Risk Analysis of the Romanian Banking System – an Aggregated Balance Sheet Approach

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Abstract
The paper presents a risk analysis for the current Romanian banking system. The analysis is conducted from the point of view of prudential rules and also from the point of view of Romanian banking system's exposure to foreign funds, considering the consequences of these features, concerning the soundness and reliability of the banking system. The analysis found a manageable risk level, apparently, although during 2009 and 2010 the expansion of risk indicators was accelerated, but finally, in the late 2010, there are some signs of stabilization. The exposure of Romanian banking system to foreign funds was another important risk source. The exposure to foreign funds had an important decrease during 2009, but in 2010 it seems to stabilize.

Keywords: prudential rules, exposure, Basel accords, capital adequacy, Romanian banking system

JEL Code: G21, E59

1. Introduction

Starting with the last months of 2008, the issues of risk and exposure became very important for Romanian banking system. In the first stage, the international crisis put pressure on financial resources at the level of the international banks and almost instantly over the entire Romanian banking system, because the most of Romanian banks are branches of international banks. Some companies, especially exporters and importers were affected immediately after, by high cuts in their incomes. Then, more or less gradually, the entire economy decreased under the effect of incomes' reduction and increasingly lower demand. Because the roots of the crisis were in the financial field, even Romanian banking system was under strong international influence, it is important to evaluate its current soundness and also its exposure to foreign funds.

On the other hand, this study is significant from the point of view of predisposal of the Romanian banking system to the modern technologies and modern banking procedures. For the purpose of large scale implementation of banking efficient solutions, the reliability of the banking system is crucial. The credibility is an issue that results from the features of the banking system and directly influences its development.

The analysis is focused on the evolution of some key prudential indicators. These risk indicators are mainly provided by National Bank of Romania (N.B.R.) and those which are not provided by N.B.R. are derived from banking system's aggregate balance sheet. The most important between these key indicators is the index of capital adequacy (solvency ratio), which is under the classical constraint of minimum 8%.

The analysis is conducted in terms of aggregate figures and aggregate prudential indicators; and consequently the conclusions address the issues that affect the entire Romanian banking system because the prudential indicators are averages for the entire system. Nevertheless, due to consolidation effect is possible to exist individual banks with lower than average prudential indicators and consequently with vulnerabilities. Although, usually, these indicators can not be much lower than the average, because N.B.R.'s prudential supervisory function doesn't allow for large deviation from the average.

2. Prudential Indicators and Banking System's Aggregate Monetary Balance Sheet

The set of selected prudential indicators used for the purpose of the risk analysis of the Romanian banking system are summarized in Table 1. (Selected Prudential Indicators Relevant for the Risk Analysis of Romanian Banking System).

Table 1. Selected Prudential Indicators Relevant for the Risk Analysis of Romanian Banking System

- % -

		31.12.2008	31.12.2009	30.09.2010
1.	Solvency ratio (Total Equity/Net exposure*) (≥ 8%)	13,76	14,67	14,59
2.	Leverage ratio (Tier-1 Equity / Total average assets)	8,13	7,55	7,89
3.	Total Equity/Total ASSETS (end of period)	10,67	11,97	14,36
4.	General risk ratio**	50,73	47,29	46,27
5.	Overdue and doubtful loans (net value)/ Total credit portfolio (net value)	0,32	1,45	2,67
6.	Total past-due and doubtful claims (net value)/ Total assets (net value)	0,29	1,01	0,52
7.	Credit risk ratio***	6,52	15,29	20,24
8.	Non-performing Loans Ratio****	6,48*****	7,89	11,67
9.	Proportion of domestic deposits in total liabilities	49,74%	53,33%	50,65%
10.	The degree of external financing for domestic assets (the percent of domestic assets financed by net foreign liabilities)	29,19	23,57	24,04
11.	Liquidity ratio (Effective liquidity/ Required liquidity)	247	138	138

Source: Data were collected and computed from N.B.R.'s Monthly Bulletins (Oct 2010, Dec 2009 and Dec 2008) [9], [8], [7].

** Net exposure is the sum of balance sheet assets and off-balance sheet items, weighted by the degree of credit risk.*

*** General risk ratio is the ratio between sum of balance sheet assets and off-balance sheet items, weighted by the degree of credit risk and the total book value of balance sheet assets and off-balance sheet items.*

**** Credit risk ratio is the ratio between gross exposure related to non-bank loans and interest under "doubtful" and "loss" and total loans and interest classified related to non-bank loans, excluding off-balance-sheet items.*

***** Non-performing loans ratio is the ratio between gross exposure of non-bank loans and interest classified as loss 2, that is overdue more than 90 days and/or for which legal proceedings were initiated against the debtor or against the operation and total classified non bank loans and related interest, excluding off-balance-sheet items.*

****** The first data available are since September 2009.*

Mainly these ratios are computed and presented by N.B.R., in monthly N.B.R. bulletins, but some of them are derived based on the Aggregate balance sheets of other financial institutions (credit institutions and money market funds) for 2008, 2009 and the last closed month of 2010 (Oct 2010). Balance sheet of the central bank is not included in the aggregate monetary balance sheet of other monetary financial institution because the analysis is focused on the risks that affect commercial banks in the system and the positions of the balance sheet of the central bank are not relevant for this purpose.

These data are enough relevant to draw an overview picture of the Romanian banking system and of its evolution during this period affected by a sharp decrease of economic activity (see Table 2. Aggregate Monetary Balance Sheet of Other Monetary Financial Institutions - Assets and Table 3. Aggregate Monetary Balance Sheet of Other Monetary Financial Institutions - Liabilities), but also provides necessary information for more detailed analyses.

Balance sheet's captions are expressed in RON, because the primary analysis is done in terms of ratios. Absolute values of are not involved and consequently there isn't any significance to convert these figures in EUR, at this level.

Table 2. Aggregate Monetary Balance Sheet of Other Monetary Financial Institutions (Credit Institutions and Money Market Funds) - Assets

- million RON -

Assets	**31.12.2008**	**31.12.2009**	**30.09.2010**
Cash and other payment means	1.858,0	1.331,5	1.418,1
Loans (including deposits taken)	3.965,1	10.042,7	7.127,1
Marketable securities other than shares	735,2	983,3	1.580,4
Money market fund shares/ units held by credit institutions	10,1	7,6	110,6
Shares and other equity held by credit institutions	341,1	415,7	490,6
Foreign assets	**6.909,5**	**12.780,8**	**10.726,8**
Cash and other payment means	3.734,0	3.533,7	3.152,6
Loans (including deposits taken)	285.248,9	280.053,1	276.714,0
Marketable securities other than shares	11.217,7	35.719,2	44.334,5
Money market fund shares/ units held by credit institutions	146,3	179,2	191,0
Shares and other equity held by credit institutions	1.103,4	1.318,6	1.511,0
Fixed assets	10.349,1	9.758,5	10.021,6
Other assets	21.140,4	22.931,9	23.858,4
Domestic assets	**332.939,8**	**353.494,1**	**359.783,2**
Total ASSETS	**339.849,3**	**366.274,9**	**370.510,0**

Source: Data were collected and computed from N.B.R.'s Monthly Bulletins (Oct 2010, Dec 2009 and Dec 2008) [9], [8], [7].

Table 3. Aggregate Monetary Balance Sheet of Other Monetary Financial Institutions (Credit Institutions and Money Market Funds) - Liabilities

- million RON -

Liabilities	**31.12.2008**	**31.12.2009**	**30.09.2010**
Overnight deposits	5.750,4	7.556,0	6.996,6
Time deposits (including loans)	97.480,7	87.708,5	88.602,4
Deposits redeemable at notice	10,5	10,5	10,5
Reverse repos	-	101,9	827,2
Deposits	**103.241,6**	**95.376,9**	**96.436,7**
Marketable securities other than shares issued by credit institutions	858,0	735,4	758,0
Nonresidents shares/units issued by money market funds			16,8
Foreign liabilities	**104.099,6**	**96.112,3**	**97.209,4**

Liabilities	31.12.2008	31.12.2009	30.09.2010
Overnight deposits	74.979,6	62.724,2	61.940,0
Time deposits (including loans)	93.866,9	123.358,6	124.534,4
Deposits redeemable at notice	-	-	-
Reverse repos	192,2	9.235,1	1.179,1
Deposits	**169.038,7**	**195.318,0**	**187.653,5**
Marketable securities other than shares issued by credit institutions	312,3	137,7	359,9
Nonresidents shares/units issued by money market funds	353,1	1.796,4	2.998,7
Capital and reserves (total equity)	36.269,2	43.831,4	53.222,9
Other liabilities	29.776,2	29.079,1	29.065,7
Domestic liabilities	**235.749,5**	**270.162,6**	**273.300,6**
Total LIABILITIES	**339.849,3**	**366.274,9**	**370.510,0**

Source: Data were collected and computed from N.B.R.'s Monthly Bulletins (Oct 2010, Dec 2009 and Dec 2008) [9], [8], [7].

3. The Procedure Used for the Analysis

The analysis is derived from basic CAMELS model [3], [4], developed by U.S. regulators as a mean of evaluation and rating, for individual banks. The name CAMELS is an acronym for the issues evaluated:

- Capital adequacy
- Assets quality
- Management structure
- Earnings (or profitability)
- Liquidity and funding
- Sensitivity to market risk

Obviously the order of the initials does not account for the importance of the risks areas evaluated.

In this paper the CAMELS approach is used for the analysis of the entire banking system. Some of the CAMELS issues are difficult or even impossible to be evaluated at the level of the entire banking system. That is why in this study some CAMELS issues, like earnings and sensitivity, are more or less ignored; and the management issue is partly approached only qualitatively.

The first three selected key indicators (indicators no. 1 to 3) evaluate the capital adequacy, from which solvency ratio is subject of constraints imposed by Basel accords. Both accords, Basel I and Basel II, have kept the same constraint of minimum 8%, related to the solvency ratio [5]. Besides, the new accord Basel III, which is work in process, keeps the same provision of 8% minimum total capital, but introduces an additional requirement of 2,5% capital conservation buffer in the form of common equity and a countercyclical buffer within a range of 0%-2,5% of common equity or other fully loss absorbing capital will be implemented according to national circumstances [6]. Nevertheless, these are still gradually targets, to be fully met in the year 2019. The basic approach of the constraint related to solvency ratio is to adapt the equity to the risk at the level of the banking system. Therefore, the exposure is quantified based on assets risk weighting approach [1]. The analyzed indicators, for Romanian banking system, reflect no risk in this area and exceed even the target of Basel III accord for 2019, including the full countercyclical buffer.

The next five indicators (indicators no. 4 to 8) are focused on the assets' quality in the Romanian banking system. These indicators evaluate risks involved by assets. Even if risks are implicitly involved by earning a return, nevertheless the quality of any bank's assets depends on their ability to be collected until or at the maturity [2]. The aggregate prudential indicators used to evaluate the quality of assets in the entire banking system reflect the aggregate portfolio quality. The indicators are based both on the liquidity and on the maturity structure of various assets and reveal a significant quality depreciation of the loans and receivables portfolio at the level of Romanian banking system. Nevertheless, levels of doubtful receivables are not quite very alarming. What was really alarming was the quickly decreasing evolution of some of these indicators, especially in 2009. The depreciation of assets' quality during the last year (2010) seems to be mainly determined by the increase of delay periods for the already overdue receivables, because the rate of new delays seems to be decreasing. After all, this seems to be the first sign of a stabilization of the assets' quality depreciation for the Romanian banking system.

Management structure is a qualitative variable, difficult to be quantified and it is related to ownership structure, branch network and specific banking policies that can differ substantially between banks. In this workpaper is only analyzed the ownership structure of the Romanian banking system, because the branch networks and banking policies are quite different between the banks (see Table 4. Ownership Structure's of Romanian Banking System), nevertheless, based on number of bank branches at 100.000 inhabitants Romanian banking system is substantially under European average [10].

Table 4. Ownership Structure's of Romanian Banking System

- number -

	31.12.2008	**31.12.2009**	**30.06.2010***
Banks with domestic majority state-owned capital	2	2	2
Banks with domestic majority private capital	3	4	4
Banks with majority foreign capital	27	25	26
Foreign banks branches	10	10	9
Total banking system	**42**	**41**	**41**
Creditcoop	1	1	1
Total credit institutions	**43**	**42**	**42**

Source: Data were collected and computed from N.B.R.'s Monthly Bulletins (Dec 2009 and Dec 2008) [8], [7] and from Financial stability report, 2010 [10].
**Data are available only for Jun 2010.*

Looking to the ownership structure of the entire banking system, from the point of view of number of banks, this approach reveals that Romanian banking system is mainly foreign owned. Even if is somehow attenuated, this conclusion is still confirmed by the proportion of foreign capital in Romanian banking system (see Table 5. Capital Structure of Romanian Banking System).

Table 5. Capital Structure of Romanian Banking System

- % -

	31.12.2008	**31.12.2009**
Banks with fully or majority state-owned capital	11,4	12,2
Banks with majority private capital (including foreign bank branches) and Creditcoop, *of which:*	88,6	87,8
Majority foreign-owned banks, *of which:*	77,2	76,5
Foreign banks branches	6,0	3,9
Total credit institutions	**100,0**	**100,0**

Source: Data were collected and computed from N.B.R.'s Monthly Bulletins (Dec 2009 and Dec 2008) [8], [7].

This ownership structure reflects that more than three quarters of Romanian banking system capital's is owned by foreigners. This exposure generates an important risk related to the linkage with international banking system and consequently important managerial decisions in the private Romanian banking system can be influenced by international conjunctures or even subordinated to interests that are primarily focused on other foreign markets.

Under the CAMELS approach, to complete the risk analysis, at the level of one bank, this involves also analysis of earnings or profitability. The issue of earnings is important from the point of view of ability of a bank to increase capital (through retained earnings), to absorb loan losses, to support the future growth of assets and to provide a positive return to investors, as an incentive to maintain their investment. Actually in this analysis the issue of earnings was ignored because of the lack of reliable aggregated updated data and also because is not very significant, as long as banks have different results depending on their policies related to the risk taken. Nevertheless, considering the fact that capital includes earnings, the analysis of capital adequacy indirectly covers partially the issue of earnings. Actually, considering the highly decreasing evolution of the economic environment during the analyzed periods the capital increase's (see Table 5. Aggregate Monetary Balance Sheet of Other Monetary Financial Institutions - Liabilities) reflects manageable losses of Romanian banking system during this period.

The next issue to be considered in the risk analysis of an individual bank, under CAMELS approach, is the issue of liquidity and funding. The liquidity and funding are related, but the issue of funding is more adequate to be evaluated at the level of individual banks because can differ substantially between banks, depending on the funding policies. Nevertheless, based on the fact that the cheapest and soundest way to generate resources in the banking system is to attract domestic deposits, the proportion of domestic deposits in the banking system's liabilities is evaluated (indicator no. 9) and resulted that only about half from the resources of the banking system are domestic deposits. The rest of the resources are not so stable, like domestic deposits, consequently there is a vulnerability of Romanian banking system related to funding structure. Therefore, the next step is to evaluate the foreign exposure (indicator no. 10). This indicator reveals a significant exposure to foreign funds. Nevertheless, the liquidity ratio (indicator no. 11, as it is provided by N.B.R. reports) is still comfortable.

Finally, CAMELS model for analysis and rating of individual banks approaches the issue of sensitivity to market risk. At the level of individual banks, the evaluation of sensitivity can be done through application of stress tests. But at the level of the entire banking system this approach, even it would be useful, is almost impossible to be done. The portfolios of individual banks can have different reactions to different market risks. Therefore, besides technical difficulties, a sensitivity analysis of the aggregate banking system is not very relevant.

Based on the analysis under CAMELS model the most significant risk affecting Romanian banking system consists in their exposure to foreign liabilities. This is confirmed by the Vienna agreement signed by nine international banking groups active on Romanian market, covering more than 70% from the assets from Romanian banking sector (March 2009) [11], with the purpose to avoid possible effects of this risk by maintaining their exposures to Romanian market. The evolution of foreign liabilities is reflected in the aggregate monetary balance sheet of other monetary financial institution (credit institutions and money market funds). Balance sheet of the central bank is not included in the analyzed aggregate monetary balance sheet of other monetary financial institution because this approach intends to evaluate the exposure of the banking system, excluding central bank, whose exposure is negligible. Conclusions of the foreign exposure analysis of Romanian banking system are presented at the end of paper.

4. Main Conclusions of the Analysis

Although, there is a small decrease of solvency ratio during the first nine months of 2010, the equity adequacy of Romanian banking system is sufficient and exceeds the minimum requirements. Current level of total equity is with 6,59% (14,59% - 30.09.2010) over 8% limit set by Basel I accord, maintained by Basel II accord and with 1,59% over the expected full provisions of future Basel III accord to be fully met in 2019(including additional requirement of 2,5% capital conservation buffer and also the variable requirement of 2,5% countercyclical buffer of common equity). Leverage ratio (Tier-1 Equity / Total average assets) also exceeds both current (4,5%) and expected condition (6%). Besides, the ratio between total equity and total assets substantially increased (from 10,67% in 2008 to 11,97% in 2009 and then to 14,36%, in Sep 2010), especially during the 2010's months, which reflects equity increases made by banks under the N.B.R. regulations, aligned with Basel II provisions, due to increased value of loans classified as not standard (loans classified as watch, substandard, doubtful and loss). Actually, because of constraints imposed by deterioration of loan portfolios, the equity increased more quickly than assets, at the level of the entire banking system. The same conclusion, of decreasing quality of loan portfolios in the Romanian banking system, is confirmed by the small reduction of solvency ratio, in 2010, even if the equity was significantly increased during this period. Nevertheless, the overall risk level of the banking system is under control (general risk ratio is less than 50%) and it is decreasing. Consequently, this means that the deterioration of loan portfolios is not impossible to be managed.

Leverage ratio has decreased, but not significantly, probably because the losses recorded under retained earnings in tier-1 equity at the level of banks, which determined a lower increase of tier-1 equity than the average assets. Also, it is possible that the equity increase to be done by increase tier-2 equity (probably subordinate loans were used).

The key prudential indicators which quantify the share of overdue and doubtful loans and past-due and doubtful receivables are not quite at very alarming levels, but their evolution was explosive in 2009 (353% and 248%). In 2010 the evolution of overdue and doubtful loans was still accelerated (84%), but the share of the past-due and doubtful receivables decreased (-49%), which can be considered a sign of stabilization.

The liquidity ratio decreased accelerated under 2, in 2009 (it decreased by 44%, from 247%), but after that remained almost stable at 138%. Although substantially decreased, this indicator still reflects a relatively reduced liquidity risk.

Finally, the significant risk revealed by the analysis related to Romanian banking system foreign exposure is analyzed. Based on the positions of Aggregate Monetary Balance Sheet of Other Monetary Financial Institutions (National Bank of Romania not included), the exposure to foreign financing was significant (29,19%) in 2008. Then, in 2009, decreased sharply to 23,57% and stabilized in 2010 (Sep 2010 - 24,04%). This current level still reflects a high domestic economy dependence on foreign savings and consequently a deficit of domestic saving and a risk affecting domestic banking system, involved by this exposure.

This evolution of this exposure was determined by the decrease of foreign liabilities more quickly than the increase of foreign exchange rate (RON/EUR).

Table 6. Foreign Exposure of Romanian Banking System

- million EUR -

	31.12.2008	31.12.2009	Diff.	30.09.2010	Diff.
Foreign exchange rate (RON/EUR)	*3,9852*	*4,2282*		*4,2674*	
Foreign liabilities (1)	26.121,55	22.731,26	-3.390,29	22.779,54	48,28
Foreign assets (2)	1.733,79	3.022,75	1.288,96	2.513,66	-509,09
Foreign liabilities, net (1)-(2)	24.387,76	19.708,50	-4.679,26	20.265,88	557,37

Source: Data were collected and computed from N.B.R.'s Monthly Bulletins (Oct 2010, Dec 2009 and Dec 2008) [9], [8], [7].

Therefore, net foreign liabilities denominated in EUR, converted using N.B.R. foreign exchange rates, substantially decreased during 2009 (see Table 6. Foreign Exposure of Romanian Banking System). Later, during the first nine months of 2010, the increase of net foreign liabilities was mainly due to the decrease of foreign assets and reflects a stabilization of foreign liabilities, after their sharp decrease. Summarizing, the decrease of about 4.7 billion of foreign liabilities, in 2009, reflects only a part of decrease of the financing granted by foreign entities to Romanian banking system, another part which is not so transparent was compensated by the increase of foreign exchange rate. Nevertheless, this risk is limited by the provisions of the Vienna agreement [11] which substantially mitigated this risk since April 2009. In 2010, is observable even a slightly increase of gross foreign liabilities.

Acknowledgements: This work was supported by CNCSIS – UEFISCSU, project number: PNII – IDEI 1852/2008, contract number: 957/2009.

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