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Macroprudential Regulation in Ensuring of the Development of Financial Markets

Abstract. Introduction*. The study has confirmed that ensuring of financial markets' development stability is connected with the development of an effective system for macroprudential regulation. The financial crisis has shown that price stability is not enough to ensure financial stability. The financial and business cycles are not synchronized – therefore risks can arise, especially during periods of "disconnection" between two cycles.*

Purpose*. The aim of the paper is to systematize basic concepts of macroprudential regulation in financial markets, considering international practice of its instruments selection and usage.*

Results*. It is clarified the approaches to a set of macroprudential instruments formation which depends on the country's economic development and the vulnerability of a financial sector to internal and external shocks. It has been substantiated that monetary regulation is aimed at ensuring price stability in the market for goods and services. It has been proven that it should not be used to address hotbeds of volatility in asset markets. This is a subject for macroprudential regulation, aimed to ensuring the stability of financial markets and containing systemic risk. It has been identified the factors causing the need to implement the strategy of macroprudential regulation in financial markets to ensure their stable development. They include: systemic risk and financial cycles; considering the importance of a growing market's credit system and measures to address its risks; the need to increase the transparency of the shadow banking sector; problems in regulating the FinTech branch; international financial standards; the growing role of the central periphery in international finance.*

Conclusions*. It has been concluded that a powerful macroprudential political mandate and an adequate set of instruments should be given for central banks to solve the problem of increasing financial risks, especially in situations where monetary regulation is adaptive. It has been substantiated the conclusion about the need to develop supervisory and coordination mechanisms in the financial market and the introduction of end-to-end monitoring of systemic risks as a prerequisite for restoring financial stability.*

Keywords*: financial cycle; financial market; financial stability; macroprudential regulation; systemic risk.*

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Макропруденційне регулювання у забезпеченні стабільності розвитку фінансових ринків

Анотація. *У статті доведено, що забезпечення стабільності розвитку фінансових ринків пов'язане з розробкою ефективної системи макропруденційного регулювання. Доведено гіпотезу, що під час фінансової кризи цінової стабільності недостатньо для забезпечення фінансової стабільності. Фінансовий та діловий цикли не синхронізовані, тому ризики можуть виникати, особливо в періоди «роз'єднаності» між двома циклами. У статті визначені підходи до формування набору макропруденційних інструментів в залежності від економічного розвитку країни і уразливості фінансового сектора до внутрішніх і зовнішніх шоків. Обґрунтовано, що монетарне регулювання спрямоване на забезпечення стабільності цін на ринку товарів і послуг, та доведено, що воно не повинно використовуватися для усунення загроз нестабільності на ринках активів. Установлено, що забезпечення фінансової стабільності фінансових ринків і стримування системного ризику підпадає під дію макропруденційного регулювання. Виявлено фактори, які викликають потребу в реалізації стратегії макропруденційного регулювання фінансових ринків для забезпечення їх стабільного розвитку. До них віднесені: системний ризик і фінансові цикли; врахування важливості, зростаючої ринкової кредитної системи та заходи щодо усунення її ризиків; необхідність в підвищенні прозорості тіньового банківського сектора; проблеми в регулюванні сфери FinTech; запровадження міжнародних фінансових стандартів; наростаюча роль центральної периферії в міжнародних фінансах. Обґрунтовано, що виникнення нової ідеології (Basel IV) пов'язане з гострою потребою банківської спільноти в рекомендаціях, застосування яких сприятиме подоланню негативних впливів наростаючої в умовах кризи агресивності зовнішнього середовища. Зроблено висновок*

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про те, що центральним банкам слід надати потужний макропруденційний політичний мандат і адекватний набір інструментів для вирішення проблеми нарощування фінансових ризиків, особливо в ситуаціях, коли монетарне регулювання є адаптивним. Обґрунтовано висновок про необхідність розвитку наглядово-координаційних механізмів фінансового ринку і введення наскрізного моніторингу системних ризиків як обов'язкової умови відновлення фінансової стабільності.

***Ключові слова**: макропруденційне регулювання; фінансовий ринок; системний ризик; фінансовий цикл; фінансова стабільність.*

Formulation of the problem. The global financial crisis has proved traditional regulation's inability to foresee and overcome the global financial imbalances' buildup, which lead to negative macroeconomic consequences. This caused the necessity of most countries to go beyond microprudential regulation and develop a more systematic approach, which ensures the financial stability of an economy as a whole. Such integrated approach is called macroprudential policy. Changes in the global financial system have a significant impact on all its components, including banks, which, in turn, are becoming increasingly vulnerable to the exogenous threats and endogenous shocks effects. The actual financial risk management system is not able to provide control on market volatility, and, consequently, the relative financial institutions' stability in it. That is why the study of macroprudential regulation has the particular importance, determines the relevance of the topic and the necessity of further research aimed to develop this issue.

Analysis of recent research and publications. S. Claessens [1], T. Kenç [2], V. Kozyuk [3], S. Naumenkova [4] devoted their research to the definition of the main provisions of macroprudential policy, macroprudential tools for its implementation. Also, A. Demirgüç-Kunt [5], S. Khoruzhyi [6], G. Kizima [7], M. Melecky [8] and others studied this subject.

However, most authors emphasize the need for further research to identify models of macroprudential regulation of financial markets, as well as to identify possible trends in the future.

Formulation of research goals. The aim of the paper is to systematize basic concepts of macroprudential regulation in financial markets, considering international practice of its instruments selection and usage.

Presentation of the main research material. The interconnection of financial institutions and markets creates the basis for risks transmission and systemic infection spread, which changes the focus of supervision from micro- to macroprudential. At the same time, a significant difference between macroprudential policy and prudential supervision lies in prudential supervision consideration of financial system's risks as exogenous factors, while macroprudential policy perceives them as endogenous factors, the occurrence of which causes by internal properties of the financial system. Globalization, liberalization of financial services regulation and new information technologies have led to the transformation of regulatory and supervision of financial institutions models. The accumulated experience in the development of financial markets indicates the importance of the relationship between a type of chosen regulatory model and a historically achieved “financial structure's depth”, as well as national institutional specifics.

In 2000s, most researchers came to the conclusion that the processes of “deepening the financial structure” are associated with accelerated economic growth [9, p. 2]. The authors of one of the most fundamental works, based on hundreds of cross-country comparisons, have finally come to the following conclusion: providing a reduction in costs associated with the collection and processing of information, as well as other transaction costs, a financial system's development initiates additional capital inflows and thereby can have a beneficial effect on general economic development processes [5]. An institutional design for supervising financial institutions activities should be able to support post-crisis regulatory and supervisory reforms and the introduction of a crisis management system for the financial sector of the economy [10].

In the literature there are various points of view on the model of financial markets' regulation (table 1).

Table 1 **The financial market regulation models’ classification**

№	Types of regulatory models	Author
1.	sectoral, integrated, Twin Peaks model, model of division of sectorssupervision	Calvo, Danial, Crisanto, Juan Carlos, Hohl, Stefan, Gutierrez, Oscar Puscual [10]
2.	sectoral, task-based, unified model supervision	Naumenkova, Svitlana, Michenko, Vladimir [11]
3.	мonoregulatory, polyregulatory	Yashchishchak, Oksana [12]
4.	мodel mega-regulator, sector model, model of cross-regulation	Kizima, Galina (2011) [7]
5.	institutional, functional, integrated, Twin Peaks	Group of Thirty [13]
6.	sectoral oversight banks outside the central bank; sectoral central bank supervision; in part integration in two authorized bodies; integration supervision in one supervisory authority; integration of all supervisory powers at the central bank	Melecky, Martin, Podpiera, Anca [8]

Source: systematized by the authors

The results of a study on the development trends of regulatory and supervisory systems allow concluding that the choice of the financial regulatory and supervision system's institutional structure is determined by numerous socio-economic factors, which take place in a state. However, in the process of such a choice, it is necessary to find compromises in determining a body, responsible for the exercise of authority, namely: the financial institutions' admission on activities in the financial services markets and ensure of such activities' supervision; microprudential supervision; financial services consumers and investors protection; macroprudential supervision and ensuring the financial stability; solutions to problems with financial institutions and their withdrawal from the market (table 2).

Table 2 **The criteria for regulatory and supervisory systems' models**

Model	Supervision of financial institutions	Microprudential supervision	Macroprudential supervision	Consumer financial protection services	Solving problems with financial institutions
Sectoral model	CB and individual FSI	CB and individual FSI	CB	Separate regulator, CB, RPS	CB or RS
Consolidated centralized and console model lidation of functions in the CB	CB	CB	CB	Separate regulator, CB, RPS	CB or RS
Consolidated model with centralization and consolidation of functions in a single FSI	The only one FSI	The only one FSI	The only one FSI with the CB	The only one FSI	RS
Integrated model "Twin Peaks"	FSI	FSI	RPS	RPS	FSI or RS

**CB – Central Bank, FSI – regulator overseeing financial activities institutions, RPS – regulator of prudential supervision, RS – financial institution withdrawal regulator "from the market"*

Source: formed by the authors according to [6]

The oversight effectiveness depends on the distribution of functions between authorized bodies and on the availability of operational autonomy, effective measures, sufficient resources and adequate incentives. The centralization and consolidation of supervision on financial institutions' activities allow to be better controlled, minimize regulatory arbitration (by introducing common approaches to regulation and supervision), and better understand risks, which arise not only in one financial institution, but also in a financial group.

Macroprudential policy is designed to monitor factors, which directly and indirectly affect financial stability; identify vulnerabilities of a banking system in relation with systemic risks; and early diagnosis of systemic instability in the financial sector. Due to the introduction and improvement of the system, ensuring financial stability, macroprudential regulation as one of its elements, central banks of the developed countries as a whole have adequately overcome the financial crisis and reduced losses from it [15]. Scientists consider it from the perspective of forecasting and neutralizing systemic risks, weakening the pro-cyclical nature of the economy and ensuring the stability of the financial sector. The main components of macroprudential policy are:

1. Macroprudential policy is a set of targeted actions of elimination or limiting systemic risks in order to prevent crises or reduce losses from them; weakening the pro-cyclical nature of the financial system and limiting the endogenous tendency of the financial system to accumulate imbalances and ensure its financial stability;
2. Goals: ultimate goal: financial stability due to the stability of a financial system and the prevention of a systemic risks' accumulation; intermediate goals: prevention of excessive growth in lending; prevention of liquidity shortages' accumulation; restriction of risks' concentration; limiting the effects of distorted incentives; increasing the sustainability of financial infrastructure;
3. Principles: independence; transparency; preventive approach; rational flexibility; coordination; proportionality; regulatory arbitration's avoidance; national characteristics' consideration;
4. Tasks: financial system stability on aggregated shocks; smoothing imbalances in the financial cycle; limiting excessive risks;
5. Macroprudential policy objects: relationships between financial intermediaries, markets, financial market infrastructure, as well as between the financial sector and the real economy;
6. Macroprudential policy's components:

Macroprudential regulation: an ongoing process, in which minimization of the scale of systemic risk (caused by the onset of macro- and micro-risks, affect the financial market and the real economy) occurs, which is achieved by coordinating in regulator's actions on reducing the pro-cyclical nature of a financial system;

Macroprudential analysis: designed to monitor factors, which directly or indirectly affect financial stability, identify vulnerabilities of the financial sector in relation to systemic risks, and early systemic instability's diagnosis [2; 14].

Any policy is implemented through a specific system of instruments. To achieve the objectives of macroprudential regulation, a wide range of macroprudential instruments is used to prevent the occurrence and spread of systemic risks in the financial sector, in order to minimize losses from violations in the provision of financial services. The use of macroprudential instruments provides operation of some of them on an ongoing basis, and depends on the deployment of the financial cycle [3]. The researcher has also evaluated the effectiveness of macroprudential instruments use depending on the general and raw materials aspects. He has identified the prerequisites for such a use, namely: the nature of the economy and the level of financial development of the country; quantitative restrictions inherent in macroprudential instruments are effective until the substitution effect; considering the factor of relative macroprudential instruments' effectiveness; the importance of consideration an exchange rate in supporting financial stability; consideration the factor of raw material dependence of a country during macroprudential policy clarification on the issue of systemic vulnerability caused by the opaque activities of oligarchic banking, lending to related parties and offshoring. Also, scientists propose the use of macroprudential instruments, based on the application of variable and constant approaches, which leads to their separation into instruments with interchangeable and fixed characteristics.

Macroprudential instruments with variable characteristics are instruments, adjust (automatically or by a regulator) in accordance with the values of macroprudential indicators, which fluctuate during the economic cycle. This approach is used, for example, when a countercyclical capital buffer or dynamic reserve formation are applying. Macroprudential instruments with variable parameters allow limiting pro-cyclical trends and chain risks, which increase during the economic cycle [4]. Fixed-performance macroprudential instruments are instruments whose values do not change depending on the stages of the business cycle (for example, leverage ratio, risk weights, licensing or corporate governance standards).

Presented macroprudential instruments should be applied depending on the economic development cycle. Therefore, studies devoted specifically to the distribution of instruments by their use, considering the phases of the cycle, deserve special attention (table 3).

Table 4 **Use of macroprudential policy instruments depending on the phases of the cycle**

Cycle phase	Levels / Subjects				
	Restrictions related to borrower, tool, activity	Financial sector balance sheet constraints (assets, liabilities	Requirements for capital and reserves	Taxes and fees	Other
Phase growth / expansion	Restrictions on credit scores (DTI, LTI, LTV) margin, lending individual sectors, credit growth	Limitation concerning imbalances and backup requirements	Countercyclical requirements for capital, limitation leverage, dynamic approach to reservation	Tax on certain assets or liabilities	Changes in management and market discipline Policy change accounting fo market prices
Containment Phase (Credit Crisis)	Adjustment of loan reserves, margins and the difference between the value of the collateral and loan; limits on foreign currency loans (regulate systemic risk); Limits on gaps in the urgency of assets and liabilities	Limitation concerning liquidity (level clean stable funding, level liquid coating		Taxes and meeting on non-core obligation	Macroprudential supervision with public protection
Distribution phase / financial infection	Various restrictions on activities or stock of assets	Setting certain (selective limits on financial risks)	Capital requirements related to systemic risk	Taxes and meeting depending on size and market connections institutions	Risk disclosure requirements; decision on a survival plan

Source: formed by the authors according to [15]

Basel Committee on Banking Supervision international standards are focused mainly on the regulation of the banking segment of the financial market. Currently, the main documents governing the systems of international banking regulation include the "Banking Standards" developed by the Basel Committee on Banking Supervision, established by the Bank for International Settlements and known as the "Basel Agreements" ("Basel I", "Basel II", "Basel II.5" and "Basel III"). Nowadays, the application of the Basel III rules is relevant. Requirements of the Basel III standard are a guideline for national regulators on the use of macroprudential regulation instruments. National regulators have the right to adopt stricter standards than Basel criteria had. The main provisions of Basel III were completed at the end of 2017. Basel III transitional arrangements by 2027 are in charge today (table 5).

Table 5 **Basel III Transitional Arrangements, 2017-2027**

Risk coverage	Transition status	The third phase of Basel III
Capital	All minimum requirements have been fully phased in by 2019, that is, common equity, total capital and the capital conservation buffer, as well as deductions from capital.	The initial phase
	Capital instruments that no longer qualify as non-core Tier 1 or Tier 2 capital have been phased out since 2013. This will end in 2021.	The initial phase
Assets tailored to risk	Capital requirements for investments in funds and exposure to central counterparties, the standardized approach to counterparty credit risk, the revised securitization framework, and the interest rate risk in the banking book and large exposure framework have all become fully effective.	The initial phase
	The revised standardized approach for credit risk and the revised IRB, CVA, operational risk and market risk frameworks will become effective in 2022. The output floor will be phased-in in 2022 starting with 50% and it will increase every year by five percentage points until 2026, with the final floor of 72.5% reached in 2027.	The final phase
Liquidity	The Net Stable Funding Ratio and Liquidity Coverage Ratio became fully effective in 2018 and 2019, respectively.	The initial phase
Leverage	The initial exposure definition became effective in 2018.	The final phase
	The revised exposure definition and the G-SIB buffer will become fully effective in 2022.	The initial phase

Source: formed by the authors according to [16]

The Basel III standards structure includes modified requirements for capital structure and liquidity risk. It should be noted that the current state of the global banking business indicates that the largest amount of formed banking capital is observed in China (table 6).

Table 6 **Top-10 world-scale banks in terms of capital**

Rank	Previous	Bank	Country	Tier 1 capital $ bn
1	1	ICBC	China	338
2	2	China Construction Bank	China	287
3	4	Agricultural Bank of China	China	243
4	3	Bank of China	China	230
5	5	JP Morgan Chase	US	209
6	6	Bank of America	US	189
7	7	Wels Fargo	US	168
8	8	Citigroup	US	158
9	10	HSBC	UK	147
10	9	Mitsubishi UFJ	Japan	146

Source: formed by the authors according to [17]

Basel III has increased the amount of capital that banks must hold, and established a first-order capital ratio of 27%. Technically, the implementation deadline for Basel III was in 2019, but recent crisis events in the global banking market have necessitated the regulator to develop even stricter rules called "Basel IV" [18; 19]. The new ideology assumes that during the period of the financial and economic crisis or in anticipation of increasing uncertainty in the economy, it is necessary to abandon the ideology of bank capital management and the creation of financial reserves to maintain liquidity and stability of financial institutions. These measures will not be able to protect the bank from default and bankruptcy. In times of crisis, prudential supervision also loses effectiveness, since violations of mandatory standards are often not associated with a low level of management or criminal behavior of the financial institutions' management.

The emergence of a new ideology is associated with the urgent necessity of the banking community for recommendations, the use of which could help in overcoming negative impacts of the growing environmental aggressiveness in a crisis. Aggressiveness is manifested in the intensity of growth and a variety of risks that can cause catastrophic consequences for banking activities. At the same time, maintaining the proper performance of financial institutions depends on the ability of banking management to "calculate risks", that is, the ability to identify, predict and regulate them, the ability of the regulator to assess and regulate the level of "risk appetite", the appropriateness and effectiveness of measures to protect against risks of each financial Institute. This ideology has transformed into a new paradigm of effective banking management, which can be formulated as an accepted set of three messages: risk; risk management; risk oriented supervision.

Conclusions. Thus, modern financial systems are characterized by increased integration of regulatory models and prudential supervision, the formation of an optimal balance between the stability of the financial system and the maintenance of fair competition between its participants. The integration degree of these models is largely determined by the level of development of an economy and a financial system, as well as the effectiveness of public administration.

The basic provisions of macroprudential regulation have been determined. The strategy of macroprudential regulation should be provided for the achievement of the result of financial market entities' impact on the economy as a whole from the position of ensuring stable gradual economic growth. Particular attention in the strategy should be given to assessing the quality of risk management and modernizing the model for assessing financial stability, considering the lessons of the global financial crisis.

It is also worth to note that the strategy of macroprudential regulation should be adjusted depending on the nature of an economy and the level of financial development of a country; considering the quantitative limitations inherent in macroprudential instruments and their relative effectiveness; the importance of an exchange rate factor in financial stability's supporting; coordination of systemic vulnerability issues caused by the opaque activities of oligarchic banking, related parties' lending and offshoring.

The most important task today is to coordinate the monetary policy and macroprudential measures as among the causes of the financial crisis are structural weaknesses in financial systems. In the arsenal of monetary policy there is no effective instrument to address these deficiencies. In this case, the macroprudential regulation will be more effective.

However, it is necessary to evaluate the effect of macro-prudential measures on monetary policy transmission channels (for example, limiting the dynamics of loans). Thus, the effective coordination of monetary policy and macroprudential policy – the key to financial stability. In determining the discount rate of the Central Bank should be focused on its approach to the maximum base rate "overnight", which provides real levers of money market liquidity.

The implementation of tight monetary policy is an obligatory condition for restoring macroeconomic and financial stability. In a crisis, with the aim of curbing inflation, ensuring stability and restore confidence in the banking system the central bank should conduct a restrictive monetary policy, while ensuring positive real interest rates. In terms of implementation of tight monetary policy, fiscal policy should not be expansionary. The degree of hardness or softness of the policy should be consistent with the nature of other policies through their coordination.

A new approach to developing recommendations for the banking community on the problems of effective banking management should be based on a new paradigm – "risks, risk management and risk-oriented supervision". Particular attention should be paid to the uncontrolled development of FinTech companies and FinTech startups, which create a situation of increased risks, causing financial instability in financial markets.

In conclusion, it can be noted that the digitization of the global banking sector is an integral element of the transformation of all banking activities in the context of the emergence of rapidly developing innovative technologies. Services emerging as a result of the integration of innovative technologies and financial services are becoming oriented platform. In these conditions, it becomes necessary to standardize methods for accessing data and developing technologies to ensure security against new risks. The financial ecosystem is changing and, following it, the models of organization of financial institutions are changing too.

Meanwhile, risks remain that are being transformed, the regulation of which is necessary both on the part of service providers and on the part of regulatory bodies. This regulation should take into account: the characteristics of the regulated area (its global nature and the gradual erosion of the boundaries in the standardization of regulatory approaches), as well as the need to respect national interests. This problem should be resolved within the framework of the strategy of macroprudential regulation adopted by every single country.

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