Central Bankers as Supervisors: Do Crises Matter?[*]

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Abstract

Following the 2007-09 Global Financial Crisis many countries have changed their financial supervisory architecture by increasing the involvement of central banks in financial supervision. This has led many scholars to argue that financial crises are an important driver in explaining the evolution of the role of central banks as supervisors. We formally test this hypothesis employing a new database that captures the full set of supervisory reforms implemented during the period 1996-2013 in a large sample of countries. Our findings support the view that systemic banking crises are important drivers of reforms in supervisory structure. However, we also highlight an equally important "bandwagon" effect, namely a tendency of countries to reform their financial supervisory architecture when others do so as well. We construct several measures of spatial spillover effects and show that they can explain institutional similarities among countries and impact the probability of reforming the role of the central bank in financial sector supervision. Our findings highlight the political drivers in reforming the supervisory architecture, notwithstanding the lack of consensus of economic theory on the optimal institutional setting.

Keywords: Financial Supervision, Central Banking, Central Bank Independence, Political Economy, Banking Supervision.

JEL classification: E58, E63, G18.

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1 Introduction

What explains the reforms in the architecture of financial sector supervision? Throughout the 1990s and early 2000s, the creation of financial sector supervisors independent from the central bank has been generally associated with the reputational failures of many central banks during banking crises (Masciandaro, 2006; Masciandaro and Quintyn, 2009). Yet, following the 2007–09 Global Financial Crisis, many countries actually increased the involvement of central banks in financial sector supervision, suggesting a sort of "great reversal" towards prudential supervision in the hands of central banks (Dalla Pellegrina et al., 2013). A classical example of this reversal is the evolution of the supervisory architecture in the United Kingdom between 1997 and 2013. In 1997, when the UK parliament voted to give its central bank operational independence with a clear objective of price stability, the responsibility for banking supervision was transferred from the Bank of England to the Financial Services Authority. However, the supervisory failure of this authority during the recent crisis led to its dismissal in 2013, with the supervisory powers being assigned to the newly established Prudential Regulation Authority, as a part of the Bank of England.

This trend towards increasing the involvement of central banks in financial sector supervision is common to a broader set of countries. Figure 1 depicts the evolution of unified supervision inside the central bank for a large sample of countries in 1996 compared to 2013. It highlights a tendency towards a more unified supervision in the hands of the central bank, depicted by the darker shades in the lower panel of the figure.

Yet, economic theory does not provide a clear answer as to whether assigning supervisory roles to central banks or other independent institutions is socially optimal. Masciandaro and Quintyn (2015) discuss the evolution of financial supervision and highlight two conflicting views regarding the merger of monetary and supervisory functions inside the central bank.

Figure 1: Evolution of unified supervision inside the central bank (1996-2013)
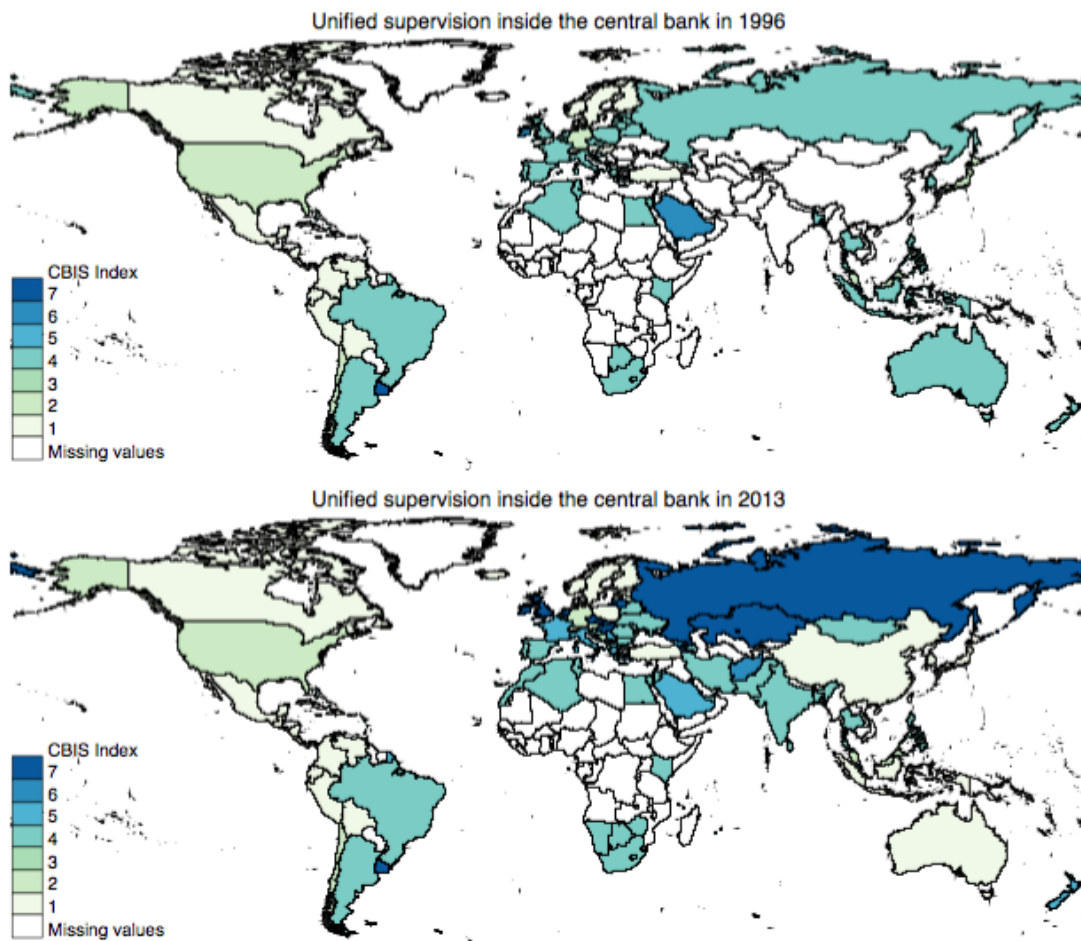
Notes: Figure presents the evolution of the index of central bank involvement in supervision (CBIS) constructed in this paper. Darker colours correspond to higher central bank involvement.

An integration view underscores the informational advantages and economies of scale derived from bringing all functions under the authority of the central bank (Peek et al., 1999; Bernanke, 2007). Alternatively, a separation argument highlights the higher risk of policy failures if central banks have supervisory responsibilities, as financial stability concerns might impede the implementation of optimal monetary policies (Goodhart and Schoenmaker, 1995; Ioannidou, 2005). Empirical literature that has investigated the relative merits of assigning banking sector supervision in the hands of central banks also provides mixed results.[1]

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[1]For example, Arnone and Gambini (2007) find evidence in support of the integration view by highlighting the positive link between compliance with the Basel principles of supervision and the integration of supervisory powers inside the central bank. Peek et al. (1999) show that having supervisory information available improves the efficiency of the monetary policy function. On the other hand, Di Noia and Di Giorgio (1999) support the

In this paper, we propose a novel approach to understanding the cross-country evolution in the institutional design of financial sector supervisors. To that end, we first create a new dataset containing information on the authorities responsible for the oversight of the financial sector (banking, insurance and financial markets) in a large sample of 105 countries, over the period 1996–2013. Using this data, we develop a new index of *Central Bank Involvement in Supervision* (CBIS Index, hereafter) and we identify the full set of reforms implemented in supervisory architecture in our sample of countries. This new index updates and extends previous attempts to measure central bank involvement in financial supervision in several ways. First, previous indexes have considered separately the issue of unified versus sectorial supervision (Melecky and Podpiera, 2013) and whether this supervisory role should be assigned to a central bank (Masciandaro, 2006, 2007). We construct a more comprehensive index that looks at whether countries adopt a *unified* financial sector supervision *inside* the central bank. Second, we look at the involvement of central banks in the supervision of the *entire* financial sector, i.e. banking, insurance and securities markets. Focusing the concept of supervision solely on the banking sector overlooks the interplay between banks, insurance companies and financial markets, as well as the creation of international financial conglomerates, which can pose new supervisory challenges (De Grauwe, 2008). Finally, our larger panel of countries and time span, allows us to construct the first full set of reforms in the institutional design of financial sector supervision.

Consequently, our main contribution rests in understanding what drives countries to modify their supervisory architecture over time. To our knowledge, this is the first study to investigate the triggers of reforms in the institutional design of financial sector supervision. In line with

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separation view by showing that inflation rates are higher and more volatile in countries where only the central bank is in charge of banking supervision. Chortareas et al. (2016) document that central banks serving both monetary policy and banking supervision functions are less inflation conservative. Similarly, Ioannidou (2005) finds that the FED's monetary policies do alter its banking supervisory activity, while Dincer and Eichengreen (2012) find evidence that nonperforming loans are lower if banking supervision is assigned to an independent authority different from the central bank.

popular belief, we find that episodes of systemic banking crises significantly increase the probability that a country reforms its supervisory structure. This result is specific to financial sector turmoil and not other types of crises, such as currency crises or economic recessions.

Given this result, a natural question arises: in the absence of random shocks to the financial sector or an optimal institutional setting, what shapes the supervisory architecture of a country? We highlight the importance of "peer" effects among countries in explaining the evolution of financial sector supervision. In particular, we find that countries are more likely to change their supervisory architecture when the share of countries undertaking reforms around the world or in the same continent is higher. We employ recent spatial econometric techniques to construct groups of peer countries based on geographical distance and trade relationships (see also Elhorst et al., 2013; Bodea and Hicks, 2015). Our findings suggest that countries whose financial architecture is farthest from the average of the peer group are more likely to reform. These results complement a recent literature that stresses the importance of an international convergence in institutional design (Abiad and Mody, 2005; Persson and Tabellini, 2009).

We also investigate what country characteristics are associated with a certain institutional setting of financial sector supervision. For example, Melecky and Podpiera (2013) identify a series of factors that might explain the prevalence of a unified supervisory architecture. We complement this work by focusing on the determinants of a unified supervision, but in the hands of the central bank. Our results show that the degree of central bank independence is highly relevant in influencing the decision to concentrate financial sector supervision in the hands of monetary policy authorities. Specifically, higher central bank independence is associated with a lower central bank involvement in supervision. Thus, not only does higher independence suggest more decentralised supervision as Melecky and Podpiera (2013) find, but also less involvement of central banks in the oversight of the financial sector. This is in line with the

view that, if the central bank is already highly independent, granting the unified supervisory power to this institution would increase the risk of bureaucratic misconduct (Masciandaro, 2009).

The sensitivity of these findings is subjected to a variety of robustness tests, including various econometric specifications, alternative measures of peer countries, controlling for the direction of reforms or for alternative definitions for the index of central bank involvement in supervision.

The outline of the paper is as follows. Section 2 discusses the methodology followed in building the index of supervisory unification inside the central bank. In Section 3 we discuss the empirical strategies followed and the data. Section 4 presents the main results, while Section 5 concludes.

2 Supervision and central banking: metrics and stylised facts

This section details the new database on financial sector supervisory authorities. We collect information on the institutions responsible for financial supervision in 105 countries from 1996 to 2013.[2] This primary data is mainly obtained from websites and charters of central banks and/or national supervisory authorities across the world. In order to capture the degree of central bank involvement in financial sector supervision, we create a consolidated index of *central bank involvement in supervision* (CBIS Index). This index takes the maximum (minimum) score in countries where all (no) supervisory responsibilities are assigned to the central bank.

The construction of this index entails the following steps. First, we identify which is the authority in charge of the supervision of the following three sectors: a) banking, b) insurance, and

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[2]Not all countries have information for the entire period, hence our panel is unbalanced. Appendix Table A1 presents the full set of countries and information on data availability. Furthermore, Appendix Table A2 provides information on the authorities responsible for financial sector supervision as of end-2013 for the set of analysed countries.

c) securities markets. Whenever we find that the central bank is the supervisor of one of these financial institutions, we ask whether this responsibility is shared or not with other authorities. Next, we classify for each country the financial sectors whose supervision is assigned to the central bank. Finally, we transform this qualitative information into quantitative indicators, by assigning a value to the degree of supervisory unification in the hands of the monetary policy authority. The CBIS index distinguishes among the following levels of unification:

A) A unified supervision inside the central bank (7 points).

B) A unified supervision of the banking and securities markets sectors inside the central bank (6 points).

C) A unified supervision of the banking and insurance sectors inside the central bank (5 points).

D) Only banking supervision is in the hands of the central bank (4 points).

E) The central bank shares the supervision of the whole financial system with another authority (Twin Peaks system) (3 points).

F) Banking supervision is shared between the central bank and another authority (2 points).

G) The central bank is not involved in supervision (1 point).

The different levels of integration assumed by this index are based on previous measures of financial sector supervision proposed in Masciandaro (2006, 2009) and Melecky and Podpiera (2013). We extend these indicators in several ways. First, our main motivation for the hierarchical structure proposed in the CBIS index is driven by the fact that the data collected shows that central banks are either involved in banking supervision and some or none of the other sectors, or have not supervisory responsibilities at all. This puts the supervisory function of

the central bank at the centre of our index. This differs from the index in Masciandaro (2006, 2009) which assigns a maximum of points whenever there is a unique supervisory authority regardless of whether this institution is the central bank. Moreover, the index proposed here brings a higher level of detail as compared to previous ones, by considering all possible levels of integration of financial sector supervision.[3]

Our measure also differs from the index in Melecky and Podpiera (2013), which only distinguishes between unified prudential supervision in the hands of an independent authority or of the central bank. Their measure of supervisory unification assigns lower values for a sectorial supervision outside (1 point) or inside (2 points) the central bank and reaches the maximum value for unified supervision in the hands of the central bank (4 points). However, previous research shows that countries are more likely to follow a path dependence in assigning financial supervision inside or outside the central bank (Masciandaro, 2006). More specifically, countries characterised by a sectorial supervision outside the central bank are more likely to reform their supervisory architecture towards a unified supervisor outside the central bank. On the other hand, whenever the monetary policy authority is already responsible for banking supervision, the move towards a unified financial sector supervision tends to place full supervisory powers in the hands of the central bank. For this reason, we consider a unified financial sector supervision *inside* or *outside* the central bank to be at the extreme opposite points of our index, an element that is not clearly distinguishable in previous categorisation.

Based on our new index of supervisory responsibilities, we find that 75% of the countries in our sample have reformed their financial supervisory architecture at least once over the period 1996-2013 by establishing a new supervisory authority and/or changing the power of at least one of the already existing supervisors. Moreover, a third of these reforms involved changes in

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[3]We, nonetheless, consider the robustness of our results when different levels of aggregation are employed.

Figure 2: Magnitude of reforms in CBIS (1996-2013)
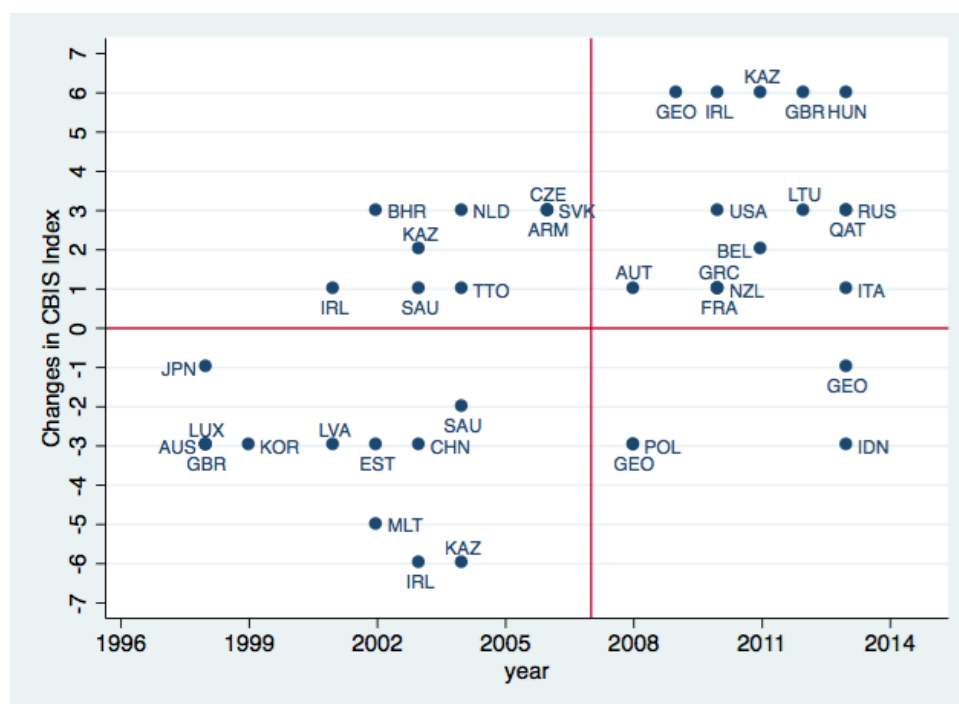
Notes: Figure summarise the magnitude of reforms that modified the degree of central bank involvement in financial sector supervision between 1996 and 2013. Positive/Negative changes in the CBIS index indicate an higher/lower involvement of the central bank in supervision.

the role of central banks in financial sector supervision.[4]

Figure 2 shows the magnitude of the changes in supervisory architecture between 1996 and 2013. A trend towards an increasing supervision in the hands of the central bank can be noticed in recent years, given that positive changes in the value of the CBIS Index correspond to an increased concentration of supervisory powers inside the central bank. At the same time, this trend appears even stronger after the 2007-09 global financial crisis. Prior to this, throughout the Great Moderation period, however, most supervisory reforms undertaken reduced the degree of central bank involvement. However, this trend is reverted after the crisis, with most countries moving towards a higher concentration in the hands of the central bank (upper right-hand side quadrant). In fact, if we look at the 19 reforms that took place since the beginning of the recent crisis, we find that 15 of them increased the involvement of central banks in finan-

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[4]Appendix Table A3 shows the list of countries that modified their supervisory architecture by re-shaping the central bank involvement in financial sector supervision.

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cial supervision. This is in line with the belief that financial crises might largely influence the decision to implement reforms in the supervisory architecture. Indeed, the reputational failures of many supervisory institutions have reinforced the idea that banking supervisors need the market expertise and professional economists of central banks and could be more efficient as a built-in function of central banking (Goodhart, 2008). Thus, a shift in the general perception of monetary policy institutions also occurred, with central banks being nowadays perceived as public policy institutions with the goal to promote both monetary *and* financial stability.

Figure 3: Direction of reforms in CBIS (1996-2013)
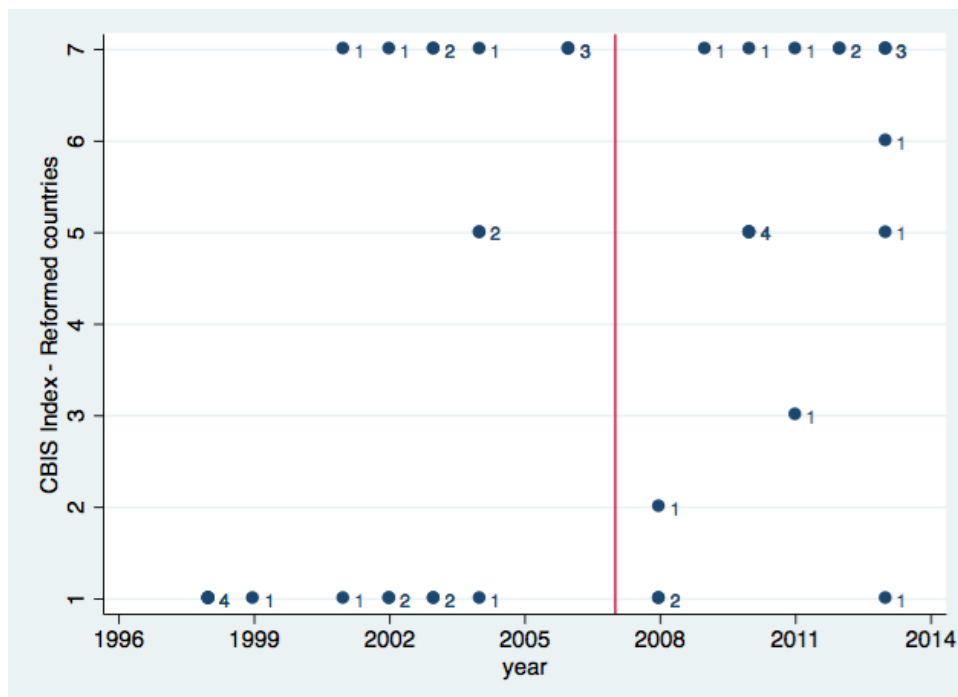
Notes: This figure indicates the institutional setting adopted by the countries that reformed their financial sector supervision between 1996 and 2013. Values reported next to each point indicate the number of countries that reformed their supervisory architecture in the year and adopted the specific level of central bank involvement in financial sector supervision.

Similarly, Figure 3 shows the institutional setting adopted by the countries that reformed their financial sector supervision over time. Interestingly, in a third of the reforms implemented prior to 2007, supervisory powers have been removed from the central bank and assigned to an independent unified supervisor. In a few cases, supervisory responsibilities have even been assigned to different sectorial authorities. After 2007, however, only three countries completely

removed supervision from their monetary policy institution, with the aim of creating a unified supervisory authority outside the central bank. On the other hand, out of the 19 reforms implemented since 2007, in 7 cases the central bank has become the unique supervisor of the financial sector.

These descriptive statistics motivate our empirical investigation, by placing episodes of financial distress at the centre of the reform process. However, the evolution across time of supervisory architectures also suggests some cyclical patterns. For instance, Ugolini (2011) discusses that, historically, banking supervision has not always been entrusted to central banks. In the decades prior to the Great Moderation, several central banks were strongly involved in supervisory activities, which were considered thoroughly integrated with the overall responsibility of central banks to manage liquidity (see also Toniolo, 2011). However, as our data suggests, a reversal occurred during the Great Moderation period, associated with a decrease in the involvement of central banks in supervision, followed recently by another shift towards more involvement. This evolution, suggests some patterns that could be driven by an international convergence towards a similar institutional setting. As a result, our second empirical interest rests in uncovering whether countries "learn" or imitate their peers when reforming their financial supervisory architecture.

3   Supervision and central banking: main drivers of reforms

Our main empirical investigation aims at identifying the main drivers of reforms in supervisory architecture. Based on the patterns of reforms suggested by the descriptive statistics in the previous section and a large literature on the political economy of reforms, we consider three sets of factors that could potentially impact the probability of reforming: (i) episodes of financial crises, (ii) bandwagon or peer effects and (iii) domestic factors. We estimate the role of

these factors on the conditional probability of having a reform in the architecture of supervisory authorities using the following specification:

$$Prob(e_{it} = 1) = F(\phi_t^{Crises}\beta_C + \phi_t^{Bandwagon}\beta_B + \phi_t^{Domestic}\beta_D), \qquad (1)$$

where e_{it} is a reform dummy variable that takes the value 1 if country i is experiencing a supervisory reform that modifies the CBIS index in year t; ϕ_t^{Crises} is a dummy for crises episodes; $\phi_t^{Bandwagon}$ captures different proxies for bandwagon effects; and $\phi_t^{Domestic}$ is a vector of country-specific characteristics. The appropriate methodology to estimate Equation (1) is determined by the distribution of the cumulative distribution function, $F(\cdot)$. Because episodes occur irregularly (97.5% of the sample is zeros), $F(\cdot)$ is asymmetric. Therefore, we estimate Equation (1) using the complementary logarithmic (or cloglog) framework, which assumes that $F(\cdot)$ is the cumulative distribution function (cdf) of the extreme value distribution. In other words, this estimation strategy assumes that:[5]

$$F(z) = 1 - exp[-exp(z)]. \qquad (2)$$

The impact of financial crises on the probability of reforms is captured by a crisis dummy that signals the presence of a systemic banking crisis in the previous two or five years. The date of the crisis comes from Laeven and Valencia (2013). Our hypothesis is that policy makers consider financial crises as signal of supervisory failure of a certain architecture. We thus expect such crises to have a positive impact on the probability of reforming. However, whether this will result in a consolidation of supervision inside the central bank or no is not a prior clear. We will address this issue empirically as well.

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[5]This methodology represents an alternative to logit and probit models and is typically used when the positive (or negative) outcome is rare (i.e. the number of zeros is large). This is also the case here since reforms do not happen that often in our sample of 1800 country-year observations.

Second, we argue that the probability of reforming financial supervision architecture is connected to an international convergence among peer countries. Masciandaro et al. (2008) call this a bandwagon effect and argue that the high level of cooperation between central banks might stimulate a process by which these institutions learn from and follow the policy changes implemented by their peers (see also Borio et al., 2011). These considerations are also in line with related literatures that highlight the importance of peers at the firm level (Leavy and Robert, 2014) or at the country level (Abiad and Mody, 2005). In particular, Abiad and Mody (2005) show that financial reforms might be stimulated by the need of a country to catch up with the leading country of its region.

We use several indicators to proxy the role played by peer pressure in the diffusion of reforms in financial supervision architecture. The first measure, called "Reforms in CBIS (World)", computes the share of countries around the world that are undertaking a supervisory reform (that modifies CBIS) in year t. This variable provides an indicator of the "popularity" of undertaking reforms, i.e., if financial supervisory reforms are fashionable in a certain year, the probability that country i undertakes a reform in year t is positively related with the share of countries that are currently undertaking reforms. Similarly, we define the variable "Reforms in CBIS (Continent)", that indicates the share of countries that are undertaking a supervisory reform in year t and are located in the same continent as country i.

The second set of measures of bandwagon effects are based on spatial spillover effects among countries. Similar techniques are employed in recent literature to explain the existence of peer effects among countries. For example, Abiad and Mody (2005) build a measure of regional diffusion that focuses on the distance of individual countries from their regional leaders to explain the diffusion of financial liberalisation. Similarly, Persson and Tabellini (2009) use an inverse distance-weighted average of democracy among neighbours to estimate the impact

of a country's "democratic capital" on growth.

We propose a similar measure of closeness of country's i supervisory architecture with respect to its neighbouring countries. Specifically, this measure, denoted by $Peers_{i,t}$, is the absolute value of the difference between a country's CBIS index and its peers, as follows:

$$Peers(\rho)_{i,t} = \left| \sum_{i \neq j} (CBIS_i - CBIS_j) \bar{\omega}(\rho)_t^{j,i} \right|, \tag{3}$$

where $CBIS_i$ is a measure of the level of CBIS in the base country i in year t and $CBIS_j$ is a measure of the level of CBIS in peer country j in year t. The weights $\bar{\omega}(\rho)_t^{j,i}$ are obtained from the inverse distance matrix between pair countries, and drops to zero for countries outside the radius ρ.[6] We consider two alternative specifications for the matrix $\bar{\omega}(\rho)_t^{j,i}$. In the first, the distance between countries is based on the geographical location. This measure, denoted by *Peers − Geographical*, assigns a weight to each peer country based on the physical distance from the reference country. Closer countries are assigned a higher weight based on the inverse distance matrix. We follow Elhorst et al. (2013) and assume a 3000 km radius for the distance.[7] Data on geographical distance is obtained from the distance database of the CEPII.

The second measure, denoted *Peers - Trade*, is based on the bilateral trade among countries. The assumption is that countries who have close trading relationships should also exert stronger spillover effect. We thus employ bilateral trade data from the CEPII and order it by the size of trade between countries. For each country, we then retain the 25% largest trading partners as the size of ρ and use these trading values to create the inverse distance matrix.

The last set of determinants of reforms in CBIS follows a large political economy literature

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[6]Different from previous studies, we look at the absolute value of this measure, since higher (or lower) values of our index cannot be interpreted as better (or worse) outcomes. While this is not clearly the case in the literature on democracy or financial liberalisations, where the leading countries are generally considered the ones characterised by higher value of the respective index.

[7]In unreported result, robustness checks are run for 2000, 4000 and 5000 km radius.

and includes several country characteristics. First, we hypothesise that reforms in central bank institutional design might also influence the degree of central banks' involvement in supervision. This is in line with the idea that reform processes are likely to be enacted at the same time. Given our panel dataset of reforms in CBIS, we obtain the full set of reforms in central bank independence as a mainstream measure of central bank institutional design from Arnone and Romelli (2013) and Romelli (2016).[8]

Furthermore, Masciandaro (2009) builds a political economy model to study the determinants of supervisory architectures and finds that, in general, the quality of public sector governance plays an important role in shaping supervisory institutional architecture. Based on these arguments one can expect that changes in the political orientation of the government might stimulate the implementation of reforms. We capture this effect through a dummy variable that proxies changes in the political orientation of the government which took place up to two years prior to a reform in supervisory structure. We further consider a governance and a democracy index as two other political economy variables that might influence the likelihood of supervisory reforms.

Additional country-specific control variables are represented by a proxy for the degree of economic development captured by a dummy variable that indicates the set of countries that belongs to the OECD to disentangle if more advanced economies experience a higher probability of reforming the degree of central bank involvement in supervision. Finally, in line with previous research such as Masciandaro et al. (2008), we also consider the legal origin hypothesis and introduce a dummy variable for civil law countries (La Porta et al., 1999).

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[8]These reforms are based on changes of the Grilli et al. (1991) (GMT) and the Cukierman et al. (1992) (CWN) indices over time. Details on how the different CBI indices are computed are provided in Appendix Table A4.

4 Empirical results

4.1 Reforms in financial supervision

Tables 1 and 2 present the estimations obtained using the complementary logarithmic framework to predict the probability of changes of the CBIS index in Equation 1. Table 1 considers the first set of proxies of bandwagon effects captured by the share of countries reforming financial supervisory architecture the same year, while Table 2 looks at the two proxies that measure a country's "closeness" to its geographical and trading peer, respectively.

Columns (1) and (3) in Table 1 present the baseline regressions which include the financial crises dummy and the share of countries reforming around the world (in column (1)) and in the same continent (in column(3)). The results show a strong correlation between the financial crisis dummy and the likelihood of reforms in central bank involvement in supervision. The positive sign suggests that countries experiencing a systemic banking crisis in the two previous years are more likely to reform their supervisory architecture.[9] However, our baseline estimations also suggest a strong peer effect among countries. The positive and statistically significant coefficient of the bandwagon effects variables suggest that countries are more inclined to change their supervisory architecture the higher is the share of countries implementing reforms as well. This suggests important international spillovers in institutional design.

These results are robust to the inclusion of additional control variables. Columns (2) and (4) in Tables 1 augment the basic estimation by introducing a dummy that captures whether a country has also modified the degree of central bank independence (CBI reform) as measured using the Grilli et al. (1991) (GMT, hereafter) index, in the same year.[10] We find that central

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[9]We have also checked the robustness of the estimations in Tables 1 and 2 when looking at the occurrence of financial crisis in the last five years. Results are qualitatively unchanged and are available upon request.

[10]Given that the Grilli et al. (1991) index also provides information on the involvement of central banks in banking supervision, the dummy variable for legislative reforms takes the value one only in years in which changes in the other characteristics of central bank institutional design took place.

Table 1: Determinants of reforms in financial sector supervision: baseline results

	(1)	(2)	(3)	(4)	(5)	(6)
Financial Crisis	0.762**	0.912**	0.887**	0.884**	0.854*	1.015**
	(0.372)	(0.417)	(0.385)	(0.437)	(0.462)	(0.481)
Reforms in CBIS (World)	0.469***	0.490***			0.368	
	(0.096)	(0.131)			(0.439)	
Reforms in CBIS (Continent)			0.115***	0.081***		0.068***
			(0.021)	(0.018)		(0.019)
CBI Reform (GMT)		0.848		1.299**	1.135*	1.416**
		(0.571)		(0.561)	(0.629)	(0.621)
Government Change		0.419		0.592	0.415	0.526
		(0.449)		(0.472)	(0.455)	(0.473)
Governance		0.423		0.292	0.437	0.344
		(0.367)		(0.399)	(0.374)	(0.397)
OECD Dummy		1.272*		1.172*	1.291*	1.197*
		(0.660)		(0.707)	(0.675)	(0.699)
Polity		-0.121**		-0.119**	-0.120**	-0.119**
		(0.056)		(0.058)	(0.055)	(0.057)
Civil Law Dummy		-1.276***		-1.005**	-1.274***	-1.088**
		(0.430)		(0.455)	(0.432)	(0.445)
Observations	1,714	1,235	1,714	1,235	914	914
Number of Countries	105	88	105	88	88	88
Year FE					YES	YES

The dependent variable is a reform dummy that takes the value one in years when the CBIS index changes. Financial Crisis is a dummy variable that takes the value one if a country has experienced a systemic banking crisis in the previous two years. Reforms in CBIS (World/Continent) represent the share of countries that have reformed their financial supervisory structure in the world/continent in the same year. CBI reform (GMT) is a dummy variable for countries that have undertaken reforms that modified the degree of independence of their central banks in the same year. Government Change is a dummy variable that indicates whether a change of the executive party took place in the past two years. Governance is the average value of the Worldwide Governance Indicators (WGI) from the World Bank. OECD Dummy is a dummy variable that takes the value one for OECD countries. Polity is a variable capturing the level of democracy of a country. Civil Law Dummy is a dummy variable for countries characterised by a civil law system. Constant terms are included, but not reported. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

bank legislative reforms that modify the degree of independence increase the likelihood of reforms across most specifications. Among the other control variables, we find no evidence that government changes or good governance play an important role in explaining supervisory reforms. Finally, more advanced economies (OECD countries) appear more likely to reforms their supervisory architecture, while countries characterised by a civil law systems present a lower probability of reforming their central bank involvement in financial supervision. Finally,

Table 2: Determinants of reforms in financial sector supervision: alternative bandwagon effects

	(1)	(2)	(3)	(4)	(5)	(6)
Financial Crisis	0.656*	0.614	0.765**	0.762*	0.709	0.971**
	(0.371)	(0.418)	(0.371)	(0.420)	(0.460)	(0.472)
Peers - Geographical	0.965***	0.939***			1.014***	
	(0.166)	(0.173)			(0.190)	
Peers - Trade			0.752***	0.715***		0.759***
			(0.127)	(0.156)		(0.167)
CBI Reform (GMT)		1.158**		0.884	1.005	0.749
		(0.550)		(0.621)	(0.665)	(0.722)
Government Change		0.609		0.473	0.592	0.386
		(0.450)		(0.442)	(0.482)	(0.461)
Governance		-0.393		-0.359	-0.475	-0.368
		(0.336)		(0.352)	(0.364)	(0.371)
OECD Dummy		1.424**		1.704***	1.504**	1.750***
		(0.643)		(0.640)	(0.656)	(0.649)
Polity		-0.062		-0.063	-0.056	-0.059
		(0.058)		(0.056)	(0.059)	(0.057)
Civil Law Dummy		-0.724		-1.016**	-0.756	-1.125**
		(0.449)		(0.459)	(0.461)	(0.472)
Observations	1,694	1,226	1,642	1,186	906	876
Number of Countries	102	87	99	84	87	84
Year FE					YES	YES

 The dependent variable is a reform dummy that takes the value one in years when the CBIS index changes. Financial Crisis is a dummy variable that takes the value one if a country has experienced a systemic banking crisis in the previous two years. Peers - Geographical/Trade represents the absolute distance between a country's level of CBIS and that of its peers, where the average value of CBIS of peer countries is computed based on geographical distance and trading partners, respectively. CBI reform (GMT) is a dummy variable for countries that have undertaken reforms that modified the degree of independence of their central banks in the same year. Government Change is a dummy variable that indicates whether a change of the executive party took place in the past two years. Governance is the average value of the Worldwide Governance Indicators (WGI) from the World Bank. OECD Dummy is a dummy variable that takes the value one for OECD countries. Polity is a variable capturing the level of democracy of a country. Civil Law Dummy is a dummy variable for countries characterised by a civil law system. Constant terms are included, but not reported. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

columns (5) and (6) check the robustness of the baseline results when controlling for time fixed effects that account for any shocks that affect all countries in a given year.

Table 2 repeats the same econometric exercise while considering the second set of bandwagon variables, namely the peer pressure coming from regional and trading partners. Columns (1)-(2) consider the distance between a country's supervisory architecture and that of its geo-

graphical neighbours, while columns (3)-(4) consider the distance between a country and its closest trading partners. The results are highly robust under these alternative peer effects measures and suggest that countries face an international pressure to reform, whenever their institutional setting is the farthest from its peers. Columns (2) and (4) consider a larger set of country-specific characteristics, while columns (5)-(6) control for time fixed effects.

Overall, the baseline results in Tables 1 and 2 provide a strong support for our two main hypotheses. Namely, they underline the strongly robust link between reforms that modify the involvement of central banks in financial sector supervision and the occurrence of financial crises. Second, we also provide robust evidence of spillover effects in the reform process. Regardless of the measure of peer countries employed, our finding reflect strong learning or converge among similar countries.

The regressions presented in Tables 1 and 2 pool together reforms that increase the degree of central bank involvement in supervision, with the ones that decrease the responsibilities of monetary policy authorities. This raises concern on whether the drivers of reforms identified are associated with changes towards higher or lower central bank involvement in unified supervision. Hence, in Tables 3, we focus our attention on events that increase or decrease the degree of central bank involvement in financial sector supervision, separately. Columns (1)-(4) pertain to reforms that increase the CBIS index, while columns (5)-(8) look at its reversals. For brevity, we restrict the attention to the key variable of interest, namely, financial crisis and bandwagon effects, but estimations control for the other set of country specific characteristics.

Interestingly, financial crisis present a positive and statistically significant correlation with the probability of improving the central bank involvement in financial supervision, while these episodes are not correlated with reversals in CBIS. These results show how recent financial crises are associated with reforms that generally increase central banks' supervisory respon-

Table 3: Determinants of positive/negative changes in CBIS

	Reforms that increase CBIS				Reforms that decrease CBIS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Financial Crisis	1.388***	1.057**	1.524***	1.310**	-0.505	0.113	-0.128	0.142
	(0.438)	(0.525)	(0.466)	(0.542)	(0.785)	(0.813)	(0.792)	(0.820)
Increases in CBIS (World)	0.735***	0.741***						
	(0.163)	(0.190)						
Increases in CBIS (Continent)			0.115***	0.094***				
			(0.026)	(0.027)				
Reversals in CBIS (World)					0.654***	0.621***		
					(0.130)	(0.157)		
Reversals in CBIS (Continent)							0.138***	0.100***
							(0.043)	(0.022)
Controls: CBI Reforms, Political, Institutional, Legal Factors		YES		YES		YES		YES
Observations	1,714	1,235	1,714	1,235	1,714	1,235	1,714	1,235
Number of Countries	105	88	105	88	105	88	105	88

The dependent variable is a reform dummy that takes the value one in years when the CBIS index increases in columns (1)-(4) and decreases in columns (5)-(8). Financial Crisis is a dummy variable that takes the value one if a country has experienced a systemic banking crisis in the previous two years. Increases/Reversals in CBIS (World/Continent) represent the share of countries that have increased/decreased the involvement of their central bank in financial sector supervision in the world/continent in the same year. Controls include a CBI reform dummy for countries that have undertaken reforms that modified the degree of independence of their central banks in the same year; a Government Change dummy variable that indicates whether a change in government took place in the past two years; Polity, a variable capturing the level of democracy of the country, as well as the World Governance Indicator, a OECD Dummy and a Civil Law dummy variable. Constant terms are included, but not reported. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

sibilities. The effects of the different bandwagon variables are still positive and strongly significant across all specifications. Therefore, peer effects are robust in explaining all types of reforms in financial supervisory architecture.

4.2   Determinants of supervision inside the central bank

The results presented so far were only concerned with the drivers of the reform process in financial supervisory architecture. Yet, taking advantage of the detailed index of the different types of integration developed in this paper, this section proposes an alternative methodological approach that looks at the determinants of a particular *level* of central bank involvement in supervision.

The dependent variable for these regressions is therefore the level of $CBIS_{it}$ which measure the degree of central bank involvement in supervision in country i in year t. Given the discrete, ordinal nature of this index, the baseline estimation uses an ordered probit model which allows for multiple discrete outcomes to be ranked.

We follow previous literature and consider a set of economic, geo-political and cultural elements as determinants of the level of the CBIS index (see also Dalla Pellegrina et al., 2013; Melecky and Podpiera, 2013). The baseline specification is as follows:

$$CBIS_{it} \;\; = \;\; \beta_1 Crises_{i,t-1} + \beta_2 CBI_{i,t-1} + \beta_3' \mathbf{X} + \varepsilon_{it}, \tag{4}$$

where *Crises* is the cumulative count of financial crises that have occurred in a country between 1970 and year $t-1$; $CBI_{i,t-1}$ is degree of central bank independence (CBI) computed using the Grilli et al. (1991) (GMT) or the Cukierman et al. (1992) (CWN) indices; and $\mathbf{X}$ is a vector of additional control variables.[11] Our approach differs from previous works such as

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[11]All explanatory variables considered are detailed in Table A4 in the appendix.

Table 4: Determinants of Supervision inside the Central Bank

	(1)	(2)	(3)	(4)	(5)	(6)
Financial Crises (Cumulative)	0.742***	0.638***	0.685***	0.725***	0.620***	0.686***
	(0.143)	(0.144)	(0.194)	(0.145)	(0.145)	(0.194)
CBI Index	-2.705***	-2.331***	-2.101**	-1.738***	-1.211***	-0.784
	(0.520)	(0.539)	(1.032)	(0.445)	(0.458)	(0.745)
Governance		-0.467*	-0.170		-0.336	-0.013
		(0.252)	(0.327)		(0.250)	(0.332)
Civil Law Dummy		-1.900***	-2.579***		-2.036***	-2.818***
		(0.536)	(0.710)		(0.541)	(0.718)
Latitude		-0.045***	-0.051***		-0.049***	-0.056***
		(0.015)	(0.020)		(0.016)	(0.020)
Macroprudential Index (MPI)			0.204**			0.229**
			(0.104)			(0.099)
Observations	1,409	1,360	933	1,495	1,432	954
Number of Countries	93	93	73	93	93	73
Continent FE		YES	YES		YES	YES
Country FE	YES			YES		

The dependent variable is the CBIS index. Financial Crises (Cumulative) capture the cumulative number of financial crises since 1970. CBI Index is a variable indicating the degree of central bank independence as computed following the Grilli et al. (1991), columns (1-3), and the Cukierman et al. (1992), columns (4-6), indices. Governance is the average value of the Worldwide Governance Indicators (WGI) from the World Bank. Civil Law Dummy is a dummy variable for countries characterised by a civil law system. Latitude indicates the latitude of the country. Macroprudential Index (MPI) is the index of macroprudential policies proposed by Cerutti et al. (2015). Continent dummies and constant terms are included, but not reported. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

Dalla Pellegrina et al. (2013) who look at the central bank involvement in banking supervision in 2010, as we employ a panel data approach that investigates the determinants of a particular financial sector supervisory architecture, over the entire period 1996–2013.

Since this approach might be subject to possible endogeneity problems, we lag most time series variables by one period. We present our main results in Table 4. Our interest is now focused on the determinants of financial supervision architecture and in particular on whether financial crisis and central bank design play an important role in influencing central bank involvement in supervision. The results presented in Table 4 show that the number of financial crises previously experienced by a country positively influence the incentives to improve the central bank involvement in supervision. In columns (1) through (3), we examine whether the

degree of central bank independence, computed following the GMT index, shapes financial sector supervision. While in columns (4) to (6), we focus on the CWN indices of central bank independence.[12] The results show a negative effect of independence on the degree of central banks involvement in financial supervision. These findings support the idea that more independent the supervisor, the greater the fear of powerful institutions or bureaucratic misconduct (Masciandaro and Quintyn, 2015). This suggests that, in countries characterised by more independent central banks, politicians are less likely to unify financial sector supervision in their hands, since they might fear bureaucratic misconduct.

In columns (3) and (6) of Table 4 we also include a the degree of involvement of the central bank in macroprudential policy. Blanchard (2015) suggests that banking supervision reforms are more important in the context of countries undertaking macroprudential policies. Hence, we might expect that countries in which central banks have a higher involvement in macroprudential policies will also be associated with more supervisory powers. The positive and statistically significant coefficient of the *Macroprudential Index (MPI)* in columns (3) and (6) provides strong support for this argument. Among the other explanatory variables, the negative sign of the civil law dummy and the latitude of the country signal how countries adopting a civil legal system and countries characterised by an higher latitude tend to have financial services supervision responsibilities outside the central bank.

To further test the robustness of these results and of our new index of financial supervisory design, we replicate some of the estimations proposed by Melecky and Podpiera (2013). These authors consider both institutional and economic elements, as well as financial sector characteristics, in explaining financial sector supervision unification. First, they relate past experiences of financial distress and previous levels of central bank independence with the current finan-

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[12]As previously mentioned, the Grilli et al. (1991) index of independence also include information on the central bank involvement in banking supervision. These information are not accounted for in the Cukierman et al. (1992) index. For this reason, we use the CWN index for robustness checks.

Table 5: Determinants of Supervision inside the Central Bank
Robustness checks

	(1)	(2)	(3)	(4)
Financial Crises (Cumulative)	0.520**	0.338*	0.514**	0.341*
	(0.239)	(0.183)	(0.237)	(0.186)
CBI Index	-2.535**	-1.536**	-0.562	-0.980*
	(1.039)	(0.597)	(0.752)	(0.530)
Governance	0.509	-0.026	0.476	0.071
	(0.441)	(0.323)	(0.432)	(0.327)
GDP per capita	-0.001***	-0.001***	-0.001***	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)
Population	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Openness to Trade	0.017***	0.013***	0.020***	0.015***
	(0.005)	(0.003)	(0.006)	(0.004)
Private credit to GDP	-0.002	0.003	-0.002	0.002
	(0.004)	(0.003)	(0.004)	(0.003)
Nonlife insurance premium to GDP	-0.531**		-0.515**	
	(0.223)		(0.221)	
Stock market capitalization to GDP	-0.004	-0.004*	-0.005	-0.004*
	(0.003)	(0.002)	(0.003)	(0.002)
Number of listed companies	-0.007**		-0.006*	
	(0.003)		(0.003)	
Bank concentration	-0.003		-0.002	
	(0.006)		(0.006)	
Bank cost to income ratio	0.009		0.011*	
	(0.007)		(0.006)	
Observations	911	1,072	943	1,129
Number of Countries	81	84	82	85

The dependent variable is the CBIS index. Financial Crises (Cumulative) capture the cumulative number of financial crises since 1970. CBI Index is a variable indicating the degree of central bank independence as computed following the Grilli et al. (1991), columns (1-3), and the Cukierman et al. (1992), columns (4-6), indices. Governance is the average value of the Worldwide Governance Indicators (WGI) from the World Bank. GDP per capita measure the level of real GDP per capita of the country. Population is a measure of the size of the county in terms of population. Openness to Trade is a measure of the country's degree of openness to trade. Private Credit to GDP, Nonlife insurance premium, Stock market capitalization to GDP, Number of listed companies, Bank concentration and Bank cost to income ratio are measures of financial development of the country. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

cial sector supervision structure. Our new results complement these findings since the more detailed structure of our index enable us to relate these country characteristics to the level of supervisory unification inside the central bank. We present the replication of some of Melecky and Podpiera's (2013) results in Table 5.

We find evidence that the degree of concentration of supervision in the hands of the central

bank is influenced by: a cumulative index of past financial crises, the degree of central bank independence, real GDP per capita, openness and financial sector development. The positive sign between the number of previous financial crises and the CBIS index suggests that countries that experienced more financial turmoils over the past two decades are prone to integrate their supervisory architecture in the hands of the central bank. This result complements those in the previous section 4.1, where we have shown that an episode of systemic banking crisis triggers a reform in supervision in the following years generally by increasing the degree of concentration in the hands of the central bank. The significant and negative coefficient of the degree of independence of the central bank suggests, as already shown in Table 4, that higher central bank involvement in supervision is a less preferred outcome for politicians in countries characterised by more independent monetary policy authorities.

Moreover, we find that a country's level of development (GDP per capita) has a negative effect on CBIS, meaning that the concentration of supervision in the hands of the central bank is more common in less developed countries. This result can be read together with the positive coefficient found for the degree of openness to trade. Indeed, smaller economies, which tend to have also a higher degree of openness to trade, are more likely to have fewer institutional authorities and thus integrate the supervision inside the central bank. Finally, we also find that less financially developed countries are characterised by a higher concentration of supervisory powers in the hands of the central bank.

Most of these results differ from those in Melecky and Podpiera (2013) and stress the key difference between our measure of supervision and theirs. While they look at unified supervision regardless of the authority in charge, we discuss about a unified supervision inside the central bank. Hence, the country characteristics that are associated with the central bank being responsible for the supervision of the entire financial sector might be significantly different.

Lastly, it should be noted that, different to previous research, our main results in section 4.1 pertain to reforms in central bank involvement in supervision, i.e., years in which the institutional setting has been modified. This econometric specification mitigates concerns regarding any subjectivity in the construction of our index, such as the different ranking assigned to the levels of integration in supervision.

4.3   Robustness checks

This section provides a series of further robustness checks. These are presented in Appendix Tables A5-A9. In Appendix Table A5, we consider an alternative definition of our first set of bandwagon effects. Instead of looking at the share of countries reforming their supervisory architecture, we now consider the share of countries that have in place the same institutional setting as the reference country. This takes into account the fact that, if a certain supervisory architecture is "fashionable", countries are less likely to undertake reforms that modify it. This alternative methodology results in two new measures denoted by "Same CBIS Index (World)" and "Same CBIS Index (Continent)" in Appendix Table A5. They indicate the share of countries that are characterised by the same institutional setting as country i in year t, all around the world and in the same continent, respectively. These variables can be interpreted as follows: if any spillover effects in the architecture of financial sector supervision are present, the probability that country i undertakes a reform in year t is negatively related with the share of countries that are currently adopting its same supervisory architecture (same CBIS). In other words, when the supervisory system of country i is identical to that in a substantial number of other countries, country i is less likely to implement a reform that would modify it. The negative and statistically significant coefficient of the new measures of peers effects across all specifications in Appendix Table A5 supports this hypothesis. Hence, the more fashionable a

26

supervisory architecture is, the less interested a country will be in implementing a reform to modify it. The different columns in Appendix Table A5 control for the same country characteristics as our estimations in Table 1.

In Appendix Table A6, we present some sensitivity tests regarding the drivers of positive versus negative reforms. In Table 3, we have considered only the first set of bandwagon effects, namely those related to the share of countries undertaking reforms. Hence, in Appendix Table A6, we re-estimate the complementary logarithmic model and look at the second set of spillover indicators which take into account the distance between the reference countries and its geographical and trading peers, respectively. Results, are highly robust and support the strong peer effects in undertaking reforms, in particular those that increase the level of CBIS.

Our next set of robustness tests refers to the type of crises that might trigger reforms in financial sector supervision. In our baseline results we have considered the impact of systemic banking crises only. We now check whether other types of crises might be associated with similar reforms. In particular, we consider the role of economic recessions or currency crises in the two years prior to a reform. Appendix Table A7 presents the same estimations as in Table 1 controlling for these other types of crises. We find no support for an effect of recessions or currency crises on the probability of reforming CBIS. Hence, only crises that originate in the banking sector trigger such reforms.

The last two sensitivity checks are performed on the empirical strategy that looks at the determinants of the level of central bank involvement in the supervision of the financial sector. In particular, Appendix Tables A8 and A9 consider an alternative ranking of the CBIS index. This index is a restricted version of our main measure and ranges from 1 to 4. Higher values indicate a higher concentration of supervisory powers in the hands of the central bank. A value of 1 is assigned if the central bank has no responsibility for financial sector supervision, 2 if the

central bank is the sole supervisor of the banking sector, 3 if the central bank has supervisory responsibility in (any) two sectors and 4 if the central bank is the sole institution responsible for supervision in the banking, insurance and securities markets sectors. This alternative aggregation and point ranking ensure us that our main results are not driven by the choice of the ordering of the different levels of supervisory integration. Appendix Tables A8 and A9 re-estimate our empirical strategies in Tables 4 and 5 employing this restricted index. The results are highly robust under this alternative specification and support the importance of financial crises and the level of central bank independence for an unified supervision inside the central bank.[13]

5 Concluding remarks

The role of central banks in the supervision of the financial sector has received a lot of attention following the 2007–09 Global Financial Crisis. It is generally argued that crises episodes signal possible supervisory failures of the institutional architecture of financial sector supervision. However, no previous study explicitly tests whether the occurrence of financial crises is associated with reforms in the architecture of financial sector supervision.

In this paper, we propose a novel investigation of the determinants of reforms that shape the involvement of central banks in financial sector supervision. We use a novel dataset that tracks the evolution of reforms in the supervisory architecture of the financial sector including banking, insurance and securities markets. We build a new index that measures the degree to which the unified supervision of the entire financial sector is concentrated in the hands of the central bank.

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[13]In unreported results, we perform several other robustness checks. We estimate the model that assesses the probability of reforming CBIS employing a probit model instead of the complementary logarithmic one. We also consider an alternative measure of central bank independence computed following Cukierman et al. (1992). Our main results hold under these alternative estimations and are available upon request.

Employing a panel of 105 countries we find that, over the period 1996–2013, systemic banking crises are important drivers of reforms in supervisory architecture. However, we also highlight an important international spillover effect among central banks. We propose several new measures to capture the effect of peer countries on the probability of reforming ones institutional setting. We show that countries are more likely to reform when the share of countries undertaking reforms in the same period is higher. We construct two measures of peer countries employing spatial characteristics of countries such as geographical distance and trade relationships. We find that countries whose institutional setting is the farthest from their peer group are more likely to undertake reforms. Finally, a country is less likely to change its supervisory architecture if this architecture is popular among its peers. These results contribute to a recent literature that tries to understand the role of international spillovers in shaping the institutional design among countries.

While our research highlights important determinants of the probability of reforms in financial supervision, we do not take a stand on whether a higher degree of central bank involvement in supervision might influence the stability or efficiency of the financial sector. Employing our new index of financial supervision architecture, future research could be directed towards understanding the macroeconomic effects of moving towards a unified supervision inside the central bank.

References

Abiad, A. and A. Mody (2005). Financial reform: What shakes it? what shapes it? *American Economic Review 95*(1), 66–88.

Arnone, M. and A. Gambini (2007). Architecture of supervisory authorities and banking supervision. *Designing Financial Supervision Institutions: Independence, Accountability and Governance, Edward Elgar, Cheltenham*, 262–308.

Arnone, M. and D. Romelli (2013). Dynamic central bank independence indices and inflation rate: A new empirical exploration. *Journal of Financial Stability 9*(3), 385–398.

Beck, T., A. Demirguc-Kunt, and R. Levine (1999). A new database on financial development and structure. Policy Research Working Paper Series 2146, The World Bank.

Bernanke, B. S. (2007). Central banking and bank supervision in the united states. Technical report. Remarks made at the Allied Social Science Association Annual Meeting, Chicago, Illinois.

Blanchard, O. (2015). Ten takeaways from the 'rethinking macro policy. progress or confusion?'. *VoxEU.org*.

Bodea, C. and R. Hicks (2015). International finance and central bank independence: Institutional diffusion and the flow and cost of capital. *The Journal of Politics 77*(1), pp. 268–284.

Borio, C., G. Toniolo, and P. Clement (2011). *The Past and Future of Central Bank Cooperation*. Studies in Macroeconomic History. Cambridge University Press.

Braun, M. and B. Larrain (2005). Finance and the business cycle: international, inter-industry evidence. *The Journal of Finance 60*(3), 1097–1128.

Cerutti, E., S. Claessens, and L. Laeven (2015). The use and effectiveness of macroprudential policies: New evidence. *Journal of Financial Stability*.

Chortareas, G., V. Logothetis, G. Magkonis, and K.-M. Zekente (2016). The effect of banking supervision on central bank preferences: Evidence from panel data. *Economics Letters 140*, 11–13.

Čihák, M., A. Demirgüč-Kunt, E. Feyen, and R. Levine (2013). Financial development in 205 economies, 1960 to 2010. Technical report, National Bureau of Economic Research.

Cukierman, A., S. B. Webb, and B. Neyapti (1992). Measuring the independence of central banks and its effect on policy outcomes. *The World Bank Economic Review 6*(3), 353–398.

Dalla Pellegrina, L., D. Masciandaro, and R. Pansini (2013). The central banker as prudential supervisor: Does independence matter? *Journal of Financial Stability 9*(3), 415–427. Central banking 2.0: Fitting the mainstream.

De Grauwe, P. (2008). There is more to central banking than inflation targeting. *The First Global Financial Crisis of the 21st Century*, 159.

Di Noia, C. and G. Di Giorgio (1999). Should banking supervision and monetary policy tasks be given to different agencies? *International Finance 2*(3), 361–378.

Dincer, N. N. and B. Eichengreen (2012). The architecture and governance of financial supervision: Sources and implications. *International Finance 15*(3), 309–325.

Elhorst, P., E. Zandberg, and J. de Haan (2013). The impact of interaction effects among neighbouring countries on financial liberalization and reform: a dynamic spatial panel data approach. *Spatial Economic Analysis 8*(3), 293–313.

Goodhart, C. (2008). The regulatory response to the financial crisis. *Journal of Financial Stability 4*(4), 351 – 358. Regulation and the Financial Crisis of 2007-08: Review and Analysis.

Goodhart, C. and D. Schoenmaker (1995). Should the functions of monetary policy and banking supervision be separated? *Oxford Economic Papers 47*(4), 539–60.

Grilli, V., D. Masciandaro, and G. Tabellini (1991). Political and monetary institutions and public financial policies in the industrial countries. *Economic Policy 6*(13), 342–392.

Ioannidou, V. P. (2005). Does monetary policy affect the central bank's role in bank supervision? *Journal of Financial Intermediation 14*(1), 58 – 85.

Kaufmann, D., A. Kraay, and M. Mastruzzi (2010). The worldwide governance indicators : methodology and analytical issues. Policy Research Working Paper Series 5430, The World Bank.

La Porta, R., F. Lopez-de Silanes, A. Shleifer, and R. Vishny (1999). The quality of government. *Journal of Law, Economics, and Organization 15*(1), 222–279.

Laeven, L. and F. Valencia (2013). Systemic banking crises database. *IMF Economic Review 61*(2), 225–270.

Leavy, M. T. and M. R. Robert (2014). Do peer firms affect corporate financial policy? *The Journal of Finance 69*(1), 139–178.

Masciandaro, D. (2006). E pluribus unum? authorities' design in financial supervision: trends and determinants. *Open Economies Review 17*(1), 73–102.

Masciandaro, D. (2007). Divide et impera: Financial supervision unification and central bank fragmentation effect. *European Journal of Political Economy 23*(2), 285 – 315.

Masciandaro, D. (2009). Politicians and financial supervision unification outside the central bank: Why do they do it? *Journal of Financial Stability 5*(2), 124 – 146.

Masciandaro, D. and M. Quintyn (2009). Reforming financial supervision and the role of central banks: a review of global trends, causes and effects (1998-2008). *CEPR Policy Insight 30*, 1–11.

Masciandaro, D. and M. Quintyn (2015). The governance of financial supervision: recent developments. *Journal of Economic Surveys*.

Masciandaro, D., M. Quintyn, and M. W. Taylor (2008). Inside and outside the central bank: Independence and accountability in financial supervision: Trends and determinants. *European Journal of Political Economy 24*(4), 833 – 848.

Mayer, T. and S. Zignago (2011). Notes on cepii's distances measures: The geodist database. Working Papers 2011-25, CEPII.

Melecky, M. and A. M. Podpiera (2013). Institutional structures of financial sector supervision, their drivers and historical benchmarks. *Journal of Financial Stability 9*(3), 428 – 444.

Peek, J., E. S. Rosengren, and G. M. B. Tootell (1999). Is bank supervision central to central banking? *The Quarterly Journal of Economics 114*(2), pp. 629–653.

Persson, T. and G. Tabellini (2009). Democratic capital: The nexus of political and economic change. *American Economic Journal: Macroeconomics 1*(2), 88–126.

PolityIV (2014). Polity iv project: Political regime characteristics and transitions, 1800-2014. *On-line (http://www.systemicpeace.org/inscrdata.html)*.

Romelli, D. (2016). The political economy of reforms in central bank design: evidence from a new dataset. Mimeo, Department of Economics, ESSEC Business School.

Toniolo, G. (2011). What is a useful central bank. Number 42 in Norges Bank Occasional Papers, Chapter What is a useful central bank? Lessons from interwar years.

Ugolini, S. (2011). What do we really know about the long-term evolution of central banking? evidence from the past, insights for the present. Working Paper 2011/15, Norges Bank.

World Bank (2014). World development indicators 2014. Technical report, World Bank Publications.

Table A1: Analyzed countries

Country	Fist Year	Last Year	Country	Fist Year	Last Year
Afghanistan	2005	2013	Kosovo	2008	2013
Albania	1996	2013	Kuwait	2011	2013
Algeria	1996	2013	Latvia	1996	2013
Argentina	1996	2013	Lebanon	2011	2013
Armenia	2000	2013	Lithuania	1996	2013
Australia	1996	2013	Luxembourg	1996	2013
Austria	1996	2013	Macedonia	2009	2013
Azerbaijan	2007	2013	Malaysia	1996	2013
Bahrain	1996	2013	Malta	1996	2013
Bangladesh	1996	2013	Mauritius	2001	2013
Barbados	1996	2013	Mexico	1996	2013
Belarus	1996	2013	Moldova	1998	2013
Belgium	1996	2013	Mongolia	2006	2013
Bermuda	1996	2013	Montenegro	2007	2013
Bolivia	1996	2013	Morocco	2002	2013
Bosnia and Herzegovina	2004	2013	Namibia	2001	2013
Botswana	1996	2013	Netherlands	1996	2013
Brazil	1996	2013	New Zealand	1996	2013
Bulgaria	1997	2013	Nicaragua	1996	2013
Canada	1996	2013	Norway	1996	2013
Chile	1996	2013	Pakistan	1997	2013
China	1998	2013	Panama	1996	2013
Colombia	1996	2013	Peru	1996	2013
Costa Rica	1996	2013	Philippines	1996	2013
Croatia	1996	2013	Poland	1996	2013
Cyprus	2002	2013	Portugal	1996	2013
Czech Republic	1996	2013	Qatar	2005	2013
Denmark	1996	2013	Republic of Serbia	2003	2013
Dominican Republic	2000	2013	Romania	2002	2013
Ecuador	1996	2013	Russia	1996	2013
Egypt	1996	2013	Saudi Arabia	1996	2013
El Salvador	1996	2013	Singapore	1996	2013
Estonia	1996	2013	Slovakia	2000	2013
Finland	1996	2013	Slovenia	2000	2013
France	1996	2013	South Africa	1996	2013
Georgia	1999	2013	South Korea	1996	2013
Germany	1996	2013	Spain	1996	2013
Greece	1996	2013	Sri Lanka	2000	2013
Guatemala	2002	2013	Sweden	1996	2013
Hong Kong S.A.R.	1996	2013	Switzerland	1996	2013
Hungary	1996	2013	Thailand	1996	2013
Iceland	1999	2013	The Bahamas	1996	2013
India	1999	2013	Trinidad and Tobago	1996	2013
Indonesia	1996	2013	Tunisia	1996	2013
Iran	2000	2013	Turkey	1996	2013
Ireland	1996	2013	Ukraine	2003	2013
Israel	1996	2013	United Arab Emirates	2000	2013
Italy	1996	2013	United Kingdom	1996	2013
Jamaica	1996	2013	United States of America	1996	2013
Japan	1996	2013	Uruguay	1996	2013
Jordan	1999	2013	Venezuela	1996	2013
Kazakhstan	1998	2013	Zimbabwe	2004	2013
Kenya	1990	2013			

Table A2: Supervisory Authorities in 105 countries as of end 2013

Country	Banking Sector	Insurance Sector	Securities Markets	Country	Banking Sector	Insurance Sector	Securities Markets
Afghanistan	CB	I	CB	Kosovo	CB	CB	CB
Albania	CB	IS	IS	Kuwait	CB	G	S
Algeria	CB	I	S	Latvia	U	U	U
Argentina	CB	I	S	Lebanon	CB,B	I	S
Armenia	CB	CB	CB	Lithuania	CB	CB	CB
Australia	BI	BI	S	Luxembourg	BS	I	BS
Austria	CB,U	U	U	Macedonia	CB	I	S
Azerbaijan	CB	I	S	Malaysia	CB,G	CB,G	S
Bahrain	CB	CB	CB	Malta	U	U	U
Bangladesh	CB	I	S	Mauritius	CB	IS	IS
Barbados	CB	IS	IS	Mexico	BS	I	BS
Belarus	CB	G	G	Moldova	CB	IS	IS
Belgium	CB,U	CB,U	CB,U	Mongolia	CB	IS	IS
Bermuda	CB	CB	CB	Montenegro	CB	I	S
Bolivia	B	IS	IS	Morocco	CB	G	S
Bosnia and Herzegovina	CB,B**	I	S	Namibia	CB	IS	IS
Botswana	CB	G	G	Netherlands	CB	CB	CB,S
Brazil	CB	I	S	New Zealand	CB	CB	S
Bulgaria	CB	IS	IS	Nicaragua	U	U	U
Canada	BI	BI	S**	Norway	U	U	U
Chile	CB,U	U	U	Pakistan	CB	IS	IS
China	B	I	S	Panama	B	I	S
Colombia	U	U	U	Peru	U	U	U
Costa Rica	B	I	S	Philippines	CB	I	S
Croatia	CB	IS	IS	Poland	U	U	U
Cyprus	CB	I	S	Portugal	CB	I	S
Czech Republic	CB	CB	CB	Qatar	CB	CB	CB
Denmark	U	U	U	Republic of Serbia	CB	CB	S
Dominican Republic	B	I	S	Romania	CB	IS	IS
Ecuador	BI	BI	S	Russia	CB	CB	CB
Egypt	CB	IS	IS	Saudi Arabia	CB	CB	S
El Salvador	U	U	U	Singapore	CB	CB	CB
Estonia	U	U	U	Slovakia	CB	CB	CB
Finland	U	U	U	Slovenia	CB	I	S
France	CB	CB	S	South Africa	CB	IS	IS
Georgia	CB	I	CB	South Korea	U	U	U
Germany	CB,U	U	U	Spain	CB	I	S
Greece	CB	CB	S	Sri Lanka	CB	I	S
Guatemala	BI	BI	S	Sweden	U	U	U
Hong Kong S.A.R.	CB	I	S	Switzerland	U	U	U
Hungary	CB	CB	CB	Thailand	CB	I	S
Iceland	U	U	U	The Bahamas	CB	G	S
India	CB	I	S	Trinidad and Tobago	CB	CB	S
Indonesia	U	U	U	Tunisia	CB	I	S
Iran	CB	I	SS	Turkey	B	I	S
Ireland	CB	CB	CB	Ukraine	CB	IS	IS
Israel	CB	G	S	United Arab Emirates	CB	CB	S
Italy	CB	CB	S	United Kingdom	CB	CB	CB
Jamaica	CB	IS	IS	United States of America	CB,B**	CB,I**	S**
Japan	U	U	U	Uruguay	CB	CB	CB
Jordan	CB	G	I	Venezuela	B	I	S
Kazakhstan	CB	CB	CB	Zimbabwe	CB	I	S
Kenya	CB	I	S				

Notes: The initials have the following meaning: B = authority specialised in the banking sector; BI = authority specialised in the banking and insurance sector; BS = authority specialised in the banking sector and securities markets; CB = central bank; G= government; I = authority specialised in the insurance sector; IS = authority specialised in the insurance sector and securities markets; S = authority specialised in the securities markets; U = single authority for all sectors; ** = state or regional agencies.

Table A3: Countries reforming Financial Sector Supervision between 1996 and 2013

Year	Countries
1996	
1997	
1998	Australia, Japan, Luxembourg, United Kingdom
1999	South Korea
2000	
2001	Ireland, Latvia
2002	Bahrain, Estonia, Malta
2003	China, Ireland, Kazakhstan, Saudi Arabia
2004	Kazakhstan, Netherlands, Saudi Arabia, Trinidad and Tobago
2005	
2006	Armenia, Czech Republic, Slovakia
2007	
2008	Austria, Georgia, Poland
2009	Georgia
2010	France, Greece, Ireland, New Zealand, United States
2011	Belgium, Kazakhstan
2012	Lithuania, United Kingdom
2013	Georgia, Hungary, Indonesia, Italy, Qatar, Russia

Table A4: Data description

Variable	Definition	Description	Source
Dependent variables			
CBIS Reform	Reforms in the degree of CBIS	Dummy that signals whether a supervisory reform that modified the CBIS Index have occurred or not in year t.	Authors
CBIS Index	Central Bank Involvement in Supervision Index	The CBIS Index ranges from 1 to 7. A higher value indicates a higher concentration of supervisory powers in the hand of the Central Banks. The variable takes value =7 if the Central Bank has full Supervision of the Financial System, =6 if Banking and Securities Market Supervision are in the hand of the Central Bank, =5 if Banking and Insurance Sector Supervision are in the hand of the Central Bank, =4 if the Central Bank is only responsible for Banking Supervision, =3 if the Central Bank is sharing the Supervision of the Financial System with another institution (Twin Peaks system), =2 if the Central Bank is partially responsible for Banking Supervision, =1 if the Central Bank is not involved in Supervision.	Authors
CBIS Restricted Index	Restricted CBIS	This index is a restricted version of the CBIS Index and it ranges from 1 to 4. A higher value indicates a higher concentration of supervisory powers in the hand of the Central Banks. The variable takes value =1 if the central bank is not assigned the main responsibility for banking supervision, =2 if the central bank has the main (or sole) responsibility for banking supervision, =3 if the central bank has responsibility in any two sectors, =4 if the central bank has responsibility in all three sectors.	Authors
Independent variables			
Financial Crisis	Systemic Banking Crises Dummy	Dummy that signals whether a crisis have occurred in the previous two years.	Authors
Reforms in CBIS (World)	Proxy for Bandwagon Effects	Share of countries that are undertaking a financial sector supervisory reform in year t.	Authors
Reforms in CBIS (Continent)	Proxy for Bandwagon Effects	Share of of countries that, located in the same continent as country i, are undertaking a financial supervisory reform in year t.	Authors
Peers - Geographical	Proxy for Bandwagon Effects	Peers - Geographical indicates the absolute distance between a country's level of CBIS and that of its peers, where the average value of CBIS of peer countries is computed based on geographical distance.	Authors
Peers - Trade	Proxy for Bandwagon Effects	Peers - Trade indicates the absolute distance between a country's level of CBIS and that of its peers, where the average value of CBIS of peer countries is computed based on trade values.	Authors

Table A4 Continued: Data description

Variable	Definition	Description	Source
CBI reform (GMT)	Central Bank Independence Legislative Reforms	Dummy that signals whether a central bank legislative reform that modified the Grilli et al. (1991) index of central bank independence took place in year t. Given that this index also provides information on the involvement of central banks in banking supervision, the dummy variable for legislative reforms takes the value one only in years in which changes in the other characteristics of central bank institutional design took place.	Romelli (2016)
CBI Index	Index of Central Bank Independence	Captures the degree of central bank independence as measured using the Grilli et al. (1991) (GMT) or the Cukierman et al. (1992) (CWN) index, respectively.	Romelli (2016)
Same CBIS (World)	Proxy for Bandwagon Effects	Contains the number of countries that are adopting the same financial supervision architecture as country i in year t.	Authors
Same CBIS (Continent)	Proxy for Bandwagon Effects	Contains the number of countries that are located in the same continent as country i and are adopting the same financial supervision architecture as country i in year t.	Authors
Financial Crisis (Cumulative)	Cumulative number of Systemic Banking Crises	Cumulative number of financial crises since 1970.	Authors

	Other explanatory variables		
Government Change	Effective Changes in the Executive Power	Dummy that signals whether the effective control of executive power have changed up to two years before or not.	Kaufmann et al. (2010)
Governance	Worldwide Governance Indicators	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	Kaufmann et al. (2010)
OECD Dummy	OECD Membership Dummy	Dummy for OECD member countries: 1= OECD member; 0 = non-OECD member.	Authors
Polity	Polity2	Index that measures the difference between the democratic and the autocratic score of a country. The resulting unified polity scale ranges from +10 (strongly democratic) to -10 (strongly autocratic).	PolityIV (2014)
Civil Law Dummy	Civil Law Legal Origins	Dummy for Civil Law legal roots: 1= French, German and Scandinavian Law; 0 = non-French, German and Scandinavian Law.	La Porta et al. (1999)
Latitude	Countries' Latitude	The value is calculated as in Beck et al. (1999) as absolute value of country's latitude standardized on values between 0 and 1.	Mayer and Zignago (2011)
Macroprudential Index (MPI)	Index of central bank oversight of macroprudential policies	This index captures the degree of central bank oversight of macroprudential policies. It is obtained by interacting the fraction of macroprudential instruments that are controlled by the central bank in 2013 and the sum of the 12 macroprudential instruments included in the Global Macroprudential Policy Instruments (GMPI) survey of the IMF.	Cerutti et al. (2015)
Continents	Continents' Dummies	Dummy that signals whenever a country is located in the Africa, America, Asia, Europe or Oceania.	Mayer and Zignago (2011)
GDP per capita	Real GDP per capita	GDP per capita at constant 2005 US$.	World Bank (2014)
Population	Population	Total population of the country. The values shown are midyear estimates.	World Bank (2014)
Openness to Trade	Degree of Trade Openness	Exports + Imports of goods and services (% of GDP)	World Bank (2014)
Private credit to GDP	Private credit to GDP	Private credit by deposit money banks to GDP	Čihák et al. (2013)
Non life premium to GDP	Non life premium volume to GDP	Non life insurance premium volume as a share of GDP.	Čihák et al. (2013)
Stock market capitalization to GDP	Stock market capitalization to GDP	Value of listed shares to GDP.	Čihák et al. (2013)
Number of listed companies	Number of listed companies	Number of publicly listed companies per 10K population.	Čihák et al. (2013)
Bank Concentration	Banking sector concentration	Assets of three largest banks as a share of assets of all commercial banks.	Čihák et al. (2013)
Bank cost to income ratio	Commercial banks cost to income ratio	Total costs as a share of total income of all commercial banks.	Čihák et al. (2013)

Table A5: Determinants of Supervisory reforms (Bandwagon effects = Same system)

	(1)	(2)	(3)	(4)	(5)	(6)
Financial Crisis	0.686**	0.709**	0.600**	0.584**	1.212**	0.855
	(0.290)	(0.290)	(0.292)	(0.292)	(0.567)	(0.531)
Same CBIS Index (World)	-7.240***	-7.045***			-8.726***	
	(0.838)	(1.221)			(1.821)	
Same CBIS Index (Continent)			-6.462***	-6.396***		-7.551***
			(1.015)	(1.488)		(1.891)
CBI Reform (GMT)		1.259*		1.225*	1.009	0.879
		(0.730)		(0.705)	(0.736)	(0.728)
Government Change		0.430		0.310	0.202	0.123
		(0.624)		(0.598)	(0.509)	(0.496)
Governance		-0.361		-0.124	-0.554	-0.214
		(0.373)		(0.449)	(0.497)	(0.476)
OECD Dummy		1.842**		1.618**	2.206**	1.825**
		(0.759)		(0.716)	(0.895)	(0.840)
Polity		-0.085		-0.069	-0.076	-0.056
		(0.068)		(0.063)	(0.073)	(0.068)
Civil Law Dummy		-1.240***		-1.415***	-1.480**	-1.619**
		(0.439)		(0.469)	(0.619)	(0.654)
Observations	1,714	1,235	1,714	1,235	914	914
Number of Countries	105	88	105	88	88	88
Year FE					YES	YES

The dependent variable is a reform dummy that takes the value one in years when the CBIS index changes. Financial Crisis is a dummy variable that takes the value one if a country has experienced a systemic banking crisis in the previous two years. Same CBIS (World/Continent) represent the share of countries characterised by the same supervisory architecture of the reference country. CBI Reform (GMT) is a dummy variable for countries that have undertaken reforms that modified the degree of independence of their central banks in the same year. Government change is dummy variable that indicates whether a change in government took place in the past two years. Governance is a World Bank indicator for the level of governance in country. Polity is a variable capturing the level of democracy of a country. Constant terms are included, but not reported. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

Table A6: Determinants of positive/ negative reforms (Bandwagon effects = Geography and Trade)

	Reforms that increase CBIS				Reforms that decrease CBIS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Financial Crisis	1.254***	1.040**	1.284***	1.052**	-0.443	-0.201	-0.220	0.074
	(0.437)	(0.515)	(0.445)	(0.520)	(0.771)	(0.800)	(0.771)	(0.811)
Peers - Geographical	1.099***	1.275***			0.619***	0.449		
	(0.184)	(0.241)			(0.219)	(0.273)		
Peers - Trade			1.046***	1.162***			0.156	-0.304
			(0.197)	(0.217)			(0.236)	(0.365)
Controls:								
CBI Reform, Political,		YES		YES		YES		YES
Institutional, Legal factors								
Observations	1,694	1,226	1,642	1,186	1,694	1,226	1,642	1,186
Number of Countries	102	87	99	84	102	87	99	84

The dependent variable is a reform dummy that takes the value one in years when the CBIS index increases in columns (1)-(4) and decreases in columns (5)-(8). Financial Crisis is a dummy variable that takes the value one if a country has experienced a systemic banking crisis in the previous two years. Peers - Geographical/Trade represents the absolute distance between a country's level of CBIS and that of its peers, where the average value of CBIS of peer countries is computed based on geographical distance and trade partners, respectively. Controls include a CBI reform dummy for countries that have undertaken reforms that modified the degree of independence of their central banks in the same year; a government change dummy variable that indicates whether a change in government took place in the past two years; a variable capturing the level of democracy, as well as a world governance indicator, a OECD dummy and civil law dummy variable. Constant terms are included, but not reported. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

Table A7: Determinants of reforms (Robustness with other crises)

	(1)	(2)	(3)	(4)	(5)	(6)
Currency Crisis	0.031	-0.059				
	(1.067)	(1.078)				
Recession			-0.462	-0.506	0.331	0.481
			(0.511)	(0.530)	(0.417)	(0.420)
Reforms in CBIS (World)	0.473***		0.517***		0.508***	
	(0.132)		(0.128)		(0.128)	
Reforms in CBIS (Continent)		0.081***		0.087***		0.086***
		(0.019)		(0.020)		(0.019)
CBI Reform (GMT)	0.742	1.237**	0.716	1.181**	0.688	1.192**
	(0.598)	(0.566)	(0.577)	(0.556)	(0.582)	(0.557)
Government Change	0.415	0.614	0.422	0.644	0.362	0.596
	(0.453)	(0.470)	(0.455)	(0.471)	(0.451)	(0.467)
Governance	0.317	0.190	0.287	0.160	0.181	0.049
	(0.380)	(0.426)	(0.352)	(0.391)	(0.344)	(0.377)
OECD Dummy	1.380**	1.329*	1.465**	1.439**	1.566**	1.526**
	(0.677)	(0.742)	(0.652)	(0.721)	(0.651)	(0.710)
Polity	-0.110**	-0.109*	-0.110***	-0.112**	-0.103**	-0.106**
	(0.056)	(0.059)	(0.042)	(0.045)	(0.043)	(0.045)
Civil Law Dummy	-1.233***	-0.967**	-1.244***	-0.984**	-1.246***	-0.961**
	(0.440)	(0.474)	(0.431)	(0.467)	(0.434)	(0.466)
Observations	1,235	1,235	1,293	1,293	1,295	1,295
Number of Countries	88	88	94	94	94	94

The dependent variable is a reform dummy that takes the value one in years when the CBIS index changes. Currency Crisis is a dummy variable that takes the value one if a country has experienced a currency crisis in the previous two years. Recession is a dummy variable that takes the value one if a country has experienced a recession in the previous two years. In columns (3)-(4), recessions are identifies in every year in which a country experience a negative growth in its per capita GDP, while in columns (5)-(6) these episodes are identified following Braun and Larrain (2005). Reforms in CBIS (World/Continent) represent the share of countries that have reformed their financial supervisory structure in the world/continent in the same year. CBI Reform (GMT) is a dummy variable for countries that have undertaken reforms that modified the degree of independence of their central banks in the same year. Government change is dummy variable that indicates whether a change in government took place in the past two years. Governance is a World Bank indicator for the level of governance in country. Polity is a variable capturing the level of democracy of a country. Constant terms are included, but not reported. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

Table A8: Determinants of Unified Supervision inside the Central Bank

	(1)	(2)	(3)	(4)	(5)	(6)
Financial Crises (Cumulative)	0.918***	0.773***	0.844***	0.905***	0.755***	0.840***
	(0.161)	(0.158)	(0.222)	(0.163)	(0.159)	(0.222)
CBI Index	-2.274***	-1.908***	-1.411	-1.535***	-1.024**	-0.628
	(0.546)	(0.554)	(1.025)	(0.471)	(0.476)	(0.771)
Governance		-0.294	0.081		-0.169	0.238
		(0.251)	(0.316)		(0.249)	(0.321)
Civil Law Dummy		-1.774***	-2.347***		-1.906***	-2.555***
		(0.503)	(0.628)		(0.507)	(0.633)
Latitude		-0.042***	-0.044**		-0.046***	-0.048***
		(0.015)	(0.018)		(0.015)	(0.018)
Macroprudential Index (MPI)			0.252**			0.275***
			(0.106)			(0.103)
Observations	1,409	1,360	933	1,495	1,432	954
Number of Country_id	93	93	73	93	93	73
Continent FE		YES	YES		YES	YES
Country FE	YES			YES		

The dependent variable is the restricted version of the CBIS index. Financial Crises (Cumulative) capture the cumulative number of financial crises since 1970. CBI Index is a variable indicating the degree of central bank independence as computed following the Grilli et al. (1991), columns (1-3), and the Cukierman et al. (1992), columns (4-6), indices. Governance is the average value of the Worldwide Governance Indicators (WGI) from the World Bank. Civil Law Dummy is a dummy variable for countries characterised by a civil law system. Latitude indicates the latitude of the country. Macroprudential Index (MPI) is the index of macroprudential policies proposed by Cerutti et al. (2015). Continent dummies and constant terms are included, but not reported. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.

Table A9: Determinants of Banking Supervision inside the Central Bank
Robustness checks

	(1)	(2)	(3)	(4)
Financial Crises (Cumulative)	0.675**	0.387*	0.635**	0.387*
	(0.273)	(0.199)	(0.275)	(0.203)
CBI Index	-2.406**	-1.386**	-0.945	-1.014*
	(1.053)	(0.601)	(0.798)	(0.546)
Governance	0.602	0.046	0.621	0.145
	(0.449)	(0.324)	(0.456)	(0.328)
GDP per capita	-0.001***	-0.001***	-0.001***	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)
Population	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Openness to Trade	0.018***	0.014***	0.023***	0.016***
	(0.005)	(0.004)	(0.006)	(0.004)
Private credit to GDP	-0.002	0.003	-0.002	0.003
	(0.004)	(0.003)	(0.004)	(0.003)
Nonlife insurance premium to GDP	-0.551**		-0.572**	
	(0.230)		(0.231)	
Stock market capitalization to GDP	-0.005*	-0.004**	-0.005	-0.004*
	(0.003)	(0.002)	(0.004)	(0.002)
Number of listed companies	-0.008**		-0.006*	
	(0.004)		(0.004)	
Bank concentration	-0.005		-0.005	
	(0.007)		(0.007)	
Bank cost to income ratio	0.007		0.009	
	(0.007)		(0.007)	
Observations	911	1,072	943	1,129
Number of Countries	81	84	82	85

The dependent variable is the CBIS index. Financial Crises (Cumulative) capture the cumulative number of financial crises since 1970. CBI Index is a variable indicating the degree of central bank independence as computed following the Grilli et al. (1991), columns (1-3), and the Cukierman et al. (1992), columns (4-6), indices. Governance is the average value of the Worldwide Governance Indicators (WGI) from the World Bank. GDP per capita measure the level of real GDP per capita of the country. Population is a measure of the size of the county in terms of population. Openness to Trade is a measure of the country's degree of openness to trade. Private Credit to GDP, Nonlife insurance premium, Stock market capitalization to GDP, Number of listed companies, Bank concentration and Bank cost to income ratio are measures of financial development of the country. See Appendix Table A4 for complete variable definitions. Standard errors in parentheses. *** denotes significance at a 1% level, ** denotes significance at a 5% level, * denotes significance at a 10% level.