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## Article

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Central Bank Review (CBR)

### Provided in Cooperation with:

Central Bank of The Republic of Turkey, Ankara

*Suggested Citation:* Garcia, Maria Terese Medeiros; de Mendonça, Frederico Cavaleiro (2023) : Compliance with the Basel Core Principles and supervisory structure: A cross-country analysis, Central Bank Review (CBR), ISSN 1303-0701, Elsevier, Amsterdam, Vol. 23, Iss. 2, pp. 1-15, <https://doi.org/10.1016/j.cbrev.2023.100117>

This Version is available at:

<https://hdl.handle.net/10419/297961>

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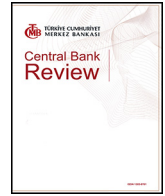
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# Compliance with the Basel Core Principles and supervisory structure: A cross-country analysis<sup>☆</sup>

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## ARTICLE INFO

### Article history:

Received 1 February 2023  
Received in revised form  
9 May 2023  
Accepted 7 June 2023  
Available online 27 June 2023

### JEL classification:

C10  
C50  
E52  
G21  
G28

### Keywords:

Banking supervision  
Basel core principles compliance  
Central banking  
Euro area  
European central bank  
Single supervisory mechanism

## ABSTRACT

This paper is motivated by the implementation of the new banking supervision structure in the European Union (EU) and the possible conflict of interest between monetary policy and the supervision authority within the European Central Bank (ECB). The empirical analysis considers the relationship between the structure of banking supervision and the compliance with the Basel Core Principles (BCP) for effective supervision. A sample of 21 countries and the Euro Area (EA) is used. In addition to the structure of bank supervision, a list of independent variables is considered to explain the dependent variable. The results suggest that the supervisory structure has no statistical significance at any notable significance level on compliance with the BCP. On the contrary, financial freedom is a statistically significant variable.

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## 1. Introduction

After the occurrence of the great financial crisis, large changes took place in banking policy and supervision within the European Monetary Union (De Rynck, 2014). A new paradigm emerged and central banks and supervisory authorities of the European Union (EU) members lost some of their powers to the European Central Bank (ECB). Following the onset of this new supervisory framework and with objective to further the development of the European

Monetary Union (EMU), new mechanisms were created, namely the Single Supervisory Mechanism (SSM) and the Single Resolution Mechanism (SRM) (Single Supervisory Mechanism, 2020).

The implementation of the SSM occurred in 2014, with the objective to concentrate the European banking supervision system under the governance of the ECB and ensure greater financial stability, as well as the soundness of banks and more banking integration, which was a mandate that the ECB did not have at the time, which supplemented the ECB's original mandate: to maintain price stability and safeguard the value of the euro (European Central Bank, 2020).

This new approach is not unanimous and therefore might shed some light on some of conflicts that exist between these two mandates, the most relevant being a possible conflict of interest between monetary policy and banking supervision, which is the main topic of this paper.

<sup>☆</sup> The authors acknowledge financial support from FCT – Fundação para a Ciência e Tecnologia (Portugal), national funding through research grant UIDB/05069/2020.

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Peer review under responsibility of the Central Bank of the Republic of Turkey.

<sup>1</sup> UECE (Research Unit on Complexity and Economics) is financially supported by FCT (Fundação para a Ciência e a Tecnologia), Portugal and REM.

After comparing the pros and cons of integrating banking supervision within the ECB and the concentration of both functions under the same roof, this paper aims to analyse some empirical evidence that might give a different perspective on the significance that this new framework is capable of having on the effectiveness and quality of banking supervision and regulation.

To achieve the above-mentioned goal, it was decided to consider the Basel Core Principles for Effective Banking Supervision (BCP) as the main study object. The BCP were first issued in 1997 by the Basel Committee on Banking Supervision (BCBS), which is part of the Bank for International Settlements (BIS). They are used by countries as a benchmark to evaluate the quality of their banking supervisory and regulatory systems, regardless of each country's supervisory structure (BIS, 2012). Regular assessments of the supervisors' compliance with these core principles by the International Monetary Fund (IMF) and the World Bank (WB) are made via the Financial Sector Assessment Programme (FSAP) (BIS, 2012). The FSAP evaluates countries for 29 core principles of what would be considered sound banking. Therefore, the FSAP evaluates each country on each of those 29 principles and assigns one of the following four descriptions: Compliant (C), Largely Compliant (LC), Materially Non-Compliant (MNC) or Non-Compliant/Not Applicable (NC/NA).

Considering a sample of 21 countries and the EA which have published their FSAP in the last six years, a compliance index was estimated to assess which of these countries comply the most with the core principles. Next, the sample was divided between those whose banking supervisory mandate is integrated within the central bank, and those whose supervision agency is independent from the central bank, with the aim to analyse and assess which type of framework complies the most with the supervisory good practises.

A cross-country analysis was then performed to measure whether the banking supervisory framework has any effect on the level of effectiveness and compliance of supervisors with the core principles for effective banking supervision. In other words, the analysis attempts to evaluate whether the fact that the banking supervision is a mandate of the central bank has any impact on the compliance with banking supervision best procedures, or not. During this analysis, the index of compliance with the BCP is the dependent variable and the key explanatory variable is a dummy which takes the value of 1 if the banking supervisor is part of the central bank, and 0 if it is not. In addition, the model also includes several other independent variables as possible explanations of the quality and effectiveness of banking supervision.

The paper follows the usual structure with the literature review, methods and data, the empirical analysis, and then the conclusion.

## 2. Literature review

After the great recession and subsequent banking crisis, a new paradigm emerged and monetary and macroprudential policies started to be used simultaneously for countercyclical management under the same roof (Smets, 2013). Monetary policy kept its focus on price stability, macroprudential policies assured financial stability, and microprudential policy concentrated on financial institutions. The same occurred within the Economic and Monetary Union (EMU), but under the auspices of the European Central Bank (ECB), through institutions such as the Single Supervisory Mechanism (SSM), which was created to concentrate supervision within the ECB, being composed of a Supervisory Board and the European Systemic Risk Board (ESRB), which were responsible for

macroprudential supervision and systemic risk respectively. This integration turned attention once again to an old discussion regarding what the central bank responsibilities should be and whether a conflict of interests might exist.

One of the biggest arguments against the integration of monetary policy and banking supervision and regulation under the same roof – in this case the central bank – is the above-mentioned conflict. According to Goodhart and Schoenmaker (1995), a good example to portray this argument is the willingness of the central bank's monetary policy function to increase interest rates in order to control inflation versus the regulatory and supervision function, due to the undesirable effects that those increases might have on the profitability and solvency of the banking system. The ultimate consequence of this situation could be less regulated, or a more flexible monetary policy with the objective to avoid adverse effects on the soundness of banks (Barth et al., 2003; Beck and Gros, 2013). Furthermore, the central bank could come to assume that its main purpose is to protect banks, rather than the public interest (Haubrich, 1996), or even fall into the risk of being captured by the supervised banks, which are part and parcel of a very well organised sector (Masciandaro and Quintyn, 2016).

Following the same line of thinking, Winecoff (2014) presents another example, stating that standard monetary policy is countercyclical, expanding or restricting the money supply according to the state of the economy and that the opposite happens when some prudential, pro-cyclical regulatory policies are in place to enforce banking discipline, such as minimum capital adequacy ratios. This situation might be an obstacle for policymakers to manage a shock in the economy, because pro-cyclical measures tend to restrict the banking activity when it is most needed.

However, Hellwig (2014) looks at the conflict from another point of view, considering an approach where monetary policy targets could dominate. The author claims that the central bank might use its microprudential supervisor mandate for monetary policy purposes and impose measures on banks that might not be on the institutions' best interest, making them take additional risks.

Another step was taken in 2016 towards establishing a full banking union within the EMU with the creation of the Single Resolution Mechanism (SRM), which is nowadays the central institution for bank resolution in the EU that is applied to banks under the SSM supervision (European Commission, 2020b). Before 2016, support for the national banking systems was principally provided by national governments and central banks (Winecoff, 2014). Similarly, the SRM is subject to the ECB rule, which places the lender of last resort and the supervisor under the same roof.

Taking into account the facts described above, Masciandaro and Quintyn (2016) state that as they know that their supervisor can bail them out, regulated institutions might fall into a moral hazard situation as they are likely to have a higher propensity for risk-taking, which is something that could be avoided if the supervisor were different from the liquidity manager. Furthermore, an intervention is always very costly, which can seriously tarnish the reputation of the supervisor, who, in this case, is responsible for the monetary policy too. This fact might produce forbearance and procrastination from the central bank's supervision mechanism in an attempt to avoid the kind of problems described above (Hellwig, 2014).

The loss of independence might be another conundrum. Beck and Gros (2013) and Lastra and Goodhart (2016) focus on this point, commenting that the growing responsibilities and power of the ECB might make it more vulnerable to political pressures. In particular,

these authors cite situations when the central bank can interfere in the functioning of the member states' banking system, bank resolutions, and capitalizations. In addition, the fact that the representatives from national supervisory authorities (members of the Supervisory Board of the SSM) might not be politically independent or have the same level of independence as a central bank might also be judged as a problem. On the other hand, the opposite might well happen, resulting in the central bank becoming too powerful, with limited accountability to legislatures and governments.

When the SSM was implemented there was a concern to ensure that an actual separation exists between the monetary policy and supervision duties. According to Beck and Gros (2013), the legislation is explicit and there should be a “Chinese Wall” between both functions – the separation principle – however, in reality it may not operate quite like that. Within the SSM, the decision-making process is based on Supervisory Board draft decisions, which are subsequently applied by the ECB Governing Council “under the non-objection procedure” (Single Supervisory Mechanism, 2020). Furthermore, the Supervisory Council itself is composed of five ECB representatives and representatives of national supervisors, which are mostly the same institutions that also make up the Governing Council.

Following the line of thinking of Lastra and Goodhart (2016), both duties should be seen as complementary, which is the real reason why they were moved to be under the governance of the ECB. One can even say that the principle of separation itself goes against most of the advantages that combination could create, such as access to more and better information, more capacity to handle moments of crisis, the ability to benefit from the independence of the ECB, better allocation of resources, and access to a more “qualified staff” (Di Noia and Di Giorgio, 1999; Barth et al., 2003; Beck and Gros, 2013; Lima, 2017).

Furthermore, it is not unanimous which framework should be followed – combination or separation. Empirical studies on the subject are sometimes contradictory. For example, Di Noia and Di Giorgio (1999) found that the inflation rate is higher and more volatile in countries where supervision is the task of the central bank. They also found, albeit just based on preliminary results, that countries whose supervision is assured by the central bank tend to have a more protected and less efficient banking system. On the contrary, Lazopoulos et al. (2016) conclude that their empirical findings do not support that the banking supervisory framework of an economy has a statistically significant impact on inflation.

Barth et al. (2003) followed another approach and opted for carrying out a cross-country analysis of the banking supervisory framework and banks' performance. The results of these authors' research do not support that any particular banking supervision structure has an impact on banking performance. Indeed, the authors point out that maybe the discussion should be focused on other aspects. On the other hand, the results of Winecoff (2014) support the need to separate supervisory tasks from the central bank, arguing that banks act less prudently when they expect favourable policies from the central bank, and go on to state that capital adequacy ratios are higher when the supervision is not enforced by the central bank. The results of Barth et al. (2002) regarding the impact of the banking supervision framework on bank safety and soundness also favour separation, stating that banks supervised by central banks tend to have more non-performing loans.

In a very specific research paper that focuses on the American Federal Reserve (FED) regarding the possible effect of monetary policy on the central bank's role as a supervisor, Ioannidou (2005) shows that when the FED tightens its monetary policy it becomes less rigorous in supervision affairs. One reason for this might be the possible compensation made by the central bank to the banking system in exchange for the extra effort it demands, or could even be

**Table 1**

Assessment grades on the Basel core principles for effective banking supervision.

Assessment	Score
C – Compliant	3
LC – Largely Compliant	2
MNC – Materially Non-Compliant	1
NC/NA – Non-Compliant/Not Applicable	0

Source: BIS (2012).

due to the need to ensure stability in the financial system.

Finally, there are several arguments for and against the integration of monetary policy and banking supervision and regulation under the same roof. Hellwig (2014) argues that supervision is an administrative activity, which is very different from monetary policy, which might raise questions about culture, procedure, and even judicial doubts. However, when considering the difficult circumstances in which the integration of supervision under the governance of the ECB was carried out, one can say that, the ECB was probably the only institution capable of carrying out this role at the time (Schnabel, 2016). Beck and Gros (2013) corroborate this view, considering that the crisis that the EU experienced at the time, due to the excessive interdependence between the sovereign credit and banking systems (Véron, 2011), overcome most of the arguments against the integration of supervision, and that only an independent institution such as the ECB could be assigned the job.

### 3. Methods and data

The Basel Core Principles for Effective Banking Supervision (BCP) are the basis of the empirical section of this paper. Focusing on the banking supervision in the EU and considering the work developed by Arnone and Gambini (2006), the compliance of the supervisors with the BCP was chosen to assess whether a potential impact exists with regards the quality and effectiveness of banking supervision arising from its integration within the central bank.

The BCP were first published in 1997 by the BIS, and are now an aggregation of 29 core principles for effective banking supervision<sup>2</sup>. They are regarded as a fundamental tool for assessing the quality of banking supervisory systems and for understanding what needs to be improved by supervision. The principles are divided into two sections: supervisory powers, responsibilities, and functions; and prudential regulations and requirements (BIS, 2012). As mentioned, those principles are assessed by FSAP as Compliant (C), Largely Compliant (LC), Materially Non-Compliant (MNC) or Non-Compliant/Not Applicable (NC/NA).

Following the Arnone and Gambini (2006) methodology<sup>3</sup>, the index of BCP compliance was estimated based on the results of the most recent FSAP reports for each country from the IMF and the WB. As the main objective is to capture the effectiveness of the SSM and similar supervision frameworks, the time period considered was from 2014 (the year that the SSM came into force) and 2020. 21 countries and the EA were assessed once during this period, albeit in different years. The sample comprised: Australia, The Bahamas,

<sup>2</sup> See Table A.1 in the Appendix.

<sup>3</sup> Footnote 14: “The value of the overall index for each country is the unweighted aggregation of the numerical scores associated to the qualitative assessments for each principle or practice ranging from 0 (non-compliant/not-observed) to 3 (compliant/fully observed). In the case of not assessed/not applicable practices the partial values of the respective chapters/practices are multiplied by a re-weighting coefficient with the rationale to give each country the possibility to achieve the maximum value. The index is normalized by its maximum value (90 = 3\*30 assessable principles) and, so, its value varies between 0 and 1.”



**Table 2**  
Basel core principles for the effective banking supervision index by country (2014–2019).

Australia (2019) (IMF, 2019a)	0.862	Korea (2014) (IMF and WB, 2014)	0.667
The Bahamas (2019) (IMF, 2019b)	0.828	Moldova (2016) (IMF and WB, 2016a)	0.552
Brazil (2018) (IMF and WB, 2018a)	0.828	New Zealand (2017) (IMF and WB, 2017a)	0.609
Canada (2014) (IMF, 2014a)	0.920	Peru (2018) (IMF and WB, 2018c)	0.828
China (2017) (IMF and WB, 2017b)	0.828	Russia (2016) (IMF and WB, 2016b)	0.690
Denmark (2014) (IMF, 2014b)	0.747	South Africa (2015) (IMF, 2015a)	0.908
Euro Area (2018) (IMF, 2018)	0.644	Switzerland (2014) (IMF, 2014d)	0.874
Georgia (2015) (IMF and WB, 2015)	0.759	Thailand (2019) (IMF and WB, 2019)	0.943
Hong Kong (2014) (IMF, 2014c)	0.966	Turkey (2017) (IMF and WB, 2016c)	0.782
India (2018) (IMF and WB, 2018b)	0.782	United Kingdom (2016) (IMF, 2016)	0.897
Japan (2017) (IMF, 2017)	0.805	United States of America (2015) (IMF, 2015b)	0.874

Source: FSAP reports and the authors' own calculations

Brazil, Canada, China, Denmark, the Euro Area, Georgia, Hong Kong, India, Japan, South Korea, Moldova, New Zealand, Peru, Russia, South Africa, Switzerland, Thailand, Turkey, the United Kingdom, and the United States of America. The Euro Area is the group of EU members that adopted the euro as their currency (European Commission, 2020a). Due to data limitations, all data concerning the independent variables are relative to the year in which the *bcpindex* was estimated for each element of the sample or the previous year, or two.

All the 29 core principles assessment contained in the FSAP reports were scored according to Table 1. Using the score values of each principle (0, 1, 2 and 3), the results of each country were aggregated and normalized in order to estimate the dependent variable *bcpindex*. This variable, which acts as an index of compliance with the core principles, ranges from 0 to 1.

The calculation of the results of the index of compliance with the core principles can be found in Table 2.

Firstly, the 22 countries sample was divided according to its supervisory framework: those where the central bank is responsible for banking supervision (13), and those where it is not (9)<sup>4</sup> (Table 3). Furthermore, in section 4, a simple and descriptive analysis of some parts of the data was performed considering the two sub-samples, with particular focus on the *bcpindex* and its relationship with the different supervisory frameworks being considered, where a *t*-test comparing the *bcpindex* means of the two sub-samples of countries was also performed. Graph 1 gives a first insight of that relationship by putting those averages in evidence.

Secondly, in order to capture the relationship between the supervisory framework and the compliance with the BCP, a cross-sectional analysis was performed by carrying out an OLS regression with robust standard errors. For a better and more effective comparison and analysis, all the nine independent variables are standardized, as most variables are presented in different scales. The standardized coefficients make the scale of the regressors irrelevant, and they place the variables "on equal footing" (Wooldridge, 2012).

The model is as follows:

$$\begin{aligned}
 bcpindex = & \beta_0 + \beta_1 cbsupervision + \beta_2 deposit + \beta_3 specialization \\
 & + \beta_4 inflation + \beta_5 fiscal + \beta_6 banksize + \beta_7 freedom \\
 & + \beta_8 finanfreedom + \beta_9 instdev + \beta_{10} FSAP + u
 \end{aligned}
 \tag{1}$$

Table 4 presents the description of the variables.

With regards the independent variables, the *cbsupervision* explanatory variable is a dummy that takes the value of 1 if the central bank is responsible for banking supervision or has a

**Table 3**  
Supervisory frameworks across the sample.

Banking Supervision	Freq.	Percent
Non-CB	9	40.91
CB	13	59.09
Total	22	100.00

Source: Authors' own calculations, using Stata

considerable role, or the value of 0 if the central bank is not the banking supervisor.

Another two dummy variables were defined. One takes the value of 1 if a country has a system of deposit insurance (*deposit*), and the value of 0 if it does not. The objective of this variable is to capture one of the preconditions for effective banking supervision from the BIS (2012) – an appropriate level of systemic protection. The other dummy takes the value of 1 if the banking supervisor is specialized in banking supervision alone (*specialization*), and the value of 0 if it is not.

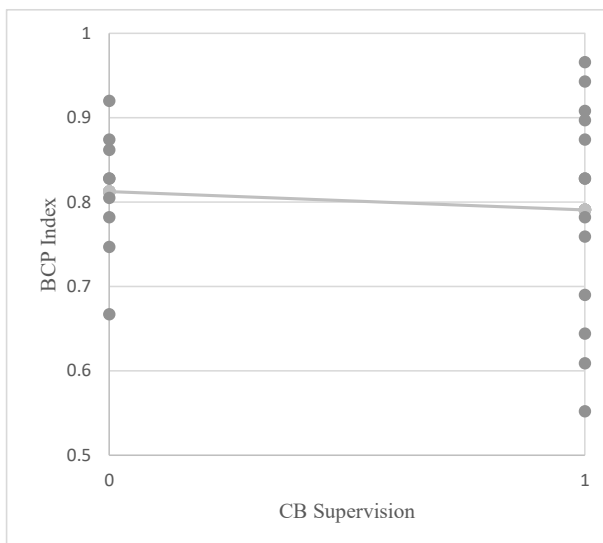
Two other control variables were defined for another precondition for effective banking supervision from the BIS (2012) – sound and sustainable macro policies. One of these is *inflation*, as measured by the average annual growth rate of the GDP implicit deflator (in percentage) during the three years prior to the most recent FSAP report from each country, using data from The World Bank (2020). The other variable is *fiscal*, which represents the fiscal balance of governments during the year that the *bcpindex* was estimated or, due to data limitations, during the previous year or two, using data from IMF (2020).

The *banksize* variable was also included to control for banking sector size effects, considering Arnone and Gambini (2006) and previous research carried out by one of the authors, which already confirmed that the development of the banking sector has a positive effect on compliance with the BCP. This variable considers the claims on domestic real nonfinancial sector by deposit money banks as a share of GDP (Beck et al., 2019).

Furthermore, two control variables considering freedom were defined. One of them is *freedom*, which reflects general freedom through an index ranging from 0 to 2 (2 – free, 1 – partly free, and 0 – not free), which considers political rights and civil liberties (Freedom House, 2014, 2015, 2016, 2017). The second variable is *finanfreedom*, which captures financial freedom through an index ranging from 0 to 100, which reflects bank efficiency and the level of independence of the financial sector from governments (Miller et al., 2014, 2015; Miller and Kim, 2016, 2017).

In addition, a variable based on Doumpos et al. (2015) was also constructed to capture the institutional development of each country (*instdev*). This indicator was calculated as the average of six governance indicators ranging from –2.5 to 2.5, as assessed by the Worldwide Governance Indicators for 2014, 2015, 2016, and 2017

<sup>4</sup> See Table A.2 in the Appendix.



Graph 1. Relationship between *bcpindex* and the different supervisory frameworks.

Table 4  
Variables description.

Dependent		
<i>bcpindex</i>		Normalized index of compliance with the BCP
Independent		Expected Impact
<i>cbsupervision</i>	= 1 if the central bank is responsible for banking supervision, 0 if not	+/-
<i>deposit</i>	= 1 if exists a deposit guarantee scheme, 0 otherwise	+
<i>specialisation</i>	= 1 if the bank supervisor is specialized in banking supervision alone, 0 otherwise	+/-
<i>inflation</i>	Inflation, 3 years average measured by annual growth rate of the GDP implicit deflator in percentage	-
<i>fiscal</i>	General government fiscal balance in GDP percentage	+
<i>banksize</i>	Claims on domestic real nonfinancial sector by deposit money banks as a share of GDP	+
<i>freedom</i>	Freedom in The World Index	+
<i>finanfreedom</i>	Financial Freedom Index	+
<i>instdev</i>	Institutional Development Indicator	+
<i>FSAP</i>	Number of years since the first FSAP assessment	+/-

Table 5  
Descriptive statistics.

Variable	Obs	Mean	SD	Min	Max
<i>bcpindex</i>	22	0.8103	0.1183	0.5517	0.9993
<i>cbsupervision</i>	22	0.5909	0.5032	0	1
<i>deposit</i>	22	0.8636	0.3513	0	1
<i>specialization</i>	22	0.3182	0.4767	0	1
<i>inflation</i>	22	3.0007	2.3905	-0.2580	8.9616
<i>fiscal</i>	22	-2.2409	2.7422	-7.9	3.6
<i>banksize</i>	22	113.6113	56.6159	32.5564	257.2248
<i>freedom</i>	22	1.5455	0.7385	0	2
<i>finanfreedom</i>	22	64.3541	18.9189	20	90
<i>instdev</i>	22	0.6627	0.8867	-0.7176	1.8606
<i>FSAP</i>	22	8.0455	4.6647	0	14

Source: Authors' own calculations, using Stata.

(Kaufmann et al., 2010; Kaufmann and Kraay, 2019). Finally, the *FSA* variable is calculated, which reflects the number of years that have passed since the first FSAP report was released, for each country

Table 5 displays the descriptive statistics for the dataset<sup>5</sup> created for the empirical analysis, where the number of observations is

higher than the number of variables, following the guidelines of Hair et al.(2013).

#### 4. Analysis

Following the literature review and all the pros and cons and the different outcomes of research papers and publications on the different banking supervisory frameworks, it became clear that there is no optimal way of assessing which framework is more effective or is most compliant with the best practises of supervision. Considering the topic of this paper, it was decided to approach the possible conflict of interest between central banking and supervision from the point-of-view of supervision. As mentioned in the previous section, an index was specifically calculated to assess the level of compliance with the core principles for effective supervision of the 22 countries of the sample, based on the methodology of Arnone and Gambini (2006). The *bcpindex* values are shown in Table 2, and the frequency of each supervisory framework across the sample are expressed in Table 3.

An analysis of Tables 2 and 3 enables us to conclude that almost

<sup>5</sup> See Table A.3 and Figs. 1, 2, 3, 4, 5 and 6 in the Appendix.

**Table 6**  
Two sample *t*-test for the BCP index.

Two-sample <i>t</i> -test with equal variances						
Group	Obs.	Mean	Standard Error	Standard Deviation	[95% Conf. Interval]	
Non-CB	9	0.8123	0.0249	0.0747	0.7548	0.8697
CB	13	0.8090	0.0399	0.1441	0.7219	0.8961
combined	22	0.8103	0.0252	0.1183	0.7578	0.8628
diff		0.0033	0.0526		-0.1064	0.1130
diff = mean(Non-CB)-mean(CB)					t = 0.0627	
H0:diff = 0					degrees of freedom = 20	
Ha:diff<0					Ha:diff>0	
Pr(T < t) = 0.5247					Pr(T > t) = 0.4753	
Ha:diff = 0						
Pr( T > t ) = 0.9506						

Source: Authors' own calculations, using Stata.

all countries have high values, since the *bcpindex* ranges from 0 to 1, and that in approximately 60% of the sample, the central bank is responsible for banking supervision.

One can notice that the values of the index are below 0.7 in the case of the five countries with the worst scores from all the sample. The respective central bank is the entity responsible for banking supervision in all these five countries, except for one – The Republic of Korea. The Euro Area counts among the five countries with the worst scores.

Considering the 22 observations, the mean of the *bcpindex* is 0.81, with a standard deviation of approximately 0.12.

Looking at Table 6, it can be seen that the mean of the *bcpindex* is very similar, whether the central bank acts as a supervisor or not. The sub-sample which represents those countries whose banks are supervised by the central bank has a mean of 0.809, whereas, on the contrary, the mean is 0.812 for those countries whose banks are not supervised by the central bank. Although it can be alleged that both values are virtually the same, when one looks at the standard deviation of each sub-sample, it is possible to confirm that the results for when banking supervision is performed by the central bank (CB sample) has almost twice the value.

Table 6 also presents the two-sample *t*-test, confirming more accurately the point discussed above regarding the supervision of banks by the central bank. Looking at the null hypothesis in the table – which is when the two means are equal, or the difference between them is zero – it is possible to verify that there is statistical evidence that the considered means are different, at a confidence level of 95%. At this point only a small difference exists regarding the level of compliance of each sub sample, which favours the framework where the central bank does not have supervisory powers, although this does not permit us to consider that this test is sufficiently conclusive.

To pursue a more conclusive output regarding the impact and significance of the supervisory frameworks for compliance with the BCP, the second part of this empirical analysis consists of a cross-sectional study, using ordinary least squares (OLS) regression with robust standard errors. The dependent variable is *bcpindex*, and the key explanatory variable is *cb supervision*, besides another nine independent variables (as presented in Table 4).

Table 7 displays the results of the regression. Not all the independent variables had the expected impact<sup>6</sup>, although five of them confirmed the expected effect on the dependent variable, namely: *deposit*, *inflation*, *banksize*, *finanfreedom*, and *instdev*.

Another outcome is that 50% of the variables revealed to have a negative impact on the *bcpindex*, with the following being the exceptions: *deposit*, *specialization*, *banksize*, *finanfreedom*, and *instdev*. This fact supports the idea that to strengthen the level of

compliance with the supervisor, the following factors are important: a system of deposit insurance, the supervisor being specialized in the banking sector alone, the development and size of the banking sector, the freedom lived in the financial sector, and the development of institutions and governance.

Out of all the independent variables, three are significant at a 95% level of confidence, with *fiscal* and *freedom* being two of them. These two variables present negative coefficients, meaning that both have a negative impact on *bcpindex*. Regarding the *fiscal* variable, it was not expected that a healthy fiscal situation with positive fiscal balances would have a negative impact on the dependent variable. Likewise, the anticipated effect of *freedom* was positive. Indeed, it was not anticipated that political rights and civil liberties would have an adverse effect on compliance with the core principles for effective banking supervision. Therefore, it appears that the model needs to be refined.

Concerning the *finanfreedom* variable, this first estimation confirms that high efficiency and independence from the government in the banking sector has a positive impact and significance on compliance with the best practises in banking supervision.

The key explanatory variable has no statistical significance at any notable significance level, with a high *p-value*. Note that the associated estimated coefficient is negative. If it were statistically significant, it would have been possible to say that a central bank being responsible for banking supervision deteriorates the level of compliance with the BCP. But the lack of statistical significance rules out that conclusion.

The interpretation of a regression result must take into consideration the correlation among the independent variables. The simplest way to assess this correlation is by employing a correlation matrix, since high correlations are the first signal of collinearity (Hair et al., 2013). A high level of correlation between these variables is called 'multicollinearity', and one solution for this possible problem is to drop the independent variables (Wooldridge, 2012).

Multicollinearity can produce several impacts on the estimation, such as affecting the predictive ability of the regression model and the estimation of the regression coefficients and statistical significance tests. Another possible impact is difficulty in understanding the real effects of each independent variable (Hair et al., 2013).

Table 8 presents the correlation matrix between the variables. Looking at the correlation matrix above, it is possible to notice that the correlation coefficient between the variables *fiscal* and *freedom* is negative, and that these are the only ones that are the opposite of the initially expected impact<sup>7</sup>. It was not foreseen that positive fiscal balances, political rights and civil liberties would have an adverse effect on the dependent variable. Furthermore, a reasonable level of correlation exists between some of the

<sup>6</sup> See Table 3.

<sup>7</sup> See Table 3.

**Table 7**  
OLS results with robust standard errors. Standardized independent variables. Dependent variable: *bcpindex*.

Linear regression				Number of obs	=	22
				F(10,11)	=	2.27
				Prob > F	=	0.0969
				R-squared	=	0.5711
				Root MSE	=	0.1071
<i>bcpindex</i>	Coef.	Robust St. Err.	t	P> t	[95% Conf. Interval]	
<i>cbsupervision</i>	-0.0304	0.0356	-0.85	0.411	-0.1088	0.0479
<i>deposit</i>	0.0035	0.0347	0.10	0.923	-0.0729	0.0798
<i>specialization</i>	0.0267	0.0331	0.81	0.437	-0.0462	0.0996
<i>inflation</i>	-0.0161	0.0359	-0.45	0.664	-0.0952	0.0631
<i>fiscal</i>	-0.1714	0.0676	-2.54	0.028	-0.3202	-0.0227
<i>banksize</i>	0.0140	0.0406	0.35	0.736	-0.0753	0.1034
<i>freedom</i>	-0.1434	0.0577	-2.49	0.030	-0.2705	-0.0164
<i>finanfreedom</i>	0.1619	0.0647	2.50	0.029	0.0195	0.3042
<i>instdev</i>	0.0433	0.0811	0.53	0.604	-0.1353	0.2218
<i>FSAP</i>	-0.0138	0.0305	-0.45	0.661	-0.0809	0.0535
<i>_cons</i>	0.8103	0.0228	35.50	0.000	0.7601	0.8606

Source: Authors' own calculations, using Stata

**Table 8**  
Correlation matrix.

(obs = 22)	<i>bcpindex</i>	<i>cbsupervision</i>	<i>deposit</i>	<i>specialization</i>	<i>inflation</i>	<i>fiscal</i>	<i>banksize</i>	<i>freedom</i>	<i>finanfreedom</i>	<i>instdev</i>	<i>FSAP</i>
<i>bcpindex</i>	1										
<i>cbsupervision</i>	-0.0140	1									
<i>deposit</i>	0.3094	-0.3306	1								
<i>specialization</i>	-0.0435	0.5684	-0.2973	1							
<i>inflation</i>	-0.2038	0.2960	-0.0104	0.1582	1						
<i>fiscal</i>	-0.1099	-0.2715	-0.1099	-0.0114	-0.3734	1					
<i>banksize</i>	0.2160	-0.2954	0.0447	-0.1112	-0.5273	0.6111	1				
<i>freedom</i>	-0.0624	-0.1398	-0.2503	-0.1107	-0.3168	-0.0637	-0.0316	1			
<i>finanfreedom</i>	0.1739	-0.2041	-0.0912	-0.1304	-0.4555	0.6552	0.4635	0.5574	1		
<i>instdev</i>	0.1314	-0.2141	-0.1775	-0.2265	-0.7113	0.5467	0.5748	0.6036	0.8319	1	
<i>FSAP</i>	0.0507	0.0489	0.1493	-0.2638	0.0564	0.1878	0.2031	-0.2782	0.0914	0.1034	1

Source: Authors' own calculations, using Stata.

**Table 9**  
Variance inflation factor.

Variable	VIF	1/VIF
<i>instdev</i>	11.73	0.0853
<i>finanfreedom</i>	7.36	0.1359
<i>freedom</i>	6.61	0.1513
<i>fiscal</i>	5.81	0.1722
<i>inflation</i>	2.97	0.3363
<i>cbsupervision</i>	2.80	0.3566
<i>banksize</i>	2.61	0.3837
<i>specialization</i>	2.26	0.4428
<i>deposit</i>	1.70	0.5888
<i>FSAP</i>	1.55	0.6468
Mean VIF	4.54	

Source: Authors' own calculations, using Stata.

independent variables, with certain values standing out, such as, for example: the correlation coefficients between *freedom*, *finanfreedom*, and *instdev*. It can be verified that the *fiscal* variable also presents several high coefficients.

The measure used for the level of multicollinearity is the variance inflation factor (VIF), which directly expresses the degree of impact of the level of multicollinearity on the estimation process. Researchers are obliged to determine an acceptable degree of

collinearity, as most defaults or recommended thresholds still permit a certain level of collinearity (Hair et al., 2013).

Table 9 confirms the doubt that arise from the correlation matrix, where it can be seen that the *instdev*, *finanfreedom*, *freedom*, and *fiscal* variables present the highest VIF values, which leads to the decision to drop the *freedom* and *instdev* variables, *ceteris paribus*.

The new econometric model is:

$$\begin{aligned}
 bcpindex = & \beta_0 + \beta_1 cbsupervision + \beta_2 deposit + \beta_3 specialization \\
 & + \beta_4 inflation + \beta_5 fiscal + \beta_6 banksize + \beta_7 finanfreedom \\
 & + \beta_8 FSAP + u
 \end{aligned}
 \tag{2}$$

Table 10 presents the output of a second OLS regression with robust standard errors. The dependent variable remains *bcpindex*, and the same output occurs with the key explanatory variable *cbsupervision*. However, in total, we end up with only eight independent variables, as two variables were dropped owing to multicollinearity. The new correlation matrix and VIF calculations are presented in Appendix 8.

Considering the new estimation results shown in Table 10, one can verify that all the variables had the expected impact<sup>9</sup>, except

<sup>8</sup> See tables A.4 and A.5 in the Appendix.

<sup>9</sup> See Table 3.



**Table 10**  
OLS results with robust standard errors. Standardized independent variables. Dependent variable: *bcpindex*.

Linear regression				Number of obs	=	22
				F(8,13)	=	1.55
				Prob > F	=	0.2328
				R-squared	=	0.3197
				Root MSE	=	0.12404
<i>bcpindex</i>	Coef.	Robust St. Err.	t	P> t	[95% Conf. Interval]	
<i>cbsupervision</i>	-0.0103	0.0336	0.31	0.765	-0.0623	0.0828
<i>deposit</i>	0.0384	0.0361	1.06	0.306	-0.0395	0.1164
<i>specialization</i>	0.0131	0.0379	0.34	0.736	-0.0689	0.0949
<i>inflation</i>	-0.0109	0.0279	-0.39	0.700	-0.0712	0.0492
<i>fiscal</i>	-0.0663	0.0448	-1.48	0.163	-0.1630	0.0304
<i>banksize</i>	0.0404	0.0418	0.97	0.352	-0.0499	0.1307
<i>finanfreedom</i>	0.0473	0.0248	1.91	0.079	-0.0063	0.1009
<i>FSAP</i>	0.0038	0.0301	0.12	0.903	-0.0613	0.0688
<i>_cons</i>	0.8103	0.026	30.64	0.000	0.7532	0.8674

Source: Authors' own calculations, using Stata.

*fiscal*, which maintained a negative coefficient. Considering the estimations from [Arnone and Gambini \(2006\)](#), one can verify that the *inflation* variable also presents a negative coefficient, as expected by the authors, with the same occurring with *specialization*. On the other hand, *fiscal* has a positive coefficient.

Comparing the outcome of this model with the previous model, an important difference stands out – namely that the key explanatory variable now has a positive coefficient. Although on the one hand this would imply that the central bank being responsible for banking supervision has a positive impact on compliance with the BCP, on the other hand, the central bank being responsible for banking supervision has no statistical significance.

The *finanfreedom* variable maintained its positive coefficient and reinforces the analysis based on the outcome of the first estimation. This variable maintained its statistical significance, albeit now with a level of confidence of just 90%.

Another change is that the *fiscal* variable lost its statistical significance. Accordingly, further research is required.

## 5. Conclusion

The literature review suggests that conflicts between monetary policy – which is one of the main roles of the ECB – and supervision might arise when both functions are under the same roof, but it also shows that it is possible to take advantages of such concentration. There is no unanimous process to assess whether these conflicts have any significant impact on the level of effectiveness and compliance of supervisors. In addition, there is no conclusion in the literature regarding which supervisory framework is the most effective for simultaneously carrying out the monetary, supervisory and regulatory duties.

The empirical section of this paper approached the issue from the supervision point-of-view, and attempted to assess which supervisory framework complies the most with the core principles for

effective supervision, and also whether the framework itself has any significance regarding the level of compliance. An attempt was made in this study to resolve this hypothesis by using the most recent data available, with the Euro Area being treated as a country, which accordingly created the ability to make a comparison with other jurisdictions. However, owing to the lack of FSAP reports published during the period under analysis, the number of countries was limited to 22. Several limitations were also encountered regarding access to up-to-date data, and, in the end, the low *R – Squared* showed that some of the independent variables may not necessarily fit the study carried out.

In addition, part of the outcome was not expected, especially the negative impact of the *fiscal* variable – which captures the central government's fiscal balance – on compliance with the BCP. Further research is needed; however, the authors suggest that this result occurs as a result of certain data limitations.

One important conclusion is the statistical significance of the *finanfreedom* variable, which determines that high levels of efficiency and independence from government in the banking sector have a positive and significant impact on compliance with the BCP.

Furthermore, the key explanatory variable has a positive coefficient, which implies that the central bank being responsible for banking supervision has a positive impact on compliance with the BCP, albeit without statistical significance. The results show that the supervisory framework does not appear to have any impact on compliance with the supervisor, on the contrary to the case of financial freedom.

In conclusion, the authors emphasise that this study is a first attempt to empirically address the role of the supervisory framework. Nevertheless, it does not currently enable practitioners and researchers to assess which framework is the optimal one, as the supervisory structure does not have statistical significance.

## Appendix

**Table A.1**

The Basel core principles for effective banking supervision

Supervisory powers, responsibilities and functions		
1	Responsibilities, objectives and powers	An effective system of banking supervision has clear responsibilities and objectives for each authority involved in the supervision of banks and banking groups. A suitable legal framework for banking supervision is in place to provide each responsible authority with the necessary legal powers to authorise banks, conduct ongoing supervision, address compliance with laws and undertake timely corrective actions to address safety and soundness concerns.
2	Independence, accountability, resourcing and legal protection for supervisors	The supervisor possesses operational independence, transparent processes, sound governance, budgetary processes that do not undermine autonomy and adequate resources and is accountable for the discharge of its duties and use of its resources. The legal framework for banking supervision includes legal protection for the supervisor.
3	Cooperation and collaboration	Laws, regulations or other arrangements provide a framework for cooperation and collaboration with relevant domestic authorities and foreign supervisors. These arrangements reflect the need to protect confidential information.
4	Permissible activities	The permissible activities of institutions that are licensed and subject to supervision as banks are clearly defined and the use of the word “bank” in names is controlled.
5	Licensing criteria	The licensing authority has the power to set criteria and reject applications for establishments that do not meet the criteria. At a minimum, the licensing process consists of an assessment of the ownership structure and governance (including the fitness and propriety of Board members and senior management) of the bank and its wider group, and its strategic and operating plan, internal controls, risk management and projected financial condition (including capital base). Where the proposed owner or parent organisation is a foreign bank, the prior consent of its home supervisor is obtained.
6	Transfer of significant ownership	The supervisor has the power to review, reject and impose prudential conditions on any proposals to transfer significant ownership or controlling interests held directly or indirectly in existing banks to other parties.
7	Major acquisitions	The supervisor has the power to approve or reject (or recommend to the responsible authority the approval or rejection of), and impose prudential conditions on, major acquisitions or investments by a bank, against prescribed criteria, including the establishment of cross-border operations, and to determine that corporate affiliations or structures do not expose the bank to undue risks or hinder effective supervision.
8	Supervisory approach	An effective system of banking supervision requires the supervisor to develop and maintain a forward-looking assessment of the risk profile of individual banks and banking groups, proportionate to their systemic importance; identify, assess and address risks emanating from banks and the banking system as a whole; have a framework in place for early intervention; and have plans in place, in partnership with other relevant authorities, to take action to resolve banks in an orderly manner if they become non-viable.
9	Supervisory techniques and tools	The supervisor uses an appropriate range of techniques and tools to implement the supervisory approach and deploys supervisory resources on a proportionate basis, taking into account the risk profile and systemic importance of banks.
10	Supervisory reporting	The supervisor collects, reviews and analyses prudential reports and statistical returns from banks on both a solo and a consolidated basis, and independently verifies these reports through either on-site examinations or use of external experts.
11	Corrective and sanctioning powers of supervisors	The supervisor acts at an early stage to address unsafe and unsound practices or activities that could pose risks to banks or to the banking system. The supervisor has at its disposal an adequate range of supervisory tools to bring about timely corrective actions. This includes the ability to revoke the banking licence or to recommend its revocation.
12	Consolidated supervision	An essential element of banking supervision is that the supervisor supervises the banking group on a consolidated basis, adequately monitoring and, as appropriate, applying prudential standards to all aspects of the business conducted by the banking group worldwide.
13	Home-host relationships	Home and host supervisors of cross-border banking groups share information and cooperate for effective supervision of the group and group entities, and effective handling of crisis situations. Supervisors require the local operations of foreign banks to be conducted to the same standards as those required of domestic banks.
Prudential regulations and requirements		
14	Corporate governance	The supervisor determines that banks and banking groups have robust corporate governance policies and processes covering, for example, strategic direction, group and organisational structure, control environment, responsibilities of the banks' Boards and senior management, and compensation. These policies and processes are commensurate with the risk profile and systemic importance of the bank.
15	Risk management process	The supervisor determines that banks have a comprehensive risk management process (including effective Board and senior management oversight) to identify, measure, evaluate, monitor, report and control or mitigate all material risks on a timely basis and to assess the adequacy of their capital and liquidity in relation to their risk profile and market and macroeconomic conditions. This extends to development and review of contingency arrangements (including robust and credible recovery plans where warranted) that take into account the specific circumstances of the bank. The risk management process is commensurate with the risk profile and systemic importance of the bank.
16	Capital adequacy	The supervisor sets prudent and appropriate capital adequacy requirements for banks that reflect the risks undertaken by, and presented by, a bank in the context of the markets and macroeconomic conditions in which it operates. The supervisor defines the components of capital, bearing in mind their ability to absorb losses. At least for internationally active banks, capital requirements are not less than the applicable Basel standards.
17	Credit risk	The supervisor determines that banks have an adequate credit risk management process that takes into account their risk appetite, risk profile and market and macroeconomic conditions. This includes prudent policies and processes to identify, measure, evaluate, monitor, report and control or mitigate credit risk (including

(continued on next page)

**Table A.1** (continued)

Supervisory powers, responsibilities and functions	
	counterparty credit risk) on a timely basis. The full credit lifecycle is covered including credit underwriting, credit evaluation, and the ongoing management of the bank's loan and investment portfolios.
18 Problem assets, provisions and reserves	The supervisor determines that banks have adequate policies and processes for the early identification and management of problem assets, and the maintenance of adequate provisions and reserves.
19 Concentration risk and large exposure limits	The supervisor determines that banks have adequate policies and processes to identify, measure, evaluate, monitor, report and control or mitigate concentrations of risk on a timely basis. Supervisors set prudential limits to restrict bank exposures to single counterparties or groups of connected counterparties.
20 Transactions with related parties	In order to prevent abuses arising in transactions with related parties and to address the risk of conflict of interest, the supervisor requires banks to enter into any transactions with related parties on an arm's length basis; to monitor these transactions; to take appropriate steps to control or mitigate the risks; and to write off exposures to related parties in accordance with standard policies and processes.
21 Country and transfer risks	The supervisor determines that banks have adequate policies and processes to identify, measure, evaluate, monitor, report and control or mitigate country risk and transfer risk in their international lending and investment activities on a timely basis.
22 Market risks	The supervisor determines that banks have an adequate market risk management process that takes into account their risk appetite, risk profile, and market and macroeconomic conditions and the risk of a significant deterioration in market liquidity. This includes prudent policies and processes to identify, measure, evaluate, monitor, report and control or mitigate market risks on a timely basis.
23 Interest rate risk in the banking book	The supervisor determines that banks have adequate systems to identify, measure, evaluate, monitor, report and control or mitigate interest rate risk in the banking book on a timely basis. These systems take into account the bank's risk appetite, risk profile and market and macroeconomic conditions.
24 Liquidity risk	The supervisor sets prudent and appropriate liquidity requirements (which can include either quantitative or qualitative requirements or both) for banks that reflect the liquidity needs of the bank. The supervisor determines that banks have a strategy that enables prudent management of liquidity risk and compliance with liquidity requirements. The strategy takes into account the bank's risk profile as well as market and macroeconomic conditions and includes prudent policies and processes, consistent with the bank's risk appetite, to identify, measure, evaluate, monitor, report and control or mitigate liquidity risk over an appropriate set of time horizons. At least for internationally active banks, liquidity requirements are not lower than the applicable Basel standards.
25 Operational risk	The supervisor determines that banks have an adequate operational risk management framework that takes into account their risk appetite, risk profile and market and macroeconomic conditions. This includes prudent policies and processes to identify, assess, evaluate, monitor, report and control or mitigate operational risk on a timely basis.
26 Internal control and audit	The supervisor determines that banks have adequate internal control frameworks to establish and maintain a properly controlled operating environment for the conduct of their business taking into account their risk profile. These include clear arrangements for delegating authority and responsibility; separation of the functions that involve committing the bank, paying away its funds, and accounting for its assets and liabilities; reconciliation of these processes; safeguarding the bank's assets; and appropriate independent internal audit and compliance functions to test adherence to these controls as well as applicable laws and regulations.
27 Financial reporting and external audit	The supervisor determines that banks and banking groups maintain adequate and reliable records, prepare financial statements in accordance with accounting policies and practices that are widely accepted internationally and annually publish information that fairly reflects their financial condition and performance and bears an independent external auditor's opinion. The supervisor also determines that banks and parent companies of banking groups have adequate governance and oversight of the external audit function.
28 Disclosure and transparency	The supervisor determines that banks and banking groups regularly publish information on a consolidated and, where appropriate, solo basis that is easily accessible and fairly reflects their financial condition, performance, risk exposures, risk management strategies and corporate governance policies and processes.
29 Abuse of financial services	The supervisor determines that banks have adequate policies and processes, including strict customer due diligence rules to promote high ethical and professional standards in the financial sector and prevent the bank from being used, intentionally or unintentionally, for criminal activities.

Source: BIS (2012).

**Table A.2**  
Banking supervisor by country

Australia	Non-CB	Korea	Non-CB
The Bahamas	CB	Moldova	CB
Brazil	CB	New Zealand	CB
Canada	Non-CB	Peru	Non-CB
China	Non-CB	Russia	CB
Denmark	Non-CB	South Africa	CB
Euro Area	CB	Switzerland	Non-CB
Georgia	CB	Thailand	CB
Hong Kong	CB	Turkey	Non-CB
India	CB	United Kingdom	CB
Japan	Non-CB	United States of America	CB

Source: FSAP reports

**Table A.3**

Dataset

Country	<i>bcpindex</i>	<i>cbsupervision</i>	<i>deposit</i>	<i>specialization</i>	<i>inflation</i>	<i>fiscal</i>	<i>banksize</i>	<i>freedom</i>	<i>finanfreedom</i>	<i>instdev</i>	<i>FSAP</i>
Australia (2019*)	0,862	0	1	0	0,89%	-1,7%	140,47%	2	90	1,54	11
Bahamas (2019*)	0,828	1	1	1	3,30%	-5,5%	70,71%	2	70	0,65	4
Brazil (2018*)	0,828	1	1	0	6,44%	-7,9%	105,26%	2	50	-0,20	5
Canada (2014)	0,920	0	1	0	1,71%	0,2%	120,10%**	2	80	1,65	6
China (2017)	0,828	0	1	0	1,88%	-3,8%	174,53%	0	20	-0,33	6
Denmark (2014)	0,747	0	1	0	1,43%	1,1%	182,88%	2	90	1,72	0
Euro Area (2018*)	0,644	1	0	1	1,05%	-1%	86,79%	2	65,79	1,10	0
Georgia (2015)	0,759	1	1	0	3,80%	-3,8%	50,71%	1	60	0,35	14
Hong Kong (2014)	0,966	1	1	1	2,74%	3,6%	257,22%	1	90	1,51	11
India (2018*)	0,782	1	1	1	3,10%	-6,4%	68,35%	2	40	-0,13	4
Japan (2017)	0,805	0	1	0	0,73%	-3,1%	157,51%	2	60	1,35	14
Korea (2014)	0,667	0	1	0	1,06%	0,4%	137,29%	2	80	0,77	11
Moldova (2016)	0,552	1	1	1	7,20%	-1,5%	32,56%	1	50	-0,42	11
N. Zealand (2017)	0,609	1	0	0	2,51%	1,3%	157,73%	2	80	1,86	13
Peru (2018*)	0,828	0	1	0	3,13%	-2,9%	41,52%	2	60	-0,10	0
Russia (2016)	0,690	1	1	0	5,86%	-3,7%	61,74%	0	30	-0,72	13
S. Africa (2015)	0,908	1	0	1	5,62%	-4,8%	77,66%	2	60	0,19	6
Switzerland (2014)	0,874	0	1	0	-0,26%	-0,3%	172,00%	2	80	1,84	12
Thailand (2019*)	0,943	1	1	1	1,79%	-0,4%	138,96%	0	60	-0,27	8
Turkey (2017)	0,782	0	1	0	8,96%	-2,2%	72,94%	1	60	-0,47	10
UK (2016)	0,897	1	1	0	1,52%	-3,3%	130,07%	2	80	1,43	13
USA (2015)	0,874	1	1	0	1,57%	-3,6%	59,27%	2	70	1,25	5

Source: Authors' own calculations.

\* Due to data limitations, the data used to create the independent variables are based on the year 2017.

\*\* Proxy value, due to data limitations, estimated based on the average of the deposit money bank assets as a percentage of GDP of the member countries of G7 (France, Germany, Italy, Japan, the United Kingdom and the United States).

**Table A.4**

Correlation matrix

(obs = 22)	<i>bcpindex</i>	<i>cbsupervision</i>	<i>deposit</i>	<i>specialization</i>	<i>inflation</i>	<i>fiscal</i>	<i>banksize</i>	<i>finanfreedom</i>	<i>FSAP</i>
<i>bcpindex</i>	1								
<i>cbsupervision</i>	-0.0140	1							
<i>deposit</i>	0.3094	-0.3306	1						
<i>specialization</i>	-0.0435	0.5684	-0.2973	1					
<i>inflation</i>	-0.2038	0.2960	-0.0104	0.1582	1				
<i>fiscal</i>	-0.1099	-0.2715	-0.1099	-0.0114	-0.3734	1			
<i>banksize</i>	0.2160	-0.2954	0.0447	-0.1112	-0.5273	0.6111	1		
<i>finanfreedom</i>	0.1739	-0.2041	-0.0912	-0.1304	-0.4555	0.6552	0.4635	1	
<i>FSAP</i>	0.0507	0.0489	0.1493	-0.2638	0.0564	0.1878	0.2031	0.0914	1

**Table A.5**

Variance inflation factor

Variable	VIF	1/VIF
<i>fiscal</i>	2.59	0.3860
<i>cbsupervision</i>	2.13	0.4693
<i>banksize</i>	2.02	0.4940
<i>finanfreedom</i>	2.00	0.4996
<i>specialization</i>	1.93	0.5183
<i>inflation</i>	1.62	0.6177
<i>FSAP</i>	1.40	0.7134
<i>deposit</i>	1.25	0.7975
Mean VIF	1.87	

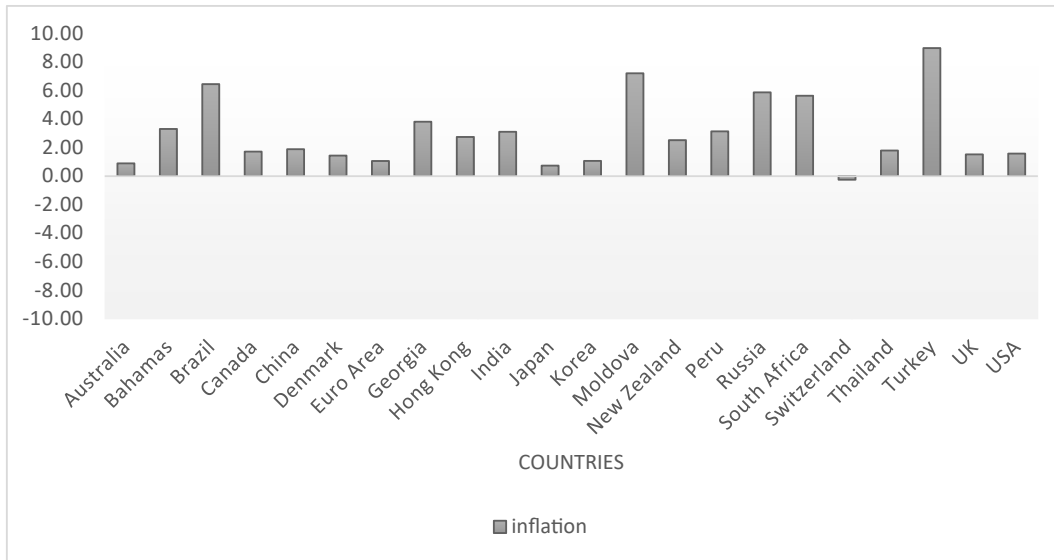


Fig. 1. Inflation, 3-years average, measured by the annual growth rate of the GDP implicit deflator (%)

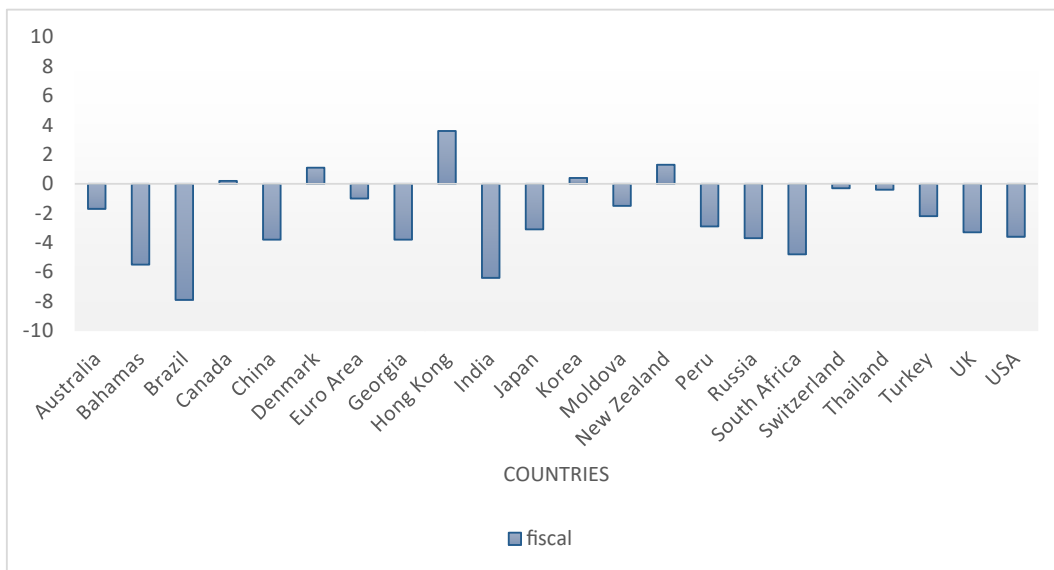


Fig. 2. General government fiscal balance to GDP (%)



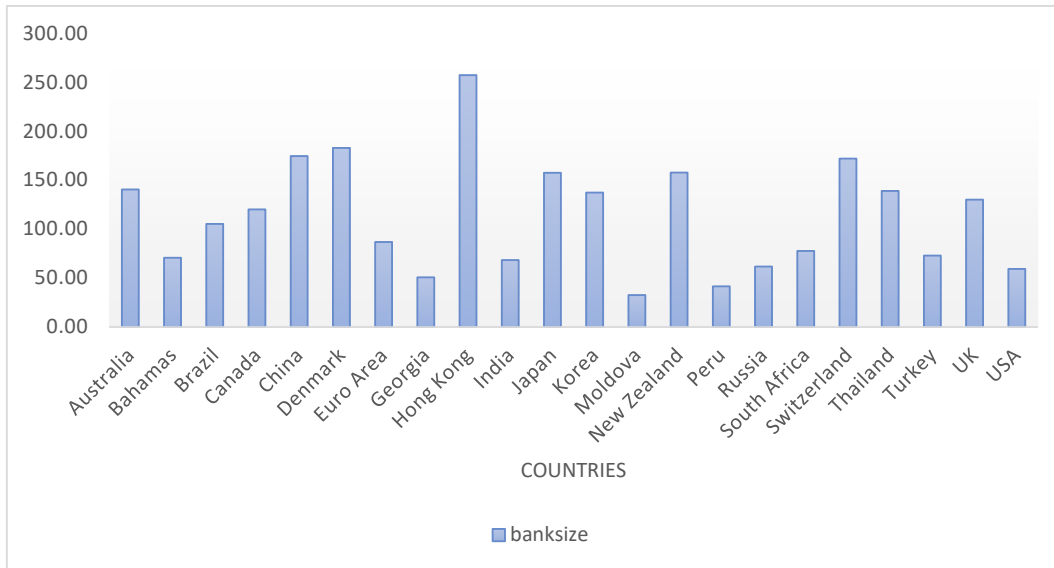


Fig. 3. Deposit money bank assets to GDP (%)

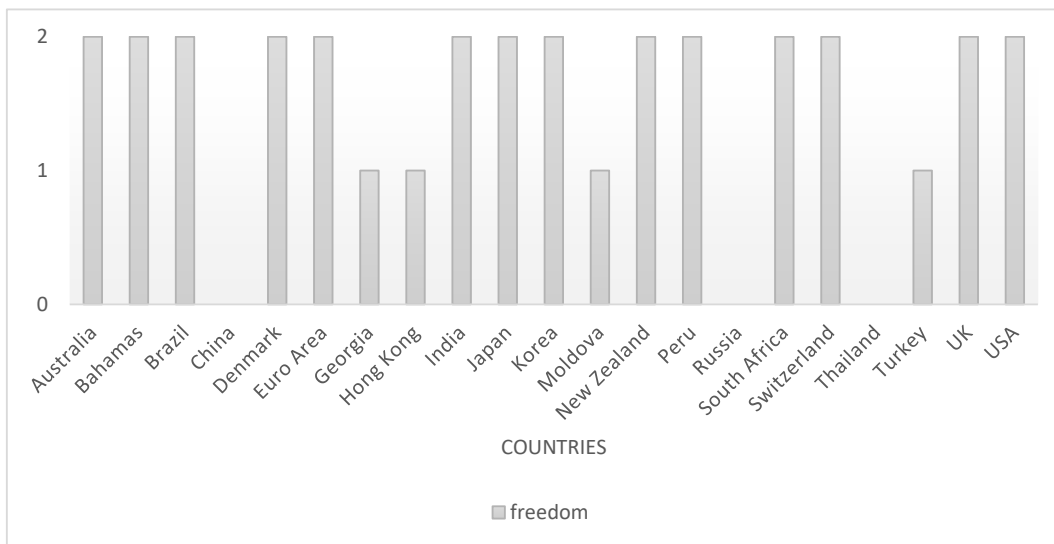


Fig. 4. Freedom in the World Index

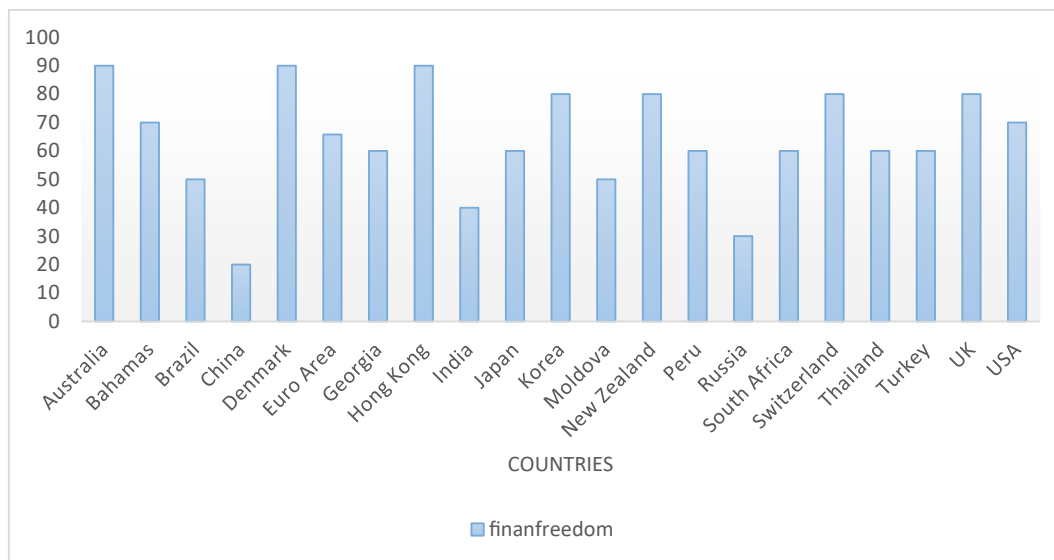


Fig. 5. Index of Economic Freedom

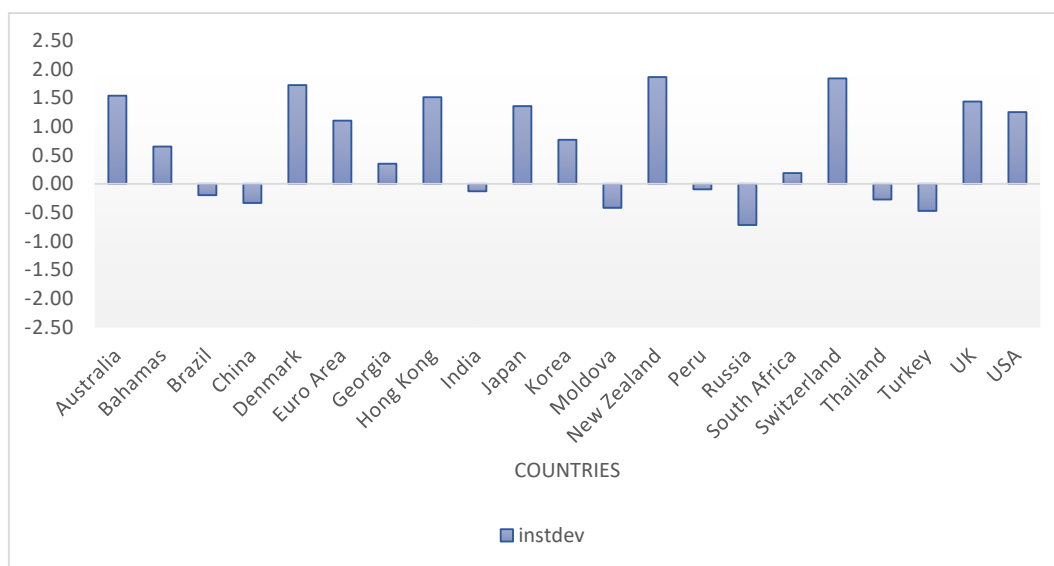


Fig. 6. Worldwide Governance Indicators

References

Arnone, M., Gambini, A., 2006. Architecture of Financial Supervisory Authorities and the Basel Core Principles. Institute of Economic Policy Working Paper N. 48, March. Catholic University of Milan-Italy.

Bank for International Settlements, 2012. Core Principles for Effective Banking Supervision. Basel Committee on Banking Supervision. September. ISBN 92-9131-146-4 (print).

Barth, J.R., Dopico, L.G., Nolle, D.E., Wilcox, J.A., 2002. Bank safety and soundness and the structure of Bank supervision: a cross-country analysis. *Int. Rev. Finance* 3 (3–4), 163–188.

Barth, J.R., Nolle, D.E., Phumiwasana, T., Yago, G., 2003. A cross-country analysis of the Bank supervisory framework and bank performance. *Financ. Mark. Inst. Instrum.* 12 (2), 67–120.

Beck, T., Demirguc-Kunt, A., Levine, R.E., Cihak, M., Feyen, E.H.B., 2019. Financial development and structure dataset. The World Bank. Available at: <https://www.worldbank.org/en/publication/gfdr/data/financial-structure-database>. (Accessed 25 September 2020).

Beck, T., Gros, D., 2013. Monetary Policy and Banking Supervision: Coordination Instead of Separation, vol. 3. European Banking Center Discussion Paper.

Doumpos, M., Gaganis, C., Pasiouras, F., 2015. Central bank independence, financial supervision structure and bank soundness: an empirical analysis around the crisis. *J. Bank. Finance* 61, S69–S83. Elsevier B.V.

European Central Bank, 2020. European Central Bank. Available at: <https://www.ecb.europa.eu/ecb/tasks/html/index.en.html>. (Accessed 15 October 2020).

European Commission, 2020a. Euro Area. Available at: [https://ec.europa.eu/info/business-economy-euro/euro-area\\_en](https://ec.europa.eu/info/business-economy-euro/euro-area_en). (Accessed 15 October 2020).

European Commission, 2020b. Single resolution mechanism. Available at: [https://ec.europa.eu/info/business-economy-euro/banking-and-finance/banking-union/single-resolution-mechanism\\_en](https://ec.europa.eu/info/business-economy-euro/banking-and-finance/banking-union/single-resolution-mechanism_en). (Accessed 15 October 2020).

Freedom House, 2014. Freedom in the World 2014 - the democratic leadership gap. Available at: <http://freedomhouse.org/sites/default/files/FIW2014.Booklet.pdf>.

Freedom House, 2015. Freedom in the World 2015 - discarding democracy: return to the iron fist. Available at: [https://freedomhouse.org/sites/default/files/01152015\\_FIW\\_2015\\_final.pdf](https://freedomhouse.org/sites/default/files/01152015_FIW_2015_final.pdf).

Freedom House, 2016. Freedom in the World 2016 - anxious dictators, wavering democracies: global freedom under pressure. Available at: [https://freedomhouse.org/sites/default/files/FH\\_FITW\\_Report\\_2016.pdf](https://freedomhouse.org/sites/default/files/FH_FITW_Report_2016.pdf).

Freedom House, 2017. Freedom in the World 2017 - populists and autocrats: the dual threat to global democracy. Available at: <https://freedomhouse.org/sites/>

- default/files/FH\_FIW\_2017\_Report\_Final.pdf%5Cnfreesomhouse.org.
- Goodhart, C., Schoenmaker, D., 1995. Should the functions of monetary policy and banking supervision be separated? *Oxford Economic Papers, New Series* 47 (4), 539–560.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., 2013. *Multivariate Data Analysis*, seventh ed. Pearson New International Edition, Essex (Pearson).
- Haubrich, J., 1996. Combining bank supervision and monetary policy. *Economic Commentary*. Federal Reserve Bank of Cleveland, (Nov). Available at: [https://econpapers.repec.org/article/fipfedcec/y\\_3a1996\\_3ai\\_3anov.htm](https://econpapers.repec.org/article/fipfedcec/y_3a1996_3ai_3anov.htm).
- Hellwig, M.F., 2014. Financial Stability, Monetary Policy, Banking Supervision, and Central Banking, vol. 9. Preprints of the Max Planck Institute for Research on Collective Goods, p. 42.
- International Monetary Fund, 2014a. Canada: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (14/71). Available at: [https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2014\\_cr1471.ashx](https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2014_cr1471.ashx).
- International Monetary Fund, 2014b. Denmark: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (14/352). Available at: [https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2014\\_cr14352.ashx](https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2014_cr14352.ashx).
- International Monetary Fund, 2014c. People's Republic of China - Hong Kong: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (14/207). Available at: <https://www.imf.org/external/pubs/ft/scr/2014/cr14207.pdf>.
- International Monetary Fund, 2014d. Switzerland: Financial Sector Assessment Program, Detailed Assessment of Compliance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (14/264). Available at: <https://www.imf.org/external/pubs/ft/scr/2014/cr14264.pdf>.
- International Monetary Fund, 2015a. South Africa: Financial Sector Assessment Program, Detailed Assessment of Compliance on the Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (15/55). Available at: [https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2015\\_cr1555.ashx](https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2015_cr1555.ashx).
- International Monetary Fund, 2015b. United States: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (15/89). Available at: [https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2015\\_cr1589.ashx](https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2015_cr1589.ashx).
- International Monetary Fund, 2016. United Kingdom: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (16/166). Available at: [https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2016\\_cr16166.ashx](https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2016_cr16166.ashx).
- International Monetary Fund, 2017. Japan: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (17/282). Available at: <https://www.imf.org/~media/Files/Publications/CR/2017/cr17282.ashx>.
- International Monetary Fund, 2018. Euro Area Policies: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (18/233). Available at: <https://www.imf.org/~media/Files/Publications/CR/2018/cr18233.ashx>.
- International Monetary Fund, 2019a. Australia: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (19/53). Available at: <https://www.imf.org/~media/Files/Publications/CR/2019/1AUSEA2019006.ashx>.
- International Monetary Fund, 2019b. The Bahamas: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (19/200). Available at: <https://www.imf.org/~media/Files/Publications/CR/2019/1BHSEA2019003.ashx>.
- International Monetary Fund, 2020. Fiscal Monitor: Policies for the Recovery (Washington, DC).
- International Monetary Fund and The World Bank, 2014. Republic of Korea: Financial Sector Assessment Program, Detailed Assessment of Compliance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (14/310). Available at: [https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2014\\_cr14310.ashx](https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2014_cr14310.ashx).
- International Monetary Fund and The World Bank, 2015. Georgia: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (15/10). Available at: <https://www.imf.org/external/pubs/ft/scr/2015/cr1510.pdf>.
- International Monetary Fund and The World Bank, 2016a. Republic of Moldova: Financial Sector Assessment Program, Detailed Assessment of Compliance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (16/71). Available at: [https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2016\\_cr1671.ashx](https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2016_cr1671.ashx).
- International Monetary Fund and The World Bank, 2016b. Russian Federation: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (16/303). Available at: [https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2016\\_cr16303.ashx](https://www.imf.org/~media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/scr/2016_cr16303.ashx).
- International Monetary Fund and The World Bank, 2016c. Turkey: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (17/46). Available at: <https://www.imf.org/~media/Files/Publications/CR/2017/cr1746.ashx>.
- International Monetary Fund and The World Bank, 2017a. New Zealand: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (17/120). Available at: <https://www.imf.org/~media/Files/Publications/CR/2017/cr17120.ashx>.
- International Monetary Fund and The World Bank, 2017b. People's Republic of China: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Supervision. IMF Country Reports, (17/403). Available at: <https://www.imf.org/~media/Files/Publications/CR/2017/cr17403.ashx>.
- International Monetary Fund and The World Bank, 2018a. Brazil: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (18/340). Available at: <https://www.imf.org/~media/Files/Publications/CR/2018/cr18340.ashx>.
- International Monetary Fund and The World Bank, 2018b. India: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (18/4). Available at: <http://documents1.worldbank.org/curated/en/158741516303040317/pdf/122859-WP-P160281-PUBLIC-1-19-9-am-India-FSAP-Update-2017-DAR-BCP-Public.pdf>.
- International Monetary Fund and The World Bank, 2018c. Peru: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (18/366). Available at: <https://www.imf.org/~media/Files/Publications/CR/2018/cr18366-PeruFSAP.ashx>.
- International Monetary Fund and The World Bank, 2019. Thailand: Financial Sector Assessment Program, Detailed Assessment of Observance - Basel Core Principles for Effective Banking Supervision. IMF Country Reports, (19/319). Available at: <https://www.imf.org/~media/Files/Publications/CR/2019/1THAEA2019004.ashx>.
- Ioannidou, V.P., 2005. Does monetary policy affect the central bank's role in bank supervision? *J. Financ. Intermediation* 14 (1), 58–85.
- Kaufmann, D., Kraay, A., 2019. Worldwide governance indicators. The World Bank. Available at: <https://info.worldbank.org/governance/wgi/>. (Accessed 25 September 2020).
- Kaufmann, D., Kraay, A., Mastruzzi, M., 2010. The Worldwide Governance Indicators: Methodology and Analytical Issues. *World Bank Policy Research Working Paper No. 5430*, (September). Available at: <https://ssrn.com/abstract=1682130>.
- Lastra, R.M., Goodhart, C., 2016. Interaction between Monetary Policy and Bank Regulation. *European Parliament, Direct General For Internal Policies, Policy Department A: Economic and Scientific Policy*, pp. 37–54.
- Lazopoulos, I., Lima, D., Gabriel, V., 2016. The effect of financial regulation mandate on inflation bias: a dynamic panel approach. *Discussion Papers in Economics, University of Surrey* 6 (0).
- Lima, D., 2017. *Essays on the Interaction of Monetary and Banking Regulation Policies*. University of Surrey.
- Masciandaro, D., Quintyn, M., 2016. The governance of financial supervision: recent developments. *J. Econ. Surv.* 30 (5), 982–1006.
- Miller, T., Holmes, K., Kim, A.B., 2014. 2014 Index of Economic Freedom. *The Heritage Foundation & The Wall Street Journal*, Washington, DC. Available at: <http://www.heritage.org/index/country/unitedarabemirates>.
- Miller, T., Holmes, K., Kim, A.B., 2015. 2015 Index of Economic Freedom: Promoting Economic Opportunity and Prosperity. *The Heritage Foundation & The Wall Street Journal*, Washington, DC. Available at: <http://www.heritage.org/index/book/chapter-3>.
- Miller, T., Kim, A.B., 2016. 2016 Index of Economic Freedom: Promoting Economic Opportunity and Prosperity. *The Heritage Foundation & The Wall Street Journal*, Washington, DC. Available at: [https://www.heritage.org/index/pdf/2016/book/index\\_2016.pdf](https://www.heritage.org/index/pdf/2016/book/index_2016.pdf).
- Miller, T., Kim, A.B., 2017. 2017 Index of Economic Freedom. *The Heritage Foundation*, Washington, DC.
- Di Noia, C., Di Giorgio, G., 1999. Should banking supervision and monetary policy tasks be given to different agencies? *Int. Finance* 2 (3), 361–378.
- De Rynck, S., 2014. Changing banking supervision in the eurozone: the ECB as a policy entrepreneur. *Bruges Political Research Papers* 38.
- Schnabel, I., 2016. What role for central banks in safeguarding financial stability? *Sveriges Riksbank Econ. Rev.* 3, 49–54.
- Single Supervisory Mechanism, 2020. Banking union. Available at: <https://www.bankingsupervision.europa.eu/about/bankingunion/html/index.en.html>. (Accessed 15 October 2020).
- Smets, F., 2013. *Financial Stability and Monetary Policy: How Closely Interlinked? European Central Bank* (May).
- The World Bank, 2020. World development indicators. Available at: <https://databank.worldbank.org/source/world-development-indicators>. (Accessed 25 September 2020).
- Véron, N., 2011. *Testimony on the European debt and financial crisis. Bruegel Policy Contribution* 2011 (11).
- Winecoff, W.K., 2014. Bank regulation, macroeconomic management, and monetary incentives in OECD economies. *Int. Stud. Q.* 58 (3), 448–461.
- Wooldridge, J.M., 2012. *Introductory Econometrics: A Modern Approach*, fifth ed. Cengage Learning US.