

# Central bank communication on financial stability

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Disclaimer: The views expressed here are solely the views of the presenter and do not necessarily reflect those of the ECB or the Eurosystem.

# Motivation

- Recent financial crisis has triggered heated discussions on how to best achieve financial stability in the future
- Important role has been assigned to central banks, many of which have explicit financial stability mandates
- A large number of CBs have communicated extensively on financial stability-related matters, e.g. through
  - Financial Stability Reports (FSRs)
  - Financial stability-related speeches and interviews

# Our paper

- Exploits the fact that CBs have communicated about financial stability in the past, via FSRs and other forms
  - Important: we infer from a time without explicit macroprudential tasks!
- Takes financial market perspective
- Sheds light on the potential effects of central bank communication about financial stability
  - Define aims of communication as in Blinder et al. (2008): “creating news” and “reducing noise” – impact on level and volatility
  - Unique dataset: 357 releases of Financial Stability Reports (FSRs) and 720 speeches and interviews by central bank governors
  - Broad country coverage: 37 countries from 1996-2009
  - Analyzes the reaction of financial sector stocks to these communication events

# Main findings

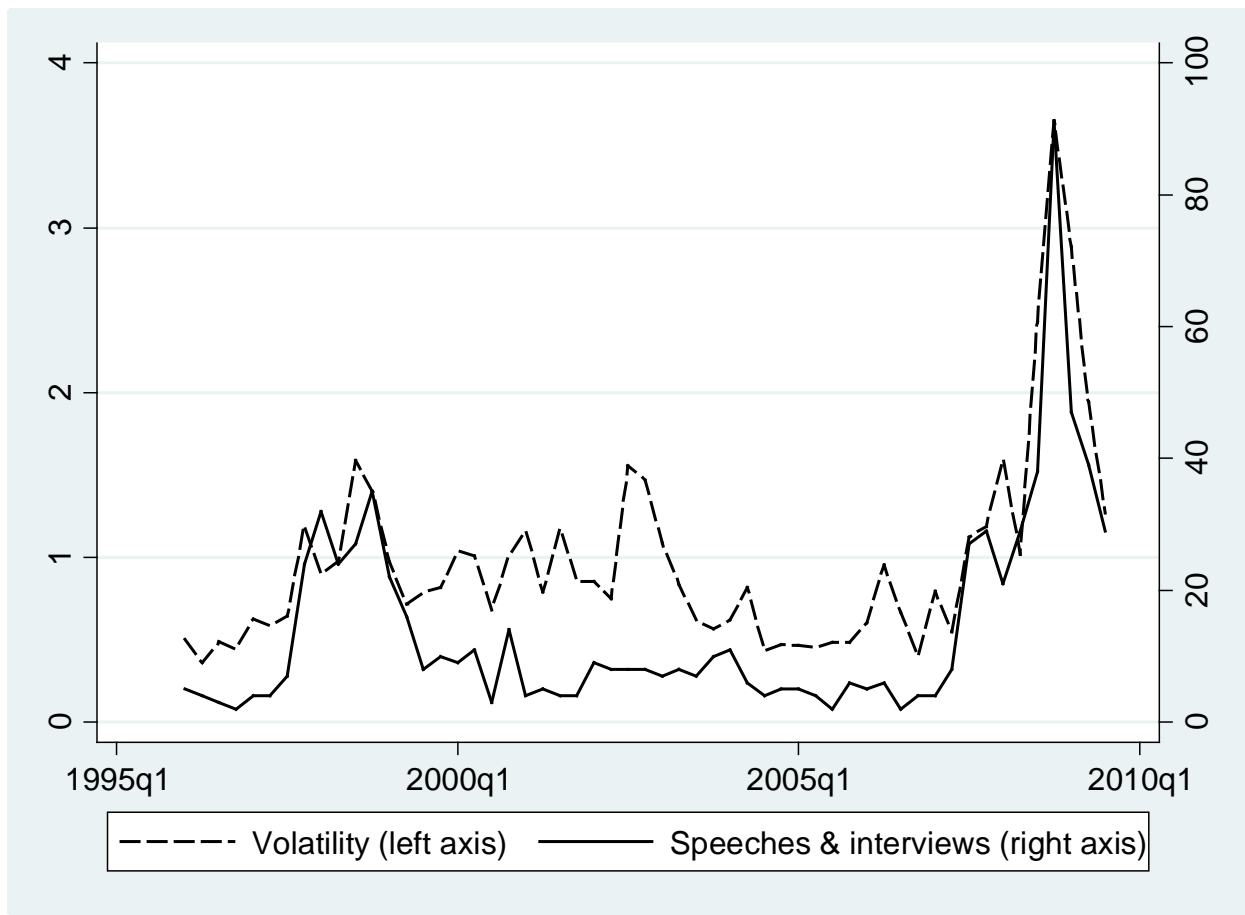
- Frequency of speeches/interviews reacts to market conditions (in contrast to pre-scheduled FSRs)
- FSRs have become less optimistic as of early 2006
- Communication about financial stability has important repercussions on financial sector stock prices
  - FSRs create news (long-lasting and sizeable effect on stock market returns)
  - FSRs reduce noise (reduce market volatility, particularly if containing optimistic assessment)
  - Speeches/interviews have little effect on returns and rather increase volatility

- Central bank communication about financial stability has not yet received much attention in the academic literature.
  - Svensson (2003): FSRs as early warning
  - Cihak (2006,2007): on the content of FSRs
  - Oosterloo, de Haan, and Jong-A-Pin (2007): who publishes FSRs, for what motives, and with what content?
  - Allen, Francke, and Swinburne (2004): recommendations for the Riksbank's FSR, i.e. some aspects of effectiveness

# Identifying the release date of communications

- **Financial Stability Reports**
  - Main source: central bank websites and press offices
  - Complemented by news reports about FSR releases from Factiva
  - 367 FSRs in total
  - These determine our country sample (36 plus USA) and our time sample (January 1996 to September 2009)
- **Speeches and interviews**
  - By central bank governors
  - Objective is to extract all relevant public statements that relate to financial stability from Factiva using name of governor plus keywords
  - Choose only the first report about a given statement
  - Caveats: search only conducted in English; possibly other keywords; news sources might be selective in their reporting
  - 768 speeches/interviews in total

# Stock market volatility and the occurrence of speeches and interviews



➔ Communication intensifies in times of financial turbulence

# Measuring the content of communication

- Employ the computerized textual-analysis software  
Diction 5.0
  - Searches text for different semantic features using a corpus of several thousand words
  - Used, e.g., in Armesto et al. (2009, JMCB) to extract the information content of the Fed's Beige Book
- We are interested in optimism dimension:
  - *Optimism*: information about current state and prospects of financial system



# Measuring the content of communication

- **Advantages:**
  - Software creates more mechanical and objective coding
  - Replicability of coding
  - Allows a consistent coding of long passages of text across a large number of communications
- **Drawback:**
  - does not consider context of the text, cannot generate “tailor-made” coding for financial-stability communication

# Measuring the content of communication

- Compute scores
  - For each news report about a speech/interview
  - For each executive summary of an FSR
- Transform the resulting scores into discrete variables (required for subsequent analysis):
  - +1: upper third of distribution
  - 0: middle third of distribution
  - -1: lower third of distribution
- Alternative classification
  - Explain content of communication

$$C_{it}^{optimism,c} = \alpha_{0i} + \alpha_{1q} + \alpha_2 T_{it-1} + \alpha_3 S_{it-1} + \alpha_4 M_{it-1} + \mu_{it}$$

- Extract residuals, and sort these into a  $\{-1,0,+1\}$  indicator

# Coding examples

## **28-01-1998: “U.K. BOE's George Confident Asia Contagion Can Be Avoided”**

“Governor of the Bank of England Eddie George said Wednesday he was 'reasonably confident' wider financial contagion from the Asia crisis could be avoided.” Source: Dow Jones International News

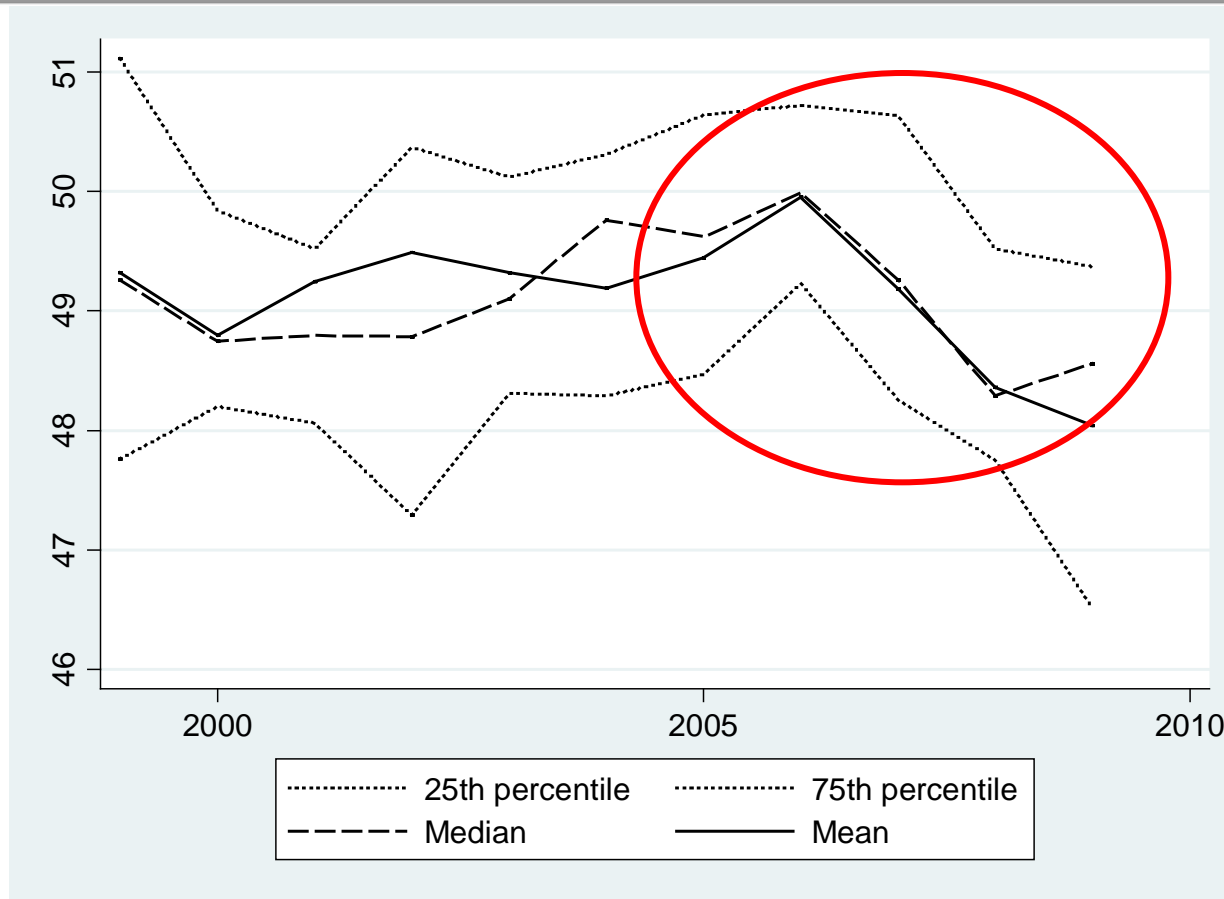
*Coded: Optimism = 1*

## **09-11-2000: “Korea markets unstable as worries linger-c.bank.”**

“South Korea's financial *markets continue to show signs of instability* as the second phase of financial restructuring progresses, the governor of the central Bank of Korea said on Thursday.” Source: Reuters News

*Coded: Optimism = -1*

# Evolution of optimism over time: FSRs



Tone of FSRs improves from 2000-2006 Q1, then drops

# Financial market data

- Daily frequency for two practical reasons
  - Financial market data with higher frequency not available for a large cross-section of countries over a relatively long horizon
  - Identification of release time of central bank communication within a day impossible
- Choice of financial sector stock market indices:
  - Expect empirical effects of financial stability communication to be most easily detected here
  - Less traditional market impact measures (implied volatilities, expected default frequencies) not available over whole cross-section and time
- All stock indices expressed in local currency
- Robustness: overall stock indices

# Event study methodology

- Event: release of FSR or delivery of speech/interview
- Questions:
  - Does an event affect stock markets in a causal way?
  - How persistent is the effect?
- Ingredients:
  - benchmark model to compute expected returns in absence of an event
  - excess returns as difference between actual and expected returns
  - Statistical tests to determine whether the event has a significant effect on returns and standard deviations

# Benchmark model

$$R_{it} = \gamma_{0i} + \gamma_{1i}R_{it-1} + \gamma_{2i}R_{mt-1} + \gamma_{3i}R_{mt} + \gamma_{4i}R_{mt+1} \\ + \gamma_{5i}D_t + \gamma_{6i}T_{it-1} + \gamma_{7i}S_{it-1} + \gamma_{8i}M_{it-1} + \varepsilon_{it}$$

## Based on Edmans et al. (2007)

- $R_{it}$  daily local currency return on financial sector stock market index
- $R_{mt}$  daily US dollar return on Datastream's global financial sector stock market index
- $D_t$  day of the week dummies

## Based on Pojarliev and Levich (2007)

- $T_{it-1}$  trend in stock markets over 20 days prior to event (momentum)
- $S_{it-1}$  standard deviation of daily returns over 20 days prior to event
- $M_{it-1}$  “misalignment” on the day preceding the event: percentage deviation of stock index from its national average over entire sample

**Estimated over non-event days  $\pm 60$  days**

# Excess returns

$$\hat{\varepsilon}_{it} = R_{it} - (\hat{\gamma}_{0i} + \hat{\gamma}_{1i}R_{it-1} + \hat{\gamma}_{2i}R_{mt-1} + \hat{\gamma}_{3i}R_{mt} + \hat{\gamma}_{4i}R_{mt+1} \\ + \hat{\gamma}_{5i}D_t + \hat{\gamma}_{6i}T_{it-1} + \hat{\gamma}_{7i}S_{it-1} + \hat{\gamma}_{8i}M_{it-1})$$

- Hypothesis to be tested:

$$\hat{\varepsilon}_{it} > 0 \text{ if } I_{it}^{optimism,c} = 1 \quad \text{or} \quad \hat{\varepsilon}_{it} < 0 \text{ if } I_{it}^{optimism,c} = -1$$



# Cumulated excess returns

- Recursive computation of excess returns  $k$  days after event:

$$\hat{\varepsilon}_{it+k} = R_{it+k} - (\hat{\gamma}_{0i} + \hat{\gamma}_{1i}\hat{R}_{it+k-1} + \hat{\gamma}_{2i}R_{mt+k-1} + \hat{\gamma}_{3i}R_{mt+k} + \hat{\gamma}_{4i}R_{mt+k+1} + \hat{\gamma}_{5i}D_{t+k} + \hat{\gamma}_{6i}\hat{T}_{it+k-1} + \hat{\gamma}_{7i}\hat{S}_{it+k-1} + \hat{\gamma}_{8i}\hat{M}_{it+k-1})$$

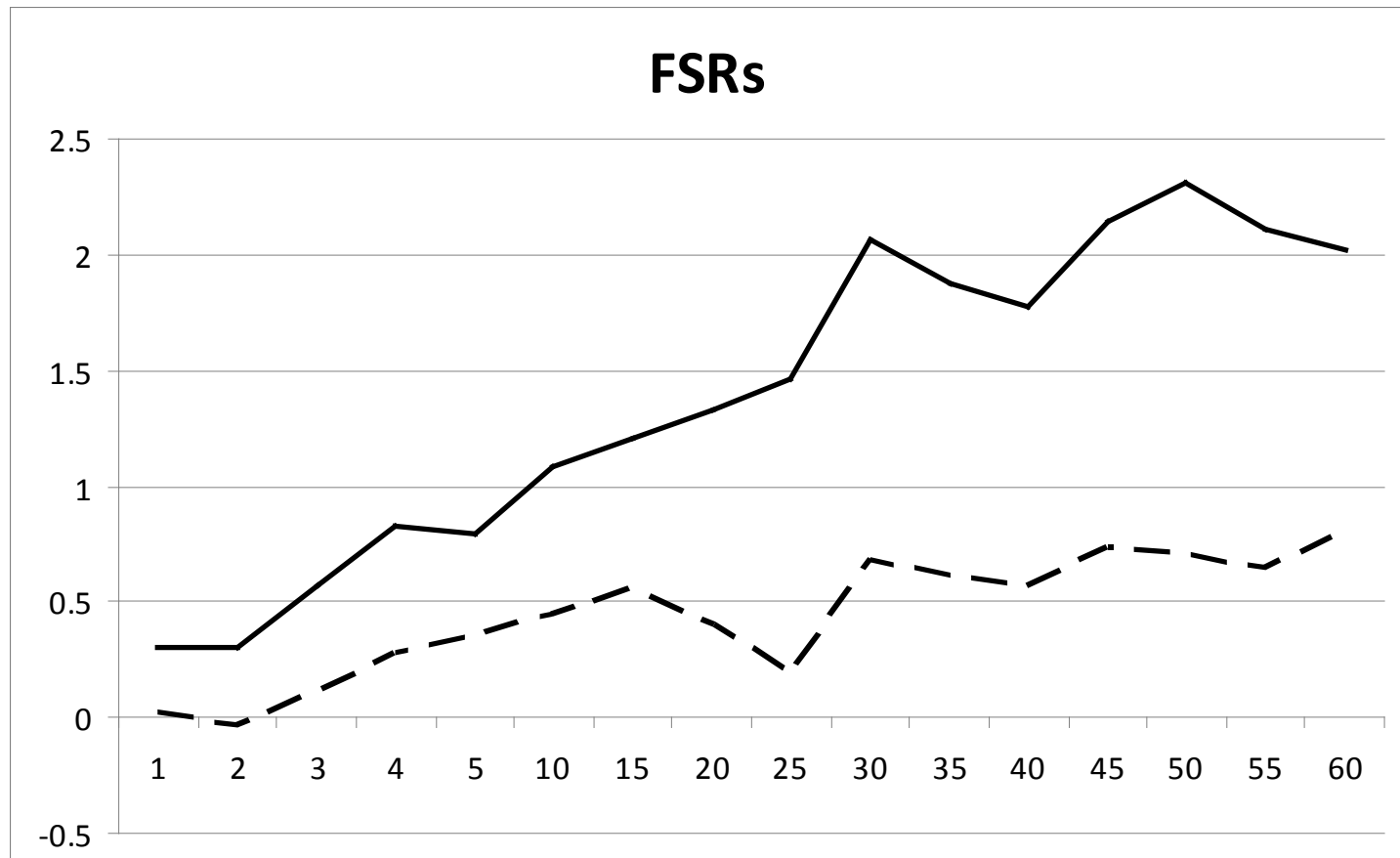
- Hypothesis to be tested:

$$\sum_{k=0}^K \hat{\varepsilon}_{it+k} > 0 \text{ if } I_{it}^{optimism,c} = 1 \quad \text{or} \quad \sum_{k=0}^K \hat{\varepsilon}_{it+k} < 0 \text{ if } I_{it}^{optimism,c} = -1$$

- To test whether communications reduce noise

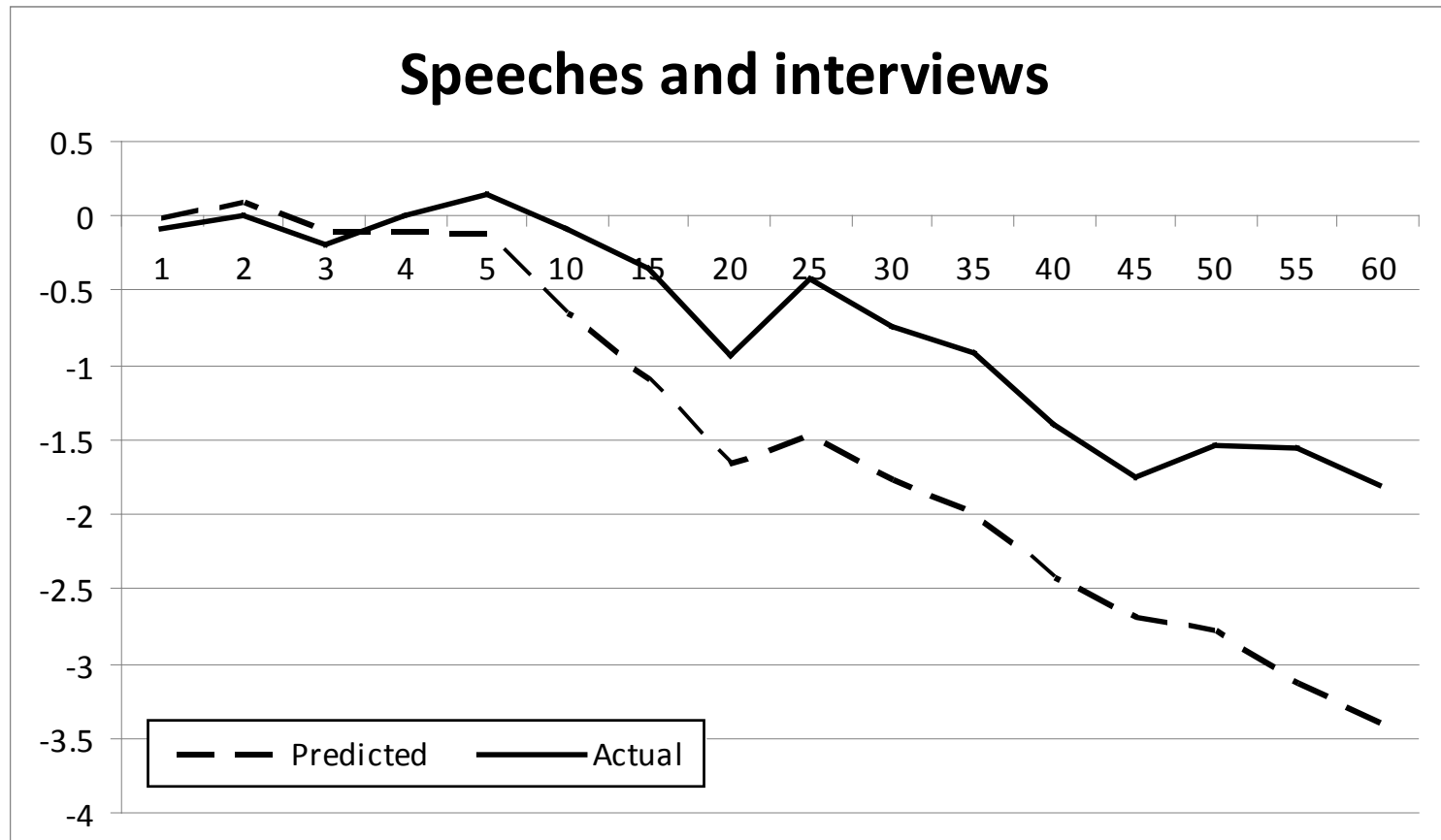
$$\sigma_{\hat{\varepsilon}_{i,t/t+k}} < \sigma_{\hat{\varepsilon}_{i,t-1/t-1-k}} \text{ if } D_{it}^c = 1$$

# Predicted vs. actual evolution of cumulated stock market returns after communication



- Markets move in direction of central bank view
- FSR release on average moves equity markets by more than 1%

# Predicted vs. actual evolution of cumulated stock market returns after communication



- Stock markets decline by less than predicted
- But difference much smaller than for FSRs

# Effectiveness of FSRs – Optimism dimension

## Joint model

# days	Returns		Standard deviation			
	% effective	% change	% effective	% change	% effective	% change
1	0.54	0.27 ***	--	--	--	--
2	0.54	0.33 **	--	--	--	--
3	0.58 **	0.46 ***	--	--	--	--
4	0.57 **	0.54 ***	0.51	-0.08 *		
5	0.53	0.44 **	0.53	-0.07 *		
10	0.53	0.63 **	0.55 **	-0.08 **		
15	0.57 **	0.64 **	0.52	-0.06 *		
20	0.56 **	0.92 **	0.55 **	-0.05 *		
25	0.57 **	1.27 ***	0.56 ***	-0.07 **		
30	0.58 ***	1.39 ***	0.56 ***	-0.05 *		
35	0.57 **	1.27 ***	0.56 ***	-0.05 *		
40	0.53	1.21 **	0.55 **	-0.04		
45	0.56 **	1.41 ***	0.55 **	-0.05 *		
50	0.56 **	1.60 ***	0.56 ***	-0.06 **		
55	0.56 **	1.47 **	0.56 **	-0.05 *		
60	0.55 *	1.21 **	0.55 **	-0.05 *		

- Initial excess return: 0.27% on average
- Cumulated excess returns of up to 1.6% after 50 days
- Sizeable and economically meaningful effect
- In particular optimistic FSRs affect financial markets
- Evidence that FSRs lead to a significant reduction in market volatility

# Effectiveness of speeches/interviews – Optimism dimension

# days	Joint model					
	Returns		Standard deviation			
	% effective	% change	% effective	% change	% effective	% change
1	0.45 "	-0.09	--	--	--	--
2	0.48	-0.10	--	--	--	--
3	0.49	-0.10	--	--	--	--
4	0.51	0.11	0.47'		0.02	
5	0.53 *	0.26	0.48		0.01	
10	0.55 ***	0.55 **	0.49		0.00	
15	0.54 *	0.74 **	0.48		0.04	
20	0.52	0.73 **	0.49		0.06'	
25	0.55 **	1.04 **	0.50		0.06"	
30	0.54 **	1.04 **	0.51		0.06"	
35	0.56 ***	1.06 **	0.50		0.06'	
40	0.54 *	1.01 *	0.50		0.05'	
45	0.52	0.95 *	0.50		0.05'	
50	0.55 ***	1.24 **	0.51		0.04'	
55	0.55 **	1.58 **	0.52		0.04'	
60	0.55 **	1.63 **	0.50		0.03	

- Effect on returns much less systematic
- some tendency, especially of optimistic speeches, to **increase** stock market volatility

# Robustness – sample splits for FSRs

	Joint model				Optimistic FSRs			
	Returns		Standard deviation		Returns		Standard deviation	
	% effective	% change	% effective	% change	% increase	% change	% effective	% change
<b>A - Benchmark</b>	0.57 **	1.27 ***	0.56 ***	-0.07 **	0.62 ***	2.18 ***	0.54	-0.05
<b>B - Sample splits</b>								
<b>1. Country Group</b>								
Advanced economies	0.56 *	0.91 **	0.59 ***	-0.11 ***	0.58 *	1.62 ***	0.55	-0.03
Emerging economies	0.62 **	2.27 **	0.48	0.05	0.69 ***	3.21 ***	0.51	-0.07
<b>2. Crisis versus pre-crisis</b>								
Pre-crisis	0.63 ***	2.10 ***	0.55 *	-0.05 **	0.64 ***	2.73 ***	0.51	-0.05 *
Financial crisis 2007-2010	0.45	-0.55	0.60 **	-0.13 *	0.52	-0.32	0.65 **	-0.01
<b>3. Supervisory role</b>								
CB is supervisor	0.56	1.47 **	0.55 *	-0.09 *	0.64 **	2.63 ***	0.63 **	-0.10 *
CB is not supervisor	0.58 **	1.17 **	0.57 **	-0.06 *	0.59 *	1.80 ***	0.46	0.00
<b>C - Robustness</b>								
All stocks	0.58 ***	1.16 ***	0.55 **	-0.02	0.66 ***	1.96 ***	0.60 ***	-0.06 **
Alternative coding	0.53	0.72 *	0.56 ***	-0.07 **	0.59 **	1.86 ***	0.54	-0.10 **
Raw Diction scores	--	0.50 ***	--	--	--	--	--	--
<b>D - Testing for the signalling channel</b>								
Short-term interest rates	0.54 *	0.05	0.55 **	0.01	0.58 **	0.04	0.55	0.00
Long-term interest rates	0.53	0.02	0.52	0.00	0.52	0.00	0.56 *	0.00

- reduction in volatility following FSRs driven by advanced countries, main effects on returns originate in emerging countries
- FSRs have no systematic effect on stock markets during the crisis

# Robustness – sample splits for speeches/interviews

	Joint model				Optimistic speeches and interviews			
	Returns		Standard deviation		Returns		Standard deviation	
	% effective	% change	% effective	% change	% increase	% change	% effective	% change
<b>A - Benchmark</b>	0.55 **	1.04 **	0.50	0.06 "	0.56 **	2.02 ***	0.48	0.12 "
<b>B - Sample splits</b>								
<b>1. Country Group</b>								
Advanced economies	0.54 *	1.02 **	0.48	0.07 "	0.58 **	2.53 ***	0.46	0.15 "
Emerging economies	0.57 *	1.10	0.56 **	0.04	0.52	0.60	0.52	0.06
<b>2. Crisis versus pre-crisis</b>								
Pre-crisis	0.52	0.48	0.51	0.02	0.52	0.84	0.52	0.01
Financial crisis 2007-2010	0.59 ***	1.87 **	0.49	0.11 "	0.62 ***	3.58 ***	0.43 '	0.27 "
<b>3. Supervisory role</b>								
CB is supervisor	0.54	0.75	0.50	0.06	0.56 *	1.81 **	0.50	0.12
CB is not supervisor	0.56 **	1.37 **	0.51	0.06	0.57 *	2.30 ***	0.45	0.12
<b>4. Clustering</b>								
Speeches as part of cluster	0.51	-0.04	0.35 ""	0.43 ""	0.50	-0.22	0.41	0.45 "
Speeches outside cluster	0.56 **	1.25 ***	0.53 **	-0.01	0.58 **	2.50 ***	0.49	0.05
<b>C - Robustness</b>								
All stocks	0.51	0.87 ***	0.48	0.06 "	0.52	1.46 ***	0.44 "	0.13 ""
Alternative coding	0.53	0.75 *	0.50	0.06 "	0.53	1.84 ***	0.51	0.08
Raw Diction scores								
<b>D - Testing for the signalling channel</b>								
Short-term interest rates	0.49	-0.07	0.53 *	-0.03 *	0.42 ""	-0.15	0.52	-0.04 *
Long-term interest rates	0.49	-0.06	0.50	0.00	0.47	-0.12	0.48	0.01

- effects of speeches and interviews are precisely driven by crisis period
- speeches that are part of a cluster are not influencing the market view, and tend to increase market volatility
- stand-alone speeches create news, largely without changing volatility

# Channels: Why are FSRs effective?

- **Coordination channel**
  - Markets lack information about financial stability, or
  - Discrepancy in market views
  - FSR coordinates market views and actions, with persistent effect on asset prices
- **Signalling channel**
  - FSRs provide information about future policy actions or future path of economy
  - FSR affects markets by signalling future policy action (though may not necessarily change expectations, i.e. may not imply “surprise”)



# Channels: Why are FSRs effective?

- Only very weak evidence for signalling channel
  - Optimistic FSRs are followed by interest rate increases
  - FSRs slightly more effective when accompanied by corresponding interest rate movements
- Persistence speaks in favour of coordination channel

# Conclusions

- Communication about financial stability has important repercussions on financial sector stock prices
- FSRs
  - Significant, potentially long-lasting effect on stock market returns
  - FSRs tend to reduce market volatility, particularly if containing optimistic assessment
- Speeches/Interviews
  - Very flexible tool
  - Only modest effects on stock market returns; do not reduce volatility
  - Affected returns significantly more during global financial crisis
- Communication effects are longer-lasting
  - potential to change dynamics in financial markets

# Policy implications

- Communication by monetary authorities on financial stability issues can effectively influence financial markets
- But: needs to be employed with care ...
- Importance of differentiating between communication tools and content when designing communication strategy on financial stability issues
- Difficulty of designing successful communication strategy on financial stability