

Sentiment in Central Banks' Financial Stability Reports

Ricardo Correa¹, Keshav Garud², Juan M. Londono¹, and Nathan Mislang³

¹Federal Reserve Board, ²University of Michigan, ³Cornell University

The views expressed in this presentation are those of the authors and do not necessarily represent those of the Federal Reserve Board.

Abstract

We use the text of financial stability reports (FSRs) published by central banks to analyze the relation between the financial cycle and the sentiment conveyed in these official communications. To do so, we construct a dictionary tailored specifically to a financial stability context, which classifies words into positive and negative based on the sentiment conveyed by these words in FSRs. With this dictionary, we construct financial stability sentiment (FSS) indexes for 30 countries between 2005 and 2017. We find that central banks' financial stability communications are mostly driven by developments in the banking sector. Moreover, the sentiment captured by the FSS index explains future movements in financial cycle indicators related to credit, asset prices, systemic risk, and monetary policy rates. Finally, our results show that the sentiment in central banks' communications deteriorates prior to turning points in the financial cycle.


Motivation

Many central banks recently added a financial stability mandate to their monetary policy mandate making financial stability communication a new tool (Born et al., 2014). Because of the novelty of financial stability communications, most existing research in this field is descriptive (e.g., Cihak et al., 2012; and Cihak, 2006).

General dictionaries, such as Harvard IV-4 and Diction, have been used extensively in the literature to analyze sentiment in texts. However, words might have different connotations depending on the context (Loughran and McDonald, 2011; Henry, 2006 and 2008). In particular, words in FSRs often have a different connotation compared to a general or a finance context.

We contribute to the existing literature by analyzing the sentiment communicated in FSRs and how this sentiment relates to the evolution of the financial cycle.

Constructing the Dictionary

- We process the text in 982 FSRs published in or translated to English between 2000 and 2017.
- Cleaning the text: remove punctuation and stop words ("and", "the", "of"), select 98 percent of remaining words, remove obviously non-financial-stability words.
- Scoring: classify words into positive, negative, or neutral (no sentiment)
 - Randomly sample 25 sentences containing each word
 - Each word is classified by 2 researchers
 - Solve disagreement in classification
- To access our dictionary, scan this code 

The FSS Index

- For each financial stability report, the FSS index is calculated as

$$FSS_{country,period} = \frac{\# \text{Negative words} - \# \text{Positive words}}{\# \text{Total words}}$$

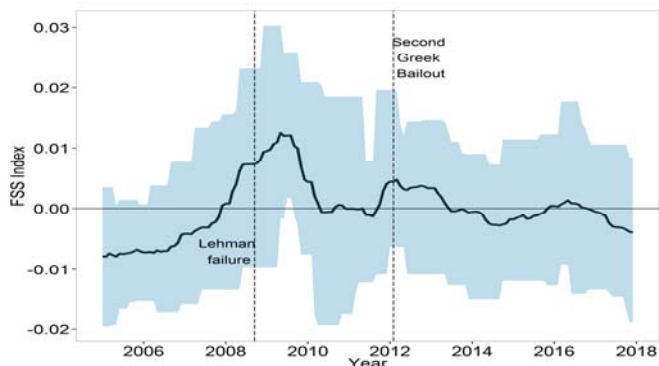


Chart 1. FSS Average FSS Index and 100 Percent Confidence Bands

Topics Driving FSS

Which sectors/topics drive the time variation in financial stability sentiment?

$$FSS_{country,period} = \sum_{j=topic\ 1}^{topic\ n} \beta^j FSS^j_{country,period} + \epsilon_{country,period}$$

Table 1. Topics driving FSS

Topic		Topic	
Banking	0.42*** (0.04)	Valuation	0.15*** (0.03)
Household	0.19*** (0.03)	Real estate	0.13*** (0.02)
External	0.16*** (0.03)	Sovereign	0.06* (0.03)
Corporate	0.15*** (0.03)		

FSS and the Financial Cycle

Do central banks incorporate and predict developments in the financial cycle through FSRs?

We estimate a panel VAR relating each country's FSS index with measures of credit growth, asset price fluctuations, monetary policy, and systemic risk.

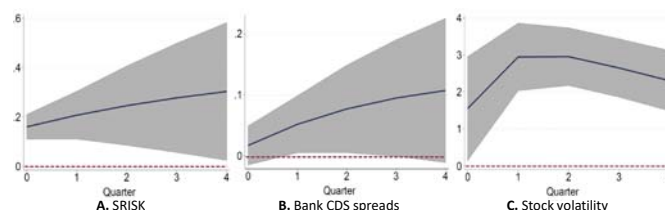


Chart 2. Impulse-response functions: FSS on future financial cycle characteristics

FSS and Financial Crises

Are central banks able to communicate the occurrence of turning points in the financial cycle?

We estimate a panel Probit to assess the predictive power of FSS for h -quarters-ahead systemic banking crises (Laeven and Valencia, 2013) or local maximums in credit-to-GDP gap.

$$C_{country,period+h\ quarters} = F(FSS_{country,period})$$

Table 2. Predictive power of FSS for financial crises

C	h=1	h=2	h=3	h=4
Systemic banking crises	0.24*	0.1	-0.04	-0.13
	-0.1	-0.09	-0.1	-0.1
Turning points in credit-to-GDP gap	1.26*	1.46*	1.39*	0.94
	-0.61	-0.63	-0.66	-0.72

Conclusions

- The banking sector is the main driver of the dynamics of the FSS index.
- A deterioration in the FSS index is followed by a deterioration in financial cycle indicators: *Although central banks are able to identify and communicate financial stability risks, communications through FSRs alone are not sufficient to alleviate a deterioration in financial vulnerabilities.*
- FSS is a useful predictor of banking crises: *Central banks change the sentiment in their communications prior to crises, although they do not seem to be able to prevent them.*

References

1. Cihak, M., 2006. How do central banks write on financial stability? Working paper. IMF.
2. Cihak, M., Muoz, S., Ten Sharifuddin, S., Tintchev, K., 2012. Financial stability reports: What are they good for? Working paper. IMF.
3. Henry, E., 2006. Market reaction to verbal components of earnings press releases: Event study using a predictive algorithm. *Journal of Emerging Technologies in Accounting* 3, 1-19.
4. Henry, E., 2008. Are investors influenced by how earnings press releases are written? *The Journal of Business Communication* 45, 363-407.
5. Loughran, T., McDonald, B., 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *Journal of Finance* 66, 35-65.
6. Laeven, L., Valencia, F., 2013. Systemic banking crises database. *IMF Economic Review* 61, 225-270.

Contact author: Juan M. Londono

Principal Economist | Federal Reserve Board

Email: juan-miguel.londono-yarce@frb.gov

Website: <https://www.federalreserve.gov/econres/juan-m-londono.htm>