ASPECTS OF RISK MEASUREMENT IN ROMANIAN BANKING SYSTEM

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Abstract. *Bank risk is a reflection of the probability that during the course of activities involving the credit institution would have adverse effects on its effects may take the form of diminishing profits, loss occurrence, failures in the banking or credit institution bankruptcy. In the paper the authors show how risk measurement in 12 banks in Romania using a system linked to financial ratios.*

Key words: *adequacy, credit risk, operational risk, assets*

JEL: *G21, G24*

1. Introduction

Credit institutions are subject of many types of risk specific to this sector, namely operational risk, credit risk, interest risk, etc.
To have early signs of possible hazards it is necessary to measure each type o risk using a correlate ratios system.
That is why in this paper we show what possible indicators can be used to evidence the banks evolution in the market place in order to prevent the bankruptcy and we measure each type of risk for a group of banks in Romania.

2. Literature review

In order to build a model of balance of financial system some authors have used a system of banks a countercyclical, procyclical or neutral rating scheme. The results indicate that banks would not choose a stable rating approach, which has important policy implications for the design of the Basel Accord. (Catarineu-Rabell, Jackson, Tsomocos, 2005)
Others have tried to show the risks facing the banking system from describe the rating systems of the two main credit rating agencies, Standard & Poor's and Moody's and then they show how an internal rating system in a bank can be organized in order to rate creditors systematically. (Crouhya, Galaib, Marka, 2001)
Other investigate Spanish financial institutions' (FIs') propensity to amend and rectify errors deriving from complaints that financial services' users file with the

Spanish regulator Complaints Service and how this propensity relates to FIs' risk profile. The study finds that FIs with higher amendment ratio are inefficient, have high liquidity, are highly profitable in the banking business and are sensitive to market risk while FIs that tend to rectify errors have lower loan loss provisions booked and have larger loan portfolios (Gambetta, Zorio-Grima, García-Benau, 2015).

In other works it highlights the risks banks using logit models. Thus an article explores how a multivariate logit model of the probability of a banking crisis can be used to monitor banking sector fragility. (Demirgüç-Kunt, Detragiache, 2000)

One of the primary responsibilities of banking regulatory agencies is to minimize the financial loss to the bank to Bank Insurance Fund that results from the failure of insured depository institutions. To discharge this responsibility, bank regulators evaluate the financial performance and condition of depository institutions and initiate prompt corrective actions when they find signs of distress. In evaluation, regulators use a combination of on-site examinations and off-site monitoring systems. (Cole, Gunther, Cornyn, 1995)

Banks play a vital role in the economy of any country and the evaluation of their overall performance is very important. The most common way of measuring financial performance and quality of banks management is calculation of financial ratios and their comparison with benchmarks. If numerous criteria (profits, liquidity, asset quality, risk level, management strategies etc.) are considered simultaneously, the process can be very complex. Different statistical methods that include regression form or production function form are often used for this purpose, as well as the non-parametric operational research method, named Data Envelopment Analysis (DEA). DEA recently became a leading method for measuring and comparing performance of different entities, especially banks. (Mihajlović, Bulajić, Savić, 2009)

Uncertainty over the banks stems from certain assets, loans and trading assets in particular, the risks of which are hard to observe or easy to change. Banks' high leverage, which invites agency problems, compounds the uncertainty over their assets. These findings bear on both the existence and reform of bank regulation. (Morgan, 2002)

Credit ratings provide a measure about the ability and willingness of an issuer to meet its financial obligations. When assigning a credit rating, a rating agency (CRA) takes into account issuer and issue-specific factors, and macroeconomic and market factors, as well as regulatory and legal factors. These ratings are of vital importance to an extensive group of stakeholders, such as investors and regulators. However, in the aftermath of the late-2000's financial crisis, CRAs came under scrutiny for various reasons such as the lack of transparency and potential conflicts of interest. (Louis, Van Laere, Baesens, 2013)

Another study aims to present an empirical model designed to forecast bank credit ratings using only quantitative and publicly available information from their financial statements. For this reason, the authors use the long-term ratings provided by Fitch in 2012. The sample consists of 92 US banks and publicly available information in annual frequency from their financial statements from 2008 to 2011. The results indicate that bank credit ratings largely rely on historical data making them respond sluggishly and after any financial problems are already known to the public. (Gogas, Papadimitriou, Agrapetidou, 2014)

In other works prestigious authors investigated the effects of the financial crisis. One such work studies the impact of the subprime crisis on the ratings issued by the rating agencies in evaluating the solvency of banks. The study designs a methodology to separate the observed change in ratings into two multiplicative components: one associated with the deterioration of the banks' solvency itself and another associated with the change in the agencies' valuation criteria. The methodology is applied to the Spanish Banking System during the period 2000–2009. The results obtained show that the observed lowering of ratings (10.88%) is explained (75%) by the deterioration in the solvency of the banks, but also (25%) by the hardening of the valuation criteria adopted by the agencies. This shows the procyclical character of ratings. (Salvador, Pastor, Fernández de Guevara, 2014).

Although Asia is at the forefront of global economic growth, its investment environment is very risky and uncertain. Credit ratings are objective opinions about credit worthiness, investment risk, and default probabilities of issues or issuers. To classify credit ratings, analyze their determinants, and provide meaningful decision rules for interested parties, this work proposes an integrated procedure. (Chen, 2012)

Bankruptcy prediction models are generally known as modalities of the "dangers" of financial entities. In financial theory are three types of assessment addressed the financial issues namely univariate analysis, multivariate analysis and logit analysis. (Bătrâncea, I., Bătrâncea, L., Stoia, 2013)

2. Method and results

The first is the size of the risk analysis and operational risk lies in the danger of unexpected losses, direct or indirect, as a result of the action of the bank's internal and external factors that affect the proper conduct of its operational activity.

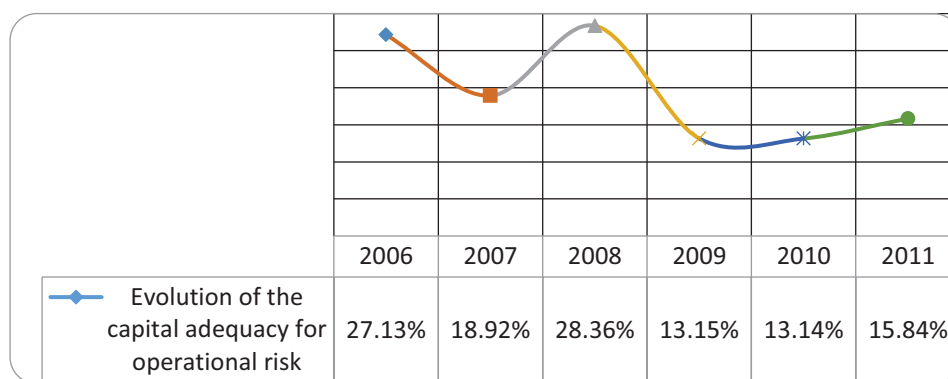|	2006	2007	2008	2009	2010	2011
Evolution of the capital adequacy for operational risk	27.13%	18.92%	28.36%	13.15%	13.14%	15.84%

Figure 1 The evolution of the capital adequacy for operational risk
Source: own calculations based on financial statements of banks analyzed

Operational risk had a decreasing trend in the period 2006 - 2010 falls from 27.13% in 2006 to 13.14% in 2009. Both in 2008 (28.36%) and 2011 (15.84%) recorded slight increases in the indicator.

Credit risk is a measure of the sensitivity of the banking business and has the largest impact on banks' activity because if such a risk occurs (when the interest, credit or both are not repaid at maturity and are repaid in part) payments it might be

delayed or not carried out, which will cause problems implicit cash flow and will affect the bank's liquidity.

In this respect it is important to know the share of overdue and doubtful loans in the total: the loan portfolio; in total bank assets and total equity of the bank.
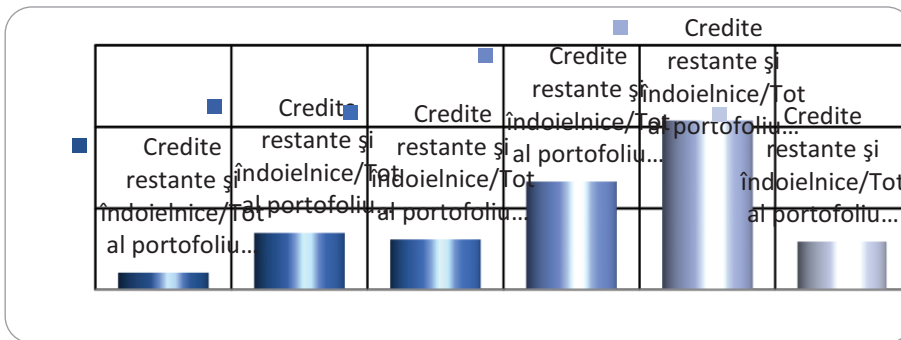

Figure 2 Loans overdue and doubtful loans in the total portfolio
Source: own calculations based on financial statements of banks analyzed

From the chart above you can see an upward trend in the volume of overdue and doubtful loans in the total loan portfolio, the peak being reached in 2010 when it reached 10.39%.
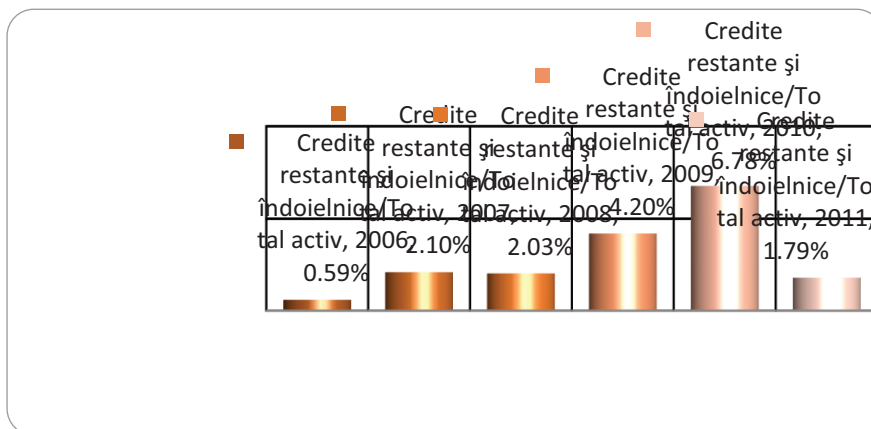

Figure 3 Overdue and doubtful loans in total bank assets
Source: own calculations based on financial statements of banks analyzed

The previous figure can observe the evolution of overdue and doubtful loans in total assets during 2006 - 2011 and that by 2010 this share increases to a level of 6.78%. 2011 brings a drop of up to 1.79%.
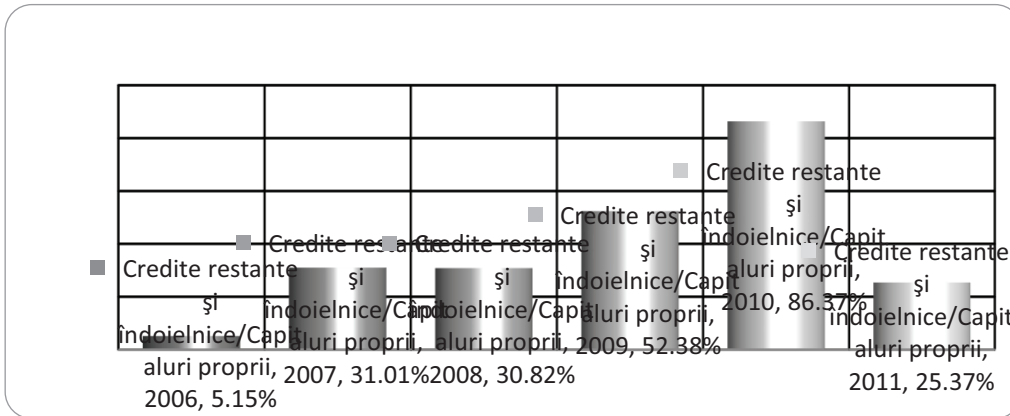
Figure 4 Overdue and doubtful loans into equity

Source: own calculations based on financial statements of banks analyzed

The chart above is an increase of these bad loans until 2010 after which their share is reduced by 2/3, reaching 23.37%. This means that the volume is high enough equity to absorb overdue and doubtful loans.

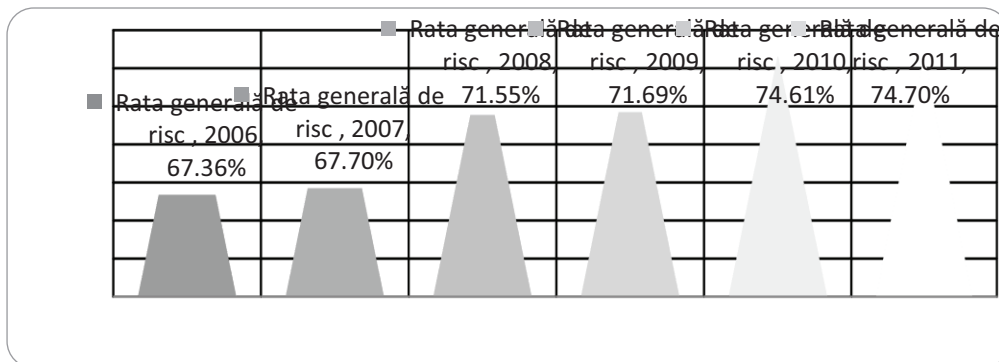An important indicator in assessing bank risk is the overall risk.

Figure 5 General risk ratios

Source: Own calculations based on financial statements of banks analyzed

From the evolution of this indicator we observed an increase from 67.36% in 2006 to 74.70% in 2011, which correlates with indicators of bad loans, and increase the exposure of banks to bankruptcy.

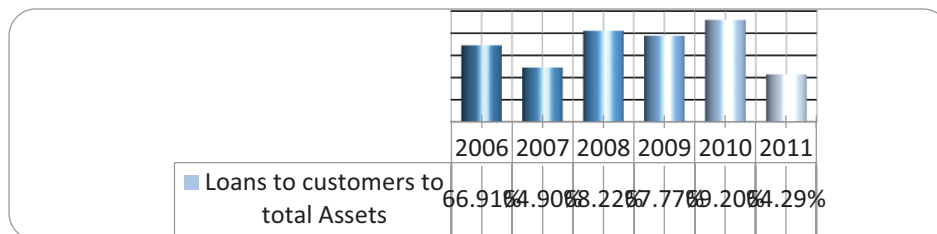|	2006	2007	2008	2009	2010	2011
Loans to customers to total Assets	66.91%	64.90%	68.22%	67.77%	69.20%	64.29%

Figure 6 Loans to customers to total assets
Source: own calculations based on financial statements of banks analyzed

Linking risks they expose a bank can be analyzed by considering loans to customers in total assets and in research conducted random fared during the analyzed period, the largest share of loans in total assets was in 2010.

A major component in analyzing risks in banks is the interest rate risk since attracted interest income is the main source of the bank and its connection with interest paid on bank management performance highlights.

Interest rate movements can lead to major losses and even insolvency of banking companies, so that the interest rate risk analysis must take into account two forms of interest, namely: the interest rate and loan interest liabilities.

A first indicator when this risk is net interest margin. Thus asset-liability management focus on net interest margin (Net Interest Margin - NIM) which expressed in monetary units the difference between interest income and interest expense capitalized assets appropriate.
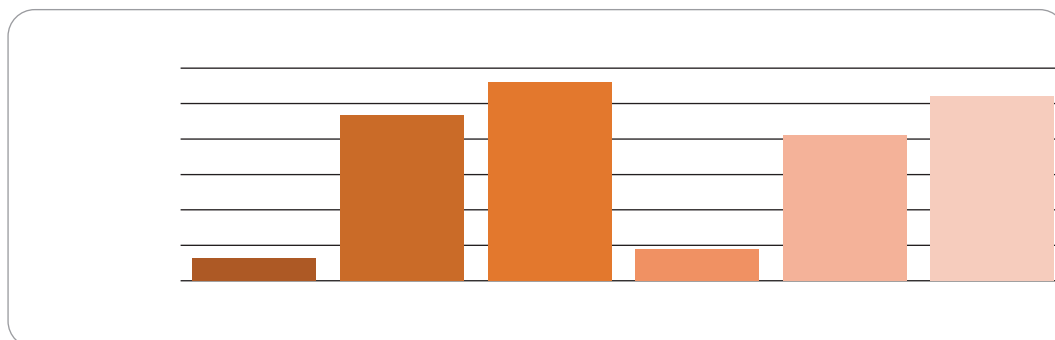

Figure 7 Net interest margin evolutions
Source: own calculations based on financial statements of banks analyzed

Data analysis can be assumed that there is some regularity in the evolution of net interest margin decreased one year followed by two years of growth, around the same absolute values.

Analysis of interest rate risk cannot ignore the GAP Analysis as the credit institution's activity differences may occur in volume between assets that the bank undertakes and the resources they have and on those grounds the credit institution identifies with the aim of establishing a " empty 'interest, the size of portfolios of assets and liabilities to be incurred again.

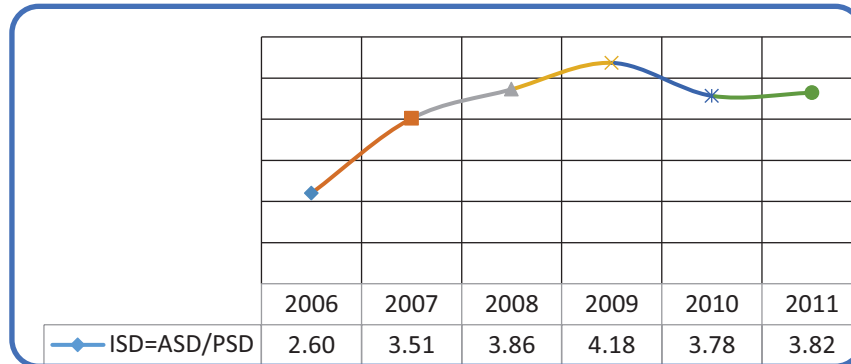|	2006	2007	2008	2009	2010	2011
ISD=ASD/PSD	2.60	3.51	3.86	4.18	3.78	3.82

Figure 8 Evolution of interest rate risk

Source: own calculations based on financial statements of banks analyzed

From the chart above we observe that the interest rate sensitivity is higher than one, which means on the one hand a long interest position and on the other hand a favorable growth and unfavorable interest rate decrease.

An important component of risk in banks is a risk of lack of liquidity. Liquidity is the ability of banks to cover effectively withdrawing deposits and other debts due and to cover cash needs.

A first indicator is the coverage ratio of deposits.

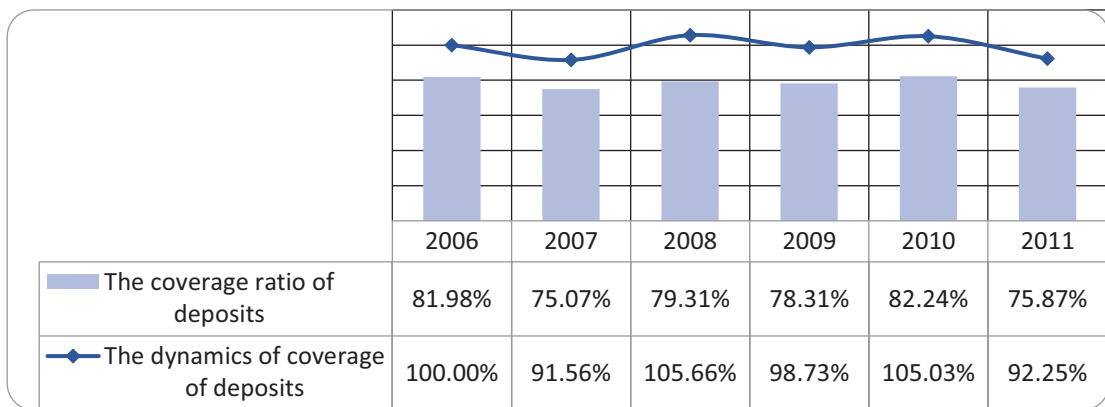|	2006	2007	2008	2009	2010	2011
The coverage ratio of deposits	81.98%	75.07%	79.31%	78.31%	82.24%	75.87%
The dynamics of coverage of deposits	100.00%	91.56%	105.66%	98.73%	105.03%	92.25%

Figure 9 Evolution of the coverage ratio of deposits

Source: own calculations based on financial statements of banks analyzed

Analysis of data from banks in the sample has shown that the actual level of coverage of deposits decreased slightly from 81.98% in 2006 to 75.87% in 2011.

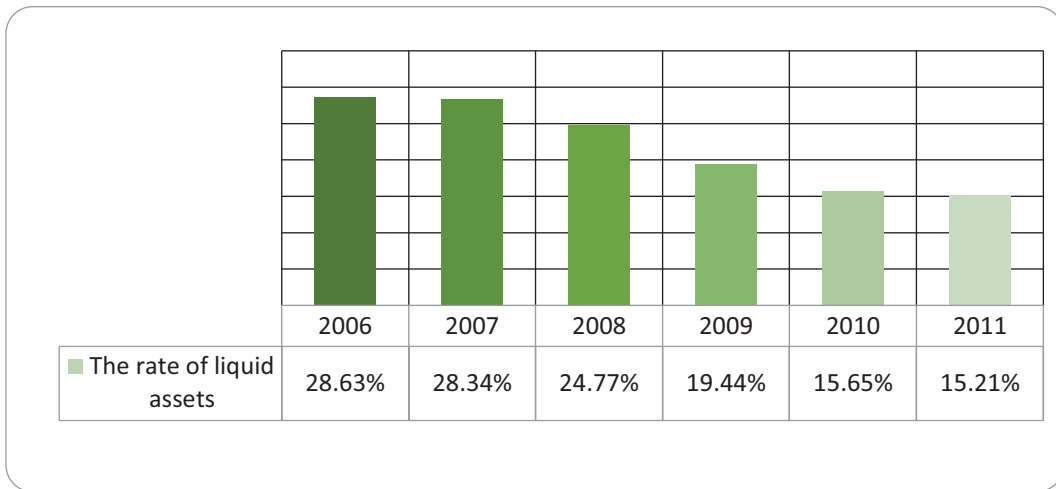|	2006	2007	2008	2009	2010	2011
■ The rate of liquid assets	28.63%	28.34%	24.77%	19.44%	15.65%	15.21%

Figure 10 Evolution of the rate of liquid assets
Source: own calculations based on financial statements of banks analyzed
Indicator analysis showed that the rate of liquid assets in total banking assets, although liquid assets have been decreasing, is still at a significant level during the financial crisis and the sovereign debt crisis that hit the banking system of all countries.

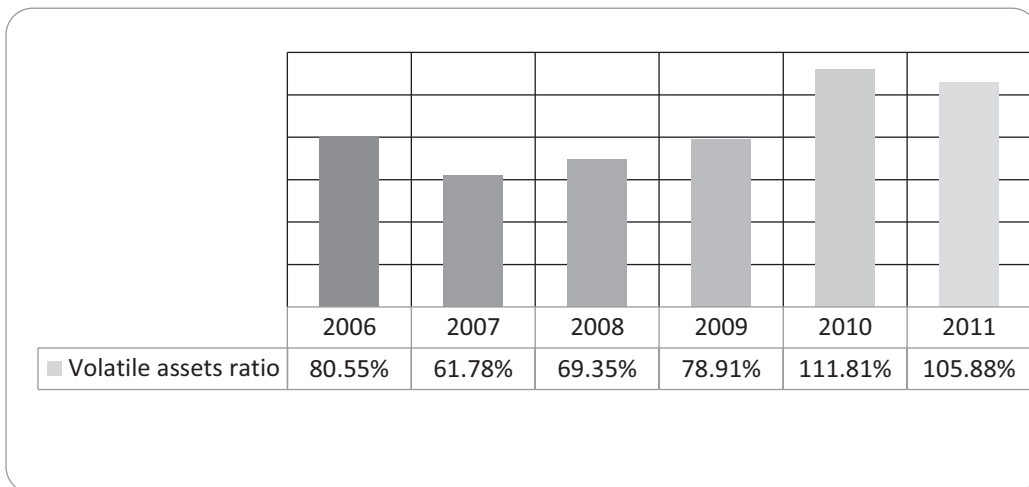|	2006	2007	2008	2009	2010	2011
■ Volatile assets ratio	80.55%	61.78%	69.35%	78.91%	111.81%	105.88%

Figure 11 Evolution of the volatile assets ratio
Source: own calculations based on financial statements of banks analyzed
The financial crisis has had an impact on banks review rate indicator showing the volatile assets which increased from 80.55% in 2006 to 105.88% in 2011 which is a significant risk in providing liquidity banks analyzed.
Market risk is the risk of loss or failure to achieve estimated profits arising from fluctuations in market prices, interest rate and exchange rate.
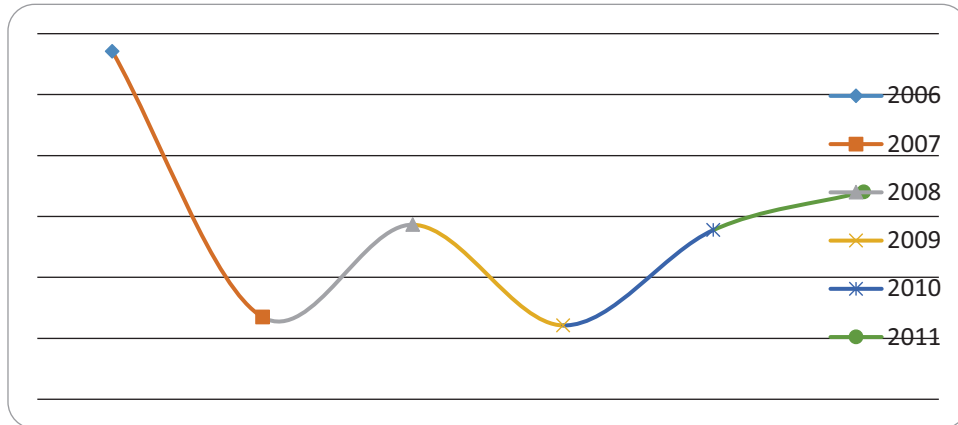
Figure 12 Evolution of the market risk index
Source: own calculations based on financial statements of banks analyzed
During the analyzed period the average market risk was halved compared to the value recorded in 2006 by 5.71%. Market risk decreased in 2007 (1.35%) and 2009 (1.21%) and recorded an average growth trend over the years on end period.

4. Conclusions

The analysis undertaken above is observed the following:
► State banking performance depends primarily on the quality of bank assets;
► Secondly we find that the return on equity has a strong impact on bank performance;
► While bank policies taken in respect of interest and fees are reflected in the bank's performance;
► Not least we find that the return on bank investments both deposits and equity decisively influence the performance of the bank;
► I finally found that too high a degree of exposure to non-bank debt and banking customer can affect performance of state banks.

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