Financial Stability Governance and Central Bank Communications[*]

Juan M. Londono,[a] Stijn Claessens,[b] and Ricardo Correa[a]
[a]Federal Reserve Board
[b]Bank for International Settlements

We investigate how central banks' financial stability governance frameworks influence their financial stability communication strategies and their effectiveness in preventing financial stress. Using data for 24 central banks, we test how communication strategies and their effectiveness depend on the powers assigned to these institutions. We find robust evidence that communications by central banks represented in interagency financial stability committees with more powers are more effective in mitigating a deterioration in financial conditions. These central banks also use macroprudential tools more consistently with their communications and, after conditions deteriorate, transmit a calmer message, suggesting that the ability to use macroprudential tools strengthens incentives not to just "cry wolf."

JEL Codes: G15, G28.

1.   Introduction

After the global financial crisis of 2008 to 2009, many countries took steps to prevent the buildup of vulnerabilities and enhance the resilience of their financial systems. Among these steps, countries strengthened their macroprudential regulatory frameworks. Many central banks also obtained a more explicit financial stability mandate and incorporated financial stability objectives in their decisionmaking process (see also Jeanneau 2014). With these changes, financial stability monitoring has become an even more important task for central banks.

Communications about financial stability have also become a tool to influence financial agents' behavior (see, for instance, Born, Ehrmann, and Fratzscher 2014). Although the literature on monetary policy communications is large (see, for instance, Blinder et al. 2008; Ericsson 2016; and Stekler and Symington 2016), central banks' financial stability communications have garnered less research attention.[1] Specifically, the drivers and the effects of financial stability communications, including how such communications interact with financial stability governance frameworks, have largely remained unexplored in the literature.

In this paper, we study how differences in financial stability governance frameworks across countries relate to central banks' financial stability communication strategies and the relative effectiveness of these communications in preventing a deterioration in financial vulnerabilities. To understand how governance frameworks might interact with central banks' communication strategies, we start with proposing a set of testable hypotheses. Our first hypothesis refers to how the relation between financial stability communications and the evolution of the financial cycle might depend on each country's financial stability governance framework, based on the notion that this framework may influence both the willingness to be transparent about the assessment of the state of vulnerabilities and how the central bank communicates about vulnerabilities. The second hypothesis explores how different communication strategies might

---

[1]Arseneau (2020) explores how central bank communications related to financial stability may be associated with the financial cycle from a theoretical perspective.

explain differences in the effectiveness of financial stability communications across central banks conditional on their financial stability governance frameworks. Variations in communication strategies should show up in how the sentiment in central bank communications differs from that conveyed in news articles, which should not contain any strategic goals, and should relate to the central bank's ability to use other policy tools, including macroprudential tools and monetary policy rates.

To empirically test these hypotheses, we merge three databases. The first one details the macroprudential governance frameworks of 24 countries (see Correa, Edge, and Liang 2019 and Edge and Liang 2017). We focus our attention on whether the central bank participates or not in an interagency financial stability committee. The second database uses text analysis techniques to determine the sentiment conveyed by communications used by central banks to transmit their assessment of financial vulnerabilities. In particular, we extend the database of financial stability sentiment (FSS) indices constructed from financial stability reports (FSRs) by Correa et al. (2021) (CGLM hereafter). We also calculate a sentiment index using news articles related to financial stability, which we name NS. The third database includes a set of country-specific measures of financial vulnerabilities, where we center our attention on the credit-to-GDP gap.

We use panel-data and probit models to assess how cross-country differences in macroprudential governance frameworks affect central banks' communication strategies. We exploit the cross-country heterogeneity to investigate how the FSS conveyed by central banks' communications affects the evolution of financial cycle characteristics, depending on three governance characteristics: (i) whether the central bank participates in an interagency financial stability committee, either de facto or de jure; (ii) whether the committee exists de jure—that is, implemented through a formal legal arrangement; and (iii) whether the committee has the power to implement policy tools, including macroprudential instruments.

In our first set of empirical tests, we explore whether a country's governance framework matters for the effectiveness of central banks' financial stability communications. We find that the communication of those central banks participating in interagency financial stability committees is relatively more effective in limiting a deterioration of

financial cycle characteristics than communications of other central banks. We also explore whether the effect of central banks' communications varies by governance characteristics around turning points in the financial cycle, where turning points are defined as local credit-to-GDP maximums followed by a decrease in the credit-to-GDP gap over at least the next four quarters. Our evidence suggests that central banks participating in interagency committees are more effective in limiting a buildup of financial vulnerabilities through communications irrespective of whether we consider episodes around turning points in the financial cycle or not.

We next use a probit model to assess whether the predictive power of the FSS index for financial cycle turning points depends on the macroprudential governance framework. We find that for central banks *not* participating in financial stability committees, a deterioration in the communicated sentiment helps predict financial cycle turning points—a 1 percent increase in the FSS index (that is, a deterioration in sentiment) of these central banks is associated with a 0.21 to 0.26 percent higher probability of a turning point. In other words, those central banks often "cry wolf" and the "wolf actually comes." However, communication by central banks participating in a committee with the ability to implement macroprudential tools is effective in reducing the probability of a turning point in the financial cycle. Thus, these central banks signal financial stability risks and act in accordance, which then reduces the likelihood of financial stresses.

In the second set of empirical tests, we investigate the drivers of the relative effectiveness of communications by exploring whether governance frameworks matter for how central banks incorporate information in their financial stability communications. Our second hypothesis suggests that some central banks could strategically deviate from the publicly available information (that should have no strategic bias) when communicating through FSRs. We test for this by exploring the dynamic relation between the sentiment in financial stability reports and that in news articles (FSS and NS, respectively).

We find that after a deterioration in the sentiment conveyed by news articles, central banks participating in financial stability committees transmit a calmer message in their FSRs than central banks not participating in such committees—that is, even as public

information signals a deterioration in financial conditions, a central bank participating in a financial stability committee transmits a calmer message than central banks without this characteristic.

These findings suggest that a central bank having at its disposal policy instruments to influence the financial cycle, or being able to make other agencies use such policy instruments, acts differently. To explore this possibility further, we assess whether the FSS index is associated with either changes in macroprudential instruments (Cerutti et al. 2016) or the monetary policy rate. We expect the communication of a central bank that can influence, directly or indirectly, macroprudential actions to be positively correlated with such actions. Consistent with this intuition, we find that a deterioration in sentiment conveyed by central banks participating in interagency financial stability committees with authority for macroprudential or related policy instruments is followed by a tightening of these instruments. In contrast, we find that the sentiment in FSRs is not related to monetary policy rates, which is a blunter tool to address financial stability concerns.

In terms of the literature, our paper combines two strands: that focusing on financial stability governance frameworks and that focusing on central bank communications. The literature on central banks' financial stability governance frameworks and the implementation of macroprudential policies has gained much interest after the global financial crisis (see Edge and Liang 2017, Masciandaro and Volpicella 2016, and papers cited therein). The literature on central banks' communication strategies and their interactions with central banks' characteristics has focused mostly on communicating monetary policy and the role of transparency (see, for instance, Blinder et al. 2008; Cukierman 2009; Ehrmann and Fratzscher; and Morris and Shin 2002). Some recent studies have explored aspects of the sentiment conveyed in monetary policy communications, including how communications can spill over across countries (Armelius et al. 2018). We contribute to this literature by showing that governance frameworks shape financial stability communication strategies and their effectiveness to alleviate a deterioration in financial cycle conditions.

The literature on financial stability communications is still developing. To date, it has been mostly descriptive (see, for instance, Allen, Francke, and Swinburne 2004; Cihak 2006; and Cihak et al. 2012), and only a few papers have explored the effect of financial

stability communications on financial cycle characteristics. Osterloo, de Haan, and Jong-A-Pin (2011) explore the effect of the publication of FSRs on a number of business and financial cycle characteristics, while Harris et al. (2019) analyze the effects of the Bank of England's FSR publication on stock returns and credit default swaps (CDS) spreads. Born, Ehrmann, and Fratzscher (2014) and CGLM use text analysis techniques to proxy the sentiment conveyed by central banks' financial stability communications and to investigate the effect of sentiment on financial cycle characteristics.[2] CGLM show that their FSS index is a useful predictor of banking crises, as sentiment deteriorates just prior to the start of a crisis.[3] At the same time, this evidence suggests that financial stability communication alone is insufficient to avoid a deterioration in financial vulnerabilities. Our evidence, however, suggests that financial stability communication can be more powerful in preventing financial crises for those countries with robust central bank governance frameworks.

Our work can also help explain why central banks without a direct macroprudential role rely more on communication to transmit concerns about financial stability, as they may signal to other agencies the need to act when financial vulnerabilities increase. Our empirical evidence also suggests that those central banks with direct or indirect control over macroprudential instruments might transmit a calmer message that conveys the system's resilience following an adverse shock.

The rest of the paper is organized as follows. Section 2 provides the intuition for the interaction between governance frameworks and central banks' communication strategies and outlines our hypotheses. Section 3 provides our data sources and presents the empirical evidence regarding the role of governance frameworks in explaining the effectiveness of central banks' financial stability communications. Section 4 explores differences in communication strategies, including

---

[2]Born, Ehrmann, and Fratzscher (2014) use Diction, a general-purpose text analysis dictionary, to extract the sentiment conveyed by these communications. CGLM construct a dictionary tailored to the financial stability context, as they find that a large portion of words in FSRs convey a different sentiment when used in a financial stability context.

[3]Other studies also use textual information to complement other indicators in models designed as early warning systems. For example, Huang et al. (2019) use the text from the *Financial Times* in a model to predict financial crises.

the deviation from the sentiment in news articles and the implementation of macroprudential and monetary policy tools. Section 5 concludes.

2.   Understanding Central Banks' Communication Strategies

Central bank financial stability communications have evolved in recent years, in part driven by a desire to make central banks' views in this area more transparent, with the aim of increasing the resilience of the financial system (Arseneau 2020). However, as noted by Cihak (2006), financial stability communication has several limitations, particularly when compared to monetary policy communication. For example, communications about financial stability may actually trigger stresses in the financial system if market participants already have concerns about the fragility of the sector. Also, and in contrast to monetary policy communications, to achieve financial stability goals, central banks need to interact with other agencies that have microprudential and supervisory powers or are in charge of deploying macroprudential tools. These interactions may also shape their communications. These and other dimensions of financial stability communications make it important to assess empirically whether the sentiment conveyed in these communications relates to the general financial stability governance framework of countries and, specifically, to the governance of prudential instruments. This section discusses these issues to motivate the hypotheses tested empirically in Sections 3 and 4.[4]

As modeled in Arseneau (2020), central banks are typically assumed to have more information than the public about the state of vulnerabilities in the financial sector, as they might have some private information. For example, central banks that have supervisory powers can obtain private information about the financial institutions they supervise. Having more information generates a strategic decision for central banks: They can be completely transparent about vulnerabilities as they see them; or they can withhold

---

[4]Section A.1 of the appendix provides a stylized conceptual framework that further motivates the discussion in this section.

(or alter) information depending on the potential effects of revealing that information. We therefore pose that each country's financial stability governance framework, including the degree to which central banks can use other tools to manage financial vulnerabilities, may determine their communication strategies and the effectiveness of communications in the evolution of those vulnerabilities.

Our first hypothesis centers around the effectiveness of financial stability communications. As noted in Correa et al. (2021), the sentiment conveyed in financial stability communications is associated with various financial cycle indicators, suggesting that financial stability communications may influence the path of the financial cycle. The effect of those communications may also depend on the financial governance structure in a given country. Governance frameworks may influence both the willingness to be transparent about the central bank's assessment of the state of vulnerabilities and the way that the central bank communicates about them. These conjectures lead us to the first hypothesis that we will test empirically:

HYPOTHESIS 1. *Financial stability governance frameworks influence the effect of central bank financial stability communications on the evolution of the financial cycle.*

The differential effects of financial stability communications may also arise because communication strategies differ depending on each country's financial stability governance framework. Therefore, we conjecture the following second general hypothesis:

HYPOTHESIS 2. *Financial stability governance frameworks and the availability and use of policy instruments influence central bank communication strategies.*

We next propose three specific testable hypotheses as to how differences in communication strategies relate to financial stability governance frameworks and the use of policy instruments. First, financial stability governance may influence how a central bank communicates, because some governance frameworks lead a central bank to withhold some information strategically in its communications. In this case, we should observe a divergence between the financial stability sentiment conveyed in communications that are

publicly available and have no strategic bias, such as news articles, and the sentiment conveyed by the central bank in its FSRs. The first hypothesis related to communication strategies is therefore the following:

HYPOTHESIS 2a. *Financial stability governance frameworks affect the sentiment conveyed in central bank communications relative to the sentiment conveyed in news articles.*

A divergence between the sentiment in FSRs and that in news articles could, of course, be explained by the central bank's strategic decision to withhold private information (conditional on the central bank having access to this information) or by the central bank's ability to use (or support the use of) other policy instruments, such as macroprudential tools and the monetary policy rate. Macroprudential instruments have been found to mitigate vulnerabilities associated with financial crises and reduce the risks of related economic recessions (see Claessens 2015 for a review). The deployment of macroprudential tools is, in many cases, left to relevant agencies' discretion, with some ex ante consulting and ex post reporting requirements.[5] As such, both the deployment of macroprudential tools and communication on financial stability would depend on governance arrangements (Committee on the Global Financial System 2016; Masciandaro and Volpicella 2016). We expect central banks that have control over macroprudential tools (or can influence other agencies that control such instruments) to be more likely to use them as their financial stability communications become more negative. This would amount to coherent communication. At the same time, substitution is possible too. For example, sentiment communicated through FSRs could become more negative in situations where macroprudential policies reach their limits (for practical, statuary, or political economy reasons). This intuition leads to our second testable hypothesis related to communication strategies.

HYPOTHESIS 2b. *Central banks that have direct or indirect (e.g., through a financial stability committee) control over macroprudential*

---

[5]There are only international guidelines for the activation of the countercyclical capital buffer and the use of surcharge for systemic banks, and even these guidelines still give ample room for discretion.

tools are more coherent and use such tools more when the sentiment in their communications deteriorates.

Central banks are (foremost) monetary policy decisionmakers. There is a large debate on the role of monetary policy in financial stability, with some arguing in favor of a policy of systemically "leaning against the wind" (Borio, Disyatat, and Rungcharoenkitkul 2019), while others argue this is too costly (Svensson 2017). Related to this debate is the interaction between monetary and macroprudential policy in mitigating financial stability risks. On the one hand, if the central bank has macroprudential policies at its disposal (directly or indirectly) and these are largely effective, then it may reserve monetary policy for addressing inflation or economic activity and employment goals. On the other hand, in the presence of constraints on either (or both) macroprudential or monetary policy, both policies may need to be employed in the pursuit of financial stability (International Monetary Fund 2013). In turn, this means that the relation between financial stability communications and monetary policy is ambiguously shaped by macroprudential governance arrangements. If the central bank also has macroprudential tools at its disposal, it could use those tools when it communicates a change in its financial stability sentiment and, at the same time, choose not to change its monetary policy. Alternatively, it could use its monetary policy tools to internalize any constraints it faces on the use of macroprudential instruments. Given this ambiguity, whether central banks' use of monetary policy to curtail financial vulnerabilities varies by governance framework becomes an empirical question, which we test in a third hypothesis related to communication strategies.

HYPOTHESIS 2c. *Central banks use monetary policy to curtail a deterioration in financial vulnerabilities if they have limited direct or indirect access to macroprudential instruments.*

3. The Effectiveness of Financial Stability Communications

In this section, we test the first hypothesis introduced in Section 2 and explore whether the effectiveness of central banks' communications depends on countries' financial stability governance

frameworks. We first introduce the data and then assess which features make communication strategies relatively more (or less) effective in alleviating the deterioration of financial cycle characteristics and the risks of turning points in the cycle.

3.1   Data

We use a panel data set consisting of quarterly data for 24 countries for the sample period between 2005 and 2019.[6] Our data set consists of three types of data: (i) an index of sentiment from FSRs (FSS index), (ii) a set of characteristics related to countries' financial stability governance frameworks, and (iii) a set of financial cycle indicators.

Financial Stability Sentiment. For each country, we characterize central banks' financial stability communications using the FSS index as developed in CGLM. For each FSR, the FSS index is calculated as follows:

$$FSS\ index_{country,period} = \frac{\#Negative\ words - \#Positive\ words}{\#Total\ words},$$

(1)

where the negative (or positive) connotation of words is obtained from the financial stability dictionary proposed by CGLM.[7] Although many central banks currently publish FSRs, we restrict our sample to those central banks that have published at least one FSR annually since 2005. As pointed out by CGLM, working with this reduced sample has two main advantages. First, it allows us to compare the indices for a homogeneous period. Second, it increases the reliability of the empirical tests because most countries excluded from our sample began publishing FSRs only around the global financial crisis. Because FSRs are published at a biannual or annual frequency, we assume a step function to interpolate between any two dates when reports are available.

Panel A of Figure 1 shows the time series for the cross-country average of the FSS indices demeaned at the country level. We use

---

[6]We use information for individual countries within the euro area (instead of using communications from the European Central Bank), as the authority to use macroprudential instruments is mostly available at the national level.

[7]The dictionary created by Correa et al. (2017) can be found at Juan M. Londono's website: https://juanmlondono.wordpress.com/.

**Figure 1. Financial Stability Sentiment Indices:
Averages across Countries**

A. All Countries

B. Interagency Financial Stability Committee
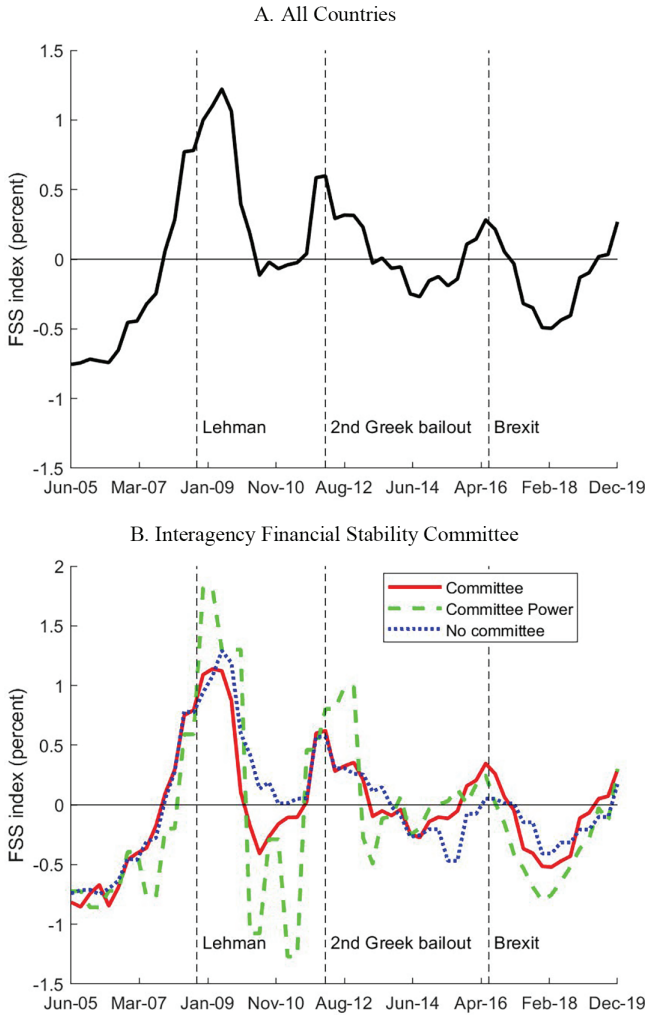
Note: Panel A shows the equally weighted average of all countries' demeaned financial stability sentiment (FSS) indices. Panel B shows the average across all countries for which the central bank participates (red solid line), in a committee with powers (dashed green line), or does not participate (dotted blue line) in an interagency financial stability committee. For reference, we add vertical lines for the following key dates (quarterly equivalent): the collapse of Lehman Brothers (marked as October 2008), the second Greek bailout (marked as March 2012), and the Brexit referendum (marked as July 2016).

demeaned FSS indices to control for systematic differences across countries. Table 1 shows a set of summary statistics for the FSS indices. As shown in Figure 1, the average FSS increases (that is, sentiment deteriorates) during several key episodes, such as the failure of Lehman Brothers in September of 2008, the approval of the second EU-IMF bailout for Greece in the first quarter of 2012, and the Brexit referendum in the summer of 2016. Around these episodes, FSS reached historical maximums for most countries in our sample, as shown in Table 1.

Governance Frameworks. Table 2 summarizes the governance framework characteristics for the central banks in our sample as of December 2019. We center our attention on those characteristics related to participating in a financial stability interagency committee, as reported in the financial stability governance framework database of Correa, Edge, and Liang (2019). For each entry, we add a time dimension to capture changes in the status of a country's governance framework. These not mutually exclusive characteristics are whether (i) the central bank participates in an interagency financial stability committee; (ii) the committee is official ("de jure"), and (iii) the committee has the power to implement policy tools, including macroprudential tools. The table also includes the date(s) for whenever changes in each characteristic occurred within the sample period (in most cases, from not having a particular characteristic, "N", to having it, "Y").

Panel B of Figure 1 shows the time series of three cross-country average FSS indices: for those central banks that participate in a financial stability committee; for those where that committee has powers; and for those countries where the central bank does not participate in a committee. This panel provides some intuition for the way communication strategies and the effectiveness of communication could vary across central banks depending on governance frameworks. Although the three FSS indices—for central banks participating in committees, in committees with powers, and not participating in committees—are highly correlated, there are differences in the levels and dynamics of the indices, especially in episodes of high uncertainty. Notably, the FSS index for central banks participating in committees with powers increases much more around the collapse of Lehman Brothers in 2008 and during the euro area crises in 2012. This index is also more volatile, in part due to the fact that

Table 1. Financial Stability Sentiment Index: Summary Statistics

Country	Mean	St. Dev.	Minimum	Date Minimum	Maximum	Date Maximum
Argentina	−0.24	0.70	−1.55	2005:Q2	1.16	2009:Q2
Australia	1.34	0.64	0.13	2006:Q1	2.70	2019:Q4
Austria	0.59	0.74	−1.00	2018:Q4	2.18	2009:Q2
Belgium	0.93	0.53	0.10	2005:Q2	2.13	2009:Q2
Canada	2.18	0.97	0.35	2017:Q4	3.81	2008:Q4
Chile	0.75	0.66	−1.29	2005:Q1	2.19	2007:Q4
Czech Republic	1.19	0.61	0.42	2006:Q2	2.49	2009:Q2
Denmark	1.19	1.11	0.02	2017:Q2	4.43	2008:Q4
Germany	1.57	0.61	0.43	2005:Q1	2.73	2018:Q4
Hong Kong	0.63	0.89	−0.87	2017:Q3	2.45	2008:Q4
Hungary	1.31	0.78	0.22	2005:Q2	2.92	2011:Q4
Indonesia	0.28	0.73	−1.45	2010:Q3	1.83	2009:Q1
Netherlands	1.97	0.84	0.37	2017:Q4	3.93	2009:Q2
New Zealand	1.18	0.74	−0.06	2010:Q2	3.04	2008:Q4
Norway	1.48	0.92	−0.28	2005:Q1	2.53	2014:Q4
Poland	0.83	0.50	−0.05	2006:Q2	1.85	2009:Q2
Portugal	0.80	0.69	−0.03	2018:Q2	2.47	2009:Q2
Singapore	1.14	1.05	−0.48	2006:Q2	3.56	2008:Q4
South Africa	2.07	0.71	0.94	2018:Q2	4.07	2009:Q1
Spain	0.79	0.96	−1.08	2006:Q2	2.55	2011:Q4
Sweden	1.46	0.64	0.59	2005:Q1	3.08	2008:Q4
Switzerland	1.54	0.98	−0.09	2006:Q2	3.53	2009:Q2
Turkey	0.34	0.66	−0.96	2017:Q2	1.63	2011:Q4
United Kingdom	1.87	0.70	0.89	2014:Q2	3.45	2008:Q2

Note: This table shows a set of summary statistics (mean; standard deviation, abbreviated as St. Dev.; minimum; and maximum) for the financial stability sentiment (FSS) indices of the 24 countries in our sample. We also report the minimum and maximum dates when the FSS index takes on its lowest and highest values, respectively.

Table 2. Financial Stability Governance Frameworks

Country	Committee (Yes/No/De Facto)	Date	Committee with Powers	Date
Argentina	N		NA	
Australia	Y		N	
Austria	Y	08-Sep-14	Y	08-Sep-14
Belgium	N	31-Jul-10	N	
Canada	D		N	
Chile	Y	31-Jul-11	N	
Czech Republic	N		NA	
Denmark	Y	28-Feb-13	N	
Germany	Y	31-Jan-13	N	
Hong Kong	Y		Y	
Hungary	N[1]	16-Sep-13	N	
Indonesia	Y[2]	30-Dec-05	N	
Netherlands	Y	30-Nov-12	N	
New Zealand	N		NA	
Norway	Y	01-Jan-06	N	
Poland	Y[3]	01-Oct-08	Y	01-Nov-15
Portugal	N		NA	
Singapore	N		NA	
South Africa	D	01-Jun-13	N	
Spain	Y	27-Feb-06	N	
Sweden	Y[4]	19-Dec-13	N	
Switzerland	D	23-Feb-10	N	
Turkey	Y	08-Jun-11	N	
United Kingdom	D[5]	28-Feb-11	Y	19-Dec-12

[1]De facto committee between 01/01/2010 and 09/16/2013. [2]Committee was de facto between 12/30/2005 and 11/30/2011. [3]Committee was de facto between 12/01/2008 and 11/01/2015. [4]Committee was de facto between 01/01/2012 and 09/01/2013. [5]Committee was de facto between 02/28/2011 and 12/19/2012.

Note: This table summarizes the financial stability governance frameworks for the central banks of the countries in our sample as of December 2019. "Y" ("N", respectively) denotes that the central bank of that country has (does not have, respectively) a particular governance characteristic. For central banks participating in an interagency financial stability committee, we specify whether this committee is official or established "de facto" ("D") through less formal memorandums of understanding. We also report the dates when changes to these frameworks have occurred within our sample period (in most cases, from not having a particular characteristic to having it). A more detailed description of this database can be found in Correa, Edge, and Liang (2019).

only four central banks in our sample participate in committees with powers.

Financial Conditions. We use the credit-to-GDP gap as the benchmark measure for the evolution of the financial cycle. This gap is calculated as the deviation of the credit-to-GDP ratio from its long-run trend and is expressed in percentages (Borio 2014). To assess the robustness of the effectiveness of financial stability communications, we use two other variables related to credit, namely the 12-quarter growth in credit to the non-financial private sector to GDP ratio and the debt-service ratio, where the latter is calculated as the ratio of interest payments plus amortizations to income for private non-financial borrowers. These variables are obtained from the Bank for International Settlements (BIS).

Table 3 shows a set of summary statistics for the credit-to-GDP gap in each country. There is substantial heterogeneity in the mean credit-to-GDP gap for the countries in our sample (by construction, the average gap is zero for large samples). The mean gap ranges from –9.90 (the United Kingdom) to 20.19 (Hong Kong). Standard deviations in the gap range from 4.0 (Austria) to 14.8 (Hong Kong). To characterize turning points in the financial cycle, we construct a dummy that takes the value of 1 whenever there is a local maximum in the credit-to-GDP gap followed by a decline in the gap over at least the next four quarters and zero otherwise. We use this definition of turning points in the financial cycle because our sample is relatively short and includes very few financial crises (as defined by Laeven and Valencia 2013, for instance). In our sample (60 quarters in total), there are no credit-to-GDP gap turning points in Germany but nine in both Hong Kong and Singapore, the most in the sample. We show the dates when turning points occurred for all countries in our sample. Many of these correspond to the key dates where FSS reaches maximum levels (as shown in Table 1).

3.2   Financial Stability Communications and the Evolution of the Financial Cycle

Motivated by the hypotheses outlined in Section 2, we first test how financial stability governance frameworks affect the relation between

Table 3. **Credit-to-GDP Gap: Summary Statistics**

Country	Mean	St. Dev.	Turning Points	Dates of Turning Points
Argentina	−3.49	6.27	2	2014:Q1, 2018:Q3
Australia	−0.83	11.37	2	2007:Q3, 2016:Q2
Austria	−4.27	4.04	2	2006:Q3, 2010:Q2
Belgium	1.28	10.08	4	2009:Q3, 2012:Q2, 2013:Q2, 2016:Q2
Canada	5.59	6.22	5	2009:Q4, 2011:Q3, 2013:Q2, 2016:Q3, 2018:Q2
Chile	0.19	10.32	3	2009:Q1, 2009:Q3, 2015:Q3
Czech Republic	9.60	7.22	5	2009:Q4, 2011:Q2, 2013:Q4, 2016:Q3, 2018:Q3
Denmark	2.28	24.43	4	2007:Q4, 2009:Q3, 2011:Q3, 2012:Q1
Germany	−7.05	4.69	0	
Hong Kong	20.19	14.80	9	2005:Q2, 2007:Q3, 2008:Q3, 2011:Q2, 2012:Q1, 2014:Q2, 2015:Q1, 2017:Q2, 2017:Q4
Hungary	0.67	23.42	4	2006:Q2, 2009:Q1, 2010:Q2, 2011:Q3
Indonesia	3.13	7.68	7	2013:Q4, 2014:Q2, 2014:Q4, 2015:Q2, 2016:Q4, 2017:Q4, 2018:Q3
Netherlands	−3.24	11.56	3	2005:Q2, 2012:Q2, 2015:Q1
New Zealand	−7.96	13.69	2	2007:Q2, 2009:Q1
Norway	7.39	11.53	5	2005:Q4, 2009:Q2, 2010:Q2, 2012:Q1, 2016:Q3
Poland	0.42	5.97	6	2009:Q1, 2010:Q2, 2011:Q3, 2013:Q2, 2014:Q2, 2015:Q2
Portugal	−7.35	26.92	4	2005:Q2, 2009:Q2, 2010:Q4, 2012:Q4
Singapore	3.55	12.41	9	2008:Q4, 2009:Q3, 2014:Q3, 2015:Q2, 2015:Q4, 2016:Q2, 2017:Q2, 2017:Q4, 2018:Q2
South Africa	1.01	5.45	2	2008:Q1, 2016:Q1
Spain	−7.84	36.58	1	2007:Q2
Sweden	8.66	13.36	6	2009:Q3, 2012:Q1, 2012:Q3, 2013:Q2, 2014:Q1, 2015:Q1
Switzerland	5.46	7.46	4	2010:Q1, 2012:Q4, 2013:Q4, 2018:Q1
Turkey	8.43	5.09	7	2006:Q2, 2008:Q2, 2011:Q2, 2013:Q3, 2015:Q3, 2016:Q4, 2018:Q3
United Kingdom	−9.90	14.02	4	2006:Q3, 2008:Q4, 2009:Q3, 2010:Q1

Note: This table reports a set of summary statistics for the credit-to-GDP, our benchmark financial cycle indicator, for the sample period from January 2005 to December 2019. We also report the number of turning points in the credit-to-GDP gap, which are defined as local maximums followed by a decrease in the gap over at least the next four quarters. The last column reports the dates (year and quarter) in which these turning points occur for each country.

central banks' communications and the evolution of the financial cycle, Hypothesis 1. In particular, we investigate how countries' financial stability governance characteristics influence the association between the FSS index and the (four-quarters-ahead) evolution of the selected financial cycle indicators using the following panel-data regression:

$$FC_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})FSS_{i,t} + \beta_3 D_{i,t-4} + \gamma \mathbf{C_{i,t-1}} + e_{i,t+h},$$ (2)

where FC_t is the credit-to-GDP gap, our benchmark financial cycle characteristic; $D_{i,t}$ is a dummy that takes the value of 1 when the country's central bank has one of the three characteristics in the governance framework database (see table 2) and zero otherwise; FSS_t is the financial stability sentiment index; and $\mathbf{C_{i,t}}$ is a vector that includes the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. The dummy for the specific governance characteristic is lagged by one year to control for potential endogeneity between FSS_t and D_t (although, as noted, the time variation is limited for these characteristics).[8]

Table 4 presents the evidence as to the role of each of the three governance characteristics in explaining the differential effects of financial stability communication on the four-quarters-ahead credit-to-GDP gap. In all estimations, we use country fixed effects to account for other time-invariant country characteristics unrelated to governance and Huber-White standard errors.[9] For the purpose of brevity, we only show estimates of the coefficients associated with FSS.

The result in column 1 shows that the relation of the FSS index with the four-quarters-ahead credit-to-GDP gap is not statistically significant when we do not consider governance characteristics. The

---

[8]In Section 4.2, we control for policy actions in the regression setting in Equation (2).

[9]Clustering at the country level is not feasible, given the small number of countries in the sample.

**Table 4. Financial Stability Governance Frameworks
and How Financial Stability Communications
Relate to Financial Cycle Indicators**

	Homogeneous (1)	Committee (2)	Official Committee (3)	Committee with Powers (4)
FSS (β_1)	1.82	2.98	2.82	2.44
	(1.80)	(2.02)	(1.62)	(1.78)
D*FSS (β_2)		−2.03	−3.68*	−4.40**
		(1.60)	(1.39)	(1.45)
R^2	0.21	0.22	0.23	0.21
N	1,192	1,128	1,128	1,128

Note: This table reports the results for the following panel-data regression:

$$FC_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})\, FSS_{i,t} + \beta_3 D_{i,t-4} + \gamma \mathbf{C_{i,t-1}} + e_{i,t+4},$$

where $FC_{i,t}$ is the credit-to-GDP gap and $D_{i,t}$ is a dummy that takes the value of 1 when the country has one of the characteristics in the financial stability governance framework database and zero otherwise, and is lagged by one year to control for endogeneity with $FSS_{i,t}$, the financial stability sentiment index calculated using the text in financial stability reports. $\mathbf{C_{i,t}}$ includes the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. In all estimations, we consider country fixed effects to account for other time-invariant country characteristics not related to governance. For the purpose of brevity, we only report estimates of the coefficients associated with FSS (β_1 and β_2).

specifications presented in the following columns, however, suggest material differences across governance characteristics. Specifically, financial stability communication by central banks participating in (interagency) committees is relatively more effective in limiting increases in the credit-to-GDP gap, as the coefficients associated with the interactions between these governance indicator variables and the FSS index, β_2, are negative. Interestingly, the coefficient associated with the interaction between FSS and the committee dummy is not significant if we consider both de jure and de facto committees (column 2). However, when we consider only official committees (column 3), β_2 becomes statistically significant, and its

estimate becomes even more negative when we consider central banks participating in committees with powers (column 4).[10]

Table 5 assesses the robustness of our main results for the interaction between FSS and financial stability governance frameworks when we consider two alternative financial cycle measures. These alternative indicators are the 12-quarters growth rate in credit to the non-financial private sector (panel A) and the debt-service ratio (panel B). Our results for the negative coefficient associated with the interaction between FSS and the dummy for central banks participating in a financial stability committee with powers remain robust for these alternative financial cycle characteristics.

As an additional robustness check, Table 6 explores whether other country-specific characteristics unrelated to financial stability governance, but arguably proxying for the overall quality of a country's financial governance, can explain the differential effects of financial stability communication on financial cycle variables. In particular, we test for the relevance of the following institutional and banking system characteristics (in addition to the effect of participating in a financial stability committee with powers): the transparency index of Dincer and Eichengreen (2014), the central bank independence index of Garriga (2016), the financial openness index of Chinn and Ito (2006), the foreign bank ownership share of Claessens and van Horen (2014), and the ratio of total international banking claims to local bank claims obtained from the BIS. The results show that the coefficients associated with the interaction between all these additional variables and the FSS index, β_3, are not statistically significant at any standard confidence level. Importantly, the differential effect of participating in a committee with powers, β_2, remains negative and significant in all cases.[11] Overall, our results lead us to not reject Hypothesis 1 and suggest that

---

[10]There are only a handful of countries in which the central bank participates in a committee with powers, including Hong Kong, which is a financial center. In unreported results, which are available upon request, we show that our results remain robust when we exclude Hong Kong from the sample.

[11]Because there are only a few countries that have committees with powers, in Table A.1 in the appendix we confirm that these results remain robust if we use the indicator variable for official committees as the financial stability governance characteristic.

Table 5. Financial Stability Governance Frameworks and How Financial Stability Communications Relate to Financial Cycle Indicators: Alternative Financial Cycle Indicators

	Homogeneous (1)	Committee (2)	Official Committee (3)	Committee with Powers (4)
A. Credit Growth				
FSS (β_1)	1.5	1.3	1.52	1.78
	(1.01)	(1.23)	(1.04)	(0.95)
D*FSS (β_2)		−0.02	−1.06	−4.01***
		(2.01)	(2.34)	(0.99)
R^2	0.16	0.18	0.16	0.15
N	1,192	1,128	1,128	1,128
B. Debt-Service Ratio				
FSS (β_1)	0.18	0.49	0.43	0.06
	(0.33)	(0.42)	(0.32)	(0.35)
D*FSS (β_2)		−0.73	−1.35	−1.00***
		(0.75)	(1.06)	(0.18)
R^2	0.06	0.07	0.10	0.07
N	877	831	831	831

Note: This table reports the results for the following panel-data regression:

$$FC_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})\, FSS_{i,t} + \beta_3 D_{i,t-4} + \gamma \mathbf{C_{i,t-1}} + e_{i,t+4},$$

where $FC_{i,t}$ is one of the following alternative financial cycle indicators: the 12-quarter credit growth (panel A) and the debt-service ratio (panel B). $D_{i,t}$ is a dummy that takes the value of 1 when the country has one of the characteristics in the financial stability governance framework database and zero otherwise, and is lagged by one year to control for endogeneity with $FSS_{i,t}$, the financial stability sentiment index calculated using the text in financial stability reports. $\mathbf{C_{i,t}}$ includes the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. In all estimations, we consider country fixed effects to account for other time-invariant country characteristics not related to governance. For the purpose of brevity, we only report estimates of the coefficients associated with FSS (β_1 and β_2).

Table 6. Other Country Characteristics and How Financial Stability Communications Relate to Financial Cycle Indicators

	Transparency (1)	Independence (2)	Financial Openness (3)	Foreign Bank Ownership (4)	Bank International Claims (5)
FSS (β_1)	5.66	−3.26	1.32	2.15	3.02
	(6.60)	(2.24)	(2.24)	(2.35)	(4.38)
D*FSS (β_2)	−5.83*	−9.99**	−8.11***	−6.48**	−8.82**
	(2.09)	(3.42)	(1.66)	(1.91)	(2.61)
X*FSS (β_3)	−0.19	6.08	0.06	0.00	−0.90
	(0.55)	(2.95)	(0.04)	(0.00)	(6.34)
R^2	0.13	0.23	0.21	0.21	0.22
N	816	980	1,100	1,128	1,076

Note: This table reports the results for the following panel-data regression setting:

$$FC_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4} + \beta_3 X_{i,t-4}) FSS_{i,t} + \gamma \mathbf{C}_{i,t-1} + e_{i,t+4},$$

where $FC_{i,t}$ is the credit-to-GDP gap and $D_{i,t}$ is a dummy that takes the value of 1 when the country's central bank participates in an interagency financial stability committee with powers and zero otherwise, and is lagged by one year to control for endogeneity with $FSS_{i,t}$, the financial stability sentiment index calculated using the text in financial stability reports. $X_{i,t}$ is one of the following country-specific characteristics: the transparency index in Dincer and Eichengreen (2014), the central bank independence index in Garriga (2016), the financial openness index in Chinn and Ito (2006), the foreign bank ownership (source: BIS), and the ratio of bank international claims (source: BIS). $\mathbf{C}_{i,t}$ includes the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. In all estimations, we consider country fixed effects to account for other time-invariant country characteristics not related to governance. Because most additional characteristics are very slow moving, in this specification we do not include the governance characteristics in levels to reduce the possibility of multicollinearity. For the purpose of brevity, we only report estimates of the coefficients associated with FSS (β_1, β_2, and β_3).

the differential effects of communication by various central banks reported in Table 4 are not driven by any other related and observable country-specific characteristics.

3.3 Financial Stability Communications around Turning Points in the Financial Cycle

Having examined how financial stability governance frameworks affect the mapping between central banks' communications and the evolution of financial cycle indicators, we now investigate how communication strategies and their effectiveness may vary over time. Specifically, we seek to address the following questions: Do governance characteristics affect how financial stability communication changes around turning points in the financial cycle? And if so, does this change in communication make some central banks relatively more effective at preventing these turning points?

We first explore whether the patterns documented in Table 4 change around turning points in the financial cycle. To do so, we use the following panel-data estimation setting:

$$FC_{i,t+4} = \alpha + (\beta_1 + (\beta_2 + \beta_3 TP_{i,t-4})D_{i,t-4} + \beta_4 TP_{i,t-4})FSS_{i,t}$$
$$+ \beta_5 D_{i,t-4} + \beta_6 TP_{i,t-4} + \gamma \mathbf{C_{i,t-1}} + e_{i,t+4}, \qquad (3)$$

where $TP_{i,t}$ is a dummy that takes the value of 1 when the credit-to-GDP gap turns and decreases over at least the next four quarters (see Table 3).

Table 7 summarizes the results for the relation between the FSS index and the credit-to-GDP gap around turning points. Most estimates of the coefficients associated with the additional effects around turning points, β_3 and β_4, are not statistically significant. Nevertheless, the main takeaway is that a deterioration in sentiment by central banks participating in committees, especially committees with powers, is followed by a relative improvement in the credit-to-GDP gap, and that this relationship holds around turning points in the credit-to-GDP gap, as shown by β_2 and $\beta_2 + \beta_3$, respectively.

To further investigate the effectiveness of central banks' communications around turning points in the financial cycle, we use the following probit specification:

Table 7. Financial Stability Governance Frameworks and How Financial Stability Communications Relate to Financial Cycle Indicators Around Turning Points

	Homogeneous (1)	Committee (2)	Official Committee (3)	Committee with Powers (4)
FSS (β_1)	1.82	2.81	2.60	2.26
	(1.80)	(2.13)	(1.66)	(1.81)
D*FSS (β_2)		−1.96	−3.54*	−4.11**
		(1.90)	(1.50)	(1.35)
D*TP*FSS (β_3)		−2.65	0.78	0.55
		(1.43)	(1.11)	(1.09)
TP*FSS (β_4)		2.90*	1.77	1.98
		(1.38)	(1.35)	(1.50)
R^2	0.21	0.23	0.23	0.21
N	1,192	1,128	1,128	1,128

Note: This table reports the results for the following panel-data regression:

$$FC_{i,t+4} = \alpha + (\beta_1 + (\beta_2 + \beta_3 TP_{i,t-4}) D_{i,t-4} + \beta_4 TP_{i,t-4})FSS_{i,t}$$

$$+ \beta_5 D_{i,t-4} + \beta_6 TP_{i,t-4} + \gamma \mathbf{C_{i,t-1}} + e_{i,t+4}.$$

where $FC_{i,t}$ is the credit-to-GDP gap, $D_{i,t}$ is a dummy that takes the value of 1 when the country's central bank has one of the characteristics in the governance framework database and zero otherwise, $TP_{i,t}$ is a dummy that takes the value of 1 when there is a turning point in the credit-to-GDP gap followed by a decrease in the gap over at least the next four quarters, and $FSS_{i,t}$ is the financial stability sentiment index calculated using the text in financial stability reports. $\mathbf{C_{i,t}}$ includes the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. In all estimations, we consider country fixed effects to account for other time-invariant country characteristics not related to governance. For the purpose of brevity, we only report estimates of the coefficients associated with FSS (β_1, β_2, β_3, and β_4).

$$Pr[TP_{i,t+4} = 1] = \Phi[X_{i,t}\beta], \tag{4}$$

where the vector $X_{i,t}$ contains the demeaned FSS index.

Table 8 summarizes the estimates of Equation (4). The results show that an increase in the financial stability sentiment conveyed by central banks *not* participating in committees is followed by a significantly higher probability of a turning point in the financial cycle. This evidence is consistent with the results reported in Tables 4

Table 8. Financial Stability Governance Frameworks and the Heterogeneous Predictive Power of Financial Stability Communications for Turning Points in the Financial Cycle

	Committee		Official Committee		Committee with Powers	
	Yes (1)	No (2)	Yes (3)	No (4)	Yes (5)	No (6)
FSS	0.05	0.26**	−0.16	0.25**	−1.03***	0.21**
	(0.13)	(0.10)	(0.18)	(0.08)	(0.16)	(0.07)
R^2	0.00	0.03	0.01	0.02	0.13	0.01
N	1,140	906	729.00	1,317	174	1,872

Note: This table reports the results for the following probit regression:

$$Pr\left[TP_{i,t+4} = 1\right] = \Phi[X_{i,t}\beta],$$

where $TP_{i,t}$ is a dummy that takes the value of 1 when there is a turning point in the credit-to-GDP gap followed by a decrease in the gap over at least the next four quarters and $X_{i,t}$ contains the demeaned financial stability sentiment index calculated using the text in financial stability reports, $FSS_{i,t}$. For each governance framework characteristic, we split the sample into central banks with that characteristic ("Yes") and those without it ("No"). *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively.

and 7—that is, for a central bank not participating in committees, the financial cycle is little affected by the central bank's communications, and the probability of a turning point in the financial cycle is higher than for other central banks. The coefficient associated with the FSS index is only negative and statistically significant—that is, a deterioration in sentiment lowers the probability of a turning point in the cycle—for central banks participating in a financial stability committee with powers (column 5). The evidence in Table 8 suggests that the results in CGLM, where it was found that central banks' communication is a useful predictor of crises and turning points in the financial cycle, are driven mostly by central banks not participating in a committee.[12]

---

[12]In Table A.2 in the appendix, we show that the main results in our probit specifications are robust to considering two alternative FSS indices, a "negativity" index, which is calculated using only negative words, and a "summary" index, which is calculated using only the text in FSR's summaries.

4.   Communication Strategies

In this section, building again on the intuition introduced in Section 2, we test the second hypothesis related to financial stability communication strategies. In particular, we explore the extent to which governance frameworks and the policy tools available to central banks determine their communication strategies. First, we investigate whether central banks convey information that differs in its sentiment from that reflected in news articles depending on their governance characteristics. Second, we explore the trade-offs faced by central banks in their communication strategies when taking into account other tools at their disposal, such as macroprudential instruments and monetary policy.

4.1   Deviations between the Sentiment in
FSRs and in News Articles

In Section 3, we showed that some governance characteristics are associated with relatively more effective financial stability communications—that is, they are consistent with more limited increases in financial vulnerabilities (i.e., excess credit). We now explore whether central banks' communication strategies respond differently to information about the financial cycle that is publicly available depending on the governance framework in which they operate. To do so, we empirically test Hypothesis 2a in Section 2 by exploring the relation between the FSS index and the financial stability sentiment conveyed in news articles.

We calculate a financial stability sentiment index for each country using news articles related to financial stability instead of FSRs. Similar to the FSS index, the news index, which we call NS, is calculated as the proportion of negative to positive words in each quarter (as in Equation (1)). We use all news articles in the Refinitiv Machine Readable News (MRN) Reuters Daily News Feed database associated with financial stability topics. To select articles related to financial stability, we filter all articles in which the body of the article contains at least one of the top bigrams found in all FSRs in our sample. To link these articles to each country, we make sure that either the headline or the body of the article contains a country-name stem (for instance, "Argentin" for Argentina).

Figure 2 compares the evolution of the (demeaned at the country level) FSS and NS indices since 2005.[13] Panel A compares the time series for all countries, while panel B does the same for central banks in a financial stability committee. Irrespective of the governance characteristic, the NS and FSS indices follow similar dynamics and both tend to increase (that is, sentiment deteriorates) around episodes of heightened financial vulnerabilities or stress. As can be seen from the figures, however, NS tends to increase less than FSS in some of these key episodes.

We first confirm that news about financial stability is not strategically biased. To do so, we extend our main results about strategic central bank communication and its relative effectiveness by assessing whether the relation between the sentiment in news articles and the evolution of the financial cycle depends on the governance characteristics of the central bank. After all, the strategic communication considerations explained so far should not apply to the sentiment in news articles. Table 9 explores the relation between NS and the evolution of the financial cycle using the same setting as that used for Table 4. Our results suggest that an increase in the sentiment in news is followed by a deterioration in the credit-to-GDP gap (β_1 is positive and statistically significant in column 1), but this relation does not depend on whether the country's central bank participates or not in an interagency financial stability committee (β_2 is insignificant in columns 2–4).

To compare the dynamics of the FSS and NS indices, Table 10 presents the estimates for the contemporaneous and lead-lag coefficients of regression specifications alternating between the two sentiment indices as regressands and regressors. As can be seen in column 1, which reports the contemporaneous relation between the FSS and NS indices, the information from NS is reflected in the FSS index— the coefficient for NS is positive and statistically significant. Importantly, the association is lower for central banks participating in interagency financial stability committees with powers—that is, the estimate of β_2 is negative and significant in those cases. The results in column 2 confirm that NS is also strongly related to the one-quarter-ahead FSS, and that this relation is less strong for central

---

[13]The time series of NS can be found at Juan M. Londono's website: https://juanmlondono.wordpress.com/.

**Figure 2. Financial Stability Sentiment Indices from
Financial Stability Reports and from News Articles:
Averages across Countries**

A. All Countries

B. Interagency Financial Stability Committee
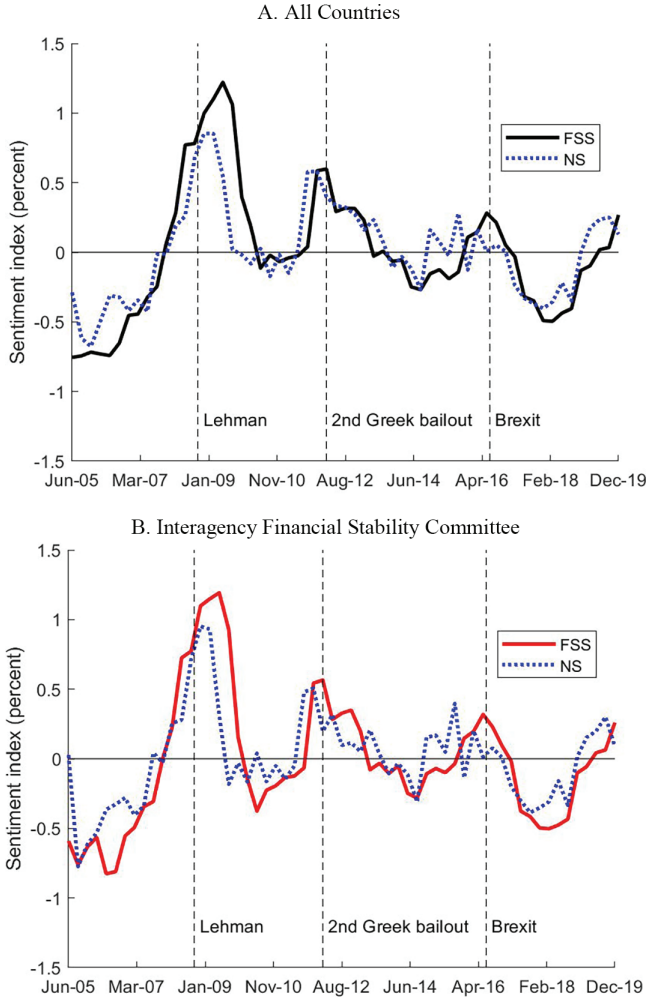
Note: Panel A compares the sentiment from financial stability reports with that obtained from news articles. These indices are calculated as the proportion of negative to positive words in either financial stability reports (FSS) or financial stability news articles (NS). The time series shown are equally weighted averages of all countries' demeaned sentiment indices. Panel B shows the average across all countries for which the central bank participates in an interagency financial stability committee. For reference, we add vertical lines for the following key dates (quarterly equivalent): the collapse of Lehman Brothers (marked as October 2008), the second Greek bailout (marked as March 2012), and the Brexit referendum (marked as July 2016).

Table 9. Strategic Communication: Sentiment in News Articles and Their Relation to Financial Stability Governance Frameworks

	Homogeneous (1)	Committee (2)	Official Committee (3)	Committee with Powers (4)
NS (β_1)	3.03*	1.76	2.26	3.82*
	(1.22)	(2.17)	(1.92)	(1.50)
D*NS (β_2)		4.49	4.08	−7.28
		(4.33)	(4.85)	(4.06)
R^2	0.21	0.24	0.23	0.21
N	942	889	889	889

Note: This table reports the results for the following panel-data regression:

$$FC_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})NS_{i,t} + \beta_3 D_{i,t-4} + \gamma \mathbf{C_{i,t-1}} + e_{i,t+4},$$

where $FC_{i,t}$ is the credit-to-GDP gap and $D_{i,t}$ is a dummy that takes the value of 1 when the country has one of the characteristics in the financial stability governance framework database and zero otherwise, and $NS_{i,t}$ is the sentiment from news articles, which is calculated as explained in Section 4.1. $\mathbf{C_{i,t}}$ includes the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. In all estimations, we consider country fixed effects to account for other time-invariant country characteristics not related to governance. For the purpose of brevity, we only report estimates of the coefficients associated with FSS (β_1 and β_2).

banks participating in financial stability committees with powers. Interestingly, however, the relation between the one-quarter-ahead sentiment in news and FSS does not change depending on whether central banks participate in committees or not, as shown in column 3, which confirms the evidence in Table 9 for the lack of strategic bias in news articles.[14]

Overall, consistent with Hypothesis 2a, this evidence suggests that central banks participating in a committee choose a communication strategy different from those institutions without such a financial stability governance arrangement. In particular, following

---

[14]In Table A.3 in the appendix, we show that these patterns hold when we consider official committees instead of committees with powers.

**Table 10. Strategic Communication: Deviations
between the Sentiment in Financial Stability
Reports and in News Articles**

	Contemporaneous (1)	RHS: Lagged NS (2)	RHS: Lagged FSS (3)
RHS (β_1)	0.42***	0.47***	0.20***
	(0.06)	(0.06)	(0.05)
D*RHS (β_2)	−0.28*	−0.29*	0.14
	(0.11)	(0.14)	(0.16)
R^2	0.12	0.15	0.08
N	1,606	1,579	1,577

Note: This table reports the results for contemporaneous and lead-lag analyses between the financial stability sentiment index, FSS, and the financial stability sentiment from news articles, NS, where NS is calculated as explained in Section 4.1. Column 1 shows the results for a regression in which we explore how information from NS is contemporaneously correlated with the FSS index when the country's central bank participates (or not) in a committee with powers:

$$FSS_{i,t} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})NS_{i,t} + \beta_3 D_{i,t-4} + e_{i,t}.$$

Column 2 shows the results for a regression in which the right-hand-side (RHS) variable is the NS index, one-quarter lagged to the FSS index,

$$FSS_{i,t+1} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})NS_{i,t} + \beta_3 D_{i,t-4} + e_{i,t+1}.$$

Finally, column 3 shows the results for a regression in which the RHS variable is the FSS index, one-quarter lagged to the NS index,

$$NS_{i,t+1} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})FSS_{i,t} + \beta_3 D_{i,t-4} + e_{i,t+1}.$$

In all regressions, $D_{i,t-1}$ is a dummy that takes the value of 1 when the country's central bank participates in a committee with powers. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. For the purpose of brevity, we only report estimates of the coefficients associated with FSS or NS (β_1 and β_2).

a deterioration in financial conditions, central banks that are part of financial stability committees convey a calmer message, on average, compared with their counterparts that are not part of committees.

Our evidence is in line with the intuition that central banks might differ on how they convey their assessment of current or expected financial conditions because of one or more of the following strategic considerations: (i) communication by itself is effective at turning around the deterioration of financial vulnerabilities, (ii) revealing

private information or alarming markets might accelerate the onset of a crisis, or (iii) they are confident about their ability to use tools, directly or indirectly, to prevent financial crises. We already tested the first consideration in Sections 3.2 and 3.3. The second consideration is difficult to test, at least with our data, as we cannot disentangle information that is publicly available from that available only to the central bank. In Section 4.2, we explore the third consideration, namely whether central banks can use or influence the use of tools to limit extreme events associated with the financial cycle.

4.2   Financial Stability Communications and Policy Actions

As outlined in Hypotheses 2b and 2c, we explore the strategic considerations relating central banks' communication and the implementation of policy actions available to the central bank using the following equation:

$$PA_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})FSS_{i,t} + \beta_3 D_{i,t-4} + \gamma \mathbf{C_{i,t}} + e_{i,t+4}, \tag{5}$$

where $PA_{i,t}$ is either the cumulative macroprudential policy index of (Cerutti et al. 2016) or the monetary policy rate targeted by the country's central bank, and $\mathbf{C_{i,t}}$ includes the macroeconomic control variables used in our previous estimations. Based on the intuition introduced in Section 2, we expect that central banks that have macroprudential tools or can influence other agencies that have those instruments are more likely to use them as their financial stability communications become more negative. The relation between financial stability communications and monetary policy is more ambiguous.

The results are presented in Table 11. The estimates in panel A show that communication by central banks in a committee with powers (column 4) appears relatively more "coherent," in the sense that a deterioration in sentiment is followed by a tightening in macroprudential policies (β_2 is positive and significant), whereas communication by central banks with none of the governance characteristics is followed by a relaxation in these tools—β_1 is negative, although statistically insignificant. This finding confirms the conjecture outlined in Hypothesis 2b.

**Table 11. Coherence in Communication: The Relation
between Financial Stability Communications,
Macroprudential Tools, and Monetary Policy**

	Homogeneous (1)	Committee (2)	Official Committee (3)	Committee with Powers (4)
A. Cumulative Macroprudential Policies				
FSS (β_1)	−0.01	−0.24	−0.14	−0.13
	(0.16)	(0.18)	(0.21)	(0.17)
D*FSS (β_2)		0.09	0.00	0.57**
		(0.36)	(0.31)	(0.17)
R^2	0.02	0.17	0.10	0.03
N	764	700	700	700
B. Monetary Policy Rate				
FSS (β_1)	−0.34	−0.09	−0.08	−0.30
	(0.25)	(0.14)	(0.10)	(0.23)
D*FSS (β_2)		−0.48	−1.01	−0.24
		(0.47)	(0.64)	(0.18)
R^2	0.06	0.09	0.11	0.07
N	860	982	982	982

Note: This table reports the results for the following panel-data regression:

$$PA_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})FSS_{i,t} + \beta_3 D_{i,t-4} + \mathbf{C_{i,t}} + e_{i,t+4},$$

where $PA_{i,t}$ is either the cumulative macroprudential index from Cerutti et al. (2016) (panel A) or the monetary policy rate (panel B). $D_{i,t}$ is a dummy that takes the value of 1 when the country's central bank has one of the characteristics in the governance framework database and zero otherwise, $FSS_{i,t}$ is the financial stability sentiment index calculated using the text in financial stability reports, and $\mathbf{C_{i,t}}$ are the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. In all estimations, we consider country fixed effects to account for other time-invariant country characteristics not related to governance. For the purpose of brevity, we only report estimates of the coefficients associated with FSS (β_1 and β_2).

The results in panel B suggest that a deterioration in sentiment is not associated with a significant change in the policy rate, which rejects the premise of Hypothesis 2c. This result could be interpreted

as lack of coherence between communication and actions, as monetary policy could be tightened to prevent a further expansion in the financial cycle. It could also indicate, however, that those central banks balance financial stability concerns and monetary policy objectives using different tools. The central bank may assess that it could fail to meet its monetary policy objectives (price stability and, in some cases, employment) if it acts just on financial stability considerations. At the same time, it may try to use macroprudential tools to curtail financial vulnerabilities, as suggested by the analysis presented in panel A.

Given that communication is more coherent for central banks participating in committees with powers to implement policy instruments, we next explore whether, for such central banks, communication complements other policy actions in preventing the deterioration of financial cycle conditions. This evidence helps gain insights into the governance and policy settings under which communication is effective in alleviating the deterioration in financial cycle conditions. To do so, we estimate the following augmented version of the panel-data specification in Equation (2):

$$FC_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})FSS_{i,t} + \beta_3 MP_{i,t} + \beta_4 IR_{i,t}$$
$$+ \beta_5 D_{i,t-4} + \gamma \mathbf{C_{i,t-1}} + e_{i,t+4},$$

where, again, $D_{i,t-1}$ is an indicator equal to 1 when the country's central bank participates in an interagency financial stability committee and zero otherwise, and where we control for lagged policy actions, with $MP_{i,t}$ the cumulative macroprudential index and $IR_{i,t}$ the monetary policy rate. The results, reported in Table 12, suggest that, after controlling for policy actions, sentiment in FSRs published by central banks participating in interagency financial stability committees with powers is more effective in limiting increases in the credit-to-GDP gap (column 4) than for central banks not participating in these committees.[15]

---

[15]Table A.4 in the appendix reports the results using the probit specification described in Equation (4), where we assess the predictive power of the FSS index for turning points in the financial cycle after controlling for policy actions. The results show that, after controlling for these actions, sentiment in FSRs by central banks not participating in committees remains a better predictor of turning points than the sentiment conveyed by other central banks.

**Table 12. Financial Stability Governance Frameworks and
How Financial Stability Communications Relate to
Financial Cycle Indicators: Controlling for Policy Actions**

	Homogeneous (1)	Committee (2)	Official Committee (3)	Committee with Powers (4)
FSS (β_1)	1.82	0.39	0.52	0.37
	(1.80)	(1.41)	(1.39)	(1.35)
D*FSS (β_2)		0.12	−1.46	−2.97*
		(1.46)	(2.23)	(1.38)
MP (β_3)		−7.00	−2.57	−8.50**
		(3.82)	(4.78)	(2.70)
IR (β_4)		0.78	0.43	0.31
		(0.84)	(0.84)	(0.76)
R^2	0.21	0.57	0.56	0.56
N	1,192	667	667	667

Note: This table reports the results for the following augmented version of the panel-data regression in Table 4:

$$FC_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})FSS_{i,t} + \beta_3 MP_{i,t} + \beta_4 IR_{i,t} + \beta_5 D_{i,t-4}$$
$$+ \gamma \mathbf{C_{i,t-1}} + e_{i,t+4},$$

where $FC_{i,t}$ is the credit-to-GDP gap and $D_{i,t}$ is a dummy that takes the value of 1 when the country has one of the characteristics in the financial stability governance framework database and zero otherwise, and is lagged by one year to control for endogeneity with $FSS_{i,t}$, the financial stability sentiment index calculated using the text in financial stability reports. We control for lagged policy actions, specifically, $MP_{i,t}$, the cumulative macroprudential index from Cerutti et al. (2016), and $IR_{i,t}$, the monetary policy rate. $\mathbf{C_{i,t}}$ includes the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. In all estimations, we consider country fixed effects to account for other time-invariant country characteristics not related to governance. For the purpose of brevity, we only report estimates of the coefficients associated with FSS (β_1 and β_2) and with lagged policy actions (β_3 and β_4).

Together, these results suggest that for central banks not participating in financial stability committees, sentiment deteriorates more (they cry wolf) and fewer policy actions are implemented (less coherent communication) than for central banks with financial stability governance characteristics. Importantly, central banks without these

governance characteristics are less likely to prevent the occurrence of a turning point in the financial cycle.

5.   Conclusion

Financial stability communications and macroprudential policies have gained prominence and become part of the set of policy tools available to central banks worldwide. Yet, the interaction between central banks' financial stability communications and countries' financial stability governance frameworks, including the allocation of powers to use macroprudential tools, remains mostly unexplored in the literature.

We investigate how differences in governance frameworks across countries explain central banks' financial stability communication strategies and the effectiveness of these strategies in preventing turning points in the financial cycle. To do so, we propose a set of testable hypotheses to understand central bank communication strategies. In particular, our first hypothesis relates financial stability governance frameworks to the effectiveness of financial stability communications, while our second hypothesis relates these governance frameworks to differences in communication strategies and the use of other policy tools. We test these hypothesis empirically, and we show how these strategical aspects play a role in the evolution of the financial cycle. Using the sentiment in financial stability communications derived from text in FSRs published by the central banks of 24 countries and data on their respective countries' financial stability governance frameworks, we empirically test whether governance frameworks are important determinants of the effectiveness of financial stability communication strategies.

We find that communications by central banks participating in an interagency financial stability committee are relatively more effective in ameliorating the deterioration in financial vulnerabilities and the occurrence of turning points in the financial cycle. We then investigate what drives the effectiveness of communication by exploring how governance frameworks matter for central banks' communication strategies. After observing an increase in financial vulnerabilities or a worsening of the sentiment reflected in news articles, we find that central banks participating in financial stability committees transmit a calmer message than banks without this

characteristic. To understand why central banks might decide to transmit a calmer message, we explore the relation between communication and other policy actions, and we find that governance characteristics affect the coherence between financial stability communications and actions—that is, changes in the implementation of policy actions follow a deterioration in sentiment for those central banks with direct or indirect access to macroprudential tools. Moreover, we find evidence that financial stability communications by central banks in financial stability committees are more effective in alleviating the deterioration of the financial cycle and the occurrence of crises, even after controlling for the implementation of policy actions. Overall, we can conclude that central banks' financial stability governance frameworks influence their financial stability communication strategies and their effectiveness in preventing a worsening of financial cycle conditions.

Appendix

A.1 Conceptual Framework Relating Financial Stability Communications to Governance Arrangements

This section develops a conceptual framework that outlines a central bank's decisionmaking process to communicate information about its financial stability assessments, potentially through a financial stability report. The framework describes actions that take place over three periods. Its main intuition is summarized in Figure A.1. In the first period, t, the central bank observes the initial financial conditions, $FC_{i,t}$, forms its expectations about the evolution of the financial cycle, $E_t^{CB}(FC_{i,t+h})$, and decides its general communication strategy. In the second period, $t + l$, the central bank communicates its views about the current financial conditions and, potentially, about the evolution of the financial cycle, $FSS_{i,t+l}$ and $FSS_{i,t+h}$, respectively. Besides communicating about financial stability, the central bank might, in this period, use other policy tools, including monetary policy and macroprudential tools. In the third period, $t + h$, financial stability conditions evolve depending on initial conditions, the decisions made by the central bank, including financial stability communication, and other shocks. For simplicity, we assume that only two states are possible in period $t + h$, a good

**Figure A.1. Central Bank Communication
and Financial Stability Governance**
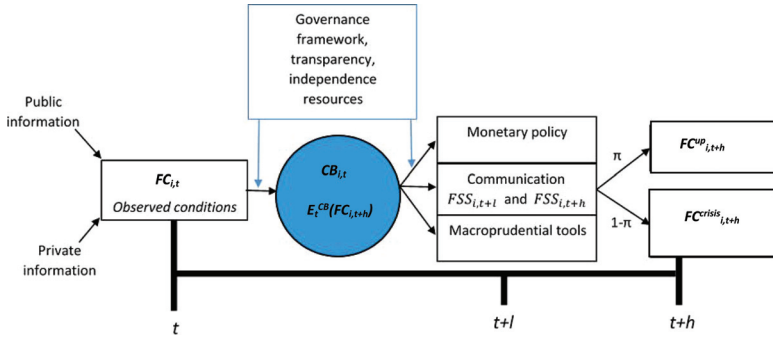
Note: This figure shows a diagram for the conceptual framework used to understand the interaction between financial stability governance frameworks and central bank communication.

state, with probability π, and a bad state (financial crisis or turning point in the cycle), with probability $1 - \pi$. From a financial stability perspective, the goal of the central bank is to decide the mixture of tools and communications that minimizes the probability of the bad state.

The financial and other information the central bank of country i observes in the first period, t, is assumed to include not only the information available to the public, I_t^{public}, but also information available exclusively to the central bank, $I_t^{private}$, such as information obtained directly from financial institutions for supervisory purposes. Based on this information, the central bank forms expectations about the evolution of the financial cycle. In particular, the central bank will determine its expectations about time $t + h$ (final) financial cycle conditions,

$$E_{i,t}^{CB}(FC_{i,t+h}) = F_i^{CB}(I_{i,t}^{public}, I_{i,t}^{private}, C_{i,t}),$$

where C_t is a set of characteristics of the country's central bank, including the financial stability governance framework in which it operates, its level of transparency and independence, its credibility, and its resources.

In the second period, the central bank uses its communication strategically to reveal some of its assessment of current financial conditions and, potentially, of the evolution of the financial cycle. Its communications about both current and future financial conditions, $FSS_{i,t+l}$ and $FSS_{i,t+h}$, depend on the set of information available to the central bank and the central bank's characteristics,

$$FSS_{i,t+l} = F_i^{current}(I_{i,t}^{public}, I_{i,t}^{private}, C_{i,t}), \qquad (A.1)$$

$$FSS_{i,t+h} = F_i^{future}(I_{i,t}^{public}, I_{i,t}^{private}, C_{i,t}). \qquad (A.2)$$

These assessments become part of the information set available to the public at time l, I_{t+l}^{public}.

The central bank's public assessments, $FSS_{i,t+l}$ and $FSS_{i,t+h}$, however, might differ from $FC_{i,t}$ and $E_{i,t}^{CB}(FC_{i,t+h})$, respectively— that is, the central bank does not necessarily reveal (all) its private information about current financial cycle conditions nor its (full) expectations about the evolution of the financial cycle, and it may reveal its private information in a (deliberately) biased manner.

There are three main reasons why $FSS_{i,t+l} \neq FC_{i,t}$ and/or $FSS_{i,t+h} \neq E_{i,t}^{CB}(FC_{i,t+h})$. The first one is institutional: The central bank does not reveal (all) information transparently because it is not fully independent or has other limits on being fully transparent. For example, legally, it cannot reveal certain institution-specific information. The second one is strategic: The central bank questions the value of full transparency. For example, it may have private information that points to a deterioration in financial stability conditions beyond what the set of information available to the public suggests, but revealing this could simply accelerate or exacerbate the occurrence of the bad state—for instance, lead to a financial crisis (see Cukierman 2009). The third reason is about coherence in communication: Given the other tools it has at its disposal and the confidence it has in them, it may convey risks differently. For example, if the central bank believes it has the tools to prevent a financial crisis (or financial boom) and is willing to use the tools, it may decide to transmit a message of calm even in the face of a deterioration (loosening) in financial conditions.

The first reason could make for a systematic bias or more noisy communication. The second reason would create a specific asymmetry in that bad information is not revealed. The third reason could

imply that the bank's communication affects its use of other tools and vice-versa.

The final financial cycle conditions, FC_{t+h}, are then a function of time-t conditions, the central bank communication strategy (FSS) and its policy actions (PA) at time $t + l$, its governance framework and other characteristics, and shocks to financial stability, $z_{i,t+h}$:

$$FC_{i,t+h} = F_i(I_{i,t}^{public}, I_{i,t}^{private}, FSS_{i,t+l}, PA_{i,t+l}, C_{i,t}) + z_{i,t+h}. \tag{A.3}$$

We assume that, in terms of financial stability—that is, setting aside its other mandates—the central bank decides its communication strategy, which in our framework is represented by $FSS_{i,t+l}$ and $FSS_{i,t+h}$, such that it minimizes $1 - \pi$, the probability of the bad state. Our simple framework then implies that the central bank's communication strategy, and the extent to which it is effective at preventing the deterioration of financial cycle conditions, will differ by a number of central bank characteristics, including the governance framework in which it operates.

A.2 Appendix Tables

Table A.1. Other Country Characteristics and How Financial Stability Communications Relate to Financial Cycle Indicators: Official Committee as the Benchmark Governance Characteristic

	Transparency (1)	Independence (2)	Financial Openness (3)	Foreign Bank Ownership (4)	Bank International Claims (5)
FSS (β_1)	6.25	-0.34	2.59	3.29	3.38
	(6.69)	(2.13)	(2.02)	(1.98)	(3.97)
D*FSS (β_2)	-7.47^*	-5.18^*	-5.16^*	-5.12^*	-5.31^*
	(2.86)	(2.17)	(2.06)	(2.06)	(2.18)
X*FSS (β_3)	-0.18	3.92	0.03	0.00	-0.13
	(0.54)	(2.74)	(0.03)	(0.00)	(5.69)
R^2	0.18	0.24	0.22	0.22	0.23
N	816	980	1,100	1,128	1,076

Note: This table reports the results for the following panel-data regression setting:

$$FC_{i,t+4} = \alpha + (\beta_1 + \beta_2 D_{i,t-4} + \beta_3 X_{i,t-4}) FSS_{i,t} + \gamma \mathbf{C_{i,t-1}} + e_{i,t+4},$$

where $FC_{i,t}$ is the credit-to-GDP gap and $D_{i,t}$ is a dummy that takes the value of 1 when the country's central bank participates in an official interagency financial stability committee and zero otherwise, and is lagged by one year to control for endogeneity with $FSS_{i,t}$, the financial stability sentiment index calculated using the text in financial stability reports. $X_{i,t}$ is one of the following country-specific characteristics: the transparency index in Dincer and Eichengreen (2014), the central bank independence index in Garriga (2016), the financial openness index in Chinn and Ito (2006), the foreign bank ownership (source: BIS), and the ratio of bank international claims (source: BIS). $\mathbf{C_{i,t}}$ are the following control variables: the change in real GDP with respect to the previous year, the change in the GDP deflator with respect to the previous year, and the unemployment rate. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. In all estimations, we consider country fixed effects to account for other time-invariant country characteristics not related to governance. Because most additional characteristics are very slow moving, in this specification, we remove the term for governance characteristics in levels to reduce the possibility of multicollinearity. For the purpose of brevity, we only report estimates of the coefficients associated with FSS (β_1, β_2, and β_3).

Table A.2. Financial Stability Governance Frameworks and the Predictive Power of Financial Stability Communications for Turning Points in the Financial Cycle: Alternative FSS Indices

	Committee		Official Committee		Committee with Powers	
	Yes (1)	No (2)	Yes (3)	No (4)	Yes (5)	No (6)
A. FSS Negativity						
FSS Negativity	0.08	0.24*	−0.19	0.24**	−0.97**	0.20*
	(0.13)	(0.12)	(0.18)	(0.09)	(0.35)	(0.09)
R^2	0.00	0.01	0.01	0.01	0.09	0.01
N	672	659	410	921	80	1,251
B. FSS Summary						
FSS Summary	0.06	0.14***	0.02	0.13***	−0.43***	0.13***
	(0.07)	(0.04)	(0.12)	(0.03)	(0.05)	(0.03)
R^2	0.00	0.03	0.00	0.02	0.13	0.02
N	629	607	367	869	80	1,156

Note: This table reports the results for the following probit specification:

$$Pr\left[TP_{i,t+4} = 1\right] = \Phi[X_{i,t}\beta],$$

where $TP_{i,t}$ is a dummy that takes the value of 1 when there is a turning point in the credit-to-GDP gap followed by a decrease in the gap over at least the next four quarters and $X_{i,t}$ contains one of the following alternative (demeaned) financial stability sentiment index measures: the negativity index, in panel A, which is calculated as the proportion of negative to total words in financial stability reports, and the summary index, in panel B, which is calculated using only the text in the summaries of FSRs. For each governance framework characteristic, we split the sample into central banks with that characteristic ("Yes") and those without it ("No"). *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively.

**Table A.3. Strategic Communication: Deviations between
the Sentiment in Financial Stability Reports and
in News Articles: Official Committee as the
Benchmark Governance Characteristic**

	Contemporaneous	RHS: Lagged NS	RHS: Lagged FSS
RHS (β_1)	0.48***	0.52***	0.23***
	(0.07)	(0.08)	(0.06)
D*RHS (β_2)	−0.27*	−0.27*	−0.10
	(0.10)	(0.12)	(0.08)
R^2	0.13	0.16	0.07
N	1,606	1,579	1,577

Note: This table reports the results for a lead-lag analysis between the financial stability sentiment index, FSS, and the financial stability sentiment from news articles, NS. NS is calculated as explained in Section 4.1. Column 1 shows the results for the following contemporaneous regression in which we explore how information from NS is contemporaneously correlated with the FSS index when the country's central bank participates in an official committee:

$$FSS_{i,t} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})NS_{i,t} + \beta_3 D_{i,t-4} + e_{i,t}.$$

Column 2 shows the results for a regression in which the right-hand-side (RHS) variable is the one-quarter-lagged NS index,

$$FSS_{i,t+1} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})NS_{i,t} + \beta_3 D_{i,t-4} + e_{i,t+1}.$$

Finally, column 3 shows the results for a regression in which the RHS variable is the one-quarter-lagged FSS index,

$$NS_{i,t+1} = \alpha + (\beta_1 + \beta_2 D_{i,t-4})FSS_{i,t} + \beta_3 D_{i,t-4} + e_{i,t+1}.$$

In all regressions, $D_{i,t-1}$ is a dummy that takes the value of 1 when the country's central bank participates in an official committee. Huber-White standard errors (see Wooldridge 2002) are reported in parentheses. *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively. For the purpose of brevity, we only report estimates of the coefficients associated with FSS or NS (β_1 and β_2).

Table A.4. Financial Stability Governance Frameworks and the Predictive Power of Financial Stability Communications for Turning Points in the Financial Cycle, Conditional on Policy Actions

	Committee		Official Committee		Committee with Powers	
	Yes (1)	No (2)	Yes (3)	No (4)	Yes (5)	No (6)
FSS	−0.05	0.29**	−0.48*	0.25***	−1.96***	0.18*
	(0.14)	(0.09)	(0.21)	(0.07)	(0.14)	(0.07)
MP	0.05**	0.03	0.05*	0.05**	0.21***	0.04**
	(0.02)	(0.04)	(0.02)	(0.02)	(0.02)	(0.02)
IR	0.00	0.05**	0.04*	0.03	0.18*	0.03
	(0.01)	(0.02)	(0.02)	(0.02)	(0.08)	(0.01)
R^2	0.02	0.05	0.07	0.04	0.29	0.03
N	500	496	289	707	51	945

Note: This table reports the results for the following panel-data probit regression:

$$Pr\,[TP_{i,t+4} = 1] = \Phi[X_{i,t}\beta],$$

where $TP_{i,t}$ is a dummy that takes the value of 1 when there is a turning point in the credit-to-GDP gap followed by a decrease in the gap over at least the next four quarters and $X_{i,t}$ contains the demeaned financial stability sentiment index calculated using the text in FSRs, $FSS_{i,t}$, the cumulative macroprudential index from Cerutti et al. (2016), and the monetary policy rate. For each governance framework characteristic, we split the sample into central banks with that characteristic ("Yes") and those without it ("No"). *, **, and *** represent the usual 10 percent, 5 percent, and 1 percent significance levels, respectively.

References

Allen, F., L. Francke, and M. W. Swinburne. 2004. "Assessment of the Riksbank's Work on Financial Stability Issues." *Sveriges Riksbank Economic Review* (3): 5–26.

Armelius, H., C. Bertsch, I. Hull, and X. Zhang. 2018. "Spread the Word: International Spillovers from Central Bank Communication." Working Paper No. 357, Sveriges Riksbank (Central Bank of Sweden).

Arseneau, D. M. 2020. "Central Bank Communication with a Financial Stability Objective." Finance and Economics Discussion Series No. 2020-087, Board of Governors of the Federal Reserve System.

Blinder, A. S., M. Ehrmann, M. Fratzscher, J. D. Haan, and D.-J. Jansen. 2008. "Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence." *Journal of Economic Literature* 46 (4): 910–45.

Borio, C., 2014. "The Financial Cycle and Macroeconomics: What Have We Learnt?" *Journal of Banking and Finance* 45 (August): 182–98.

Borio, C., P. Disyatat, and P. Rungcharoenkitkul. 2019. "What Anchors for the Natural Rate of Interest?" BIS Working Paper No. 777.

Born, B., M. Ehrmann, and M. Fratzscher. 2014. "Central Bank Communication on Financial Stability." *Economic Journal* 124 (577): 701–34.

Cerutti, E., R. Correa, E. Fiorentino, and E. Segalla. 2016. "Changes in Prudential Policy Instruments — A New Cross-Country Database." Working Paper No. 16/110, International Monetary Fund.

Chinn, M., and H. Ito. 2006. "What Matters for Financial Development? Capital Controls, Institutions, and Interactions." *Journal of Developments Economics* 81 (1): 163–92.

Cihak, M. 2006. "How Do Central Banks Write on Financial Stability?" Working Paper No. 06/163, International Monetary Fund.

Cihak, M., S. Muñoz, S. Ten Sharifuddin, and K. Tintchev. 2012. "Financial Stability Reports: What Are They Good For?" Working Paper No. 12/1, International Monetary Fund.

Claessens, S. 2015. "An Overview of Macroprudential Policy Tools." *Annual Review of Financial Economics* 7: 397–422.

Claessens, S., and N. van Horen. 2014. "Foreign Banks: Trends and Impact." *Journal of Money, Credit and Banking* 46 (2–3): 295–326.

Committee on the Global Financial System. 2016. "Experiences with the Ex Ante Appraisal of Macroprudential Instruments." CGFS Paper No. 56, Bank for International Settlements.

Correa, R., R. M. Edge, and J. N. Liang. 2019. "A New Dataset of Macroprudential Policy Governance Structures." IFDP Notes, Board of Governors of the Federal Reserve System, November 7.

Correa, R., K. Garud, J. M. Londono, and N. Mislang. 2017. "Constructing a Dictionary for Financial Stability IFDP Notes." Board of Governors of the Federal Reserve System, June 28.

———. 2021. "Sentiment in Central Banks' Financial Stability Reports." *Review of Finance* 25 (1): 85–120.

Cukierman, A. 2009. "The Limits of Transparency." *Economic Notes* 38 (1–2): 1–37.

Dincer, N. N., and B. Eichengreen. 2014. "Central Bank Transparency and Independence: Updates and New Measures." *International Journal of Central Banking* 10 (1, March): 189–253.

Edge, R. M., and J. N. Liang. 2017. "New Financial Stability Governance Structures and Central Banks." Hutchins Center Working Paper No. 32, Brookings Institution.

Ehrmann, M., and M. Fratzscher. 2007. "The Timing of Central Bank Communication." *European Journal of Political Economy* 23 (1): 124–45.

Ericsson, N. 2016. "Eliciting GDP Forecasts from the FOMC's Minutes around the Financial Crisis." *International Journal of Forecasting* 32 (2): 571–83.

Garriga, A. C. 2016. "Central Bank Independence in the World. A New Dataset." *International Interactions* 42 (5): 849–68.

Harris, R., V. Karadotchev, R. Sowerbutts, and E. Stoja. 2019. "Have FSRs Got News for You? Evidence from the Impact of Financial Stability Reports on Market Activity." Working Paper No. 792, Bank of England.

Huang, C., S. Simpson, D. Ulybina, and A. Roitman. 2019. "News-based Sentiment Indicators." IMF Working Paper No. 19/273.

International Monetary Fund. 2013. "The Interaction of Monetary and Macroprudential Policies." IMF Policy Paper, January 29.

Jeanneau, S. 2014. "Financial Stability Objectives and Arrangements—What is New?" *BIS Papers* 76 (February): 47–58.

Laeven, L., and F. Valencia. 2013. "Systemic Banking Crises Database." *IMF Economic Review* 61 (2): 225–70.

Masciandaro, D., and A. Volpicella. 2016. "Macro Prudential Governance and Central Banks: Facts and Drivers." *Journal of International Money and Finance* 61 (March): 101–19.

Morris, S., and H. S. Shin. 2002. "Social Value of Public Information." *American Economic Review* 92 (5): 1521–34.

Osterloo, S., J. de Haan, and R. Jong-A-Pin. 2007. "Financial Stability Reviews: A First Empirical Analysis." *Journal of Financial Stability* 2 (4): 337–55.

Stekler, H. O., and H. Symington. 2016. "Evaluating Qualitative Forecasts: The FOMC Minutes, 2006–2010." *International Journal of Forecasting* 32 (2): 559–70.

Svensson, L. E. 2017. "Cost-benefit Analysis of Leaning against the Wind." *Journal of Monetary Economics* 90 (October): 193–213.

Wooldridge, J. 2002. *Econometric Analysis of Cross Section and Panel Data.* MIT Press.