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INTERNATIONAL STANDARDS FOR BANK CAPITAL REGULATION

Abstract. The paper analyzes the evolution of the introduction of international standards for bank capital regulation.

The aim of the research is to study international standards for bank capital regulation and their impact on financial stability and sustainability of domestic banking systems.

The 2007—2009 Global Financial Crisis was perhaps the greatest banking and financial crisis since bank failures and the financial panic of the Great Depression in early 1930s. According to academics and professionals, there has been much debate over the last decade as to whether the 2007—2009 banking crisis was primarily a solvency crisis or a liquidity crisis. Capital adequacy of banks today is the main indicator of increasing society's confidence in banking systems. The flexible and balanced implementation of Basel Committee on Banking Supervision (BCBS) recommendations on the assessment of bank capital adequacy is of particular importance in the context of the deepening economic crisis caused by COVID-19 quarantine restrictions.

Regulation of bank capital is primarily settles by the ability to execute basic functions inherent in it. A number of shocks in connection with the crisis require the renewal and search for a new paradigm of regulation, which today is focused on achieving financial stability, overcoming pro-cyclicity, especially in the banking sector. One of the latest developments in the field of bank capital regulation has been the implementation of international banking supervision standards recommended by BCBS, which have been transformed from Basel I, Basel II, Basel III, Basel 3.5 to Basel IV.

The new ideology suggests that in times of financial and economic crisis or in anticipation of growing uncertainty in the economy, it is necessary to abandon the idea 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. This ideology has become a new paradigm of effective banking regulation, which can be formulated as an accepted set of three vectors: risk; risk management; risk-oriented supervision.

Keywords: bank capital, international standards, financial stability, liquidity, banking crisis, banking regulation.

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МІЖНАРОДНІ СТАНДАРТИ РЕГУЛЮВАННЯ БАНКІВСЬКОГО КАПІТАЛУ

Анотація. Проведено аналіз еволюції запровадження міжнародних стандартів регулювання капіталу банків.

Метою роботи є дослідження міжнародних стандартів регулювання банківського капіталу та їхнього впливу на фінансову стабільність і стійкість розвитку національних банківських систем.

Велика фінансова криза 2007—2009 років була, можливо, найбільшою банківською і фінансовою з часів банкрутств банків і фінансової паніки Великої депресії 1930-х років. Як наголошується в академічних і професійних колах, за останнє десятиліття відбулося багато дискусій про те, чи була банківська криза 2007—2009 років перш за все кризою платоспроможності або кризою ліквідності. Достатність капіталу банків на сьогодні виступає головним індикатором підвищення довіри до банківських систем з боку суспільства. Гнучка і виважена імплементація рекомендацій Базельського комітету з банківського нагляду щодо оцінювання адекватності капіталу банків набуває особливого значення в умовах поглиблення фінансової кризи, яка викликана карантинними обмеженнями COVID-19.

Регулювання банківського капіталу передусім зумовлено спроможністю виконувати основні, властиві для нього функції. Низка потрясінь у зв'язку з кризами вимагає поновлення і пошуку нової парадигми регулювання, яка сьогодні сфокусована на досягненні фінансової стабільності, подоланні проциклічності, перш за все, в банківському секторі. Одним з останніх напрямів у галузі регулювання банківського капіталу стало впровадження

міжнародних стандартів банківського нагляду, рекомендованих Базельським комітетом з банківського нагляду, які трансформувалися, починаючи від «Базелю I», «Базелю II», «Базелю III», «Базелю 3.5» до «Базелю IV».

Нова ідеологія припускає, що в період фінансово-економічної кризи або в очікуванні зростаючої невизначеності в економіці потрібно відмовитися від ідеології управління банківським капіталом і створення фінансових резервів для підтримки ліквідності та стабільності фінансових установ. Ці заходи не зможуть захистити банк від дефолту і банкрутства. Ця ідеологія перетворилася на нову парадигму ефективного банківського регулювання, яку можна сформулювати як прийнятий набір із трьох векторів: ризик; управління ризиками; нагляд, орієнтований на ризик.

Ключові слова: банківський капітал, міжнародні стандарти, фінансова стабільність, ліквідність, банківська криза, банківське регулювання.

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Introduction. The importance of standards in the field of financial services is explained by their extension to all segments of the population and types of organizations. Standards are especially important in the process of financial inclusion: protecting the rights of those unfamiliar with the subtleties of credit, insurance and other customer service is an impossible task without the introduction of regulations governing the full range of financial services' applied aspects — from advertising to operations, from staff training to concluding contract's procedures. In this aspect, the banking business is no exception, the reliability and competitiveness of which depends on the adequacy of its capital base.

The crisis in recent decades has caused a resonance in the global and domestic financial markets for the introduction of effective instruments to regulate the bank capital adequacy. This issue is addressed at all levels of regulators and organizations in each country.

Capital adequacy of banks today is the main indicator of increasing society's confidence in banking systems. That's why the issue of assessing bank capital adequacy to cover the risks to which they are exposed in the course of their activities, is given considerable attention in both international and domestic banking practice.

Flexible and balanced implementation of the Basel Committee on Banking Supervision recommendations on assessing bank capital adequacy is especially important in the context of the deepening financial crisis caused by COVID-19 quarantine restrictions. This is accompanied by a significant deterioration in the financial condition of borrowers and the quality of loan portfolios in many banks, rising cost of borrowed capital, complicating the procedure for raising funds by enterprises of the real sector [1, p. 5].

One of the main assertions of international standards is that all banks must have sufficient capital to cover all significant risks to which their business is vulnerable. It is the requirements of the Basel Committee on Banking Supervision that provide a closer link between capital requirements and the risks inherent in banks in the course of their operations.

Despite the consistent development and unification of international banking standards, the problem of improving approaches to the regulation and evaluation of bank capital adequacy's statistical component remains relevant. Increased attention to this problem by members of the banking community around the world is due to the lack of a universal approach to determining the minimum allowable amount of capital for banks, which would be equally used for the domestic banking system of each country. Therefore, the problem of defining transition periods for the implementation of international standards for the regulation of bank capital, is an important issue for research.

Analysis of recent research and problem statement. The review of official documents [2—9] and others shows that approaches to calculating equity and risk assessment have been refined in recent years, but the main criterion still remains the same — capital adequacy depends on the level of risk of bank losses.

The scientific works of foreign researchers such as A. Rossignolo [10], D. Craig [11], A. Thakor [12], R. De Young [13], E. Carletti [14] and others are devoted to the problem of bank

capital regulation with the international standards. The presented scientific works consider problematic issues related to the introduction of international standards for the regulation of bank capital, transformational areas of considering operational, credit, market and other risks in determining the adequacy of bank capital.

A. Thakor concluded that the appropriate regulators' response should be to increase capital requirements in order to reduce solvency risk, rather than freezing billions of dollars in real estate by requiring banks to invest in «high-quality liquid assets» (within the new requirements for bank liquidity) [12, p. 109].

The combination of regulation processes for bank liquidity and bank capital under Basel III has launched a new study. As noted by R. DeYoung, S. Distinguin and F. Tarazi, the liquidity of bank's assets, the stability of bank's liabilities and the desired level of bank's equity are interrelated, which is fully understood by both regulators and researchers [13]. In addition, a recent paper by E. Carletti, I. Goldstein and A. Leonello examined the interdependence of bank capital and liquidity by constructing a global game model to analyze the interdependence of bank capital and liquidity on the likelihood of solvency and liquidity crises [14].

Among Ukrainian scientists should be noted studies of M. Zveryakov [15], S. Naumenkova [1], O. Mozhovi [16]. The authors of the presented scientific works consider the problematic aspects of international standards' introduction in the domestic banking services market; opportunities and prospects of considering risks in calculating bank capital adequacy; determine the leading role of bank's capitalization level on the financial stability of the system as a whole; formation of the concept of banking activity focused on risk-oriented supervision from the point of view of bank capital regulation.

Further research is intended to help address the main challenges associated with the implementation of international standards for bank capital regulation in terms of growing crises, especially those caused by COVID-19.

Therefore, the aim of the paper is to study the international standards of bank capital regulation and their impact on financial stability and sustainability of domestic banking systems.

Research results. Regulation of bank capital is primarily settles by the ability to execute basic functions inherent in it, which are defined as protective, operational and regulatory. But the range of bank's capital functions, which increase its importance in ensuring the stable operation of banks, can be supplemented by additional ones, namely: operational (insurance function for depositors and creditors, investment, innovation, guarantee, control, regulatory, income function, valuation, coordination) and strategic (indicative, mobilizing, communicative, stimulating).

To implement them in the global regulatory practice, a number of standards have been developed, which today are called Basel I, Basel II, Basel III, Basel 3.5 and Basel IV.

The harmonization of banking capital standards began more than 30 years ago, when in early 1988 the Basel Committee on Banking Supervision published the International Convergence of Capital Measurement and Capital Standards (BCBS, 1988) [2], which became known as the Accord «Basel I». At the time, after the Latin American sovereign debt crisis in the early 1980s, Basel I was the first attempt to internationally harmonize the definition of bank capital and the amount of capital which banks should maintain.

This first Basel Accord had three objectives, according to the BCBS itself: to ensure that banks had sufficient capital to cover their risks; to align the playing field between international banks; to promote the comparison of banks' capital positions [15, p. 18].

One of the weaknesses of Basel I was that all private sector loans were given the same weight of risk and capital requirements. This encouraged banks to focus on riskier loans that have higher expected returns (regulatory capital arbitrage). Therefore, the subsequent introduction of Basel II was aimed at solving this problem.

The Basel II Agreement, «International Convergence of Capital Measurement and Capital Standards — A Revised Concept» (BCBS, 2004) [3], was adopted in June 2004 and enforced in Europe in January 2008. The introduction of Basel II focused on self-regulation and market discipline; it is based on the definition of three pillars (*Fig. 1*).

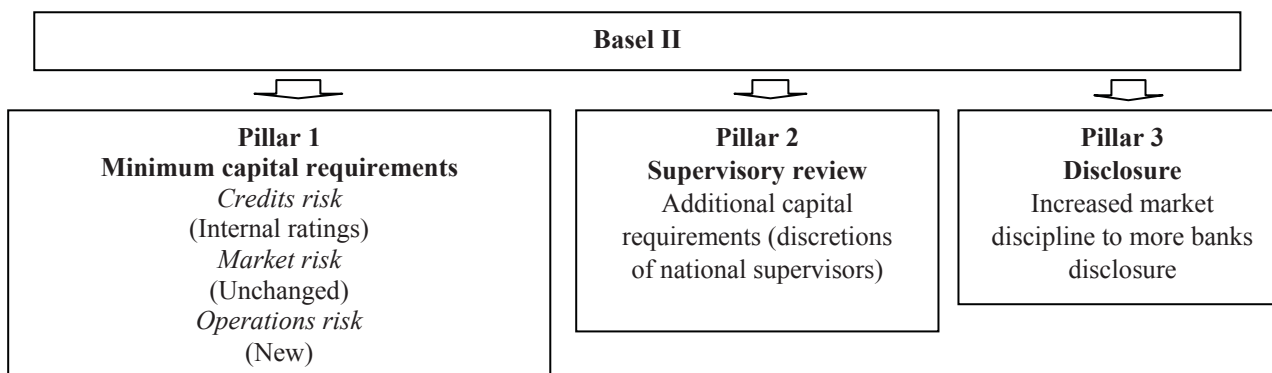
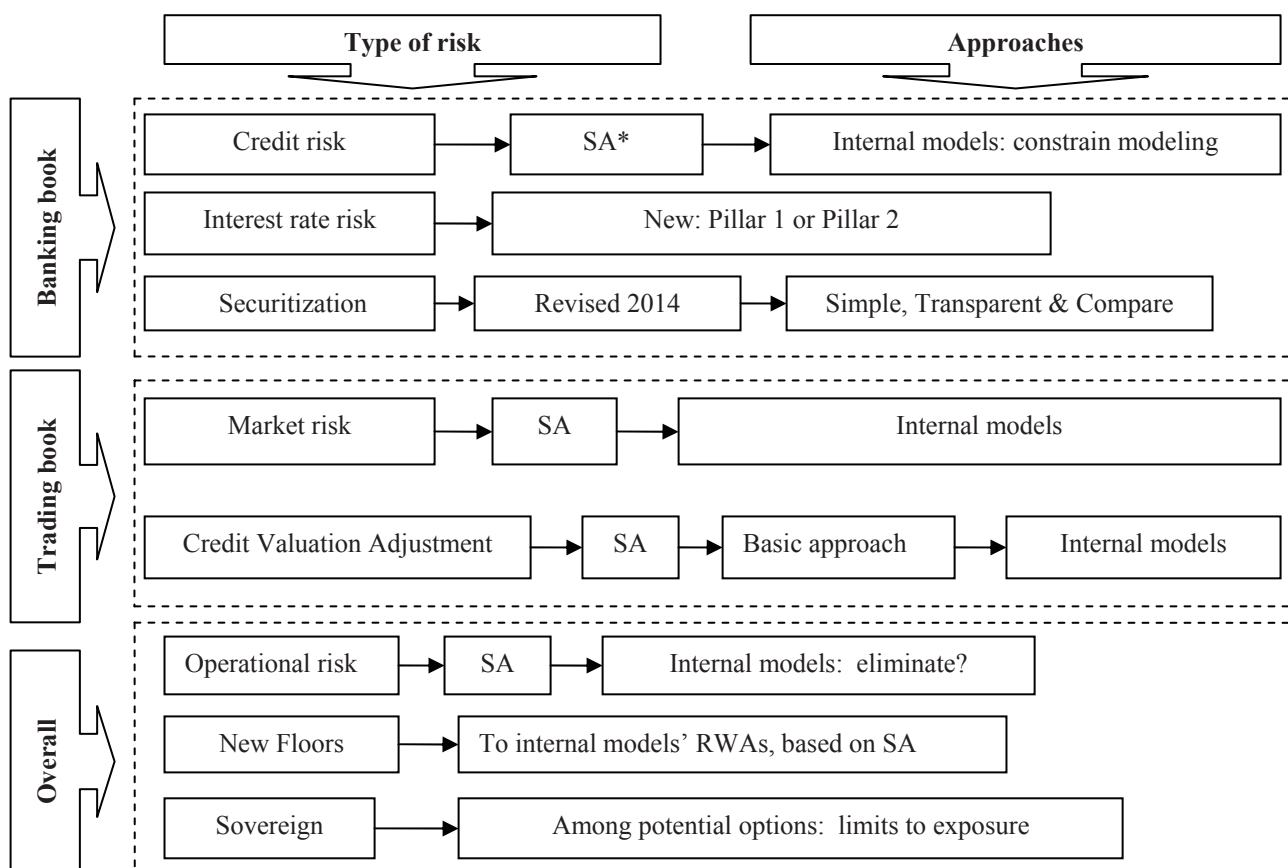


Fig. 1. Three Pillars of Basel II

Source: BCBS, 2004.

Basel II allowed the most experienced banks to develop internal risk assessment models in order to calculate the amount of capital needed to cover, thus solving the Basel I problem by applying regulatory capital arbitrage. However, the ability to develop their own risk models has led banks to underestimate the risk in their loan portfolios and, consequently, allowed them to significantly reduce the required amount of capital.

Following the fall of Lehman Brothers in September 2008, which was followed by a global banking crisis in both the United States and Europe, international banking supervisors recognized the need to significantly increase bank capital levels. Basel III of December 2010, «A Global Regulatory Framework for More Sustainable Banks and Banking Systems» (BCBS, 2010) [4], addressed this issue by narrowing the items considered in the calculation of capital (reducing use of hybrid debt instruments executed as part of capital) and by increasing the required capital adequacy ratios. The main changes which have taken place within Basel III are shown in Fig. 2.



* SA — standardized approach; RWAs — the amount of risk-weighted assets

Fig. 2. Main Revisions to the Basel III Framework

Source: compiled by the authors on the basis of materials (BCBS, 2010; Rossignolo, A.F. 2020).

In Europe, Basel III has been transposed into law, in particular through the adoption in 2013 of the «Capital Requirements Regulation (CRR)» and the «Capital Requirements Directive IV (CRD IV)». Moreover, as a result, a single supervisory mechanism (SSM) has been established within the European Banking Union, which distributes supervisory functions between European Central Bank, as well as a single mechanism for resolving instability (SRM).

Adequate supervision and regulation of the banking sector may be even more important in Europe rather than in United States, as in Europe the financial system is more bank-based and therefore more likely to have a significant impact on the economy when crises arise.

The Basel III agreement on the completion of post-crisis reforms, dated December 2017, largely solves the incentive problems associated with banks' minimizing the estimated risk weights using their own internal models, in order to minimize regulatory capital requirements. To mitigate these incentives, so-called floors have been set: the percentage of standard risk weights set by supervisors below which capital cannot decline (BCBS, 2017) [5].

BCBS has decided to introduce floors in stages over five years. Initial values will be introduced from January 2022 and will be set at 50% of standardized risk weights, and then will increase by 5% annually from 2022 to 2026, until they are set at 70%, and then finally increase up to 72.5% in 2027 (PricewaterhouseCoopers, 2018) [6] (Tabl. 1).

Table 1

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. 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 The initial phase
Risk Weighted Assets	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 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 initial phase 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 revised exposure definition and the G-SIB buffer will become fully effective in 2022.	The final phase The initial phase

Source: [17, p. 28].

Under Basel III, the most important requirement is capital adequacy, which depends on the amount of risk-weighted assets (RWA). However, the question of calculating RWA has never been fully regulated in any of Basel Accords. Banks can either apply a standardized approach (SA) based on risk weights determined by supervisors or recognized rating agencies, or use an internal rating model (IRB) which allows to set bank's own risk weighting criteria. In practice, this means that banks can have a direct impact on the final level of required regulatory capital. According to V. Le Lesle and S. Avramova, it is difficult to find a better incentive to play in such a calculation process [18]. The Economist called the received IRB capital «capital for self-construction» [19]. Basel IV aims to address this issue by «restoring confidence in the calculation of RWA and improving the comparability of bank capital adequacy ratios» (Finalizing Basel III IN BRIEF 2017) [7]. The main changes, which have taken place within Basel IV, are shown in Fig. 3.

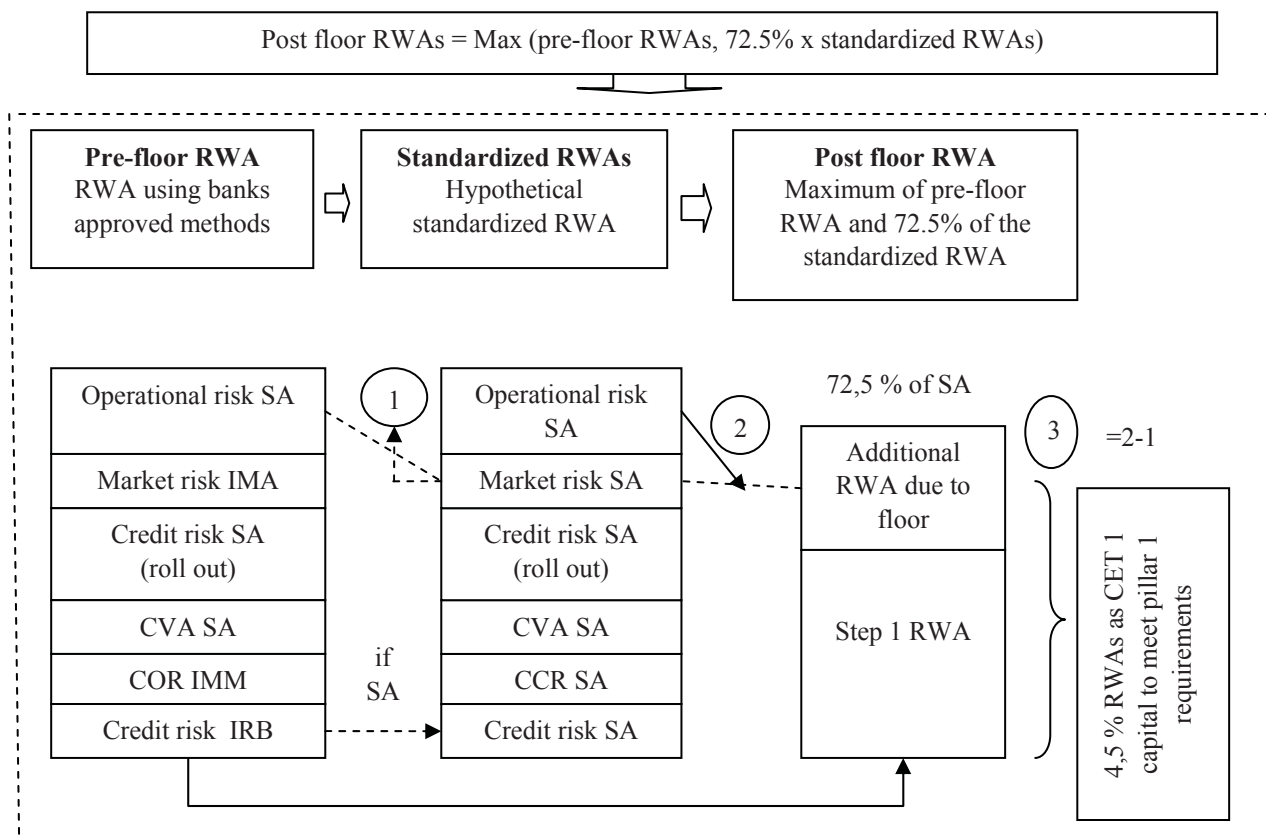


Fig. 3. Basel IV Capital Floor

Source: compiled by the authors on the basis of materials (Craig D. at all, 2019).

Basel IV contains four major innovations. First, the use of IRB to calculate credit risk has been excluded due to certain typical risks. Only SA is allowed for capital. In turn, the risk weights for banks and other financial institutions, as well as individual corporations, should not be assessed using the extended IRB, while changes in basic IRB are allowed.

Second, due to the high level of unpredictability of operational risk, the only method of quantifying such a risk is the use of SA. In this aspect, internal models have been found to be too unreliable (Finalizing Basel III IN BRIEF 2017) [7]. Naturally, SA can increase comparability between financial institutions and equal conditions in this regard. On the other hand, due to the huge differences between modern banking models, this may harm some of them by imposing a «one size fits all» policy.

The third innovation complements the risk-based structure of capital adequacy. For global systemically important banks (G-SIBs), risk independence is a new requirement. It sets a special additional leverage ratio for the G-SIB, «to support the relative incentives provided by both risk-weighted and risk-free capital constraints» (High-level Summary of Basel III Reforms 2017) [8]. The final leverage ratio is defined as the sum of the base requirement of 3% and half of the risk-weighted higher loss claims, which are determined annually by Financial Stability Board (FSB). For example, according to FSB list, in 2019 HSBC was placed in the basket № 3 (2%) [20]. Thus, it will be required to adhere to the leverage ratio buffer at 4% (3% + 0.5 × 2%).

The fourth, and, perhaps, most controversial requirement included in the Basel IV framework is the introduction of a capital requirements floor calculated on the basis of internal models. This is a fixed level for all RWAs calculated using SA, below which the number of RWAs based on IRB cannot be reduced. The selected threshold is 72.5% of RWA calculated using SA. For example, if a bank uses IRB to calculate its RWA, the total amount cannot be less than 72.5% of such bank’s RWA, calculated by SA:

$$\text{IRB-based calculation} \geq 72.5\% \text{ SA-based calculation.}$$

If IRB-based calculation is below 72.5% of SA-based calculation, a bank is required to use 72.5% of SA-based result as the amount of RWA in the process of calculating the required regulatory capital to be maintained. No matter how necessary these reforms are, their final form is far from perfect. Neither «restored trust» nor «facilitated comparability» (Financial Basel III IN BRIEF 2017) [7], which regulators are striving for, are completely worth the price that EU banks will have to pay for complying with these requirements. Most importantly, the negative consequences to be expected with the implementation of these rules may result in less regulated SBS. In summary, it can be provided the following characteristics of main novelties (*Tabl. 2*).

Table 2

Basel IV Novelties Overview

Novelties	Pros	Contras	General summary
SA for credit risk of certain exposures	Comparability (equal conditions of the game); Less risk of calculations' distortion; Considered differences in the nature of exposures	Less accuracy; Capital shortage, which leads to an indirect increase in capital requirements	Useful, if it's determined individually for each institution considering its business model; Alternative: more supervised access to IRB
SA for operational risk	Comparability (equal conditions of the game); Less risk of calculations' distortion		
Leverage ratio add-on for G-SIB	Completion of the specific GSIB structure (after GSIB Capital addition)	Dependence on a fairly arbitrary GSIB definition; Incentive to take more risk	Adjustments are needed to consider the systemic nature of banks
Capital requirements floor	The last stronghold which prevents too low RWA score for banks	Arbitrary; Half of the capital deficit is related to this; Incentive to take more risk	Arbitrary; Not necessarily in the presence of a properly worded SA

Source: systematized by the authors.

In general, it should be noted that at the initial stage of Basel IV implementation was expected by 2022 on risks and calculation of RWA, the minimum level — 72.5% should be gradually reached till 2027. However, a new crisis came faster than expected when the Covid Pandemic forced the world to isolate. In these circumstances, the banks have stated that they will not have the capacity to support the real economy [21]. Regulators and supervisors around the world have begun to reduce capital requirements and release capital, fearing that banks will not have enough resources for lending. In EU, in addition to the actions of European Central Bank to reduce capital requirements, France, Germany and the Netherlands have abandoned the countercyclical buffer. In addition, BCBS has taken steps to «free up operational opportunities for banks and supervisors as they respond to the economic performance of COVID-19» (BCBS, 2020) [9]. In particular, the introduction of Basel IV was postponed for one year, until early 2023. Under these conditions, the current state of global banking business indicates that the largest amount of generated banking capital is observed in China (*Tabl. 3*).

Table 3

Top-10 World-Scale Banks in Terms of Capital in 2020

Rank	Bank	Country	Tier 1 capital		BIS Capital Adequacy Ratio (Total), %	Ratios (Leverage), %	RWA Density, %
			\$ bn	%			
1	ICBC	China	380	12,6	16,8	8,8	61,8
2	China Construction Bank	China	316	10,0	17,5	8,7	59,2
3	Agricultural Bank of China	China	278	14,3	16,1	7,8	62,2
4	Bank of China	China	258	12,4	15,6	7,9	62,0
5	JP Morgan Chase & Co	US	214	2,6	16,0	8,0	56,4
6	Bank of America	US	188	-0,3	14,8	7,7	61,4
7	Wells Fargo & Co	US	159	-5,3	15,8	8,2	64,6
8	Citigroup	US	155	-1,5	16,6	8,8	59,8
9	HSBC	UK	148	0,8	20,4	5,5	31,1
10	Mitsubishi UFJ	Japan	145	-2,1	15,9	4,6	34,2

Source: formed by the authors according to (The Banker, 2021).

It is worth to note the changes in the biggest banks’ rating over the last 20 years (Fig. 4). As can be seen from the presented data, Chinese banks have a fairly stable tendency to gain high positions in terms of capitalization.

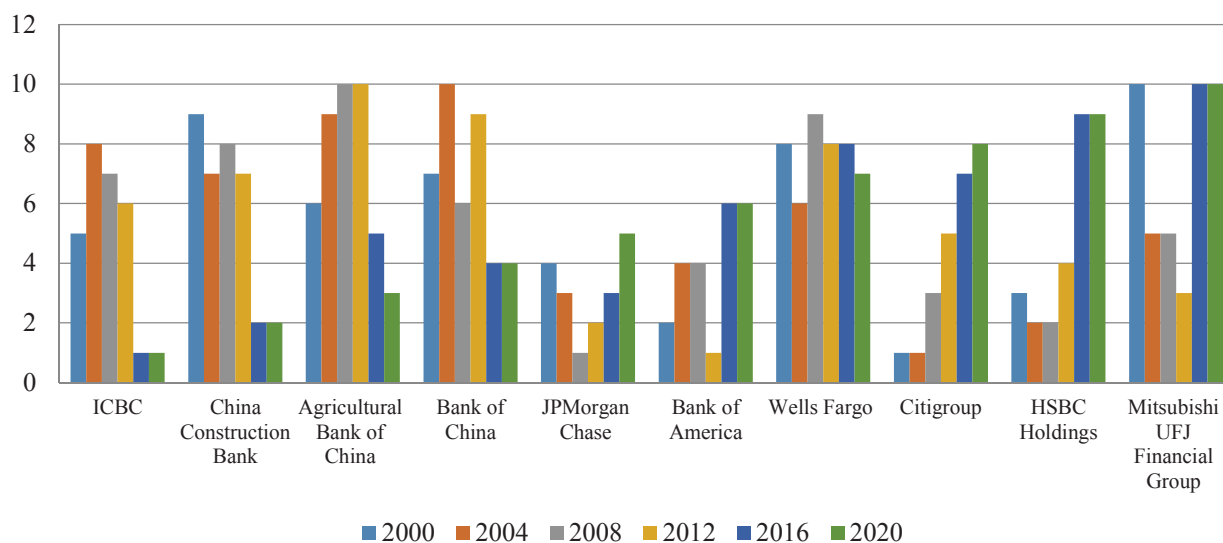


Fig. 4. Dynamics of Global Top-10 Banks in 20 Years

Source: formed by the authors according to (The Banker, 2021).

It is arguable that if there is anything positive about banks and economies around the world entering an period of unprecedented turbulence, it is the years of reform following the global financial crisis have created a safer, more capitalized banking system which is resilient to economic shocks. In the current terms, the regulatory requirements introduced after the crisis of 2007—2008 may justify themselves.

Conclusions. The study showed that the financial shocks which have accompanied the development of the banking business in recent decades, make adjustments in the process of regulating banks’ capital, which are controversial in terms of stabilizing the situation.

A clear trend in the development of economic and banking systems, both in developed and developing countries, is the shift of emphasis to institutional transformation, improving the financial architecture and increasing the role of regulation in solving emerging problems, including fundamental ones. This trend is especially performs in banking and financial sectors, which are very sensitive to market factors and associated risks.

Obviously, a number of shocks in connection with the crisis require the renewal and search for a new paradigm of regulation, which today is focused on achieving financial stability, overcoming pro-cyclicality, especially in the banking sector. One of the latest developments in the field of bank capital regulation has been the implementation of international banking supervision standards recommended by BCBS, which have been transformed from Basel I, Basel II, Basel III, Basel 3.5 to Basel IV.

The new ideology suggests that in times of financial and economic crisis or in anticipation of growing uncertainty in the economy, it is necessary to abandon the idea 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. During a crisis, prudential supervision also loses effectiveness, as breaches of mandatory standards are often not linked to poor management or negligent behavior.

The emergence of a new ideology is associated with the urgent need of the banking community to provide recommendations, the use of which could help overcome the negative effects of growing environmental aggression in a crisis. Aggression is manifested in the intensity of growth and a variety of risks that can have catastrophic consequences for banking. At the same time, maintaining proper performance of financial institutions depends on the ability of bank’s

management to «calculate risks», i.e. the ability to identify, forecast and regulate them, the ability of the regulator to assess and regulate the level of «risk appetite», the feasibility and effectiveness of measures to protect financial institution. This ideology has become a new paradigm of effective banking regulation, which can be formulated as an accepted set of three vectors: risk; risk management; risk-oriented supervision.

However, although it is unlikely that the final form of Basel IV can be changed, under the quarantine restrictions caused by COVID-19, it will not be effective until used wisely by global regulators and supervisors in terms of finding a balance between the non-existent prudential rules and the ever-increasing compilation of standards.

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