

Heterogeneous funding patterns and income structure of Croatian banks: panel data evidence

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Abstract. *Dependence of the bank income statement indicators on its capital structure is in the focus of this paper. The dynamic panel data analysis encompasses 28 commercial banks from the Republic of Croatia in a pre-recession period i.e. 2003-2008 with a goal of estimating whether heterogeneity of capital structures among banks in Croatia explains differences seen in their profitability. In comparison to the existing empirical background on the capital structure and bank financial performance nexus, the novelty of this research is in the operating margin which is being defined as a dependent variable, among the other usually employed proxies of the bank profitability.*

Keywords: bank funding, liability management, operating margin, commercial banks, Croatia.

JEL Classification: G21; G28; P34.

REL Classification: 7G.

1. Introduction

A numerous empirical researches have been performed lately in order to confirm a general model on determinants of bank profitability, in which bank profitability is driven by the bank internal characteristics, macroeconomic surrounding as well as some general banking sector specificities. However, the bank liability management has rarely been in the focus when researching a bank performance due to a several reasons. First, active liability management strategies by commercial banks have been adopted since the development of the bank debt securities markets in the 1960s and 1970s at the most developed banking sectors world over i.e. banking sectors of the Anglo-Saxon countries. Second, the bank capital structure is highly regulated due to an existence of explicit deposit insurance schemes since the Great Depression and an appearance of the risk weighted capital requirements in the 1980s under the Basel Accord. Altogether, due to these exogenous restrictions, for a long time it was perceived that bank funding patterns are given in advance and pretty uninventive. Thus, the bank capital structure has not been widely perceived as an origin of differences in its profitability.

The financial liberalization, possibilities of financing on the international money and capital markets, a more competitive markets of banking products, an increased volume of an interest-sensitive funding sources and a reduction of profits in the business of banking (Rose, 2003: pp. 17-21) i.e. a contemporary trends in the banking industry, shed a light on the cost of capital as a mean for altering the bank cost and profit efficiency. In addition, a few empirical researches demonstrated relevance of the capital structure choice for the bank profitability (Berger, 1994; Navapan and Tripe, 2003; Hutchison and Cox, 2006; Berger and Bonaccorsi di Patti, 2006; Ngo, 2006; Pratomo and Ismail, 2006; Kyereboah – Coleman, 2007; Naceur and Kandil, 2009; Berger and Bouwman, 2009). A certain empirical evidence for the Croatian banking sector on the research issue has been given in Kundid (2012). However, the aforementioned analysis for the Croatia used only the return on assets as a proxy for the bank profitability. The intention of this paper is to go a step further by employing the return on equity and the operating margin as bank profitability indicators. Altogether, the paper contributes to a scarce empirical work on profitability implications of the bank liability management and enriches literature on determinants of bank profitability.

The rest of the paper is organized as follows: the second section reviews both, theoretical and empirical background of the research problem, which is found in the transfer of the cost of capital to the credit price and the credit growth, as well as in the agency cost hypothesis. The methodological aspects and the research

results of the empirical analysis for Croatia are given and discussed in the fourth section. The last section summarizes the key findings.

2. Theoretical and empirical background

2.1. The cost of capital in a model of the banking firm

One of the basic financial management principles is that the cost of capital needs to be estimated and incorporated in investment decision – making and asset allocation. Thus, investment decisions or cost-benefit analysis of the capital projects, following the profitability criteria, usually follow the next equation (Vidučić, 2011: p. 273):

$$NPV_o = \sum_{n=1}^N \frac{NCF_n}{(1+k)^n} - I_0 \quad (1)$$

where:

n – the period of return,

NPV_o – net present value,

NCF_n – expected net cash flow in the period n ,

k – the cost of capital,

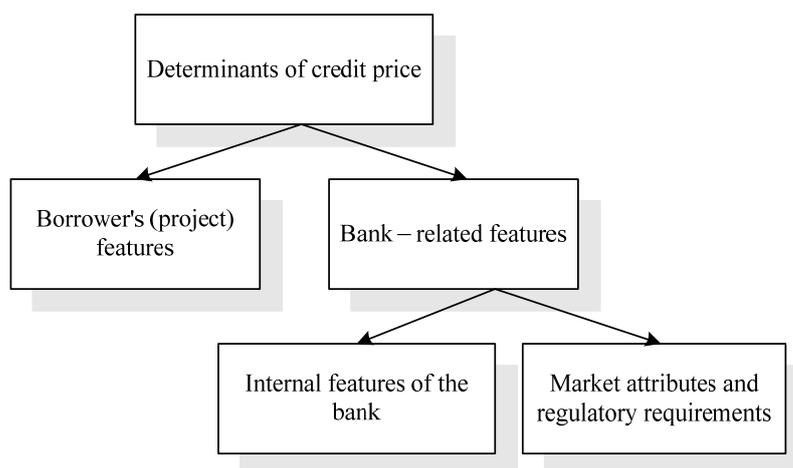
I_0 – initial investment expenditure.

The same holds for the commercial bank financial management. The cost of capital needs to be incorporated in the required rate of return on placements in order to attain and sustain profitability, during the continuous process of creation and usage of capital. Commercial banks take into consideration the cost of its capital in loan granting i.e. the cost of capital is an important feature of a loan pricing and an overall credit risk management process. The cost-plus loan pricing method might serve as an example of the cost of capital relevance due to the loan interest rate being a sum of the following four components: marginal cost of raising loanable funds to lend to borrower, nonfunds operating costs, estimated margin to compensate for default risk and desired profit margin or required rate of return on equity funds (Rose and Hudgins, 2013: p. 577).

However, other determinants of the credit price should be also borne in mind. Thus, general framework of credit price is presented with Figure 1. Borrower's and/or project features are quantified with an estimated margin to compensate for default risk, while nonfund operating costs and marginal funding costs depend upon internal features of the bank. Regulatory requirements might impact funding costs, operating costs and desired profit margin in dependence with an adjustment modes of banks to an existing or new regulatory burden. Further, banking sector

(market attributes) and the position of one bank in a sector, especially whether the bank is a price taker or price setter, correspond to a desired profit margin and, moreover drive bank cost and profit efficiency. Obviously there exist multiple direct and indirect relations between various loan interest rate components and bank and the banking sector characteristics. Thus, the structure of the loan interest rate can be modified with interest rate remaining on the same level what means that a commercial bank internalizes some bank-related features of the credit price. Contrary to the aforementioned, bank clients will be affected by the changes in the loan interest rate, as well as, if an overall economy passes throughout considerable changes. Apparently, each determinant of the credit price from the presented model depends upon a general macroeconomic environment – a systemic component which is a non-diversifiable.

Figure 1. *General framework of credit price*



Source: Author's presentation.

Further, the level of financial liberalisation has sizeable effects to an overall economy, as well as on the commercial banks efficiency due to an intensified competition, broader range of permitted activities, liberalized capital flows and reduced regulatory requirements. A scarcity of available funding sources due to limited economy potentials, disposal of money and capital funds inside banking and overall financial-service industry and diverting towards direct financial markets amplified a necessity of searching for the more efficient bank capital structure. On the other hand, increased competition reduces profitability levels and meltdowns the potential of individual set up of the desired profit margin. In addition, Rose and Hudgins (2013: p. 577) conclude that “deregulated competition has narrowed profit margins many lenders are able to earn, making correct pricing of loans even more imperative today than in the past”. The most of banks are price takers and thus are in a poor position to increase the desired profit margin. On the

other hand, borrower's and project characteristics are out of bank scope and are considered as exogenous or uncontrollable variable in the presented model. Non-interest expenses might be reduced if the better cost management and accounting techniques are adopted. Nevertheless, interest costs remain the most important deductible item of the income statement. This is why the capital structure issue has been altered since the financial liberalisation took place. Monitoring the level of the cost of capital i.e. acquiring and managing a capital in a manner which minimizes the costs and maintains banks credit capacity is a foundation upon which decisions on financial placements are carried out with an obvious impact on the bank profitability.

A contribution of the market trends in the passive interest rates and capital structure to the net income volume is visible from the following equation (Koch and MacDonald, 2000: p. 111):

$$NI = \sum_{i=1}^n r_i A_i - \sum_{j=1}^m c_j L_j + (OI - OE) - PL + SG - T \quad (2)$$

where:

NI – net income,

r_i – average pre-tax yield on the i^{th} asset,

c_j – average interest cost of the j^{th} liability,

A_i – volume of the i^{th} asset,

L_j – volume of the j^{th} liability,

OI – noninterest income,

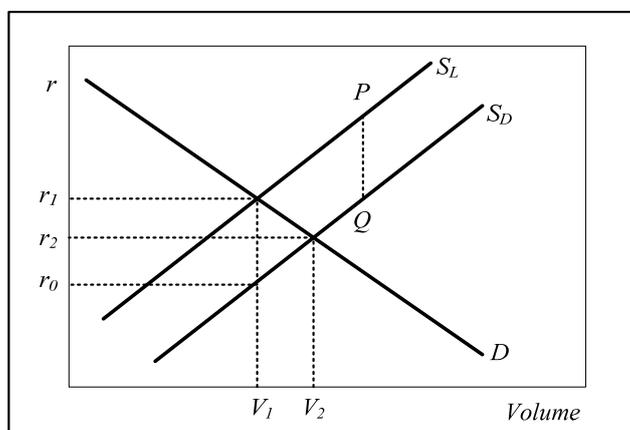
OE – noninterest expense or overhead expense,

PL – provisions for loan losses,

SG – securities gains (losses),

T – taxes.

In line with an equation, it seems that a bank should increase the level of assets in order to boost its net income ceteris paribus. On the other hand, capital requirements limit growth of assets potentials. Thus, the value of the interest income could be increased if more loans are granted at higher interest rates, what corresponds to the capital market line conclusion on the linear relationship between risk and profit as well as to the banking firm model (Figure 2).

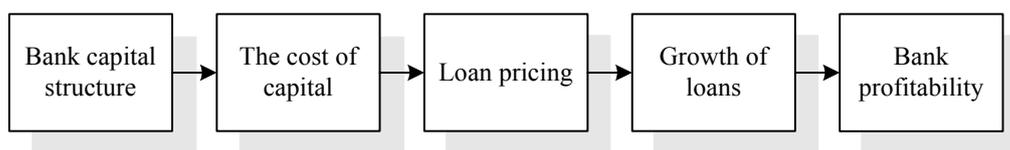
Figure 2. *The banking firm model*

According to a banking firm model (Llewellyn, 1999: pp. 13-14), the volume of deposits (S_D) and loans supply (S_L) is proportional to the interest rate level (r). Thus, higher the interest rate, higher the volume of deposits and volume of loans. However, due to reserve requirements (whether obligatory or voluntary reserves), bank grants lower amounts of loans in comparison to received deposits. In addition, it “sells” loans at the interest rate which is for the difference between P and Q interest rate points higher than the interest rate on deposits. PQ serves to cover bank non-deposit costs, the cost of capital, the risk premium charged on loans, tax and net income. The volume of loan demand (D) is increasing with an interest rate decrease. Although, the banking firm model is widely accepted description of the business of banking logic, a several model presumptions are considered to be at least disputable if not wrong. First, there exists no clear empirical evidence that the interest rate level will be the solely driver of the volume of deposits (Pojatina, 2000: pp. 8-16), even in the case of the deposit insurance system existence. Regulatory interventions, whether discretionary on non-discretionary (likewise regulation Q) should reduce bank/s policy of aggressive deposit taking or attracting. On the other hand, cross-selling appearance is decreasing opportunities for the deposits transition from banks with lower to banks with higher deposit interest rates due to transaction costs. Second, the model assumes only the demand-driven credit rationing and ignores the supply-driven credit rationing.

Namely, in the traditional banking intermediation, the bank growth and consequently a bank profitability is highly driven by the prudent credit growth. According to the credit rationing theory (Stiglitz and Weiss, 1981) credit price is inversely connected with the probability of credit payment and contrary to the general market mechanism in which supply is linearly connected with a price, on the bank loan market continuously rising supply loan curve is an irrational

assumption due to an increased probability of the bad debt loans. In short, increase of the financing costs could become an originator of a default risk. This is relevant for the both, the borrower of the bank and the bank itself. With an increase of the bank financing costs, credit price for the bank clients increases what decreases bank profitability in a time lag. Slower credit growth caused by a decrease in both, loan supply and demand on one hand, or rising non-performing loans induced by the higher risk taking behaviour on the other hand, impair bank profitability what corresponds to the previous equation. According to the aforementioned theoretical background, the overall model which summarizes the impact of the bank capital structure on its profitability is presented with the Figure 3.

Figure 3. *The impact of the bank capital structure on its profitability*



Source: Author's presentation.

However, availability of a certain funding sources and the choice of the bank capital structure affect not only the credit risk of the bank, but market risks as well, likewise liquidity risk (e.g. funding liquidity risk), interest rate risk (e.g. refinancing costs) and currency risk. Thus, multiple effects of the bank capital structure on its profitability occur.

2.2. Agency cost hypothesis in the banking industry: a review of the empirical work

In addition to an explanations of the capital structure relevance for the bank profitability, derived from the financial management literature and found in commercial banks risk management practice, theoretical explanations on the capital structure (i)relevance for the company value are controversial and ununiformed. However, a discussion on the capital structure theory and its applicability to the banking industry is beyond the scope of this work and is available in e.g. Orgler and Taggart (1981), Marcus (1983) and Miller (1995). Nevertheless, a relation between debt and equity financing in the profitability context, usually comes down to an empirical examination of the agency cost hypothesis which points out that the financial leverage is a mean for the disciplined and efficient managers i.e. there exists proportional linkage between financial leverage and profitability due to reduced potentials for the moral hazard behaviour of bank managers. This is why an empirical background refers to the latter hypothesis.

The key methodological features and conclusions of the reviewed empirical researches can be summarized in the following points:

- *Data sample unit.* The most of researches refer to commercial banks, and only one research relates to microfinance institutions (Kyereboah – Coleman, 2007).
- *Data sample spatial attributes.* Banking sector of the USA is the most frequently explored one (Berger, 1994; Hutchison and Cox, 2006; Berger and Bonaccorsi di Patti, 2006; Ngo, 2006; Berger and Bouwman, 2009), while researches for the developing countries are deficient (Pratomo and Ismail, 2006; Kyereboah – Coleman, 2007; Naceur and Kandil, 2009; Kundi, 2012). With reference to the spatial component the sample size varies: from the samples with only 15 banks (Navapan and Tripe, 2003; Pratomo and Ismail, 2006) to the samples with a more than 18 000 banks (Berger and Bouwman, 2009). Among reviewed papers, cross – country researches are extremely rare (Navapan and Tripe, 2003).
- *Data sample time period attributes.* Berger and Bonaccorsi di Patti (2006) and Kundi (2012) analyse the shortest data sample period – 6 years. The longest time period is being analysed by Naceur and Kandil (2009) – 16 years and by Berger and Bouwman (2009) which analyse the data from the period of 25 years. The data since 2005 has been included only in Berger and Bouwman (2009) and Kundi (2012), and both researches end data with 2008.
- *Variables selection.* The most of the researches aimed to examine the relation between capital structure and return on equity (Berger, 1994; Navapan and Tripe, 2003; Hutchison and Cox, 2006; Pratomo and Ismail, 2006; Berger and Bouwman, 2009). Capital structure has usually been proxy with equity to asset ratio or *vice versa*, financial leverage ratio. A step further in variables selection is visible from the Ngo (2006) who uses capital adequacy ratio and Kundi (2012) who beside capital adequacy ratio takes into consideration various bank capital structure indicators. Profit efficiency function as a profitability proxy is found in Berger and Bonaccorsi di Patti (2006), Kyereboah – Coleman (2007) takes into consideration financial performance by commercial banks in the broadest sense by using non-performing loans in relation to total loans as well as an indicator of an annual percentage change in the number of bank clients, while an impact of the capital structure on the bank net interest margin is found in Naceur and Kandil (2009) and on the return on assets in both, Naceur and Kandil (2009) and Kundi (2012).
- *Bank capital structure and profitability interdependence.* Mutually positive equity and return on equity relation is confirmed only by Berger (1994). Agency cost hypothesis i.e. negative impact of higher equity to asset ratio on the bank profitability is given in Navapan and Tripe (2003) and Hutchison and Cox (2006) and *vice versa* the positive impact of higher indebtedness on the business profitability is found in Berger and Bonaccorsi di Patti (2006),

Pratomo and Ismail (2006) and Kyereboah – Coleman (2007). Poor effect of profitability on the bank capitalisation is recorded by Berger and Bonaccorsi di Patti (2006), while Ngo (2006) completely rejects hypothesis on the mutual linkage between capital and profitability and thus affirms the capital neutrality hypothesis. Berger and Bouwman (2009) conclude that a higher level of equity could be beneficial both to small and large banks in the financial crisis and can positively reflect on the return on equity.

- *Capital regulation impact on the bank profitability.* Negative effects are recorded by Kundid (2012), and positive ones by Naceur and Kandil (2009). Ngo (2006) argues conclusion on the zero net effect from the capital adequacy introduction with positive effects from the equity increase and negative effects from the cost of capital increase being mutually annulled.
- *Comparability of the banking sector results for developed and developing economies.* There exists no clear difference in the research results which could be attributed to the level of economic development.

To sum up, the theoretical background indicates that the research problem is relevant and actual, while according to the reviewed empirical work, further empirical evidence which takes into account various profitability indicators is suggested. Altogether, a research hypothesis H_1 is set up:

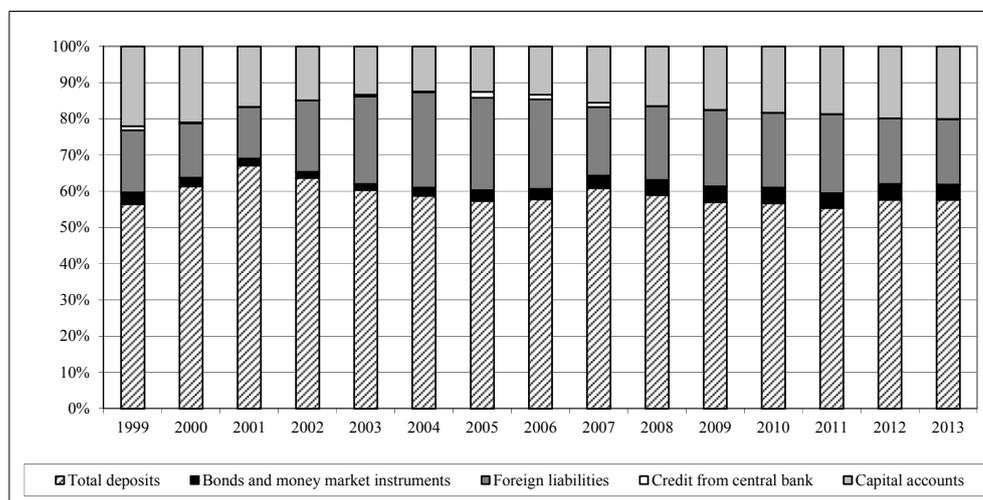
H_1 : Bank liabilities management adds to its overall profitability proxy with a return on equity and operating margin.

3. Capital structure and bank earnings in Croatia

3.1. Key facts and figures

The capital structure of Croatian banks has not been changing significantly in the last decade, at least, not at the aggregate – the banking sector level (Figure 4). Banks in the Republic of Croatia have been dominantly financed with deposits which on average made approximately 60% of the overall funding sources during the observed period (1999-2013). However, the modest absolute volume of the banking sector assets in 1999 which amounted 93.3 billion HRK (Croatian kuna) should be noted. Until 2013, the banking sector asset has been continuously increasing up to 408.4 billion HRK, what means that the volume of deposit financing has also enlarged (Figure 5). Among all deposit types, foreign currency deposits achieved the largest growth.

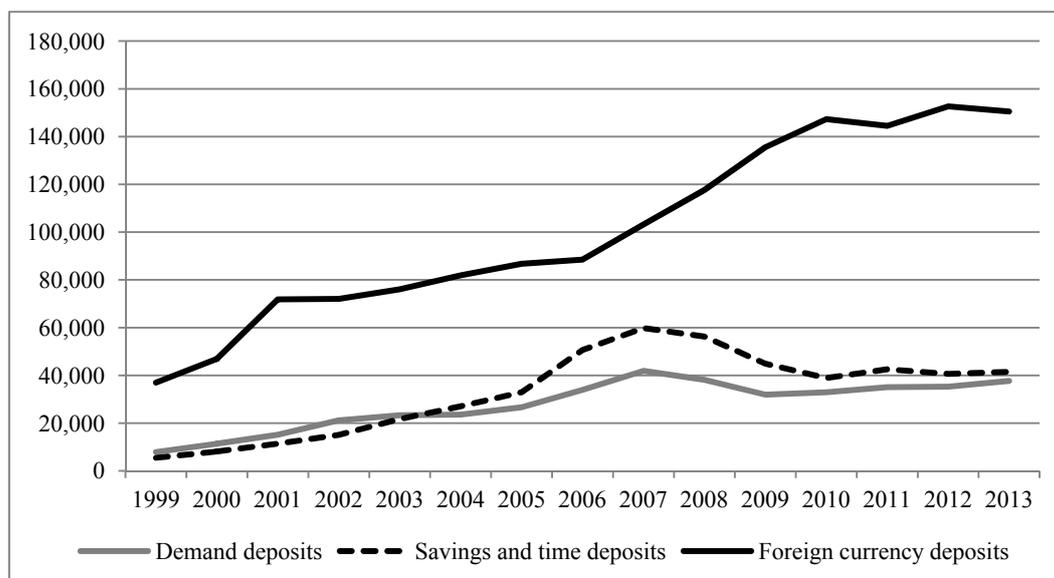
Figure 4. Capital structure of commercial banks in the Republic of Croatia, 1999 – Q2/2013, in percentage



Source: Author's calculation according to the Croatian National Bank (CNB) data.

Foreign liabilities were the second most important funding source in the observed period with 20.4% participation in the capital and liabilities, on average. Capital accounts were on the average level of 16.8%. Bonds and money market instrument were on average 3.2% and credit from central bank was 0.4%.

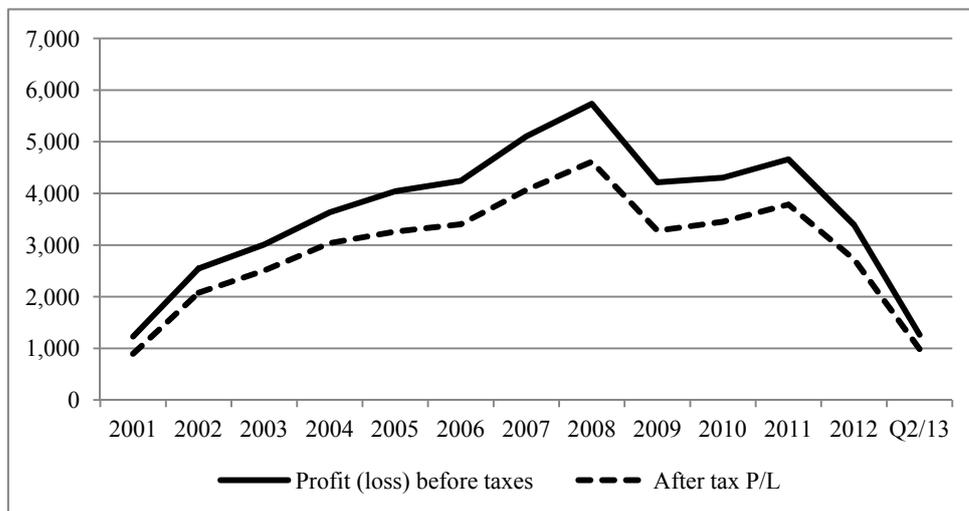
Figure 5. Commercial banks deposits by deposit types in the Republic of Croatia, 1999 – Q2/2013, in millions HRK



Source: Author's calculation according to the CNB data.

In the period from 2001-2008 the amount of the overall banking sector profits had been on continuous increase (Figure 6) and in 2008 amounted 5.7 billion HRK before taxes and 4.6 billion HRK after taxes. The influence of the financial and overall economic crisis in Croatia is the best seen in the fact that currently (mid-year results for 2013) profit and loss before taxes is 1.2 billion HRK or 0.9 billion HRK after taxes. The latter means that after a decade of growth and profitability the banking sector has returned to a level from 2001 when privatization and reconstruction of the banking sector started taking place.

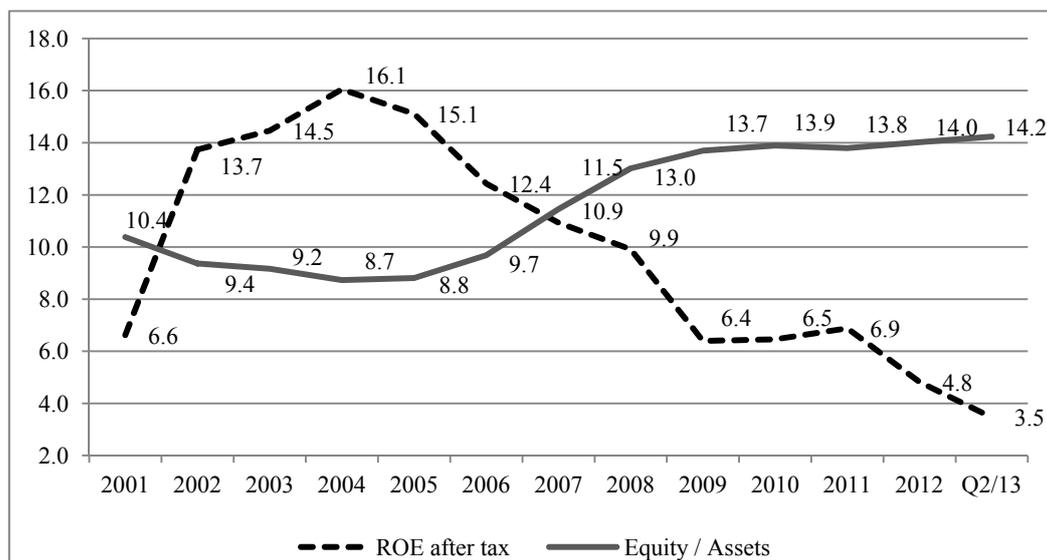
Figure 6. *The commercial banks earnings in the Republic of Croatia, 2001 – Q2/2013, in millions HRK*



Source: Author's calculation according to the CNB data.

Figure 7 shows that the average return on equity was the highest in 2004 (16.1%), when equity to assets ratio was on the lowest level (8.7%). Since then financial leverage is on the continuous decrease as well as return on equity of the Croatian banking sector.

Figure 7. The commercial banks return on equity and equity to assets ratios in the Republic of Croatia, 2001 – Q2/2013, in percentage



Source: Author's calculation according to the CNB data.

3.2. Testing the impact of the capital structure on bank profitability

3.2.1. Data, methodology and model development

The empirical research – the dynamic panel analysis (by the Arellano – Bond estimator), to be more precise, has been performed on a data sample of 28 commercial banks in the Republic of Croatia in the period 2003-2008. The list of banks which were encompassed by the analysis is given in the appendix. In every observed year, according to the asset size, a more than 95% of the overall Croatian banking sector has been covered by the analysis. Dynamic panel models have been developed with a goal of establishing relations and impact between the bank funding sources composition and its profitability, proxy with a return on equity (ROE) and an operating margin (OPM). Return on equity is normally used as an indicator of bank profitability, whilst the usage of operating margin could be perceived as a novelty of this study. In addition, operating margin is perceived to be the most stable component of bank earnings or so called structural determinant of bank profitability according to Couto (2002) which, thus, can be used as an estimator of the future trends in the bank profitability. Research results were obtained throughout STATA 11 and EViews 7. Correlation between aforementioned dependent variables is found to be moderate (0.50972). Thus, both variables have been used interchangeably as profit efficiency indicators. Developed models are specified as follows:

$$\begin{aligned}
ROE_{it} = & \mu + \gamma ROE_{i,t-1} + \beta_1 GROWE_{it1} + \beta_2 INT_L_{it2} + \beta_3 INT_D_{it3} + \beta_4 MOR_{it4} + \\
& + \beta_5 INSD_A_{it5} + \beta_6 GROWRC_{it6} + \beta_7 GROWA_{it7} + \beta_8 GROWD_{it8} + \beta_9 CA_{it9} + \\
& + \beta_{10} SHARE_{it10} + \beta_{11} E_A_{it11} + \beta_{12} RECD_A_{it12} + \beta_{13} RECL_A_{it13} + \alpha_i + \varepsilon_{it}; \\
& i = 1, \dots, N, t = 1, \dots, T
\end{aligned} \tag{3}$$

$$\begin{aligned}
OPM_{it} = & \mu + \gamma OPM_{i,t-1} + \beta_1 GROWE_{it1} + \beta_2 INT_L_{it2} + \beta_3 INT_D_{it3} + \beta_4 MOR_{it4} + \\
& + \beta_5 INSD_A_{it5} + \beta_6 GROWRC_{it6} + \beta_7 GROWA_{it7} + \beta_8 GROWD_{it8} + \beta_9 CA_{it9} + \\
& + \beta_{10} SHARE_{it10} + \beta_{11} E_A_{it11} + \beta_{12} RECD_A_{it12} + \beta_{13} RECL_A_{it13} + \alpha_i + \varepsilon_{it}; \\
& i = 1, \dots, N, t = 1, \dots, T
\end{aligned} \tag{4}$$

where: i denotes an individual and t denotes time, μ is an intercept, γ is a parameter of the lagged dependent variable, $\beta_1, \beta_2, \dots, \beta_K$ are the parameters of the exogenous variables, α_i is an individual-specific effect and ε_{it} the error terms.

Table 1. List of variables used in regression models

Group of indicators	Explanation	Variable
Profitability indicators	Return on equity	ROE
	Operating margin (before overheads)	OPM
Growth indicators	Growth of assets	GROWA
	Growth of equity	GROWE
	Growth of deposits	GROWD
	Growth of regulatory capital	GROWRC
Capital structure indicators	Equity / Assets	E_A
	Received loans / Assets	RECL_A
	Received deposits / Assets	RECD_A
	Insured deposits / Assets	INSD_A
Interest costs indicators	Interest costs on received loans / Received loans	INT_L
	Interest costs on received deposits / Received deposits	INT_D
Regulatory indebtedness ratio	Capital adequacy ratio	CA
Bank size and market share indicator	Market share of bank assets	SHARE
Dummy variable	Marginal obligatory reserve (1 for 2005, 2006 and 2007; 0 for 2003, 2004 and 2008)	MOR

Source: Author's presentation.

3.2.2. Research results and model quality

Panel data estimations of developed models are given in the Table 2.

The growth of equity (GROWE), both the interest cost indicators (INT_L and INT_D) and the growth of deposits (GROWD) have a negative sign in the case of return on equity being set as a dependent variable. The indicator of interest costs on the received loans (INT_L) has the highest negative impact on the return on equity. The growth of regulatory capital (GROWRC), growth of assets

(GROWA), equity to assets (E_A) ratio, received deposits in total assets (RECD_A) and received loans in total assets (RECL_A) are in a positive relation with a return on equity. Indicators of received deposits and received loans as well as equity to assets ratio have the highest impact on return on equity. All aforementioned dependent variables are statistically significant, while the rest of the model variables are statistically insignificant.

Panel data estimation for the model with an operating margin pointed out a few statistically significant variables, out of which only the capital adequacy ratio (CA) has a negative sign. A lagged dependent variable ($OPM_{i,t-1}$), interest costs on the received loans (INT_L), dummy variable for the marginal obligatory reserve (MOR) and equity to assets (E_A) indicator are in a positive relation with an operating margin.

Table 2. Panel data estimation

Explanatory variables	Dependent variable (ROE)	Dependent variable (OPM)
$ROE_{i,t-1}$	-0,1094765 (0,1979566)	-
$OPM_{i,t-1}$	-	0,3635791** (0,1785584)
$GROWE_{i,t}$	-0,1249235*** (0,0354799)	-0,0085164 (0,0058042)
$INT_L_{i,t}$	-3,755649*** (1,487077)	0,5715978* (0,2970123)
$INT_D_{i,t}$	-0,4421207** (0,2018459)	-0,0073868 (0,0239496)
MOR_t	1,079312 (1,170052)	0,2628979* (0,1439724)
$INSD_A_{i,t}$	0,0587783 (0,0675773)	-0,0103749 (0,0106649)
$GROWRC_{i,t}$	0,095623** (0,0437231)	0,004704 (0,0066227)
$GROWA_{i,t}$	0,2495951** (0,1284364)	0,0087047 (0,0152616)
$GROWD_{i,t}$	-0,1246445* (0,0763249)	-0,0001055 (0,0099774)
$CA_{i,t}$	-0,0614427 (0,3118851)	-0,0963696** (0,0465865)
$SHARE_{i,t}$	1,016102 (1,987709)	-0,2141808 (0,2968431)
$E_A_{i,t}$	2,200452*** (0,5997935)	0,2531556*** (0,101158)
$RECD_A_{i,t}$	1,138344*** (0,3866984)	0,0487386 (0,0883488)
$RECL_A_{i,t}$	0,8371724*** (0,3222816)	0,0351776 (0,0770462)
α	-1,034738 (0,893666)	-0,4286095*** (0,1047991)
Number of observations	108	108
Number of groups	28	28

Explanatory variables	Dependent variable (ROE)	Dependent variable (OPM)
Sargan test (p-value)	0,0727	0,885
m_1 test (p-value)	0,94	0,0973*
m_2 test (p-value)	0,2189	0,8767

*** Statistically significant at 1% level, ** statistically significant at 5% level, * statistically significant at 10% level.

Source: Author's calculation.

Sargan's test as well as autocorrelation test (the second order i.e. m_2 test) prove reliability and quality of both models as Sargan test exceeds 0.05 and the second-order autocorrelation test exceeds 0.10. The first-order autocorrelation (i.e. m_1 test) can be ignored as it is often being expected.

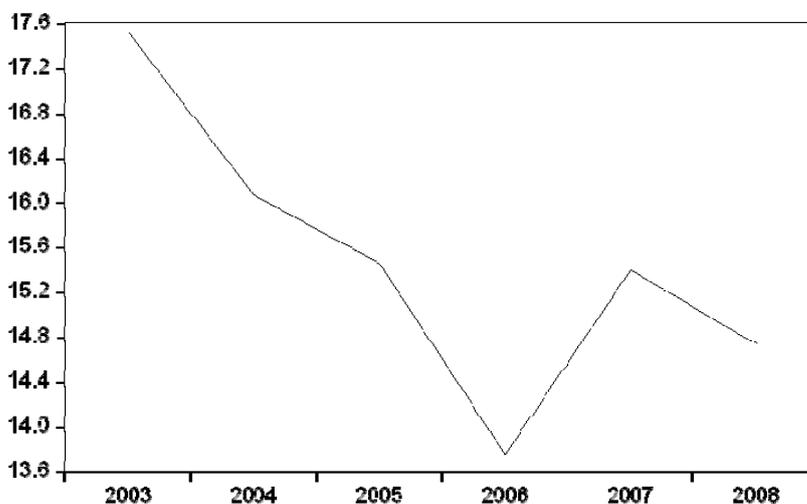
3.2.3. Discussion on the estimation results

Return on equity seems to be driven by a several growth indicators. A negative impact of equity growth (GROWE) is expected as it means deleveraging and thus higher financing costs. However, growth of deposits (GROWD) also decreases return on equity in estimated model what could be explained with an argument of a more expensive deposit attracting for commercial banks in a more competitive financial-service industry and an insufficient saving capacity of the national economic subjects. Further, marginal obligatory reserve, which was put into effect with a goal of reducing the interbank deposits from the Croatian parent banks from other European Union countries, additionally increased the deposit financing costs. Growth of regulatory capital (GROWRC) increases return on equity as well as growth of assets (GROWA). The aforementioned implies that commercial banks assets growth is supported by the required regulatory capital growth which is normally higher when riskier, and potentially more profitable, activities are being performed. Equity to assets (E_A) indicator positively impacts return on equity as higher equity financing reduces bankruptcy costs and refinancing risks i.e. funding liquidity risk and interest rate risk. Further, the cost of equity financing is almost equal to zero (if transaction or issuing costs are being ignored) when accounting profitability measures are used as proxies. In addition, a positive effect of using the financial leverage is proven with received deposits to assets (RECD_A) and received loans (RECL_A) to assets indicators. Both interest cost indicators are in a negative relation with return on equity what is expected due to interest costs being a deductive item in the profit and loss account. However, the interest costs on received loans (INT_L) impacts return on equity more intensively than the interest costs on received deposits (INT_D), what means that financing from the so called purchased funds i.e. loans in this case can be a source of comparative advantage/disadvantage as lower these costs are, higher the profitability indicator and vice versa. The outflows or sudden stops in the

wholesale financing might trigger crisis events likewise evidenced by Brealey (1999) for the Asian financial crisis and Jeong and Jung (2013) for Korea. In addition, Winkler (2009), and Ercegovac and Kundid (2011) pointed out a threat of a similar episodes in the South-eastern Europe and Croatia, respectively.

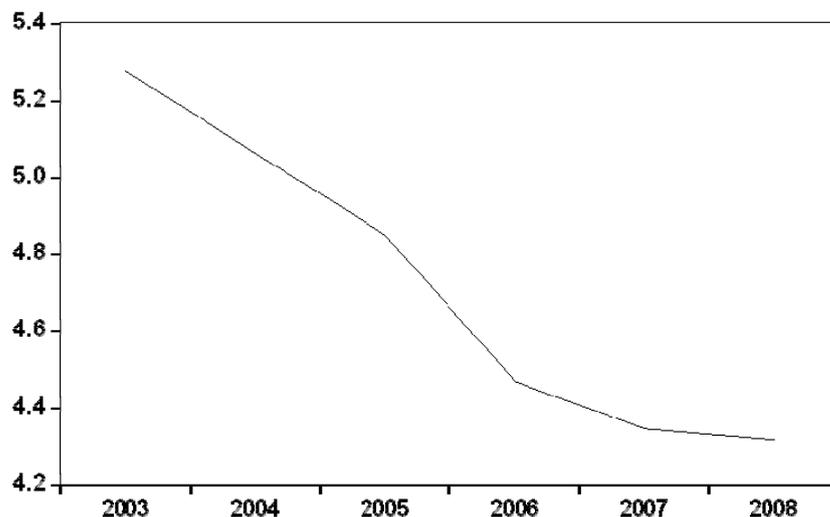
Operating margin is positively determined with operating margin in the previous year(s) what is in line with the phenomenon of persistence in profitability, contrary to results for the return on equity. Coefficient value of slightly above 0.35 indicates that profitability persistence exists at a moderate level and that the Croatian banking sector seems to be fairly competitive (if the value is closer to 1 the banking sector is less competitive). With reference to this, market share is not statistically significant. Explanation for the positive impact of equity to assets ratio to bank profitability is already explained in the aforementioned text. Marginal obligatory reserve (MOR) increased bank operating margin due to substitution of commercial banks external debt with an equity financing. Finally, capital adequacy (CA) ratio negatively affects operating margin, what means lower the capital adequacy ratio, higher the operating margin (obviously due to movements at the end of an observed period i.e. from 2006-2008). Figures 8 and 9 serve as an insight into capital adequacy and operating margin trends.

Figure 8. *Capital adequacy – mean value for the data sample*



Source: Author's calculation.

A subsample analysis shows that after 2005 large banks increased their capital adequacy until 2007, while medium-sized and small banks were since 2003 continuously decreasing this ratio.

Figure 9. *Operating margin – mean value for the data sample*

Source: Author's calculation.

Finally, interest cost indicator (INT_L) has an unexpected positive impact on the operating margin and the argument that could be used is that the marginal obligatory reserve penalized deposit/loan financing from the abroad and thus increased its costs and reduced its volume. Namely, the most of the deposit/loan funding in the Croatian banking sector was originated by the foreign owned banks throughout interbank liabilities. The biggest banks alleviated these negative effects by substituting the debt with equity, by retaining earnings as well as by increasing the credit price, which altogether led to higher operating margin level. Thus, the causes of this positive influence are multiple. To sum up, operating margin is driven by the inherited financial results, higher equity financing and better transfer of the bank cost of capital price on credit price (proxy with an interest cost indicator). At last, marginal obligatory reserve is found to be a correct measure of reducing the external debt created by commercial banks and appropriate measure of ensuring the banking sector stability.

4. Conclusion

Deregulation has altered the bank capital structure importance. Namely, liability management of commercial banks was until recently perceived to be driven solely by the depositors confidence, their objective needs and saving capacity and habits or on the other hand regulatory restrictions related e.g. to the financial leverage usage. Thus, researches on the capital structure as a source of the bank

comparative advantages/profitability were deficient. This paper aimed to go a further from the previous papers and instead of using return on assets as a profitability indicator, it uses both, return on equity and operating margin as dependent variables. The most of the research results could be explained with beneficial effects of using the financial leverage i.e. bank managers achieving better overall results when the pressure of returning debt is higher. However, the agency cost hypothesis is only one possible explanation in the capital structure theory. In addition, the level of competition, the level of financial liberalization, the bank ownership and the observed time period with reference to trend in the overall economy i.e. recession or expansion, significantly impact funding opportunities, the cost of capital and finally, allocative efficiency. Likewise, regulatory restrictions in a form of the marginal obligatory reserve in the Republic of Croatia increased operating margin due to loan funding substitution with a cost-free equity financing, at least in the accounting sense. This is why, further researches which might build and estimate models on some of the aforementioned direct and indirect relations between bank or the banking sector funding patterns and consequently its profitability are highly welcomed. At last, presented models could be estimated using the data samples from the banking sectors which are comparable to the Croatian.

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Appendix: The data sample commercial banks

Zagrebačka banka, Privredna banka Zagreb, Erste & Steiermärkische Bank, Raiffeisenbank Austria, Soci t  G n rale Splitska banka, Hypo Alpe – Adria – Bank, Hrvatska poštanska banka, OTP banka Hrvatska, Slavonska banka, Volksbank, Međimurska banka, Podravska banka, Jadranska banka, Istarska kreditna banka Umag, Karlovačka banka, Banco Popolare Croatia, Croatia banka, Kreditna banka Zagreb, Credo banka, Centar banka, Partner banka, Štedbanka, Imex banka, Banka Kovanica, Samoborska banka, Banka Brod, Nava banka, Primorska banka.