The Effect of the Economic Crisis on the Bank Profitability in the V4 Countries

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Abstract: In our study we are focusing on the average profitability of the Hungarian commercial banking sector from 2005 to 2014 with special attention on the effects of the financial crisis. In our globalized world the unavoidable question is how the profitability of our banks fits the same values of the North-American and European, especially the V4 commercial banks. In order to find a well-established answer we carried on a financial ratio analysis with the help of the Bankscope database, which was extended with a panel analysis. On the basis of the time series it can be concluded that the performance of the Hungarian commercial banks – at least in case of the profitability- was in a steady decline and far away from the V3 numbers. It cannot be stated that the higher profitability delivers only advantages for the affected national economies. However it is presumed that the interests of the shareholders have an effect on the quantity and quality of the debts, indirectly on the development of the total economy.

Keywords: crisis, commercial banks, lending

Introduction

There were several studies about the financial crisis. The authors are dealing with a very important aspect of the crisis from a Hungarian point of view, namely with the role of the decline on the profitability of the domestic commercial banks, more accurately whether the evaluation of the average profitability of our commercial banks fits the tendencies of the V4 countries or the developed countries.

The commercial banking system is an inevitable part of the modern economy which plays an important role in the creation, flow, reallocation and effective handling of the money. The development of the commercial banking system, the

amount of the services, its quality and differentiation and the adequacy for the requirements are all such factors that have an effect on the macro economic development.

The studies examining the performance of the banks can be divided into two main groups: one of them based on the financial ratios the other is focusing on the external factors, mostly on the indicators describing the economic performance. From this aspect the external factors are such variables which are independent from the bank management; usually contain the legal legislation and those economic factors that have direct effect on the performance and operation of the credit institute.

1 Literature

The studies based on the financial ratios consider usually the return on assets (ROA) and the return on equity (ROE) as a profitability indicator. Molyneux and Thorton (1992) examined the performance of banks from 18 European countries and confirmed the statements of Bourke (1989) that there is a positive correlation between market concentration and profitability thanks to the appearing monopolistic profit. According to Demirguc, Kunt and Huizinga (1988) the other macro factors like the taxation, deposit insurance legislation or the legal and institutional legislation have effect on the interest rate margin and on the profitability. Pasiouras and Kosmidou (2007) made similar conclusions after examining banks from 15 European countries which confirms that both in case of the foreign and domestic credit institutes beyond the branch specific factors the structure of the financial market and the macro economic factors have effect on the profitability. Bikker and Hu (2002) and Goddart et al. (2004) found positive and significant relation between the size and profitability which anticipates – especially in case of small and middle size banks – that the increase of the size is accompanied with higher profitability. On the contrary Barros et al. (2007) found the bigger and more diversificated banks weaker where the reason might be the better handling of the asymmetric information by the smaller and on one specific scope specialized credit institutes. Despite of the opposite statements there is consensus that the average cost curve is forming a U shape where the middle size banks are performing better than the smaller or bigger competitors. Because of this the effect of the size will be not linear, at the beginning the profitability will be growing then due to the bureaucracy and other costs it will turn into decrease (Athanasoglou et al. 2008).

Trujillo and Ponce (2013) examined the profitability of the Spanish banks where they found empirically proved that there is a relation between the high profitability and high debt and deposit portfolio, efficiency and the low credit risk. According to Bordeleau and Graham (2010) the high proportion of liquid assets has positive

effect on the profitability, however after a certain level, the effect weakens. The examined sample contained 65 North-American banks. Klaassen and Eeghen (2015) used a data of 23 years for examining the effect of different financial ratios on the asset and equity based profitability and created a performance scheme system. Schildbach and Wenzel (2013) highlighted the difference of the profitability between the European and North American banks. Here the development of the lending activity and the other constant revenues played an important role which already reached the pre-crisis levels.

2 Material and Method

We downloaded the necessary data from the „Bankscope" database, provided by Bureau van Dijk which contains the financials of more than 30 000 credit institutes worldwide. Our selected timeframe covers the 2005-2014 period and focusing on 2 geographical regions, North-America and the European Union, in the latter the V4 countries are examined more deeply. We excluded all those banks where the data was not available for the whole term. The central banks were also excluded then we have selected the 400-400 largest European and North American entities according to total average assets and evaluated 184 banks of the V4 countries. The final sample contained only commercial banks.

We were looking for such regression method which allows the analysis of both the cross sectional and time series data, that's why we choose the panel regression method. The panel models take into account the non-observed heterogeneity of the data, can be fixed or random effect, depending on the individual/temporal effects are considered as constant or variable. The regressive relation between the time series with n variable and T period is described by the following equation:

$$Y_{it} = \alpha + b\, X_{it} + \upsilon_i + \varepsilon_{it}$$

where α means constant

Y is the dependent variable

β's are the coefficients

X are the independent variables

$\upsilon_i + \varepsilon_{it}$ are the rezidums

From this we can set the following equation

$$\bar{Y}_i = \alpha + b\, \bar{X}_i + \upsilon_i + \bar{\varepsilon_i} \text{ , ahol}$$

$$\bar{Y}_i = \Sigma_t\, Y_{it}/T_i \text{ , } \bar{X}_i = \Sigma_t\, \bar{X}_{it}/T_i \text{ , } \bar{\varepsilon_i} = \Sigma_t\, \bar{\varepsilon}_{it}/T_i$$

Subtracting the two equation from each other we get:

$$(Y_{it}-Y_i)=(X_{it}-X_i)\,b_i+(\varepsilon_{it}-\bar{\varepsilon_i})$$

This examination was not performed for the whole sample, only the V4 banks were taken into consideration, and only those ones where all examined data were available. Thus our sample number decreased to 46. At the V4's the crisis did not caused a structural fraction in the data, that's why the panel method seemed to be applicable for the analysis. The calculations were done with the usage of the Stata software where we first declared the data as a panel data, and then we ran the two type of regression analysis. We used the Haussmann test in order to decide which one to choose. It examines whether there is a significant correlation between the regressors and the random effect or not. If there is, then the random effect has to be applied, if not the fix effect has to be selected.

In most of the cases the dependent variables were the average return on assets and average return on equity which is confirmed by the literature overview. In case of the independent variables we tried to involve more areas which might have effect on the profitability like the quality of the assets, the equity, the liquidity or the operation. From this reason we selected the following ratios:

- Net Interest Margin
- Total Capital Ratio
- Impaired Loans/Gross Loans
- Other Operating Incomes/Average Total Assets
- Net Loans/Average Total Assets
- Equity/Total Assets
- Equity/Net Loans
- Logarithm of the Total Assets
- Yearly average Inflation
- Yearly GDP Growth

3 Results

3.1 Results of the descriptive statistics

In the first step we are looking for the answer that what kind of changes can be observed in the profitability from 2005 to 2014 in case of the commercial banks of

the V4 countries. For measuring the profitability we used the well-known ratios valuating the income of the shareholders founds, the average return of equity. The other parallel ratio is used for balancing the distortion caused by the differences in the leverage during the usage of the ROAE.
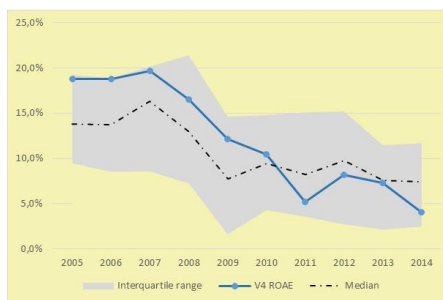

Figure 1.

ROAE weighted by total assets of selected commercial banks of Visegrad countries with indication of interquartile range and median

Source: own calculations based on Bankscope data

As it is shown on the first figure, the V4 banks were quite profitable before the escalation of the financial crisis. It can be also followed that the return of equity went down to 5,2% in 2011 from the pre-crisis level of 19% which can be considered as a 72% absolute decrease. In the same period the return of assets ratio decreased to 0,8% from 1,7% which is a 53% absolute decline. The favorable tendencies of 2012 and the expectations of the recovery temporarily increased both ratios but the last two examined year brought another setback. Examining the different factors it can be concluded that the different development of the two examined profitability ratios is thanks to the decrease of the average leverage.
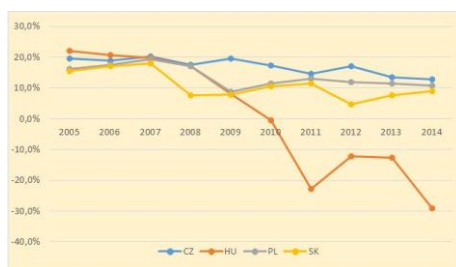

Figure 2.

Average ROAE of selected commercial banks by countries

Source: own calculations based on Bankscope data

The 2nd figure displays the ROAE ratio of the commercial banks by country. In Poland an in the Czech Republic the ratio decreased with one third in the examined years due to the financial crisis. The profitability of the banks after a

heavy fluctuation went down with 42%. In the same time after 2009 the Hungarian decline was so dramatic that it was examined by the researchers of the Hungarian National Bank but probably will be a basis of many future researches.

Lets see the time series of the ROAA country by country.
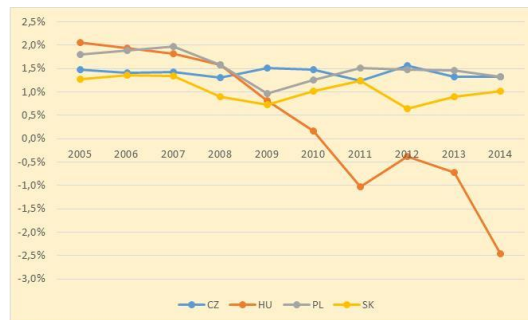

Figure 3.

Average ROAA of selected commercial banks by countries

Source: own calculations based on Bankscope data

On the 3rd figure the nominal change is smaller but the tendencies are similar to the ROAA ratio. The equity based profitability of the Czech banks decreased from 1,5% to 1,3%, in Slovakia it was from 1,3% to 1,0% and in Poland the diminution was 0,3% from 1,8%. More significant was the decline of the equity based profitability of the Hungarian banks where it went down from 2,1% to -2,5%.

It can be concluded that the low performance of the V4 banks was strongly influenced by the Hungarian numbers. It makes it more interesting that the average leverage of the Hungarian banks is increased in the examined period which moderated de decrease of the ROAE with 5%.

In the following steps we extended the scope of the analysis to the North-American and European Union banks in order to see how they fit to the previously presented results. Let's see first the evaluation of the ROAA and ROAE at 177 American banks.
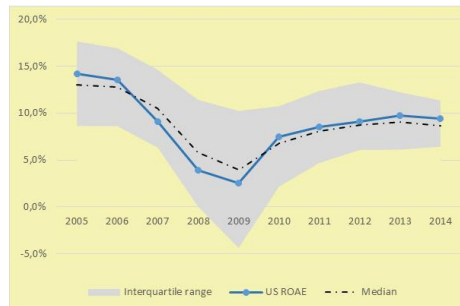
Figure 4.a.
ROAE weighted by total assets of selected American commercial banks with indication of
interquartile range and median
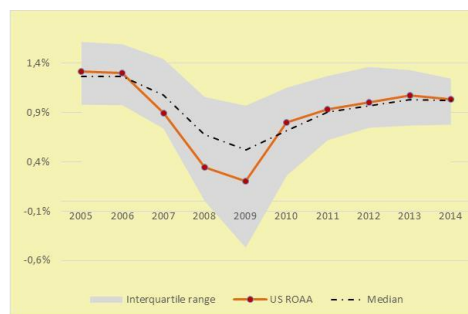Source: own calculations based on Bankscope data

Figure 4.b.
ROAA weighted by total assets of selected American commercial banks with indication of
interquartile range and median

Source: own calculations based on Bankscope data

At the beginning of the examined period the return on equity was 14% (left axis) a bit less than at the V4's. The decline of the profitability starts earlier and the measure is more drastic compared to the V4 banks. In the same time the signs of the recovery also appeared earlier however the 2014 level was 34% lower than before the crisis. The ROAA was also below the values that we have seen on the 1st figure and the decline was more powerful in 2009. The average profitability of the commercial banks was close to zero at the end of 2009 but we have to add that the standard deviation was high in the sample (the lowest value was -9,1%, the highest 8,8%).

The profitability of the Western European banks was examined on a sample of 127 commercial banks; the results can be seen on the 6th figure.
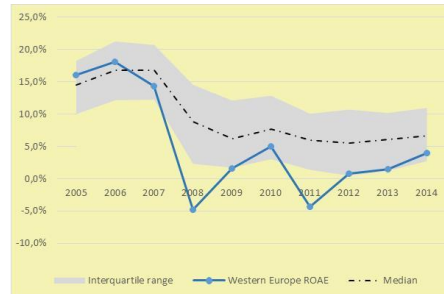
Figure 5.a.

ROAE weighted by total assets of selected Western-European commercial banks with indication of interquartile range and median

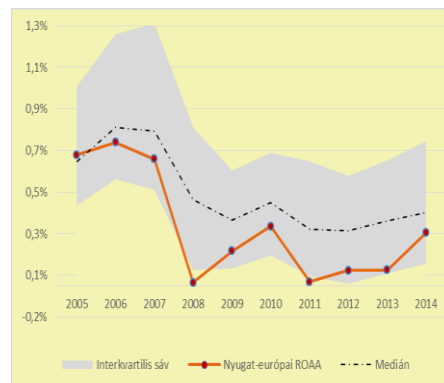Source: own calculations based on Bankscope data

Figure 5.b.

ROAA weighted by total assets of selected Western-European commercial banks with indication of interquartile range and median

Source: own calculations based on Bankscope data

The average of the first 3 years average of equity based profitability was 16,2% slightly higher than in case of the US banks bat lower than the V4 results. The crisis appeared in a much discussed W shape in the region, at the first bottoming in 2008 the ROAE was -4,8% at the second it was -4,3. The end period 4% value is much lower than it was at the beginning. The leverage decreased with 40% in 2014 compared to 2005.
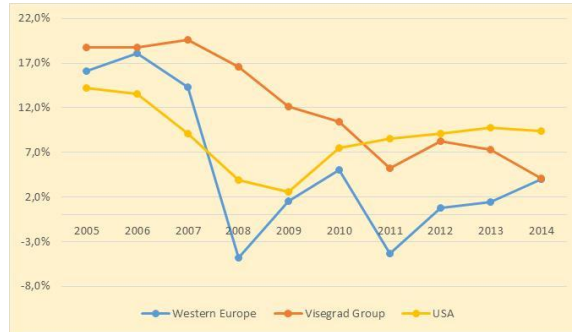
Figure 6.a.

ROAE weighted by total assets at American, Western European and Visegrad Group commercial banks

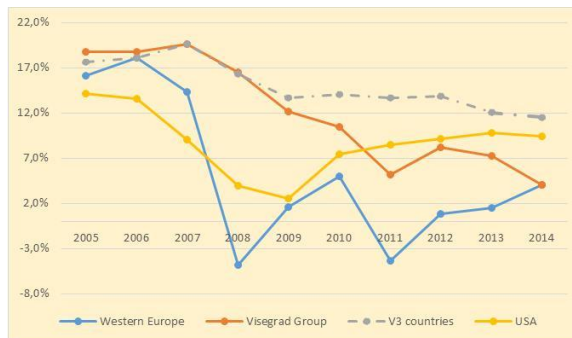Source: own calculations based on Bankscope data

Figure 6.b.

ROAE weighted by total assets at American, Western European and V3 commercial banks

Source: own calculations based on Bankscope data

The 7th figure displays the ROAE of all selected regions. With the usage of the twin figure we tried to highlight the role of the Hungarian commercial banks within the V4's, since the remaining three countries performed better than the US and EU banks.

Of course it cannot be stated that the higher profitability delivers only advantages for the affected economies. But it can be presumed that the shareholders interest is to maintain this position with the extension of the bank activity, technical development and the upgrade of the labor staff. All of this might have directly and indirectly a positive effect on the quality and quantity of the loan portfolio, through this on the development of the whole economy.

3.2 Results of the Panel Regression

During the panel regression two models were performed, one for the ROAA and another for the ROAE dependent variables. According to the result of the Haussmann test, in both cases the fix effect model proved to be better.

The F test was significant in both cases, so we refuse the null hypothesis that there is no relation between the dependent and independent variables.

R2: within = 0.4184 Between= 0.3814 Total= 0.4005			Number of observations 460 Number of groups 46			
Variables	Coefficients	Stand. Err.	t	P>t	[95% Conf.	Interval]
TCR	0,147	0,117	1,26	0,21	-0,0830	0,3771
IMPG	-1,991	0,133	-15,01	0,000	-2,2512	-1,7298
trans9	0,014	0,011	1,22	0,225	-0,0086	0,0364
NLT	-0,050	0,073	-0,68	0,496	-0,1940	0,0942
ETA	0,741	0,301	2,46	0,014	0,1490	1,3340
ENL	-0,035	0,032	-1,09	0,277	-0,0972	0,0279
LNA	2,371	2,006	1,18	0,233	-1,5733	6,3154
INF	1,100	0,335	3,29	0,001	0,4424	1,7576
GDP	0,127	0,204	0,62	0,532	-0,2731	0,5276
_cons	-26,061	30,484	-0,85	0,393	-85,9872	33,8647

R2: within = 0.3991 Between = 0.4497 Total = 0.4242			Number of observations 460 Number of groups 46			
Változók	Koefficiensek	Stand. Hiba	t	P>t	[95% Conf.	Interval]
TCR	0,024	0,011	2,220	0,027	0,003	0,045
IMPG	-0,155	0,012	-12,700	0,000	-0,179	-0,131
trans9	0,001	0,001	0,780	0,436	-0,001	0,003
NLT	-0,016	0,007	-2,410	0,016	-0,030	-0,003
ETA	0,218	0,028	7,830	0,000	0,163	0,272
ENL	-0,013	0,003	-4,320	0,000	-0,018	-0,007
LNA	0,346	0,185	1,870	0,062	-0,017	0,710
INF	0,098	0,031	3,170	0,002	0,037	0,158
GDP	0,021	0,019	1,110	0,268	-0,016	0,058
_cons	-5,042	2,810	-1,790	0,073	-10,565	0,482

Table 1.

Results of the panel regression

Source: Stata 13/own calculations

The total capital ratio proved to be significant and has a positive presage. The high value is not favorably by all means since the higher proportion of the solvency capital can be considered as abstraction of the resources. From many reasons we could think that the high proportion of the capital has positive effect on the profitability. The available capital act as a safety net during the investments

(Athanasoglou et al. 2008), thus the financing of the assets will have also better conditions. According to Berger (1995) the increase of the capital can be a sign which intended to demonstrate the prosperity for the external environment and increase the trust.

The impaired loans/gross loans ratio was significantly negative and means that the bad loan portfolio has an effect on both dependent variables, and the high level of capital reserve has a negative effect on the profitability thus the effect harmonize with the expectations.

The equity/total assets were significant in case of both dependent variables. The direction is positive so the capitalization has a positive effect on the profitability, unlike the equity/net loans ratio which was significant for the ROAA however the change does not modify substantially the value of the dependent variable.

The positive effect of the inflation on the profitability anticipates the good forecasting ability of the bank management. If it's effective, with the modification of the interest rate levels, the incomes can increase faster as the costs which will result is the context explained in the model (Athanassoglou et al, 2005). The positive relation between the profitability and the inflation was proved in more previous studies (Alexiou and Sofoklis 2009; García-Herreto et al. 2009; Pasiouras and Kosmidou 2007).

The net loans/total assets ratio has a negative coefficient in the model, the variable was only significant in case of the ROAA, and the direction slightly goes against the current conclusions since the profitability will grow with the higher amount of debt. According to Garcia and Herrero (2009) the higher operational costs which are caused by the high amount of debt can be balanced by the growth of the profit, till the determination of the interest rates is liberalized.

The explanatory power of the model was higher in case of the ROAE, here 41,8% of the deviations of the profitability were explained by the independent variables. At the ROAA it was a bit lower , 39,9%

Conclusions

Our study tried to demonstrate the profitability influencing factors on the commercial banking sector focusing mainly on the V4 countries. In order to carry on a deep analysis we examined the data of nearly 1000 banks, in the panel regression we involved 46 of them thus it contained 460 observations. The results empirically proved that the significant variables were the same like in the previous studies in the same sector and period. During the process of the data several former context were confirmed for instance the low proportion of the impaired loans has a positive effect on the profitability because the allocative obligation caused by the bad payment behavior can have negative effect on the profitability.

Our study is obviously limited, the conclusions are incomplete. Despite all of this we hope that our study contributed a bit to the understanding of the problem and will help to find a solution.

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