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BANKING SYSTEM STABILITY:COMMERCIAL AND CO-OPERATIVE BANKS

Empirical study

Abstract

Commercial banks and co-operative banks are credit institutions, but there are some differences between the main operations proceeded by each of them. Based on these specific characteristics, we want to identify the manner in which financial crisis affected their activity. As we all know, the financial crisis had a major impact in the United States, the "natal" country of the crisis, because great banks such as Lehman Brothers or Merrill Lynch have bankrupted. Even if the Romanian banking system was not affected by such catastrophic situations, surely the financial crisis had a significant impact on it. We found that co-operative banks are more stable than commercial banks. Even if there is a huge difference between the business scales of these two categories of banks, co-operative banks did not record any losses during financial crisis, while the commercial banks recorded huge loses especially in the second part of the period, 2011-2012. Even if, theoretically, a commercial bank has diversified activities compared to a co-operative bank, this does not mean that the risk is reduced.

Introduction

The world around us is in a permanent change, without taking into account that the humanity has experienced during its evolution various stages of development. Amount of information and facts are increasing over and over in all domains, even in financial and economic world.

We saw that financial world was characterized by a series of structural shifts during the financial crisis from 2008. Important banks and financial institutions(e.g.Lehman Brothers, Merrill Lynch, Wachovia and others) had bankrupted or recorded huge losses.

One of the cause is represented by financial globalization which is able to cause financial instability across the world, and to increase the danger of a major global recession, because this "progressive interaction and integration of economies and societies around the world" (Dilip, 2003, p.12) created international interdependence.

Globalization is one of the most controversial worldwide phenomena, which become today, a universal paradigm explaining the most complex phenomena of the contemporary world, having both positive and negative effects due to the high degree of risk and volatility.

Financial crisis from 2008 released high risk on financial markets, known as systemic risk, which caused a lot of instability on financial and banking sectors.

Over the time, researchers tried to compute the risk recorded on financial market based on several methodologies: Value at Risk, CoVaR (Adrian and Brunnermeier, 2008), expected capital shortfall (Acharya et al., 2012) or Marginal Expected Shortfall.

Going more deeply, when we are referring to banking sector, the starting point in measuring the stability of this sector is represented by Altman research, from 1977, through which he developed a ZETA model in order to calculate the probability of bank's failure.

Over the time, there were several papers which tried to simplify this methodology. The most important one is represented by Mercieca et al. (2007), through which, they developed a more simplified Z-score test. This test is using to compare the banks' financial stability by taking into account three factors: the return on assets, equity to assets ratioand the standard deviation of ROA. A higher value will show us that the bank is more stable, while a lower one can indicate us some problems regarding the financial stability of the analyzed bank.

Through this paper we want to analyze the Romanian banking sector financial stability, by using the Z-score developed by Mercieca et al. (2007), in order to be able to compare the stability of commercial banks with the stability of co-operative banks, to see which type of business is less risky during a period of financial distress.

The paper is organized as follows: the first section presents the main papers which tried to analyze the financial stability of banks and other financial institutions, second section is presenting the methodology used in the article, section 3 outlines the main data and some descriptive statistics of the data used in analysis, section 4 presents the main results of our paper, and the last section is concluding the present research.

1. Literature review

Risk management has a long history. Seven decades ago, Leavens suggested a quantitative method for risk measurement.

Over the time, several authors (Lambadiaris et al. 2003; Sollis, 2009; Davis et al, 2004) have analyzed the most used measure for risk quantification, namely Value at Risk, which can be computed based on three types of procedures: historical simulation, variance-covariance and Monte Carlo simulation.

Other researchers tried to create different types of models in order to estimate the volatility of instruments traded on

financial markets: Autoregressive Conditional Heteroscedasticity model (Engle, 1982) orGeneralized Autoregressive Conditional Heteroscedasticity model (Bollerslev, 1986), which were further developed by other researchers.

As is stated by Altman (2000) one of the most used models for corporation's vulnerability identificationare represented by Z-Score model and ZETA® credit risk model. The author highlights the huge potential of ZETA model in order to analyze the financial stability, not only for corporations, but moreover for financial institutions.

A more simplified measure for assessing the financial stability is represented by the Z-score developed by Mercieca et al. (2007). Through their paper, they analyzed the effect of diversification over the bank's performance, showing that there is no benefit of diversification. Many researchers were interested to see if the risk is different in banking industry, based on each bank specific activity. Regarding this,Lepetit et al. (2008), found that there is no difference in risk diversification between banks which are engaged into large and diversified activities (e.g. commercial banks) compared to banks which are serving few core clients (e.g. co-operative banks or universal banks).

Going further, Groeneveld and De Vries (2009), applied the Z-score to two samples of banks: commercial banks and co-operative banks, in order to quantify the financial stability of these two groups between 2002 and 2007. Based on their results, it seems that the average Z-score is higher for co-operative banks compared to commercial banks, which means that the co-operative banks are more stable compared to the other group.

The same method was also applied by Miklaszewska et al. (2012) for assessing the regulation impact on bank stability for Central and Eastern Europe. Therefore, they showed a sharp decline in bank stability during financial crisis, followed by an increase in Z-score during 2009-2010, increase which can be explained by banks' profit reinvestment over these two years. Moreover, Andries and Capraru (2011), showed that during the period 2004-2008, the Z-score increased continuously for 17 countries from Central and Eastern Europe (including Romania), which means an improvement of bank system financial stability. This can be explained by the process of harmonization of national regulatory framework with the European Union acquis.

According to ihák (2007), Z-score has several advantages, but in the same time disadvantages. The main advantage of this measure is represented by the easily computation for a financial institution or corporation. On the other side, the main disadvantage of this method is represented by the fact that it does not catch the correlation between financial institutions (contagion relation).

Not only in the international economic literature we found researcherswho developed different models in order to assess a bank financial stability, or the probability of bankruptcy, but also we found Romanian researchers, who tried to create several models, as it is stated by Bordeianu et al. (2011).

Through this paper we want to apply the Z-score methodology, and to compare the financial stability of two main important groups of banks from Romania: commercial banks and co-operative banks.

Our paper will be an important contribution to the literature, because we will be able to see more detailed the manner in which evolved the financial stability for Romanian credit institutionsduring financial crisis. Moreover, we will be able to find if the financial crisis had a powerful impact on financial stability of the two analyzed groups.

2. Methodology

In this research we used quarter data, obtained through interpolation based on

annual data. Interpolation is a simplest way to obtain unknown points between two known points. For example, if we have points $A(X_A, Y_A)$ and $B(X_B, Y_B)$ the interpolation for another point $C(X,Y)$ between A and B, is given by the following formula:

$$(1) \quad Y = Y_A + (Y_B - Y_A) \frac{X - X_A}{Y_B - Y_A}$$

In this paper we will use the Z-score, as it was computed by Groeneveld and De Vries (2009). This score is computed based on three main indicators: ROA – return on assets, E/A – equity to asset ratio and the standard deviation of ROA. Based on this score, we will be able to see how many standard deviations of ROA need to change in order to cause an increase in bank's assets over its debts. This Z-score is computed based on formula (2):

$$(2) \quad Z - score = \frac{ROA + \dfrac{E}{A}}{\dagger(ROA)}$$

As Mercieca et al., 2007 stated, a higher Z-scorereveals a more stablebank.

3. Data and descriptive statistics
This paper analysis the financial stability during financial crisis of two main important bank groups: commercial banks and co-operative banks. In order to achieve this, for co-operative banks group, we selected the CreditCoop network, formed by the Central CreditCoop bank with its 17 agencies and other 46 regional co-operative banks from Romania. For the second group, represented by commercial banks, we selected 13 commercial banks, namely: BCR, BRD, Transilvania Bank, Raiffeissen Bank, CEC Bank, UniCreditTiriac Bank, Alpha Bank, Volksbank, Bancpost, Romanian Bank, Piraeus Bank, OTP Bank, and IntesaSanpaolo Bank. These 13 banks have together over 80% of market share of

commercial banks in the Romanian banking sector.

All the data were took from Annual reports, for period 2008-2012, and based on interpolation, we transformed the data into quarterly data.

Descriptive statistics for the main variable used in this paper (asset, equity, net profit, ROA and E/A) are presented in table 1. We can see that the average asset value of commercial banks (273 billion RON) is 350 times greater than asset value of co-operative banks. Even if, the average net profit of co-operative banks is 7 million RON (350 times less than average net profit recorded by commercial banks) we are able to see that the co-operative banks did not record any losses during financial crisis.We cannot say the same about commercial banks, which recorded losses especially in 2011-2012.

The asset, equity and net profit evolution for co-operative banks can be seen in figure 1, while the evolution for commercial banks is presented in figure 2.

If we analyze figure 3, we are able to see that equity to asset ratio is much higher for co-operative banks compared to commercial banks. Moreover, after a period when ROA for commercial banks was higher than ROA for co-operative banks, we see that after 2010, co-operative banks are more profitable than commercial banks. This can be explained based on the losses recorded by commercial banks during 2011-2012.

Based on these variables we were able to compute Z-score, which will be presented in the next section.

4. Results
Using the values for ROA, equity to asset ratio and standard deviation for ROA, we computed the Z-score for both groups: co-operative banks and commercial banks. The evolution of Z-score can be seen in figure 4.

It is not necessary to do a *t*-test in order to check if there is a difference between the average Z-score between these two groups,

because we can see this just by looking to the graph. As we expected, the Z-score is much higher for co-operative banks – 41, compared to commercial banks group, which has an average Z-score of 14. As Mercieca et al., 2007 stated, the higher the Z-score, the more stable is the bank. This means that the co-operative banks are more stable than commercial banks.

Going further, we want to understand the evolution in Z-score during the period 2008-2012. Based on figure 4, we see that there is a sharply decrease in Z-score for co-operative banks until 2009, followed by a slow and consistent increase until 2012. In the same time, after a decrease in Z-score for commercial banks in 2009, it is recorded an increase in 2010 and 2011, when it wasreached a peak of 14.11. But after that it is recorded a rapid decrease until the end of 2012. This decrease can be associated with the losses recorded by commercial banks during this period.

5. Conclusion

Even if commercial banks and co-operative banks are credit institutions, there are some differences between the main operations realized by each of them.

Through this paper we want to see the differences between the manners in which financial crisis affected their activity, and we were able to identify the risk differences between these two types of business.

We obtained similar results as Groeneveld and De Vries (2009), because we found that co-operative banks are more stable than commercial banks. Even if there is a huge difference between the business scales of these two categories of banks, co-operative banks did not record any losses during financial crisis, while the other group represented by commercial banks recorded huge loses especial in the second part of the period, 2011-2012.

Even if, theoretically a commercial bank runs diversified activities compared to a co-operative bank, this does not mean that the risk is reduced.

Further research can be done to find if there is a difference between the financial stability of these two groups of banks for the period before 2008 compared with the period after 2008. Going further, someone can try to understand the main factors which affect the financial stability of these banks.

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Tables and figures

Table 1.
Descriptive statistics for analyzed variable for period 2008-2012

	Variable	Mean	Median	Max.	Min.	St.Dev.
Co-operative banks	Assets	775	790	856	643	72
	Equity	122	122	133	108	6
	Net profit	7	7	13	2	3
	ROA	0.91%	0.89%	1.68%	0.24%	0.41%
	E/A	15.82%	15.48%	17.15%	14.72%	0.82%
Commercial banks	Assets	273,085	280,750	300,078	209,152	25,671
	Equity	27,327	28,149	32,163	19,094	4,149
	Net profit	2,500	2,816	5,646	-1,837	2,047
	ROA	0.97%	1.00%	2.17%	-0.61%	0.80%
	E/A	9.96%	10.03%	10.95%	9.13%	0.68%

Note. The values for assets, equity and net profit are expressed in million RON.
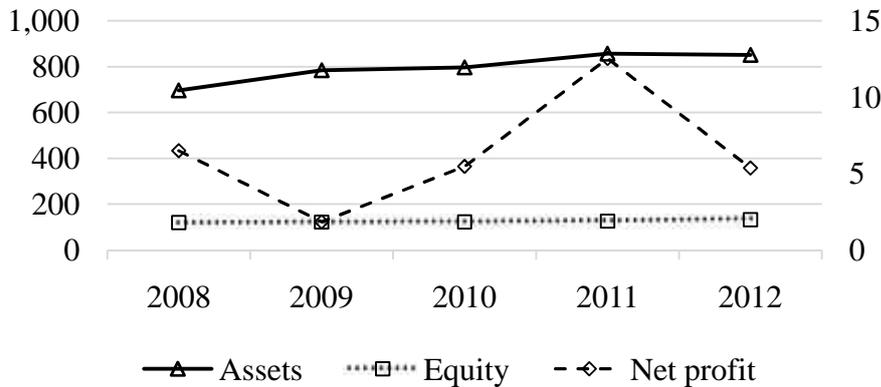

Figure 1.Co-operative banks group: assets, equity and net profit evolution (million RON)
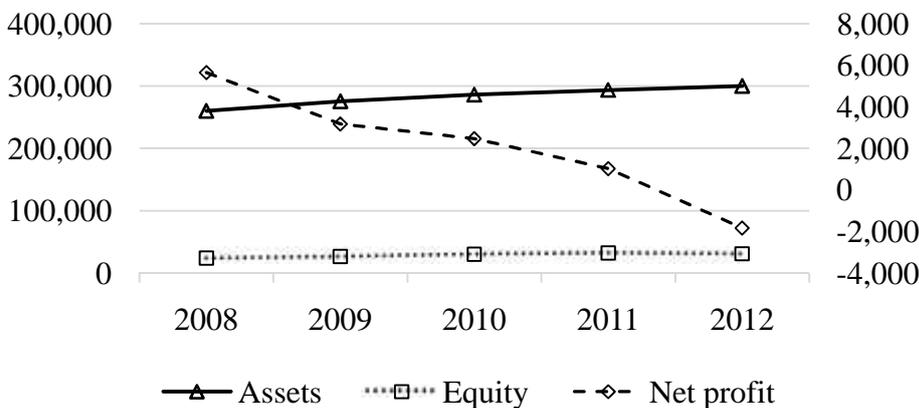
*Figure 2.*Commercial banks group: assets, equity and net profit evolution (million RON)
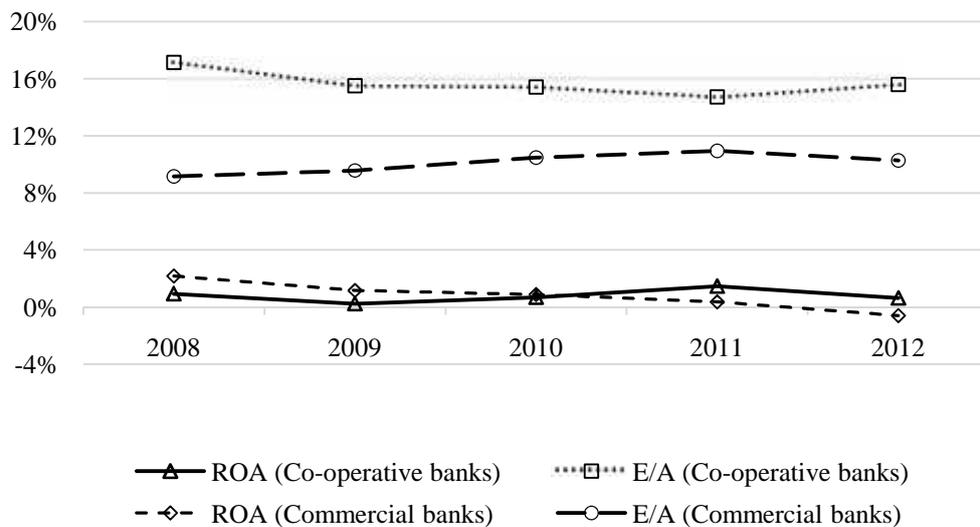

*Figure 3.*ROA and E/A evolution for commercial banks group and co-operative banks group
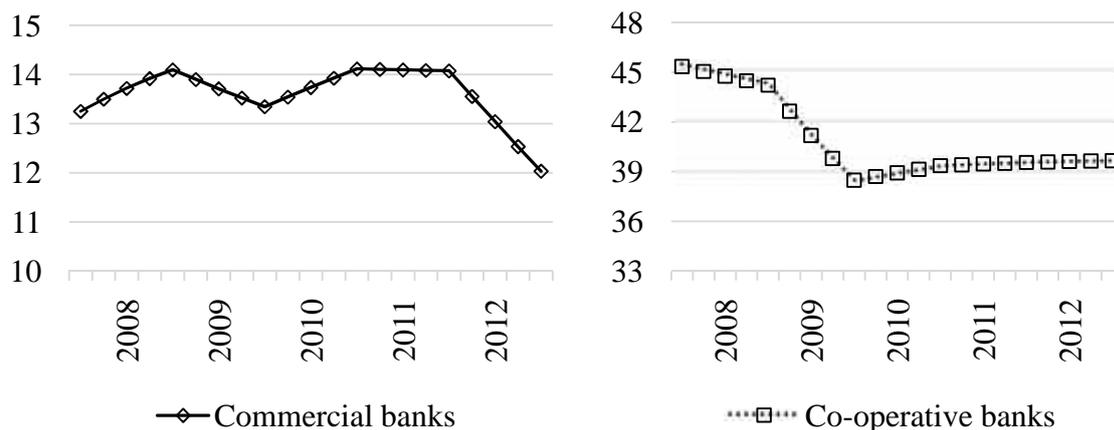

*Figure 4.*Z-score evolution for commercial banks group and co-operative banks group