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## THE PREVENTION OF SYSTEMIC LIQUIDITY RISK IN MODERN CONDITIONS OF BANKING REGULATION

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**Abstract.** The urgency and danger of systemic risks of the banking sector are highlighted. The features to the interpretation of the concept of systemic risk from both the position of scientists and through the prism of international organizations dealing with issues of regulation of financial markets are determined. There are three main approaches to understanding: microeconomic, macroeconomic and integrated are written. The concept of systemic liquidity risk, features of it's distribution and necessity of regulation are disclosed. The methods of measuring the systemic liquidity risk in accordance with international practice are indicated and the main parameters of its estimation in the domestic banking sector are presented. Complex analysis of the banking system of Ukraine was conducted to identify a systemic liquidity risk or finding the possibility of developing it, and draw some conclusions. The necessity of strengthening control over systemically important banking institutions is mentioned. The prospects for improving the regulation of systemic liquidity risk for the Ukrainian banking market are proposed.

**Keywords:** banking regulation, financial system, systemic risk, systemic liquidity risk, high liquid assets, refinancing, systemically important institutions.

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## ПОПЕРЕДЖЕННЯ СИСТЕМНОГО РИЗИКУ ЛІКВІДНОСТІ В СУЧАСНИХ УМОВАХ БАНКІВСЬКОГО РЕГУЛЮВАННЯ

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**Анотація.** Висвітлено актуальність і небезпечність системних ризиків банківської сфери. Визначено особливості трактування поняття системного ризику як з позиції науковців, так і через призму міжнародних організацій, які займаються питаннями регулювання фінансових ринків. Виокремлено три основні підходи до його розуміння: мікроекономічний, макроекономічний та інтегрований. Розкрито поняття системного ризику ліквідності, особливості його поширення та необхідність регулювання. Зазначено методи виміру системного ризику ліквідності відповідно до міжнародної практики і наведено основні параметри його оцінки у вітчизняному банківському секторі. Здійснено комплексний аналіз банківської системи України на предмет виявлення або можливості розвитку системного ризику ліквідності, зроблено відповідні висновки. Наголошено на доцільності посилення контролю за системно важливими банківськими установами. Запропоновано перспективи поліпшення регулювання системного ризику ліквідності для банківського ринку України.

**Ключові слова:** банківське регулювання, фінансова система, системний ризик, системний ризик ліквідності, високоліквідні активи, рефінансування, системно важливі установи.

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## ПРЕДУПРЕЖДЕНИЕ СИСТЕМНОГО РИСКА ЛИКВИДНОСТИ В СОВРЕМЕННЫХ УСЛОВИЯХ БАНКОВСКОГО РЕГУЛИРОВАНИЯ

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**Аннотация.** Освещена актуальность и опасность системных рисков банковской сферы. Определены особенности трактовки понятия системного риска как с позиции ученых, так и сквозь призму международных организаций, которые занимаются вопросами регулирования финансовых рынков. Выделены три основные подходы к его пониманию: микроэкономический, макроэкономический и интегрированный. Раскрыто

понятие системного риска ликвидности, особенности его распространения и необходимость регулирования. Указаны методы измерения системного риска ликвидности в соответствии с международной практикой и приведены основные параметры его оценки в отечественном банковском секторе. Проведен комплексный анализ банковской системы Украины на предмет выявления или возможности развития системного риска ликвидности, сделаны соответствующие выводы. Отмечена необходимость усиления контроля за системно важными банковскими учреждениями. Предложены перспективы улучшения регулирования системного риска ликвидности для банковского рынка Украины.

**Ключевые слова:** банковское регулирование, финансовая система, системный риск, системный риск ликвидности, высоколиквидные активы, рефинансирование, системно важные учреждения.

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**Introduction.** Year by year, global approaches to efficient banking regulation are being updated and upgraded. From the beginning of the 21st century, more and more attention was concentrated to ensure financial stability as a perfect state of the market for the effective functioning of all its entities. Among the main threats of stability, the global risks of financial systems, or as they are called at present — systemic risks, deserve the greatest attention nowadays. Systemic risks of the financial sector are mainly localized in the banking sector, which is the main channel for intermediary and redistribution of financial resources.

Taking into account the specifics of the last two financial crises: the global crisis of 2007—2009 and the national crisis of 2014—2016, studying the issues about modern approaches for preventing systemic risks, including the systemic liquidity risk, becomes special relevance in the context of securing world financial stability and banking regulation.

**Literature review and problem statement.** The problem of systemic risk has been paid much attention by such foreign and domestic scientists as J. Kaufman, K. Scott, E. Cherutti, J. Sinki, G. Karcheva, L. Primostka and others. Their works are devoted mainly to the general aspects of identifying, detecting and monitoring systemic risks in the complex. O. Baranovskyi [1], S. Naumenkova and V. Mishchenko [2] focus attention on the disclosure of the essence of systemic risks and the danger of their spread. The work of M. Samsonov [3] is devoted to consideration the processes of supervision and monitoring of the systemic risks of the banking sector. However, a detailed comprehensive analysis of systemic risks leaves insufficiently highlighted the issue of identification of their individual types, including the systemic liquidity risk, which complicates the process of their prevention in the context of general banking regulation.

The purpose of the article is to demonstrate the importance and necessity of preventing systemic liquidity risk in the banking sector, main parameters for its identification and assessment, both in global approaches and in the domestic banking market, and to provide suggestions for improving its regulation.

**Research results.** Systemic risks concept is quite complicated and dangerous. In our time, there is no doubt that uncontrolled local risks can easily be transformed into unregulated systemic risks that pose a serious threat to financial stability and economic growth of both individual economies and the global economic system as a whole.

Despite the considerable attention given to the systemic risks study, there is still no clear interpretation of it. A well-

known domestic researcher and professor O. Baranovskyi defines systemic risk as a risk of violating of the whole system with potentially serious negative consequences for the domestic market and the real economy [1]. Other domestic researchers, S. Naumenkov and V. Mishchenko, have the opinion that systemic risk should be considered as a risk that objectively follows from the existence of systemic interconnection and the accumulation of imbalances in the activities of certain sectors or financial institutions on the basis of the implementation of mechanisms for the transmission of risks and potential mutual contamination because of insufficient management of financial processes in certain financial institutions or in the financial system as a whole [2, p. 188].

Consequently, the interpretation of the systemic risk concept reduces to a violation of the financial system on the basis of the contamination of unstable, high-risk institutions of other participants in the financial system, and lead to negative consequences for economic stability. Instead, foreign scientist J. Sinki considers systemic risk as uncertainty, which is associated with the possibility of the financial system collapse [4, p. 775].

The systemic risk concept is also considered by international financial organizations, such as the European Central Bank, The World Bank, International monetary fund and others. For example, the European Central Bank describes this category as a risk that the provision of necessary financial products and services by the financial system will be impaired to a point where economic growth and welfare may be materially affected [5]. In addition, it is precisely the prevention of the rise of systemic risk representatives of the European Central Bank called the state of financial stability, which only once again proves the interdependence of these financial concepts. Moreover, the fact that the representatives of the European Central Bank identify the financial stability as a state whereby the build-up of systemic risk is prevented, only once again proves the interdependence of these financial concepts. A similar interpretation is provided by the World Bank [6, p. 6]: systemic risk is limited to financial shocks that are likely to be serious enough to damage the real economy. Definitions of the European Central Bank and the World Bank are mainly reduced to the economic side of possible problems, while the International Monetary Fund focuses on the social aspects of systemic risk manifestation, considering it as a threat confidence in the financial system and a substantive threat of growth and living standards [7, p. 5].

The generalization of existing approaches to the definition of systemic risk, allowed to distinguish three main



approaches (microeconomic, macroeconomic and integrated) to disclose the essence of this concept [3, p. 274–275].

The first microeconomic approach is based on the idea of interconnection between participants or system elements (domino effect). Representative of this approach E. Cherutti notes that systemic risk arises due to the failure of one or more financial institutions to timely and fully fulfill their obligations to counterparties, which causes the insolvency (bankruptcy) of other participants in monetary and financial relations.

The macroeconomic approach is based on the assumption that systemic shocks cause a disturbance of the stable functioning of the financial system. For example, J. Kaufman and K. Scott define it as the probability of failure of the whole system, in contrast to the failure of its individual parts or components, as evidenced by the relationship (correlation) between the majority or all its parts.

The third (integrated) approach takes into account both horizontal and vertical relationships between financial market participants and the possibility of occurrence of systemic risk is allowed through the influence of macroeconomic shocks on separate elements of the system with the further spreading of negative consequences between other elements of the system.

The evidence of the total threat of systemic risks can be the creation of the European Systemic Risk Board after the global financial crisis of 2007–2009, the main task of which is to identify potential systemic risks of the financial sector and struggle with them through macro-prudential recommendations and approaches. The answer of the domestic banking market to that was to create a Financial Stability Board in Ukraine in 2015, which is assigned the task of identifying systemic risks and minimizing their negative impact on the financial system of Ukraine.

Systemic risks are even more worrying because they are difficult to predict and more difficult to overcome. Because they capture the whole financial system, it can be argued that exactly the systemic risks are responsible for a series of major-scale crises in the history of mankind.

One of the important risks of the banking sector is the liquidity risk, which represents the possibility of the bank / group of banks / banking system of the country at all to be responsible for all its obligations, and maintaining the optimum level of profitability, financial image and ability to provide an increase in active operations. It is an integral part of banking activity and mainly serves as the mainstay of the systemic crisis. The liquidity risk in the banking always exists, despite the fact that it is spoken only in a situation when it becomes significant and leads to a deterioration of the financial state either a separate institution or the whole banking system. In the case of its extension to the whole banking system, it is advisable to speak of the systemic nature of its manifestation.

The systemic liquidity risk concept is currently underestimated by domestic researchers, while global regulatory institutions in the face of the Basel Committee on Banking Supervision (BCBS), the International Monetary Fund (IMF), the European Central Bank (ECB) are paying more and more attention to this issue. Systemic liquidity risk can be defined as a risk of simultaneous liquidity

constraints in several financial institutions. However, this category has a deeper background. According to the IMF (2011) [8, p. 76], systemic liquidity risk reflects the tendency of financial institutions to collectively underestimate the risk of liquidity in the period of financial stability when markets receive funding from the central bank without any obstacles. Underestimation of possible threats that may arise because of liquidity risk from financial institutions that mistakenly believe, that in the event of stress can uninterrupted obtain the necessary funding from the regulator, pushes them to direct more and more of their assets to high-risk operations, and keeping a smaller amount of liquid assets, that is necessary to meet the needs of customers and timely fulfillment of all their liabilities. The more such institutions in the banking system, the greater probability of development the systemic liquidity risk, which, through the effect domino will capture all its entities.

It can be concluded that the systemic liquidity risk is the probability of a global liquidity crisis, reflecting the inability of most of the institutions of the banking system of the country / group of countries or the world at all (including systemically important banks) to fulfill their liabilities to creditors and depositors characterized by a decrease in banks' capital, a significant outflow of funds from the banking system, a sharp decrease in revenues because of a deterioration of the loan and investment portfolio, and causes a negative financial climate, reduction of confidence to banking system / banking systems of countries of the world on a global scale and falling economic activity.

For successful prevention and control of systemic liquidity risk it is important to identify it in time. Nowadays, it is difficult to do, there is no clear approach to its evaluation. Appropriate techniques are still under development and their implementation has some difficulties. Some methods are complicated mathematical models, for the others the problem is in the lack of necessary data. In addition, existing methods are discussed mainly for developed countries, while recent events have shown that this issue is also important for developing countries.

However, in its report on financial stability in April 2011, the International Monetary Fund proposed three methods for measuring systemic liquidity risk [8, p. 98]:

- Systemic Liquidity Risk Index;
- Systemic Risk-Adjusted Liquidity Model;
- Stress-Testing Framework.

Unfortunately, these methods can not be called universal and fully understandable for use, which prevents their immediate use for monitoring the situation with liquidity in the financial market of Ukraine. Consequently, the primitive instruments that signal the emergence (occurrence) of a systemic liquidity risk in the Ukrainian banking market can be:

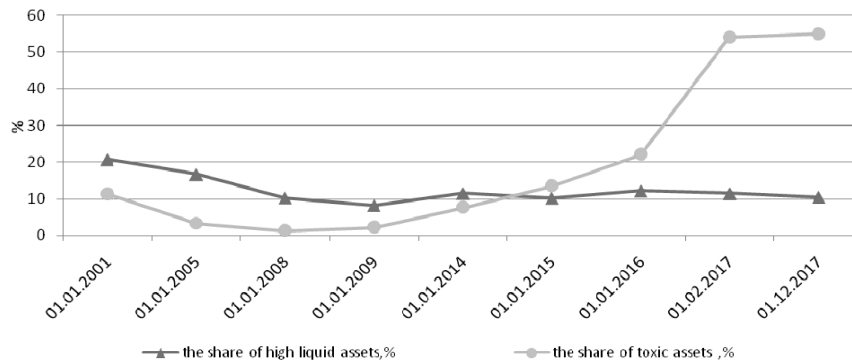
- decrease in the share of high liquid assets by more than 2 percentage points (p.p.) during the year;
- outflow of deposit resources from the banking system of the country (by 5–10 % during the year), characterized by the emergence of panic among the population;
- default on mandatory liquidity standards by banks,
- the growth of volumes of refinancing operations (by 2–3 times a year) as the main tool for maintaining liquidity;

– increase in the share of toxic assets in its total amount of banking institutions (by 5 % or more during the year), etc.

High liquid assets of the banking sector characterize the degree of protection of financial institutions from various macroeconomic (systemic) shocks, another words, they act as an emergency stock. Note that in recent years there has been a positive trend in the growth of high

liquid assets (*Fig. 1*). Compared to the beginning of 2015 (10.2 %), the share of high liquid assets in its total amount of Ukrainian banks gradually increased, which confirms the gradual restoration of the banking system of the country after a long period of crisis shocks.

As of December 1, 2017, this indicator fell again (to 10.5 %), showing a negative tendency in banks' liquidity.



*Fig. 1. Assessment of systemic liquidity risk of Ukrainian banks in 2000—2017 years*

Source: compiled by the author with the help of [9].

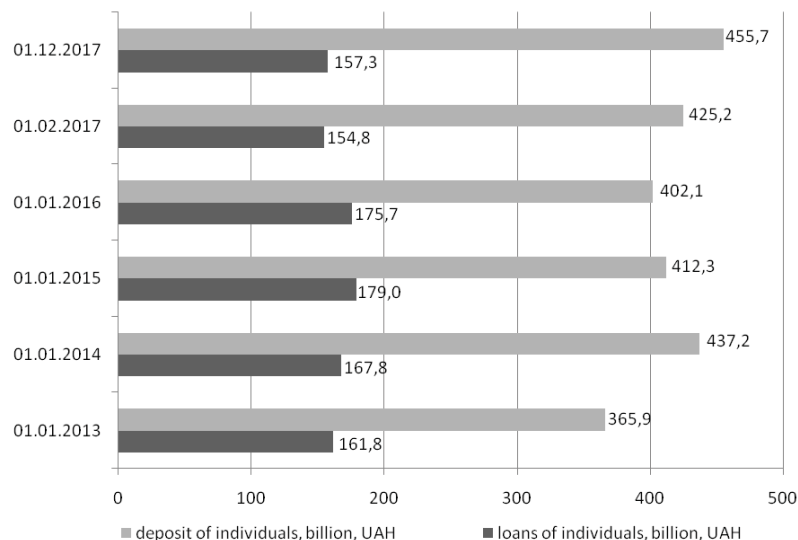
It should be noted that the lowest level of high liquid assets was observed in 3 periods: 1) during the crisis of 2008—2009 — 8.2 % and 9.6 % respectively; 2) during the national crisis of 2014 — 10.2 %. Consequently, there is a direct link: the lower level of high liquid assets, the greater expose to systemic liquidity risk by the banking system of the country.

The significant amount of problematic (toxic) assets poses an increase in systemic liquidity risk, which leads to lack of revenue from banks and negatively affects on their liquidity and financial performance (*Fig. 1*). The credit activity of the banks after the crisis of 2014—2015 has significantly decreased because of geopolitical factors and the difficult macroeconomic situation.

Since 2017, lending has gradually begun to recover, but mainly in the segment of consumer lending. But even

despite this, because of the low solvency of borrowers and the massive debt on foreign currency loans, the share of overdue loans has grown rapidly: if as of January 1, 2016 this indicator was 22.1 %, then as of December 1, 2017, it reached 54.9 %, increasing by 2.5 times in almost two years. Such data testify to the fact that the Ukrainian banking system can not recover from the negative consequences of the crisis for 2014—2015.

As systemic liquidity risk arises because of the impossibility for most banks of the system to fulfill its liabilities, in this case we can talk about a decrease in confidence to banking institutions and a massive outflow of deposits of individuals. Therefore, to assess the systemic liquidity risk, it is advisable to analyze the dynamics of the deposit and loan portfolios of individuals in the banking system of the country (*Fig. 2*).



*Fig. 2. Dynamics of the deposit and loan portfolios of individuals during 2012—2017 years*

Source: compiled by the author with the help of [9].



According to the table, there is a slight volatility of the deposit portfolio of individuals. Thus, during 2012—2013 there is a growth of the portfolio (approximately on 19 %), but during the next 2 years — its gradual decrease (by 8 % compared with January 1, 2014). From 2016, the volume of deposits grows again until the period of October 1, 2017 (11 % compared to the indicator as of January 1, 2016). That is, during the period of the national crisis of 2013–2015, the volume of the deposit portfolio of individuals decreases, which characterizes the distrust of the population during this period and the withdrawal of deposits from the banking system.

According to the table, there is a slight volatility of the deposit portfolio of individuals. Thus, during 2012—2013 there is a growth of the portfolio (approximately on 19%), but during the next 2 years — its gradual decrease (by 8 % compared with January 1, 2014). From 2016, the volume of deposits grows again, reaching the figure of 455,7 billion UAH as of December 1, 2017 (13 % compared to the indicator as of January 1, 2016). That is, during the period of the national crisis of 2013—2015, the volume

of the deposit portfolio of individuals decreases, which characterizes the distrust of the population during this period and the withdrawal of deposits from the banking system.

At the same time, during the 2015—2016 the lending volumes of individuals decreased by 13 %, which is also typical for the period of the crisis. A slight increase in lending by the end of 2017 demonstrates a gradual restoration of the banking system.

Taking into account the deep systemic crisis of Ukraine's banking sector in 2013—2015, and the complicated post-crisis period, many financial institutions were unable to cope with the difficulties and lack of liquidity. In such difficult circumstances, the role of the national regulator comes to the fore, because from its work depends not only the predestination of bank services' market, but also the predestination of all economy of the country. The NBU, as the central management body in accordance to the functions assigned to it, provides support of banks' liquidity by various instruments, among which the main role is played by refinancing operations (Fig. 3).

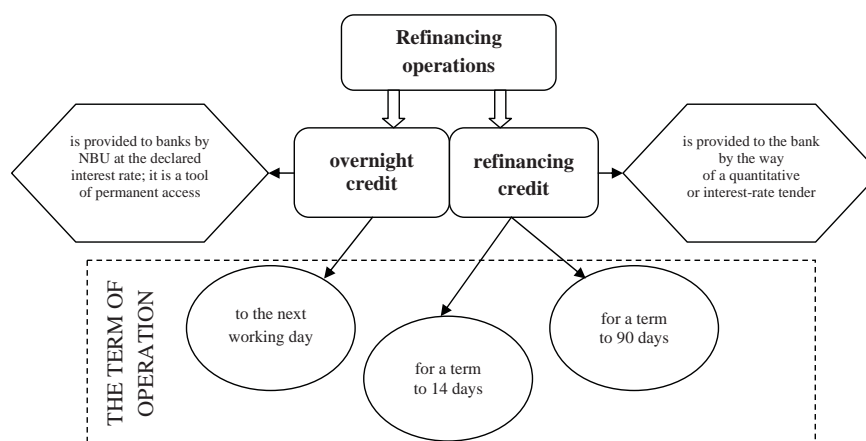


Fig. 3. Types of refinancing operations of Ukrainian banks

Source: compiled by the author.

Systemic liquidity risk can also be estimated depending on the volume of lending that was sent to refinancing operations to maintain the liquidity of banking institutions. The bigger amounts of refinancing was provided to banks,

the bigger problems with maintaining liquidity were observed in the banking sector of the country and to a certain extent, it shows the existence of a systemic liquidity risk (Fig. 4).

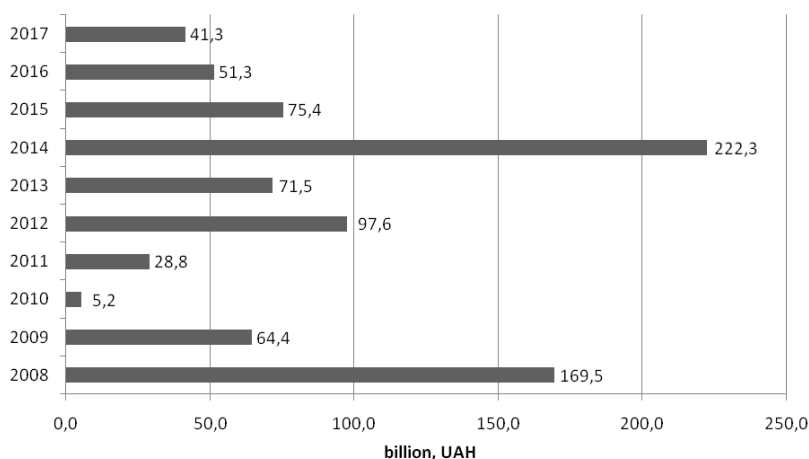


Fig. 4. Dynamics of volume of refinancing operations in 2008—2017

Source: compiled by the author with the help of [9].

Based on this data, the largest amount of refinancing is observed in 2014 (UAH 222,3 billion), which indicates on more deeper crisis of the banking system of Ukraine in this period, in contrast to the global financial crisis of 2008 (UAH 169,5 billion). Note that a significant reduction in lending since 2015 indicates a gradual exit from the «debt pit» of Ukrainian banks, reducing the risk of developing systemic liquidity risk. Taking into account the massive outflow of deposits from the country's banking system, the high volatility of high liquid assets, the growth in the share of toxic assets and the largest amounts of refinancing operations (in 2014), we can conclude that the systemic liquidity risk occurred during the crises of 2013–2015, the results which still hinders the economic development of Ukraine and does not allow to fully achieve the pre-crisis level of profitability of banking.

In addition to the information highlighted above, special attention from regulatory authorities is required by systemically important banking institutions, because of concentration in them a significant part of assets. The emergence of a systemic liquidity risk in such institutions will inevitably have a negative effect on the entire banking system of the country, and ultimately — on the global banking market.

That is why it is advisable to set tougher requirements for economic ratios, in particular, to liquidity ratios. The introduction of such step on the domestic market (in the Instruction on Banking Regulation in Ukraine, dated August, 28, 2001 № 368, Section X) indicates a

deliberate step in preventing the negative consequences of the liquidity crisis in systemically important banks, which contributes to the overall improvement of banking regulation in Ukraine.

Conclusions. Systemic risks of the banking sector are one of the most threatening phenomenon for effective banking activity. Systemic liquidity risk, which in the general sense represents the possibility of a global liquidity crisis, requires special attention and vigilance in the context of general banking regulation. The presence of several negative aspects of the functioning of the banking market, such as the decline in the share of high liquid assets, outflow of deposit resources from banks, non-compliance with liquidity ratios, and the growth of refinancing operations, points to the first signs of the development of systemic liquidity risk.

The complex analysis of the Ukrainian banking system during 2000–2017 indicates the negative trends in the periods of the global economic crisis of 2007–2009 and the national crisis of 2014–2015. However, a well-balanced NBU policy allowed banks to exit the crisis and prevent further threatening events.

For a more successful and effective regulation of systemic liquidity risk, it would be advisable to create general banking indicators for early preventing of its development, and a tougher monitoring the compliance of banks with all necessary requirements are needed. Further studying and understanding of systemic liquidity risk is the first step to effective banking management and regulation.

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