

## **New Financial Stability Governance and Central Banks\***

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## **New Financial Stability Governance and Central Banks**

### **1. Introduction**

Since the global financial crisis, countries have been assessing and reforming their regulatory structures, strengthening their microprudential policy regime, as well as creating or enhancing frameworks for macroprudential policies directed at system-wide or macro-level risks. Such macroprudential frameworks were laid out in a number of early discussion documents (see, for example, the IMF (2011), CGFS (2010), and Bank of England (2009)). These documents emphasize that the ultimate objective of macroprudential policy is the stability of the financial system as a whole and across all likely macroeconomic and credit market backdrops. The documents describe three components of macroprudential policy frameworks, specifically: (i) measuring and monitoring systemic risk; (ii) implementing policies to mitigate identified systemic risks; and, (iii) establishing an institutional and governance structure for implementing policy.

This paper reviews progress on the third above-mentioned component of a macroprudential policy framework – institutional arrangements and governance. We review macroprudential policymaking frameworks in a sample of 57 countries and consider whether countries have put in place frameworks to address potential financial stability risks, particularly time-varying or cyclical systemic risks. There are two reasons for the interest in frameworks for time-varying risks. First are the concerns often expressed about risks that could emerge in low interest rate environments, such as elevated asset prices, increased risk taking, as well as pressures on bank profits. These concerns have been the focus of many country and cross-country financial stability reports, including the October 2016 IMF Global Financial Stability Report (GSFR) and November 2016 report by a joint ESRB-ECB taskforce on “Macroprudential issues and structural change in a low interest rate environment.”<sup>1</sup> Second, the framework for implementing macroprudential policies to address cyclical risks, as opposed to structural risks, is less well-established. We look closely at the governance structures that have been put in place in recent years that might be positioned to monitor risk-taking in a low rate environment and increase resilience to risk-reassessments, as emphasized by these reports.

In our review of the governance structures to address cyclical financial stability risks, we center on the role of financial stability committees as well as the role of central banks, both as members of their economy’s financial stability committee and in their own right. Cyclical risks may

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<sup>1</sup> A late 2015 the BCBS Macroprudential Group undertook a detailed study of “Current macrofinancial risks and official sector responses” that involved a review of BCBS member financial stability reports. This review found the most widely-noted current concern among members to be the potential impact of the low global interest rate environment. These concerns related to both how the extended period of low interest rates and compressed risk premia could lead (and in some cases have led) to excessive risk taking, asset price acceleration and a weakening in lending standards and how low rates have promoted significant cross-border flows into emerging economies.

require the ability to take actions that are countercyclical, which may require political independence and experience with assessing time-varying risks. We look at the composition of financial stability committees and whether it is a coordinating body of existing financial regulators or an independent body with separate tools. We focus on central banks because some of its traditional roles intersect closely with time-varying macroprudential policy responsibilities, including implementing monetary policy that operates by affecting financial conditions and maintaining stability in the monetary system. The role of central banks as an economy's lender of last resort also gives them an information and skill advantage, although this role ties in more with crisis management rather than pre-emptive policies. Notably, all of these roles of central banks are independent of whether the central bank is also a microprudential regulator, which occurs in two-thirds of the central banks in our sample.

Although the literature on governance structures for implementing macroprudential policies is small – a fact often remarked on by Tucker (2014, 2016) – a few papers have summarized and studied post-crisis macroprudential policy governance structures, albeit with a different emphasis to us. We begin with a review of these papers in Section 2. A 2010 IMF survey on Financial Stability and Macroprudential Policy is a major source of information to measure governance, but a large number of countries have implemented changes to their macroprudential governance structures since 2010. In addition, as discussed in Section 3, we choose as a starting point for our sample the countries that have taken macroprudential policy actions that appear to be related to credit cycles, based on Cerutti, Correa, Fiorentina, and Segalla (2016). This sample leads to a greater number of advanced economies relative to earlier studies, which had focused more on emerging market economies. Our review, however, relies on our own retrieval of information from national authorities' websites and financial stability reports, IMF Article IV reports, and, where available, IMF financial sector assessment program (FSAP) reports. As such, our measures of macroprudential governance structures are based on our interpretations of public statements. In line with the developing attention to macroprudential policy governance, we find that a substantial number of new committees have been formed in recent years, and indicates frequent updates are important.

We turn to the special role of the central bank in Section 4. Like previous studies, we also find that central banks play an especially prominent role in financial stability governance. For the 57 countries, they are a member or the chair or co-chair of the financial stability committee, or are the single agency with responsibility for macroprudential policymaking in all but two countries. However, we also document an important role for the ministry of finance on the financial stability committee in many countries. In Section 5, we examine empirically what factors determine the strength of the roles of the central bank or the ministry of finance on the financial stability committee. We look at whether their roles reflect interests in building on a central banks' expertise in macroeconomic and cyclical developments or are concerned about concentrating power or too many responsibilities in the central banks. Because many central

banks are also prudential regulators, we also look at whether that arrangement which gives central banks informational advantages leads to a stronger role for the central banks on the financial stability committees. Finally, since the implementation of time-varying macroprudential tools, like monetary policy, may be politically unpopular (the proverbial taking away the punch bowl), we look at whether central banks that are more independent are given a stronger role.

On balance, our findings indicate that nearly all countries have changed their governance structures to better measure and monitor systemic risks, but they have made only modest changes to how they would take actions to mitigate any identified financial vulnerabilities. In 14 countries, generally smaller countries, the central bank that is also the prudential regulator is the single macroprudential authority. In the 40 countries that now have financial stability committees, most are designed primarily to share information and coordinate actions, and only about one-quarter (12 of 40) of the committees have authority for any tools, including even “comply or explain,” to take their own macroprudential actions. This outcome is not surprising given the political difficulties of creating a new independent authority when prudential regulators already exist. But the risk of this outcome is similar to that from the widespread growth in the production of financial stability reports; that is, monitoring and coordination will have improved but they will not necessarily result in better financial stability outcomes. Thus, attention should be paid to whether structures are in place for financial stability committees to take actions when needed.

## **2. Previous Research on Governance Structures for Macroprudential Policies**

The literature on governance structures for macroprudential policies is limited, but growing, and generally focuses on either (a) whether the institutional structures are in place to support the implementation of macroprudential policy or (b) what explains governance structure differences across countries. Policy papers by institutions like the IMF covering the topic of macroprudential policy governance structures in more general terms are quite prominent, alongside academic studies that typically focus on a few specific issues.

### **a. Institutional structures**

In general, the question of whether institution structures are in place to support the implementation of macroprudential policy has received the most focus. The primary issue is about how to best structure the institutional set-up to identify system-wide risks and implement policies to mitigate risks, given that both of these processes require cooperation, at a minimum, across multiple autonomous agencies.

Nier et al. (2011) provides a comprehensive summary of macroprudential institutional frameworks, based on IMF case studies and a 2010 survey with responses from 50 countries.<sup>2</sup> They group the institutional frameworks observed internationally into seven broad *types* and consider the capacity of these different types of framework to provide for (i) the effective identification, analysis, and monitoring of systemic risks; (ii) the timely and effective use of macroprudential tools; and (iii) the coordination across policies to address systemic risks, while preserving autonomy of institutions. Within (iii), Nier et al note the role of the central bank (CB) in supporting effective coordination of macroprudential policy with monetary policy as well as microprudential policy, although they note concerns related to the concentration of power in a single institution and the need for safeguards in this situation (an issue also considered by ESRB, 2012, and Tucker, 2014, 2016). Related also to (iii), Nier et al note the importance of coordination and cooperation between agencies, supervisors, and the CB.

Lim et al (2013) use the database from Nier et al (2011) to develop measures of institutional setups for macroprudential policies in 39 countries (12 advanced and 27 emerging or developing), based on the respective roles of CBs and governments in macroprudential regulation. They define and calculate three indices, a macroprudential (MaPP) index, a microprudential index and a government or ministry of finance (MF) index. The three indices are ranked from 1 to 4 to reflect the importance of the CB for financial stability and for individual institution safety and soundness, as well as the role of the government (MoF) for financial stability.

Lim et al (2013) document commonalities in institutional arrangements: For 62 percent of their sample, the financial stability mandate is shared by multiple agencies and the CB is a member of the coordination body but not the chair. In the remaining arrangements, the CB chairs the coordination body – which occurs in 10 percent of countries – or is the sole owner of the financial stability mandate – which occurs in 21 percent of countries. For microprudential policy, they find that in 67 percent of countries the CB supervises at least the banking sector, while in the remaining 33 percent of countries the supervisory has this responsibility. With regard to the role of the MoF, they document that it is also a major player and coordinates the FSC in about 31 percent of countries. Below we document that the role of the CB may have increased since the 2010 survey used by Lim et al., even though we have a larger number of advanced economies that are less likely to rely solely on the CB as the main financial stability authority.

Additionally, Lim, et al use their measures of the strength of CB and MoFs in the macroprudential policy framework to explain the timeliness of responses by financial stability

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<sup>2</sup> They catalog existing structures by five criteria: (i) the degree of institutional integration between central bank and financial regulatory and supervisory functions; (ii) the ownership of the macroprudential mandate; (iii) the role of the government (treasury) in macroprudential policy; (iv) the degree to which there is organizational separation of decision making and control over instruments; and (v) whether or not there is a coordinating committee that, while not itself charged with the macroprudential mandate, helps coordinate several bodies.

authorities to emerging financial-system vulnerabilities. They show that a stronger CB role is conducive to reducing policy response time.

Lombardi and Siklos (2016) also develop a measure of a country's capacity to implement macroprudential policy based on a large number of factors.<sup>3</sup> Some of these factors are similar to those in Lim, et al (2013), such as countries' inter-agency financial stability coordinating bodies, including the chair, the members, and the CB's involvement. But many factors go beyond inter-agency issues, such as the institutional set-ups for financial stability internal to CBs, how the CB views the relationship between macroprudential and monetary policy, and CB communications on macroprudential policy and financial stability topics, the latter of which they interpret as capturing transparency and accountability. Some factors also seem to go beyond macroprudential policy, such as the country's deposit insurance regime. While they link capacity to various measures of financial stability – including credit growth, but also variation of real GDP growth and variance of inflation – they do not try to evaluate whether capacity affects these measures. Indeed, they find a statistically significant relationship between their measure of the capacity and only credit growth, and the relationship is positive, which they interpret to as evidence that the institutional capacity is designed to deal with the financial stability challenges of credit growth. Relative to Lombardi and Siklos, our study of countries' frameworks for implementing macroprudential policy is more focused on FSC structures, which are largely inter-agency, and the role of the CB.

For 27 EU countries Smaga (2013) also considers the role of CBs in financial stability committees (FSCs) and as the single agency with authority over macroprudential policy tools, although he considers this question in the context of a much broader index of "CB involvement in financial stability." This index, which builds on an earlier literature – some of it, pre-crisis – also views CB involvement in financial stability as including its involvement in the payments system, in microprudential supervision, and in liquidity support (roles also considered by Healey, 2001) as well as related to whether CBs have financial stability mandates, how CBs viewed their role in financial stability, how CBs organize their financial stability function internally, and whether CBs publish financial stability reports (roles also considered by Osterloo and de Haan, 2003).<sup>4</sup> Additionally, Smaga also considers publication of a financial stability report and publication of stress test results as determinants of a CBs' financial stability involvement. In contrast to Lim et al (2013) and Lombardi and Siklos (2016), Smaga's interest in measuring CB

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<sup>3</sup> They summarize eight broad criteria, which are based on 30 elements: implementing macroprudential policy; coordination and responsibility for macroprudential policy; deposit insurance; transparency and accountability; organizational structure of the central bank; view of central bank of links between monetary policy and macroprudential policy; distance to FSB/G20 recommendations; and response time to recommendations.

<sup>4</sup> In Smaga's review of the literature, it appears that it is mainly in post-crisis papers – specifically the Ingves Report (2009) by the Central Bank Governance Group of the BIS and Vinals Report (2010) by the IMF – that the use of macroprudential policy tools and interagency coordination start to enter consideration for central banks' involvement in financial stability.

involvement in financial stability is not to assess how effectively countries utilize macroprudential policy tools or maintain financial stability but rather is to consider whether countries joining the common currency area lead to a refocussing of efforts and resources.

## **b. Determinants of governance structure**

In a series of essays, Tucker (2014, 2016) considers the appropriate assignment of macroprudential authorities across agencies, particularly as they relate to time-varying policies. Tucker notes that – similar to monetary policy – the immediate risk of unpopularity that stems from activating time-varying macroprudential policies leads to the tendency for policymakers to delay action until financial-system vulnerabilities are unquestionably evident, thereby precariously high. This consideration he notes would argue for entrusting authority for time-varying policies with unelected officials.<sup>5</sup> That said, he notes that macroprudential policies both increase the resilience of the system to prevent future crises and – particularly, for time-varying policies – correct credit cycles and misallocations of credits and since the latter have important distributional consequences, such decisions should rest with elected, rather than unelected, officials. For example, he argues that loan-to-value (LTV) and debt service-to-income (DSTI) ratio caps should not be set by unelected officials – such as prudential authority or CB officials – because of their significant distributional consequences. Rather, unelected officials’ authorities should instead be limited only to setting caps on the fractions of mortgages exceeding some ratio. Tucker also discusses the principles by which macroprudential policy decision-making authorities should be assigned to CBs, PRs, and market regulators, an issue that we will discuss in more detail when we consider the role for CBs.

Masciandaro and Volpicella (2016) adopt a political economy perspective to explain the strength of the CB role in the macroprudential policy infrastructure of 31 countries, as measured by Lim et al’s (2013) MaPP index. They find that if the CB already has micro supervisory responsibilities for banks, it is more likely to have a stronger role, perhaps reflecting a desire to take advantage of informational advantages. They also find a stronger role for the CB if the CB has less political independence, which they speculate may represent a balancing by politicians to not place too much power in a CB. Moreover, they find a weak relationship between a strong CB for macroprudential policy if it has a clear monetary policy mandate, such as a clear inflation target, consistent with limiting the power of the CBs. We consider some similar issues to Masciandaro and Volpicella, although our analysis covers a larger number of countries with a greater representation of advanced economies. Additionally, Masciandaro and Volpicella do not explore factors that might explain the role of the MoF in the coordinating body, which is one of the issues that we explore below.

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<sup>5</sup> The ESRB’s guidance to countries on their macroprudential policy framework emphasizes that should be shielded against outside pressures through independence; see, [https://www.esrb.europa.eu/pub/pdf/recommendations/2011/ESRB\\_2011\\_3.en.pdf](https://www.esrb.europa.eu/pub/pdf/recommendations/2011/ESRB_2011_3.en.pdf).

### **3. Characteristics of Governance Structures for Macroprudential Policy**

We collect data on governance structures for a sample of 57 countries (listed in Appendix 1). A brief outline of how we collected our data is provided in the first subsection and a description of our findings is given in the second subsection.

#### **a. Sample and data sources**

Because we ultimately want to link governance structures to the use of tools, specifically cyclical tools, we started with the sample of 64 countries in the macroprudential policy tool database of Cerutti, Correa, Fiorentino, and Segalla (2016). We dropped from the database, however, the 7 countries that Cerutti et al (2016) highlight as having limited information about the use of tools as well as Taiwan, largely because we faced significant difficulties in finding information about Taiwan's governance structure. Finally, we added Cyprus because it is the only EU country excluded from the Cerutti et al (2016) macroprudential tool database. This process results in a sample of 57 countries, of which 31 are advanced economies and 26 are emerging or developing economies, as categorized Amone and Romelli (2013), which are consistent with the IMF's 2007 WEO report.<sup>6</sup>

The main sources for our information on countries' financial stability governance structures, safety and soundness authority responsibilities, and tool availability were national authorities' websites (and further documents referenced therein), national authorities' financial stability reports, IMF Article IV reports, and, where available, IMF financial sector assessment program (FSAP) reports. In addition, we undertook various cross checks, including comparing what we inferred about financial stability governance structures from our sources with Lombardi and Siklos (2016) on macroprudential policies and with Nier et al (2011) on safety and soundness for microprudential policies. For information on CB financial stability mandates, we consulted Jeanneau (2011) and CGFS (2016b), in addition to countries' websites. For information about the availability of tools, we additionally consulted responses to the IMF's Global Macroprudential Policy Instrument (GPMI) survey for 2013 data. A large reason for our preference for national authority websites are the ongoing changes in financial stability governance structures, some of which have occurred as recently as 2015.

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<sup>6</sup> More recent IMF WEOs have added 7 additional countries to the listing of advanced economies. With the exception of the Czech Republic, the countries that have been added are those that have in recent years become members of the common currency euro area. (See the IMF's website titled "Changes to the World Economic Outlook Database," October 04, 2016 – link: <https://www.imf.org/external/pubs/ft/weo/data/changes.htm> – for a listing of these changes.) Given this reason for the change in classification we do not use the more recent WEO definition. Moreover, we want the variable to represent the economy's status at the time countries were considering how to structure their new governance structures, and 2007 is right before the global financial crisis and most new structures were beginning to be formed.

**b. Financial stability committees (FSCs)**

Our review of the governance structures of 57 countries finds that 40 countries have FSCs. Of these 40 countries, 34 have a FSC created formally by legislation, and another 6 countries having a de facto FSC, which means that a committee exists and meets regularly but exists only from non-legal arrangements between the agencies, such as memorandums of understanding (MOUs). Of the 17 countries that do not have formal committees, 15 are categorized as having a single agency authority for financial stability (14 CBs and 1 prudential regulator, PR) and a number of the 17 have informal arrangements with other agencies. Saudi Arabia has interagency arrangements for financial stability that, like in Israel, appear to be moving toward the more formal formation of a FSC. New Zealand has an arrangement in which there is a written MOU between the CB governor, who is responsible for macroprudential policy, and the minister for finance, which says that the governor must consult with the minister when macroprudential policy actions seem likely. In Singapore, where “stamp duties” have been an important policy tool to address rapidly increasing house-price valuations, informal consultative arrangements are in place between the CB and MoF. In Finland, meetings take place between the CB, PR, and MoF before any meeting by the board of the PR on macroprudential issues. But these meetings occur at the staff level and have not been formalized through any procedural documents. Our sample contains one country, Hungary, that created a FSC with three members, the CB, PR, and MoF, in 2010, but in 2013 merged the PR into the CB, such that currently the CB is the single authority.

**Table 1. Financial Stability Committees (FSCs)**

Type		Year formed		Chair or co-chair of FSC <sup>(a)</sup>		No. of agencies that vote on FSCs	
Formal	34	≤ 2008	11	Central Bank	15	2	5
DeFacto	6	2009	1	Ministry of Finance <sup>(b)</sup>	25	3	9
Single Agency	15	2010	5	Prudential Regulator	1	4	15
Central Bank	14	2011	3	Other	3	5	8
Prudential Regulator	1	2012	3			≥ 6	3
Informal	2	2013	9				
		2014	4				
		2015	4				
Total	57	Total	40			Total	40

(a) Sums to more than 40 because for 3 committees the central bank and ministry of finance are co-chairs and for 1 committee the central bank and prudential regulator are co-chairs.

(b) Includes the First Deputy Prime Minister who chairs the FSC of the Russian Federation.

Most of the 40 FSCs that are in existence today were created relatively recently and, specifically, after the recent financial crisis. Only 11 FSCs were formed before 2008, and 29 were formed in

2009 and later. The most frequent year for formation is 2013, with 9 countries. Of these 9 countries, 7 were EU countries, so it is possible that this large number of FSCs formed was tied to the ESRB's recommendations that were issued in 2012. Indeed, of the 17 FSCs formed from 2013 onwards, 12 were from EU countries. These recent dates indicate the importance of ongoing updates on progress.

For the 40 countries that have formal or defacto FSCs, we identify the chairs. We find that the CBs and MoFs are the most frequent chairs. The MoF is the chair or co-chair of 25 FSCs and the CB is the chair of 15 FSCs. The MoF and CB co-chair 3 FSCs and the PR and CB co-chair 1 FSC. In no country is the PR the sole chair. In one country – Romania – the chair of the FSC rotates between members and in one country with a de facto FSC – Japan and the Philippines – there is no FSC chair.

Of the 17 countries that do not have formal committees, we determine that 15 have assigned, at least in practice, macroprudential responsibilities to a single institution. Of the 17 countries, 10 are EU members, which means that under the ESRB's recommendation on the macro-prudential mandate of national authorities (ESRB 11/3) they are required explicitly to designate a macroprudential authority. In nine of these countries the CB is the designated authority, and in one country – Finland – the PR is the designated authority. In the seven non-EU countries, the extent to which the macroprudential authority is explicitly designated to a particular government agency varies. If not explicitly stated, we judge the agency that is responsible for prudential regulation to be the macroprudential authority. In all but one case, this agency is the CB. The one case is Peru, for which it is the PR, which is separate from the CB.

Most (32 of 40) formal or defacto FSCs have three to five agencies as members with voting rights: 15 have four voting agencies, nine have three, and eight have five. Only three FSCs have members from more than five agencies and five FSCs have members from only two agencies. Note that we are reporting here the number of agencies represented and that vote, not the number of members of the committee, to represent the structure of the financial system. Many committees include more than one representative from any member agency and many committees include external members or experts on specific topics.

Policy committee structures were active areas of research in the monetary policy arena in the late 1990s and early 2000s following the significant changes in monetary policy formulation that occurred earlier in the 1990s. The literature considered several issues, including the degree of consensus that committees sought to achieve, the strength of the leadership of the committee chair, committee size, committee membership, and committee appointments. Researchers in this area – such as Blinder (2007, 2008) – noted that desirable committee size depends on a number of factors, including the range of expertise that was desired on the committee, the degree of consensus that was desired on committee decisions, and the size of the country, which

determines the talent pool and the ability to staff the committee. Given this logic, it is not surprising that the most frequent committee size is four, a typical representation of a CB, PR, market regulator, and MoF. In addition, a more complicated financial sector would likely call for a larger committee, while a higher desire for consensus among policymakers would likely call for a smaller committee. In our review, only three countries have FSCs with six or more members, and all FSCs with tools – with the exception of the U.S. – have five or fewer members, which seems a manageable number for coordination.

### **c. Authority for macroprudential tools**

Few FSCs have what the FSB/IMF/BIS report (2016) and the IMF *Key Aspects of Macroprudential Policy* (2013) would consider as “hard” or “semi-hard” powers: Hard powers give policymakers direct control over macroprudential tools or the ability to direct other regulatory authorities, and semi-hard powers enable policymakers to make formal recommendations to other regulatory authorities, coupled with a “comply or explain” requirement. Comply or explain requirements can be used to influence the wide range of regulatory actions that would ultimately be undertaken by other supervisory and regulatory agencies.

The IMF (2013) views comply and explain powers as being well-suited to situations where further judgment by the relevant agency is important and potentially also to situations where a policy action is expected to face considerable political pressure and where a comply-and-explain directive could both broaden support for the agencies’ action as well as result in greater transparency for the decision. It also views comply and explain powers as being more practical for addressing the structural component of systemic risk since they may be better suited to macroprudential policy interventions that are less frequent in nature. An example of this is the U.S. FSOC recommendation to the market regulator in 2014 to eliminate the fixed net asset value in order to reduce the risk of investor runs in prime money market funds that were permitted to invest in instruments with credit risk. More recent experience, however, suggests that FSC comply-and-explain instructions can likely also be directed at cyclical risks. For example, in November 2016 the ESRB issued comply and explain warnings on medium-term vulnerabilities in the residential real estate sector to the MoFs of eight EU Member States (specifically, Austria, Belgium, Denmark, Finland, Luxembourg, the Netherlands, Sweden and the United Kingdom).

Only 12 of the 40 FSCs have semi-hard or hard powers (Table 2, column a). France’s High Council for Financial Stability and UK’s Financial Policy Committee have hard powers over

time-varying macroprudential tools.<sup>7</sup> Other than these two cases, most FSCs have only semi-hard powers, which in all cases is the authority to make recommendations with formal “comply and explain” authority. The remaining 28 FSCs have either only “soft” powers, which enable policymakers to express an opinion, a warning, or a recommendation but without any “comply or explain” requirements, or have only an information sharing function, which is an even softer power. Indeed, most committees appear to function to promote information sharing and coordination, rather than to directly implement policies.

Information collection and sharing powers, as noted by IMF (2013), are important for closing information gaps in financial stability monitoring as well as for avoiding the duplication of costs for providing information on the financial industry. Additionally, it notes the need for the policymaker to be able to collect information beyond the regulatory perimeter, since financial activity can migrate in response to regulation in unintended ways.<sup>8</sup>

**Table 2. Authority for Tools**

FSC Tools		Authority for CCyB		Authority for stress tests <sup>(a)</sup>		Authority for LTVs	
Soft only	28	NO	5	NO	0	NO	19
Semi-hard or hard	12	YES	52	YES	56	YES	38
		If YES:		If YES:		If YES:	
		Central Bank	30	Central Bank	36	Central Bank	21
		CB is a PR	29	CB is a PR	32	CB is a PR	20
		Prudential Regulator	16	Prudential Regulator	18	Prudential Regulator	7
		Ministry of Finance	4	Joint CB and PR	2	Ministry of Finance	9
		FSC	2	Ministry of Finance	0	FSC	
Total	40			FSC	0		1

(a) Unknown for South Korea.

IMF (2013) also notes the need for strong communication as part of countries’ macroprudential institutional arrangements to promote public awareness of risks and understanding of the need for authorities to take mitigating actions.<sup>9</sup> Financial stability reports (FSRs) have for some time been used by CBs to present institutions’ analyses on financial stability issues. Cihak et al

<sup>7</sup> The U.S. Financial Stability Oversight Council (FSOC) has a fairly unique hard power to designate nonbank financial firms as systemically important. Such designation needs two-thirds majority support from the members of the FSOC and the Secretary of the Treasury must be part of this majority. Somewhat similarly, the UK FPC has the power to make recommendations to HM Treasury on the regulatory perimeter and on which activities should be regulated and whether an institution carrying out regulated activities should be designated for prudential regulation by the PRA rather than the FCA and vice versa. Notably, however, this tool is not a time-varying tool in that it is not used to designate firms during credit expansions and de-designate during busts with an intent to promote moderate credit growth.

<sup>8</sup> In the U.S., the Office for Financial Research’s authority to collect information directly from financial firms, is an example of this broad back-up power (see also Berner, Oct. 21, 2016 speech.)

<sup>9</sup> See CGFS (2016b) for a comprehensive discussion of the use of communication in the conduct of financial stability policy and a survey of many countries’ experiences.

(2012) document the rapid growth in the number of CBs – from 1 to about 50 – issuing FSRs between 1996 and 2005, and the publication of FSRs by 44 countries over much of the period 2000-09. Cihak et al, however, find only modest evidence that better FSRs yielded better financial stability outcomes. This has been interpreted by some that information provision on its own is not sufficient, and suggests a need to combine it with broader system-wide analysis to support a coordinated use of tools by existing agencies or new tools.

Cihak et al also document that some FSCs have begun publishing FSRs, including the U.S. Financial Stability Oversight Council (FSOC) that in 2011 published its first FSR, and Mexico's Council for the Stability of the Financial System (CESF) has also published reviews and assessments on financial stability. As FSCs become part of the more normal financial regulatory framework, an interesting question is whether FSC's publishing FSRs rather than CBs would lead to better outcomes, perhaps because the actual production process facilitates greater information sharing and cooperation and ultimately better policy-making. A concern is that FSCs that only produce FSRs might – without powers to direct actions – lead to a similar outcome as FSRs; that is, that gains in financial stability outcomes are only modest.

Since our review found that most FSCs have only soft tools, we looked further at which agencies had the authority to implement time-varying tools. We look specifically at the authorities for the countercyclical capital buffer (CCyB), bank stress tests, and LTVs. Cerutti et al (2016) show that of the 12 macroprudential tools considered by Cerutti, Claessens, Laeven (2014), only five were used frequently, and most were changed very infrequently over 2000 to 2013. Among the five that were used most frequently, they document that only LTV ratios and reserve requirements (for purposes other than monetary policy) are correlated with credit growth in a way to suggest they have been used to reduce a boom-bust credit cycle. The other three tools, related to general capital, concentration limits, and interconnections, had not been adjusted in a way consistent with countercyclical intentions. Their finding that capital is not a countercyclical tool is because it captures the adoption of higher Basel III capital requirements, a structural adjustment, and does not include the new CCyB or the increasing use of bank stress tests. We assume the CB retains the authority for reserve requirements, even if a FSC exists, and as such do not include this tool in Table 2. (Recall that only two FSCs have hard tools – the U.K.'s Financial Policy Committee and France's High Council for Financial Stability – and neither list reserve requirements as one of their policy tools.)

The CCyB as a new tool went into effect in 2016, is calibrated generally to system-wide rather than bank-specific risks, and allows for cross-border reciprocity arrangements, so it seems plausible that countries could have established the authority at the new FSCs or it would involve the MoF (or government more broadly). On the other hand, the skills for calibrating CCyB, which are based on time-varying system-wide financial vulnerabilities, would normally be at the staff of CBs and the tool would be applied to regulated banks. We found that the vast majority, 52 countries, have established the authority to set the CCyB. For the 52 countries, the CB has

the power in 30 and the PR has it in 16. Only 2 countries have the FSC as setting the CCyB and 3 have the MoF (albeit advised by other agencies). While it appears that the CB is the most frequent authority, all but one of the CBs is also the PR. Only in Indonesia is the authority for the CCyB assigned to a CB that is not a PR and here there is a somewhat specific situation in which the CB was the PR until only a few years ago. Thus, we interpret these findings as indicating that tools are not taken from existing regulators, little is granted to the FSC or non-regulators, and the committees are designed for cooperation and coordination, rather than to implement macroprudential policies.

Our findings for stress tests also line up with this interpretation. Stress tests are a relatively new tool but pre-date the formation of many of the FSCs. Currently, 56 countries report using this tool. No doubt there is great variation in how stress tests are implemented across the countries, from being done by banks themselves and providing results to their supervisors, or an aggregate top-down test by authorities, to very detailed stress tests using loan-level data such as in the U.S., and those conducted by independent PRs may differ from those done by a PR that is part of a CB. In terms of which entity has the authority to implement, the CB is the primary agency in 36 countries and the PR is in 18 countries. Among the 36 CBs, 32 are also PRs. In no countries is the MoF in charge, unlike in the case of CCyB, where a handful of MoFs set the buffer. Given the CCyB is generally based on system-wide indicators and involves cross-border reciprocity, it makes sense for the MoF to be more involved in that instrument than in stress tests, which often are bank-specific and involve supervisory oversight. But the bottom line is that the MoF or FSCs are rarely the entity in charge.

LTVs have been used for a more significant time, are used rather frequently, and are borrower-rather than lender-based. They were used before many FSCs were set up, and so we might not expect the authority to have been switched to the new FSCs. But it is a broad tool aimed at borrowers, not lenders, which indicates a more system-wide approach might be needed for implementing. There are fewer countries that have established the authority for LTVs than for CCyBs: 38 countries employ this tool and 19 do not, although we recognize that countries may be able to establish a new authority if they were to want to use LTVs as a macroprudential tool. We find again an important role for the CB. The CB has the authority for 21 countries, the MoF has the authority for 9 countries, the PR for 7 countries, and 1 is set by an FSC. Of the time-varying macroprudential policy tools, LTVs have the most cases of authority being assigned to the MoF. This outcome is consistent with the view – often articulated by Tucker (2014, 2016) – that policies like LTVs, because they have distributional consequences, should not be given to unelected officials in independent agencies.

To summarize our analysis of governance structures so far, many countries have established financial stability committees and most were created recently, or have the CB as the sole authority. The CBs and MoFs are the most frequent chairs. The CB is the chair or co-chair of

the FSC in 15 countries, and is the sole agency in another 14 countries. It is part of the governance structure in all but two countries, Chile and Peru. This near-universal representation suggests that CBs play a special role. While the MoF is also an important player and is chair or co-chair in 25 countries, it is not a voting member in many countries. PRs are the chair or co-chair in only two countries and are not, on their own, the lead macroprudential authority. While there is substantial variation in the committee structures, they appear to be set up to encourage cooperation and coordination among existing regulators, rather than establishing new separate entities with independent tools. Most FSCs have between 3 to 5 voting agencies, which likely includes the primary PRs, the CB, and often the MoF, and are small enough so they can successfully coordinate actions across the entities. But the new committees do not have a lot of independent authority for time-varying tools. Although most countries have adopted the CCyB and stress tests, and many use LTVs, the authorities for these tools reside primarily with the traditional agencies.

#### **4. Rationale for Special Role of the Central Bank**

While Nier et al (2011) note that countries will have different institutional set-ups for reasons related to their long-standing legal and financial regulatory systems, they conclude that a key desirable feature is that the “central bank should play an important role in macroprudential policy making” (p. 6). This view is also held by the IMF (2011) and the ESRB (2012).<sup>10</sup> In particular, the ESRB recommends “the national central banks should have a leading role in macroprudential oversight because of their expertise and their existing responsibilities in the area of financial stability. This conclusion is further strengthened when central banks are also in charge of microprudential supervision.”<sup>11</sup>

We summarize the main reasons provided for an important role for the CB in Table 3. Nier, et al (2011) support a strong CB role because CBs have expertise in identifying and analyzing systemic risks that is crucial to inform macroprudential policies to reduce pro-cyclicality risks. In addition, a strong CB role enables use of the CB’s existing experience in communicating risks to the markets and general public, and it would lead to greater coherence about risk warnings and messages. They cite drawbacks as well, including lack of institutional mechanisms to challenge the risk assessment views formed within just one institution; the risks of managing too many functions within the CB; and concentration of too much power at the CB, which is run by unelected CB officials.

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<sup>10</sup> Earlier studies of financial stability policymaking capacity focused almost entirely on the central bank rather than coordinating bodies (Smaga (2013)).

<sup>11</sup> EN 14.2.2012 Official Journal of the European Union C 41/1

Tucker (2014, 2016) also discusses the principles by which macroprudential policy decision-making authorities should be assigned to CBs, PRs, and market regulatory authorities. With regard to CBs he notes that both CBs with and without PR responsibilities are reasonable candidates for having authority for time-varying macroprudential policies. As the liquidity reinsurer for the financial system, CBs are called to the scenes of financial disasters regardless of whether or not they have prudential authorities. Moreover, their core purpose of maintaining stability in the monetary system overlaps with financial stability given that it is private institutions (mainly banks) that issue monetary liabilities. Additionally, the deliberations and processes for undertaking time-varying macroprudential policies are much more akin to monetary policy than are microprudential policies. The key considerations against strong CB authorities for time-varying macroprudential policies are too much power as well as whether additional responsibilities take CBs too far away from their monetary functions.

Nier et al (2011) also provide some empirical evidence, albeit somewhat limited, that suggest better outcomes from a more important CB role. In particular, they cite that losses are lower in the event of failures when the CB is also a bank supervisor or there is a good coordinating mechanism. Nier et al (2011) look at three measures of the costs of banking crises -- failed banking assets, capital injections, and guarantees -- and find that the group of countries with close integration between CB and banking supervisory agencies have lower average costs than those countries with separate arrangements. They cite an earlier study by Goodhart and Schoenmaker (1995) as one of very few existing studies to examine the effect of the institutional structure on outcomes. That study found, based on a sample of 104 (large) bank failures that occurred across 24 countries in the 1980s and early 1990s, that there were significantly lower actual and expected bank failure rates in the 11 countries with an integrated regime than in the 13 countries with a non-integrated regime. Merrouche and Nier (2010) found that the buildup of financial imbalances (measured by the ratio of loans to deposits) depends on institutional structure, with a less severe buildup where the CB had full control of supervision and regulation.

However, Koetter, Roszbach, and Spagnola (2014) examine for 44 countries whether the CB is also the PR affects the credit risk or non-performing loan ratio at banks, and finds no evidence of a relationship. Thus, the empirical evidence is mixed on benefits from the CB also having supervisory authorities. Moreover, these studies focus on the effects of greater CB interaction on the financial condition of the banks, rather than the entire financial system, and do not consider the existence of new focus by regulators on system-wide risks or broader tools.

Lim et al (2013) examine if the institutional arrangements can explain response times for the use of tools to moderate credit growth. For example, for one measure of response time measure, they identify a break in the trend of credit, and then measure how long it takes to implement one of eight macroprudential tools. For their sample of 39 countries, from 2008 to 2011, they find a negative correlation between policy response time and the involvement of the CB suggesting that

including the CB is conducive to reducing policy response time. Their results support the IMF’s position that the CB needs to play an important role, reflecting its unique position to monitor macrofinancial linkages, identify systemic risks, and its experience in communicating risk to markets and the general public. They do not find a similar link to the strength of the MoF in the macroprudential set-up.

**Table 3. Role of Central Bank for FSCs and Macroprudential Policymaking**

<p><b>Arguments in favor of a stronger role</b></p> <p><i>Information synergies</i>          Central bank expertise from other responsibilities, including being the lender of last resort for financial firms, operating the payments system, and – for some central banks – being the prudential regulator. [Nier, M&amp;V, Tucker].</p> <p><i>Skill advantage in time-varying analysis</i>          Central bank has expertise in</p> <ul style="list-style-type: none"> <li>• Monitoring macroeconomic and financial conditions over time (i.e., filtering signal from noise)</li> <li>• Analyzing and assessing the broader systemic implications of identified vulnerabilities, derived from its monetary policy responsibilities</li> <li>• Communicating potential risks that may require a policy response.</li> </ul> <p>Required skills are more similar to monetary policy than microprudential supervision [Nier, Tucker]</p> <p><i>Independence</i>          Independent authority and thus better able to set countercyclical policies that are unpopular [Tucker]</p> <p><i>Consistency advantage</i>          Greater consistency and coherence in using a range of tools in a single entity [Nier]</p>
<p><b>Arguments in favor of a weaker role</b></p> <p><i>Power.</i> Central bank already is an independent monetary authority, and would have too much power [M&amp;V, Nier, Tucker]</p> <p><i>Responsibilities.</i> Central bank with many functions, given limited resources, will not perform all functions well, and the function that is most visible will receive the most attention [Nier, Tucker].</p> <p><i>Undermine monetary policy mandates.</i></p> <ul style="list-style-type: none"> <li>• A leadership role also for financial stability could undermine its commitment to monetary policy objectives, which could lead to higher inflation [M&amp;V, Tucker, Ueda-Valencia].</li> <li>• Could threaten monetary policy independence if leads to additional government scrutiny (Tucker) or if crises result and the central bank loses credibility (Smets).</li> </ul> <p><i>Inappropriate.</i> Would inappropriately give unelected officials authority for policies with distributional effects [Nier, Tucker]</p>

CBs face a unique situation as part of a macroprudential policy committee. CBs also set monetary policy, and even if they do not have view financial stability as a mandate for monetary policy, they may not be able to ignore the potential effects of MP because it can affect the build-up of vulnerabilities through a risk-taking channel. Ueda and Valencia (2012) consider how

time-inconsistency and political pressures can distort the incentives of a monetary authority that makes simultaneous monetary policy and macroprudential decisions. Smets (2014) presents a simplified, static version of this model in which policymakers minimize a quadratic loss function for inflation and output variability, augmented with a loss term for leverage variability (where this function can be obtained from a second-order approximation to the social welfare function in a model with nominal rigidities and agency costs in credit markets). Additionally, economic activity and leverage in this model are affected by the macroprudential policy instrument, and the economy's full employment level of output is below that of its efficient level (a standard assumption in the Barro-Gordon literature) while leverage is above its optimal level (due for example, to fire sale externalities).

When the CB can credibly set inflation expectations, and monetary policy has price stability as its sole objective, policy will be set to achieve the optimal level of inflation, and macroprudential policy also delivers the optimal level of output and leverage, knowing that if it is lax and allows debt to become excessive, monetary policy will not inflate away the debt by delivering higher inflation. But if monetary policy also has financial stability as an objective, it will have an incentive to inflate away debt. Knowing this, macroprudential policy will be lax, which will mean higher output, but also higher optimal debt and an upward inflation bias. Smets notes that these time-inconsistency risks can be mitigated if the objectives, instruments, communications, and accountability for price stability and financial stability are separate, albeit with information sharing between the two bodies leading to the view that this type of structure is beneficial. An additional reason that Smets notes to keep macroprudential policy separate from monetary policy is that since monetary policy cannot fully prevent crises, the actual occurrence of a crisis could compromise the credibility and, in turn, independence, of the CB.

## **5. Empirical Analysis of FSC Structures**

### **a. Variable definitions**

It is not surprising that FSC structures differ, given they are starting from regulatory structures already in place, but there are some commonalities in terms of having representation from all the different regulators and having a prominent role for the CB. As noted, the chairs of the committee are primarily split between the CB and the MoF. Chairs are especially important member of the committees because they set the agenda, and even if only for an information-sharing committee, they may be held relatively more accountable for the committee's actions.<sup>12</sup> We test if there are observable factors that can explain the choice of chairs.

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<sup>12</sup> Clearly, the role of the chair may differ across FSCs but at this stage we do not attempt to evaluate this possible difference. The issue of chair dominance has been studied in the context of monetary policy committees, see Blinder (2007, 2008).

As highlighted in table 3, the advantages for having the CB as chair include information advantage because of its other functions (most notably, for some CBs, being the prudential supervisor); a skill advantage because of its focus on time-varying analysis which is typical for its monetary policy duties; and it has some independence from the government and may be able to impose unpopular but necessary policies.

Offsetting these advantages, there could be concerns of excessive concentration of power without accountability in the CB, too many responsibilities, reduced commitment to price stability, or some risk to losing its credibility or independence in the future which could jeopardize price stability. If these concerns were high, countries might want to make the MoF or other entity the chair, or create a strong FSC with its own tools.

We start by defining several variables, which are summarized in Table 4.

**Table 4. Strength of Central Bank and Ministry of Finance**

Strong CB in FS	N	Strong MoF in FS	N	Strong CB in S&S	N
1 CB not on FSC or not single agency	2	1 MoF not on FSC or not single agency	22	1 CB not a PR	23
2 CB on FSC and not chair	26	2 MoF on FSC and not chair	10	2 CB is a PR for banks only	18
3 CB on FSC and chair or co-chair	15	3 MoF on FSC and chair or co-chair	25	3 CB is a PR for banks and some nonbanks	9
4 CB single agency	14	4 MoF single agency	0	4 CB is a PR for the entire financial system	7

The first variable we construct is “Strong central bank in financial stability” (*Strong\_CB\_in\_FS*) and we assign a value to it for each country according to the following definition:

- *Strong\_CB\_in\_FS* = 1, if a FSC *exists* but the central bank *is not* a member of the FSC or if a FSC *does not exist*, another agency is the economy’s macroprudential authority;
- *Strong\_CB\_in\_FS* = 2, if a FSC *exists* and the central bank *is* a member but *is not* the chair of the FSC;
- *Strong\_CB\_in\_FS* = 3, if a FSC *exists* and the central bank *is* the chair of the FSC; and,
- *Strong\_CB\_in\_FS* = 4, if a FSC *does not exist* but the central bank *is* the economy’s macroprudential authority either in effect or by designation.

It is worth noting that some analyses (*e.g.*, IMF, 2013) make an even finer distinction between governance frameworks within *Strong\_CB\_in\_FS* = 4. In particular, these analyses distinguish between the macroprudential authority decisions being taken by the bank’s CB Board (which they note to be the case in the Czech Republic) and decisions being taken by a special committee for financial stability within the CB. Tucker’s (2014, 2016) views a separate committee to be

important given the general difficulties that exist in practice within one decision-making body being responsible for multiple policies.

The second variable we construct is “Strong ministry of finance in financial stability” (*Strong\_MoF\_in\_FS*) and we assign a value to it for each country according to the following definition:

- *Strong\_MoF\_in\_FS* = 1, if a FSC exists but the ministry of finance *is not* a member of the FSC or if a FSC *does not exist*, another agency is the economy’s macroprudential authority;
- *Strong\_MoF\_in\_FS* = 2, if a FSC *exists* and the ministry of finance *is* a member but *is not* the chair of the FSC;
- *Strong\_MoF\_in\_FS* = 3, if a FSC *exists* and the ministry of finance *is* the chair of the FSC; and,
- *Strong\_MoF\_in\_FS* = 4, if an FSC *does not exist* but the ministry of finance *is* the economy’s macroprudential authority either by in effect or by designation.

Our *Strong\_CB\_in\_FS* and *Strong\_MoF\_in\_FS* are conceptually similar to variables that Lim et al (2013) construct, and used subsequently in Mosciandaro and Volpicella (2016). As shown in table 4, (and discussed above in section 3), the CB is the chair or co-chair for 15 committees, and is the single agency for an additional 14 countries. The MoF is chair or co-chair in 25 committees, and is never the single agency. Relative to Lim et al (2013), we show CBs have a stronger role in financial stability governance. In Lim, CBs are either the chair or single agency for 31 percent of their sample, while we show a higher percentage of 53 percent. A reason for this higher share is that there are now more coordinating committees than in Lim’s 2010 sample. In addition, we show that MoFs also have a somewhat stronger presence, and is the chair 40 percent of the time, rather than 31 percent. Interestingly, even if the MoF is not a member of the FSC, it is singled out to be an observer in five countries.

We also construct a variable describing the strength of the CB as a microprudential regulator, which we use to test for a CBs’ information advantage, particularly, in the risks faced by banks. The variable is called “Strong central bank in safety and soundness” (*Strong\_CB\_in\_S&S*) and we assign a value to it for each country according to the following definition:

- *Strong\_CB\_in\_S&S* = 1, if the CB *is not* a prudential regulator;
- *Strong\_CB\_in\_S&S* = 2, if the CB *is* a prudential regulator and regulates *only* banks;
- *Strong\_CB\_in\_S&S* = 3, if the CB *is* a prudential regulator and regulates banks and other financial institutions; and,
- *Strong\_CB\_in\_S&S* = 4, if the CB *is* a prudential regulator and regulates *all* of the regulated parts of the financial system.

As shown, CBs are not also a PR in 23 countries, but they are in 34 countries (column c). In these 34 countries, they are only bank PRs in 18 countries, while in 17 countries, they regulate

more than just the banking system. This variable (*CB as PR*) is an important variable in our analysis. If a CB is also a PR, then it not only is an independent agency, but it has a substantial information advantage over other regulators and the government about potential risks to financial stability arising via the banking system. If a country wants to take advantage of this type of informational synergy, we would expect that the strength of the CB in financial stability would be positively related to CB as PR. In contrast, if the strength of the MoF were positively related, it might reflect that a country sets up arrangements to prevent too much power or responsibilities for financial stability in the CB. We investigate these issues with a set of regressions, described below, aimed at understanding our variables *Strong\_CB\_in\_FS* and *Strong\_MoF\_in\_FS*.

Another measure of governance structure is the strength of the FSC. We construct the variable *Strong\_FSC* and assign a value to it for each country with an FSC according to the following definition:

- *Strong\_FSC* = 1, if an FSC exist but it only has soft tools or only an information sharing function; and,
- *Strong\_FSC* = 2, if an FSC exists and it has semi-hard or hard tools

As noted earlier, of the 40 countries that have FSCs, 28 would have values of *Strong\_FSC* equal to 1 and 12 would have values equal to 2.

A stronger FSC could mitigate concerns about excess responsibilities for a CB that is politically independent and has a mandate for financial stability in addition to its traditional mandate for price stability. In these situations, a country may want to set up the FSC with semi-hard or hard tools, to provide an alternative set of tools to those an independent CB would have. Note that if our measure indicates a FSC does not have semi-hard or hard tools, it does not mean that the country cannot implement macroprudential policies. Rather, the authority for implementing macroprudential policy remains with the primary regulator or CB or another entity, but not the FSC.

## **b. Baseline regressions**

We run the following three baseline logit regressions to assess what factors determine the choice to grant the CB a strong role in financial stability policymaking. We follow the basic structure of Mosciandaro and Volpicella (2016), but use a larger and more updated sample, separate the cases of CB as chair of the FSC and as a single agency, and examine determinants of the MoF chair to help interpret the CB results. We look specifically at whether the choice of a CB chair is affected by (1) wanting to benefit from its information advantage, most notably as a PR, (2) its skills advantage in macroeconomic analysis developed for monetary policy, (3) to avoid excess concentration of power, and (4) its political independence, which may allow it to implement unpopular countercyclical policies.

(1)  $Strong\_CB\_in\_FS = 3 / Strong\_CB\_in\_FS = 1 \text{ or } 2 =$   
 $f(\text{CB as PR,}$   
 $\text{Credit-to-GDP,}$   
 $\text{Advanced economy,}$   
 $\text{CB independence,}$   
 $\text{log\_GDP}).$

(2)  $Strong\_CB\_in\_FS = 4 / Strong\_CB\_in\_FS = 1 \text{ or } 2 =$   
 $g(\text{CB as PR,}$   
 $\text{Credit-to-GDP,}$   
 $\text{Advanced economy,}$   
 $\text{CB independence,}$   
 $\text{log\_GDP}).$

(3)  $Strong\_MF\_in\_FS = 3 / Strong\_MF\_in\_FS = 1 \text{ or } 2 =$   
 $h(\text{CB as PR,}$   
 $\text{Credit-to-GDP,}$   
 $\text{Advanced economy,}$   
 $\text{CB independence,}$   
 $\text{log\_GDP}).$

We treat CB as chair or co-chair of a committee ( $Strong\_CB\_in\_FS = 3$ ) separate from CB as the single agency ( $Strong\_CB\_in\_FS = 4$ ). Unlike in Lim et al (2013) and M&V (2016), we do not assume that a single agency represents a stronger CB than when the CB is the chair of a FSC. Our reason is that their formulation combines two decisions – to create a committee and to designate a chair – rather than a simple ranking that the CB is a stronger presence in financial stability when it is a single agency than when it is a chair of a committee. We separate the two cases and find that they empirically depend on different country characteristics. We check the robustness of these results by combining the two cases.

The main explanatory variables are described below and summarized in Table 5, and the baseline estimation results for equations (1) to (3) are shown in Tables 6 and 7. All the variables, except the number of voting agencies, are measured in 2007, just before the recent financial crisis and before most of the FSCs were created, and represents information available to country authorities when establishing the FSC structures.

- The credit-to-GDP ratio, denoted  $Credit\_to\_GDP$ : This variable may affect governance structure since an economy with higher credit intensity may have higher output

variability, and indicate a greater need for time-varying macroprudential policy and the skills of a central-bank oriented policy framework.

- The current account-to-GDP ratio, denoted *Current Acct\_to\_GDP*. This variable may affect governance structure since an economy with large gross capital flows may have higher output variability, and indicate a greater need for time-varying macroprudential policy and the skills of a central-bank oriented policy framework.
- *Advanced* economy or not (either emerging or developing, according to the IMF WEO classification). Advanced economies may have more complex financial systems because there may be more types of firms, markets, and regulatory agencies. Macroprudential policymaking in these countries would require more coordination. Countries concerned about concentration of power would not give the CB more authority and would want to give authority to an independent entity.
- The number of voting agencies (not members), denoted as *# of FSC voting agencies*, on the committee. The greater the number, the higher the need for coordination. As with Advanced, countries concerned with concentration of power would not give the CB more authority.
- The *Political Independence* of the central bank, measured by the Grilli, Masciandaro, and Tabellini (GMT). Political independence reflects the ability of the central bank to select the final objectives for monetary policy.<sup>13</sup> This may affect governance structure since the more independent the central bank, the more able it is to implement policies that might be unpopular. .
- The fiscal cost of the most recent financial crisis, denoted *Fiscal\_Cost\_to\_GDP*: This is from Laeven and Valencia (2012) who document significant fiscal outlays associated with banking crises, averaging 6.8 percent of GDP during 1970-2011. These costs may affect governance structure since countries might want more active participation of the ministry of finance or other parts of the government when the costs of crises are high, in order to coordinate macroprudential policies with other macro policies.
- The size of the economy, measured by US dollar denominated GDP and denoted *Log\_GDP*: This variable may affect governance structure since larger economies have more resources to staff different agencies.

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<sup>13</sup> Mosciandaro and Volpicella (2016) distinguish between political independence and operational independence. Operational independence is based on linkages between the central bank and government in terms of credit provision by the central bank to the government, and also if the central bank is a prudential regulator. Because of this last criteria, we do not include operational independence.

**Table 5. Sample Characteristics**

	<b>N</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>10<sup>th</sup> percentile</b>	<b>90<sup>th</sup> percentile</b>
Credit-to-GDP	57	92.9	53.7	29.5	171.9
Current Acct-to-GDP	57	-0.8	9.6	-14.0	10.8
Log (Fiscal cost-to-GDP)	54	1.8	1.3	0	3.5
Advanced	57	.49	.50	0	1
# of FSC voting agencies	40	4	1.4	2	5
Political independence	57	.64	.30	.25	1
Log(GDP)	57	26.5	1.5	24.4	28.6

Looking first at the results for CB as chair of FSC (equation (1)), the coefficient on CB as PR is positive but not significant in various specifications (three specifications are shown in columns 1 to 3), suggesting that information advantages associated with also being the PR is not an important indicator that the CB is the chair. This result is in contrast to Mosciandaro and Valpicello, and is because we separate CB as chair from CB as single agency, an issue we will discuss further below. The coefficient on credit-to-GDP is positive and significant, indicating CBs are more likely to be the chair when credit intensity is higher and may be a more significant factor for macroeconomic performance, suggesting countries value the macroeconomic skill advantage of CBs.<sup>14</sup> The coefficient on the current account-to-GDP is positive, though not significant (column 2). In addition, the coefficient on Advanced is negative and significant, indicating the CB is less likely to be the chair in advanced economies, perhaps because of concerns of granting additional powers to a CB in a more complex financial system, and perhaps its information advantage over other entities is smaller. The coefficient or number of FSC voters (column 3) is negative, though not significant, consistent with this interpretation.

We estimated separately the regressions for CB as the single agency (*Strong\_CB\_in\_FS* = 4 in equation (2)) because this outcome reflects two decisions, setting up a committee and designating a chair. The results for what determines the CB as the single agency, shown in columns 4 and 5, differ markedly from results for CB as the chair for an FSC (*Strong\_CB\_in\_FS* = 3), shown in columns 1 to 3. Indeed, we find only one significant factor – country size – in the regression for CB as the single agency. Note that we did not include the variable *CB as PR* in

<sup>14</sup> We also included the percent change in the credit-to-GDP ratio from 2007 to 2014, and the coefficient was positive but generally not significant. This variable is meant to approximate the variability of the credit-to-GDP ratio, where higher variability would lead to greater demand for central bank macroeconomic analytical skills. We plan to include the standard deviation of credit-to-GDP in the next version.

the regressions, since the CB as single agency is, by definition, the PR.<sup>15</sup> The coefficient on log(GDP) is negative and significant, suggesting that CB as a single agency reflects resource constraints of smaller countries. In contrast, the coefficients on country size in the CB as chair regressions were never significant. We also included the other variables in the CB chair and MoF chair regressions, such as credit-to-GDP and Advanced, in this regression, and they were not significant. These results confirm that determinants of a single CB authority and a CB chair of a FSC are very different.

We look further at the sensitivity of these results and estimate the CB as chair and single agency combined. Empirical results (columns 7 and 8) are a combination of the two separate outcomes. We find, as do Mosciandaro and Volpicella (2016), that the coefficient on *CB as PR* is positive and significant. They interpret this result as countries trying to benefit from information advantages. But we have shown, by comparing columns (1) and (4), that this result reflects that CB as a single agency would also be the PR, almost by definition. Thus, our results do not support their finding of important informational advantages about banks as a reason for a CB chair. Instead, our results suggest a more nuanced interpretation. If we remove the countries where the only agency charged with financial stability and implementing macroprudential policies is the CB, which is shown to be determined mainly by resource constraints, it is not more likely that a CB that is also a PR will have a stronger role in the financial stability committee. Thus, we do not support greater information advantage as an important determinant for the CB as chair of a FSC.

**Table 6. Logit Estimation Results for Central Bank as Chair of FSC or as Single Agency**

	CB as FSC Chair (excluding CB as single agency)			CB as Single Agency for full sample		CB as Chair or Single Agency	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CB as PR	-.30	-.40	-.35	--	--	.76**	.74**
Credit-to-GDP	.03***	.03***	.03**	-.01	-.01	.01*	.02*
Current Acct- to-GDP		.08	.07		.05		.04
Advanced	-3.61***	-4.89***	-4.51**	1.27	1.24	-1.31	-1.65
# of FSC voting agencies			-.33				
Political independence	2.15	3.51*	2.84	.38	.33	.92	1.40
Log(GDP)	.14	.10	.20	-.52**	-.43*	-.27	-.33
Constant	-6.09	-5.91	-6.56	12.7	9.86	4.71	5.73
N	43	43	40	57	57	57	57
Pseudo R2	.18	.23	.22	.08	.10	.17	.18

<sup>15</sup> The 14 countries are Argentina, Belgium, Cyprus, Czech Republic, Greece, Hungary, Ireland, Lithuania, New Zealand, Portugal, Saudi Arabia, Singapore, Slovakia, and Thailand.

We turn next to the determinants for MoF as chair (Table 7). We first estimate equation (3) for the full sample, including countries where there is no FSC because the CB is the single agency for macroprudential policy. In principle, even if there is only a single combined CB and PR in the country, it still could have decided to create a committee to involve the MoF. We find that the only significant variable is *CB as PR*, where the coefficient is negative and highly significant (columns 1 to 3). These results seem to simply reflect that the MoF is less likely to be chair in the 14 countries that have chosen the CB to be the single agency authority for financial stability. When the sample is restricted to exclude those countries (shown in columns 4 and 5), the coefficient remains negative but less significant.

The coefficients on the other potential determinants are generally not significant, suggesting that what determines the CB as chair is not the same as for MoF as chair. Committees with more voting agencies are more likely to have the MoF as chair (column 5). This result may, however, reflect partly whether the MoF is on the committee, since all committees with only two members never include the MoF but rather include the CB and the PR – if separate entities – or the joint CB and PR and an agency like a deposit insurer. Countries that are Advanced economies might also be more likely to have MoF as chair.

**Table 7. Logit Estimation Results for Ministry of Finance as Chair of FSC**

	MoF as FSC Chair for full sample			MoF as FSC Chair (excluding CB as single agency)		CB as FSC Chair (excluding CB as single agency)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CB as PR	-1.15***	-1.19***	-1.21***	-.73*	-1.07*	-.30	-.45	-.19
Credit-to-GDP	-.00	-.00	-.00	-.01	-.02	.03***	.03**	.03**
Current Acct- to-GDP		.03		.05				-.14
Fiscal cost-to- GDP			.05				-.60	
Advanced	.09	.12	.26	.76	3.09*	-3.61**	-4.53**	-4.18**
# of FSC voting agencies					1.17**			-.58
Political independence	.96	.84	1.03	.73	1.62	2.15	1.98	2.84
Log(GDP)	.32	.39	.25	.26	-.41	.14	.24	.12
Constant	-7.30	-8.81	-5.48	-6.16	7.62	-6.09	-7.24	-2.63
N	57	57	54	43	40	43	41	40
Pseudo R2	.19	.20	.20	.10	.34	.18	.23	.24

These results, combined with those for the CB as chair, suggest that economic factors that help explain the CB as chair are not the same as for MoF as chair, and that there is very little to help explain the MoF as chair. We summarize these findings as CBs are designated chairs of FSCs where the credit-to-GDP ratio tends to be larger, suggesting gains from the CB's analytical skills

for time-varying analysis of macroeconomic and financial developments to be applied to financial stability. In addition, countries that designate the CB as the single authority for financial stability do it for very different reasons as CB as chair, and appear to do so because they are smaller economies and may lack resources or may not need coordination. Finally, more advanced economies are less likely to designate the CB as chair, and more likely to designate the MoF, especially if there are more voting agencies on the FSC, indicating granting the MoF a stronger role when there are more agencies to coordinate.

For both CB and MoF as chair regressions, we also included measures of CB political independence, but did not find they are significant determinants for either choice. Mosciandaro and Volpicella (2016) found a significant negative coefficient on political independence in their strong CB regressions based on a sample of 31 countries, which they interpret as countries not wanting to give CBs additional macroprudential powers if they were already an independent agency, for fear of creating an all-powerful bureaucracy. We plan to explore further why we do not find a similar result. We plan to look also at other measures of CB independence, such as from Cukierman 2007/2008 and deJaan and Eijffinger (2016), which are more up-to-date and also whether our measures being more recent and covering more advanced economies is a factor.<sup>16</sup> Notably, many of the FSCs in our sample were formed after various bodies – like the ESRB – emphasized the role of CBs in FSCs and it is possible that these recommendations may have moved countries toward giving CBs more authority on FSCs than otherwise, and these countries had CBs with political independence.

Instead, our results overall provide some evidence for the CB as chair because of skill advantages related to developing monetary policy and choice of MF as chair in more advanced and complex financial systems that require coordination. Surprisingly, and in contrast to Mosciandaro and Volpicella, we do not find support of taking advantage of information synergies from also being a PR.

In addition to looking at CB as chair to indicate the special role of the CB, we can also look at what determines how strong the FSC itself is. We define strong as having its own hard and semi-soft tools. Some preliminary results (not shown) indicate that none of the variables that help to explain either CB or MoF chair are significant in a regression of strong FSC. The only variable that is significant is political independence of the CB, and the coefficient is positive. This coefficient could be interpreted as countries set up stronger FSCs if the CB already exercises independence in its traditional functions – setting monetary policy and overseeing the payments system—and is done to prevent excess concentration of power or responsibilities of a CB. In addition, of the 12 FSCs that have tools, the MoF is the chair or co-chair in nine of them,

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<sup>16</sup> We also included a dummy variable for participation in the euro, but it was not significant. We also excluded countries in the euro when we ran the regressions, but the results were not significantly changed.

while the CB is chair in three countries – UK, Latvia, and Slovenia.<sup>17</sup> These proportions for MoF chair are somewhat higher in this sample of FSCs with tools than in the whole sample. Mosciandaro and Volpicella had found that political independence led to a weaker role for the CB for financial stability, a result which we did not find. One possibility to reconcile our results is that in the interim period from 2010 to 2015, countries concerned about excess responsibilities or power at the CB chose to create a FSC, and the difference in our results reflect that change. We plan to explore this issue further.

CBs can play a special role in financial stability arrangements for a number of possible reasons: information advantages because they also are the lender of last resort, or if they are also the PR; skill advantages because they have existing frameworks for monetary policy which are well-suited for evaluating financial stability risks; or they may be able to exercise independence. Our preliminary regression analysis provides support for institutional set-ups to benefit from the macroeconomic analytical skills of CBs -- the coefficient on credit-to-GDP is positive and significant for CB as chair, and negative for MoF as chair. On information advantages, governance structures do not appear to take direct advantage if a CB is also a PR by making them the chair of the FSCs, contrary to findings in Mosciandaro and Volpicella (2016). At the same time, MoFs are more likely to be chairs in advanced and more complicated financial systems, perhaps because they require more coordination across agencies, which may be better suited for government than a CB. In addition, we interpret our finding that governance structures do not take advantage of information synergies from when the CB is a PR and granting FSCs greater authorities when the CB is politically independent to reflect reluctance to grant more authorities and concentrate powers in an already strong CB.

## 6. Summary and Conclusions

Using a newly-constructed dataset of governance structures for financial stability, we find that nearly all of the 57 countries in our sample have a formal or defacto financial stability committee as of 2016 or have placed that responsibility with the central bank. Most financial stability committees were created after the crisis. Financial stability committees appear to function in most countries as information sharing bodies to promote cooperation, and are not collaborative bodies or independent agencies with new tools. Only 12 financial stability committees have hard or semi-hard tools, most of which are “comply or explain.”

Financial stability committees appear to have limited power, which raises questions about their effectiveness. This set-up may simply reflect the political realities of trying to create a new governance structure for macroprudential policy without overly upsetting the already existing

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<sup>17</sup> The UK appears to be an obvious exception, by placing the FSC (and the PR) into the CB, the CB institution has authority over microprudential, macroprudential, and monetary policies.

system for microprudential policy. But this set-up may also reflect a cautious approach on the part of countries given uncertainty about how to calibrate macroprudential policies and their effectiveness. A recent CGFS paper (No. 56 “Experiences with the ex ante appraisal of macroprudential instruments”) highlights the importance of promoting wider cooperation in conducting appraisals of how macroprudential tools can impact the financial system and economy. The skills required for these appraisals are unlikely to exist within one entity and rely heavily on expert judgment given the nascent science, and policy effectiveness may depend on the setting of other policies.

In terms of the entities on financial stability committees, the central bank is the most prominent. It has a more important role in financial stability than prudential regulators or ministries of finance. It is a member of all but two financial stability committees, chairs or co-chairs the financial stability committee in 15 countries and is the single agency in 14 others. It has authority to implement various time-varying macroprudential tools in more countries than the prudential regulators, financial stability committees. However, the ministry of finance is also an important member of financial stability committees, which may reflect a change in recent years. It is the chair or co-chair in 25 countries, though unlike the central bank, it is never the sole agency. In rare instances, it has sole authority for the countercyclical capital buffers and in several countries it has sole authority for loan-to-value ratios. Prudential regulators are on nearly all of the committees and have authorities for tools in many countries. But they are the co-chair in only one country, indicating that microprudential regulators are important in the institutional set-ups for financial stability, but they are not in charge of macroprudential policies. Representation of securities regulators is similar to prudential regulators, with representation on most committees but they are never the chair.

We examined the determinants for the role of central banks in the governance of financial stability. Our preliminary analysis indicates that countries are more likely to give the central bank a stronger role based on its macroeconomic analytical skills, but not for potential information advantages from also being a prudential regulator. We suspect that countries are not taking more advantage of the central bank’s information advantages for political economy reasons, as they are reluctant to add even more responsibilities and powers to an already powerful central bank. This is also reflected in how countries have set up the authorities of the financial stability committee, but this is an area for continued analysis.

Overall, there are some indications that the new governance structures are good for implementing time-varying policies and will promote financial stability. Nearly all countries have a financial stability committees or have the central bank as the macroprudential authority. Moreover, central banks play a very prominent role, which appears to be related to a need for their macroeconomic analytical expertise, and many have authorities for the use of the countercyclical capital buffer, loan-to-value ratios, and stress tests. Financial stability

committees generally have 3 to 5 members, involving all the major players, and this size is reasonable for coordination.

However, these new structures have risks of inaction. Because the financial stability committees do not have direct powers, they would need to convince the existing regulators to use their tools to mitigate identified financial stability risks. In addition, the ministry of finance is the chair of many FSCs, but it generally has more political constraints than do the central bank or prudential regulators, and it thus may be more reluctant to take politically unpopular actions. Another possible consequence is that this governance raises risks to central banks' price stability mandates: With central banks having such prominent roles but without a dominant lead to take macroprudential actions, they may need to more strongly consider financial stability in its monetary policy decisions, and the risk of losing its credibility is higher if a crisis were to occur.

As experience is gained – and, possibly, as countries experience situations in which financial system vulnerabilities are detected by a financial stability committee but policy responses are unavailable – countries may adjust their committees. In the meantime, given that many committees are coordinating bodies of the relevant prudential agencies, they represent an additional regulatory layer. In this regard, it is important to clarify its role to avoid overlap and conflicts with existing agencies to be most effective. In addition, the new financial stability committees that we study in this paper seem to be building institutions with both central banks and ministries of finance, which should facilitate engagement between the financial regulators and macro policymakers for monetary and fiscal policies. Still, the current set-up highlights the risks that financial stability committees will be prone to inaction. Some possibilities to consider to offset this tendency are to create automatic mechanisms for financial stability committees to request tools when needed, as in the UK, rather than to just issue a warning about a potential risk, or for countries to grant comply and explain powers to the committees that currently do not have them. Another way, which might not require legislation, would be for financial stability committees to ask the central bank or prudential regulators that currently have the powers to set the CCyB, LTVs, and stress tests, to articulate frameworks ahead of time for the conditions that would prompt them to use the tools for macroprudential purposes.

In terms of other avenues for further research over time, it will be important to evaluate whether differences in governance structures actually affect the use of tools. . For example, it might be useful to evaluate whether a stronger central bank role would make it more likely for countries to implement time-varying macroprudential tools. Given the recent formation dates for many financial stability committees, however, there has not yet been enough experience with the use of tools, but we expect that these governance measures may be useful for such analysis in the future.

**Appendix**

**Appendix Table 1 – Countries considered**

Argentina	Hong Kong	Philippines
Australia	Hungary	Poland
Austria	Iceland	Portugal
Belgium	India	Romania
Brazil	Indonesia	Russian Federation
Bulgaria	Ireland	Saudi Arabia
Canada	Israel	Singapore
Chile	Italy	Slovak Republic
China	Japan	Slovenia
Colombia	Latvia	South Africa
Croatia	Lithuania	South Korea
Cyprus	Luxembourg	Spain
Czech Republic	Malaysia	Sweden
Denmark	Malta	Switzerland
Estonia	Mexico	Thailand
Finland	Netherlands	Turkey
France	New Zealand	Ukraine
Germany	Norway	United Kingdom
Greece	Peru	United States

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