How Much is the Choice of Capital Structure Important for Bank Profitability in Croatia?

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Abstract: Whether the capital structure design may be a source of a comparative advantage in the business of banking has been rarely empirically answered due to researchers' focus on the complications related to the bank capital regulation in the last two decades. In the paper, the capital structure and profitability nexus is being explored using the data from the Croatian banking sector in the period from 2003 to 2008. A panel data analysis was employed for the 28 commercial banks. The main assumption that heterogeneity in the capital structure of banks in the Republic of Croatia explains differences in their profitability is confirmed. It has been found that banks with a higher equity financing and insured deposits have a higher return on assets. At the same time a higher level of the capital adequacy implies a lower profitability. Some inconsistencies of the research results and theoretical framework could be explained by introduction of the marginal obligatory reserve. At last, a necessity of managing the funding structure with a purpose of improving the bank profitability is pointed out.

Keywords: Capital structure, commercial banks, profitability, Croatia.

JEL Classification: G21; G32.

Introduction

Determinants of bank profitability have been widely theoretically and empirically explored. The same holds for the capital structure and profitability nexus in the contemporary corporate finance studies. At the same time more detailed empirical studies on the bank capital structure in relation to its profitability are somewhat rare. Our analysis attempts to fulfill this gap. To be more precise, this research endeavors to borrow a theoretical discussion from the capital structure theory, originally developed for non-financial enterprises in order to redirect the empirical investigation on the determinants of bank profitability from its generalized frame-

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work. Thus, the paper aims to focus on the capital structure as a determinant of bank profitability.

The empirical examinations on drivers of bank profitability usually employ widely recognized bank-specific, industry-specific and macroeconomic explanatory variables as a bank performance is a result of various controllable and uncontrollable factors. A bank size, market share, credit quality, cost control, employee productivity, financial leverage or equity financing, income from fees and commissions, assets, loan or deposit growth, liquidity management, structure of deposits and ownership structure are some internal or microeconomic variables of bank profitability listed by Rose (2003, pp. 172-173). The external or contextual variables are proxy with a concentration index and regulatory variables for the banking sector characteristics and some general macroeconomic indicators. The empirical framework that follows ignores an explicit inclusion of the macroeconomic conditions as it can be assumed that a bank management adjusts its capital structure decision to the given context. Thus, the macroeconomic influences are captured in some bank-specific variables like the interest costs indicators and moreover regulatory policies set up by the Croatian National Bank (CNB). Furthermore, as the research objective is to empirically verify the importance of the choice of the funding structure for bank profitability some new variables outlining the capital structure specificities are introduced. Generally, the researches on the determinants of bank profitability describe the capital structure with a single indicator, that of the leverage financing or in the reverse equity to assets ratio (Abreu and Mendes, 2002; Anthanasoglou et al., 2005; Anthanasoglou et al., 2006; Demirgüç-Kunt and Huizinga, 1998; Goddard et al., 2004; Kosmidou et al., 2005; Košak and Čok, 2008; Mamatzakis and Remoundos, 2003; Pejić Bach et al., 2009; Ramlall, 2009; Sayilgan and Yildirim, 2009; Sufian and Razali Chong, 2008). A capital adequacy ratio is employed as a capital assets ratio in Ngo (2006). In Kundid et al. (2011) in addition to the equity to assets ratio, the received deposits to assets ratio is used as a capital structure indicator. Among the aforementioned papers, the Croatian banking sector was included in the work of Anthanasoglou et al. (2006), Košak and Čok (2008), Pejić Bach et al. (2009) and Kundid et al. (2011).

One might ask why the empirical researches on the proposed paper title are scarce. We believe that the underlying reasons further given could be accepted as a justification. Since the introduction of the various capital requirements forms in 1980s and their following upgrades there is a flood of the literature examining the interdependence of the capital and risk-taking behavior of the commercial banks. Undoubtedly, this raised the importance of the capital structure theory, originally developed in the corporate finance field. However, one issue is usually being omitted from the researches on the bank capital structure which is almost inevitably put in the context of bank stability: that of a classical presumption of the capital structure being relevant for the bank profitability. Although the capital structure theory is by itself a controversial topic, the additional disputes existed whether its conclusions could be

applied outside the corporate finance framework at all. Justification for borrowing a theoretical background for the bank capital structure investigations from the corporate finance literature was among others given by Orgler and Taggart (1981), Marcus (1983) and Miller (1995). Namely, the optimal bank capital structure theory has not been developed yet due to various specificities of the business of banking like the existence of the deposit insurance schemes and capital regulation through the capital adequacy requirements. Some worthwhile attempts are brought up by Harding et al. (2008, 2009). Furthermore, the empirical analyses are more oriented to the determinants rather than the profitability consequences of the bank capital structure. In addition, the researches on the capital structure and bank profitability nexus are almost always oriented to the developed countries (Berger, 1994; Navapan and Tripe, 2003; Berger and Bonaccorsi di Patti, 2006; Hutchison and Cox, 2006; Ngo, 2006).

In short, this paper assumes that the bank capital structure can explain disparities that exist in the bank profitability. Taking into consideration the Croatian banking sector between the two instability periods i.e. 2003-2008 developed model is to be tested. Some domestic researches related to this topic should not pass without mentioning[1]. Thus, Jurman (2007) gave an insight into the capital structure of the Croatian banking sector while Ercegovac and Kundid (2011) discussed a risk of the capital outflow through the interbank deposit market.

The proposed research indirectly underlines a banking stability issue. The first, it regresses the capital structure indicators to profitability and answers the question which of them raises the bank performance. Profitability is considered to be a prerequisite for bank stability as it protects and builds up its own funds through the auto-financing process (Kundid et al., 2011, p. 170). The second, the paper reminds that the cost of capital is an important input in the placements decisions. The financing costs need to be covered with the interest revenues on loans. With transferring a higher cost of capital to the borrowers, either credit rationing (Stiglitz and Weiss, 1981) whether supply or demand-driven or a higher risk taking behavior occurs. This is why an increase in short term interest rates is proved to be a main cause of the banking sector instability (Demirgüç-Kunt and Detragiache, 1998, p. 83). On the other hand, reduction in the cost of capital might decrease the loan price and spur the economic growth if the conditions of the competitive banking sector are satisfied. With all said, this research might be relevant for the bank management structures and the prudential authorities due to some policy recommendations and useful to the academicians in the related field of interest. Other aspects of the capital structure choice in the banking industry like the microeconomic, risk-taking consequences are beyond the scope of this work and intended to be extensively approached in our papers in future.

The rest of the paper is composed of four sections: the theoretical background on the impact of the capital structure on profitability of the corporate entities is provided in the second section. The third section reviews the empirical researches on the capital structure and profitability nexus for the banking firms. Next, an empirical

framework and the research results for the Croatian banking sector are presented and discussed. The last section summarizes the key findings.

Capital structure and profitability: borrowing theoretical background from the corporate finance literature

(Ir)relevance of the capital structure choice for the company value occupies attention of the economic researchers since the mid of the 20th century. The outlines of the contemporary capital structure theory are found in the work of Durand from 1952 (Orsag, 2003, pp. 535-538) who discussed the three scenarios of the capital structure influence on a company value which later served as a base for more sophisticated mathematical and empirical examinations. Durand concludes that there may be an optimal capital structure which leads to the highest value of a company what he named a traditional approach. In addition, he explains that 1) the maximum indebtedness ensures the highest value of a company due to the assumed constant cost of debt and equity, and that 2) every combination of debt and equity leads to the same average cost of capital and a company value does not depend on its funding structure. In compliance with the latter, rather than the capital structure relevance for a company performance, Modigliani and Miller (1958) point out the relevance of the way capital is allocated to the investments. According to their famous irrelevance proposition, the capital structure should not be considered as a source of the companies comparative advantages and cannot increase their value. However, the underlying assumptions of their model like a frictionless world and the absence of the bankruptcy costs were used as an argument for a new hypotheses development by themselves and other economists in which the capital structure added a value to the firms. Likewise Miller (1988, p. 100) warns that "the view that capital structure is literally irrelevant or that 'nothing matters' in corporate finance is far from what we ever actually said about the real world applications of our theoretical propositions". Further, Marcus (1983, pp. 1218-1219) summarizes that „in practice, taxation, bankruptcy costs, and the regulatory environment are all relevant to the optimal financial structure of a bank".

The static tradeoff theory and pecking order theory (Myers, 1984) are the next building blocks of the capital structure theory. The former confirms the existence of the optimal capital structure in line with the traditional approach. The optimal capital structure is determined by the costs and benefits from the employing financial leverage i.e. tradeoff of the bankruptcy costs (or the financial distress costs) and benefits of a tax shield, while the assets and investment plans are held constant. The adjustment costs and a time lag necessary for the adjustment toward the optimal capital structure are ignored. Although this theory may point out that a company endeavors to achieve its optimal capital structure it does not explain the financial habits of companies in the real world. For example it does not explain why the companies issue equity when

the market values of the shares increase as a static tradeoff theory would expect a debt funding to take place. This is why the pecking order theory gained popularity. According to the latter, a company does not target its capital structure and its financial managers always prefer the internal rather than the external financing sources, debt instead of the equity financing, and a stable dividend policy. Namely, managers always try to avoid the market discipline of their investors and this gave an importance to the managerial theory of the corporate finance like the agency theory and signalization effects.

In conclusion, the use of the financial leverage might increase a firm profitability, reduce the moral hazard of managers if the restrictive clauses are added into the debt contracts and ensure the company growth well above its own resources (Orsag, 2003, pp. 501-532). With respect to the second, Berger et al. (1995) notice that on the low level of a capital agency problem between the owners and creditors occurs while on the high level it is decreasing between the owners and creditors and increasing between owners and managers. However, the debt financing has various disadvantages like absence of a tax shield in case of losses, pressure seen in the interest costs and payment deadlines, the reduced financial and credit capacity as well as the financial and business independence (Orsag, 2003; Pojatina, 2005; Vidučić, 2004). If the level of the business activity falls, debt becomes a burden that reduces the profitability potentials and threatens the equity deterioration.

Banking firms are special in comparison to the non-financial enterprises for their regulatory environment and the nature of the services they provide. This is why the capital structure theory should be approached taking these specificities into consideration. Vis-a-vis the non-financial firms, the commercial banks have a higher degree of leverage due to a tax advantage of the deposits over the corporate bonds and the reduced agency and bankruptcy costs in presence of the deposit insurance schemes and continuous prudential supervision (Orgler and Taggart, 1981). In addition, the small banks are usually less leveraged than the large banks as the latter are more frequently subject of a bailout if a failure threatens to them. Thus, the optimal bank capital ratio depends upon the advantages of the deposit finance and the disadvantages of the excessive debt finance seen in the loss of the bank charter in case of bankruptcy and regulatory pressures. Marcus (1983, p. 1219) points out that "the bank thus maximizes its value by increasing equity to the point at which the marginal value of reduced regulatory pressure and potential bankruptcy costs equals the marginal tax disadvantage of equity finance". With all said, the pecking order theory is being less relevant for banks. In short, the financial leverage points out a bank risk profile, the potential financial distress and bankruptcy costs, and affects the financial funds type, size and price, and thus business activity in the near future" (Kundid et al., 2011, p. 171).

Empirical background on capital structure relevance for bank profitability

The empirical researches usually examine the causes rather than the consequences of the capital structure choice. This holds for the banking sector as well as for the non-financial firms. Some rare examples of the ex post studies dealing with the financial institutions are further reviewed.

Berger (1994), Navapan and Tripe (2003) and Hutchison and Cox (2006) explored the causality between a return on equity and the financial leverage. Using the method of Granger causality, Berger (1994) reported the research results for the USA banks in the period 1983-1989 which support the positive interdependence of capital to asset ratio and a return on equity. The higher equity finance causes the higher return on equity and vice versa. While the positive impact of profitability on the equity is expected a reverse, the impact of equity on the shareholders profitability is explained by the decreased financing costs on an uninsured debt when the financial leverage is decreasing. However, the results for the 1990-1992 do not support the previously mentioned positive capital-earnings relationship. Likewise Berger (1994), Hutchison and Cox (2006) continued to study the banking sector of the USA in the two time periods: 1983-1989 and 1996-2002. However, the latter reports on a negative relationship between the bank capital and the equity profitability except for the most profitable banks. This is argument with a more different methodological approach than those of Berger (1994). In addition, a negative capital-earnings relation is confirmed for the New Zealand and Australian banks in the period 1996-2002 (Navapan and Tripe, 2003).

Berger and Bonaccorsi di Patti (2006) proposed examination of the bank capital structure as a determinant and consequence of its profit efficiency in order to confirm the agency costs hypothesis in practice. For the period 1990-1995 (although some robustness checks included the different sample periods), the banking sector of the USA was again taken into consideration with more than 7500 commercial banks, and it was found that the higher the financial leverage, the higher the bank profit efficiency. Namely, in case of a higher leverage, the managers are constrained or encouraged to act more in the interest of shareholders. The results for the reverse causality from the bank performance to the capital structure where somewhat weak.

Ngo (2006) conducted a research on a sample of the 2500 largest banks (according to the total assets) in the USA for the period 1996-2005. On the contrary to the most of the published papers he finds no statistically significant relationship between capital and profitability. A positive repercussion of a higher equity finance – decrease in borrowing costs is compensated with the higher costs of the equity issuance. Thus, the net effect of the increased equity is proved to be zero on the bank profitability (which is measured as a return on assets and a return on equity) and vice versa. The capital is proxy with a capital adequacy ratio. Explanation of such results is that a bank capital ratio is endogenously determined within a profit maximization process.

Pratomo and Ismail (2006) examined the linkage of the profit efficiency measured with a return on equity and financial leverage of the 15 Islamic banks in Malaysia in the period from 1997-2004 and confirmed it to be positive. Namely, the higher equity financing decreases the profit efficiency in the chosen sample. Furthermore, Kyereboah-Coleman (2007) analyzed the impact of the capital structure on the performance of the 52 microfinance institutions in Ghana in the ten-year period 1995-2004. Using a panel data regression he finds out that the debt finance has a positive impact on the performance upgrade of microfinance institutions. Performance is proxy with the two variables: an indicator of the loan defaults in relation to loan disbursement and an indicator of an outreach measured by the annual rate of a change of the clientele base. The former is decreasing while the latter is increasing with the financial leverage. Together with Pratomo and Ismail (2006), Kyereboah-Coleman (2007) accepts an agency costs hypothesis which looks at the financial leverage as a mean for the disciplined and efficient managers.

Finally, the studies on the determinants of bank profitability are worth of mentioning as the most of them report on the role of the capital in determining profitability. The hypothesis that the well-capitalized banks have a higher return on assets or/and a higher net interest margin was confirmed in Abreu and Mendes (2002), Anthanasoglou et al. (2005), Anthanasoglou et al. (2006), Demirgüç-Kunt and Huizinga (1998), Kosmidou et al. (2005), Košak and Čok (2008), Kundid et al. (2011), Mamatzakis and Remoundos (2003), Ramlall (2009), Sayilgan and Yildirim (2009), Sufian and Razali Chong (2008). In addition, Abreu and Mendes (2002), Goddard et al. (2004), Pejić Bach et al. (2009) proved the positive effects of a higher equity financing on the return on equity. Nevertheless, a positive, negative or neutral impact of the capital structure (i.e. debt or equity proportion) on the bank profitability occurs as an outcome of the different methodological approaches and the bank performance indicators being employed. Thus, it partly remains an empirical issue.

Empirical framework and estimation results

Data, methodology and model development

The empirical analysis of the bank capital structure as a determinant of its profitability is carried out on a data sample of the 28 commercial banks in the Republic of Croatia in the period 2003-2008. The aforementioned is considered to be a period of the banking sector stability. No earlier data are taken into consideration due to the unfinished process of the Croatian banking sector rehabilitation, consolidation, privatization and modernization toward the developed industry and a failure of one middle-sized bank in 2002. No later items were calculated from the publicly available bank balance sheets and the income statements due to the larger national

economic instability occurrence since the origination of the financial and economic crisis worldwide. In addition, melt down of the bank profitability and slow down of the asset growth, the problems of the small-sized banks which in 2011 led to the closure of one of them by the prudential authority, the changes in the regulatory environment like an increase in the amount of the deposit insurance[2] are some of the remaining arguments for the current omission of the period 2009-2010 from the empirical evaluation. The separate analysis of the aforementioned period would not be reliable due to the problems connected with the analysis of the short time-series. Hence, the data sample only partly encompassed the financial crisis period i.e. its aftermath in 2008.

In the selected period analysis continuously referred to more than 95 % of the assets of the overall banking intermediation. Namely, in order to avoid the false impression of the larger sample some small-sized banks that were operating in the Croatian banking sector only in the part of the observed period were excluded from the analysis. Thus, following statement of Kundid et al. (2011, p. 173) that "the usage of the dynamic panel model and the inclusion of the instrumental variables of banks that had one or two observations in already small observed period would not significantly change the obtained results" we reduce the sample to the commercial banks that had business and thus data continuity in the selected period. The excluded small-sized banks were mainly being taken over by the largest, foreign-owned banks. At last, the data were adopted or calculated from the statistical data and publications available on the CNB website, the annual reports of the selected banks[3] (from their websites or printed forms) and the selected numbers of the economic journal "Privredni vjesnik". All indicators report the annual values.

The selected data sample is being attributed by the time and space component which makes the panel data analysis suitable for the empirical estimation. Škrabić (2009, p. 14) points out that "the usage of the simple multiple regression is not possible as it cannot be assumed that there is an independence between the observations of one observed item during a time period". As the following analysis is based on the bank financial statements, the indicators of one period are dependent on the same indicators in the previous period i.e. there is a process of the first-order autoregression. Thus, the empirical estimation is conducted using the dynamic panel model which contains the lagged values of the dependent variable. As Škrabić suggested for Kundid et al. (2011, p. 174), Arellano-Bond estimator is used in this study, too.

The bank profitability is a dependent variable in the proposed model. It is approximated with the value of a return on assets (ROA). Namely, according to the International Monetary Fund (IMF), ROA is the key ratio for the evaluation of the bank profitability (Anthanasoglou et al., 2005, p. 13). Also widely used, a return on equity (ROE) might not be a suitable bank profitability indicator for this model development as ROE is an outcome of ROA and the equity multiplicator i.e. a reverse equity financing ratio which is in a focus of the capital structure examination in this

research. Similarly, Ngo (2006, p. 10) explains that "an analysis of ROE disregards the greater risks normally associated with greater debt financing, thus ROA emerges as a preferred measure of profitability". The list of explanatory variables is given in Table 1.

Table 1: Definition of explanatory variables used in the regression model.

Variable	Explanation	Group of indicators
RASTAK	Growth of assets	Growth indicator
RASTJK	Growth of regulatory capital	Growth indicator
RASTDEP	Growth of deposits	Growth indicator
OSUAK	Insured deposits / Total assets	Capital structure indicator
UKUAK	Equity / Total assets	Capital structure indicator
UPKUAK	Received loans / Total assets	Capital structure indicator
UPDUAK	Received deposits / Total assets	Capital structure indicator
KT1	Interest costs on received loans / Total received loans	Interest cost indicator
KT2	Interest costs on received deposits / Total received deposits	Interest cost indicator
TRUDIO	Market share of bank assets	Bank size and market share indicator
AK	Capital adequacy ratio	Regulatory indebtedness ratio
OR	Placements growth reduction	Dummy variable
GR	Marginal obligatory reserve	Dummy variable

Source: Author's presentation.

The independent variables can be classified in one of the four groups of indicators: the growth indicators, capital structure indicators, interest cost indicators and other indicators. The most of the indicators where extracted from the general bank management literature while some of them were calculated or inspired by CAMELS – supervisors' analytical instrument for the individual bank stability assessment[4]. Both dummy variables can take value 0 or 1 where 0 presents the absence of a certain regulatory measure and 1 its enactment. The inclusion of the regulatory measures into the analysis points out the specificities of the Croatian banking sector that might have had influence on the bank profitability through the available capital structure and/or the growth potentials. It is assumed that the placements growth reduction (OR) and the marginal obligatory reserve (MR) are of particular importance. The placements growth reduction through the mandatory CNB bills (Decision on the purchase of compulsory CNB bills, Official Gazzette, 71 and 100, 2007)[5] was implemented in 2007 and 2008 while the marginal obligatory reserve was put into effect in the period from 2005-2007. The former measure was promoted under the goal of limiting the placements growth of banks in the Republic of Croatia in order to avoid the excessive risk-taking connected with the credit bloom in the period of prosperity. It was abol-

ished in December 2009 what could hardly have had any effect on the banking sector as a credit contraction process already took place due to the unfavorable economic environment. The marginal obligatory reserve was introduced with a purpose of discouraging the capital flows from abroad i.e. mostly deposits from the parent banks of the largest banks in Croatia and thus, slowing down the foreign debt growth.

Finally, developed model is specified and given by the following equation:

$$ROA_{it} = \mu + \gamma ROA_{i,t-1} + \beta_1 KT1_{it1} + \beta_2 KT2_{it2} + \beta_3 OSUAK_{it3} + \beta_4 RASTAK_{it4} + \beta_5 RASTJK_{it5} +$$
$$+ \beta_6 RASTDEP_{it6} + \beta_7 AK_{it7} + \beta_8 TRUDIO_{it8} + \beta_9 UKUAK_{it9} + \beta_{10} UPDUAK_{it10} +$$
$$+ \beta_{11} UPKUAK_{it11} + \beta_{12} GR_{it12} + \beta_{13} OR_{it13} + \alpha_i + \varepsilon_{it}; \ i = 1,...N, t = 1,...T$$

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

Research results and economic interpretation

The empirical results of the estimated panel model are given in the following table[6]. The results are obtained using STATA 11 and EViews 7.

A lagged dependent variable ($ROA_{i,t-1}$) and independent variables growth of regulatory capital (RASTJK), the capital adequacy ratio (AK), the interest cost indicators (KT1 and KT2) have a negative sign and are statistically significant. The estimated parameters are the highest for the indicator of interest costs on the received loans (KT1) and the return on assets in the previous period ($ROA_{i,t-1}$). Thus, KT1 and $ROA_{i,t-1}$ have the highest negative impact on the return on assets (ROA).

Further, the growth of assets (RASTAK), equity to asset ratio (UKUAK), the marginal obligatory reserve (GR) and the insured deposits ratio (OSUAK) are in a positive relation with the dependent variable and are statistically significant. Among those, the marginal obligatory reserve has the highest estimated parameter. The rest of the variables are statistically insignificant.

A negative sign of a lagged dependent variable (at 1 % level) was not expected and is not in line with the theoretical background (a hypothesis of persistence in profitability) and previous empirical results (Anthanasoglou et al., 2005, Goddard et al., 2004, Mamatzakis and Remoundos, 2003; Kundid et al., 2011). On a year basis the bank profitability is supposed to be positively determined with the earlier profitability achievements. Hence, a sharp decline of the medium and small-sized banks ROA since 2006 and the simultaneous rise of the biggest banks ROA in the last two observed years might be explanation for the former results. Thus, volatility of the profitability indicator in form of the interchangeably sharp increase and decrease explains a negative sign in the developed model.

Table 2: Panel data estimation of developed model.

Explanatory variables	Dependent variable (ROA)
$ROA_{i,t-1}$	-0,4707212*** (0,1110627)
$KT1_{i,t}$	-0,4952537* (0,3070731)
$KT2_{i,t}$	-0,0727194*** (0,0209071)
GR_t	0,3812978*** (0,1599533)
OR_t	0,2816179 (0,1893898)
$OSUAK_{i,t}$	0,0334394*** (0,0105516)
$RASTAK_{i,t}$	0,029682* (0,0154516)
$RASTJK_{i,t}$	-0,0044954** (0,0022393)
$RASTDEP_{i,t}$	-0,0053537 (0,0063475)
$AK_{i,t}$	-0,0736352*** (0,0307073)
$TRUDIO_{i,t}$	-0,0720427 (0,2672648)
$UKUAK_{i,t}$	0,1818372* (0,1006788)
$UPDUAK_{i,t}$	-0,0164541 (0,0433579)
$UPKUAK_{i,t}$	-0,0507805 (0,0407334)
α	-0,3017325** (0,1551736)
Number of observations	108
Number of banks	28
Sargan test (p-value)	0,3289
First-order autocorrelation (p-value)	0,0961*
Second-order autocorrelation (p-value)	0,4173

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

Source: Author's calculation.

The estimated parameter for the variable growth of regulatory capital has a negative sign. This means that the higher the growth of regulatory capital the lower is the bank profitability and reverse. The small-sized banks usually have the capital buffers well above the regulatory requirements as they are not "too-big-to-fail" and have the modest risk management capabilities especially as serving the local market reduces

their diversification possibilities. At the same time, the small banks have the substantially lower profits (or operate with losses) while their asset growth was limited by the CNB's regulatory measure on the placements growth limitations which was eventually more in line with the large banks growth appetites. Altogether, the negative influence of this growth variable is argument with the evidence from the Croatian banking sector practice. All said is opposite from the explanations that could be given for the large banks. Furthermore, the growth of assets has a positive sign in the proposed model. Namely, the expansion of the banking intermediation is a profitability determinant if a bank is properly managed and the funding sources allocated to the profitable placements likewise proved in Kundid et al. (2011).

The equity to assets ratio is positively connected with the bank ROA and thus the higher equity financing is a source of the increased bank profitability. This is not consistent with the corporate finance literature where the equity financing is the most expensive way of financing. However, the obtained results are in line with the accountancy treatment of the costs of equity financing. In profit and loss account equity is costless. In addition, the lower financial leverage decreases the refinancing costs. The result is supported with the earlier mentioned research findings (third section). A sign of the insured deposits indicator is positive, too. The later is in compliance with the hypothesis on the reduced or even non-existent market discipline of the depositors protected from the savings losses by the deposit insurance funds. The lack of their monitoring over the bank financial and business risks is seen in the requested interest rate on deposits. The overall conclusion is that the commercial banks which attract a large base of the small – insured deponents ceteris paribus have a higher profitability. In addition, the insured deposits are partly composed of the current accounts of customers e.g. households or a vista deposits where the interest cost is near to zero and the income from the account maintenance significant.

Both interest cost indicators remarked a negative sign in relation to the bank profitability which is logical if the income statement structure is on mind. Yet the influence of the interest costs on loans outperforms those of the interest costs on deposits.

The dummy variable marginal obligatory reserve is positively related to the bank ROA. As this reserve requirement decreased capital inflows from the international interbank deposit market the further asset growth of the large banks was since then spurred with the equity financing. Thus, the substitution of liabilities with own funds again increased the bank profitability due to the accounting blunder of the equity financing being almost costless when the transaction costs of the equity financing which are the cost accounting category are taken into consideration. At last, the capital adequacy ratio has a negative sign on the bank profitability. From 2003-2007 the average capital adequacy ratio continuously falls and the average banking sector ROA is almost constant. Thus, the empirical estimation on the relation capital adequacy – profitability is not surprising.

Concluding remarks and policy implications

The paper shows that the bank capital structure determines its financial performance. Thus, the equity and liabilities management should be actively led in the commercial banks. Not only that the appropriate funding management can reduce the cost of capital and increase the bank profitability it is also a prerequisite for the credit potential availability in the future. In the Croatian banking sector the return on bank assets is increasing with the equity to assets ratio and indicator of insured deposits. The first result could be explained from the accounting side of the story in which the cost of equity financing is almost zero. With respect to the second-mentioned result a bank should work on extending the base of the deponents, especially the households current and a vista accounts as they have the multiple effects on the bank profitability: they are included in the deposit insurance schemes up to a certain amount, they are cheap founding sources and the best is that they earn fees from the account maintenance. In addition, the cross-selling possibilities could be more severely exploited. The insured deposits also include the term deposits which substantially contribute to the bank profitability due to a lack of the market discipline, decreased liquidity risk and wider allocation potentials. While the impact of the placements growth limitations was not statistically significant, the marginal obligatory reserve increased the bank profitability due to the equity infusions that were done in order to support the asset growth of the large banks instead of the interbank deposit reliance in the pre-measure period. Thus, the prudential authorities played an important role in the capital structure decisions of the commercial banks in Croatia in the post-transitional era. However, sustainability of the existing way of the bank financing in Croatia is doubtful and dependent on the overall economic progress, opportunities on the international interbank market and discretionary prudential authority acts.

To our best knowledge this is the first published paper that deals with the capital structure - profitability issue taking into consideration the banking sector in the Republic of Croatia and moving ahead from the descriptive statistics. It could inspire and facilitate the similar researches in this field for the individual banking sectors or cross-country analysis. However, the latter would have to take into consideration the macroeconomic variables. At last, the examinations of the bank capital structure and profitability nexus in the crisis period, as well as look at the determinants of the bank capital structure, are highly recommended.

NOTES

[1] In the empirical part, this paper is based on the fifth chapter of Kundid's master thesis.

[2] Deposit insurance amount was increased from 100 000 to 400 000 Croatian kunas and the scope of deposits reliable for insurance was extended allowing insurance of deposits from legal subjects up to the same amount (of 400 000 Croatian kunas) from the 1st January 2010.

[3] As a reflection of Basel II third pillar on market discipline, public disclosure requirements are adopted into Credit Institutions Act (Official Gazzette, 117, 2008). This Act was put into the effect 1st January 2009 and thus its requirements for the mandatory website disclosures of financial and annual reports. According to the Credit Institutions Act (Official Gazzette, 117, 2008, Article 175, Paragraph 3) "credit institution is obliged to disclose its revised non-consolidated financial statements together with its annual report on its websites and is obliged to make them available at the latest within five months since the end of business year for which they are related to". From now on increased public disclosure requirements for banks should facilitate empirical researches related to the banking sector issues.

[4] CAMELS stands for indicators belonging to one of next groups: Capital adequacy, Assets quality, Management quality, Earnings, Liquidity, Sensitivity to market risk.

[5] A version of placements growth reduction was put into effect yet in 2003 and applicable in part of 2004. Permitted annual bank asset growth rate was 16 % and was calculated on the quarter level. Overdue of this growth rate implied duty to subscribe low-return CNB bills in amount of 200 % on the overdue growth amount. Described measure as well as placements growth reduction which was put into effect in 2007 in which permitted annual asset growth rate was 12 % could not be treated as equal. With the purpose of research consistency on mind, reduction of placements growth will be understood as the measure from 2007 that had more significant effects on the banking business with special reference to small-sized banks.

[6] Correlation matrix and descriptive statistics are available upon request.

REFERENCES

Abreu, M., Mendes, V., (2002), Commercial Bank Interest Margins and Profitability: Evidence from Some EU Countries, available at http://www.iefs.org.uk/Papers/Abreu.pdf [Accessed 26/08/10].

Athanasoglou, P. P., Brissimis, S. N., Delis, M. D., (2005), Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability, *Bank of Greece*, Working Paper, No. 25, Athens.

Athanasoglou, P. P., Delis, M. D., Staikouras, C. K., (2006), Determinants of Bank Profitability in the South Eastern European Region, *Bank of Greece*, Working Paper, No. 47, Athens.

Berger, A. N., (1994), The Relationship between Capital and Earnings in Banking, *The Wharton Financial Institutions Center*, Working paper, No. 17.

Berger, A. N., Bonaccorsi di Patti, E., (2006), Capital Structure and Firm Performance: A New Approach to Testing Agency Theory and an Application to the Banking Industry, *Journal of Banking & Finance*, Vol. 30, 1065-1102.

Berger, A. N., Herring, R. J., Szegö, G. P., (1995), The Role of Capital in Financial Institutions, *Journal of Banking & Finance*, Vol. 19, June, 393-430.

Demirgüç-Kunt, A., Detragiache, E., (1998), The Determinants of Banking Crises in Developing and Developed Countries, *International Monetary Fund*, Staff Papers, Vol. 45, No. 1, March.

Demirgüç-Kunt, A., Huizinga, H., (1998), Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence, *The World Bank*, Policy Research Working Paper, No. 1900, Washington.

Ercegovac, R., Kundid, A., (2011), Interbank Deposit Market Relevance for Croatian Banking System Sustainability, *Ekonomski pregled*, Vol. 62, No. 1-2, 48-66.

Goddard, J., Molyneux, P., Wilson, J. O. S., (2004), The Profitability of European Banks: A Cross-Sectional and Dynamic Panel Analysis, *The Manchester School*, Vol. 72, No. 3, 363 – 381.

Harding, J. P., Liang, X., Ross, S. L., (2008), The Optimal Capital Structure of Banks: Balancing Deposit Insurance, Capital Requirements and Tax-Advantaged Debt, University of Connecticut, *Department of Economics Working Paper Series*, Working paper, No. 2007-29R, February.

Harding, J. P., Liang, X., Ross, S. L., (2009), Bank Capital Requirements and Capital Structure, University of Connecticut, *Department of Economics Working Paper Series*, Working paper, No. 2009-09, February.

Hutchison, D. E., Cox, R. A. K., (2006), The Causal Relationship Between Bank Capital and Profitability, available at http://ssrn.com/abstract=956396 [Accessed 20/06/09].

Jurman, A., (2007), Oblikovanje optimalne strukture izvora sredstava u bankama, *Računovodstvo, revizija i financije*, No. 9, 85-91.

Kosmidou K., Tanna S., Pasiouras F., (2005), Determinants of Profitability of Domestic UK Commercial Banks: Panel Evidence from the Period 1995-2002, available at http://www.coventry.ac.uk/cu/external/content/1/c4/09/52/v1204731103/user/RP2008-4.pdf [Accessed 26/08/10]

Košak, M., Čok, M., (2008), Ownership Structure and Profitability of the Banking Sector: The Evidence from the SEE region, *Zbornik radova Ekonomskog fakulteta u Rijeci*, Vol. 26, No. 1, 93 – 122.

Kundid, A., (2010), *Efikasnost strukture bankovnih izvora*, Specijalistički poslijediplomski rad, Ekonomski fakultet, Zagreb.

Kundid, A., Škrabić, B., Ercegovac, R., (2011), Determinants of Bank Profitability in Croatia, *Croatian Operational Research Review*, Vol. 2, 168-182.

Kyereboah-Coleman, A., (2007), The Impact of Capital Structure on the Performance of Microfinance Institutions, *The Journal of Risk Finance*, Vol. 8, No. 1, 56-71.

Mamatzakis, E. C., Remoundos, P. C., (2003), Determinants of Greek Commercial Banks Profitability, 1989-2000, *Spoudai*, Vol. 53, No. 1, 84 – 94.

Marcus, A. J., (1983), The Bank Capital Decision: A Time Series-Cross Section Analysis, *The Journal of Finance*, Vol. 38, No. 4, 1217-1232.

Miller, M. H., (1988), The Modigliani – Miller Propositions After Thirty Years, *The Journal of Economic Perspectives*, Vol. 2, No. 4, 99-120.

Miller, M. H., (1995), Do the M&M Propositions Apply to Banks? *Journal of Banking & Finance*, Vol. 19, 483-489.

Modigliani, F., Miller, M. H., (1958), The Cost of Capital, Corporation Finance and the Theory of Investment, *The American Economic Review*, Vol. 48, No. 3, 261-297.

Myers, S. C., (1984), The Capital Structure Puzzle, *The Journal of Finance*, Vol. 39, No. 3, 575-592.

Navapan, K., Tripe, D., (2003), An Exploration of the Relationship Between Bank Capital Levels and Return on Equity, *16th Australian Finance and Banking Conference*, December.

Ngo, P. T. H., (2006), Endogenous Capital and Profitability in Banking, *The Australian National University*, Working papers in Economics and Econometrics, Working paper, No. 464, May.

Orgler, Y. E., Taggart, R. A. Jr., (1981), Implications of Corporate Capital Structure Theory for Banking Institutions, *NBER Working Paper Series*, Working paper, No. 737, August.

Orsag, S., (2003), *Vrijednosni papiri*, Revicon, Sarajevo.

Pejić Bach, M., Posedel, P., Stojanović, A., (2009), Determinante profitabilnosti banaka u Hrvatskoj, *Zbornik Ekonomskog fakulteta u Zagrebu*, Vol. 7, No. 1, 81-92.

Pojatina, D., (2005), Izazovi povećanju kapitala dioničkih društava, *Računovodstvo, revizija i financije*, No. 4, 78-84.

Pratomo, W. A., Ismail, A. G., (2006), Islamic Bank Performance and Capital Structure, *Munich Personal RePEc Archive*, Paper No. 6012, November.

Ramlall, I., (2009), Bank-Specific, Industry-Specific and Macroeconomic Determinants of Profitability in Taiwanese Banking System: Under Panel Data Estimation, *International Research Journal of Finance and Economics*, No. 34, 160 – 167.

Rose, P. S., (2003), *Menadžment komercijalnih banaka*, MATE, Zagreb.

Sayilgan, G., Yildirim, O., (2009), Determinants of Profitability in Turkish Banking Sector: 2002-2007, *International Research Journal of Finance and Economics*, No. 28, 207-214.

Stiglitz, E.J., Weiss, A., (1981), Credit Rationing in Market With Imperfect Information, *The American Economic Review*, Vol. 71, No. 3, 393 – 410.

Sufian, F., Razali Chong, R., (2008), Determinants of Bank Profitability in a Developing Economy: Empirical Evidence from the Philippines, *Asian Academy of Management Journal of Accounting and Finance*, Vol. 4, No. 2, 91 – 112.

Škrabić, B., (2009), *Determinante razvoja financijskog sustava zemalja središnje i istočne Europe*, Specijalistički poslijediplomski rad, Ekonomski fakultet, Zagreb.

Vidučić, Lj., (2004), *Financijski menadžment*, RRiF plus, Zagreb.