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SYSTEMIC RISK IN BANKING: NEW APPROACHES UNDER THE CURRENT FINANCIAL CRISIS

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Abstract

In the context of the current financial crisis, the stability of the financial system becomes a priority on the agenda of the national monetary authorities. Since "systemic risk" is widely accepted as the fundamental underlying concept for the study of financial instability, this paper attempts to highlight the new dimensions of the concept in the pursuit of effective crisis management. Today, the potential for increased systemic risk is particularly related to combinations of structural trends. The increasing use of credit risk transfer (CRT) instruments and other financial innovations have changed the nature of systemic risk in banking activity. Moreover, as banks have become broad-based financial institutions engaging in a full spectrum of financial services including investment banking, brokerage services, asset management or proprietary trading, their risk exposures have become considerably more complex and interdependent. Thus, the risk of bank failure triggering a chain reaction and generating negative externalities for the whole financial system is significantly grown. Consequently, there is a stringent need for appropriate regulation and for macro-prudential supervision.

Keywords: systemic risk, financial innovation, contagion effects, CRT instruments, shadow banking system

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Introduction

The financial crisis 2007-2008 has changed the dimensions under which systemic risk in banking is analyzed and inducts the necessity of new risk management instruments. The current context of the global financial system reveals the fact that the quantitative measures of risk have underestimated systemic risk. Financial innovation and the rising opacity of financial markets have amplified the systemic risk.

Even if Basel II intended to provide a more consistent and transparent framework for evaluating systemic risk in the banking system (trough credit cycles), this risk has not been reduced because regulators focused most on the microeconomic risk. There is a fundamental difference between idiosyncratic risk and systemic risk, a difference which has been neglected both by regulators and U.S. bankers.

At the moment, an appropriate assessment of systemic risk is a crucial challenge for re-establishing supervisory and regulatory frameworks, since systemic risk was the "mobile" that transformed the U.S. crisis into a global one.

This paper is structured as follows. In Section 1, I discuss the traditional sources of systemic risk, as a necessary background and link to Section 2, where I analyze the new dimensions of systemic risk under the current financial crisis. In Section 3, I analyze the systemic risk in the banking activity of Romania and the last section concludes this paper.

1. Traditional approaches of systemic risk in banking

According to Kaufman (1995), systemic risk is the probability that cumulative losses will accrue from an event that sets in motion a series of successive losses along a chain of institutions (typically, banks) comprising a system. That is, systemic risk is "the risk of a chain reaction of falling interconnected dominos". The cause of this happening should be the illiquidity or insolvency of a large bank.

Another definition that emphasizes the correlation with causation, requiring direct and close connections among institutions is the definition given by the Bank for International Settlements (BIS 1994): "the risk that the failure of a participant to meet its contractual obligations may in turn cause other participants to default with a chain reaction leading to broader financial difficulties". This *"knock-on" reaction* is caused by direct financial exposures among firms. For example, if bank A defaults on a loan, deposit or other payment to bank B, which produces a loss greater than bank B's capital and forces it to default on a payment to bank C, generating a loss larger than bank C's capital, and so on down the chain (Crockett, 1997). In brief, the smaller a bank's capital-assets ratio is (the more leveraged it is), the more likely it is to be driven into insolvency by other bank insolvencies on the transmission chain.

An approach that does not involve direct causation, requiring weaker interconnections, emphasizes similarities in third-party risk exposures among the units involved and it is referred to as a "common shock" effect (Kaufman, 2000). When one unit experiences an adverse shock that generates severe losses, in order to minimize additional losses, market participants will withdraw funds from the units which have a similar risk exposure profile with that of the initial unit. One example of "common shock" is the 11th of September 2001 event.

Traditionally, systemic risk in banking regarded two primary channels for bank contagion: the exposure channel and the informational channel (Saunders, 1987). *The exposure channel* refers to the potential for "domino effects" through real exposures in the interbank markets and payment systems, whereas *the informational channel* relates to contagious withdrawals

by the imperfectly informed depositors who ignore the type of shocks hitting banks and their physical exposure to each other (de Bandt and Hartmann, 2000). Because this information is not available immediately, accurately or free, participants will transfer their funds to safer units with the tendency to adjust their portfolios in quantities rather than in prices (interest rates). That is, they will not lend at any rate, generating a run to quality of units that appear potentially at risk.

Scholars (Kaminsky and Reinhart, 1998) also make distinction between rational or information-based systemic risk and "pure" contagious, random or non-information based systemic risk. Random contagion does not differentiate between parties, affecting both "guilty" and "innocent" parties. The degree of guiltiness/innocence is measured by the levels of solvability and leverage.

Essentially, any asset portfolio is a financial network. Likewise, the balance sheet of a bank is a network with nodes defined by the assets and links defined by the correlations directional lending relationship among those assets (Lazarov, 2009). Similarly, the financial system is a network, with nodes defined by the financial institutions and links defined by the financial interconnections between these institutions. Since this network faces unavoidably many uncertainties, identifying, pricing and managing balance sheet risk becomes a very difficult task for risk managers.

2. Systemic risk in the *shadow banking system*

In 1999, important provisions of Glass-Steagall Act, prohibiting a bank holding company form owning other financial companies, were repealed. As a consequence, banks have made use of ambiguous and poor regulations to develop the non-regulated sector – their own non-bank financial institutions (NBFI), independent entities – and thus, creating a *shadow banking system* (Dăianu, 2008). Between 2000 and 2008, these non-bank financial institutions have come to play an important role in providing credit across the global financial system.

The *shadow banking system* comprises entities that do not accept deposits and therefore they are not subjects to the same regulations as depositary banks, such as investment banks, hedge funds, SIVs (structured investment vehicles), mutual funds, insurance companies, pension funds and various broker/dealers and other related intermediaries. What made these entities vulnerable was the fact that they borrowed short term in liquid markets to purchase long-term, illiquid and risky assets, being also highly leveraged.

Together with the *shadow institutions* and financial and technological innovation, a new market has developed – the market for derivatives and structured products. In this context, banks created Credit Risk Transfer (CRT) instruments through which banks could transfer credit risk in the financial system, such as loan securitisations, Credit Default Swaps (CDS) and Collateralized Debt Obligations (CDOs). The effects of such products on systemic risk accrue from the fact that derivatives can be used to create unlimited amounts of risk, risk that did not exist before the two parties entered into the transaction. Then, derivatives can be used to negate risks that parties were already exposed to in exchange for assuming other risks, thereby acting as a risk-transferring device. According to Nijskens and Wagner (2008), banks undertaking CRT activities may be individually less risky, but actually they are posing a greater risk for the financial system, as a whole.

Securitisation, the process of creating and issuing asset-baked securities (CDOs) may involve the use of credit derivatives, such as CDS, through which banks buy protection against a debtor's bankruptcy. The mechanism of creating CDOs implies the existence of an independent (shadow) entity (SIVs) which buys a package of assets/credits (mortgages) from a bank – package which will serve as collateral – by issuing new securities/bonds.

In this way, bankers wanted to reduce the risk of nonperforming credits (idiosyncratic risk), not taking into consideration an adverse tendency of the market (a systemic shock). When this has happened and the housing prices went down, a huge liquidity crisis occurred and many of these shadow institutions went into bankruptcy, creating severe problems to the bank institutions owning them.

Partly, the run on the shadow banking system has been caused by the broadening of intermediation. As the number of market players increased, assessing the nature and magnitude of the risk involved or locating those who bear the risk, became increasingly difficult. The multiplication of CDOs has made it difficult to identify who is holding what. Rating agencies played here an important role: they have rated these instruments with triple-A, because a lot of defaults would have been needed to trigger losses and also because they were in conflict of interests (they were payed by the issuers and not by the purchasers of the instruments).

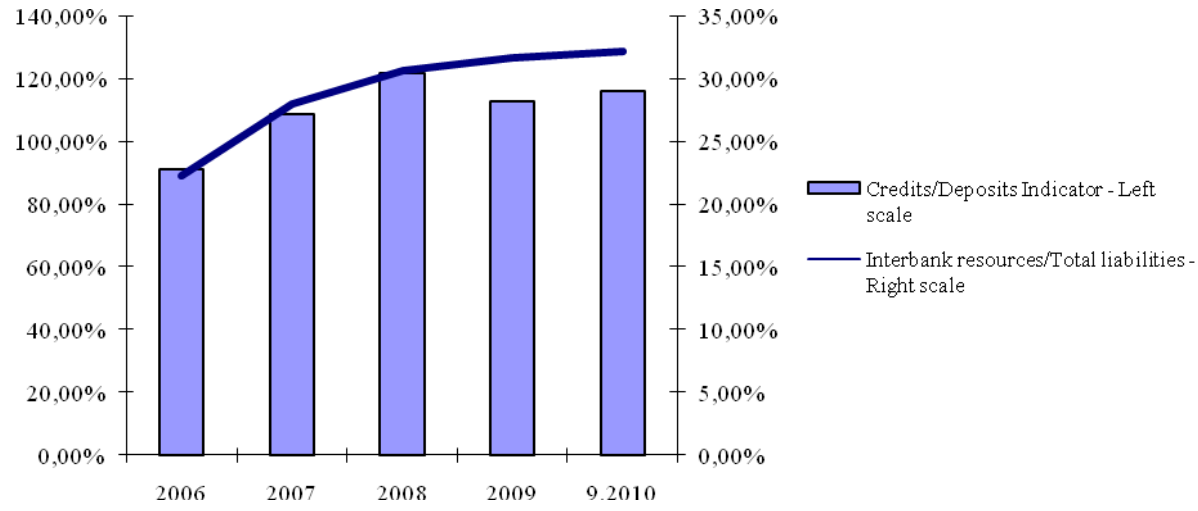
3. Systemic risk in the banking activity of Romania

In Romania the shadow banking system is very low developed and does not pose any threat to the domestic banking system. Hence, systemic risk is not increased by non-bank financial institutions because they did not use those sophisticated financial instruments and the quality of their assets is very good.

The approach under which we analyze systemic risk is still traditional: through interbank exposures and liquidity risk. Bank assets portfolios do not comprise any "toxic asset" and even if their liquidity depressed lately, due to the global liquidity (and confidence) crisis, is still at a comfortable level.

As we can observe in Figure 1, beginning with 2007, the dynamic of credits was superior to that of the deposits, with the maximum level in 2008. Under these conditions, the equilibrium of the balance sheet was sustained by growing the weight of interbank resources in total liabilities from 22, 3% in 2006 to 28% in 2007 and 32,27% in September 2010 and thus, heightening banks' exposure to liquidity shocks. Even if the credits/deposits indicator is at a better level now, the dependence of interbank resources is still growing.

Figure 1: The comparative evolution of two liquidity risk indicators



Source: Author's work based on the statistics published by the National Bank of Romania (www.bnro.ro)

The structural analysis of interbank resources highlights the prevalence of external resources, especially from mother-banks. Taking into consideration that at the end of June 2010, resources from mother-banks represented 85% from total interbank resources of domestic banks, the most probable risk scenario would be the limitation of funds from mother-banks. But these banks have to maintain their exposures to Romania during the Agreements with IMF and EC and such an action would not be desirable.

The tests proceeded by the National Bank of Romania regarding the internal risk of interbank contamination show that the occurrence of a knock-on reaction is very improbable. The interbank exposures are very low in comparison with the own capital and the liquid assets at the disposal of creditor-banks.

The perspectives of a strong systemic process to arise in the Romanian banking system are related to a potential generalisation of banks' behaviour to finance the development of credit activity mainly with interbank resources.

The evolution of the main banking risk indicators in the latest years is suggestive for the way in which national authorities have managed systemic risk. Despite all the prudential regulations, Romanian banking system did not remain unaffected by the global financial crisis. As we can see in the table below, almost all indicators have worsened in 2008, 2009 and by September 2010.

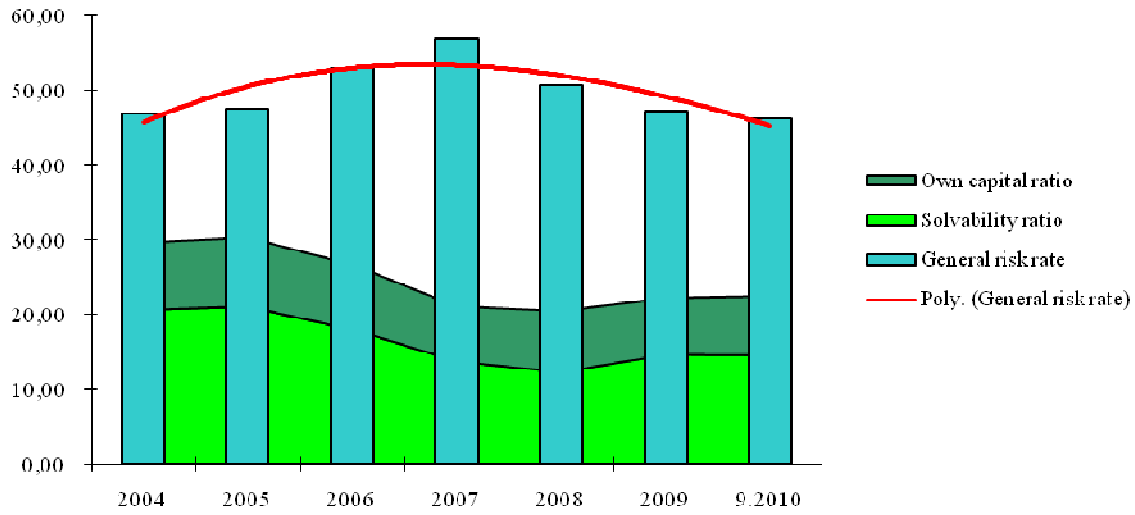
Table 1: The evolution of the main banking risk indicators in Romania since 2004

Indicator	2004	2005	2006	2007	2008	2009	09.2010
Solvability ratio (≥8%)	20,64	21,07	18,02	13,78	12,34	14.67	14,59
Own capital ratio	8,93	9,18	8,63	7,32	8,13	7,55	7,89
General risk rate	46,95	47,61	53,01	56,94	50,73	47,29	46,27
Interbank investments and credit / Total assets	33,58	29,50	35,97	29,98	26,01	23,03	18,54
Credit granted to clients / Total assets	45,64	46,60	53,17	59,09	62,50	59,13	60,76
Overdue credit / Total credit	0,28	0,26	0,20	0,22	0,32	1,45	2,67
Total overdue claims / Total assets	0,18	0,15	0,14	0,17	0,29	1,01	1,82
Total overdue claims/Total debt	0,20	0,18	0,16	0,19	0,32	1,10	2,00
Credit risk rate	2,87	2,61	2,81	4,00	6,52	15,29	20,24
Liquidity indicator	2,28	2,59	2,31	2,13	2,47	1,38	1,38

Source: Monthly Bulletin of National Bank of Romania no. 10/2010, p. 57

Beginning with 2006, both solvability ratio and own capital ratio decreased, even if the own capital ratio went down with a lower rate (8,57% compared with 19,03%). This evolution is explained by the fact that solvability was influenced by the more rapid rate of growth of the risk weighted assets in comparison with the rate of own capital. The continuous heightening of the general risk rate was due to the expansionary policy regarding credit volume and, also, a consequence of a higher concentration of banking assets in assets with risk. However, we observe that this indicator has slightly decreased in 2009 and by the end of September 2010 to 46,27% showing, partly, the efficiency of the measures taken by the Romanian authorities in the pursuit of long-term stability of the banking system. The comparative evolution of these three indicators in the analyzed period is illustrated in Figure 4.

Figure 4: The comparative evolution of solvability ratio, own capital ratio and general risk rate



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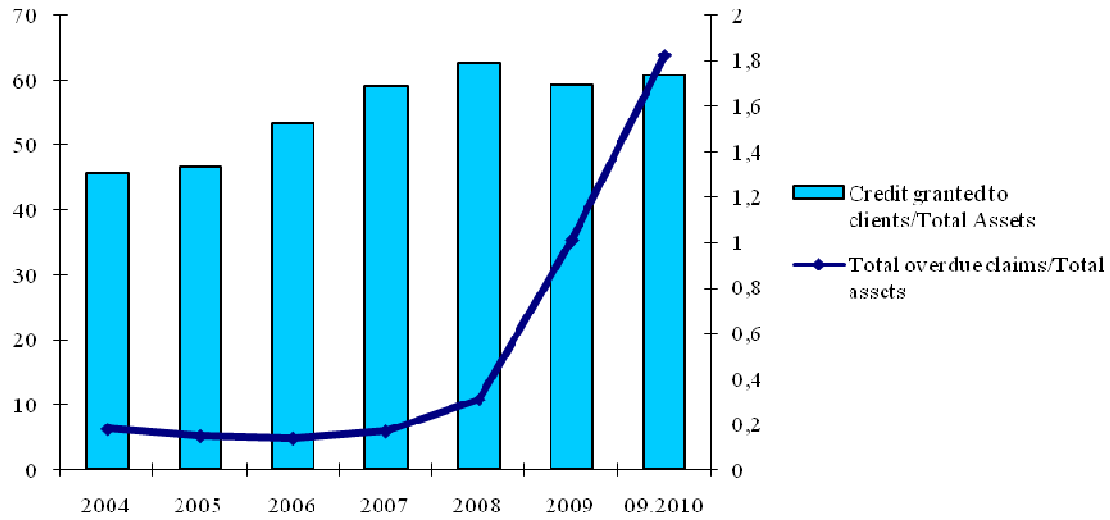
Source: Author's work

The figure below shows the effects of the global liquidity crisis on the Romanian banking system. From 2008 we observe a sharp growth of the weight of total overdue/non-performing claims in total assets, with 248% in 2009 and with 80,19% in September 2010.

Figure 5: The comparative evolution of the weights of credit granted to clients and total overdue claims in total assets



Source: Author's work

Also, we remark that in 2009 the weight of total credit granted to clients in total assets decreased due to the restrictions placed on giving credits. Since this indicator increased in September 2010, the measure taken by National Bank of Romania of reducing the interest rate had the desired effects.

Conclusions

The current financial crisis revealed new dimensions of systemic risk. Firstly, due to the creation of the shadow banking system, the concept has come to include non-banks along with banks. Secondly, it has moved beyond traditional lending to include all sorts of financial activities and resulting exposures. Nevertheless, interdependencies between market participants as well as their exposure to common risk factors became an important issue in assessing systemic risk in banking.

In the pursuit of huge profits, the highly leveraged shadow institutions involved in speculative operations, multiplying risks, which increased systemic risk and endangered the stability of the whole financial system.

Monetary authorities play now a crucial role in re-establishing the global order. The market freedom has failed and there is a need for state intervention. We expect new regulations and macro-prudential supervision to form the fundament of a financial reform to address systemic risk.

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