Problems and Opinions

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Macroprudential capital requirements in the European Union during the COVID-19 crisis

Abstract

The article tackles the issue of macroprudential policy in the European Union during the COVID-19 pandemic, from the end of 2019 to mid-2021. The main purpose of the analysis was to compare changes in the restrictiveness of macroprudential requirements (capital buffers) using various restrictiveness measures (capital requirement, excess capital buffer, bank lending capacity). Using quantitative and qualitative data analysis, the main reasons for changes in the restrictiveness of macroprudential policy have been identified. It has been shown that the reduction of the regulatory stringency resulted to a bigger extent from improved capital position of banks than from a lower capital requirement. The analysis has also indicated that among the EU countries, capital requirements for banks in Poland were loosened the most during the pandemic.

Key words: European Union, macroprudential policy, COVID-19 pandemic, capital requirements, restrictiveness

JEL codes: E51, G18, G21, G28

Makroostrożnościowe bufory kapitałowe banków w Unii Europejskiej w trakcie kryzysu pandemicznego

Streszczenie

Artykuł poświęcony jest polityce makroostrożnościowej w gospodarkach Unii Europejskiej w okresie pandemii COVID-19, od końca 2019 do połowy 2021 roku. Głównym celem analizy było porównanie zmian restrykcyjności wymogów makroostrożnościowych (buforów kapitałowych) z wykorzystaniem różnych miar restrykcyjności (wymóg kapitałowy, nadwyżkowy bufor kapitałowy, potencjał do ekspansji kredytowej). Stosując metody ilościowej i jakościowej analizy danych zidentyfikowano główne przyczyny zmian restrykcyjności polityki makroostrożnościowej, wykazując że jej ograniczenie wynikało w większej mierze z dążenia do odbudowy pozycji kapitałowej banków niż z obniżenia wymogu regulacyjnego. Analiza pokazała ponadto, że spośród badanych państw wymogi kapitałowe dla banków w Polsce w trakcie pandemii zostały poluzowane najbardziej.

Słowa kluczowe: Unia Europejska, polityka makroostrożnościowa, pandemia COVID-19, wymogi kapitałowe, restrykcyjność

Introduction

The COVID-19 pandemic and the accompanying processes and crisis phenomena were the first real test for macroprudential capital requirements (conservation buffer, countercyclical buffer, systemic risk, and systemically-important institutions – global or other)[1] which, according to the assumptions, were intended to reduce risky banking activities and prevent the building up of systemic risk. The introduction of national sanitary regulations and the reduction (voluntary or compulsory) of mobility of people, or even lockdown, have led to a sudden and unprecedented breakdown of economic activity and have resulted in a loss of financial continuity for many companies and a threat to sustainable employment of workers. It was only possible to stabilize the situation after an extensive and extremely rapid (compared to historical experiences) intervention of governments with the use of economic policy instruments (monetary and fiscal). However, these interventions did not prevent recession, the scale of which could be compared to the one that occurred at the turn of 2008 and 2009. However, they have allowed the financial sector to be protected from the crisis, which seemed very likely after monthly perturbations initiated at the end of February 2020.

As part of the stabilization policy, among many, the macroprudential policy has been loosened. In the European Union, the first steps were already taken in March 2020, whereby the capital and liquidity requirements were loosened in most Member States. Banks were also motivated to restore their excess capital during the period of limited demand for credit and under the protective umbrella of economic policy.

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[1] The so-called "Pillar 2 Requirements" are considered micro-prudential at work due to their determination on the basis of stress-tests for individual institutions.

Consequently, from a regulatory point of view, five quarters after the outbreak of the pandemic, the capital position of most banks was better than in February 2020, i.e. before the pandemic.

The objective of the presented analyses was to identify the reasons of changes in restrictiveness of the macroprudential policy in the European Union in the face of the pandemic crisis. Various measures of restrictiveness (capital requirement, excess capital buffer, bank lending capacity) and their evolution during the pandemic were compared in the analyses carried out using quantitative and qualitative methods.

1. Review of literature regarding the measure of restrictiveness of macroprudential policy

The assessment of effectiveness of macroprudential policy usually involves the examination of impact of prudential instruments on bank lending, the level of indebtedness and the price of assets (including, in particular, real estate) or the interest rate on loans. The specificity of prudential instruments results in the analysis being mainly based on discrete (discontinuous) data and sometimes zero-one data. This is, among many, due to the characteristics of the prudential tools used, the multiplicity and diversity of which in each country results in a limited comparability and hence the assessment of restrictiveness. Early studies used single or aggregate fictitious variables to assess the impact of implementation or change of a specific regulatory instrument. Examples of works with single variables are: Lim, Columba, Costa, Kongsamut, Otani, Saiyid, Wezel and Wu (2011), Tovar, Garcia-Escribano and Vera Martin (2012) as well as Arregui, Benes, Krznar, Mitra and Santos (2013). Analyses with aggregate fictitious variables were conducted by Kuttner and Shim (2016) if more than one instrument was changed or introduced during the period considered. Crowe, Dell'Ariccia, Igan and Rabanal (2013) used the case study method to assess the impact of selected macroprudential variables on the real estate market. Claessens, Ghosh and Mihet (2013) and Geršl and Jašová (2014) used a binary approach to determine the period during which a given regulation was in force.

Vandenbussche, Vogel and Detragiache (2015) introduced more sophisticated measures of restrictiveness of macroprudential policy. They have not only distinguished the direction of changes in macroprudential instruments, but also assigned a degree of restrictiveness to them. An example was the introduction of the LTV ratio at the level of 60% as more restrictive than the LTV-100% ratio. Thus, they recognised changes in the level of bank capital requirements, differentiating them according to the size of the change in the total requirement measured in percentage points.

The discretion of data reflecting macroprudential policy was one of the most important factors hampering the analysis of the impact of changes in prudential regulations on the financial sector. The most common solution to this problem was the creation of aggregated (composite) measures involving far fewer or more

related instruments (cf. Ostry, Ghosh, Chamon and Qureshi (2012), Zhang and Zoli (2016) and Bruno, Shim and Shin (2017)). The structure of these macroprudential policy indexes quickly became popular. They were used, among many, by Fendoğlu (2017), Cerutti, Claessens and Laeven (2017), and Akinci and Olmstead-Rumsey (2018), who additionally developed separate indexes for loosening and tightening macroprudential policy), Cizel, Froost, Houben and Wierts (2019), differentiated pricing and quantitative instruments in their study in order to solve the problem of boundary conditions, since the fictitious variables available in most databases did not allow for an assessment of the scale of regulatory actions.

Kuttner and Shim (2016) stressed that the use of binary rather than numerical variables in assessing the effectiveness of macroprudential policy is a simplification, but results from a high heterogeneity of data (cf. also Carreras, Davis and Piggott (2018)). This is an important statement, since even the use of very similar prudential instruments, such as DTI (debt-to-income ratio of the debtor) and LTV (loan-to-value ratio) ratios, cannot be compared easily (due to different types of properties, types of customers, lenders, etc.). Lee (2013) analysed the case of South Korea, where the LTV and DTI ratios were different due to the type of property, its location, maturity of the loan, type of financial institution that granted it, or even the debtor's marital status. The problem was also addressed by Tillmann (2015) and Lee, Asuncion and Kim (2016), who used the econometric modelling (vector autoregression enhanced by the use of qualitative variables, Qual VAR) to convert binary variables with macroprudential shocks to continuous data. Zhang and Tressel (2017) mapped macroprudential instruments, assigning them to factors influencing the change in the criteria of granting credit. For example, they did not use fictional variables for the LTV requirements, but they analysed changes to these requirements on the basis of analyses by the chairmen of the credit committees (*Bank Lending Survey*). In addition to using the traditional macroprudential policy index, Dumičic (2018) directly used the values (in percentage or percentage points) of the minimum reserve requirement as well as the LTV and DTI ratios. Some research used changes in variables following previously imposed requirements, such as the dynamic provisioning mechanism (Jiménez, Ongena, Peydró and Saurina 2017) or the LTV ratio (Richter, Schularick and Shim 2019).

2. Evolution of research on capital requirements of banks

A growing standardization (through the successive Basel Capital Agreements) and the use (due to the introduction of Basel III) of capital buffers creates a promising field of research the object of which is assessing the impact and effectiveness of prudential tools directed at the supply side of banks. In view of the existence of capital requirements, each bank must condition the decisions on the expansion of its business by the level of capital held (own funds). As each bank must, when granting a credit, set aside a sufficient part of these funds (subject to the capital requirement, but also to an independent decision on possible internal buffers), it appears that

weaker institutions grant fewer credits. Altavilla, Boucinha, Holton and Ongena (2018) show that a lower rate of credit expansion of weaker banks is due both to the reduced supply and demand for credit, which depends, among others, on their risk profile and the financing structure. Gambacorta and Shin (2018) indicate that the level of equity is an important factor defining both the cost of financing and the dynamics of bank lending. In their view, banks with larger equity are characterized by faster credit expansion due to the possibility of obtaining cheaper financing. The European Banking Authority (2015) has established in the pan European banking sector survey that a higher level of capital has a significant positive impact on the supply side of bank lending.

Capital requirements have been at the centre of research for many years (cf. Bernanke and Lown (1991), who pointed to the relationship between equity, assets and credit expansion, suggesting that the decrease in banks' capital could have aggravated the 1990 recession in the USA; Hancock and Wilcox (1993) showed that bank lending in 1990 slowed down due to the insufficient level of equity in banks, which made some of them reduce the volume of loans to meet capital requirements). Heid, Porath and Stolz (2003) showed that the response of banks to changes in capital requirements depends on their (excess) capital buffers, i.e. the difference between the capital adequacy ratio and the regulatory requirement. This approach was widely used even before the global financial crisis (cf. Fonseca, González and Pereira da Silva (2010), who have carried out a very detailed review of literature from that period), because (at a fixed level of requirements which was in force at that time) it enabled the assessment of the (relative) binding force of the regulation.

The use of capital ratios as a determining factor for bank lending took place after the global financial crisis of 2007–2009. Aiyar, Calomiris and Wielądek (2014) measured the impact of capital requirements changes on credit expansion of banks. The approach based on the capital requirement or capital adequacy ratio has been changed relatively quickly to the one which places the focus on excess capital above the regulatory requirement (cf. among many Berrospide and Edge (2010), Borio and Gambacorta (2017), Catalán, Hoffmaister and Harun (2017) and Gambacorta and Shin (2018)). Kapuściński (2017) provides an example of use of the second approach in the Polish environment. De Jonghe, Dewachter and Ongena (2020) did not directly use the excess capital, but they modelled various measures of credit expansion, while taking advantage of the requirement and the capital adequacy ratio. Finally, Imbierowicz, Löffler and Vogel (2021), in addition to the excess capital, used the relation between risk-weighted assets to total assets. They stressed that using such an approach continued the observation that banks with a lower average risk weight are less exposed to changes in capital requirements. All the above-mentioned measures aim at improving the comparability of data not only between different banks, but also between different jurisdictions, which may be characterised by different levels of capital requirements, structure of credit demand (and thus an average risk weight depending on the type of credit that is dominant in the banking portfolio).

3. Data characteristics and research methodology

The study of the restrictiveness of macroprudential policy in the European Union was carried out using four variables: capital requirement, capital adequacy ratio, (excess) capital buffer and the bank lending capacity measured both in absolute (EUR billion) and relative (as a percentage of assets) terms[2]. The conclusions drawn, in particular in terms of excess capital and bank lending capacity, are based on the capital adequacy of banks to regulatory capital (rather than internal capital), which means that they do not capture banks' internal decisions to maintain a minimum (used only in extreme situations) excess of own funds above the regulatory requirement.

The analysis of the combined buffer requirement is limited to macroprudential instruments. This means that it excludes the so-called Pillar 2 buffers, which relate to the so-called supervisory discipline, and hence they are determined on a case-by-case basis for a given institution based on their specific risks (micro approach). The analysis covered data for 27 countries of the European Union. The values of capital requirements/buffers are derived from documents published by the European Systemic Risk Board[3], while capital adequacy, balance sheet and risk weight measures are derived from the database of the European Central Bank (ECB Statistical Data Warehouse). Table 1 describes the data used and their sources.

Table 1. Variables used in the study and sources of information

Variables	Source of information
Own funds for a given institution	Consolidated financial statements
Own funds for the sector	Own calculations based on asset, CAR and average risk weight data (all from the ECB)
Loans and securities	ECB
Exchange rates	stooq.pl
Average risk weight of assets	ECB
Total assets	ECB
Capital adequacy ratios	ECB
Capital buffers requirements	ESRB

Source: Own study.

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[2] According to the methodology proposed by Czaplicki (2021), this is the quotient of the excess capital and the total capital requirement.

[3] "Overview of national capital-based measures" published quarterly on the ESRB website presenting national supervisory activities (https://www.esrb.europa.eu/national_policy/html/index.en.html), as well as the notification of local authorities conducting macroprudential policy.

Due to diversified values of the combined buffer requirement, not only for different economies but also for individual banks, data aggregation at national level has been carried out in order to set a requirement for individual banking sectors. To this end, data for 197 banks have been collected (banking groups from the European Union), which were included in the ESRB database. At the same time, if, during the analysis period, further mergers or acquisitions between banks in the base took place, historical data were adequately aggregated to obtain a uniform set of historical data. Table Z1 in the Annex contains the list of banks under analysis.

Data on capital requirements for particular banks in the analysed country were dominated by their shares in the total own funds of the sector concerned[4]. As a result, the capital requirement for the domestic banking sector is a weighted average of the requirements for the banks operating there. In contrast to the dominant form of analysis (e.g. 10.5–12.0%), the approach used allows a more accurate analysis of restrictiveness by indicating a single point measurement.

The study also analysed the reasons for the change in restrictiveness of macropru-dential policy. This was possible thanks to its decomposition. Firstly, a modification of the capital requirement and a change in the level of capital adequacy were identified as two main reasons for the volatility of both the excess capital and the potential for expansion of banks' assets. The reasons for changes in capital adequacy were then analysed, identifying the volatility of own funds, the size of banks' assets and their average risk weight. On the one hand, this approach allows a more precise indication of the immediate causes of changes in policy restrictiveness, provided that the measure of restrictiveness is not a requirement alone, but a degree of "nuisance" for the regulated institutions. On the other hand, this approach does not correspond to the highest possible degree of detail. In particular, changes in risk weights may have resulted either from supervisory and regulatory decisions (such as the introduction of CRR Quick Fix) or from bank decisions on credit and investment policy (leading to a change in the structure of assets and hence their average risk weight). In the case of own funds, due to the lack of available data, it was not possible to identify the extent to which their change was influenced by bank profits or losses, possible share issues or subordinated bonds, or other factors.

There are two ways in which the decomposition of changes in capital capacity to the expansion of banks' activities in the European Union has been performed. The first was performed using the harmonized measurement in euro and the second using values in national currencies. The latter made it possible to avoid distortions due to, for example, weakening of the exchange rate, despite the increase in nominal assets or own funds.

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4   For example, if we have a sector consisting of bank A and B with requirements of 12% and 15% re-spectively and own funds of EUR 1 billion and EUR 3 billion, then bank A has a weighting of 25% and bank B 75%, therefore, the (weighted) requirement for the whole sector is 12% x 25% + 15% x 75%, meaning 14.25%.

4. Macroprudential policy in the European Union during the COVID-19 crisis

The COVID-19 pandemic and the related crisis were the first opportunity to review the assumptions underlying macroprudential policy conducted in earlier years. This concerned in particular the widespread reduction of capital buffers which mitigated the impact of the crisis on bank lending. Casanova, Hardy and Onen (2021) analysed different ways of increasing bank lending and confirmed the positive impact of increasing bank lending capacity. Banks which improved their capital position at the beginning of the pandemic showed a higher increase in the volume of loans in the following quarters of 2020. Based on a sample of 133 large banks, Hardy (2021) showed that the restrictions on the payment of dividends resulted in an increase of the capital base in 2020 and translated into a higher bank lending. Dicanio and Montesi (2021) analysed the aggregated data for France, Spain, Germany, the United Kingdom, Italy and the USA, comparing the potential for absorption of bank losses (capital surplus against the requirement taking into account the increase in potential losses due to the pandemic) before the global financial crisis in 2007 and the pandemic crisis in 2019, and the impact of reductions on bank lending capacity. They concluded that banks had much higher buffers before the pandemic crisis, which allowed them to increase their assets by 10–20% while maintaining their potential to absorb possible losses related to the crisis. On the other hand, the Financial Stability Board (2021, p. 10) concluded that banks mostly increased their excess capital during the first months of the pandemic. Riksbank (2020) estimated that the reduction in capital requirements by the Swedish supervisor at the beginning of the pandemic would release approx. SEK 900 billion of credit capacity of Swedish banks.

The analyses of Budnik, Dimitrov, Groß, Jancokova, Lampeg, Sorvillo, Stular and Volka (2021) show that the supervisory, regulatory and public authorities (in particular the loan guarantees) undertaken in the first half of 2020 have allowed to keep the private non-financial sector loan portfolio at the level of approx. 5% higher (including 12% higher for non-financial enterprises) than would be the case in the absence of this intervention. In addition, the intervention measures had a positive impact on both the level of non-supported loans and the profitability the banks. Avezum, Oliveira and Serra (2021) have demonstrated that the loosening or abolition of capital buffers (in particular the countercyclical systemic risk buffer) had a positive impact on bank lending addressed to households (mainly mortgage loans) and small businesses. Dobrzańska (2020) and Radek (2021) carried out a review of micro- and macroprudential tools used or changed during the pandemic in the European Union.

Czerniak, Czaplicki, Mokrogulski, Niedziółka and Szelągowska (2021, pp. 289–290) estimated that "the change in capital requirements, together with the increase in capital adequacy ratios in the banking sector allowed to increase the credit capacity of (banks in the countries of Central and Eastern Europe belonging to the European Union) by 41.7%, a total of EUR 148,7 billion (in 2020)". These authors also examined the difference between the degree of restrictiveness of capital regulations in the group of 11 countries in the region of Central and Eastern Europe and concluded

that banks in the region "were well equipped to support the government in anti-crisis measures, and the credit capacity was between 33.5% (Slovakia) and 54.9% (Estonia) of the value of the volume of the already granted credits."

5. Results of research on the change of restrictiveness of capital requirements in the EU

The source literature lacks a comprehensive analysis of changes in the capital requirements of banks during the COVID-19 pandemic crisis. Therefore, the study attempts to fill this gap by an empirical analysis of changes in macroprudential capital requirements and bank capital adequacy in the 27 Member States of the European Union over the period from the end of 2019 to September 2021.

The global spread of the coronavirus pandemic and the resulting recession has hit the European Union economy at an unprecedented speed, which has led to an immediate response of many governments and central banks in the scope of monetary and fiscal policy, but also macroprudential policy. In France, Ireland and Lithuania, the countercyclical buffer has been reduced to zero. In Belgium, Germany and Slovakia, the previously announced increases in this buffer have been cancelled (Slovakia subsequently reduced the buffer to 1%). The Estonian and Finnish authorities have abolished the systemic risk buffer, and in the Netherlands the risk buffer has been reduced from 3% to 1.5%–2.5% depending on the institution. Buffers of other systemically important institutions (OSII) in Cyprus, Finland, Lithuania and the Netherlands have also been reduced or the period for the implementation of the pre-planned requirements has been extended (Portugal and Greece). In addition, the European Central Bank (2020) encouraged banks in the euro area to use available capital buffers, including Pillar 2 buffer[5]. Supervisory and regulatory authorities have taken steps to reduce the burdensome capital requirements for banks also outside the euro area. The Czech Republic has halved its countercyclical buffer, from 1.75% to 0.5%. In Denmark and Sweden, this buffer has been completely abolished. In Bulgaria, the previously adopted increase was suspended. In Poland, the systemic risk buffer was *de iure* abolished, which in fact meant its reduction from 3% to 0%. In Hungary, the buffers of other systemically important institutions have been reduced to zero. By 30 June 2021, all macroprudential measures taken in the euro area countries have released EUR 34.0 billion of own funds and EUR 48.1 billion across the European Union.

The analysis of Chart 1 shows a very large variation in the capital freed up in the banking sectors of EU countries. From this point of view, a very high position of the Polish banking sector is worth highlighting, where almost 59% of the capital released in Germany has been released, distancing substantially the remaining Central and Eastern European countries from the EU Member States.

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[5]   This issue was not directly used in the study under consideration in this article.

Chart 1. Released own funds of banks in EU countries following a reduction in macroprudential requirements (As of 30 June 2021)
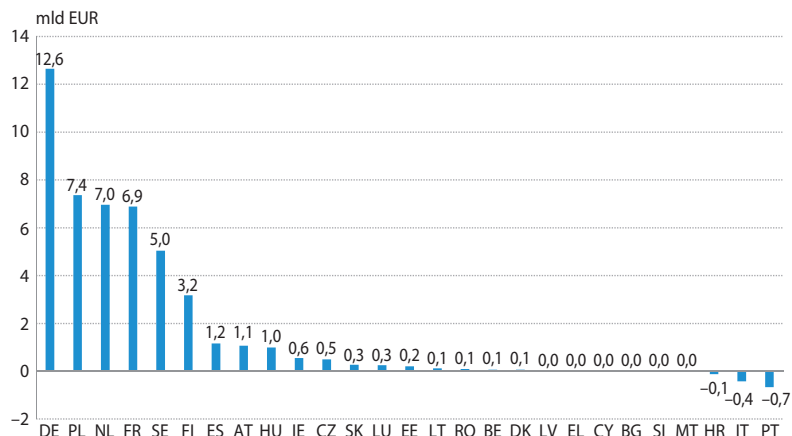
Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

The values in Chart 1 are derived from both changes in the regulatory requirement and the size of the banking sector concerned. Chart 2, however, illustrates a relative change in the level of the combined buffer of macroprudential requirements in the EU countries between March 2020 and September 2021. This parameter has been mostly reduced in Poland by almost twice the percentage points for Sweden taking the second position and almost eight times for the EU average.

Chart 2. Change in the total capital macroprudential buffer requirements of EU countries between March 2020 and September 2021.
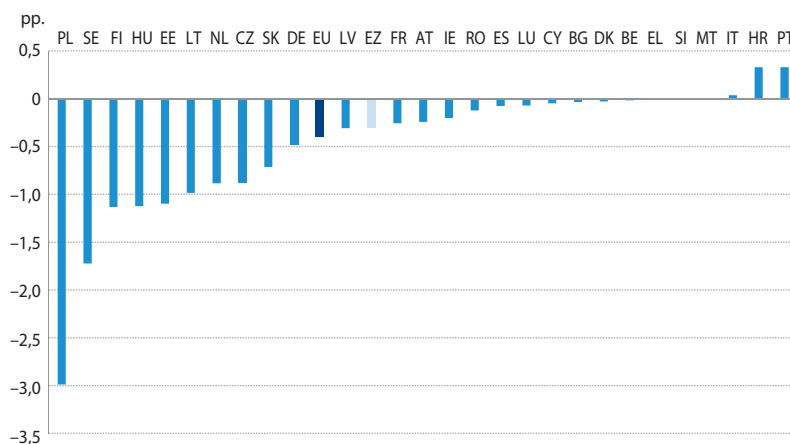
Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

Charts 1 and 2 show that the average capital requirement for the sector has not decreased in all EU countries, which did not allow the banks to release own funds, even though individual instruments have been reduced. In Italy, this was due to increases in the O-SII capital buffers for the largest banks at the end of 2020, in Portugal due to an increase in the size of banks with higher capital requirements (leading to an increase in the average requirement) and in Croatia due to a change in the calculation of the requirement (at the outbreak of the pandemic, the higher of the O-SII buffer or the systemic risk was taken into account)[6]. What is interesting, the impact of the reduction in the countercyclical buffer in Ireland at the beginning of Q2 2020 was greater than the subsequent (Q4 2020 and Q2 2021) increases in buffers of other systemically important institutions. In addition, it is worth pointing out that decisions to reduce requirements have often been justified by space for such action. The greater the pre-pandemic macroprudential requirement (above 8%), the greater the space for its reduction during the pandemic crisis. Chart 3 illustrates that many macroprudential supervisory authorities have made use of this possibility. It also shows that in countries where the sum of macroprudential buffers was close to the level of the conservation buffer (2.5%), supervisors refrained from amending decisions (minor changes to the requirement result from shifts in the sector structure, which are a derivative of the methodology adopted in the study[7]).

Chart 3. Pre-pandemic macroprudential buffer and the scale of decrease in capital requirement during the pandemic
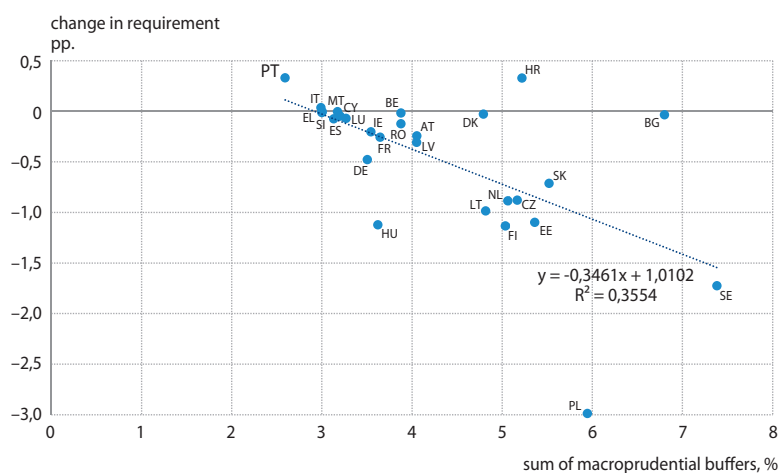
Note: dots in the graph represent countries of the European Union.

Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

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[6] Since the end of 2020, their values have been added up, which for some banks has coincided with a reduction of the systemic risk buffer.

[7] The requirement, which in the study is calculated for each country, is the weighted average of the requirements for individual institutions operating in them, and therefore (for example) if the size of banks with high individual requirements increases and is stable for the remaining ones, the average requirement for the whole sector is also increasing. This is a derivative of the greater importance of these institutions in the local banking sector.

The increase in the amount of own funds (e.g. as a result of retained earnings) and the decrease in the average risk weight of assets (resulting from a change in the structure of the assets toward those less risky)[8] have reduced the negative impact of the increase in the balance sheet total on the capital adequacy ratio. Chart 4 shows that the capital adequacy ratio (CAR) has increased almost in all EU countries apart from Slovenia, the Netherlands and, above all, Greece (EL), where it has decreased by more than 2 pp.

Chart 4. Change in capital adequacy in the European Union countries between 31 December 2019 and 30 June 2021

pp.
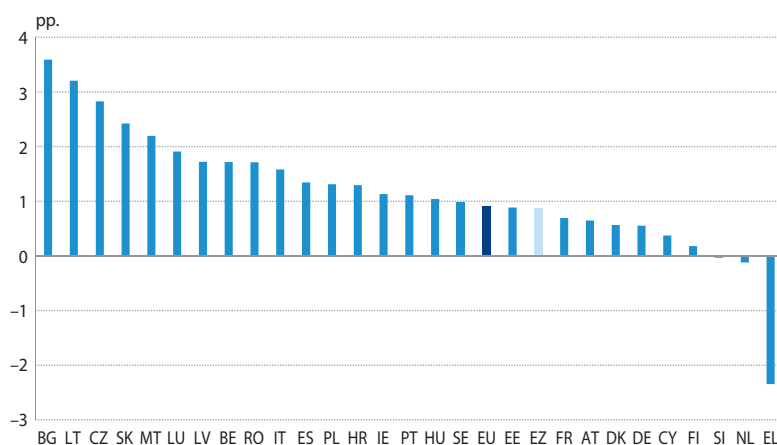
Source: Own study based on ECB data.

The compilation of changes in macroprudential requirements and capital adequacy measures shows that, between the beginning of 2020 and the end of June 2021[9], the banks' excess capital did not increase only in Slovenia, the Netherlands and Greece. Chart 5 presents a summary of changes of this excess as per EU countries, with a breakdown of its sources for changes in capital requirements and capital adequacy ratio.

The analysis of Charts 2, 4 and 5 indicates that despite the decrease in capital adequacy measures in the Netherlands, the cumulative reduction of the requirement has allowed to increase the excess capital. This means that in the banking sector, regulatory actions have freed up additional capital to credit expansion or absorption of pandemic losses. Quite the opposite was observed in the case of Italy, Portugal and Croatia. Despite an increase in the requirement, the improvement in adequacy

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8   Apart from Luxembourg and Denmark, where the average risk weight of assets has increased, but the
      assets themselves have decreased.
9   At the time of the study, more up-to-date balance sheet data were not available in the ECB database.

measures has resulted in an increase in the excess capital. However, in Greece, the decrease in the average capital adequacy ratio was large enough that the reduction in the regulatory requirement could only reduce its negative effects. It is worth pointing out that the sole drop in the requirement in Greece was almost unnoticed, as in Slovenia, where it also did not offset the decline in capital adequacy measures in the banking sector. In turn, in the case of Bulgaria, capital requirements have in principle not changed (for some institutions they have been slightly strengthened, for others the obligation to maintain the OSII capital buffer has been abolished), but the measure of capital adequacy has increased most from all EU countries, which moved Bulgaria right behind the EU's podium in terms of increase in excess capital in the period under consideration.

Chart 5. Change in the excess capital of banks in the European Union countries between 31 December 2019 and 30 June 2021
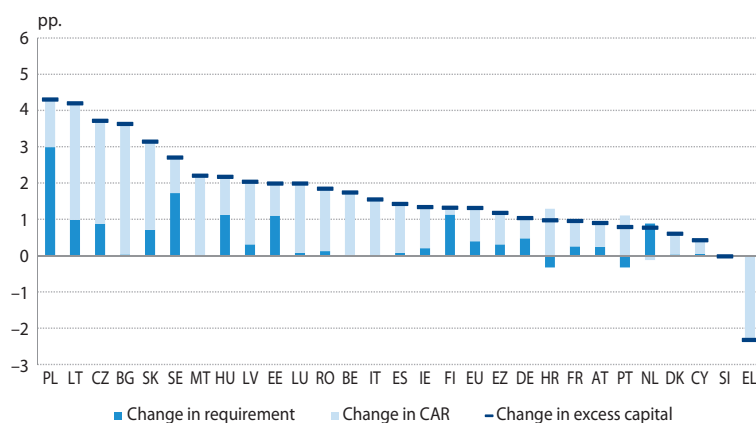

Note: Values greater than zero mean that: the capital requirement has decreased (i.e. *ceteris paribus* the excess has increased) or the capital adequacy ratio has increased (i.e. *ceteris paribus* the excess capital has increased). The change in excess capital is the sum of the effects of the two components analysed.

Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

The analysis of the results also leads to other interesting conclusions. Although Finland has experienced the greatest fall in requirements in the euro area (and the third largest in the Union), it is not even in the upper half of countries with the largest increase in excess capital. Sweden, on the other hand, which was only behind Poland in terms of reduction of requirements, is only on the sixth place in the case of excess buffer. This can be interpreted in such a way that the absolute measure of restrictiveness of macroprudential policy in the form of a capital requirement is not suitable for comparisons of international or individual financial institutions. Excess capital (excess buffer) proved to be a much better measure. However, it is not without defects either. The banking sector may be characterised by a greater excess,

although its bank lending capacity will be much smaller. This depends mainly on the level of the requirement in a given country and the lending policy of the banks (e.g. structure of bank lending and a method of measuring risk that translates directly into the average risk weight of assets). Chart 6 includes a comparison of capacity changes to bank lending as a percentage of the current exposure to risk (i.e. approximately a percentage of the total assets[10]).

Chart 6. Change in capital capacity* for the expansion of banks in EU countries between 31 December 2019 and 30 June 2021
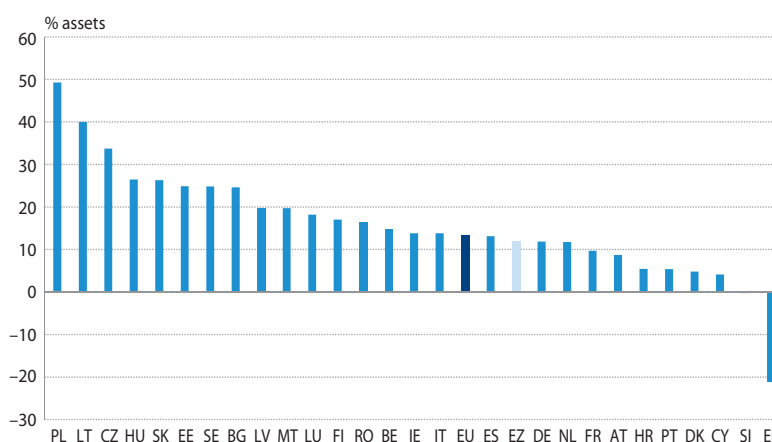
*   By how many percent may increase the assets with the excess capital held and assuming their average risk weight is maintained.

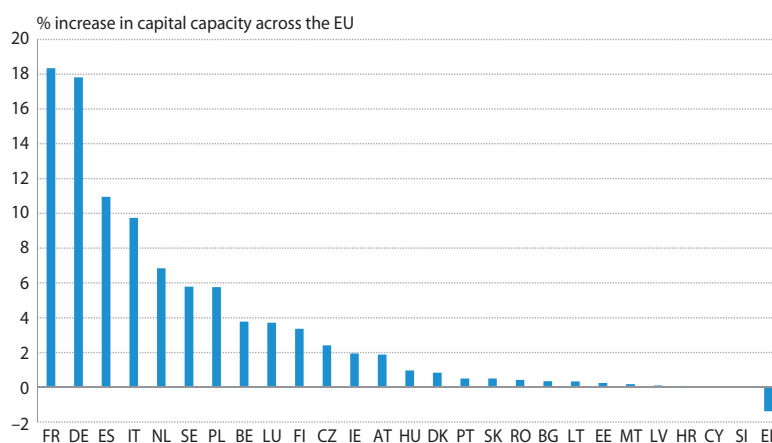Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

Chart 6 confirms that the conclusions of the analysis of capital potential for bank expansion and bank surplus capital (or sector) are similar, but do not need to be the same. For example, in Hungary, the macroprudential policy was more liberalized during the COVID-19 pandemic than in Bulgaria (but also in Sweden or Malta), despite the fact that the excess capital increased more in that country. In addition, the proportions of particular measures have changed. In the case of Lithuania, in the period under consideration, the excess capital increased by 4.2 pp, meaning more than twice than in Estonia (2.0 pp), but the potential for expansion increased by only 60.8% more than the latter (respectively 40.0% against 24.9% of space for the increase in assets).

Generally, throughout the European Union, the loosening of macroprudential requirements has freed additional space in banks to increase their assets by 4.1% or EUR 1.424 trillion, while the increase in capital adequacy has added 9.3% of assets

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[10] Approximately because some risks, such as operational or market ones, are not always directly proportional to the size of the balance sheet total.

(EUR 3.234 trillion). Both of these factors have led to a reduction of restrictiveness of macroprudential policy of around EUR 4.659 trillion, which has increased the potential for the expansion of the balance sheet of the Union banking sector. In the euro area, these values are 3.1% (EUR 0.992 trillion), 8.8% (EUR 2.769 trillion) and EUR 3.760 trillion, respectively. This shows that the banking sector of non-euro area countries has a total of only 9.2% of banking assets, but was responsible for 19.3% of the EU-wide capital capacity increase. Chart 7 documents that Sweden, Poland, Hungary and Denmark have mostly been behind this (15.8% in total).

Chart 7. Contribution to the development of capital capacity for the expansion of banks in the European Union countries between 31 December 2019 and 30 June 2021


Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

The increase in capital capacity for the expansion of banks may result from both a decrease in capital requirements and an increase in the level of their capital adequacy, i.e. the ratio of own funds to risk-weighted assets. The decrease in the value of assets is relatively rare. It may therefore turn out that the improvement in capital adequacy is not due to an increase in capital endowment of banks, but to a reduction in the scale of operations, a change in the structure of assets or a use of other risk measurement methods. These issues are illustrated in Chart 8, which takes into account the changes in the capital adequacy ratio, taking into account a decomposition into components.

The excess capital of banks is a consequence of changes in their capital adequacy and changes in the capital requirement. Knowing the determinants of change in capital adequacy, the analysis of change in the excess capital may be expanded. This is illustrated in Chart 9.

Chart 8. Changes in the capital adequacy of banks in the European Union countries including CAR components between 31 December 2019 and 30 June 2021 (in EUR)*
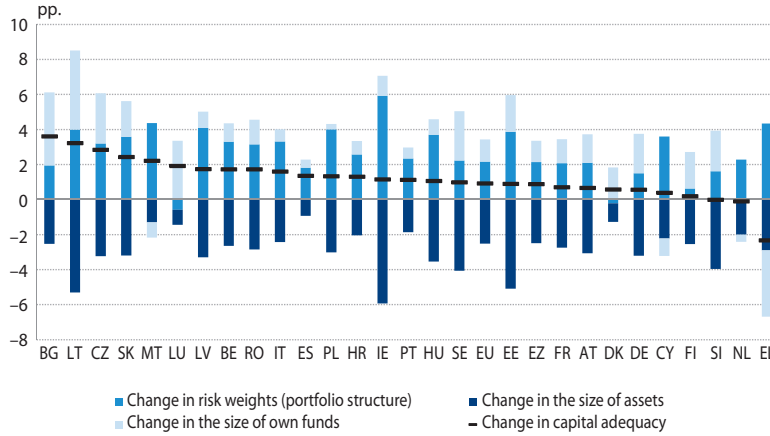
* An increase in the value of assets leads to a decrease in the excess; an increase in the risk weight of assets leads to a decrease in the excess; an increase in the value of own funds leads to an increase in the excess capital.

Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

Chart 9. Changes in the composition of the excess capital of banks in the European Union countries, expressed in euro between 31 December 2019 and 30 June 2021*
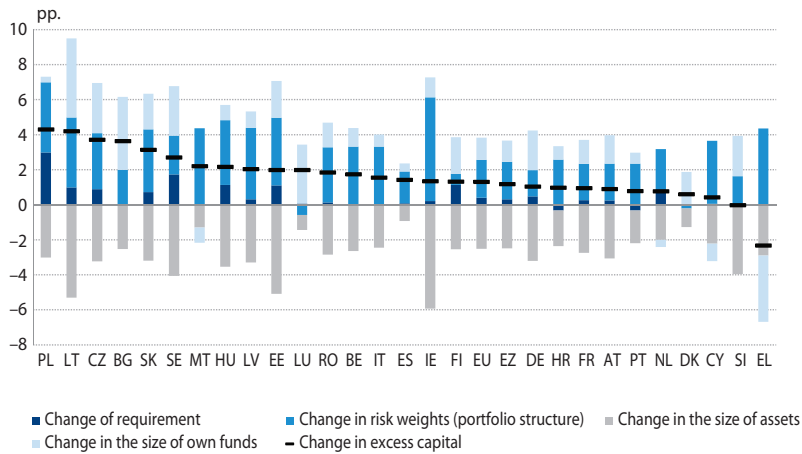

* An increase in the requirement leads to a decrease in the excess; an increase in the value of assets leads to a decrease in the excess; an increase in the risk weight of assets leads to a decrease in the excess; an increase in the value of own funds leads to an increase in the excess capital.

Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

Charts 8 and 9 illustrate the impact of individual components after the national sectors balance sheet values have been converted into euro. Depending on changes of the exchange rate, the comparison of balance sheet values in euro is encumbered with risk, as illustrated by the example of Poland, where own funds have increased during the pandemic, but the parallel depreciation of zloty has resulted in the value in euro change only slightly. Chart 10 illustrates comparable components in terms of national currencies.

Chart 10. Changes in the composition of the excess capital of banks in the European Union countries, expressed in national currencies between 31 December 2019 and 30 June 2021
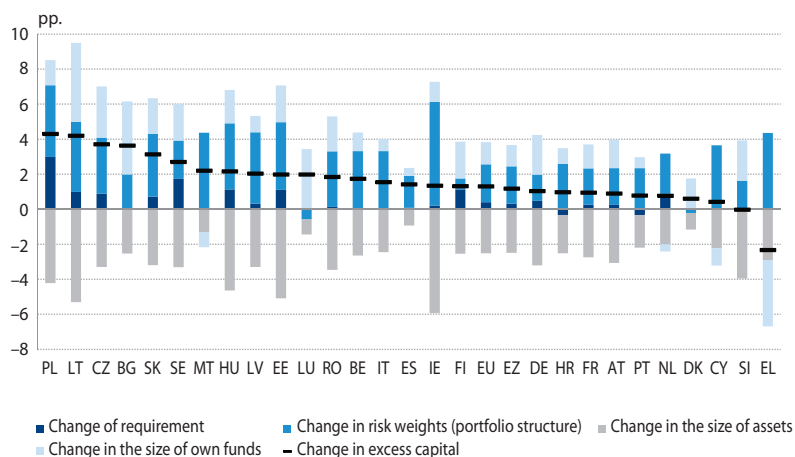
Source: Own study based on data from the ESRB, the ECB, stooq.pl and the consolidated accounts of banks.

Chart 10 illustrates that the reconstruction of the capital of banking sectors in the European Union was largely the result of a change in the structure of assets which resulted in the reduction of their average risk weight (from 39.16% to 35.10%). At the same time, the EU banking sector's own funds have increased (by EUR 158.3 billion). This resulted in an increase in the capital adequacy ratio from 18.65% at the end of 2019 to 19.55% at the end of June 2021, despite an asset increase of up to 14.0% (i.e. EUR 4.261 trillion). The effect of the increase in own funds was almost 3.2 times stronger than the effect of the macroprudential fall of the capital requirement by around 0.4 pp (), which released EUR 48.1 billion of own funds (until 30 June 2021). This shows that banks have actively strengthened their capital position during the COVID-19 pandemic. Only in Poland, the Netherlands, Greece, Malta and Cyprus, the impact of loosening the requirements was stronger than the changes in own funds. Malta and Cyprus, as well as the Netherlands and Greece, have seen their decline. This means that from the banking sectors which experienced an increase in own funds, only in Poland its impact on capacity

for expansion was lower (twice lower) than the effect of decrease in the capital requirement. This confirms the strength of the supervisory authorities' reaction in Poland, although it points to the weakness of the banks and their poor ability to accumulate capital in crisis (*de facto* retaining profits because the emergence of uncertainty in the financial markets significantly reduces the possibility of issuing debt and equity instruments)[11].

Conclusion

The distinctive feature of the COVID-19 pandemic crisis in the light of previous financial crises was the speed of its spread, as well as the rapid reaction of public and monetary authorities. The priority was to ensure access to financing and to maintain the liquidity of economic operators as well as their solvency. The authorities have taken steps to maintain the capacity of manufacturing enterprises at a time when the anti-pandemic restrictions were sustained. The relevant measures also concerned the banking sector, which would first be affected by a wave of possible bankruptcies of its customers. In order to ensure its smooth operation during and after the pandemic, monetary and supervisory authorities have decided to undertake an unprecedented loosening of monetary and macroprudential policies.

The study showed that more than a year after the outbreak of the pandemic[12], most national macroprudential policies in the European Union countries were less restrictive than before the outbreak. Furthermore, it was pointed out that greater changes in requirements were introduced in countries where, prior to the crisis, supervisory authorities applied a more restrictive macroprudential policy. However, an extreme example of Portugal has shown that even in the face of a reduction in requirements, macroprudential policy may prove more restrictive due to an increase in the share of the banks sector covered by higher requirements.

The article also showed that, in order to reduce the restrictiveness of macroprudential policy in the EU countries, the capital adequacy ratio, including the increase in own funds (e.g. as a result of retained earnings), was 2.3 times more important than loosening the requirements[13]. As a result, despite the increase in assets, additional potential for credit expansion has been achieved. However, this general conclusion does not mean that there were no specific cases. For example, loosening regulations in Poland became the largest in the EU, and the increase in own funds was (relatively) the smallest (Poland was followed only by those countries where own funds shrunk during the period considered).

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[11] Structural (tax and regulatory) reasons for the limited ability of Polish banks to increase their own funds are indicated by Kochaniak, Mikołajczyk and Ulrichs in Kochaniak (ed.) (2020).

[12] Exactly 3 months and 14 days of taking actions by the first supervisor in the euro area – the Bank of Finland.

[13] The exception was the Netherlands, Finland, Poland, Sweden, Estonia and Hungary (sequence is not accidental), where loosening requirements, in the face of a decrease in capital adequacy measures, was the main source of growth in excess capital and bank lending capacity.

Finally, the analysis of the change of bank lending capacity, and in particular the arrangement of banking sectors in the European Union according to the scale of its growth, has produced slightly different results than a (simple) analysis of changes in excess capital. The differences were due to the fact that some sectors have a clearly lower average risk weight of assets, either because of their different structure or because of the use of advanced methods of measuring them.

The test carried out is not free from defects or simplifications. Limiting the analysis of the scope of changes to supervisory and regulatory instruments to macroprudential capital requirements has meant that it did not include, for example, the so-called Pillar 2 requirements. In addition, the supervisory activities undertaken in this respect were included only indirectly (in the form of changes in the level of risk weights of assets), without distinguishing between the impact on these weightings of, among many, the introduction of CRR Quick Fix from the sovereign decisions of banks on the change in the holding of securities. Finally, the study does not take into account other supervisory activities, such as encouraging banks to retain their profits generated in 2019. The analysis also does not answer the question whether the increase in the potential to increase the balance sheet (including lending capacity) has translated into a real increase in bank lending.

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Annex

Table Z1. List of banks under analysis

Austria
BAWAG P.S.K. Bank für Arbeit und Wirtschaft und Österreichische Postsparkasse Aktiengesellschaft
Deniz Bank AG
Erste Group Bank AG
HYPO NOE Landesbank für Niederösterreich und Wien AG
Hypo Tirol Bank AG
Hypo Vorarlberg Bank AG
Oberösterreichische Landesbank AG
Raiffeisen Bank International AG
RAIFFEISEN-HOLDING NIEDERÖSTERREICH-WIEN registrierte Genossenschaft mit beschränkter Haftung
Raiffeisenlandesbank Niederösterreich-Wien

Table Z1 – continued

Raiffeisenlandesbank Oberösterreich AG
Sberbank Europe AG
UniCredit Bank Austria AG
Volksbanken Wien AG
Belgium
Argenta Spaarbank NV
AXA Bank Belgium SA
Belfius Banque SA
BNP Paribas Fortis SA
Euroclear Bank
ING Belgium SA
KBC Group NV
The Bank of New York Mellon SA
Bulgaria
Bulgarian Development Bank
Central Cooperative Bank AD
DSK Bank EAD
Eurobank Bulgaria AD
First Investment Bank AD
Raiffeisenbank (Bulgaria) EAD
UniCredit Bulbank AD
United Bulgarian Bank AD
Croatia
Addiko Bank d.d., Zagreb
Erste&Steiermärkische Bank d.d. Rijeka
Hrvatska poštanska banka d.d., Zagreb
OTP banka Hrvatska d.d., Zagreb
Privredna banka Zagreb d.d., Zagreb
Raiffeisenbank Austria d.d., Zagreb
Zagrebačka banka d.d., Zagreb

Table Z1 – continued

Cyprus
Alpha Bank Cyprus Ltd
Astrobank Ltd
Bank of Cyprus Public Company Ltd
Eurobank Cyprus Ltd
Hellenic Bank Public Company Ltd
RCB Bank Ltd
Czech Republic
Česká spořitelna, a.s.
Československá obchodní banka, a.s.
Jakabovič & Tkáč (consolidating liable entity J&T Banka, a.s.)
Komerční banka, a.s.
PPF FH B. V. (consolidating liable entity PPF Banka, a.s.)
Raiffeisenbank, a.s.
UniCredit Bank Czech Republic and Slovakia, a.s.
Denmark
Danske Realkreditselskab A/S
DLR Kredit A/S
Jyske Bank A/S
Nordea Kredit Realkreditaktieselskab A/S
Nykredit Realkredit A/S
Spar Nord Bank A/S
Sydbank A/S
Estonia
AS LHV Pank
AS SEB Pank
Luminor Bank AS
Swedbank AS
Finland
Municipality Finance Plc
Nordea Group
OP Group

Table Z1 – continued

France
BNP Paribas
Groupe BPCE
Groupe Crédit Agricole
Groupe Crédit Mutuel
La Banque Postale
Société Générale
Germany
Bayerische Landesbank
COMMERZBANK AG
DekaBank Deutsche Girozentrale
Deutsche Bank AG
DZ BANK AG
ING-DiBa AG
J.P. Morgan AG
Landesbank Baden-Württemberg
Landesbank Hessen-Thüringen Girozentrale
Landwirtschaftliche Rentenbank
Norddeutsche Landesbank -Girozentrale-
NRW.Bank
UniCredit Bank AG
Volkswagen Bank GmbH
Greece
Alpha Bank S.A.
Eurobank Ergasias S.A.
National Bank of Greece S.A.
Piraeus Bank S.A.
Hungary
CIB Bank Zrt
Erste Bank Hungary Zrt
Kereskedelmi és Hitelbank Zrt.
Magyar Takarékszövetkezeti Bank Zrt

Table Z1 – continued

MKB Bank*
OTP Bank Nyrt.
Raiffeisen Bank Zrt
UniCredit Bank Hungary Zrt
Ireland
Allied Irish Bank Group PLC
Bank of America
Bank of Ireland Group PLC
Barclays Bank Ireland PLC
Citibank Holdings Ireland Ltd
DePfa Bank plc
Ulster Bank Ireland DAC
UniCredit Bank Ireland plc
Italy
Banco BPM
Intesa Sanpaolo S.p.A.
Monte dei Paschi di Siena
UniCredit S.p.A.
Latvia
AS Citadele banka
AS Rietumu Banka
AS SEB banka
Swedbank AS
Lithuania
AB SEB bankas
AB Šiaulių bankas
Swedbank AB
Luxembourg
Banque et Caisse d'Epargne de l'Etat Luxembourg
Banque Internationale à Luxembourg S.A.
BGL BNP Paribas S.A.

Table Z1 – continued

Clearstream Banking S.A.
Deutsche Bank Luxembourg S.A.
J.P. Morgan Bank Luxembourg S.A.
RBC Investor Services Bank S.A.
Société Générale Luxembourg
Malta
APS Bank plc
Bank of Valletta plc
HSBC Bank Malta plc
MDB Group Ltd
the Netherlands
ABN AMRO Bank N.V.
Bank Nederlandse Gemeenten
Coöperatieve Rabobank U.A.
De Volksbank N.V.
ING Bank N.V.
Poland
Alior Bank SA
Bank Handlowy w Warszawie SA
Bank Millennium SA
Bank Polska Kasa Opieki SA
Bank Polskiej Spółdzielczości SA
BNP Paribas Bank Polska SA
Deutsche Bank Polska S.A.
ING Bank Ślaski SA
mBank SA
Powszechna Kasa Oszczedności Bank Polski SA
Santander Bank Polska SA
SGB-Bank SA

Table Z1 – continued

Portugal
Banco BPI
Banco Comercial Português
Caixa Economica Montepio Geral
Caixa Geral de Depósitos
LSF Nani Investments S.à.r.l.
Novo Banco
Santander Totta SGPS
Romania
Alpha Bank Romania S.A.
Banca de Export-Import a României Eximbank S.A.
Banca Comercială Intesa SanPaolo Romania S.A.
Banca Comercială Română S.A.
Banca Cooperatista Creditcoop
Banca Română de Credite şi Investiţii S.A.
Banca Românească S.A.
Banca Transilvania S.A.
BRD – Groupe Societe Generale S.A.
CEC Bank S.A.
Credit Agricole Bank Romania S.A.
Credit Europe Bank S.A.
First Bank S.A.
Garanti Bank S.A.
Idea Bank S.A.
Libra Internet Bank S.A.
OTP Bank Romania S.A.
Patria Bank S.A.
Porsche Bank S.A.
ProCredit Bank S.A.
Raiffeisen Bank S.A.

Table Z1 – continued

Techventures Bank S.A.
UniCredit Bank S.A.
Vista Bank Romania S.A.
Slovakia
Československá obchodná banka, a.s.
Poštová banka, a.s.
Slovenská sporiteľňa, a.s.
Tatra banka, a.s.
Všeobecná úverová banka, a.s.
Slovenia
Abanka d.d.
Intesa Sanpaolo
Nova Kreditna Banka Maribor d.d.
Nova Ljubljanska Banka d.d.
SID – Slovenska izvozna in razvojna banka d.d.
SKB Banka d.d.
UniCredit Banka Slovenija d.d.
Spain
Banco Bilbao Vizcaya Argentaria, S.A.
Banco de Sabadell, S.A.
Banco Santander, S.A.
BFA Tenedora de Acciones S.A.U. (holding of Bankia, S.A.)
CaixaBank, S.A.
Sweden
Nordea Hypotek AB
Skandinaviska Enskilda Banken AB (SEB)
Svenska Handelsbanken AB
Swedbank AB

Source: Own study.