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DETERMINANTS OF THE AMOUNT OF BANKS' LOANS TO NON-FINANCIAL CORPORATIONS IN THE REPUBLIC OF CROATIA

DETERMINANTE IZNOSA KREDITA BANAKA NEFINANCIJSKIM TRGOVAČKIM DRUŠTVIMA U REPUBLICI HRVATSKOJ

ABSTRACT

Croatian capital market is extremely bank-based market and most companies, in addition to their own internally generated funds, are financed primarily by borrowing from banks. Banks in Croatia are mainly focused on financing the household population while the proportion of funds that are approved to corporations is significantly smaller. Furthermore, government often indirectly requires banks to buy government debt securities. Croatian non-financial corporations have no significant possibility to finance their business with debt or equity securities but have to mainly rely on financial institutions and in the Republic of Croatia financial institutions are generally banks. A bank, in such a business environment, defines the basic conditions and the amount of financing which will be allocated to non-financial corporations. The aim of this paper was to identify, via multiple regression, among certain variables those variables that have significant influence on the amount of bank loans to non-financial corporations in the Republic of Croatia. The results show that the ratio of the share of loans granted to the central government in total loans, the share of loans granted to households in total loans and the share of purchased long-term central government debt securities in total assets has a statistically significant negative effect on the amount of loans granted by banks to non-financial companies. On the other hand, the increased share of banks' reserves with the Croatian National Bank in total assets ratio has a statistically significant positive effect on the amounts of loans granted by banks to companies. A conclusion can be made based on the obtained results about the impact of certain variables on the amount of loans to non-financial companies. Direct or indirect influence on certain variables can affect the amount of loans granted by banks to non-financial companies in the Republic of Croatia.

Key words: loan, corporation, bank, financing, securities.

SAŽETAK

Hrvatsko tržište kapitala je bankocentrično tržište. Na takvom tržištu trgovačka društava pored vlastitih interno generiranih sredstava, za financiranje investicija i tekućeg poslovanja prvenstveno se zadužuju kod banaka. Banke u Republici Hrvatskoj uglavnom su orijentirane na financiranje stanovništva dok je udio sredstava koji se odobrava trgovačkim društvima značajno manji. Također

i država često indirektno zahtijeva od banaka da kupuju njezine dužničke vrijednosne papire. Hrvatska nefinancijska trgovačka društva nemaju mogućnosti značajno se financirati drugim dužničkim ili vlastitim vrijednosnim papirima već se u velikoj mjeri moraju prvenstveno osloniti na financijske institucije, a u Republici Hrvatskoj to su prvenstveno banke. Banka u takvom poslovnom okruženiu definira osnovne uviete kreditiranja koje odobrava trgovačkim društvima i iznose koje će namijeniti trgovačkim društvima. Cilj rada bio je putem višestruke linearne regresije ispitati koje varijable među odabranim varijablama značajno utječu na iznos kredita koje banke odobravaju nefinancijskim trgovačkim društvima u Republici Hrvatskoj. Dobiveni rezultati pokazuju kako udio odobrenih kredita središnjoj državi u ukupno odobrenim kreditima, udio odobrenih kredita stanovništvu u ukupnim kreditima kao i udio dugoročnih dužničkih vrijednosnih papira kupljenih od središnje države u ukupnoj imovini banaka ima statistički značajan negativan utjecaj na iznos kredita koje banke odobravaju nefinancijskim trgovačkim društvima. S druge strane povećanje udjela pričuva banaka kod Hrvatske Narodne Banke u ukupnoj imovini banaka ima statistički značajan pozitivan utjecaj na iznose kredita koje banke odobravaju trgovačkim društvima. Temeljem dobivenih rezultata može se donijeti zaključak o utjecaju pojedinih varijabli na iznose kredita koje banke odobravaju nefinancijskim trgovačkim društvima. Putem istih može se indirektno ili direktno utjecati na iznose koje banke odobravaju nefinancijskim trgovačkim društvima u Republici Hrvatskoj.

Ključne riječi: kredit, trgovačko društvo, banka, financiranje, vrijednosni papir.

1. Introduction

A country's financial system consists of its currency, the payment system, financial markets, financial institutions, and the institutions that regulate and supervise their work. In the Republic of Croatia commercial banks take up a commanding position in the financial system and their work is regulated and supervised by the Central Bank – Croatian National Bank (CNB). Commercial banks are the most active financial institutions, and in the payment system, as well as on the financial markets. On the money market commercial banks collect the free funds and give them as loans to physical persons and legal entities. Banks give loans in form of liquidity and interact on the socalled interbank market, and occasionally take such liquidity loans on the money market and from other legal entities that are not banks. In the last few years records show consolidation of the market on the Croatian bank market. Figure 1 shows the movement of the number of banks on the market for a period from 1993 until the end of the third quarter of 2014. In 1993 in the Republic of Croatia there were 25 state-owned banks, whereas in 2013 there were only 2 banks state-owned banks. In 1993 there were 18 private domestic banks whereas in 2013 there were 12 such banks. The only constantly increasing figures, when compared to 1993, are the ones regarding foreign owned banks. In 1993, there were no foreign-owned banks in the Republic of Croatia, whereas in 2013 there were 16 foreign banks. The number of foreign banks in the early 2000 's was higher, but due to the already mentioned consolidation of the market, today there are 17 such banks. The largest number of banks on the market of the Republic of Croatia was recorded in 1997 and in 1998 when there was a total of 60 banks. Today the number is half that size and there are 30 banks on the market.



Source: authors' research based on data available on www.hnb.hr

Croatian financial market is said to be highly bank-centred, meaning that bank loans are the primary source of financing companies. In such a situation, banks should be the mainstay of economic development in the Republic of Croatia. However, figure 2 shows just the opposite. Nowadays banks most usually finance by the population. In the mid-1990s the largest share of loans were loans given to non-financial corporates (companies). The share of corporate loans was over 70%, and in January 1997, it was as high as 76.63%. Still, since then on, up to present, the share of loans to companies has been decreasing significantly. These days banks give loans primarily to households. Household lending finances consumption (primarily the purchase of housing and cars), while financing investments (through loans to companies) is not quintessential. The share of household loans in January 2014 amounted to 44.81%, whilst the share of corporate loans amounted to 38.09%. In the long run, if there is no investment, there is no growth in disposable income which can ultimately lead to a situation in which the population will not be creditworthy either. An interesting fact that stands up is the increase of the share of lending to the government. In January 2014, the share of loans to the state amounts to 15.21% and it is constantly growing over the observed period. By taking loans more and more from the banks on the domestic market, the state also takes away the potential liquidity of banks that could be directed to financing companies and, ultimately, new investments. These days, the state does not invest, but mostly spends, making this an absurd situation. In Croatia, by financing the population, banks are oriented primarily to financing consumption, while the companies have, as their only alternative, bank loans (if they do not have a sufficient amount of their own funds). According to the above mentioned, financing companies is not the bank's primary job.



Figure 2 Loan structure of banks in Republic of Croatia

Source: authors' research based on data available on www.hnb.hr

In such circumstances, when the bank prefers financing the population, and the only potential source of external financing imposed to companies is again the bank, banks firmly hold a privileged position. In such a business environment, the bank is the one that defines the basic funding conditions such as interest rate on loans granted. The aim of this study was to examine with multiple regression which variables among chosen ones have significant influence on the amount of bank loans to non-financial corporations in the Republic of Croatia. The paper consists of four main parts. The first one is the introduction that puts forward the basic concepts of the banking system in Croatia. The second part sets the research basis, describes the method or multiple linear regression, used in the research. The second part consists of descriptive statistics of variables explored. The third part of the paper presents the results of the research, while the fourth section holds the conclusion.

2. Methodology and data description

As already mentioned, the aim of this paper was to examine with multiple regression which variables among the chosen ones have significant influence on the amount of bank loans to nonfinancial corporations in the Republic of Croatia. Research is done in statistic software STATA. Based on the obtained results a conclusion about the impact of certain variables on the amount of loans to non-financial companies can be given. Direct or indirect influence on recognized variables can have effects on the amount of loans granted by banks to non-financial companies in the Republic of Croatia.

The data taken for the survey are defined on a monthly basis for the period from January 2011 to December 2014. Descriptive statistic of dependent and independent variables is shown in table 1. Marks for variables y1, x1, x2, x3, x4, x5, x6, x7, x8 are in the first column. Previously mentioned marks represent dependent variable (y_1) – share of bank loans to non-financial corporations in the Republic of Croatia in total credits and independent variables (x1 do x8). Independent variables included in research are: x_1 – share of loans granted to the central government in total loans, x_2 – share of loans granted to households in total loans, x_3 – ratio of non-financial corporation's demand deposits with credit institutions and total loans granted to non-financial corporations, x4 ratio of households' demand deposits with credit institutions and total loans granted to households, x5 - share of banks' reserves with the Croatian National Bank to total assets ratio, x6 - share of T-

bill in total bank asset, x7 - share of purchased long-term central government debt securities in total assets and x8 – due and undue claims on the basis of granted loan interests ratio.

The following tables show the results of the research. Abbreviated designation (y1, x1, x8 ...) was used in order to simplify the review of the results.

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Variable	Obs.	Mean	Std. dev.	Min	Max
y1	45	0,3022	0,0141	0,2825	0,3217
x1	45	0,1181	0,0146	0,0881	0,1389
x2	45	0,4507	0,0068	0,4419	0,4681
x3	45	0,1845	0,0337	0,1233	0,2521
x4	45	0,1299	0,0116	0,1167	0,1575
x5	45	0,1188	0,0046	0,1092	0,1285
x6	45	0,0313	0,0037	0,0262	0,0377
x7	45	0,0346	0,0039	0,0279	0,0395
x8	45	0,3628	0,1774	0,0776	0,7896
-					

Table 1 Descriptive statistics

Source: authors' research based on data from statistic software STATA

Total number of observations per each variable is 45. Share of bank loans to non-financial corporations in the Republic of Croatia in total credits (y1) is stable during the observed period of investigation with mean of 30,22%. Other independent variables show low volatility too, except due and undue claims on the basis of granted loan interests ratio.

Multiple linear regression model was used to test the influence and direction of the independent variables on the share of bank loans to non-financial corporations in the Republic of Croatia in total credits. The aim of the regression analysis is to present or describe the connection between the observed variables by means of an appropriate analytical mathematical expression, i.e. regression model (Papic, 2005, 142). If the regression analysis examines the connection between the dependent and a larger number of independent variables, then the most commonly used model is the linear multiple regression model. Using several independent variables can lead to distorted and unrealistic assessment of contributions of individual independent variables when trying to explain the dependent variable. This problem is created by high dependence (collinearity) of two, i.e. multicollinearity between more than two independent variables.

The assumptions that should be followed in multiple regression model assert that the independent variables are inter-independent (Rozga, 2006, 197).

Table 2 shows the results of the research and examines the problem of multicollinearity between the independent variables.

Table 2 Correlation matrix									
	x1	x2	x3	x4	x5	x6	x7	x8	
x1	1,0000								
x2	-0,6408	1,0000							
x3	0,7497	-0,1411	1,0000						
x4	0,7756	-0,3154	0,9015	1,0000					
x5	0,1321	-0,0619	-0,1043	-0,2372	1,0000				
x6	0,7994	-0,2721	0,8760	0,8742	0,0476	1,0000			
x7	0,3990	-0,3269	0,1717	0,3534	-0,1379	0,2342	1,0000		
x8	-0,4256	0,0865	-0,4270	-0,4595	-0,0027	-0,4806	-0,1547	1,0000	

Source: authors' research based on data from statistic software STATA

The consequences of multicollinearity are unrealistically high standard errors regarding estimates of regression coefficients, i.e. unrealistically low values of t-tests and can lead to a wrong conclusion about the significance of certain variables in the examined model. To avoid the problem of multicollinearity in the set of independent variables, only the ones that are not highly correlated are to be chosen; i.e. the ones with the correlation coefficient in absolute value below 0.7.

Table 2 shows that there is a high degree of dependence among certain independent variables, i.e. there is a problem of multicollinearity. Following the instruction that asserts that one of the solutions to the problem of multicollinearity is excluding independent variables that contribute to multicollinearity problem, this research did the same. The independent variables x3, x4, x6 were excluded from further research.

After excluding variables that create the problem of multicollinearity, the possible presence of the same problem was once again examined among the remaining three independent variables as shown in Table 3.

	x1	x2	x5	x7	x8
x1	1,0000				
x2	-0,6408	1,0000			
x5	0,1321	-0,0619	1,0000		
x7	0,3990	-0,3269	-0,1379	1,0000	
x8	-0,4256	0,0865	-0,0027	-0,1547	1,0000

Table 3 Correlation matrix among the remaining independent variables in research

Source: authors' research based on data from statistic software STATA

Table 3 shows the solution to the problem of multicollinearity. The following step is to go ahead with the survey by linear model of multiple regression with the remaining five independent variables $(x_1, x_2, x_5, x_7, x_8)$. The following is the equation of the model:

$$y_1 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_5 + \beta_4 x_7 + \beta_5 x_8 \tag{1}$$

3. Empirical results

On the basis of equation 1, multiple linear regression was performed and its results are shown in Table 4.

Source	SS	df	MS		Number of obs.	= 45
					F(5, 39)	= 211,58
Model	0,0085	5	0,0017		Prob > F	= 0,0000
Residual	0,0003	39	7,9954E-06		R-squared	= 0,9644
Total	0,0088	44	0,0002		Adj R-squared Root MSE	= 0,9599 = 0,0028
y1	Coef.	Std. Err	t	P > t	[95% Conf.Interval]	
x1	-1,0709	0,0455	-23,5500	0,0000	-1,1628	-0,9789
x2	-0,4376	0,0858	-5,1000	0,0000	-0,6112	-0,2640
x5	0,4646	0,0950	4,8900	0,0000	0,2724	0,6568
x7	-0,2214	0,1235	-1,7900	0,0810	-0,4711	0,0283
x8	-0,0036	0,0028	-1,3000	0,2010	-0,0092	0,0019
cons	0 5797	0.0441	13 1400	0.0000	0 4904	0.6689

Table 4 Multiple regression results

Source: authors' research based on data from statistic software STATA

Table 4 shows how multiple determination coefficient (R2) represents the proportion of variance of the dependent variable interpreted by the model. Table 4 shows that this coefficient is 0.9644, i.e. 96.4% of the variance of share of bank loans to non-financial corporations in the Republic of Croatia in total credits explained with share of loans granted to the central government in total loans, share of loans granted to households in total loans, share of banks' reserves with the Croatian National Bank to total assets ratio, with share of purchased long-term central government debt securities in total assets and with due and undue claims on the basis of granted loan interests ratio. Multiple determination coefficient (R2) serves as a measure of representativeness of the model and the value it shows indicates a highly representative model.

Statistical significance of the model can be determined based on the p-values of the empirical Fratios in Table 4. If the p-value of the empirical F-ratio is statistically significant, this leads to a conclusion that at least one of the independent variables significantly affects the dependent variable. More specifically, it can be said that the model is statistically significant. F-ratio of the tested models is less than 1%, and it can be argued that the model shown in equation 1 as a whole is statistically significant.

The data in Table 4 show the statistical significance of some independent variables in the model. Four of five independent variables are statistically significant. x1, x2, x5 are statistically significant at the level of 1%, while the independent variable x7 is statistically significant at the level of 10%. X8 variable is not statistically significant. The variables x1, x2 and x7 are negatively correlated with the dependent variable, and the variable x7 is positively correlated with the dependent variable. Data from Table 4 lead to equation 2 of multiple regression model with listed coefficients.

$$y_1 = 0.5797 + -1.0709x_1 + -0.4376x_2 + 0.4646x_5 + -0.2214x_7 + -0.0036x_8$$
 (2)

The following is the interpretation of statistically significant variables of the model: B_0 (0.5797) - if all five independent variables were equal to zero, than average value of share of bank loans to non-financial corporations in the Republic of Croatia in total credits would be 12.32%

 β_1 (-1.0709) - if the share of loans granted to the central government in total loans increased by 1

percentage point, while the other four variables remain unchanged, the share of bank loans to non-financial corporations in the Republic of Croatia in total credits would decline by 1.0709%

 β_2 (-0.4376) - if the share of loans granted to households in total loans rise for 1% ,, and the other four independent variables remain unchanged, share of bank loans to non-financial corporations in the Republic of Croatia in total credits would decline by 0.4376%

 β_3 (0.4646) - if the share of banks' reserves with the Croatian National Bank to total assets ratio increased by 1% and other four independent variables stay unchanged, the share of bank loans to non-financial corporations in the Republic of Croatia in total credits would rise by 0.4646%

 B_4 (-0.2214) - if the share of purchased long-term central government debt securities in total assets increased by 1%, and other four independent stay unchanged, the share of bank loans to non-financial corporations in the Republic of Croatia in total credits would decline by 0,0,2214%

4. Conclusion

Choosing independent variables and testing their impact on the share of bank loans to non-financial corporations in the Republic of Croatia in the total credits leads to obtaining a model of high degree of interpretability. 96.64% of all changes in the share of bank loans to non-financial corporations in the Republic of Croatia in total credits can be explained by examining variables; share of loans granted to the central government in total loans, share of loans granted to households in total loans, share of banks' reserves with the Croatian National Bank to total assets ratio, share of purchased long-term central government debt securities in total assets and the due and undue claims on the basis of granted loan interests ratio. Croatian economy is characterized by import orientation and orientation to financing consumption. But, again, this consumption is the one of imported goods whose production does not include Croatian companies. Recognizing the variables which can be used to increase the share of bank loans to non-financial corporations can help formulate guidelines that would, among other activities, contribute to the development of business entities and, ultimately, the economic growth. The government's policy has to be oriented towards encouraging banks to reduce lending to the population, and, also, decrease financing the expensive state apparatus from banks operating in the Republic of Croatia, or find other source of financing. Consequently, banks would direct the excess of liquidity towards the economy, which would have a positive effect in the long term for everybody.

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