

THE IMPORTANCE OF SYSTEMIC RISK MANAGEMENT IN THE BANKING SECTOR

Vilma Deltuvaitė

Kaunas University of Technology, Lithuania, vilma.deltuvaite@ktu.lt

crossref <http://dx.doi.org/10.5755/j01.em.17.3.2097>

Abstract

Billio *et al.* (2010) note that the financial crisis of 2007–2009 has created renewed interest in systemic risk. The objective of this paper is to argue the importance of systemic risk management in the banking sector and to analyze the arguments of systemic risk management in the banking. The research results of this study show that the main arguments of systemic risk management in the banking can be distinguished into four main groups. The most important economic arguments of systemic risk management in the banking are following: the major role of banks in the financial system and economy, the high frequency of banking crises and their economic consequences, and the occurrence of banking crisis increase the probability of other financial crises. The social arguments of systemic risk management in the banking are also important because banking crises can have long-term consequences for human development and long-term deleterious effects on the psychological wellbeing of population. The scientific and other important arguments of systemic risk management in the banking are also discussed in this article.

Keywords: systemic risk, banking sector, risk management, financial crises.

JEL Classification: D23, M21, M53.

Introduction

Acharya *et al.* (2011) maintain that the recent international financial crisis provides ample evidence of the importance of containing systemic risk. Billio *et al.* (2010) also state that the financial crisis of 2007–2009 has created renewed interest in systemic risk which means today any broad-based breakdown in the financial system. According to Billio *et al.* (2010), the events of 2007–2009 have demonstrated that panic and runs can affect non-bank institutions as well. Caruana (2010) also notes that the international financial crisis of recent years has made to think not only about what systemic risk means, but also about the importance of systemic risk management. According to Caruana (2010), systemic risk was underestimated before this financial crisis and many countries have faced with the unthinkable when a plenty of very large financial institutions failed, despite the strength of their balance sheet and leadership in risk management. Caruana (2010) argue that systemic risk is vital important because the aggregate risk facing the banking system is much higher than the simple sum of the individual risks attending banks, products and markets.

Scientific problem of the article. De Bandt & Hartmann (2000), De Bandt *et al.* (2009), ECB (2009, 2010) discuss the concept of systemic risk and survey the existing research literature on this issue. They note that research in the last two decades has made significant progress in analysing systemic risk. However, most of empirical studies (De Bandt & Hartmann (2000), Reinhart & Rogoff (2008, 2009), De Bandt *et al.* (2009), Trichet (2009), Allen & Carletti (2009), ECB (2009), Serwa (2010), Bollard (2011), etc.) focus on the concept of systemic risk and the economic consequences of systemic banking crises. There is surprisingly little empirical literature (Ruhm (2000), Alderman *et al.* (2006), Friedman & Thomas (2007), Das *et al.* (2008), Ravallion (2008), Ferreira & Schady (2008), Laeven & Valencia (2010)) analyzing the other aspects of systemic risk management in the banking.

Scientific novelty of the article. Most of academics (Hutchison & Noy (2005), Barrell *et al.* (2006), Demirgüç-Kunt *et al.* (2006), Davis (2007), Von Hagen & Ho (2007), Rancière *et al.* (2008), Reinhart & Rogoff (2008, 2009), Laeven & Valencia (2008, 2010), Allen & Carletti (2009), Serwa (2010), Bollard (2011)) highlight the economic arguments of systemic risk management in the banking, however, there are many other reasons for systemic risk management in the banking sector. The academic literature does not provide any comprehensive analysis on this issue for the present. This study aims to fill this gap and to analyze different arguments of systemic risk management in banking.

The aim of the article: to argue the importance of systemic risk management in the banking sector and to analyze the arguments of systemic risk management in the banking.

The research object: the importance of systemic risk management in the banking sector.

The research methods: the analysis and synthesis of scientific literature, logic analysis and synthesis, the analysis of statistical data.

The importance of systemic risk management in the banking

ECB (2009) note that “the financial and economic crisis that has shaken the world economy for more than two years illustrates the relevance of systemic risk”. Systemic risk, according to Billio *et al.* (2010), can be characterized as a series of correlated defaults among financial institutions, triggering a widespread loss of confidence in the financial system as a whole. According to the experts from European Central Bank (ECB (2010)), “systemic risk refers to the risk that financial instability becomes so widespread that it impairs the functioning of a financial system to the point where economic growth and welfare suffer materially”. Other important international financial institutions (International Monetary Fund, Financial Stability Board and Bank for International Settlements) systemic risk define as “a risk of disruption to financial services that is caused by an impairment of all or parts of the financial system and has the potential to have serious negative consequences for the real economy.”

Many arguments could illustrate the importance of systemic risk management in the banking sector. Most of academics (Reinhart & Rogoff (2008, 2009), Laeven & Valencia (2008, 2010), Serwa (2010)), etc.) highlight the economic arguments of systemic risk management in the banking, however, there are many other reasons for systemic risk management in the banking sector. The main arguments of systemic risk management in the banking can be distinguished into four main groups (see Figure 1).

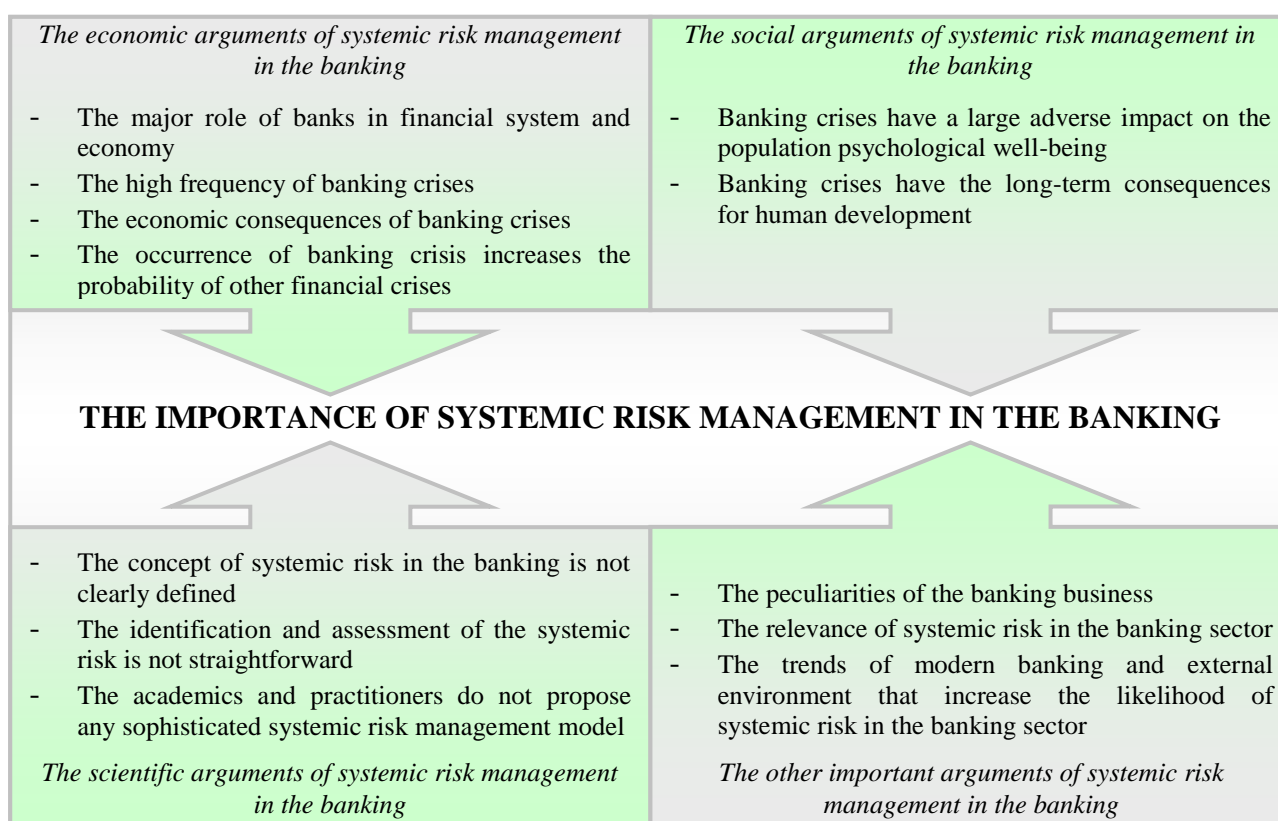


Figure 1. The arguments of systemic risk management in the banking

Source: compiled by author

The economic arguments of systemic risk management in the banking

Most of academics (Hutchison & Noy (2005), Demirgüç-Kunt *et al.* (2006), Davis (2007), Von Hagen & Ho (2007), Rancière *et al.* (2008), Reinhart & Rogoff (2008, 2009), Laeven & Valencia (2008, 2010), Allen & Carletti (2009), Serwa (2010), Bollard (2011)) emphasize the economic arguments of systemic risk management in the banking. The most important economic arguments of systemic risk management in the banking are following: the major role of banks' in the financial system and economy, the high frequency of banking crises and their economic consequences, and the occurrence of banking crisis increases the probability of other financial crises.

The major role of banks in financial system and economy. The many roles that banks play in the financial system and economy emphasize the importance of banks'. Allen & Carletti (2009) note that the

importance of the different roles of banks varies across countries, however, banks are always critical to the financial system. Academics Allen & Carletti (2009) and Bollard (2011) distinguish the main roles of banks in the financial system and economy: banks (1) play a very important role in the funds transformation process; (2) assess the credit worthiness of borrowers and provide an ongoing monitoring function of borrowers; (3) play an important role in sharing risk in the economy by diversifying risks; (4) contribute to economic development; (5) collect demandable deposits and raise funds in the short-term capital markets and invest them in long-term assets; (6) play a role in providing payment and settlement services and etc. The second argument proving the importance of banks in financial system and economy is the size of the banks. Davis (2007) pays the attention to the dramatic growth in the size of the world's largest banks over the past two decades. This increase in the size of the largest global banks can be illustrated with the statistical figures: the ratio of the top ten banks' assets to world GDP increased from 25.7 to 36.9 percent, while the largest bank's size increased from assets of 2.1 percent to 5.9 percent of the G7 countries' GDP between 1985 and 2005. The third argument explaining the importance of banks is their dominant role in the financial system. For example, the OECD countries statistic shows that the banks' control the largest share of financial system's assets in most of OECD countries (average value is about 75 percent) (OECD (2010)).

The high frequency of banking crises. The financial crisis episodes have been analyzed in many empirical studies (Demirgüç-Kunt & Detragiache (2005), Caprio & Klingebiel (2003), Von Hagen & Ho (2007)), however, only a few academics (Reinhart & Rogoff (2008, 2009), Laeven & Valencia (2008, 2010)) analyzed a large amount of financial crisis episodes. Laeven & Valencia (2008) identified 394 financial crises over the period 1970 to 2007: 124 systemic banking crises, 207 currency crises and 63 episodes of public debt crises. According to Laeven & Valencia (2008, 2010), banking crises were most frequent during the period 1990-1994 (about 9 crises per year) (see Figure 2). The academics give some explanations for this: many transition economies have experienced banking crises in the early 1990's. The frequency of banking crises increased from 0.8 to 8.6 during period 1975 to 1994, and then suddenly decreased to 1 episode per year in period 2000-2004. The situation changed dramatically in 2007-2008, when the spurt of banking crises was observed (21 episodes). According to Laeven & Valencia (2008, 2010), banking crises were most frequent in Argentina (4 episodes), USA and Zaire (3 episodes) during the period 1970-2009. Reinhart & Rogoff (2008, 2009) indicated 264 episodes of banking crises around the world during the period 1800-2007. According to Reinhart & Rogoff (2008, 2009), banking crises were most frequent in United Kingdom (13 cases) and USA (12 episodes). A comprehensive survey on the financial crisis frequency in different countries around the world is presented in my previous study (Deltuvaitė (2010)).

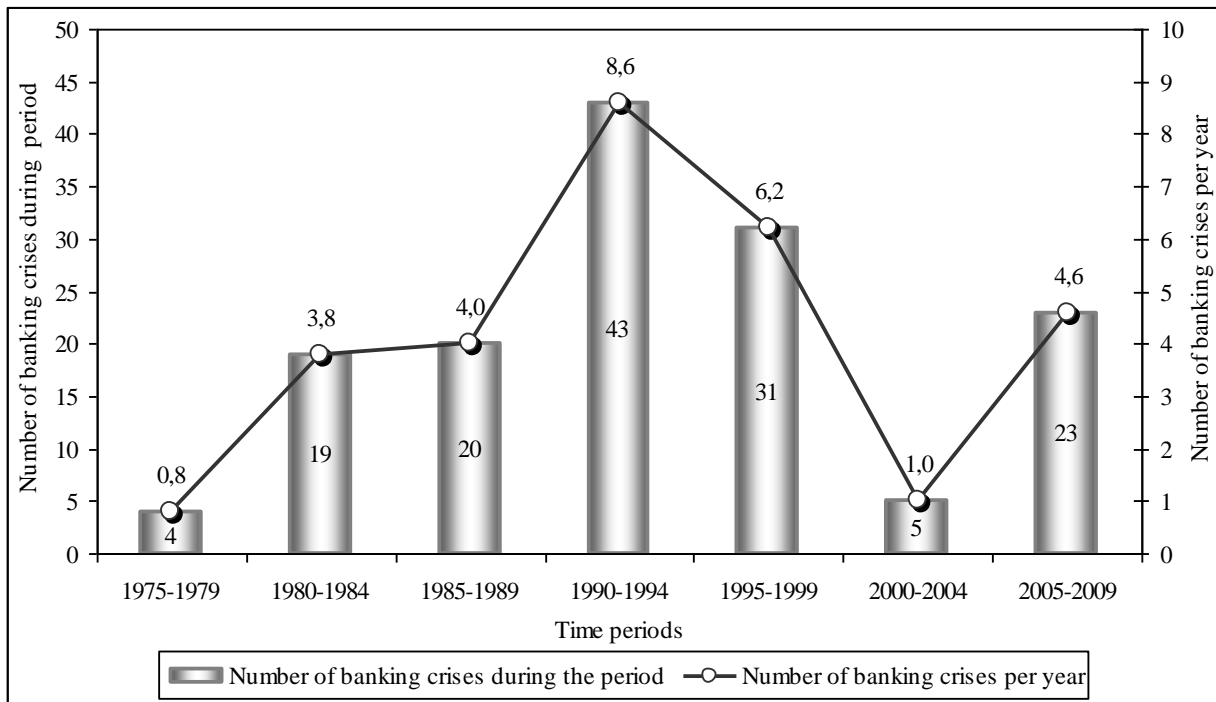


Figure 2. The frequency of banking crises during the period of 1975-2009

Source: author's calculation, data source – Laeven & Valencia (2008, 2010)

The economic consequences of banking crises. The economic consequences of banking crises have been analyzed in many empirical studies (Boyd *et al.* (2005), Hutchison & Noy (2005), Barrell *et al.* (2006), Demirgüç-Kunt *et al.* (2006), Laeven & Valencia (2008, 2010), Serwa (2010), etc.). In most of empirical studies have been indicated very large estimates of output losses and fiscal costs of banking crises, however in some cases, according to International Monetary Fund (1998) study, no significant output losses were estimated (in approximately 20 percent of the banking crises episodes). A comprehensive survey on the cost of banking crises is presented in my previous study (Deltuvaitė (2011)). Despite the fact that most of academics emphasize a negative effect of banking crises, Rancièrè *et al.* (2008) state that countries that have experienced financial crises have grown faster than countries where financial conditions were stable.

Laeven & Valencia (2008) note that fiscal costs associated with banking crisis management can be substantial (about 13.3 percent of GDP on average). They also state that output losses of banking crises can be large and range from 0 percent to 98 percent of GDP during the first four years of the banking crisis (about 20 percent of GDP on average). The results of Laeven & Valencia (2008) study show that banking crises were most costly in the period of 1975-1984 (see Figure 3). In their recent study Laeven & Valencia (2010) note that the economic costs of the new banking crises that occur in 2007-2008 around the world are on average larger than that of past crises: the median output losses are 5 percent points of GDP larger, while the median increase in public debt is 8 percent points of GDP higher in recent banking crises, compared to past banking crises. The higher economic costs of the new banking crises, according to Laeven & Valencia (2010), could be resulted by several reasons: the recent banking crises occurred in high-income countries, the size of financial systems increased in past decades and the size of the initial shock to the financial system was larger. However, Laeven & Valencia (2010) also note that the direct fiscal costs of banking crises were smaller this time at 5 percent points of GDP due the swift policy actions and the significant indirect support to the financial system.

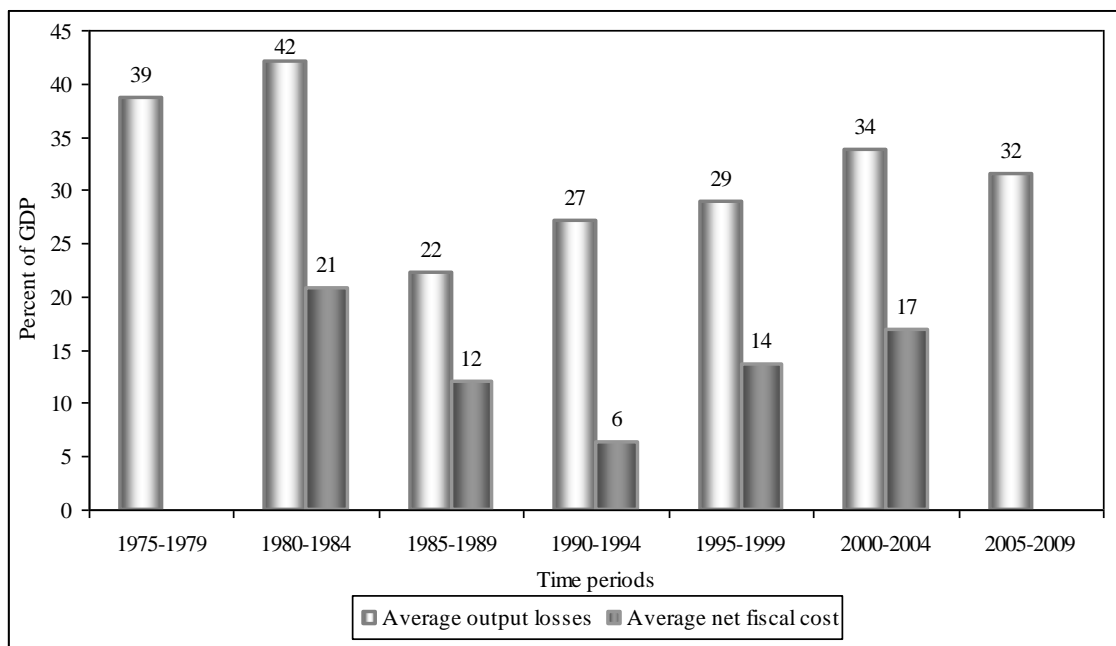


Figure 3. The cost of banking crises during the period of 1975-2009

Source: author's calculation, data source – Laeven & Valencia (2008, 2010)

The occurrence of banking crisis increases the probability of other financial crises (e.g. public debt crisis, currency crisis). The occurrence of financial crises in the global context has been analyzed only in a few studies (Reinhart & Rogoff (2008, 2009), Laeven & Valencia (2008, 2010)). The frequency of different types of financial crises (banking, currency, and sovereign debt), as well as the occurrence of “twin” or “triple” financial crises has been analyzed in Laeven & Valencia (2008) study. They note that several countries experienced multiple financial crises over the period 1970 to 2007: 42 cases can be considered as “twin” financial crises episodes and 10 cases can be classified as “triple” financial crises.

The relation between the different types of financial crises is presented in Figure 4. The results show that the currency and debt crises are most frequent during the period $[t, t+2]$, where t denotes the beginning

of the banking crisis. The currency crisis mostly occurs at the same time or one year after the banking crisis began. However, the results presented in Figure 4 show that a two-way causal relationship between banking crises and currency crises could exist: the currency crisis could be a cause as well as a consequence of the banking crisis. The results show that the banking crisis could lead to the occurrence of debt crisis.

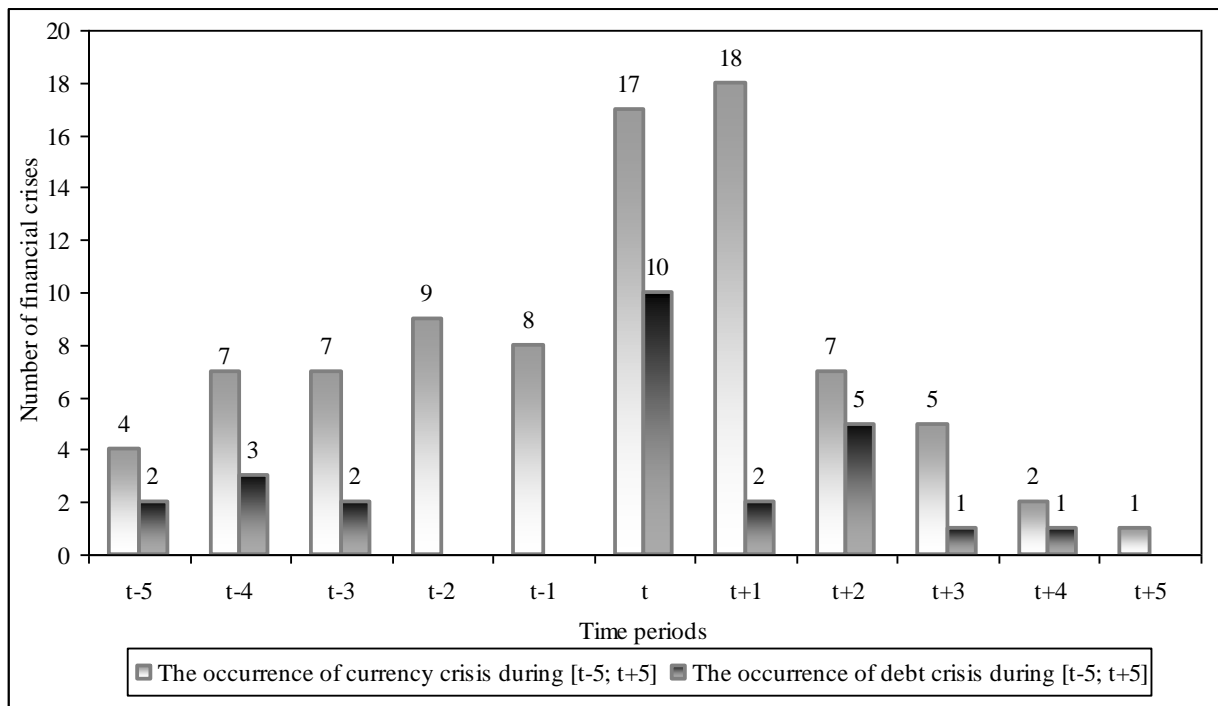


Figure 4. The occurrence of financial crises during the period of 1970-2007

Source: author's calculation, data source – Laeven & Valencia (2008)

The results of empirical studies (Boyd *et al.* (2005), Hutchison & Noy (2005), Barrell *et al.* (2006), Demirgüç-Kunt *et al.* (2006), Davis (2007), Von Hagen & Ho (2007), Rancière *et al.* (2008), Reinhart & Rogoff (2008, 2009), Laeven & Valencia (2008, 2010), Allen & Carletti (2009), Serwa (2010), Bollard (2011)) suggest that economic arguments of systemic risk management in the banking are most important.

The social arguments of systemic risk management in the banking

Most of academics (Barrell *et al.* (2006), Demirgüç-Kunt *et al.* (2006), Laeven & Valencia (2008, 2010), Serwa (2010), etc.) focus on the economic consequences of banking crises, however, the expert from World Bank (Ravallion (2008)) pays the attention to the social consequences of banking crises. Ravallion (2008) argues that the banking crises have the impact on population psychological well-being and the long-term consequences for human development.

Banking crises have a large adverse impact on the population psychological well-being. Analyzing a large sample of countries Das *et al.* (2008) found that the economic crises can have a great impact on the human mental health. Friedman & Thomas (2007) investigated the effects of the 1997 banking crisis in Indonesia and found that this banking crisis had a large adverse impact on population psychological well-being. The results of Friedman & Thomas (2007) study showed that several dimensions of psychological distress substantially increased over the crisis period and persisted even after indicators of economic well-being had returned to pre-crisis levels. Friedman & Thomas (2007) suggest that banking crisis has the long-term deleterious effects on the psychological wellbeing of the Indonesian population.

Banking crises have the long-term consequences for human development. According to Ravallion (2008), banking crises have the long-term consequences for human development. Ravallion (2008) note that the households affected by banking crisis might try to smooth the consumption by increasing their labour supply or (and) drawing down their savings in the short run, but when the households have little or no savings, no access to credit and scarce work opportunities, they have to reduce food intake or pull out children from school. Alderman *et al.* (2006) note that evidence from past banking crises show that children experiencing short-term nutritional deprivations can suffer long-lasting effects. However, Ravallion (2008)

note that the economic shocks have often presumed having negative effects on the education and health outcomes, but empirical findings are diverse. In practice, according to Ruhm (2000), Ferreira & Schady (2008), economy recessions in developed countries are generally associated with better health and education outcomes, however, in the poorest developing countries adverse effect is observed.

The results of empirical studies (Ruhm (2000), Alderman *et al.* (2006), Friedman & Thomas (2007), Das *et al.* (2008), Ravallion (2008), Ferreira & Schady (2008)) suggest that social arguments of systemic risk management in the banking and social consequences of banking crises are also important. The analysis of empirical studies shows that banking crises can have long-term consequences for human development and long-term deleterious effects on the psychological well-being of population.

The scientific arguments of systemic risk management in the banking

The scientific arguments of systemic risk management in the banking are critically important. The academic discussions about the concept of systemic risk in the banking, the identification and assessment of the systemic risk and the systemic risk management are topical.

The concept of systemic risk in the banking is not clearly defined. The phenomenon of systemic risk and some important elements of the concept of systemic risk are described in the academic research literature (De Bandt & Hartmann (2000), De Bandt *et al.* (2009)), however, the experts from European Central Bank (ECB (2009)) argue that there is no commonly accepted definition of systemic risk at present. European Central Bank (ECB (2009)) describes systemic risk as the risk of experiencing a strong systemic event that adversely affects a number of systemically important financial intermediaries or financial markets including the infrastructures. According to ECB (2009), the trigger of the event could be an exogenous (from outside the financial system) or endogenous (from within the financial system or from within the economy) shock. De Bandt & Hartmann (2000), ECB (2009) distinguish two perspectives of systemic risk: the “horizontal” perspective of systemic risk, where all components of financial systems (financial intermediaries, financial markets and market infrastructures) can be involved and the “vertical” perspective of systemic risk in which the two-way relationship between the financial system and the economy is taken into account.

De Bandt *et al.* (2009), Trichet (2009), ECB (2009) distinguish three main “forms” of systemic risk: the contagion risk, the risk of macro shocks causing simultaneous failures of financial intermediaries and the risk that widespread imbalances that have accumulated over time unravel suddenly. According to De Bandt *et al.* (2009), Trichet (2009), ECB (2009), the contagion risk usually refers to an initially idiosyncratic problem that becomes more widespread in the cross-sectional dimension, often in a sequential fashion. The second form of systemic risk, according to De Bandt *et al.* (2009), Trichet (2009), ECB (2009), refers to a widespread exogenous shocks (e.g. financial market shocks or adverse macroeconomic developments) that negatively affects a range of financial intermediaries and markets in a simultaneous fashion. De Bandt *et al.* (2009), Trichet (2009), ECB (2009) note that the third form of systemic risk refers to the endogenous accumulation of widespread imbalances in financial systems gradually over time (e.g. the credit and asset market bubbles) that may unravel suddenly, with adversely effects on many financial intermediaries and markets at the same time. De Bandt *et al.* (2009), Trichet (2009), ECB (2009) also note that all these three forms of systemic risk may materialise independently or in conjunction with each other, however, the last two forms of systemic risk are particularly relevant for the pro-cyclicality of financial systems.

The identification and assessment of the systemic risk is not straightforward. ECB (2010) notes that the identification and assessment of the systemic risk requires market intelligence, plain data analysis and analytical models and tools. ECB (2010) distinguishes four broad analytical approaches of the identification and assessment of systemic risk in the banking (see Figure 5). The experts from European Central Bank (ECB (2010)) also note that the improvement and extension of available models and tools is necessary. According to ECB (2010), new financial stability and early warning indicators need to be developed in reaction to financial innovation trends and structural change in the financial and banking systems. The macro stress testing models, as has been noted in the Financial stability review by European Central Bank (ECB (2010)), need to be more consistent and should incorporate non-bank financial intermediaries and new theoretical frameworks that reflect the two-way relationship between financial systems and the economy. And finally contagion models should incorporate some amplification mechanisms that may play a role in actual stress situations. However, the practical application of these systemic risk identification and assessment models has some limitations. ECB (2010) also argues that there are some limitations and challenges in the use of various approaches: each systemic risk identification and assessment model or analytical tool relies on specific assumptions, as well as on the reliability and availability of the data.

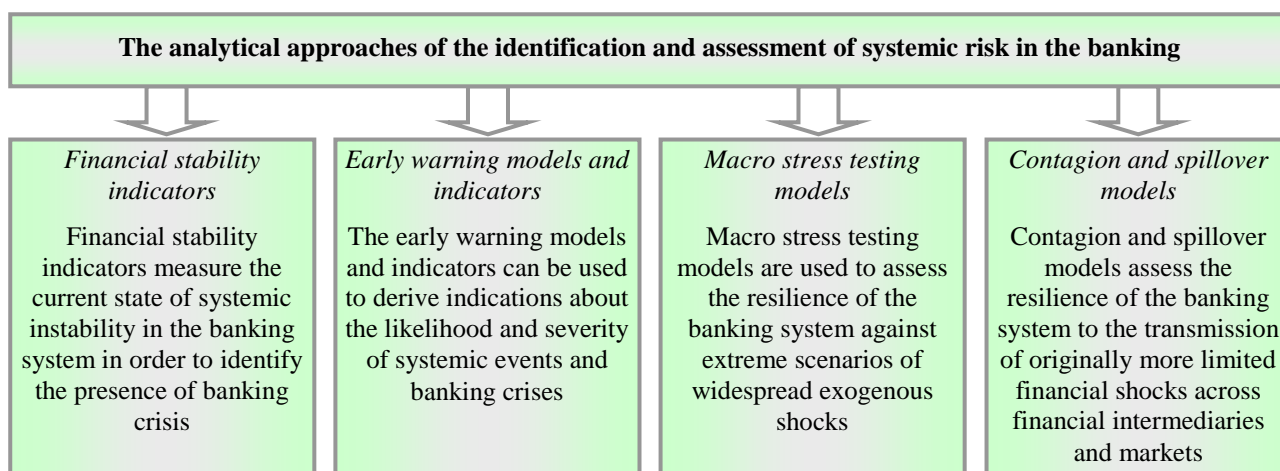


Figure 5. The analytical approaches of the identification and assessment of systemic risk in the banking
Source: compiled by author, according to ECB (2010)

The academics and practitioners do not propose any sophisticated systemic risk management model. De Bandt & Hartmann (2000) note that the academic research aimed at specifying empirical models of systemic risk management in the banking is quite limited. Hoggarth & Reidhill (2003) and some other academics propose the framework of banking crisis resolution. ECB (2010) also propose the main steps of the systemic risk management in context of the macro prudential oversight process. However, the academics and practitioners do not propose any sophisticated systemic risk management model at this time.

The results of empirical studies (De Bandt & Hartmann (2000), Hoggarth & Reidhill (2003) De Bandt *et al.* (2009), Trichet (2009), ECB (2009, 2010)) suggest that scientific arguments of systemic risk management in the banking are also important.

The other important arguments of systemic risk management in the banking

The academics also distinguish some other important arguments of systemic risk management in the banking: the peculiarities of the banking business, the relevance of systemic risk in the banking sector, the trends of modern banking and external environment that increase the likelihood of systemic risk.

The peculiarities of the banking business. ECB (2009) distinguishes some peculiarities of the banking business that increase the likelihood of systemic risk: the inter-temporal nature of the financial contracts, the information intensity, the balance-sheet structures of banks (high leverage level, the maturity mismatches between banks liabilities and assets, the high degree of interconnection of financial intermediaries). Kaufman (1996) also distinguishes three characteristics of the banks' balance sheet that result the extreme fragility of the banking sector: low cash to assets ratio (fractional reserve banking), low capital to assets ratio (high leverage), and high demand deposits to total deposits ratio (high potential for runs).

The relevance of systemic risk in the banking sector. The experts from European Central Bank (ECB (2009)) distinguish a variety of market imperfections (externalities, asymmetric information, incomplete markets, public-good character of banking system stability, etc.) that lead to a greater fragility of banking systems compared to other economic sectors. Kaufman (2000b) also pays the attention to the relevance of systemic risk in the banking sector. According to Kaufman (2000b), the suddenness of the transmission of exogenous or endogenous shocks and the breadth of the potential impact differentiates the banking sector from most other economic sectors. Kaufman (1996) also notes that the banks failures have greater damaging effects on the economy and are more important than the failure of other types of business companies because of a fear that banks failures may spread in domino way throughout the banking system. Kaufman (1996) identified five reasons for greater relevance of systemic risk in banking than in other industries: in banking, systemic risk (1) occur faster; (2) spread more widely within the banking industry; (3) lead to a larger number of banks failures; (4) result in larger losses to creditors at failed banks; and (5) spread more beyond the banking industry to other sectors and other countries.

The trends of modern banking and external environment that increase the likelihood of systemic risk in the banking sector. The academics and practitioners (Kaufman (2000a, 2000b), Laeven & Valencia (2010),

IISD (2012), etc.) argue that systemic risk has become more likely and more important in recent years as a result of some important trends of modern banking and external environment (see Figure 6).

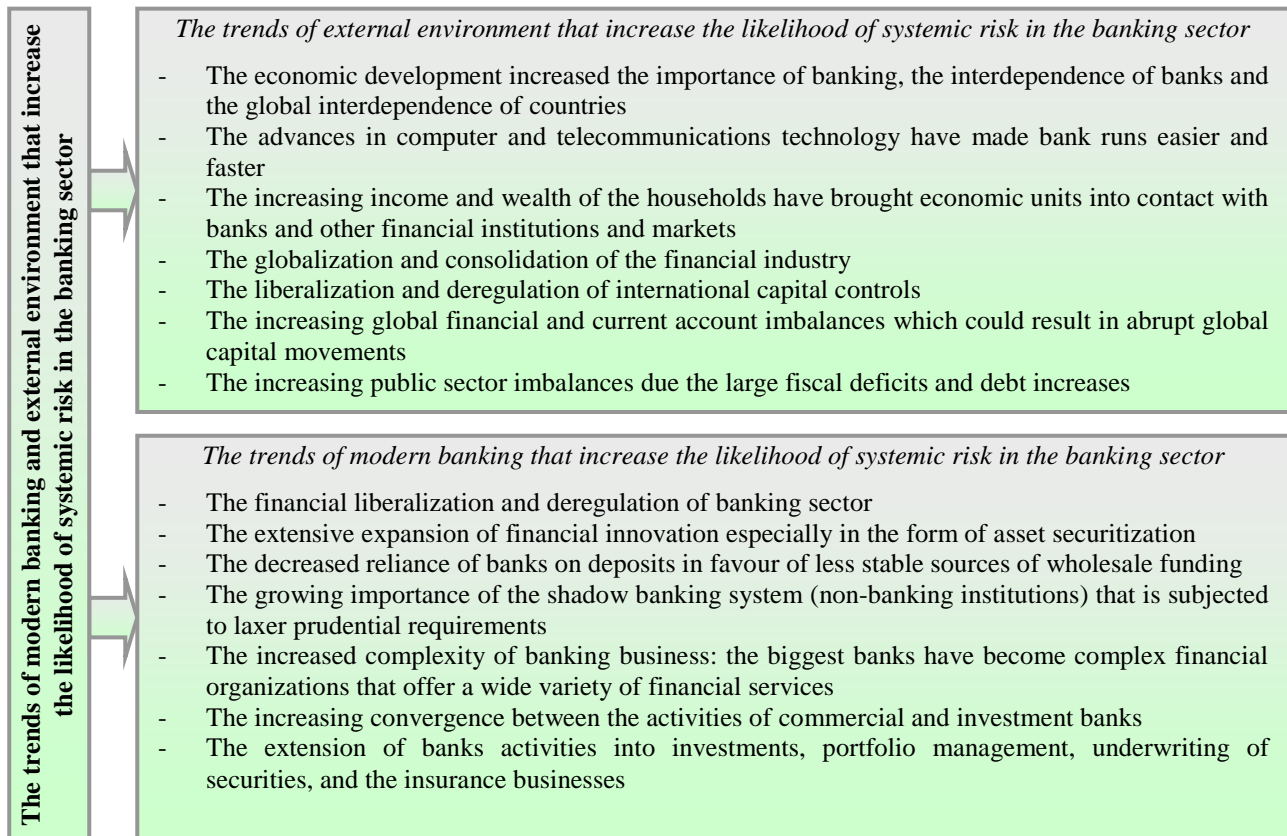


Figure 6. The trends of modern banking and external environment that increase the likelihood of systemic risk in the banking sector

Source: compiled by author, according to Kaufman (2000a, 2000b), Laeven & Valencia (2010), IISD (2012)

The analysis of empirical studies (Kaufman (1996, 2000a, 2000b), ECB (2009), Laeven & Valencia (2010), IISD (2012)) suggests that other important arguments of systemic risk management in the banking such as the peculiarities of the banking business, the relevance of systemic risk in the banking sector, and the trends of modern banking and external environment that increase the likelihood of systemic risk in the banking sector are also important and need to be analyzed.

Conclusions

1. The research results of this study show that the main arguments of systemic risk management in the banking can be distinguish into four main groups. The most important economic arguments of systemic risk management are following: the major role of banks in financial system and economy, the high frequency of banking crises and their economic consequences, and the occurrence of banking crisis increases the probability of other financial crises. The results of this study suggest that social arguments of systemic risk management and social consequences of banking crises (long-term consequences for human development and long-term deleterious effects on the psychological wellbeing of population) are also important. The scientific arguments of systemic risk management in the banking are critically important: the concept of systemic risk in the banking is not clearly defined, the identification and assessment of the systemic risk is not straightforward and the academics and practitioners do not propose any sophisticated systemic risk management model. Furthermore, there are some other important arguments of systemic risk management: the specificity of the banking business, the relevance of systemic risk in the banking, the trends of modern banking and external environment that increase the likelihood of systemic risk in the banking sector.

2. Most of academics emphasize the economic arguments of systemic risk management in the banking. Firstly, banks play the major role in financial system and economy: they dominate in the financial system and play many roles in the financial system and economy. Secondly, banking crises are frequent: they

were most frequent during the period 1990-1994 (about 9 crises per year). Thirdly, banking crises have large economic consequences: fiscal costs associated with banking crisis management are about 13.3 percent of GDP on average, while output losses range from 0 percent to 98 percent of GDP (about 20 percent of GDP on average). Fourthly, the occurrence of banking crisis increases the probability of other financial crises: the currency and debt crises mostly occur at the same time or 1-2 year after the banking crisis begins.

3. Some academics pay the attention to the social arguments of systemic risk management in the banking. Firstly, banking crises have the impact on population psychological well-being. Some studies note that several dimensions of psychological distress substantially increased over the crisis period and persisted even after indicators of economic well-being had returned to pre-crisis levels. Secondly, banking crises have the long-term consequences for human development. Academics note that the economic shocks have often presumed having negative effects on the education and health outcomes, but empirical findings are diverse: economy recessions in developed countries are generally associated with better health and education outcomes, however, in the poorest developing countries adverse effect is observed.

4. The scientific arguments of systemic risk management in the banking are critically important. Firstly, the concept of systemic risk in the banking is not clearly defined. The phenomenon of systemic risk and some important elements of the concept of systemic risk are described in the academic literature, however, there is no commonly accepted definition of systemic risk at present. Secondly, the identification and assessment of the systemic risk is not straightforward. Four broad analytical approaches of the identification and assessment of systemic risk in the banking are distinguished in the academic literature, however, the improvement and extension of available models and tools is necessary in the context of financial innovation trends and structural change in the financial and banking systems. Thirdly, the academics and practitioners do not propose any sophisticated systemic risk management model at this time.

5. The academics also distinguish some other important arguments of systemic risk management in the banking. Firstly, the banking business has some peculiarities. The peculiarities of the banking business that increase the likelihood of systemic risk are the inter-temporal nature of the financial contracts, the information intensity, balance-sheet structures of banks. Secondly, the relevance of systemic risk in banking is greater than in other industries. Academics note that the suddenness of the transmission of exogenous or endogenous shocks and the breadth of the potential impact differentiates the banking sector from most other economic sectors. Finally, some trends of modern banking (the extensive expansion of financial innovation, the extension of banks activities into investments and the insurance businesses, etc.) and external environment (the globalization and consolidation of the financial industry, the advances in computer and telecommunications technology, etc.) increase the likelihood of systemic risk in the banking sector.

References

1. Acharya, V.V., Pedersen, L.H., Philippon, T., Richardson, M.P. (2011). Measuring Systemic Risk. American Finance Association 2011 Denver Meetings Paper, p. 1-46.
2. Alderman, H., Hoddinott, J., Kinsey, B. (2006). Long-Term Consequences of Early Childhood Malnutrition. *Oxford Economic Papers*, Vol. 58(3), p. 450-474.
3. Allen, F., Carletti, E. (2009). The Roles of Banks in Financial Systems. In *The Oxford Handbook of Banking*, edited by A. Berger, P. Molyneux, and J. Wilson, Oxford University Press, 2009, Chapter 2, p. 37-57.
4. Barrell, R., Davis, E.P., Pomerantz, O. (2006). Costs of Financial Instability, Household-Sector Balance Sheets and Consumption. *Journal of Financial Stability*, Vol. 2(2), p. 194-216.
5. Billio, M., Getmansky, M., Lo, A.W., Pelizzon, L. (2010). Measuring Systemic Risk in the Finance and Insurance Sectors. MIT Sloan School Working Paper No. 4774-10, p. 1-69.
6. Bollard, A. (2011). The Role of Banks in the Economy – Improving the Performance of the New Zealand Banking System after the Global Financial Crisis. The New Zealand Shareholders Association Annual Meeting, Tauranga, 6 August 2011.
7. Boyd, J.H., Kwak, S., Smith, B.D. (2005). The Real Output Losses Associated with Modern Banking Crises. *Journal of Money, Credit, and Banking*, Vol. 37 (6), p. 977-999.
8. Caprio, G., Klingebiel, D. (2003). Episodes of Systemic and Borderline Financial Crises. World Bank, January 2003, pp. 1-21.
9. Caruana, J. (2010). Systemic Risk: How to Deal with It? BIS Publications, 12 February 2010.
10. Das, J., Do, Q., Friedman, J., McKenzie, D. (2008). Mental Health Patterns and Consequences: Results from Survey Data in Five Developing Countries. Policy Research Working Paper 4495, World Bank, Washington.

11. Davis, K. (2007). Banking Concentration, Financial Stability and Public Policy. Reserve Bank of Australia, RBA Annual Conference Volume, No. 2007-16.
12. De Bandt, O., Hartmann, P. (2000). Systemic Risk: A Survey. European Central Bank Working Paper No. 35.
13. De Bandt, O., Hartmann, P., Peydró J. (2009). Systemic Risk in Banking: An Update. In A. Berger, P. Molyneux and J. Wilson (eds.), Oxford Handbook of Banking, Oxford University Press, 2009.
14. Deltuvaitė, V. (2010). Finansinių krizių klasifikacija: teoriniai ir praktiniai aspektai. Apskaitos ir finansų mokslas ir studijos: problemos ir perspektyvos. 2010, Nr. 1(7), p. 44-54.
15. Deltuvaitė, V. (2011). Measuring the Costs of Banking Crisis: Theoretical and Practical Aspects. Economics and management, 2011, No. 16, p. 1089-1100.
16. Demirgüç-Kunt, A., Detragiache, E. (2005). Cross-Country Empirical Studies of Systemic Bank Distress: A Survey. National Institute of Economic Review, No.192, April, pp.1-32.
17. Demirgüç-Kunt, A., Detragiache, E., Gupta, P. (2006). Inside the Crisis: An Empirical Analysis of Banking Systems in Distress. Journal of International Money and Finance, Vol. 25(5), p. 702-718.
18. ECB (2009). Financial Stability Review. December, 2009, p. 223.
19. ECB (2010). Financial Stability Review. June, 2010, p. 225.
20. Ferreira, F., Schady, N. (2008). Aggregate Economic Shocks: Child Schooling and Child Health. Policy Research Working Paper 4701, World Bank, Washington, DC.
21. Friedman, J., Thomas, D. (2007). Psychological Health Before, During and After an Economic Crisis: Results from Indonesia, 1993-2003. Policy Research Working Paper 4386, World Bank, Washington, DC.
22. Hoggarth, G., Reidhill, J. (2003). Resolution of Banking Crises: A Review. Financial Stability Review, Bank of England, December 2003, p. 109-123.
23. Hutchison, M.M., Noy, I. (2005). How Bad Are Twins? Output Costs of Currency and Banking Crises. Journal of Money, Credit and Banking, Vol. 37, p. 725-752.
24. International Institute for Sustainable Development (IISD) (2012). Trends in the Banking Industry.
25. International Monetary Fund (1998). Financial Crises: Characteristics and Indicators of Vulnerability. World Economic Outlook, May. Chapter 4, p. 24.
26. Kaufman, G.G. (1996). Bank Failures, Systemic Risk, and Bank Regulation. Cato Journal, Spring/Summer 1996, pp. 17-45.
27. Kaufman, G.G. (2000a). Banking and Currency Crises and Systemic Risk: A Taxonomy and Review. Netherlands Central Bank, Staff Reports No. 48, 2000.
28. Kaufman, G.G. (2000b). Banking and Currency Crises and Systemic Risk: Lessons from Recent Events. Economic perspectives, Federal Reserve Bank of Chicago, Third Quarter 2000, Vol. 24.
29. Laeven, L., Valencia, F. (2008). Systemic Banking Crises: A New Database. IMF Working Paper No. 08/224, September, 2008, p. 80.
30. Laeven, L., Valencia, F. (2010). Resolution of Banking Crises: The Good, the Bad, and the Ugly. IMF Working Paper No. 10/146, June 2010, p. 36.
31. OECD (2010). Structure of the Financial System. OECD Banking Statistics (database).
32. Rancière, R., Tornell, A., Westermann, F. (2008). Systemic Crises and Growth. The Quarterly Journal of Economics, MIT Press, Vol. 123(1), p. 359-406.
33. Ravallion, M. (2008). Lessons from World Bank Research on Financial Crises. World Bank Policy Research Working Paper Series 4779, p. 33.
34. Reinhart, C.M., Rogoff, K.S. (2008). This Time Is Different: A Panoramic View of Eight Centuries of Financial Crises. NBER Working Paper No. 13882, March, pp. 1-125.
35. Reinhart, C.M., Rogoff, K.S. (2009). This Time Is Different: Eight Centuries of Financial Folly. Princeton University Press, pp. 1-496.
36. Ruhm, C. (2000). Are Recessions Good for Your Health? Quarterly Journal of Economics, Vol. 115(2).
37. Serwa, D. (2010). Larger Crises Cost More: Impact of Banking Sector Instability on Output Growth. Journal of International Money and Finance, Vol. 29 (8), p. 1463-1481.
38. Trichet, J.C. (2009). Systemic risk. Clare Distinguished Lecture in Economics and Public Policy, University of Cambridge, Cambridge, 10 December 2009.
39. Von Hagen, J., Ho, T.K. (2007). Money Market Pressure and the Determinants of Banking Crises. Journal of Money, Credit and Banking, Vol. 39(5), pp. 1037-1066.