) since DW statistics (1.623) enters into the area where it is not possible to make a decision. The observed period runs from the first quarter of 1997 to the first quarter of 2005. The following results have been obtained:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,981[a]	,962	,961	1408,48057	1,623

a. Predictors: (Constant), Loans to households

b. Dependent Variable: Seas adj ser for GROSDOMESTICPRODUCTmarketprices from SEASON, MOD_2 MUL EQU 4

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	28747,240	500,204		57,471	,000
	Loans to households	,392	,014	,981	28,171	,000

a. Dependent Variable: Seas adj ser for GROSDOMESTICPRODUCTmarketprices from SEASON, MOD_2 MUL EQU 4

The model runs like this: $\hat{Y}_t = 28,747.24 + 0.392 \cdot X_t$ The parameter next to the independent variable shows that we can expect the growth of GDP by 0.392 units if there is no seasonal influence and if total credits to households quarterly increase by 1 million HRK, with other variables unchanged.

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[2] Linear univariate regression model.

3.4. Credits to Households and Trade Turnover

Since the resources for the purchase of flats (and houses) can be considered a long-term investment and not a consumption, we have left it out of the analysis. Therefore, our intention was to establish the existence of a relation between trade turnover and credits given to households (without housing credits). As the trade turnover showed a distinctive seasonal character in the period between July 1999 and July 2005, we calculated monthly seasonal Indexes, in other words seasonal adjusted values of time series as well as trend-cycle values. After ACF and PACF testing it turned out that the most adequate model would be the ARIMA model $(1,0,0) \times (1,0,0)_{12}$, together with fulfilled conditions of stationarity and invertibility. In fact, it is a question of a non-seasonal part of auto-regression process of the first rank AR(1) and a seasonal part of auto-regression process of the first rank $AR(1)_{12}$ with the period of 12 months. After the application of Two Stage Least Squares we obtained the following system of equations:

$$y_t = 3{,}733.639 + 0.0832 \cdot X_{t-12} + e_t$$
$$e_t = 0.7596 \cdot e_{t-1} + \varepsilon_t$$

The parameter by the variable X_{t-12} shows that on an average we can expect the increase of trade turnover of 83 million HRK if credits to households (without housing credits) increase by 1 billion HRK supposing that other variables do not change. All the parameters by given variables are statistically important as the empiric level of significance amounts to approximately 0.00%. DW statistics amounts to 2.44.

3.5. Credits to Enterprises and Trade Turnover

We used the same procedure as in the previous example to establish if there is any dependence of seasonal adjusted trade and credits given to enterprises (with one-year-shift) in the period between January 1998 and July 2005 (monthly observations). We have found that the relation between the mentioned variables exists, but only at the significance of 14.7%. Thus, by the application of Two Stage Least Squares we have obtained the following system of equations:

$$y_t = 1{.}923{,}088 + 0{,}1109 \cdot X_{t-12} + e_t$$
$$e_t = 0{,}947 \cdot e_{t-1} + \varepsilon_t$$

With the increase of credits given to enterprises (with one-year-shift) of one billion HRK we can expect the increase in the trade turnover on an average of 110 million HRK, supposing that other variables do not change. Regardless of this explanation, the credits given to households have a bigger influence on the realized trade turnover than credits given to enterprises since the relation between the trade turnover and credits to enterprises is significant at only 14.7%.

3.6. Key message

If we compare the results of regression analysis we can conclude that there is greater influence on GDP by credits to enterprises than by credits to households although the coefficient of determination is lower by 7.5% (0.887 in comparison to 0.962).

Namely, the parameters themselves show that the increase in units of credits to enterprises will increase the GDP (on an average by 0.807 units for each quarter) more than the same increase in units of credits to households (on an average by 0.392 units for each quarter). Nevertheless, we have not been able to assess the parameters of multiple regression in which we observe the dependence of GDP simultaneously on both - credits to households and credits to enterprises because the problem of multicolinearity would appear. In other words, both independent variables would be in strong (according to intensity) and positive (according to direction) correlation (+0.969). Therefore, we will trust the parameters of partial regressions which are statistically very important, because the empiric level of significance almost amounts to 0.00%. It is logical that the influence on the trade turnover is bigger by credit to households than by credits to enterprises. This means that the quality of GDP growth is not encouraging since it is based on faster increase in consumption.

4. Credit Risk, Boom and Bust

Despite the fact that the previous econometric analysis confirmed the existence of positive relation between the dynamics of bank credits and economic growth, it has not shown anything about the possible influence of credit risk factors on that growth and vice versa. However, different facts suggest that the presence of this factor should not be disputable. It is the question of intensity of influence it has on financial and economic stability and growth.

Figure 1.

Growth rates of credits and GDP
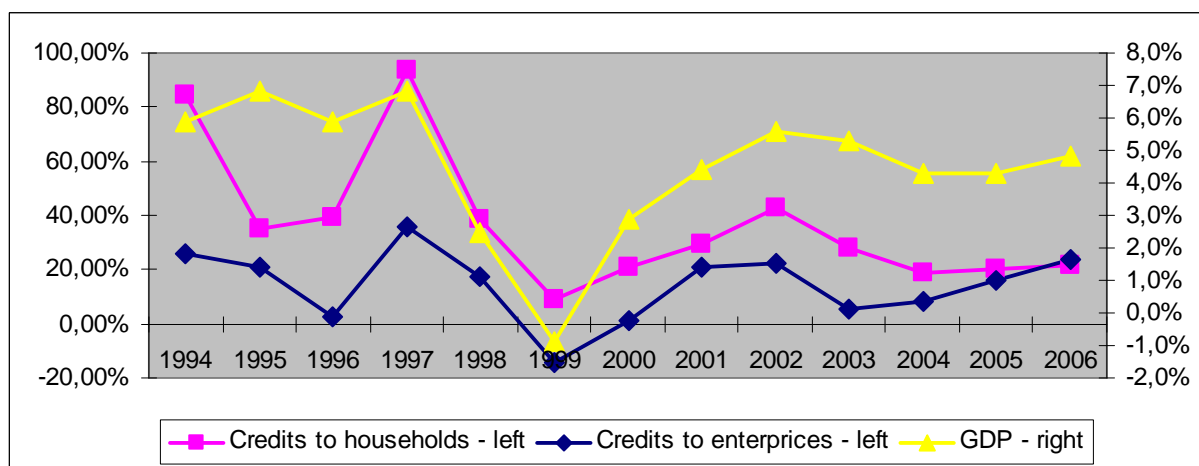
Source: CNB, Web page. Author's calculation.
　　　CNB, Bulletin no. 132, 2007. Author's calculation.

Figure 1. clearly discloses the existence of two characteristic periods in which a credit boom and more or less important positive rates of economic growth are recorded. The first period lasts till 1998 and the second one begins in the year 2000. Between the two there is a period of credit bust with simultaneous and drastic decrease of economic growth rate. As there were credit restrictions and economic recession at the time of bank crisis, one could get an impression that there was a strong connection

between neglects in the credit risk management and the fall of economic activity. However, the poor credit risk management could be only one of the factors of the bank crisis. In addition, it is understood that economic activity is not determined only by changes in the credit policy of banks. Generally speaking, influences of different financial and real factors of static and dynamic nature interwove here. Of course, it can also be applied to the period since 2000. At first sight the present condition of the banking system appears to be stable. It is partly the result of improved skills in the credit risk management. A credit expansion together with acceptable rates of economic growth can be seen as well. However, the situation in Croatian banking system is not so idyllic. There are some traces of its vulnerability. Some of them are permanently present, while some others have appeared recently. Therefore, it is necessary to remind of the circumstances when the first credit boom and bust happened.

4.1. Credit Risk, Bank Crisis and Recession

The manifestation of bank crisis in the market economies is always and basically the same. It is regularly preceded by credit expansion and increasing credit risk. According to some opinions the bank crisis usually follows if the credit expansion exceeds 5% of GDP (Demirgüc - Kunt and Detragiache, 1997, p.16-30; Cottarelli et al, 2005, p.83-104). Depending on the expanse and depth of the crisis, a stronger or a weaker fall of economic activity rate is recorded. Such was the scenario of the bank crisis and its consequences in Croatia. However, the credit boom and bank crisis in Croatia cannot be explained, or at least predominantly explained, by the consequence of influence of factors described in the item 2. The specific circumstances that preceded the first credit boom have to be taken into consideration.

Principally, the factors of liberalization, the suspension of quantitative credit limitations and administrative interest rate management, or the removal of barriers for entrance of new banks into the market - all create good conditions for credit expansion and development of disaster myopia. The liberalization of economy started before and continued after Croatia became independent. In addition, after the Government's first intervention regarding the solution of the problem of blocked savings in foreign exchange in 1991, the inherited bad bank claims were substituted by government bonds. Some state-owned banks were privatized under strange circumstances. Nevertheless, after adopting stabilisation and inflation reduction programme in 1993 it was found that balance and off-balance potential losses of large regional banks significantly surpassed regulated amounts of their own funds and reserves. Therefore some new interventions with government bonds followed. It was written about some quiet rehabilitations as well. But all of this gave poor results. One of the two biggest banks together with three big regional banks remained insolvent. They were main participants of a large demand in the interbank market, which induced the rise of interest rate above the level of 30%. This interest rate was substantially reduced (to approximately 9%) in the beginning of 1996 after takeover and additional capitalization of problematic big banks by the government. Till that period the banks' lending activity had been narrowed due to some other reasons including the state of war. However, besides the rehabilitation of major banks, some other conditions for the start of credit boom had been created before that. Thus, the Banks and Savings Institutions Law from 1993 anticipated low capital requirements and relatively easier conditions for bank founding. Interest rate formation was

liberalized as well. Those two reasons, together with some other, provoked a powerful entrance of new participants into the bank market. Between 1990 and 1997 the number of banks increased almost by 3 times (from 23 to 60). Banking business became the most attractive activity as big differences between lending interest rate and borrowing interest rate enabled high profits.

Figure 2.

The difference between lending and borrowing interest rate*
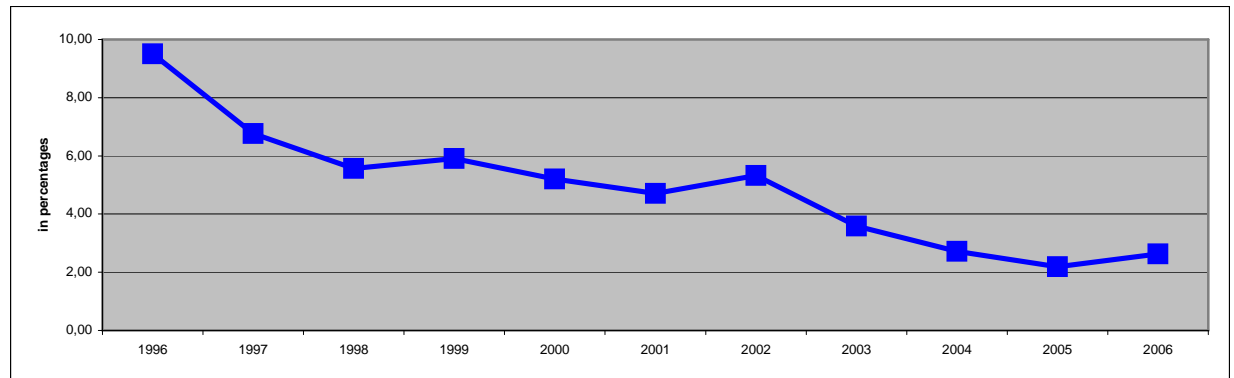
* Banks' lending interest rates on HRK credits indexed to foreign currency and on credits in Euros (total average)
  Banks' borrowing interest rates on HRK deposits indexed to foreign currency and on foreign
  currency deposits (total average).
Source: CNB, Bulletin, no. 132, 2007.

Although the entrance of new banks had a certain influence on the size of the bank system and growth of credits, "the entrance itself was not the main factor of expansion of available credits" (Kraft and Jankov, 2005, p.110). On the rank-list of 15 biggest banks in 1997 there were 5 new banks that participated with only 10.6% in the total bank assets. According to these two authors the liberalization of interest rate, which was an important presumption for the development of market society, had a very strong effect. That policy enabled the development of banking activities based on the principle of profit maximization, in distinction from the earlier dictated political priorities. Banks' freedom in determining the amount of deposit rate made the growth of credit sources possible. The significant rise of deposit rate followed primarily because some new banks tried to achieve their fast growth in that way. Naturally, to some extent that affected the reallocation of deposits among banks themselves. However, interbank competition left its mark. Other banks followed fast-growing banks, so that it came to general rise of deposit rate and accordingly of lending interest rate. The interest rate spread on the Croatian bank market increased much more than one recorded in the majority of bank systems in West-European countries. In this way, in the circumstances of rigid monetary policy the growth of total banks sources occurred. The growth of total banks sources is caused by growing inflow of savings in the first place. The growth of savings is mainly explained as a result of more attractive deposit rewarding. That could attract especially the savings of Croatian returned emigrants. Deposits growth probably derived from tesauration of money, savings earlier directed abroad and an increasing number of rich individuals or big depositors. Anyway, the growth of total banks sources gave an opportunity for the expansion and overheating in the credit market. The epilogue was the bank crisis.

The bank crisis started in the beginning of 1998 with the collapse of one fast-growing bank and reached its culmination by the end of the first quarter of the following year. During that period 16 banks, which participated with nearly 16.2 % in the total assets of the bank sector, were ruined. Due to that occurrence and to decreasing of credit activity of other banks a negative credit growth rate was recorded in 1999. The reasons for the bank crisis were directly connected to weaknesses in performing institutional reforms (legal system etc.) and to the privatization process which resulted in "tycoon empires". Ownership correlation of private banks to the corporate sector resulted in mutually connected lending. The lending throve due to the weaknesses of banking regulations and the central bank's supervision. Loans to insiders are thought to have been the biggest part of problematic bank credits (Kraft and Jankov, 2005, p. 112). After all, weaknesses of the credit risk management in the phase of credit boom led to the bank crisis and credit bust.

Finally, in spite of a statistically clearly proved relation between credit and economic cycles, it cannot provide a complete explanation. Some other factors, which have macroeconomic and microeconomic characteristics, influenced changes in the GDP rate of growth. Some of them, which are supposed to be the main factors, were present in the second credit boom as well.

4.2. Potential Dangers of Banking Distress

A new credit boom, which started in 2000, occurred in altered circumstances. After banks had been conveyed upon foreign proprietorship, they intensified activities in qualitative and quantitative sense (Haas and Lelyveld, 2006, p.1927–1952). Croatian banks improved their risks management and solvency ratios seem to be satisfactory. They are efficient in the technical sense as well. However, one thing is functioning here - it is a credit channel from growing inflow of foreign short-term capital that gives preference to final consumption. According to some statements banks might become vulnerable because of an excessive expansion of total credits to the private sector, a decrease of differences between lending and borrowing interest rate, and possible slowing down of economic activity (Mihaljek, 2004, p.93-119; Égert et al, 2006, p.29-30).

Figure 3

Credits to private sector
- in percentage according to GDP -
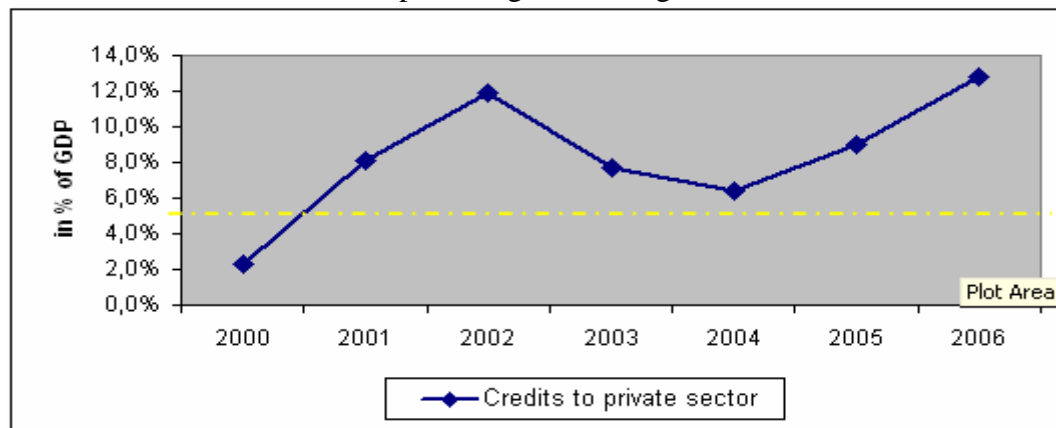
Source: CNB, Web page. Author's calculation and graphics.

The statement that a bank crisis develops in the circumstances of growth of credits to the private sector above 5% of GDP cannot be abandoned. As between 2000 and 2006 those rates were 2.3%, 8.1%, 11.9%, 7.7%, 6.4%, 9.0% and 12.8% a credit bust should have already begun. If it has not happened yet, it does not mean that it will not happen. Our opinion is that the growth of credits to private corporate sector should not be problematic if a good credit risk management is applied (Cebenoyan and Strahan, 2004, p. 19–43). What disturbs even more is an excessive growth of credits granted to the consumer sector in the conditions of poor domestic sources of saving.

In the growing bank competition, the decrease of differences between lending and borrowing interest rate under a certain limit could threaten the effectiveness of their business. On the other hand, Figure 2 shows that it has not happened yet. Finally, banks have really high profit, even at existing differences between these two rates.

Table 1.

Net margins
- in percentage -

	1998	1999	2000	2001	2002	2003	2004	2005
Net interest margin	4.71	4.09	4.21	3.58	3.28	3.33	2.97	2.87
Net non-interest margin	1.76	2.14	1.94	0.96	1.40	1.16	1.30	1.21
Net business margin	6.47	6.23	6.15	4.54	4.68	4.49	4.27	4.08

Source: CNB, Annual report, different years. Author's calculation.

Although net business margin has a decreasing tendency, it is still considerably above the one realized in banks in Western Europe. Thus, in 2005 this margin came to 2.09 in Italy, 2.24 in Austria, 2.07 in Germany, 1.80 in France etc. (OECD.Stat Extract, author's calculation). In addition, in banks in some of these and some other countries net non-interest income represents a bigger part than net interest income. In the period

between 1998 and 2005 the percentage share of non-interest income in the total income of Croatian banks chronologically was: 27.1; 34.3; 31.6; 21.2; 29.9; 25.7 and 37.1 (CNB, Annual report, different years). That means that Croatian banks have big opportunities for developing off-balance activities, especially in the area of financial market operations (issue of securities for the corporate sector etc.). Rationalization can be also found within administrative costs.

It seems that banks might be the most vulnerable to a possible decrease of economic activity rate. The circumstances in which the existing rates of GDP growth occur are not very optimistic. Macroeconomic indicators disclose that to a great extent.

Table 2.

Crucial macroeconomic indicators

	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06
GDP - year-on-year rate of growth (in %, constant prices)	5,9	6,8	2,5	-0,9	2,9	4,4	5,6	5,3	4,3	4,3	4,8
Average year-on-year inflation rate	3,5	3,6	5,7	4,0	4,6	3,8	1,7	1,8	2,1	3,3	3,2
Current account balance (as % of GDP)	-4,8	-12,3	-6,8	-7,0	-2,4	-3,6	-8,5	-7,1	-5,1	-6,4	-7,8
Outstanding external debt (as % of GDP)	27,0	38,0	47,6	54,5	61,4	61,4	61,9	75,8	80,0	82,4	85,3
Imports of goods and services (as % of GDP)	48,0	56,8	49,1	49,3	52,3	54,6	56,4	57,9	56,5	55,9	57,3
Consolidated central government deficit (as % of GDP)	-	-	-	-7,1	-7,5	-6,8	-4,9	-6,2	-4,8	-4,0	-3,0

Source: CNB, Bulletin, no. 132, 2007.

Is the current economic growth sustainable or not - that is the question, because it is based on the consumption which depends on export (Zbašnik, 2005, p. 201-218). Besides the expansion of bank credits to households, the consumption is also backed by overrated exchange rate. That can be clearly proved through growing deficit of the balance of payments, fast-growing external debt and budget deficit. The relation between balance of payments deficit and GDP growth is more than obvious. The balance of payments deficit is mostly the result of commodity exchange deficit. Therefore, some national economists propose the depreciation (devaluation) of the national currency. On the other hand, more serious analyses give a range of arguments that are not in favour of that particular move. In general, a positive effect on the balance of payments, from the depreciation of exchange rate (increase of export and decrease of import), could be neutralized in different ways. Among other things, increase of inflation rate would follow, then decline of employment in non-export sectors and of national real income, increase in payment of the indexed internal debts and burden of external debt payment (Stručka, 2004, p.24). However, an efficient economic policy is not a simple task. The decrease of tax pressure and budget deficit is necessary but it cannot be done painlessly. Our country's external debt almost exceeds the limit of endurance, so that some cuts have to be done especially in public investments out of these sources. The final consumption will have to adapt itself to domestic production opportunities. Although the CNB has the right policy in limiting

banks' external debt, it is still not enough. Of course, it is necessary to create conditions for capacitating domestic production. It certainly cannot be done easily and quickly. Anyway, banks should act in that direction. Otherwise they themselves will become vulnerable. Efficient economic allocation of sources and fight against credit and other risks are their first and permanent tasks.

5. Conclusion

Credit markets are imperfect. There are asymmetric information, moral hazard, adverse selection, disaster myopia and some other phenomena that explain the pro-cyclical nature of movements in credit markets, financial and economic instability. Between 1995 and 2006 there were two credit booms and between them one credit bust in the Croatian banking system. During the credit bust, which was a result of a bank crisis, the rates of economic growth decreased drastically partly showing negative values. As the bank crisis was the consequence of poor credit risk management and supervisor's neglect, there should be no doubt that there is a connection between credit risk and cycle on the one hand and economic cycles on the other. Everything shows that a new credit bust could follow and according to the IMF estimate even a financial crisis. Balance of payments deficit and commercial balance deficit, external debt and budget deficit have become intolerable. Existing GDP rates of growth, mostly based on the growth of consumption, cannot be sustained. Limitation of deficit and slowing down of economic activity could make the banks even more vulnerable. In such situation credit risk management becomes more complex.

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KREDITNI RIZIK, KREDITNI I EKONOMSKI CIKLUSI U HRVATSKOM BANKARSTVU

Sažetak

Cilj ovog rada je istražiti vezu između kreditnog rizika i kreditnog ciklusa s jedne strane, te ekonomskog ciklusa s druge strane u hrvatskom bankarstvu i ekonomiji. Također će se ustanoviti potencijalne prijetnje ispravnom upravljanju kreditnim rizikom u bankama i stabilnosti financijskog sustava koje proizlaze iz utjecaja različitih faktora. Ne teorijskoj razini oko tih pitanja nije postignuta suglasnost. Ipak, ovisnost ekonomskog ciklusa o kreditnom ciklusu i riziku je jasno potvrđena u mnogim empirijskim studijama. U Hrvatskoj takva istraživanja nisu provedena. Rezultati naše regresijske analize pokazali su, između ostalog, da poduzetnički krediti imaju jači utjecaj na BDP od kredita kućanstvima. Statistički smo uočili dvije kreditne ekspanzije među kojima je došlo do kreditnog kolapsa. Tijekom prvog kreditnog kolapsa, do kojeg je došlo radi bankarske krize, stope ekonomskog rasta su drastično pale. Bankarska kriza je bila posljedicom lošeg upravljanja kreditnim rizicima i nepažnje supervizora. Sve ukazuje na to da bi mogao uslijediti novi kreditni kolaps i nova financijska kriza. Nemoguće je održati postojeće stope rasta BDP-a koje se baziraju uglavnom na rastu potrošnje stimuliranom kreditima. Ograničenje deficita i usporavanje ekonomske aktivnosti bi banke moglo učiniti još osjetljivijim na kreditni rizik.

JEL: G21

***Ključne riječi**: kredit, rizik, ciklus, bankarstvo, Hrvatska*