

## “QUO VADIS” CAPITAL ADEQUACY? – REFLECTIONS ON CAPITAL ADEQUACY MANAGEMENT IN BANKS ACCORDING TO BASEL REGULATIONS

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**Purpose:** The main purpose of the article is to present the effects of implementing the capital requirements recommended by the Basel Committee on Banking Supervision by banks around the world. The main identified research area is the evolution of banks' capital adequacy according to the Basel standards, i.e. banks' possession of an appropriate level of loss-absorbing capital (Tier 1/CET1, Tier 2), presented as a percentage of their risk-weighted assets (RWAs).

**Design/methodology/approach:** The research process consisted of a theoretical and cognitive stage and verification of the collected quantitative data. As part of it, the literature review methodology was used, applied to books, scientific journals, as well as reports and studies prepared by the Basel Committee on Banking Supervision. Therefore, the use of the method of Polish- and foreign-language literature studies was of key importance in the writing of the article. The application of this method was the starting point for the further part of the research process, during which the method of graphical data presentation and analysis with elements of comparisons was used.

**Findings:** The aim of the Basel recommendations is to strengthen the global banking sector's ability to absorb the financial consequences of a rapid deterioration of its economic situation, regardless of the cause, and to reduce the risk of spreading the consequences from the banking sector to the real economy. The research results confirm a significant increase in the capital base as a result of the implementation of the Basel capital recommendations: banks in Europe, the Americas and the rest of the world strengthened their capital in the years 2011-2022, but the growth rate was not the same for each region and type of capital.

**Originality/value:** Due to the fact that the process of unifying capital requirements among banks operating in different countries of the world, originating from economies with different degrees of advancement, is a difficult and multi-stage task, there is a need to constantly monitor progress in this area. This article contributes to the assessment of the effectiveness of this process and is the foundation for further analyses of the effects and dynamics of the Basel III reforms.

**Keywords:** capital adequacy, risk-weighted assets, Basel Committee on Banking Supervision.

**Category of the paper:** General review.

## 1. Introduction

Banks are economic entities that play a special role in national economies. Banking institutions can be classified as financial intermediaries that deal with the allocation of surplus liquidity between entities. They accept deposits from over-liquid entities and provide these funds to deficit entities in the form of loans and credits, which is crucial for growth of economies in micro- and macro-scale. A logical consequence of the fact that banks and banking sectors play an extremely important role in national economies is that this issue is of interest to the public and professionals. These matters are presented in many studies devoted to the issues of banking business security, as well as in measurements and assessments of the effectiveness of banks (Kunz, Heitz, 2021; Birge, Judice, 2013; Balcerzak et al., 2017; Fethi, Pasiouras, 2010; Sáez-Fernández, Picazo-Tadeo, Jiménez-Hernández, 2021; Tan, Floros, 2013).

The major trends of the last few decades, such as competition intensified due to the globalization process, the global financial crisis of 2007-2008 and its long-term consequences (Amendola et al., 2021; Wolters, Barbosa Do Couto, Felício, 2014) have increased the pressure in the financial sector. They have eroded public confidence in the banking institution (Fungáčová, Kerola, Weill, 2021). They forced banks to reconsider the need to better manage their capital (Bitar et al., 2021), monitor their risk more closely (Tóth-Laufer, Takács, Rudas, 2015) and develop technically advanced solutions to ensure customer security (Maček et al., 2019). The turbulent changes in the economy, caused primarily by the Covid-19 pandemic, have intensified the interest in risk in banking activity even more, and in particular in having adequate capital to cover possible losses, which is the subject of this article (Borri, di Giorgio, 2021; Kaiser, 2021).

Paradoxically, the phenomena mentioned above are not new to the economy. However, the approach of supervisors to the speed of response to disturbances in banking activity has definitely changed. Until the 1970s, it was widely believed that national supervisors could unilaterally monitor the safety and health of banks without referring to emerging trends, such as globalization. However, the rapid market changes of this decade have made regulators aware of the growing interdependence of banks around the world and the declining effectiveness of national controls. The two major banking crises in 1974, the fall of Herstatt Bank in Germany and Franklin National Bank in New York, were decisive in bringing about a complete change in the attitudes of national banking supervisors (Rost, 2009). The global effects of the collapse of these entities made the regulators realize that the traditional approach to banking security had become insufficient. In direct response to bank failures, the central banks of the G10 countries and Switzerland established the Standing Committee on Banking Regulations and Supervisory Practices in 1974. In 1990, this body was renamed the Basel Committee on Banking Supervision. The initial goal of its activity was to address ad hoc problems that emerged as a result of the crisis on international financial markets, to develop

general principles of banking supervision and to improve contacts between banking supervisors. Soon, capital adequacy standards became an important area of regulation of the banking sector, the importance of which increased when the Basel Committee defined the minimum capital requirements for banks in 1988 (Basel I) (Jones, 2020; Newman, Posner, 2018). This institution successively continues to work on unifying capital standards in order to ensure uniformity and security in the operation of banks around the world and the role of capital structure became crucial in enterprise safety (Róžański, Bogołębska, 2022).

## **2. From Basel I to Basel IV - capital adequacy evolution for better risk absorption**

The primary function of capital is to support the bank's operations, to act as a cushion to absorb unexpected losses and asset drops that might otherwise cause the bank to fail, and to protect depositors and debt holders in the event of the bank liquidation (Lesambo, 2020). This assumption is related to two aspects of the operation of banks: the bank's possession of a minimum level of own funds to support their activity and the adequacy of these funds to the level of risk.

Regulation of the level of equity in the form of minimum capital requirements is a common instrument used by banking regulators around the world. In the 1970s, in order to reduce the likelihood of financial failure, banking regulators required banks to hold a certain amount of equity measured as a percentage of their assets (International Monetary Fund, 2008). However, this solution turned out to be insufficient, which was confirmed, among others, by the crisis of savings and loan associations in the United States in 1989, related to the real estate market (Dorsey, Rockwell, 2018). The cause of this state of affairs was observed, among others, by Laeven and Valencia (Laeven, Valencia, 2013) who pointed out that advanced and emerging economies usually experienced greater losses in production than developing economies. Kroszner, Laeven, and Klingebiel suggest that these larger production losses are driven to some extent by deeper banking systems, making the banking crisis more destructive (Kroszner, Laeven, Klingebiel, 2007). As a consequence of the aforementioned crisis in the USA and its echoes around the world, an attempt was made to link capital requirements with assets exposed to banking risk. The result of these works was the first agreement on minimum capital requirements for banks, the so-called “Basel I”, which was concluded in 1988 (Basel Committee on Banking Supervision, 1988). It was addressed mainly to institutions operating internationally and had no legal force, but that did not prevent its propagation, or the enforcement of the recommendations, as it was commonly introduced into the applicable law by most countries in the world, in a manner specific to local banking and legal systems. The main idea of these regulations was for the bank to maintain an appropriate minimum ratio

of capital (mainly own funds) to risk-weighted assets (RWAs) at a level of 8%. Risk weights were assigned depending on the type of the debtor's exposure and belonging to a specific class of entities and the collateral held for this exposure.

Further changes were brought about by the collapse of the English Barrings Bank (Kunz, Heitz, 2021) as a result of unauthorized transactions contracted by one of its employees, which became a catalyst for a complete reconstruction of the applicable standards and creation of a comprehensive solution in the field of capital standards and bank risk management, taking into account a new type of risk – the operating risk (Basel Committee on Banking Supervision, 2001). The New Capital Accord (Basel II) was a revised version of the 1988 Capital Accord. It was published in 2004 and concerned the structure of assessing the capital adequacy of financial institutions (Basel Committee on Banking Supervision, 2004).

The structure of the new standards was based on three complementary pillars:

- Pillar 1: the minimum capital requirement;
- Pillar 2: the internal capital assessment process (ICAAP) and the supervisory review and evaluation process (SREP);
- Pillar 3: the obligation for banks to publish qualitative and quantitative information on capital adequacy, intended to eliminate asymmetry of information between market participants.

The first pillar (the minimum capital requirement) included the sum of capital requirements for credit, operational and market risks. In addition, the existing methods of determining the capital requirement for credit risk were modified. The method based on the appropriate classification of exposures to which fixed risk weights had been hitherto assigned, the so-called standardized approach, was improved by making the risk weights dependent on the ratings from recognized rating agencies. It was also allowed to use, after obtaining the consent of the competent supervisor, the so-called Internal Ratings Based Approach (IRBA), which was mainly based on internal estimates of the characteristics of credit exposures – the probability of default (PD), the exposure at default (EAD) and the percentage of loss in the exposure (loss given default, LGD). Among the methods of determining the capital requirement for operational risk, two simple methods based on ratios built on the bank's average financial results were introduced - the Basic Indicator Approach (BIA), the Standardized Approach (STA) and one more complicated - the Advanced Measurement Approach (AMA). The methods of determining the capital requirement for market risk have remained practically unchanged.

Despite a significant improvement of the prudential regime, introducing risk management standards and rules for setting capital requirements more correlated with the risk actually incurred by banks, and self-imposed market discipline requirements, Basel II did not prevent perturbations accompanying the financial crisis that began in 2007-2008. In response to these events, the Basel Committee prepared and published in December 2009 the first consultation documents on changes to the New Capital Accord (Basel Committee on Banking Supervision,

2009a, 2009b) which a year later, after the completion of public consultations and approval by the G20 countries, formed the text of new regulations referred to as “Basel III” (Basel Committee on Banking Supervision, 2010). The third part of the Basel Accords was aimed at strengthening banks’ capital requirements by increasing liquidity and reducing leverage.

However, as noted by Huang (Huang, 2021) and Hoenig (Hoenig, 2012), the strengthening of the requirements was to be associated primarily with the increased capital burden incurred by banks around the world. Basel III required banks to have enough capital to cover unexpected losses and remain solvent in the event of a crisis. This rule was expressed as a percentage of risk-weighted assets (RWAs). The more risky the assets, the more capital the bank would be required to have. Depending on its quality and riskiness, the capital was divided into categories shown in Figure 1. According to the division, Tier 1 capital is used to cover losses in the solvent state of the bank. It allows the bank to continue its normal operations and ensures its liquidity. The qualitatively best Tier 1 capital is usually called “common equity Tier 1” (CET1). Tier 2 capital is used to cover losses in the event of the bank’s insolvency. It allows the bank to repay depositors and preferred creditors when the bank becomes insolvent. The total capital that banks and investment companies are required to hold should be at least 8% of their risk-weighted assets. Of this, capital of the highest quality (common equity Tier 1) should correspond to 4.5% of the risk-weighted assets. In addition to the mandatory 4.5% common equity Tier 1, all banks must have a capital conservation buffer and a countercyclical capital buffer, i.e. they must accumulate enough equity in good times to absorb losses during a crisis.

BASEL II regulations					BASEL III regulations				
TIER 3	>8%	Tier 3	dedicated to market risk		CAPITAL BUFFERS	Countercyclical capital buffer		0-2,5%	
						Capital conservation buffer		2,5%	
TIER 2	4%	Tier 2	max. 100% of Tier 1		TIER 2	2%	Tier 2	2%	min. total capital 8%
		Tier 2 (subordinated term debt)	max. 50% of Tier 1				Additional Tier 1		
TIER 1	>4%	Innovative Tier 1	2%		TIER 1	min. 6%	Common Equity Tier 1 (CET1)	min. 4,5%	
		Common Equity Tier 1 (CET1)	at least 50% of Tier 1	2%					

**Figure 1.** Evolution of capital structure under Basel II and Basel III.

Source: own elaboration on the basis of (Ferreira, Jenkinson, Wilson, 2019).

Basel III has no “Tier 3” category, i.e. “short-term capital”, and the “common Tier 1” category introduced a differentiation into the so-called “common equity Tier 1” (CET1), meaning equity from the issuance of ordinary shares and retained earnings, and “Additional Tier 1” meaning equity from the issuance of preferred shares and bonds without maturity dates (perpetuals). Tier 2 capital, i.e. subordinated debt, is still acceptable, but taking into account the fact that capital buffers may only be created from CET1, its importance is likely to be marginalized. The data summarized in Table 1 show a gradual increase in the minimum levels

of the indicators assumed by Basel III, starting from 2013. A particularly strong growth can be observed in the case of the share of capital of the first category in total capital. The table also includes the conservation buffer, which was increased by 0.625 pp from 2016 to its final value of 2.5% in 2019. This buffer consists of only the highest quality capital, i.e. CET1. Since 2019, a countercyclical buffer has also been in force, ranging from 0 to 2.5% of share capital or other capital capable of absorbing losses according to national regulations (Magdoń, 2015).

**Table 1.**

*Basel III minimal capital requirements (as percentage of RWAs)*

<b>Phase*</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>as of 2019</b>
<b>Capital ratio</b>							
Minimum CET1 ratio (Common Equity Tier 1)	3.5%	4.0%	4.5%				4.5%
Capital conservation buffer	-	-	-	0.625%	1.25%	1.875%	2.5%
Countercyclical capital buffer	-	-	-	-	-	-	0-2,5%
Minimum Tier 1 capital	4.5%	5.5%	6.0%				6.0%
Minimum total capital				8.0%			8.0%
Minimum total capital plus capital conservation buffer	8.0%			8.625%	9.25%	9.875%	10.5%

\* - all dates are as of 1 January.

Source: own elaboration on the basis of (Basel Committee on Banking Supervision, 2010).

Basel III was supposed to be introduced between 2013 and 2015, but its full implementation was extended several times in the wake of the Covid-19 pandemic – initially until January 1, 2022, then until January 1, 2023, and again, with transitional arrangements, until January 2028 (Mérő, 2021). The need for the extension also resulted from the introduction by the Basel Committee in December 2017 of the so-called “post-crisis reforms” which are unofficially considered Basel IV standards (Basel Committee on Banking Supervision, 2017). They were introduced to standardize the calculation of risk-weighted assets (RWAs) in order to provide greater transparency in the disclosure of regulatory capital and comparable capital ratios by banks. In practice, this meant the obligation to significantly increase capital and is treated in the literature as the next stage of securing capital adequacy of the banking sector (Basel IV) (Bodellini, 2019).

The need for banks to obtain capital of the highest quality will mean that the coming years may lead to further share issues or to limiting the scope of operations in order to reduce the off-balance sheet risk-weighted assets and liabilities. Due to the low pace of economic growth, it may be difficult to improve the capital position of banks, as it is recommended to accumulate assets for capital buffers, among others, in times of economic prosperity (Berger, Bouwman, 2013; Oyetade, Obalade, Muzindutsi, 2021).

The scope of the Basel III arrangements became the basis for examining their potential impact on the banking sector in many countries and the inspiration for the work on this article.

### **3. Analysis of capital adequacy of international banking sector after Basel III implementation**

#### **3.1. Data and methodology**

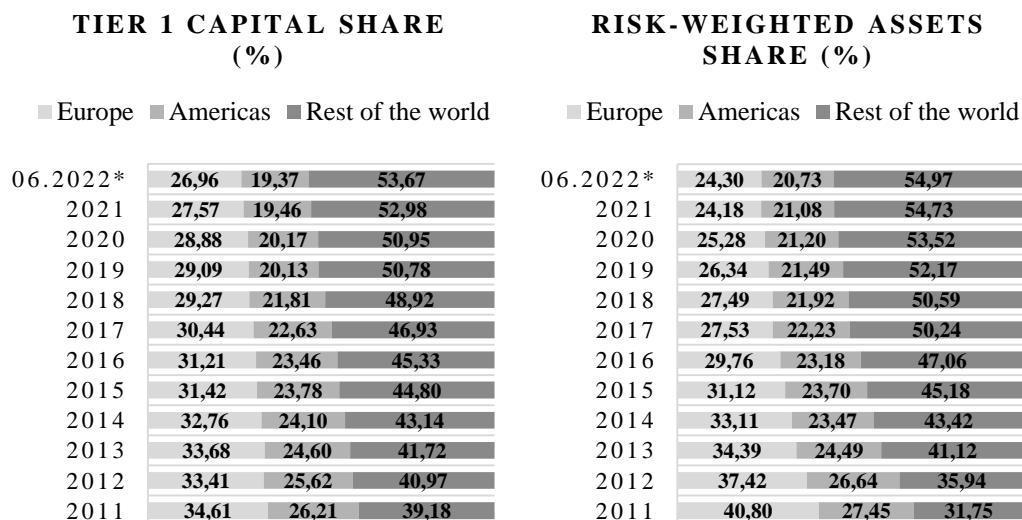
In order to assess the impact of the framework of the currently applicable capital standards (Basel III) on the capital adequacy of banks, the analysis used data collected by the Basel Committee on Banking Supervision as at June 30, 2022 (other data, starting from 2011, present the situation as at the end of December each year). The data was collected for 180 banks based on information provided by the banks and their national supervisory authorities and structured according to the following breakdown adopted by the Basel Committee:

- Group 1: 114 large international banks with Tier 1 capital exceeding the equivalent of EUR 3 billion at the reporting date, including 30 G-SIBs, i.e. global systemically important banks;
- Group 2: 66 other banks.

For the purposes of the empirical part of the article, data concerning only Tier 1 capital (including CET1), Tier 2 capital and risk-weighted assets (RWAs) were selected and systematized according to the geographical criterion dividing banks according to origin into three groups: European, South and North American, Others. Where the geographical breakdown was not possible to analyze for the entire research group, the results for Group 1 were used as the most representative due to the 97.53% share of this group in Tier 1 capital and 97.95% share of risk-weighted assets in the entire research group. On this basis, the process of adjusting the capital requirements of banks in the world to the Basel standards in the evolutionary dimension was assessed. For this purpose, the method of graphical presentation of the results and the synthesis of conclusions were used.

#### **3.2. Results and discussion**

At the outset, the share of banks from the three world regions in the level of Tier 1 capital and risk-weighted assets held was assessed. Figure 2 shows the share of Group 1 banks, broken down into Europe, both Americas and other countries, in Tier 1 capital and RWAs in the years 2011-2022. There are notable trends of reduction the share of Tier 1 capital in Europe and both Americas, and of increase of the share in the rest of the world. From the end of 2011 to June 2022, the share of European banks in Tier 1 capital decreased by 7.65 pp to 26.96% and by 16.5 pp to 24.30% in terms of RWAs. The Americas' share in Tier 1 capital decreased by 6.84 pp to 19.37%, while the share of RWAs decreased by 6.72 pp to 20.73%. At the same time, the share of banks from the rest of the world increased. The share of Tier 1 capital in this area increased to 53.67%, i.e. by 15.49 pp, and the percentage of RWAs in 2022 was close to 55% of the RWAs in Group 1 banks, which represented an increase in the share by 23.22 pp.



\* - all years are as of 31 December except 2022.

**Figure 2.** The share of banking Tier 1 capital and risk-weighted assets by regions over time.

Source: own elaboration on the basis of (Basel Committee on Banking Supervision, 2023).

Table 2 presents the evolution of the most important capital components of banks regulated by Basel III. As shown earlier in Table 1, most changes in capital ratios were to be implemented by the end of 2018, so it was important to examine how banks coped with this task. The analysis of Table 2 confirms the increase in capital base: banks in Europe, the Americas and the rest of the world significantly strengthened their capital, but the growth was not the same for each region. Since the end of 2011, the best-quality CET1 capital of European banks has increased by nearly EUR 469 billion, of American banks by EUR 301 billion and of the rest of the world's banks by EUR 1,491.5 billion (as at the end of December 2021). In the case of European banks, the increase in the absolute value of CET1 capital did not go hand in hand with the increase in the importance of this capital in the total of Tier 1 and Tier 2 capital. The share of CET1 in the capital structure has been decreasing cyclically and reached the smallest percentage in 2016, in favor of the additional Tier 1 and Tier 2 capital. Although CET1 in the rest of the world was almost three times higher at the end of 2021 than in 2011, the growth in Europe and both Americas was more smaller: 71.10% and 70.01%, respectively.

Additional Tier 1 capital showed some initial declines in 2011-2013 in Europe and the Americas, and a slight increase in the rest of the world. The increase in additional Tier 1 capital in the following years was more modest in Europe, and especially in US banks. A definitely opposite trend could be observed in the rest of the world's banks, where the value of this capital increased 39 times. However, when measuring the importance of additional Tier 1 capital in the total capital of all the banks, it has a share of about 10%. Tier 2 capital stock has increased from the baseline date of end-2011 for all banks except the Americas. This region saw a decline between 2011 and 2014, followed by a slight increase later on. Since the end of December 2021, only the rest of the world saw an increase in the share of Tier 2 (by EUR 37.8 billion), while Tier 2 capital of banks slightly decreased in Europe and the Americas.

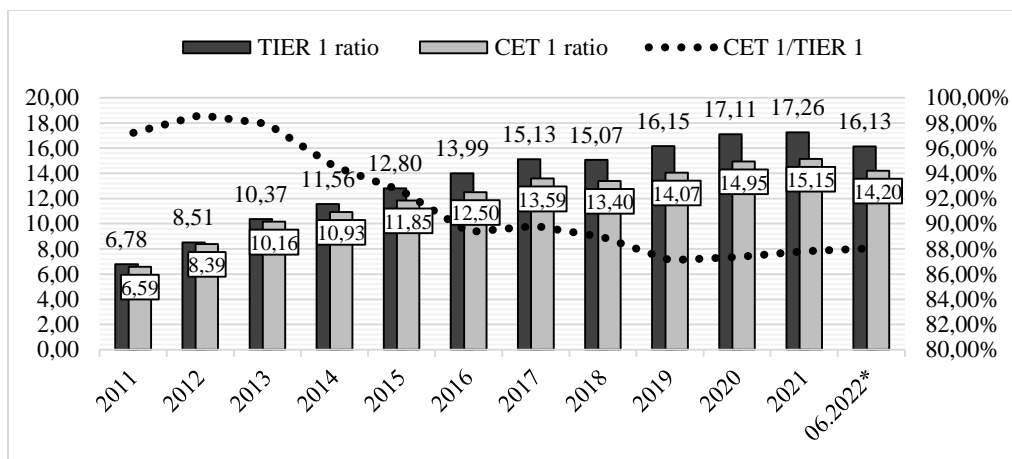


**Table 2.**  
*Evolution of the Basel III capital components by regions over time*

Europe									
	CET1 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)	Add. Tier 1 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)	Tier 2 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)
2011	<b>700,79</b>	87,43%	100,00%	<b>20,09</b>	2,51%	100,00%	<b>80,71</b>	10,07%	100,00%
2012	<b>782,01</b>	88,65%	111,59%	<b>10,98</b>	1,24%	54,65%	<b>89,14</b>	10,11%	110,45%
2013	<b>882,46</b>	83,66%	125,92%	<b>18,56</b>	1,76%	92,40%	<b>153,75</b>	14,58%	190,50%
2014	<b>947,08</b>	80,27%	135,15%	<b>54,48</b>	4,62%	271,22%	<b>178,30</b>	15,11%	220,92%
2015	<b>986,94</b>	77,14%	140,83%	<b>78,79</b>	6,16%	392,23%	<b>213,72</b>	16,70%	264,80%
2016	<b>1014,87</b>	72,73%	144,82%	<b>121,26</b>	8,69%	603,66%	<b>259,24</b>	18,58%	321,20%
2017	<b>1050,28</b>	76,10%	149,87%	<b>119,04</b>	8,63%	592,58%	<b>210,77</b>	15,27%	261,14%
2018	<b>1046,78</b>	74,98%	149,37%	<b>130,36</b>	9,34%	648,96%	<b>218,85</b>	15,68%	271,16%
2019	<b>1098,66</b>	74,05%	156,77%	<b>162,87</b>	10,98%	810,77%	<b>222,06</b>	14,97%	275,13%
2020	<b>1171,90</b>	75,11%	167,23%	<b>169,47</b>	10,86%	843,66%	<b>218,95</b>	14,03%	271,28%
2021	<b>1199,08</b>	76,21%	171,10%	<b>166,49</b>	10,58%	828,83%	<b>207,84</b>	13,21%	257,51%
06.2022*	<b>1169,76</b>	76,26%	166,92%	<b>158,89</b>	10,36%	790,98%	<b>205,34</b>	13,39%	254,41%
Trend line									
Americas									
	CET1 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)	Add. Tier 1 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)	Tier 2 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)
2011	<b>447,64</b>	69,24%	100,00%	<b>41,26</b>	6,38%	100,00%	<b>157,64</b>	24,38%	100,00%
2012	<b>506,93</b>	75,68%	113,25%	<b>38,74</b>	5,78%	93,88%	<b>124,12</b>	18,53%	78,73%
2013	<b>547,73</b>	79,18%	122,36%	<b>45,00</b>	6,51%	109,06%	<b>99,01</b>	14,31%	62,81%
2014	<b>595,44</b>	78,35%	133,02%	<b>66,18</b>	8,71%	160,39%	<b>98,33</b>	12,94%	62,37%
2015	<b>638,59</b>	76,62%	142,66%	<b>84,04</b>	10,08%	203,66%	<b>110,86</b>	13,30%	70,32%
2016	<b>666,22</b>	76,14%	148,83%	<b>95,15</b>	10,88%	230,59%	<b>113,57</b>	12,98%	72,04%
2017	<b>682,02</b>	76,13%	152,36%	<b>96,45</b>	10,77%	233,74%	<b>117,41</b>	13,11%	74,48%
2018	<b>685,07</b>	76,24%	153,04%	<b>96,49</b>	10,74%	233,83%	<b>117,03</b>	13,02%	74,23%
2019	<b>688,03</b>	76,48%	153,70%	<b>94,74</b>	10,53%	229,59%	<b>116,81</b>	12,99%	74,10%
2020	<b>743,60</b>	76,86%	166,12%	<b>101,68</b>	10,51%	246,40%	<b>122,22</b>	12,63%	77,53%
2021	<b>761,04</b>	77,91%	170,01%	<b>102,20</b>	10,46%	247,69%	<b>113,53</b>	11,62%	72,02%
06.2022*	<b>748,77</b>	77,44%	167,27%	<b>106,02</b>	10,97%	256,94%	<b>112,11</b>	11,59%	71,11%
Trend line									
Rest of the world									
	CET1 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)	Add. Tier 1 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)	Tier 2 (EUR bn)	Share in total Tier 1 + Tier 2	Change (2011=100)
2011	<b>817,44</b>	91,54%	100,00%	<b>7,68</b>	0,86%	100,00%	<b>67,82</b>	7,60%	100,00%
2012	<b>970,88</b>	92,95%	118,77%	<b>4,40</b>	0,42%	57,38%	<b>69,25</b>	6,63%	102,10%
2013	<b>1114,23</b>	92,00%	136,31%	<b>8,39</b>	0,69%	109,26%	<b>88,53</b>	7,31%	130,52%
2014	<b>1281,20</b>	89,02%	156,73%	<b>33,00</b>	2,29%	429,87%	<b>125,01</b>	8,69%	184,32%
2015	<b>1459,76</b>	87,45%	178,58%	<b>61,96</b>	3,71%	807,21%	<b>147,48</b>	8,84%	217,45%
2016	<b>1561,04</b>	87,65%	190,97%	<b>83,60</b>	4,69%	1089,15%	<b>136,34</b>	7,66%	201,03%
2017	<b>1688,42</b>	83,99%	206,55%	<b>111,35</b>	5,54%	1450,61%	<b>210,44</b>	10,47%	310,27%
2018	<b>1829,19</b>	81,42%	223,77%	<b>122,97</b>	5,47%	1602,03%	<b>294,35</b>	13,10%	433,99%
2019	<b>1968,56</b>	76,48%	240,82%	<b>203,49</b>	7,91%	2650,99%	<b>401,83</b>	15,61%	592,46%
2020	<b>2102,67</b>	75,08%	257,23%	<b>245,40</b>	8,76%	3196,94%	<b>452,67</b>	16,16%	667,42%
2021	<b>2314,33</b>	73,88%	283,12%	<b>292,26</b>	9,33%	3807,46%	<b>525,91</b>	16,79%	775,41%
06.2022*	<b>2308,93</b>	72,73%	282,46%	<b>301,83</b>	9,51%	3932,21%	<b>563,72</b>	17,76%	831,15%
Trend line									

Source: own elaboration on the basis of the Basel Committee on Banking Supervision data.

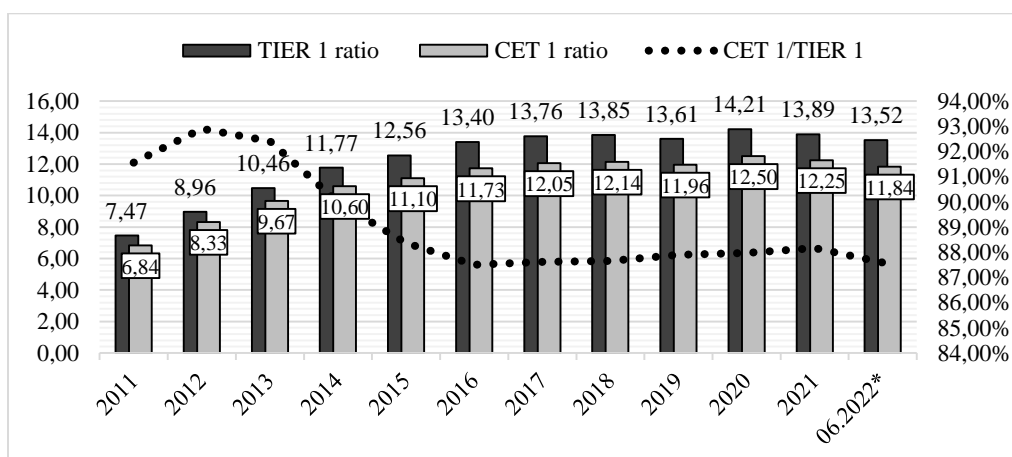
Basel III obligated banks to increase their capital reserves for protection against potential threats. Capital ratios, including Tier 1 “common capital” ratio and the highest quality CET1 ratio, are used to assess whether a bank has sufficient capital. CET1 is defined in banking regulations as capital of the highest quality. The Tier 1 (CET1) ratio shows the relationship between Tier 1 capital (CET1) and the bank’s risk-weighted assets (RWAs). Risk-weighted assets are assets rescaled by the degree of risk associated with them, giving a total picture of the risk burdening the bank’s portfolio. The Tier 1 (CET1) ratio increases when capital increases or when the value of risk-weighted assets decreases. An increase in capital may result, for example, from the issuance of new shares by the bank or from withholding the distribution of profits, and a decrease in risk may be a consequence of the sale of assets or replacing them with less risky ones. Figures 3-5 present the ratio of total Tier 1 and CET1 capital to RWAs and the percentage share of CET1 capital of the highest quality in common equity Tier 1 in the years 2011-2022.



\* - all years are as of 31 December except 2022.

**Figure 3.** Basel III Tier 1 and CET1 ratios of European banks over time.

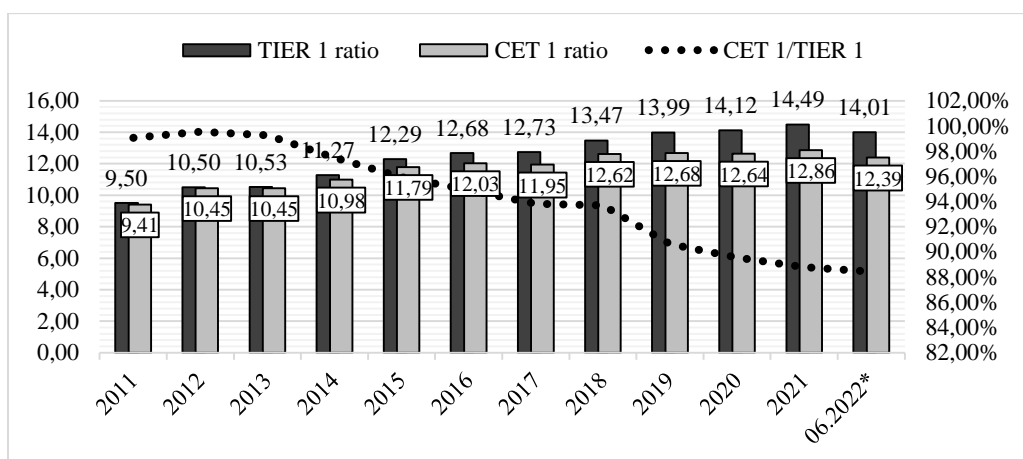
Source: own elaboration on the basis of (Basel Committee on Banking Supervision, 2023).



\* - all years are as of 31 December except 2022.

**Figure 4.** Basel III Tier 1 and CET1 ratios of Americas' banks over time.

Source: own elaboration on the basis of (Basel Committee on Banking Supervision, 2023).



\* - all years are as of 31 December except 2022

**Figure 5.** Basel III Tier 1 and CET1 ratios of other regions’ banks over time.

Source: own elaboration on the basis of (Basel Committee on Banking Supervision, 2023).

In 2011, initial Tier 1 capital ratios were more than 2 pp lower in the Americas and Europe than in the rest of the world. However, capital ratios increased in Europe and the Americas more than in the rest of the world. As a result, the original situation reversed around 2014, when European and American banks started to have higher average core capital than banks in the rest of the world. In 2019, the capital ratios in the Americas decreased, becoming aligned with the capital ratios in other countries (outside Europe). Since then, the average Tier 1 starting capital ratio in the Americas has been close to that in the rest of the world. According to the report of the Basel Committee (Basel III Monitoring Report, 2022), the fluctuations in the value of the ratios are due to uneven changes in the level of Tier 1 capital and RWAs. A certain stabilization of the level of capital ratios in European banks can be seen in 2017-2018, and their slight decrease at the end of 2018, i.e. during the period of partial implementation of the Basel III provisions. The analysis of the data also shows that the Covid-19 pandemic did not radically affect the capital performance of banks – only American banks recorded a decrease in capital ratios in 2020-2022. A uniform trend since 2012 for all the banks has been the successive reduction of the share of CET1 capital of the highest quality in Tier 1 capital. This ratio dropped sharply in European and American banks (moderately in other banks) until 2016, but finally, in mid-2022, all banks maintained the percentage of CET1 capital in Tier 1 at around 88%.

#### 4. Conclusion

The disturbances in the financial stability of the banks in the 1990s and earlier, as well as the experience of the financial crisis of 2008, have shown that the availability of broadly understood “capital” for banking activity is insufficient. This capital must be of appropriate quality, i.e. it is to provide security not only in the situation of the bank’s normal operation,

but also (and even above all) it is supposed to absorb losses that the bank does not expect or expects as minimally probable for various reasons.

On December 7, 2017, the Group of Central Bank Governors and Heads of Supervision (GHOS) finalized the Basel III reforms, adding a number of changes aimed at restoring the shattered credibility in the calculation of RWAs and capital ratios of banks. Banks were obliged to maintain common equity Tier 1 ratios (including the CET1 capital of the highest quality), Tier 2 capital and total capital within the agreed minimum proportions. In addition, it was expected that banks would accumulate higher capital in good times, which they would be able to use in the event of losses (capital buffers). In addition, further, even higher capital requirements were imposed on banks recognized as globally and systemically important.

This study uses data collected by the Basel Committee on Banking Supervision for the years 2011-2022, on the basis of which it was assessed how the process of ensuring capital adequacy was carried out by banks around the world. The results confirm an approximately 67% increase in CET1 among European and American banks and an almost 3-fold increase among banks in the rest of the world. European banks consistently maintain the highest CET1 (as well as Tier 1) capital ratio. This state of affairs allows us to draw certain conclusions that may become a basis for further research. Banks' adaptation to the new regulatory requirements will require banks to choose one of the two most obvious solutions resulting from the construction of the numerator and denominator of capital ratios. The first one means increasing own funds by issuing shares. Equity is the most expensive source of financing for banks, by definition "condemned" to absorb unexpected losses. For this reason, investors expect a higher risk premium in the form of capital appreciation or an attractive dividend rate, which is not conducive to the return on capital of the banking sector - low prices imply weak demand from investors. The second way is to reduce risk-weighted assets, which in turn means a reduction in the money supply and the side effect of slowing down economic growth. In practice, this means a significant reduction in the lending activity of banks, resulting from the need to meet higher capital and liquidity requirements, and the possibility of an increase in the cost of money as a result of limiting its supply. Both solutions are bad and the only advantage is the fact that the implementation of the new requirements will take place gradually over a period of several years, and therefore these changes should not pose a threat to the banking sector and world economies.

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