



IILAB WORKING PAPER SERIES

IILAB WPS

IILAB SERIJA ČLANAKA U NASTAJANJU

ISSN

UDC

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No. 01-06

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European Union economic growth nexus**



Sveučilište u Zagrebu  
Ekonomski fakultet

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## 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 EU 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, but also the pro-cyclical contraction of bank credit and the advanced adaptive consolidation of the banking sector. The strengthened role of 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. Although the full implementation of the structural regulation of Basel III on the one hand raises the question of the consistency of the universal banking model, especially in bank-oriented economies due to capital constraints. 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.*

**Key words**

*regulatory requirements, bank capital, bank liquidity, financial system, dynamic panel models*

**JEL classification:** 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 drawing conclusions about 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 provided the authors with the arguments indicating that a strong and efficient banking system is a prerequisite for economic growth in bank-based economies. The pro-cyclical effect of the banking sector was strong and the public cost of bailouts was high. In bank-based economies, the concentration of capital in the banking sector and the productivity of the factors of production are the basic transmission channel from the financial to the real economy; 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 undercapitalised and that banking companies could not manage structural liquidity risk. The level of non-performing loans was increased due to the structural problems of the financial sector as well as the pro-cyclical effect of the banks' lack of lending potential. The global financial crisis led to unprecedented government intervention to bail out failing banks, while deposit insurance schemes around the world have become more generous and expanded in both scope and coverage (Anginer et al., 2019).

Regulators are putting forward a very ambitious programme of international regulatory reforms under the Basel III framework, focused on building a safer and more resilient banking system. The primary effect of the new regulatory measures has been to increase capital and improve the liquidity profile of banks in order to encourage bank lending. The new regulatory framework required a higher volume of regulatory capital with a more stable capital structure. 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, then, 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 work is divided into five separate units. The introduction is followed by an overview of previous relevant research, while the third part of the paper presents the sample and the formation of an econometric model. The fourth part presents the results and discussion. Through the concluding remarks in the fifth part, a synthesis of the paper is presented with recommendations for further research.

## **2. LITERATURE REVIEW**

Many authors emphasise 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 recent financial crisis shows that banks' performance affects lending with 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 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.

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 given sufficient time for the necessary regulatory adjustment (Klinac et al., 2019; Ercegovic et al., 2020). The timeline and dynamics of introducing structural changes to the capital structure components are presented in the Annex, Figure 1. A countercyclical 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 was fully concurrent with the introduction of the previous capital buffer and must ultimately contribute to greater financial stability overall. Even more, 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 part of the changes in prudential regulation since the financial crisis, a new regime for liquidity management and liquidity risk regulation was introduced to improve financial discipline and maintain financial stability without additional fiscal costs. The new framework introduced by the Basel authorities introduces 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 in 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 required to manage with 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 began to implement non-conventional monetary policy measures to support liquidity and encourage credit activity in the banking sector (Ercegovic & Buljan, 2017).

Most banks use the facility of the central bank credit channel to fund liquidity gaps (Acharya & Tuckman, 2014). The credit programmes 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 have stimulated 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) has 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) analysed the problem of selling liquid assets during the financial crisis and the need for liquidity support to avoid losses due to falling prices. Santos & Suarez (2019) analysed 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 has 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 analysing 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 securitisation of financial assets have helped banks manage non-performing loans (Regulation EU, 2017/2402). 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 ECONOMETRIC MODEL**

Following Klinac (2019), Klinac et al. (2019) and Ercegovic 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 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 aggregate economic activity. The description of these and the expected effects are listed in the appendix 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 credit risk of an individual banking unit. 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 is 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 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 analysed 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 static fixed or random effects models, while the two-step analysis did not reveal any significant quality of the model. Prior to 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),
- enabling the identification of certain parameters or issues without the need to limit assumptions (Verbek, 2004),
- greater efficiency of model parameters is ensured with less restrictive assumptions while reducing the problem of multicollinearity (Škrabić Perić, 2012),
- dynamic panel models possess a unique ability 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):

$$y_{i,t} = \mu + \gamma \cdot y_{i,t-1} + \beta_1 \cdot x_{i,t} + \beta_2 \cdot x_{i,t} + \dots + \beta_k \cdot x_{i,t,k} + \alpha_i + \varepsilon_{i,t},$$

$$i = 1, \dots, N, t = 1, \dots, T. \quad (1)$$

where  $i$  denotes the unit,  $t$  time,  $\mu$  constant term,  $\gamma$  parameter with dependent variable with the lag,  $\beta_1, \beta_2, \dots, \beta_k$  are the parameters of exogenous variables,  $x_{i,t}$  are independent variables,  $\alpha_i$  is the specific error for  $i$ -th bank, and  $\varepsilon_{i,t}$  represents the error of the relation of the  $i$ -th bank.

The expected impact of dependent variable is shown in table is following.

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	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	+/-

Note: All model variables are used as the first difference.

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 are reducing 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 stabilise 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 was checked by 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 was established, i.e. the analysis of the stationarity of the selected research sample was conducted. Testing was done using the unit root or Dickey - Fuller test and the results shown in Table 4 clearly 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 was 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 was written in equation (2), while by introducing the dummy variable of the impact of regulatory measures on the aggregate level of real economic activity (DRM) into the model, we tested the main research hypothesis as written in equation (3):

$$\Delta GDP_{i,t} = \mu + \gamma \cdot \Delta GDP_{i,t-1} + \beta_1 \cdot \Delta LnHQLA_{i,t} + \beta_2 \cdot \Delta NPA_{i,t} + \beta_3 \cdot \Delta TCaP_{i,t} + \beta_4 \cdot \Delta LnTA_{i,t} + \alpha_i + \varepsilon_{i,t},$$

$$i = 1, \dots, N, t = 1, \dots, T. \quad (2)$$

and

$$\Delta GDP_{i,t} = \mu + \gamma \cdot \Delta GDP_{i,t-1} + \beta_1 \cdot \Delta LnHQLA_{i,t} + \beta_2 \cdot \Delta NPA_{i,t} + \beta_3 \cdot \Delta TCaP_{i,t} + \beta_4 \cdot \Delta LnTA_{i,t} + \beta_5 \cdot DRM_{i,t} + \alpha_i + \varepsilon_{i,t},$$

$$i = 1, \dots, N, t = 1, \dots, T. \quad (3)$$

The analytical results of the two observed models are shown in Table 5. The Wald and Arellano-Bond tests were used to cheque 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 same was not present in the second row, as expected.

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

<b>Dependent variable: increase in real economic activity</b>		
<b>Variable</b>	<b>MODEL_1</b>	<b>MODEL_2</b>
$\Delta GDP_{i,t-1}$	0.2525704*** (0.0530043)	0.4260403*** (0.0286949)
$\Delta LnHQLA_{it}$	-0.5456712 (0.3679188)	-0.1419672 (0.3752816)
$\Delta NPA_{it}$	-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)
$\mu$	1.061458*** (0.1014318)	1.004708*** (0.1450459)
<i>Number of observations</i>	195	195
<i>Number of groups</i>	22	22
<i>Wald <math>\chi^2</math></i>	128.41 (0.0000)	892.27 (0.0000)
<i>AR(1)</i>	-4.1866 (0.0000)	-4.419 (0.0000)
<i>AR(2)</i>	-0.57879 (0.5627)	-1.7934 (0.0729)

Note:  $\Delta$  - first diff .; \* stat.sign. at 10%, \*\* stat.sign. at 5%, \*\*\* stat.sign. at 1%.

Source: Authors (2021).

The model results are in line with theoretical assumptions and base researching hypothesis. The negative impact of non-performing loans on the economy has been analysed 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 the various programs using high quality liquid assets ( $\Delta \text{LnHQLA}_{it}$ ) obviously helps to keep the interbank market liquid (Altavilla et al., 2015), but without statistical significance of the negative impact on real economic activity in post crisis period. Finally, the model shows the significant and negative impact of regulatory capital requirements ( $\Delta \text{TCaP}_{it}$ ) on GDP growth.

The increase in liquid assets in the European banking system has not sufficiently supported 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 stabilise 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 analysing the EU banking system in accordance with 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 implemented wide regulatory framework ( $\text{DRM}_{it}$ ) on GDP growth is the evidence of regulatory support of bank restructuring and bank assets growth. The statistically significant and positive effect of total bank asset growth ( $\Delta \text{LnTA}_{it}$ ) on the dependent variable confirms the basic research hypothesis that regulatory measures have 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 model confirmed the positive and statistically significant impact of the lagged dependent variable due to the structural adjustment of economic activities during the researching 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, the allocation of factors of production and risk management (Demetriades & Hussein, 1996).

## 5. CONCLUDING REMARKS

The weaknesses of the banks' business model during the global financial crisis have prompted academic authorities and global economic policymakers to radically change the regulatory framework. The type of regulation that applies to an individual financial institution critically depends on how systemic its market operations are and is determined by its size, liquidity profile, regulatory capital structure and ultimately interconnectedness. Therefore, the Basel III regulatory architecture has to ensure sufficient levels of banking capital and liquidity of the highest quality in order to stimulate bank lending to promote economic growth and development. Finally, both macroprudential and microprudential development should make the banking sector more resilient for future crises.

The immediate regulatory responses of European countries focus primarily on the built-in liquidity and capital weaknesses of financial institutions and the risks posed by banks' cross-border activities. The sample analysis suggests that leading banks in Europe have increased their capital, improved their liquidity profile, restored confidence in the banking sector and increased their assets as well as their business activities as a result of the changes in the regulatory framework. The empirical model confirmed the direct relationship between selected banking variables and real economic activity, although it abstracted from other related institutional and regulatory changes in the development of the European single market. In compare with other studies from the theoretical overview, this research is specific in variable selection, representative data base selection, and researching period characterised by the strong crisis effect on banking system what resulted the internal and external enforced structural changes.

A strong regulatory framework can stabilise the banking system, but in the long run it can increase the cost of bank capital, raise regulatory costs and reduce the competitiveness of the European banking sector (Agénor et al., 2018). Regulatory efficiency requires intensive and regular dialogue with stakeholders in the banking system. Levine (1997) emphasises the importance of the financial sector to the real economy in fostering capital accumulation and financing production and innovation, and seeks to incorporate research models into theories of endogenous growth. Otherwise, the abstraction of the strong coexistence and interrelationships between real and financial growth leads to the simple and ingenious conclusion that the

financial sector dominates over the other micro- and macroeconomic parameters, which was intensively discussed during the rethinking of the development of underdeveloped countries (Patrick, 1966).

The conclusion is that the resilience and stable banking sector support the economy growth in bank-based economies. The further researchers can develop models of strength and the direction of the nexus of real and financial sector in comprehensive endogenous model of economic growth.

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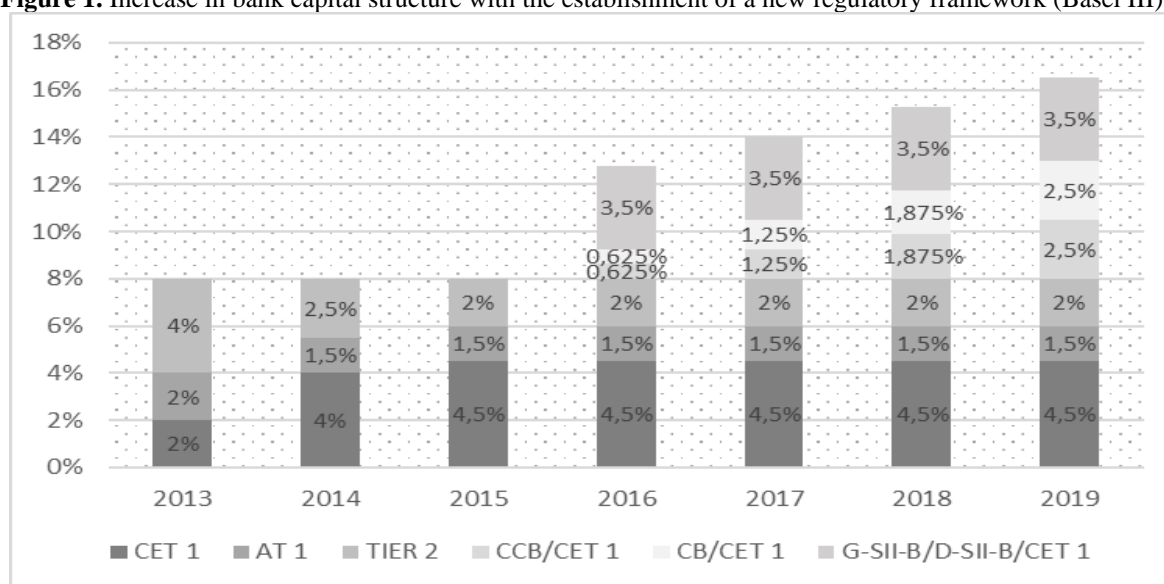
## APPENDIX

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

Bank	Country	LnHQLA	NPA	TCaP	LnTA
ABN Amro Group	Netherland	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

Izvor: 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 globally/domestic system important institutions.

Source: Authors (2021).