POST CRISIS BANKING SECTOR REGULATION AND EUROPEAN UNION ECONOMIC GROWTH NEXUS

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Abstract

The objective of this paper is to examine the impact of the new banking regulation on the European Union real economic activity in the period following the global financial crisis using a sample of 22 listed banking groups with high systemic importance, using dynamic panel models with a one-step GMM estimator. Higher regulatory capital and liquidity requirements are the main consequences of the global financial crisis, the pro-cyclical contraction of bank credit, and the advanced adaptive consolidation of the banking sector. The strengthened role of the ECB as lender of last resort and market maker may have had a significant impact on eliminating interbank market dysfunctionality and maintaining overall financial stability. In implementing the Basel III regulatory framework banks significantly increased the quality and consistency of the capital structure. On the other hand, the long-term stability of reduced systemic risks and the stimulation of the credit cycle are at stake. The research results clearly show that the necessary increase in a banking firm's regulatory capital and liquidity position have positive effects on real economic activity and potential sustainable economic growth.

Keywords: regulatory requirements, bank capital, bank liquidity, financial system, dynamic panel models

JEL: C33, D53, F65, G21

1. Introduction

The nexus of the real and financial economy has long been a topic in economic research. Schumpeter (2013) put forward the first comprehensive theory on the impact of bank credit on economic growth within the framework of endogenous growth theory. Since the early days of research on model development, economists have been confronted with the question of the direction of the nexus between finance and growth (Thiel, 2001). The complexity of assessing the impact of the financial sector on real economic growth depends on the bank-based or capital-based structure of the financial system. Studies that assume a bank-based financial system overstate the importance of the financial system and the one-way nexus.

The last global financial crisis of 2007-2008 indicated in bank-based economies the strong nexus between the banking system efficiency and economic growth. The pro-cyclical effect of the banking sector was significant, and the financing of the bailouts caused high public costs. Therefore, the concentration of capital in the banking sector and the productivity of the factors of production are the fundamental transmission channel from the financial to the real economy, i.e., the stability of the banking system is necessary for long-term economic growth. The financial sector is responsible for allocating capital to productive investment, which directly affects the productivity of the economy.

During the global financial crisis, it was clear that the banking sector was undercapitalized and that banking companies could not manage structural liquidity risk. The level of non-performing loans was increased due to the financial sector's structural problems and the pro-cyclical effect of banks' lack of lending potential. The global financial crisis led to an unprecedented government intervention to bail out failing banks, while deposit insurance schemes around the world became more generous and expanded in both scope and coverage (Anginer *et al*., 2019). Regulators put forward a very ambitious program of international regulatory reforms under the Basel III framework, focused on building a safer and more resilient banking

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system. The primary effect of the new regulatory measures is to increase regulatory capital, a more stable capital structure and finally, the improved liquidity profile of banks to encourage bank lending. Therefore, increasing the liquidity of the banking system is one of the priorities of the regulatory objectives. With insufficient capital and liquidity, the banking system cannot sustain lending activities, which has a negative impact on economic growth and development. Moreover, the discontinuity of the banking sector's lending activities can have a pro-cyclical effect on the quality of the current loan portfolio in the market. The basic research hypothesis is that regulatory measures are directly and positively associated with real economic activity as measured by gross domestic product.

The research model is developed on the sample of twenty-two market-leading and listed European banks in the post-crisis period of implementation of new regulatory frameworks. Finally, the research is conducted using a dynamic panel model.

The paper is divided into five separate units. The introduction is followed by an overview of previous relevant research, while the third part presents the sample and the formation of an econometric model. The fourth part brings the results and discussion. Through the concluding remarks in the fifth part, a synthesis of the paper is presented with recommendations for further research. Compared to other articles dealing with the impact of key banking ratios on lending and economic growth, this study differs in the selection of the sample, the study period, and the inclusion of a dummy variable for the period in which the prudential measures apply. The research findings obtained from the sample of market-active and systemically important banks can be applied to the entire European banking system.

2. Literature review

Many authors emphasize the relationship between financial sector development and economic growth. Claessens & Laeven (2002) discussed the transmission channel from the allocation of financial to real assets, focusing on the structure of the financial system. The global financial crisis shows that banks' performance affects lending with a direct impact on economic growth and development (Ferreira, 2016). The crisis environment forces the intervention of regulators to increase the stability of the banking system and promote bank lending activities (Leaven & Valencia, 2013). Finally, the last financial crisis shows the weakness of the banking system model and significant deficiencies in banks' capital adequacy and liquidity, which required a comprehensive reform of the regulatory framework (Basel Committee on Banking Supervision, 2010).

According to Diamond & Rajan (2000), the capital structure of a banking firm directly affects its ability to offer liquidity and credit. Since a healthy banking system is a key to sustainable and qualitative economic growth and development, understanding the key factors that determine a bank's capital is also important. For example, not only is it important that a bank's business risk is covered by a high-quality capital base, but the crisis in the financial system has also exposed inconsistencies in the definition of capital by different national regulators, as well as deficiencies in the accounting for categories of capital that allow markets to fully assess and compare capital quality.

The key element of the new Basel III capital requirement is a stronger emphasis on Tier 1 capital as the highest quality component of bank capital (Basel Committee at Banking Supervision, 2011). As a result of the monetary authorities' intention to strengthen the structure of bank capital versus the reluctance and negative feelings of equity owners towards investing in the capital base, the regulators have in any case sufficient time for the necessary regulatory adjustment (Klinac *et al.*, 2019; Ercegovac *et al.*, 2020). The timeline and dynamics of introducing structural changes to the capital structure components are presented in Appendix, Figure 1. A counter-cyclical protective layer of capital is intended to mitigate excessive credit growth and risks in times of a general economic downturn (Basel Committee on Banking Supervision, 2017a). The implementation of the counter-cyclical capital buffer is fully concurrent with the introduction of the previous capital buffer and must ultimately contribute to greater financial stability overall. Even more, the Basel Committee on Banking Supervision (2017b) has developed a methodology that includes quantitative indicators and qualitative elements to identify

global systemically important banks that are leaders in capital transformation.

In addition to the lack of capital, most banks faced liquidity problems during the global financial crisis, even though they had a high proportion of liquid financial assets in their balance sheet structure. The interbank market was dysfunctional and the credit quality of banks was questioned.

As a part of the changes in prudential regulation following the financial crisis, a new regime for liquidity management and liquidity risk regulation is introduced to improve financial discipline and maintain financial stability without additional fiscal costs. The new framework introduced by the Basel authorities brings mandatory reporting and supervisory standards that set minimum requirements for a bank's liquidity profile as well as rules and principles for liquidity management (Basel Committee on Banking Supervision, 2008). The primary objective of structural risk management is to increase stable sources of funding to protect the banking entity from deposit outflows and potential banking panics (Gobat *et al*., 2014). New regulatory standards are required to manage quantitative indicators of the bank's liquidity profile to maintain the required stable sources of funding (Basel Committee at Banking Supervision, 2014). In addition to regulatory requirements, monetary authorities begin to implement non-conventional monetary policy measures to support liquidity and encourage credit activity in the banking sector (Ercegovac & Buljan, 2017).

Most banks use the facility of the central bank credit channel to fund liquidity gaps (Acharya & Tuckman, 2014). The credit programs provided by monetary authorities increase banks' resilience to liquidity shocks caused by local or global financial stress and interbank market dysfunctionality (Cocco *et al*., 2009). By providing liquidity, monetary authorities stimulate the functionality of the interbank market (Drechsler *et al*., 2016).

Following the implementation of the Basel III liquidity supervision measures, the European Central Bank - ECB (2018) looked very closely at the standards implemented and assessed the costs and benefits of liquidity management in the European banking sector. Acharya *et al*. (2011) analyzed the problem of selling liquid assets during the financial crisis and the need for liquidity support to avoid losses due to falling prices. Santos and Suarez (2019) analyzed the problems of moral hazard and information problems by liquidity providers. Berger *et al*. (2016) showed a new creation of liquidity in the banking system under new regulatory measures and capital support in ensuring bank solvency. This led to the development of a new banking model in bank liquidity risk management to maintain bank performance (Chiorazzo *et al*., 2018). In summary, when analyzing the impact of liquidity regulation, many authors look for an assessment of the regulatory framework of liquidity risk in the newly created regulatory architecture. Therefore, other regulatory changes supported the restructuring process of European banks.

New debt market regulation and securitization of financial assets helped banks manage non-performing loans.[1] The new possibilities to trade non-performing loans allowed banks to reduce the non-performing loan ratio to an acceptable level and create capacity for new lending activities (Deloitte, 2018). Ultimately, the expected impact of the regulatory changes was to restructure banking sector capital and liquidity, enforce bank lending policies, restore confidence in the stability of the banking system, improve bank performance measures and promote economic growth and development (Iwanicz-Drozdowska, 2016).

3. Sample and formation of the econometric model

Following Klinac (2019), Klinac *et al*. (2019), and Ercegovac *et al*. (2020), a research sample was formed using a publicly available Bloomberg database, while a highly balanced data panel was formed for the final empirical analysis. Using consolidated balance sheet data (as per International Financial Reporting Standards - IFRS), 22 banking groups operating in the period from 2010 to 2019 were selected (Appendix, Table 6).

The banking groups in the selected sample have a distinct systemic character, not only in terms of asset size and business activities but especially in terms of regulatory importance vis-à-vis the

common European Union and the Swiss financial system as a whole. Consolidated financial statements allow us to effectively avoid potential errors in the selection of observed parameters per time unit, while on the other hand, by omitting large national and regional promotional banks from the analysis, we ensure the highest degree of research objectivity in assessing the impact of business models of the selected banking firms.

The dependent variable of this study is the development of aggregate economic activity (GDP) of the selected countries under the conditions of full implementation of regulatory measures in the context of the global financial crisis. The following independent variables also affect the development of GDP. Their description and the expected effects are listed in Table 1:

- HQLA - High-quality liquid assets consisting of cash, regulatory deposits, miscellaneous reserves, and given interbank deposits and prime debt securities. From a regulatory perspective, they facilitate compliance with the specified capital requirements as well as regulatory liquidity requirements. The volume of high-quality liquid assets is a direct result of changes in the regulatory framework.
- NPA - the non-performing portfolio ratio, which provides us with information on the level of the credit risk of an individual banking unit. It dynamically represents the chosen risk management model over the long term for an individual banking unit. The volume of non-performing assets is caused by the health and functioning of the economy and the credit capacity of the financial system.
- TCaP - Total regulatory capital. It is used to cover potential losses from bad banking transactions, the content, and definition of which are the sole responsibility of the regulator. High regulatory capital is associated with additional capital buffers, especially for systemically important banks.
- TA - Net assets consisting of all investments and placements with the embedded credit risk of the banking entity in a unit of time. The growth of total assets in bank-based economies is related to the restructuring of the banking system, mainly due to macro- and micro-prudential policies and changes in the business model of banks.
- DRM - Dummy variable of the full implementation of the regulatory measures of the Basel standards III from 2010 to the end of the analyzed period.

To prove the hypothesis put forward, a panel analysis was conducted using Arellano-Bover / Blundell-Bond dynamic linear panel. A one-step GMM estimator was used. The very dynamic nature of the sample of empirical data ruled out the possibility of using statically fixed or random-effects models, while the two-step analysis did not reveal any significant quality of the model. Before this, the relevant econometric literature was consulted, which pointed us to the main advantages of using panel data, such as:

- the possibility of modelling at the individual level with control of heterogeneity at the same individual level with the assumed difference between the observed sample units (Wooldridge, 2002),
- the identification of certain parameters or issues without the need to limit assumptions (Verbek, 2004),
- the greater efficiency of model parameters is ensured with less restrictive assumptions while reducing the problem of multicollinearity (Škrabić Perić, 2012),
- the unique ability of dynamic panel models to solve the problem of endogeneity as well as effective management of heteroskedasticity and autocorrelation of residues.

For the purposes of this research, the theoretical model can be written by equation (1):

$$y_{i,t} = \mu + \gamma \cdot y_{i,t-1} + \beta_1 \cdot x_{i,t} + \beta_2 \cdot x_{i,t} + \cdots + \beta_k \cdot x_{i,tk} + \alpha_i + \varepsilon_{i,t},$$
$$i = 1, \ldots N,$$
$$t = 1, \ldots T. \quad (1)$$

where i denotes the unit, t time, μ constant term, γ parameter with dependent variable with the lag; $\beta_1, \beta_2, \ldots, \beta_k$ are the parameters of exogenous variables, $x_{i,t}$ are independent variables, α_i is the specific error for *the* i-$_{th}$ bank, and $\varepsilon_{i,t}$ represents the error of the relation of the i-$_{th}$ bank.

The expected impact of the dependent variable is shown in the table as follows.

Table 1. *Description of variables and expected impact*

Label	Definition of variables	Expected impact
GDP	Gross Domestic Product in%	Dependent variable
LnHQLA	Natural logarithm of High-Quality Liquid Assets	-
NPA	The ratio of Non-Performing Assets portfolio in%	-
TCaP	Total Regulatory Capital = Tier 1 (CET1+ AT1) + Tier 2. Percentage ratio over Risk-Weighted Assets – RWA	-
LnTA	Natural logarithm of Total Assets	+
DRM	Dummy variable regulatory measures	+/-

Source: Authors (2021)

The level of liquid assets reduces the credit potential of banking companies. To meet the new regulatory requirements, banks should shift more funds into cash and cash-like instruments, including highly liquid government bonds. Moreover, to support liquidity in the interbank market, banks reduce their loan portfolios, which is directly linked to lower growth rates. Therefore, a higher regulatory capital ratio is an indicator of an increase in the volume of capital or a reduction in the volume of risky assets. A higher absolute level of capital has an impact on the cost of capital if banks' performance indicators remain unchanged, which makes investment in the banking sector less attractive.

The reduction in risk-weighted assets shows the allocation of banks' funding potential to liquid assets, which directly affects bank lending (Ercegovac *et al*., 2020). The level of non-performing assets is directly linked to the structure of the economy, the creditworthiness of firms, and the macroeconomic environment. Therefore, regulatory changes can affect the real sector in two directions: they can increase regulatory costs and increase non-performing assets, or they can stabilize the banking system, inject liquidity into the real sector, and increase the lending potential of banks. Finally, even in the case of endogenous money creation, the growth of bank assets indicates recovery and economic growth.

4. Results and discussion

By descriptive analysis of the research sample (Table 2), we give general characteristics of the observed sample variables while the presence of a potential multicollinearity problem is checked by the additional analysis, using a correlation matrix of variables' influence on real economic activity growth (Table 3).

Table 2. *Descriptive statistics of research sample variables*

Variables	Obs	Mean	Std. Dev.	Min	Max
GDP	220	1.482	1.396062	-3.1	7.7
LnHQLA	220	11.98186	0.9733583	9.514658	13.45561
NPA	218	2.476746	2.332139	0.120342	9.959431
TCaP	219	17.75374	3.683154	8.9	31.8
LnTA	220	13.54311	0.6948533	12.15936	14.69845

Source: Authors (2021).

According to Škrabić Perić (2012), no clear test for detecting multicollinearity between independent variables has yet been established, while most available studies use a correlation coefficient of the variables of no more than 0.5, although in some cases the presence of a moderate correlation does not affect the empirical model.

Table 3. *Correlation matrix of the impact of variables on the growth of real economic activity*

	GDP	LnHQLA	NPA	TCaP	LnTA
GDP	1				
LnHQLA	0.0562 *(0.4079)*	1			
NPA	-0.2472 *(0.0003)*	-0.0329 *(0.6320)*	1		
TCaP	-0.1663 *(0.0146)*	-0.0372 *(0.5876)*	0.0201 *(0.7703)*	1	
LnTA	0.2399 *(0.0003)*	0.4627 *(0.0000)*	-0.1147 *(0.0941)*	-0.0942 *(0.1687)*	1

Source: Authors (2021)

According to Bahovec & Erjavec (2009), the null hypothesis of the assumption of non-stationarity of the process is established, i.e., the analysis of the stationarity of the selected research sample is conducted. Testing is done using the unit root or Dickey-Fuller test and the results in Table 4 indicate that all the selected variables are the first difference of the same, i.e., for the dependent and all independent variables the null hypothesis of the presence of the unit root is rejected at the 1% level of statistical significance.

Table 4. *Results of the Dickey-Fuller stationarity test*

	GDP	LnHQLA	NPA	TCaP	LnTA
t-stat	-3.8716	-9.0989	-5.5516	-10.0693	-8.5273
p-value	0.0001	0.0000	0.0000	0.0000	0.0000

Source: Authors (2021)

The basic regression model of the panel analysis is written in equation (2) while introducing the dummy variable of the impact of regulatory measures on the aggregate level of real economic activity (DRM) into the model, it is tested the main research hypothesis as written in equation (3):

$$\Delta GDP_{i,t} = \mu + \gamma \cdot \Delta GDP_{i,t-1} + \beta_1 \cdot \Delta LnHQLA_{i,t} + \beta_2 \cdot \Delta NPA_{i,t} + \beta_3 \cdot \Delta TCaP_{i,t} + \beta_4 \cdot \Delta LnTA_{i,t} + \alpha_i + \varepsilon_{i,t},$$
$$i = 1, \dots N, t = 1, \dots T. \quad (2)$$

$$\Delta GDP_{i,t} = \mu + \gamma \cdot \Delta GDP_{i,t-1} + \beta_1 \cdot \Delta LnHQLA_{i,t} + \beta_2 \cdot \Delta NPA_{i,t} + \beta_3 \cdot \Delta TCaP_{i,t} + \beta_4 \cdot \Delta LnTA_{i,t} + \beta_5 \cdot DRM_{i,t} + \alpha_i + \varepsilon_{i,t},$$
$$i = 1, \dots N, t = 1, \dots T. \quad (3)$$

The analytical results of the two observed models are shown in Table 5. The Wald and Arellano-Bond tests were used to check the accuracy of the results of the regression models.

The Wald test confirmed the statistical significance of the entire model, with the test statistic AR (1) being negative and significant. In contrast, the significance of the test statistic AR (2) was non-existent. In summary, the empirical models are well specified, i.e., the autocorrelation in the first row was confirmed at the 5% significance level, while the autocorrelation is not present in the second row.

The results of the model are shown in the following table.

Table 5. *Results of the panel analysis of the impact of regulatory measures on the overall level of real economic activity*

Dependent variable: *increase in real economic activity*		
Variable	MODEL_1	MODEL_2
$\Delta GDP_{i,t-1}$	0.2525704*** *(0.0530043)*	0.4260403*** *(0.0286949)*
$\Delta LnHQLA_{it}$	-0.5456712 *(0.3679188)*	-0.1419672 *(0.3752816)*
ΔNPA_{it}	-0.8018288*** *(0.2718956)*	-0.2720973** *(0.1274596)*
$\Delta TCaP_{it}$	-0.1074523*** *(0.0289502)*	-0.0489987** *(0.0202409)*
$\Delta LnTA_{it}$	2.531078** *(1.07589)*	4.053404*** *(0.7767886)*
DRM_{it}	-	1.251783*** *(0.0763375)*
μ	1.061458*** *(0.1014318)*	1.004708*** *(0.1450459)*
Number of observations	195	195
Number of groups	22	22
Wald χ^2 *(p-value)*	128.41 *(0.0000)*	892.27 *(0.0000)*
AR(1) *(p-value)*	-4.1866 *(0.0000)*	-4.419 *(0.0000)*
AR(2) *(p-value)*	-0.57879 *(0.5627)*	-1.7934 *(0.0729)*

Note: Δ - All model variables are used as the first difference; * stat. sign. at 10%, ** stat.sign. at 5%, *** stat. sign. at 1%; Standard errors are shown in parentheses.
Source: Authors (2021).

The model results are in line with theoretical assumptions and base research hypotheses. The negative impact of non-performing loans on the economy has been analyzed by many authors (Balgova *et al*., 2018). They conclude that a high volume of non-performing loans constrains the supply of credit, disrupts lender-borrower relationships, and shakes confidence in market efficiency.

The European strategy to address the problem of high levels of non-performing loans on bank books has shown a long-term impact (Aiyar *et al*., 2015).

Monetary easing through various programs using high-quality liquid assets ($\Delta LnHQLA_{it}$) helps maintain interbank market liquidity (Altavilla *et al*., 2015) and produces a negative impact on real economic activity in the post-crisis period, but without statistical significance. Finally, the model shows the significant and negative impact of regulatory capital requirements ($\Delta TCaP_{it}$) on GDP growth.

The increase in liquid assets in the European banking system does not sufficiently support the bank lending channel in the post-crisis period (Horst & Neyer, 2019). Liquid assets and additional capital are largely used to comply with regulatory requirements to stabilize the banking system in the post-crisis period and to change the banks' business model. The negative impact of the two main prudential targets (liquidity and capital) is related to the adoption of the new prudential frameworks announced in the double-button GDP movement during the period.

When analyzing the European Union banking system following the new Basel regulatory framework III, it is evident that

the new capital and liquidity requirements were adopted in a stable proportion in the second phase of the banking system restructuring (European Banking Authority, 2020).

The positive impact of a wide implemented regulatory framework (DRM_{it}) on GDP growth is evidence of regulatory support for bank restructuring and bank assets growth. The statistically significant and positive effect of total bank asset growth ($\Delta LnTA_{it}$) on the dependent variable confirms the basic research hypothesis that regulatory measures recovered the European banking system and enabled it to promote economic growth. In a comprehensive study of banking, the expansion of the system, and economic growth, Langfield & Pagano (2015) concluded that in a highly banked European economy, there is a strong relationship between the expansion of bank assets and growth in output and wealth.

Finally, both models confirmed the positive and statistically significant impact of the lagged dependent variable due to the structural adjustment of economic activities during the research period.

The research data confirm the theoretical assumptions that the health of the banking system is related to economic growth. Although the theoretical approach is ambiguous about the link between the financial and real sectors (De Gregorio & Guidotti, 1995), a dysfunctional financial sector can disrupt the liquidity of the economy, investment opportunities, allocation of factors of production, and risk management (Demetriades & Hussein, 1996).

5. Concluding remarks

The research model confirmed the base research hypothesis and found a strong relation between the implementation of regulatory measures and economic growth. The regression coefficient of the implementation of the dummy variable of regulatory measures (DRM_{it}) is 1,251783 with a high level of statistical significance of 99%.

The strong impact on economic growth is found in the set of other model variables that are the target objectives of regulatory authorities' requirements. The measure of the bank liquidity assets ($LnHQLA_{it}$), the measure of the bank total capital ($TCaP_{it}$), and the non-performing loan measure (NPA_{it}) show the negative impact on economic growth due to the slowdown of bank lending activities and balance sheet restructuring. Grasmann *et al*. (2019) confirmed similar results of the negative impact of non-performing loan volume on lending activities and economic growth.

Some research on the local loan market (Accornero *et al*., 2017) observed that low loan quality discourages bank lending activities and decreases the bank credit supply (Cucinelli, 2015). Therefore, the negative direct impact of the bank capital ratio (Ratnovski, 2013), and the high liquid assets ratio (Polizzi *et al*., 2020) is in line with the model result, but the authors emphasize strong indirect effects on banking sector stabilization and increasing potentials of collection of the new funding sources.

The expectation of long-run bank stability affects the growth of bank assets, which is consistent with the model result and strong positive impact of the volume of total bank assets ($LnTA_{it}$) on the economic growth.

Given that the research focused on the relationship between regulatory measures and economic growth, some variables of the bank performance measures had to be ignored, which can be the main limitation of the research model.

Further researchers should take into consideration the bank performance adjustments to upcoming Basel IV capital requirements, which can increase the cost of bank capital, raise regulatory costs, switch banking activities to risk-free assets, decrease the lending portfolio, enlarge loan interest rates, and reduce the competitiveness of banking financial intermediaries (Agénor *et al*., 2018).

The regulatory authorities stabilized the banking system with prudential measures in a critical post-crisis period of the bank system restructuring, but restrictions imposed on banks to prevent overfinance can produce long-run negative effects on financial sector development (Arcand *et al*., 2012).

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[1] Regulation (EU) 2017/2402 of the European Parliament and of the Council of 12 December 2017 laying down a general framework for securitization and creating a specific framework for simple, transparent and standardized securitization, and amending Directives 2009/65/EC, 2009/138/EC, and 2011/61/EU and Regulations (EC) No 1060/2009 and (EU) No 648/2012.

Appendix

Table 6. *Empirical sample of bank data average (2010 - 2019)*

Bank	Country	LnHQLA	NPA	TCaP	LnTA
ABN Amro Group	Netherlands	10.8	1.71	20.8	12.9
Banco Bilbao Vizcaya	Spain	11.5	3.12	14.7	13.4
Banco Santander	Spain	12.4	2.74	14.1	14.1
Barclays	UK	13.0	0.91	18.4	14.3
BNP Paribas	France	13.1	2.01	14.3	14.5
CaixaBank	Spain	10.1	5.74	14.4	12.7
Commerzbank	Germany	12.0	1.94	16.7	13.2
Crédit Agricole	France	13.3	1.06	16.8	14.3
Credit Suisse Group	Switzerland	12.8	0.22	20.0	13.5
Danske Bank	Denmark	11.6	2.06	20.7	13.0
Deutsche Bank	Germany	12.9	0.50	16.9	14.3
Erste Group Bank	Austria	10.8	5.77	16.7	12.3
HSBC Holdings	UK	13.3	1.08	17.5	14.6
Intesa Sanpaolo	Italy	11.4	7.09	16.0	13.5
KBC Group	Belgium	10.9	3.06	18.5	12.5
Lloyds Banking Group	UK	11.6	2.78	19.9	13.9
Nordea Bank	Sweden	11.4	0.92	19.4	13.3
Royal Bank of Scotland	UK	12.4	2.10	18.8	14.0
Société Générale	France	13.2	1.76	15.1	14.1
Swedbank	Sweden	10.6	0.69	23.8	12.3
UBS Group	Switzerland	12.7	0.21	22.6	13.7
UniCredit	Italy	11.9	7.27	14.7	13.7

Source: Bloomberg (2020)

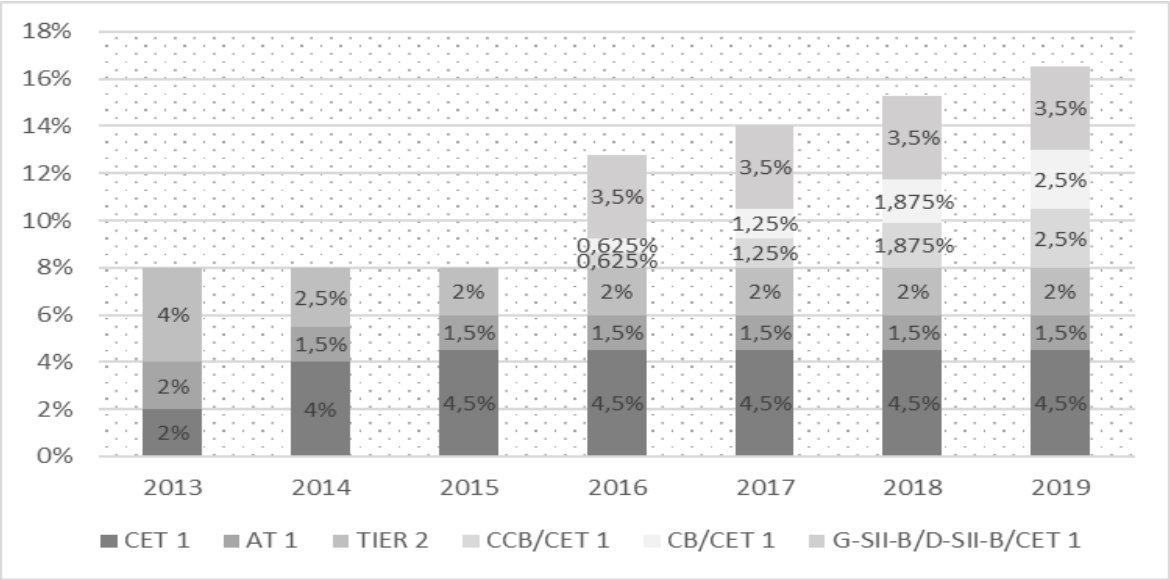

Figure 1. *Increase in bank capital structure with the establishment of a new regulatory framework (Basel III).*
Note: CCB/CET 1- capital conservation buffer CET 1; CB/CET 1- countercyclical capital buffer CET 1; G-SII-B/D-SII-B/CET1- capital conservation buffer CET 1 for global/domestic systemically important institutions.
Source: Authors (2021)