

Market Response to Policy Initiatives during the Global Financial Crisis

Yacine Ait-Sahalia

Jochen Andritzky

Andreas Jobst

Sylwia Nowak

Natalia Tamirisa

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Road Map

- Motivation and research question
- Literature and contribution of this paper
- Methodology and data
- Key findings
- Policy implications

Key Policy Question in 2007-09

- What measures can help stabilize the financial system and restore market confidence?
- How much priority to give to macroeconomic policy easing, liquidity support and financial restructuring?
- Bail out individual banks (or let them fail), or design system-wide support programs?

Literature

- Interest rate cuts and liquidity support are typical immediate responses; financial restructuring is crucial
 - Rogoff and Reinhart (2009)
 - Calomiris, Klingebiel and Laeven (2005)
- No clear answers for the crisis; intense real time debate
 - Severe shock to the core of the global financial system—spillovers and policy coordination
 - Novel and non-transparent financial instruments
- Analysis focused on specific policies or countries
 - Taylor and Williams (2009)
 - Panetta et al (2009), Baba and Packer (2009), King (2009)

Contribution

- Broad range of policy initiatives announced during the crisis
 - June 1, 2007 to March 31, 2009
 - United States, United Kingdom, Euro area, Japan
 - Macroeconomic and financial sector policies
 - Action and inaction, system-wide and ad hoc measures
 - Database available at www.imf.org
- Immediate market reaction to policy announcements
 - Positive reaction may be self-fulfilling and indicative of policy success in calming markets
 - Simple and parsimonious event study, with extensive robustness analysis

Event Study Approach

- Events are announcements of changes in macroeconomic and financial sector policies
- Market response is measured as abnormal changes in the Libor-OIS spread
- Tests of means before and after announcements, over a narrow event window, during two crisis periods
- Multiple draws of announcements are created by pooling them across countries
- Robustness analysis (parametric and nonparametric tests and alternative event windows and measures of financial distress)

The 3-month U.S. dollar Libor-OIS spread as the main indicator of financial distress

- Counterparty and liquidity risk in the global interbank markets
 - London Interbank Offered Rate (LIBOR) contains the expected risk-free interest rate over a specific term + credit risk premium of trading with another bank and the liquidity risk premium of term in lieu of overnight (unsecured)
 - Overnight Index Swap (OIS) rate is a measure of the expected risk-free interest rate over a specific term (secured)
- Strongly correlated with other financial indicators and widely monitored during and since the crisis

Classification of Policy Announcements

Policy action and system-wide measures

- Fiscal policy
- Monetary policy
 - Interest rate cuts
 - Quantitative and credit easing
- Liquidity provision
 - Domestic currency
 - Foreign exchange swaps
- Financial sector policy
 - Recapitalization
 - Asset purchases
 - Liability guarantees and deposit insurance

Policy inaction and ad hoc bank bailouts

- Monetary policy
 - Interest rate increases
 - No changes in interest rates
- Financial sector policy
 - Ad hoc bank bailouts
 - Bank failures

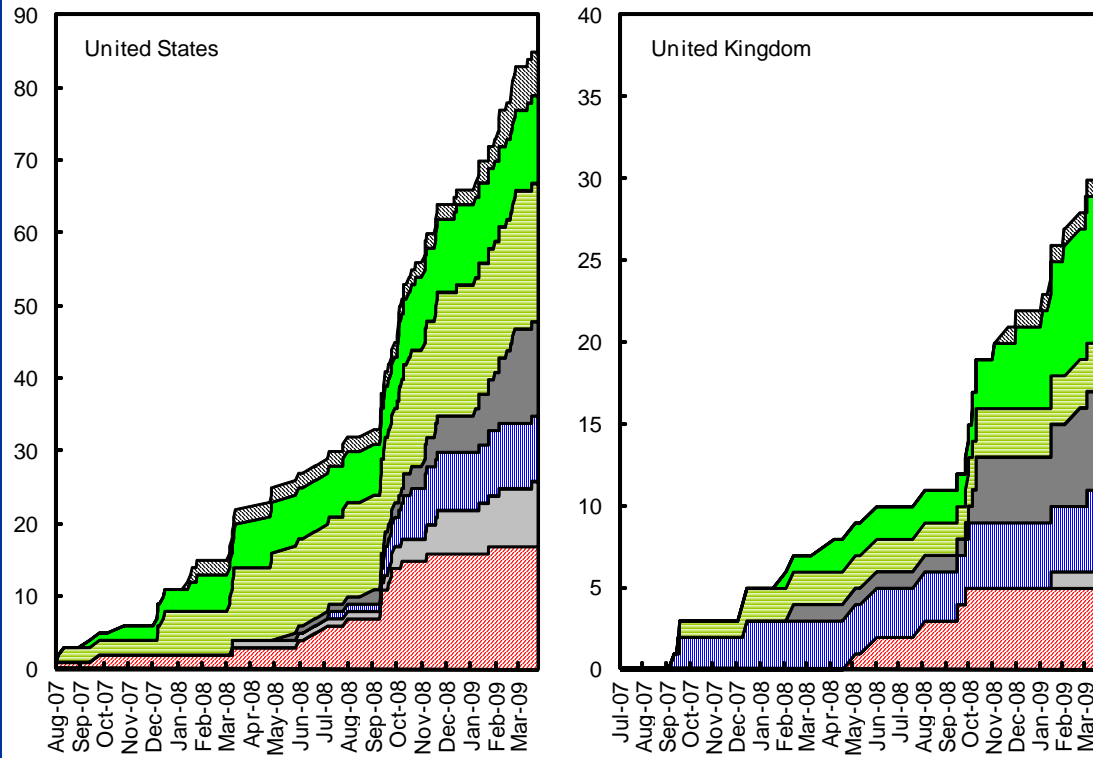
Database on Policy Announcements

- Day, month, and year of announcements
- Watershed events—front pages of FT and WSJ
- Classification by type—the “driving force” concept
- Expectations of magnitude—interest rate changes and fiscal packages
- Total number of announcements—196
 - US 43%, UK 16%, Euro area 37%, Japan 8%
 - Fiscal 5%, monetary 15%, liquidity support 19%, financial sector restructuring 40%
 - Policy inaction and ad hoc bank bailouts 23%

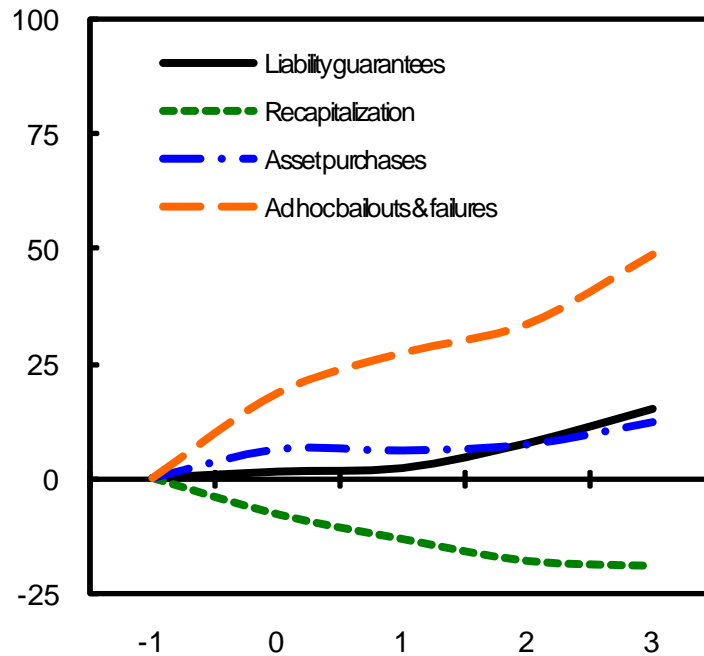
Data Example

Cumulative Number of Front-Page Policy Announcements
June 1, 2007–March 31, 2009

- Fiscal easing
- Liquidity support and forex swaps
- Liability guarantees
- Policy inaction, bank bailouts and failures
- Monetary easing
- Recapitalization
- Asset purchases



Impact of Policy Announcements on the Libor -OIS Spread, September 14, 2008 – March 31, 2009
(In basis points)



Source: Authors' estimates.

Note: The variable plotted on the vertical axis is the average cumulative abnormal differences in basis points within the event window of one day before the event and three days after the event. The horizontal axis shows days within the event window, with "0" corresponding to the day of the announcement.

Results of Statistical Tests

	Parametric Test Statistic	Non-parametric Test Statistic	Parametric Test Statistic	Non-parametric Test Statistic
	Subprime Phase		Global Phase	
Fiscal policy	0.70	-0.50	-0.68	0.27
Monetary policy				
Interest rate cuts	-1.30	0.34	-11.16	2.77
Quantitative and credit easing	—	—	1.50	-0.71
Liquidity support				
Domestic currency	2.71	-0.42	-6.40	1.32
Forex swaps	-4.14	1.03	39.64	-0.50
Financial Sector Policy				
Recapitalization	—	—	-3.71	0.76
Asset purchases	9.82	-0.50	3.31	-0.50
Liability guarantees	-10.90	2.60	9.88	-1.14
Policy inaction and ad hoc bank bailouts	1.43	-1.41	25.50	-1.50
Higher/stable interest rates	1.79	-1.16	1.44	-0.50
Ad hoc bank bailouts	0.62	-0.59	28.65	-1.32
Bank failures	1.15	-0.59	27.54	-0.50
Surprises				
Fiscal policy	—	—	0.39	-0.16
Monetary policy	-4.45	0.19	-13.18	3.34

Robustness Tests: Subprime Phase

Statistical Tests for Alternative Measures of Financial Risk									
		3-month LIBOR-OIS Spread (Spot)	3-month NYFR-OIS Spread (Spot)	3-month LIBOR-OIS Spread (Spot- Future)	Repo- Risk free Spread	TED Spread	VIX	CDS Composite Index	Equity Composite Index
		Subprime Phase							
Fiscal policy		↑	—	—	↑	↑	↑	↑	↓*
Monetary policy	Interest rate cuts	↓	—	↓	↑	↓	↑	↓	↓
	Quantitative and credit easing	—	—	—	—	—	—	—	—
Liquidity support	Domestic currency support	↑	↑	—	↓*	↓	↓	↑	↑
	Forex swaps	↓*	—	—	↑	↓*	↑	↑*	↓***
Financial sector policy	Recapitalization	—	—	—	—	—	—	—	—
	Asset purchases	↑	—	—	↑	↑	↑	↓*	↓*
	Liability guarantees	↓***	—	—	↓***	↓***	↓***	↑	↑
Policy inaction and ad hoc bank bailouts	Increase of interest rates	↑	—	—	↑	↓	↓	↓	↑
	Stable interest rates	↑**	↑**	↑*	↑*	↑**	↑*	↑**	↓
	Ad hoc bank bailouts	↑	↑	↑	↑	↑	↑*	↑*	↑
Surprises	Fiscal policy surprises	—	—	—	—	—	—	—	—
	Monetary policy surprises	↓	—	—	↓	↓***	↓*	↓***	↑*

Note: An arrow "↑" ("↓") indicates an increase (decrease) of the corresponding market indicator. "—" denotes that no observations were available due to the absence of such policy measure or the late sample starting date (for example, for the New York Funding Rate and the Libor-OIS futures rates). Asterisks ***, **, * indicate statistical significance (two-tailed, standard normal distribution) at the 1, 5 and 10 percent level based on the parametric and nonparametric tests. Statistical significance is assigned if all parametric and non-parametric tests are consonant with each other at the significance level of at least 10 percent; the lowest value of the test statistics is used.

Robustness Tests: Global Phase

Statistical Tests for Alternative Measures of Financial Risk									
		3-month LIBOR-OIS Spread (Spot)	3-month NYFR-OIS Spread (Spot)	3-month LIBOR-OIS Spread (Spot- Future)	Repo- Risk free Spread	TED Spread	VIX	CDS Composite Index	Equity Composite Index
		Global Phase							
Fiscal policy		↓	↓	↓**	↓**	↑*	↓	↓	↓
Monetary policy	Interest rate cuts	↓***	↓**	↓**	↑**	↓***	↑	↑	↑
	Quantitative and credit easin	↑	↑	↓	↓	↑	↓***	↓	↑
Liquidity support	Domestic currency support	↓*	↓	↓	↓	↓	↓	↓	↑
	Forex swaps	↑	↑	↓*	↓*	↑	↑	↑	↑
Financial sector policy	Recapitalization	↓	↓*	↓**	↓	↓*	↓	↓	↓
	Asset purchases	↑	↑	↑	↓	↑	↑*	↓	↓
	Liability guarantees	↑*	↑	↑***	↓*	↓	↑	↓	↓
Policy inaction and ad hoc bank bailouts	Increase of interest rates	—	—	—	—	—	—	—	—
	Stable interest rates	↑	↑*	↑*	↑	↑	↓*	↓*	↑
	Ad hoc bank bailouts	↑***	↑*	↑***	↑	↑**	↑	↓	↓
Surprises	Fiscal policy surprises	↑	↓	↑***	↓	↑*	↓	↓	↑
	Monetary policy surprises	↓***	↓*	↓	↑	↓*	↑	↓*	↓*

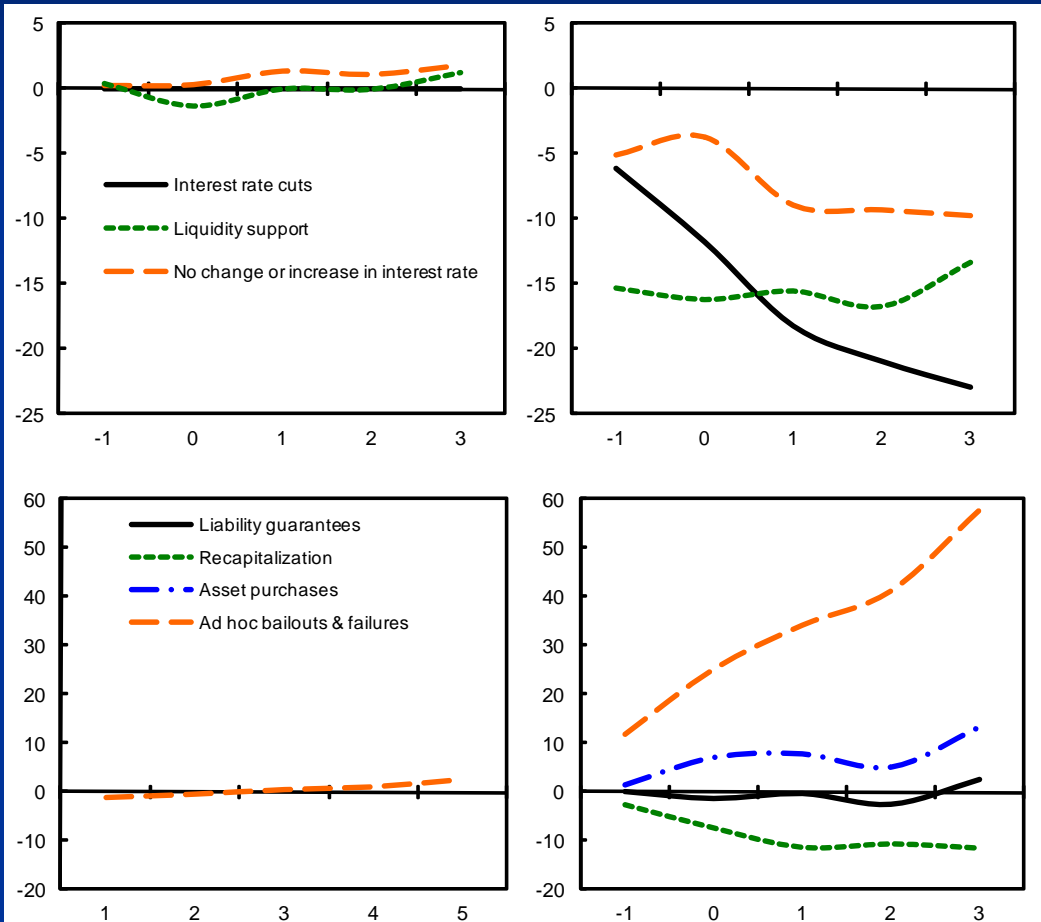
Note: An arrow "↑" ("↓") indicates an increase (decrease) of the corresponding market indicator. "—" denotes that no observations were available due to the absence of such policy measure or the late sample starting date (for example, for the New York Funding Rate and the Libor-OIS futures rates). Asterisks ***, **, * indicate statistical significance (two-tailed, standard normal distribution) at the 1, 5 and 10 percent level based on the parametric and nonparametric tests. Statistical significance is assigned if all parametric and non-parametric tests are consonant with each other at the significance level of at least 10 percent; the lowest value of the test statistics is used.

Impact of policy announcements on the NYFR-OIS spread

(In basis points)

Subprime
Phase

Global
Phase



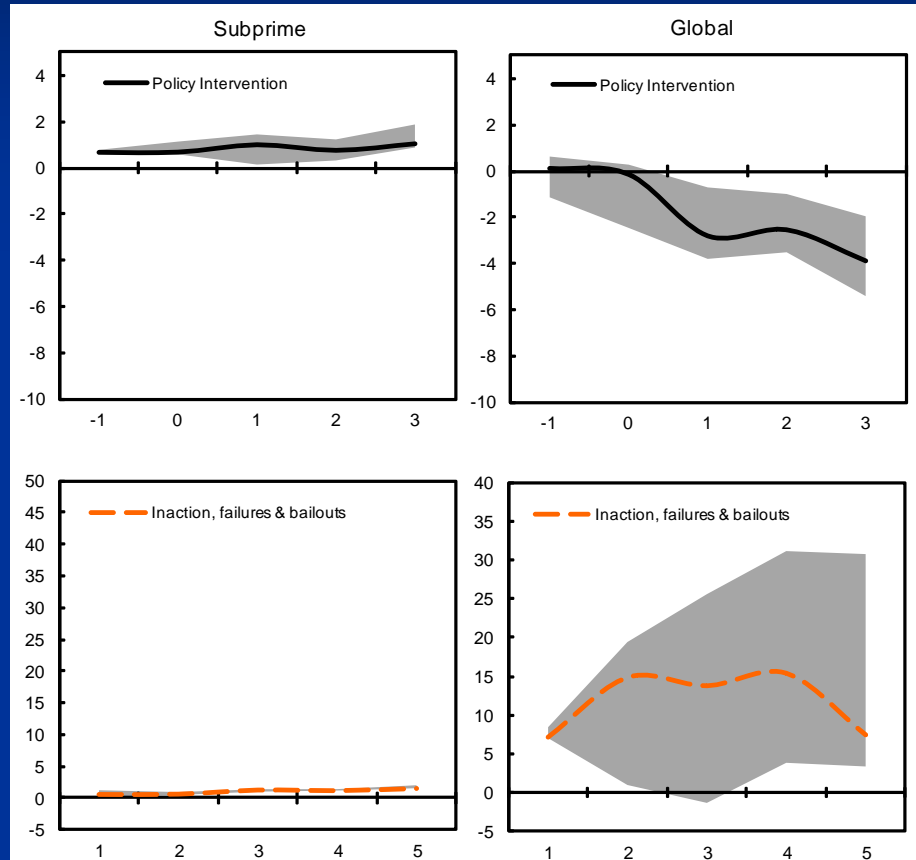
Source: Authors' estimates.

Note: The variable plotted on the vertical axis is the average cumulative abnormal differences in basis points within the event window of one day before the event and three days after the event. The horizontal axis shows days within the event window, with "0" corresponding to the day of the announcement.

Impact of policy announcements on alternative measures of financial distress

(In basis points)

Subprime
Phase



Global
Phase

Source: Authors' estimates.

Note: The variable plotted on the vertical axis is the median value of the average cumulative abnormal differences in basis points across five alternative measures of market response (TED spread, NYFR-OIS spread, repo-riskfree rate spread, LIBOR-OIS futures spread, and CDS spread) composite of sample countries. The grey shaded area shows the inter-quartile range (IQR) of values between the 25th and 75th percentile. The horizontal axis shows days within the event window, with "0" corresponding to the day of the announcement.

Policy Spillovers

Effects of Foreign Policy Announcements on the Libor-OIS Spreads

		Subprime Phase				Global Phase			
		United States	United Kingdom	Euro Area	Japan	United States	United Kingdom	Euro Area	Japan
Fiscal policy		—	US	US,UK	US	JP	EU	JP	US
Monetary policy	Interest rate cuts	o	o	o	o	UK,JP	EU,JP	JP	EU,UK
	Quant./credit easing	o	—	o	o	o	o	UK,JP	UK
Liquidity support	Domestic currency	o	o	o	o	o	o	o	o
	Forex swap lines	EU	o	o	o	—	—	—	—
Financial sector policy	Recapitalization	o	o	UK	o	EU	US, JP	US,UK	US
	Asset purchases	—	o	o	o	o	EU	o	EU
	Liability guarantees	UK	US	UK	US	o	US	US	o
Policy inaction and ad hoc bank bailouts		o	JP	US,UK	US	EU	US	UK	US

Source: Authors' estimates.

Note: The table shows statistically significant spillover effects of domestic policy announcements on the foreign Libor-OIS spreads. Country abbreviations indicate the countries where spillovers originated. The countries that received spillovers are shown in column headers. The abbreviation "US" stands for the United States, "UK" for the United Kingdom, "EU" for the euro area, and "JP" for Japan. Green (orange) cells indicate statistically significant decreases (increases) in the Libor-OIS spreads following the respective foreign policy announcements. "o" indicates that spillovers were statistically insignificant. "—" means that spillovers were not feasible, i.e., foreign announcements in the respective policy category did not occur or did not qualify as a front-page event.

Key Findings

- Announcements of
 - Interest rate cuts and liquidity support
 - Recapitalization and liability guarantees

were associated with a decline in the interbank risk premium, albeit to a different degree during the subprime and global phases of the crisis

- Decisions not to reduce interest rates and bail out individual banks in ad hoc manner had adverse implications

The results are robust to ...

- Using a narrower event window (-1/+1 day)
- Controlling for the surprise content of monetary and fiscal policy announcements
- Using alternative measures of interbank risk premium
 - Transaction-based NYFR-OIS spread
 - Libor-risk free rate spread, a.k.a. TED spread

Policy Implications

- A systemic financial crisis requires an integrated, macro-financial policy response
- Some policy decisions, e.g., decisions not to reduce interest rates, to allow banks to fail or ad hoc bank bailouts may aggravate market distress in the short run
- Significant policy spillovers underscore the need for international coordination of policy response to a systemic financial crisis

Additional Slides

Parametric Test

- Event window T ($\tau=-1/+3$ days) for all policy events M and corresponding sample observations N , with pre-event window L of $l=20$ days
- Average Cumulative Abnormal Differences (ACAD) statistic for m policy event types

$$\frac{ACAD_m}{\sigma ACAD_m} = \frac{\frac{1}{5N_m} \sum_{i=1}^{N_m} \sum_{\tau=-1}^{T=3} \overbrace{x_{i,\tau} - x_{i,\tau-1}}^{AD_{i,\tau}}}{\sqrt{\frac{1}{N_m^2} \sum_{i=1}^{N_m} \sum_{l=\tau-20}^{L=20} \frac{x_{i,\tau} - x_{i,\tau-1}}{L-2}}} \square \Phi 0,1$$

- Patell (1976), Boehmer et al (1991), Corrado and Zivng (1992), Kolari and Pynnonen (2008)

Nonparametric Tests

- Sign test (N^+ number of ACADs)

$$\left(\frac{N_m^+}{N_m} - 0.5 \right) \frac{\sqrt{N_m}}{0.5} \square \Phi 0,1$$

- Sign-size test

$$\left(\frac{\frac{\sum_{i=1}^{N_m^+} k - CAD_i^+}{N_m^+} \frac{N_m^+}{N_m} - 0.25}{\frac{\sum_{i=1}^{N_m^-} CAD_i^- - k}{N_m^-} + \frac{\sum_{i=1}^{N_m^+} k - CAD_i^+}{N_m^+}} \right) \frac{\sqrt{N_m}}{0.5} \square \Phi 0,1$$

$$\therefore CAD_i = \frac{CAD - \min_N CAD_i}{|\max_N CAD_i| + |\min_N CAD_i|} \in 0,1$$

$$\therefore k = \begin{cases} \frac{|\min_N CAD_i|}{|\max_N CAD_i| + |\min_N CAD_i|} & \text{if } \min_{N_m} CAD_i < 0, \max_{N_m} CAD_i > 0 \\ 1 & \text{if } \min_{N_m} CAD_i, \max_{N_m} CAD_i < 0, \text{ else } 0 \end{cases}$$