Federal Reserve Policies and Financial Market Conditions During the Crisis

Scott Brave and Hesna Genay
Federal Reserve Bank of Chicago
Bank Structure and Competition
May 5, 2011

The views expressed here are those of the authors and do not necessarily represent the views of the Federal Reserve System.

Main Question

Did the Fed policies implemented during the crisis have a significant impact on broad financial conditions?

Federal Reserve Liquidity & Credit Facilities

Traditional Counterparties			Other Investors and Borrowers		Other	Portfolio Purchases
Depository Institutions	Other Central Banks	Primary Dealers	MMMF and Commercial Paper Markets	Consumer and Small Business Credit	Specific Institutions	Treasury, GSEs, and Residential Mortgages
Discount window (8/2007)	Foreign Exchange Swap Lines (12/2007)	PDCF* (3/2008)	AMLF* (9/2008)	TALF* (11/2008)	Bear Stearns* (3/2008) AIG* (9/2008) Bank of America (1/2009) Citigroup (11/2008)	Large scale purchases of Treasury securities, GSE debt, and agency MBS (11/2008; 11/2010)
TAF (12/2007)		TSLF* (3/2008)	CPFF* (10/2008)			
Interest on reserves (10/2008)		TOP* (7/2008)	MMIFF* (10/2008)			

*authorized under Section 13(3) of the Federal Reserve Act – "unusual and exigent circumstances."
The dates in parentheses reference the introduction and the end (when applicable) of each program.

Previous Studies

- **TAF & Swap lines**
  McAndrews et al. (2008); Taylor and Williams (2009); Christensen et al. (2009);
- **LSAPs**
  Gagnon et al. (2010); Hancock and Passmore (2011); Krishnamurthy and Vissing-Jorgensen (2011);
- **TALF** – Campbell et al. (2011)
- **AMLF** – Duygan-Bump et al. (2010)
- **CPFF** – Adrian et. al. (2010)
- **TARP –** Veronosi and Zingales (2010); Ng et. al. (2010)

Brave and Genay

- **Event Study:** Broad set of policy actions
  - All announcements
  - Initiation/expansion only

- **Broad measure of financial conditions**
  - Higher threshold for finding significant effects from policy actions

- **Account for endogeneity of policy actions**
  - Estimate a two-equation system with a “policy response” function

Main Results

- The response function of policymakers matter
  - The Fed was more likely to take action when financial market and economic conditions were worse than normal
  - Failing to take into account the Fed's policy response has significant effects on measured effects of policies

- Collectively, the Fed actions improved broad financial market conditions significantly

- The results are robust to alternative definitions of events and model specifications

Definition of Policy Events

Baseline Model: January 2007 – August 2010

- **monetary policy actions (FFR, LSAP #1)**
- **credit and liquidity facilities; assistance to specific inst.**
- **excludes U.S. policy actions not coordinated with the Fed (e.g. actions by the Treasury, FDIC, etc.).**
- **initiations, expansions, extensions, reductions, and ends**

Measuring Financial Market Conditions

FRB Chicago National Financial Conditions Index (NFCI)
Available at www.chicagofed.org/nfci

- **Broad coverage of financial markets**
  - **A weighted average of 100 financial indicators**
    - **Money Markets (28/100)**
    - **Debt/Equity Markets (27/100)**
    - **Banking System (45/100)**

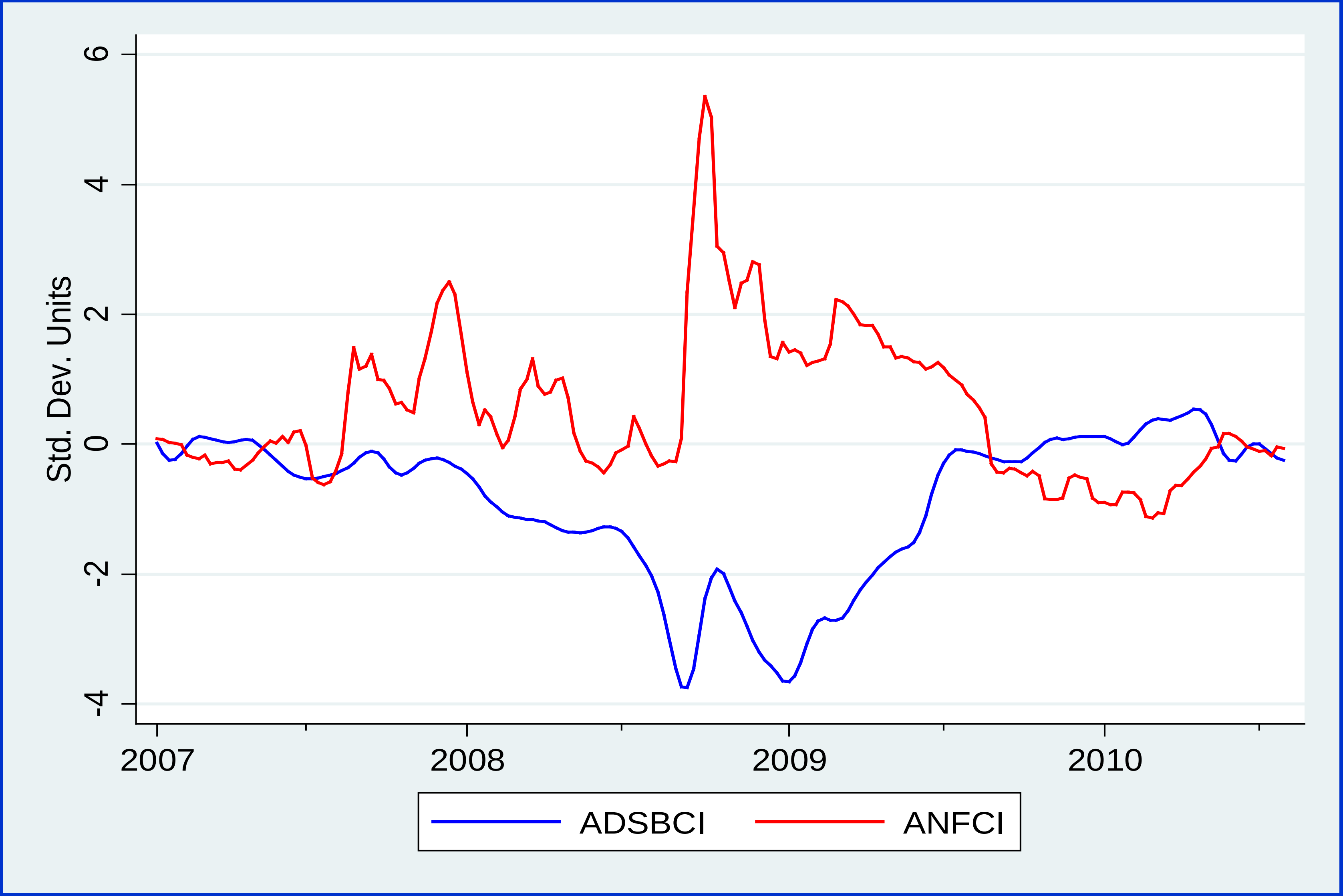
- **Weekly frequency: Jan. 1973 – Aug. 2010**
  - **Uses an unbalanced panel of weekly, monthly, and quarterly data**
  - **Captures a single common factor among the indicators**

Measuring Financial Market Conditions

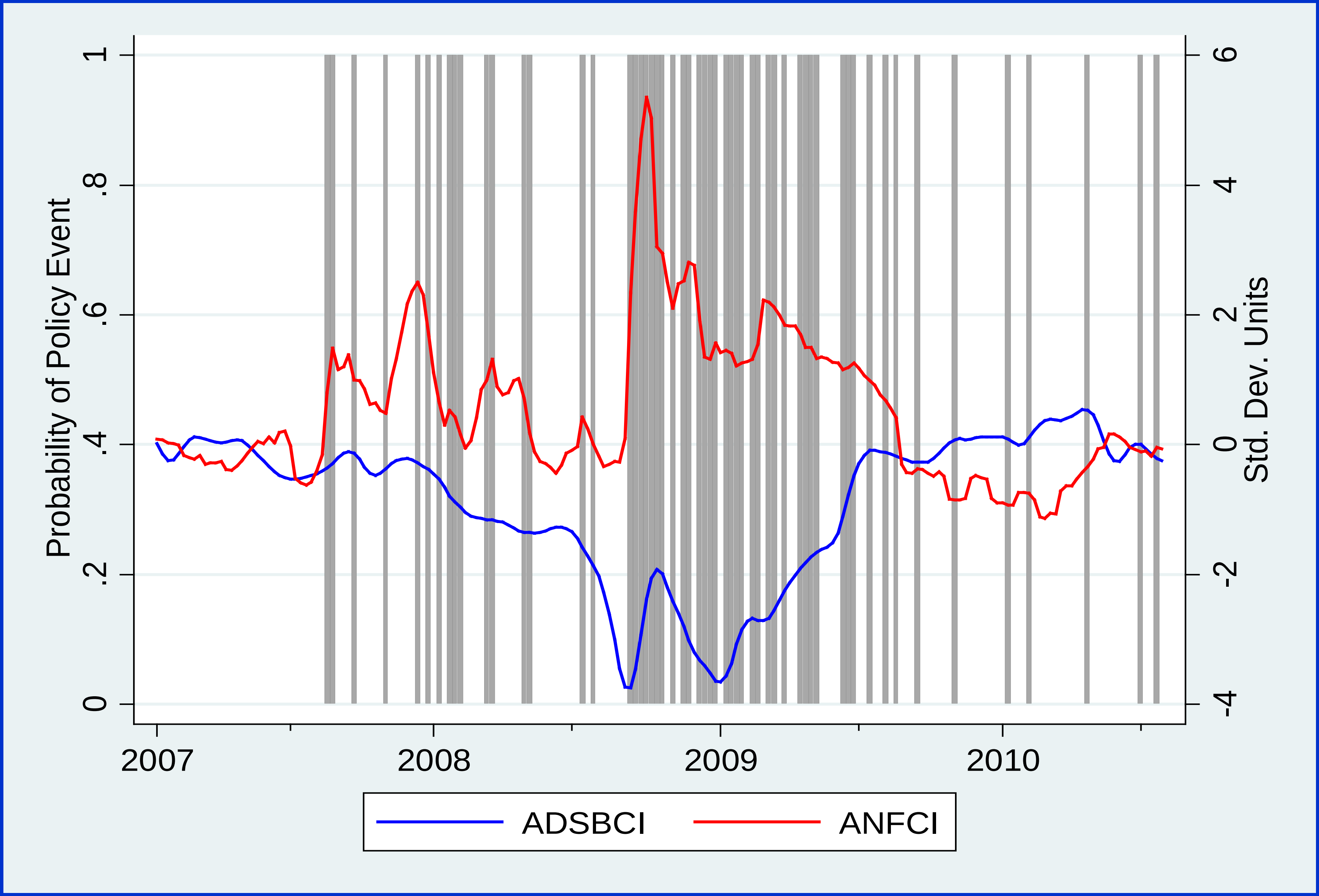
- Express financial conditions relative to economic conditions
  - First regress each financial indicator on current and lagged business cycle and inflation indicator
  - Use the standardized residuals to estimate the ANFCI

- Degree measured in standard deviations from mean
  - Positive value = "Tighter" than suggested by economic conditions
  - Negative value = "Looser" than suggested by economic conditions

Financial and Economic Conditions



Policy and Financial & Economic Conditions



Methodology

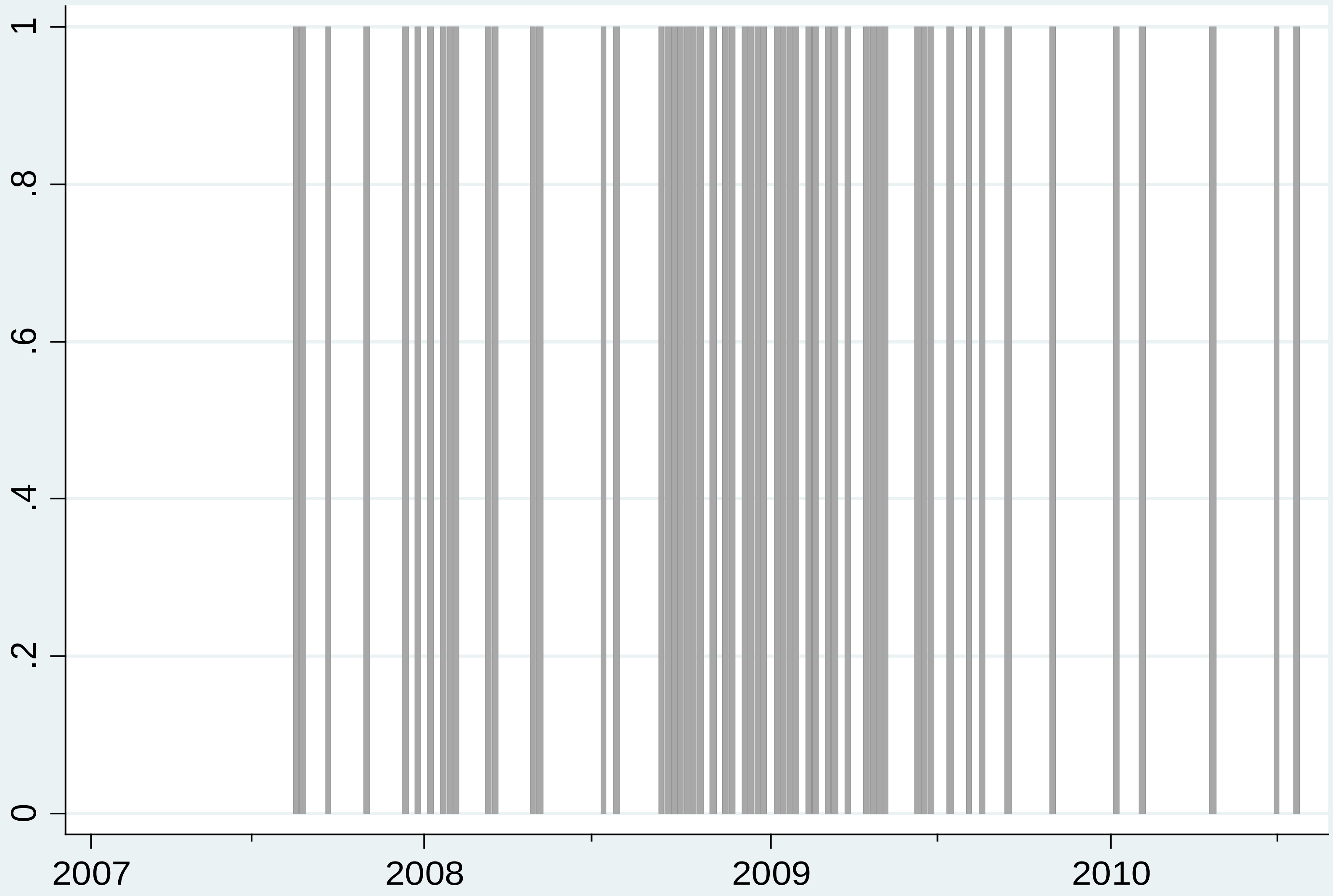
Estimate a two-equation system by Maximum Likelihood

$$I_t = g(AFCI_{t-1}, ADSBCI_{t-1}, AFCI_{t-1}*ADSBCI_{t-1}, I_{t-1}, \varepsilon_t)$$

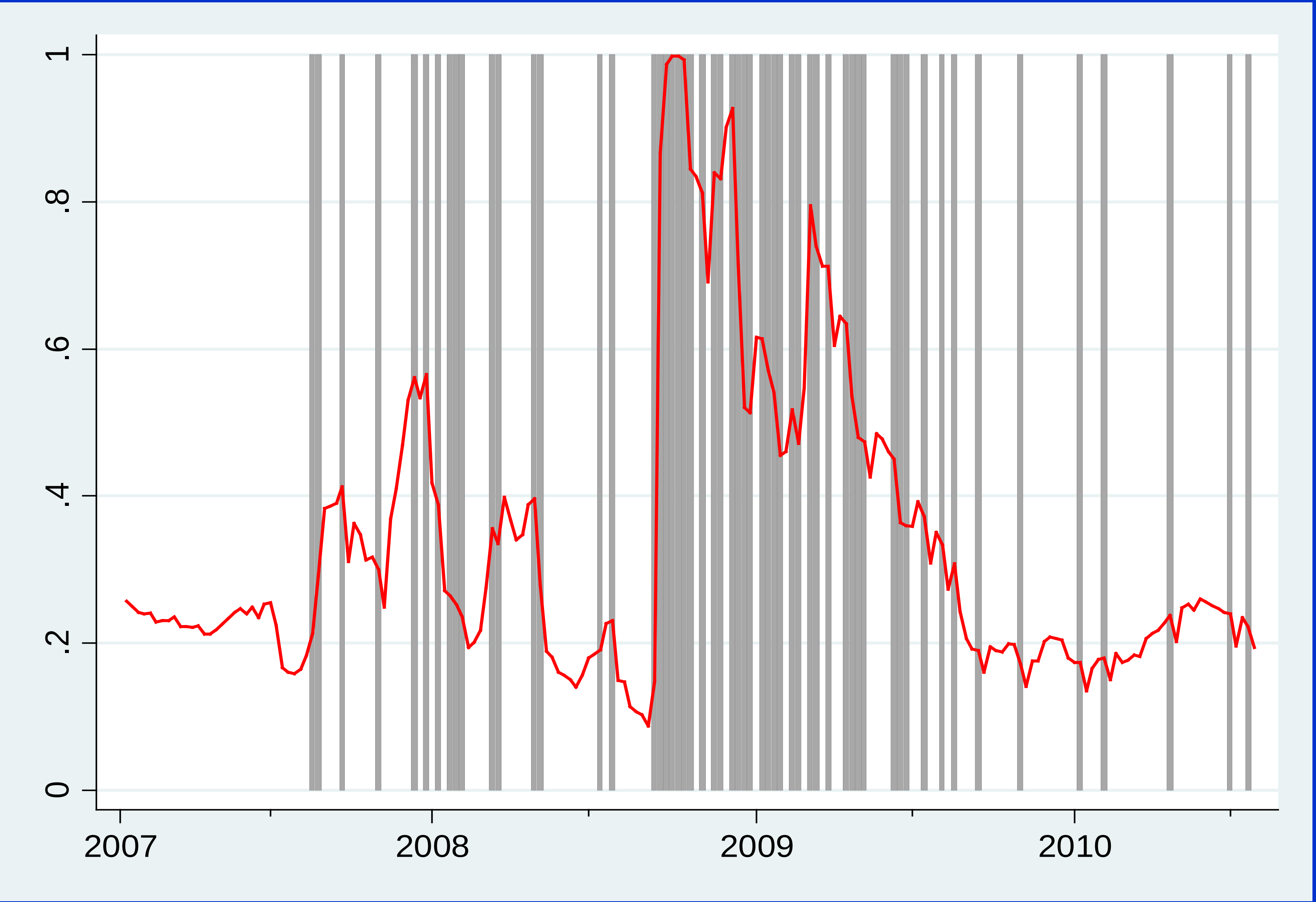
$$\Delta AFCI_t = f(I_t, \Delta AFCI_{t-k}, \Delta ADSBCI_{t-k+1}, \eta_t)$$

$$Cov(\varepsilon_t, \eta_t) = \lambda$$

Actual vs Predicted Probability of All Policy Actions



Actual vs Predicted Probability of All Policy Actions



Probability of Policy Action

The Fed was more likely to take policy action when financial conditions were tight and business conditions were weak

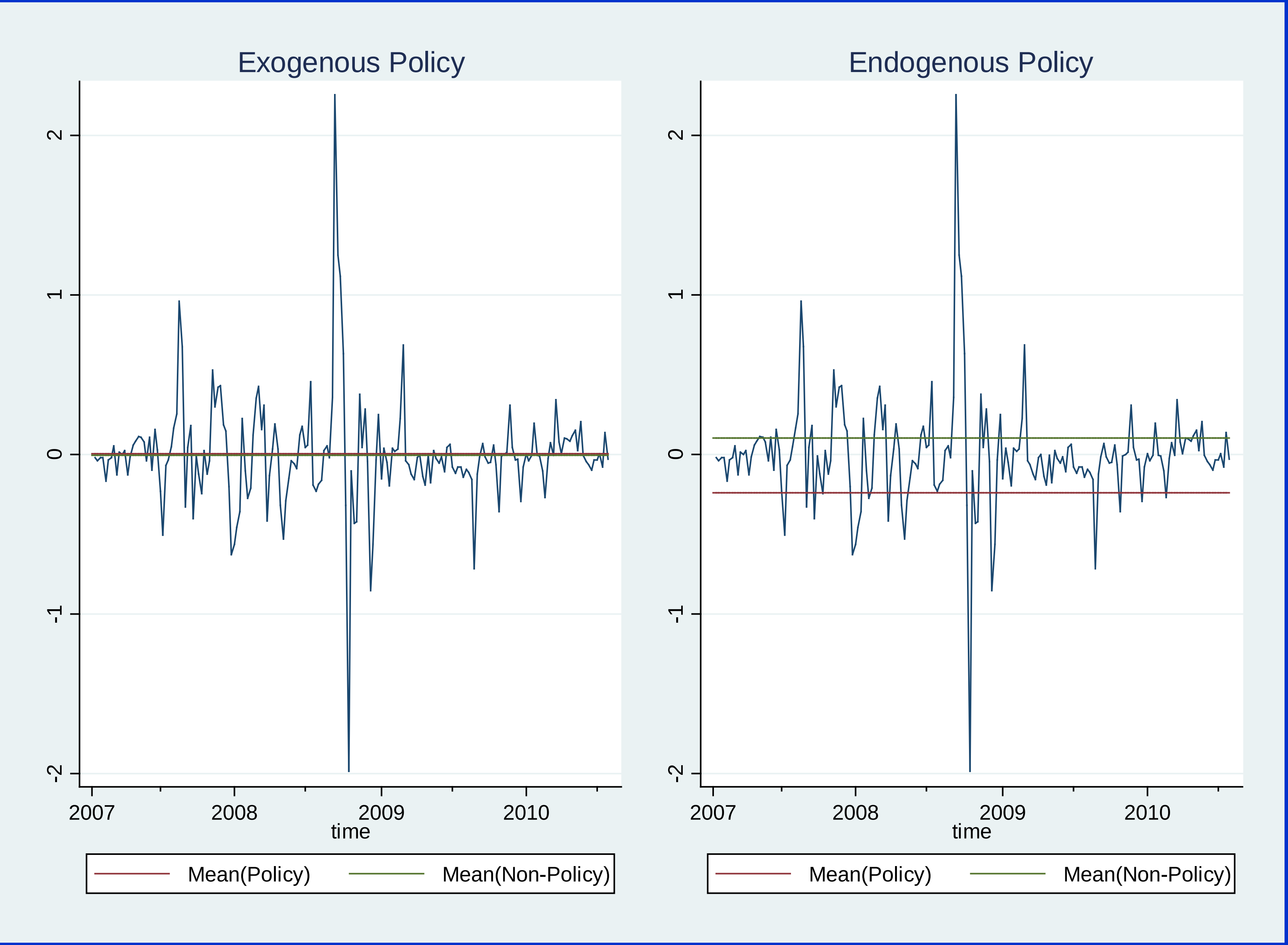
Assume normal business conditions, 1 std. dev. increase in ANFCI

⇒ **Probability (Action) increases by 10%**

Assume business conditions 1 std. dev. below average, 1 std. dev. increase in ANFCI

⇒ **Probability (Action) increases by 14%**

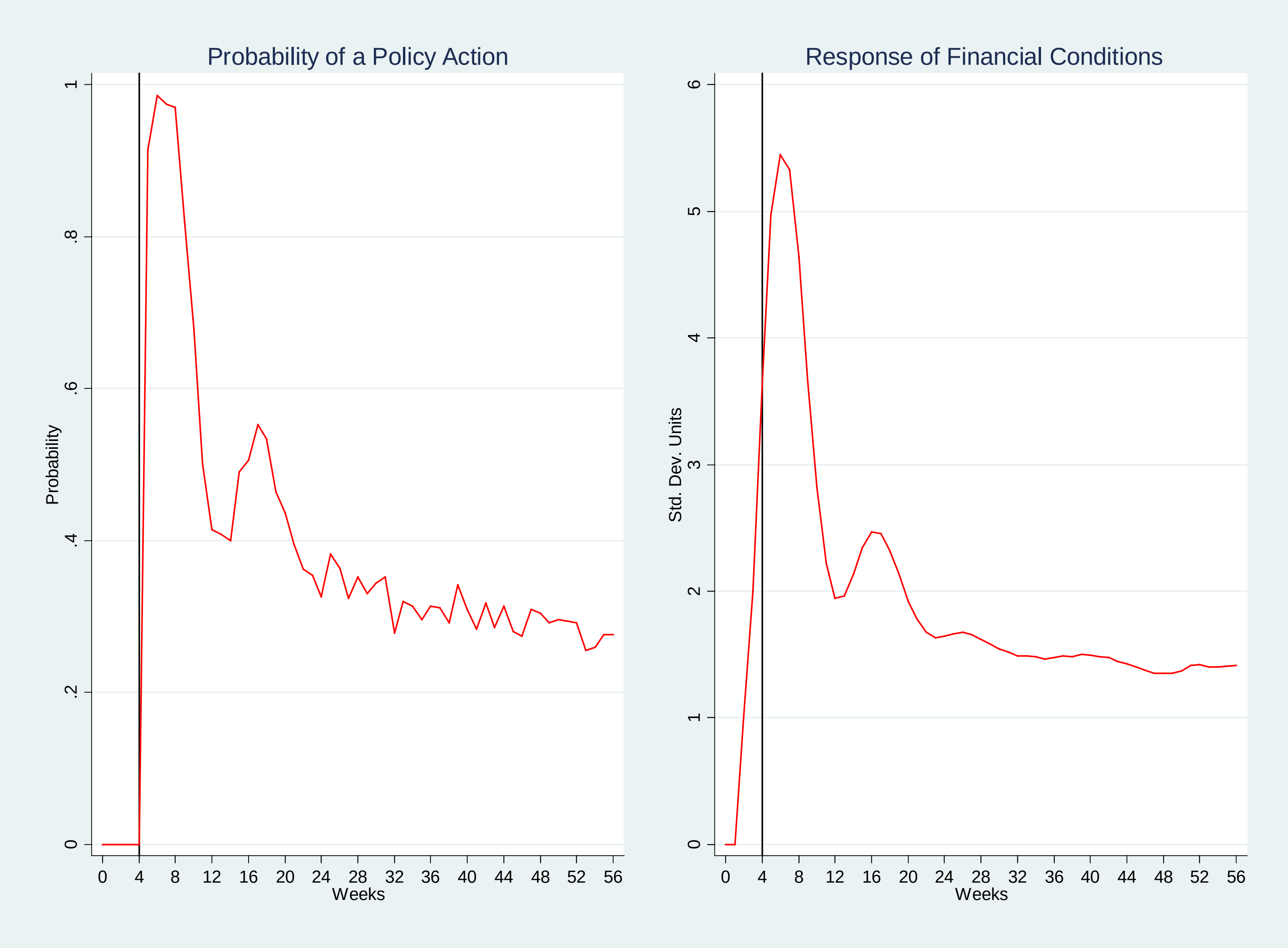
Average Policy Effects – All Events



Estimated Effects on Individual Measures

Financial Indicator	Average Effect
TED spread	-16 bps
3-month LIBOR-OIS spread	-14 bps
10 yr. – 3m Treasury spread	8 bps
1-month Nonfinancial A2P2/AA spread	-14 bps
Moody’s Baa/10-yr Treasury spread	-4 bps
Citigroup ABS/5-yr Treasury spread	-12 bps
MOVE	-3%
VIX	-1%

Model Simulations – All Events



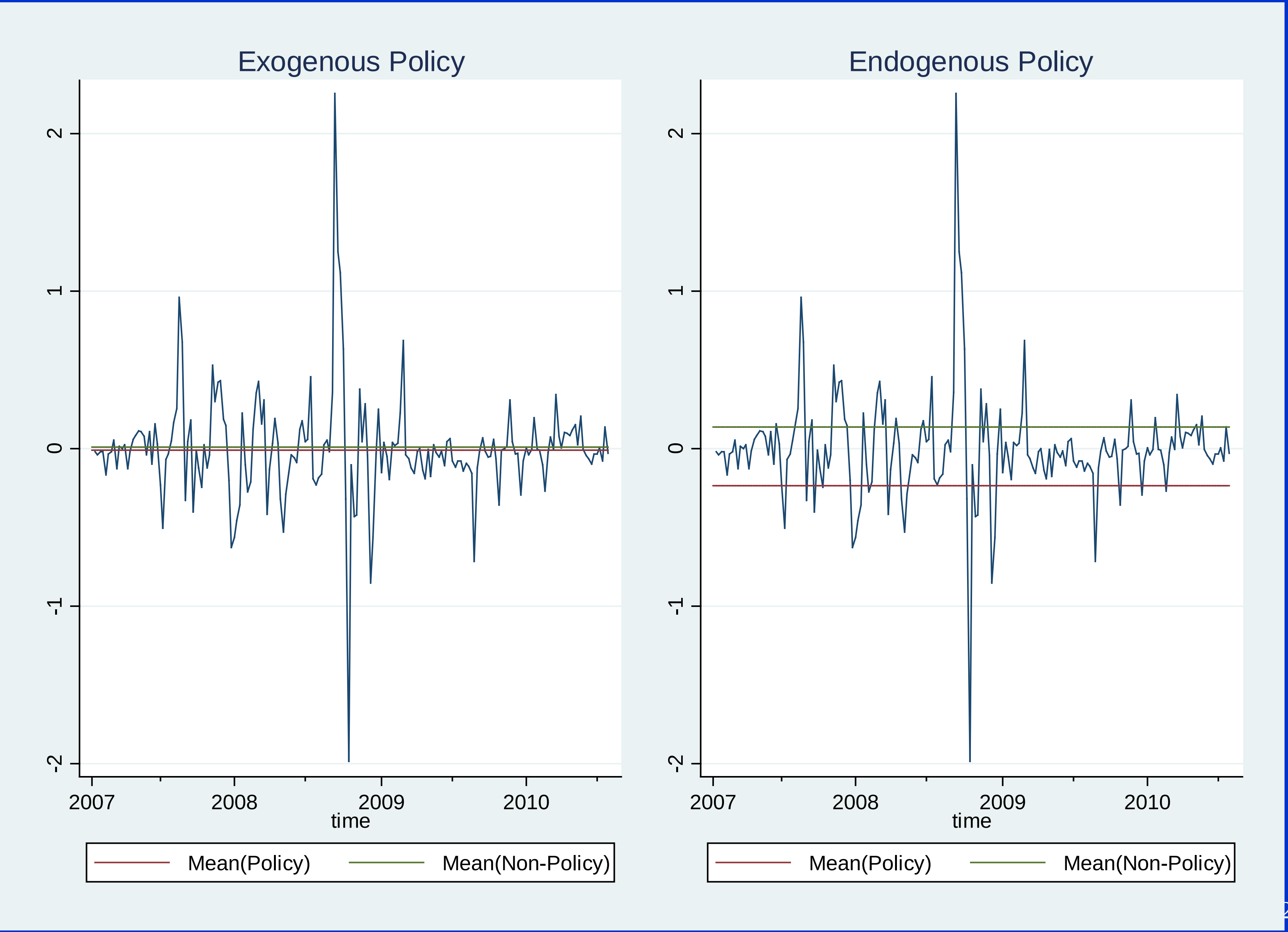
Summary

- During the crisis, the Fed was more likely to take policy action when financial and economic conditions deteriorated

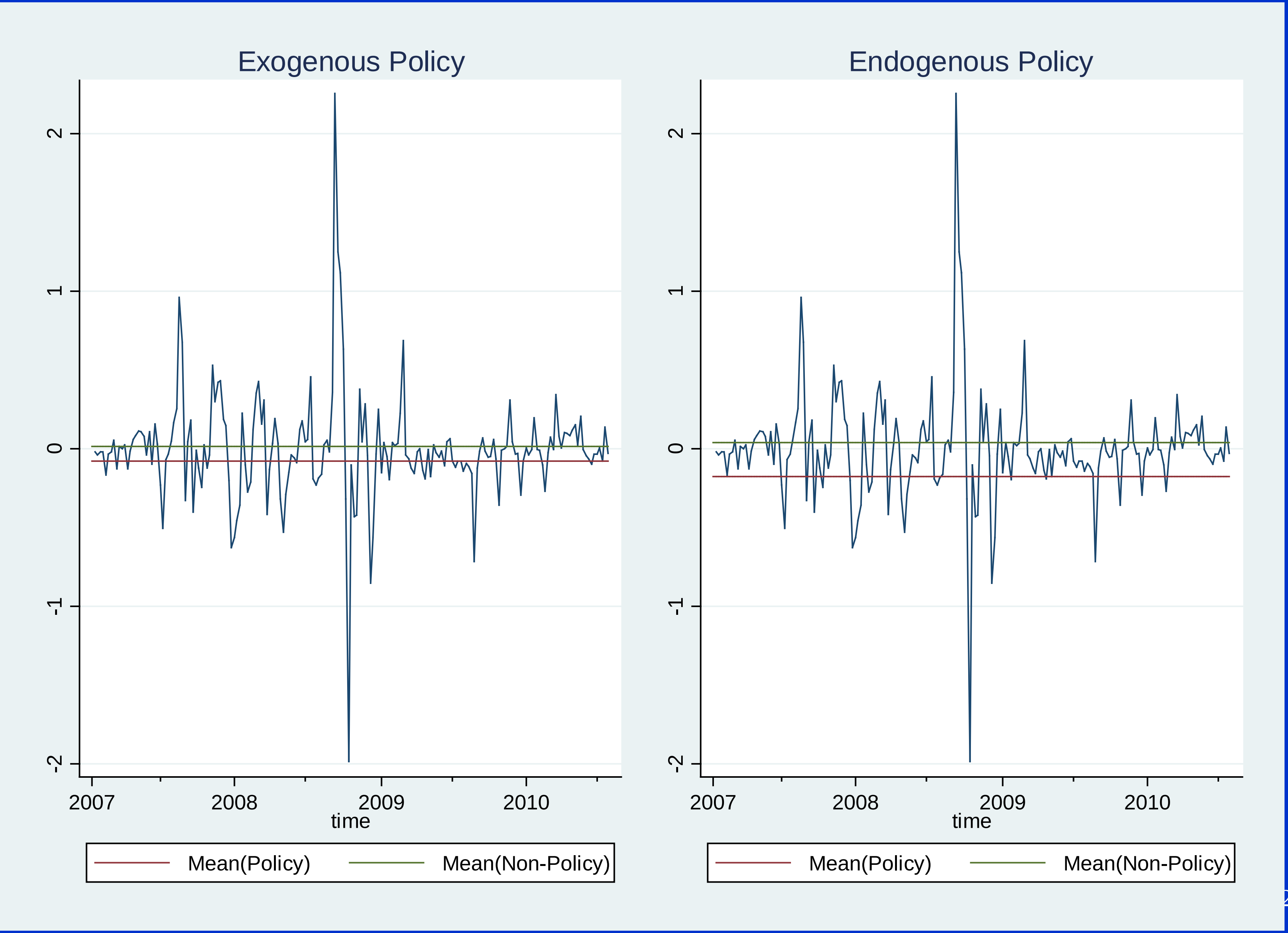
- In estimating the effects of policies, it is important to take the policy response function into account

- The policy actions were associated with significant improvements in financial markets
  - Dynamics of financial and business conditions during this period suggest that the improvements lasted beyond the announcement week

Average Policy Effects – Initiations

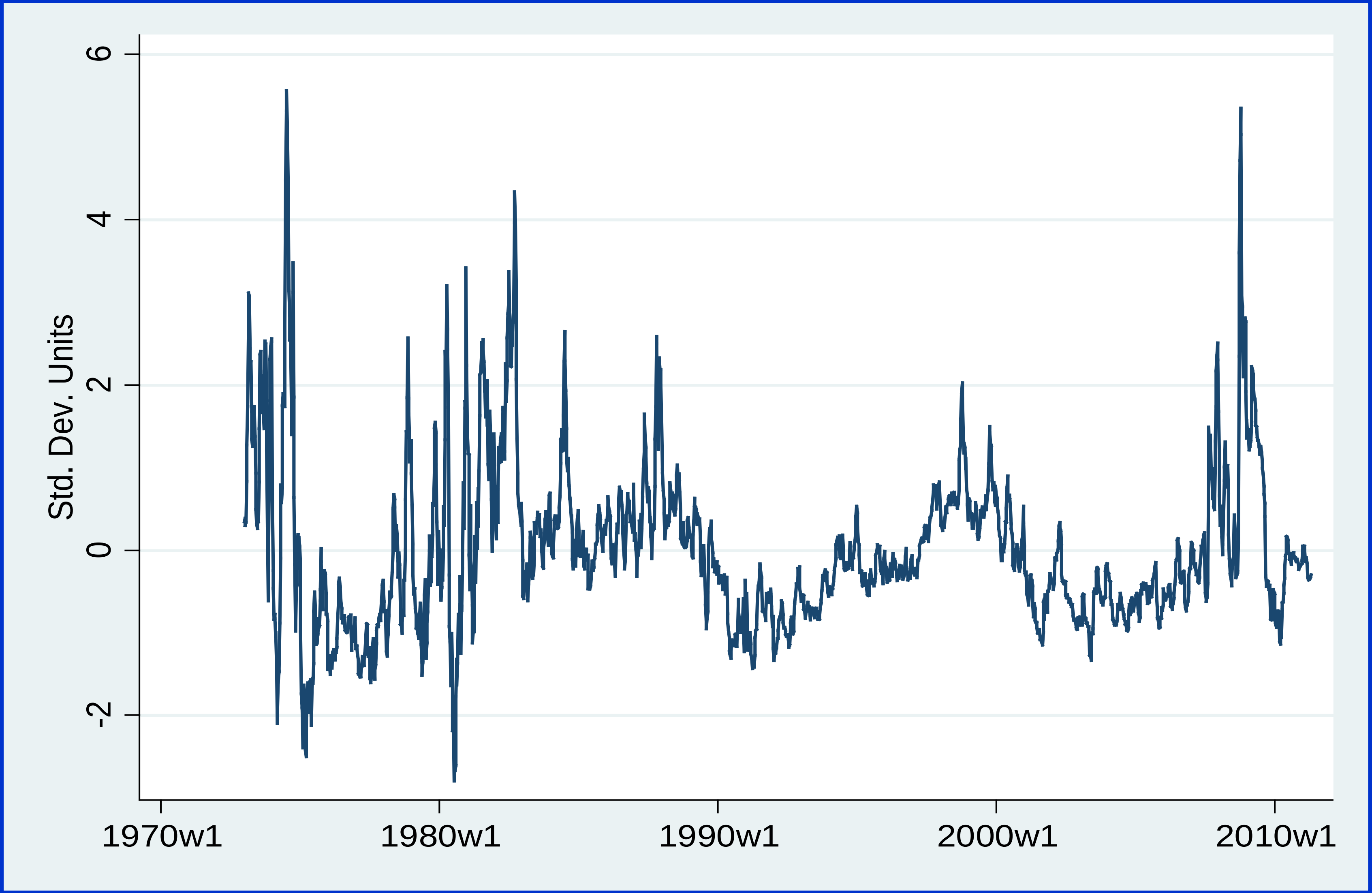


Average Policy Effects – Fed Only (All Events)



APPENDIX

Financial Conditions Indexes: ANFCI



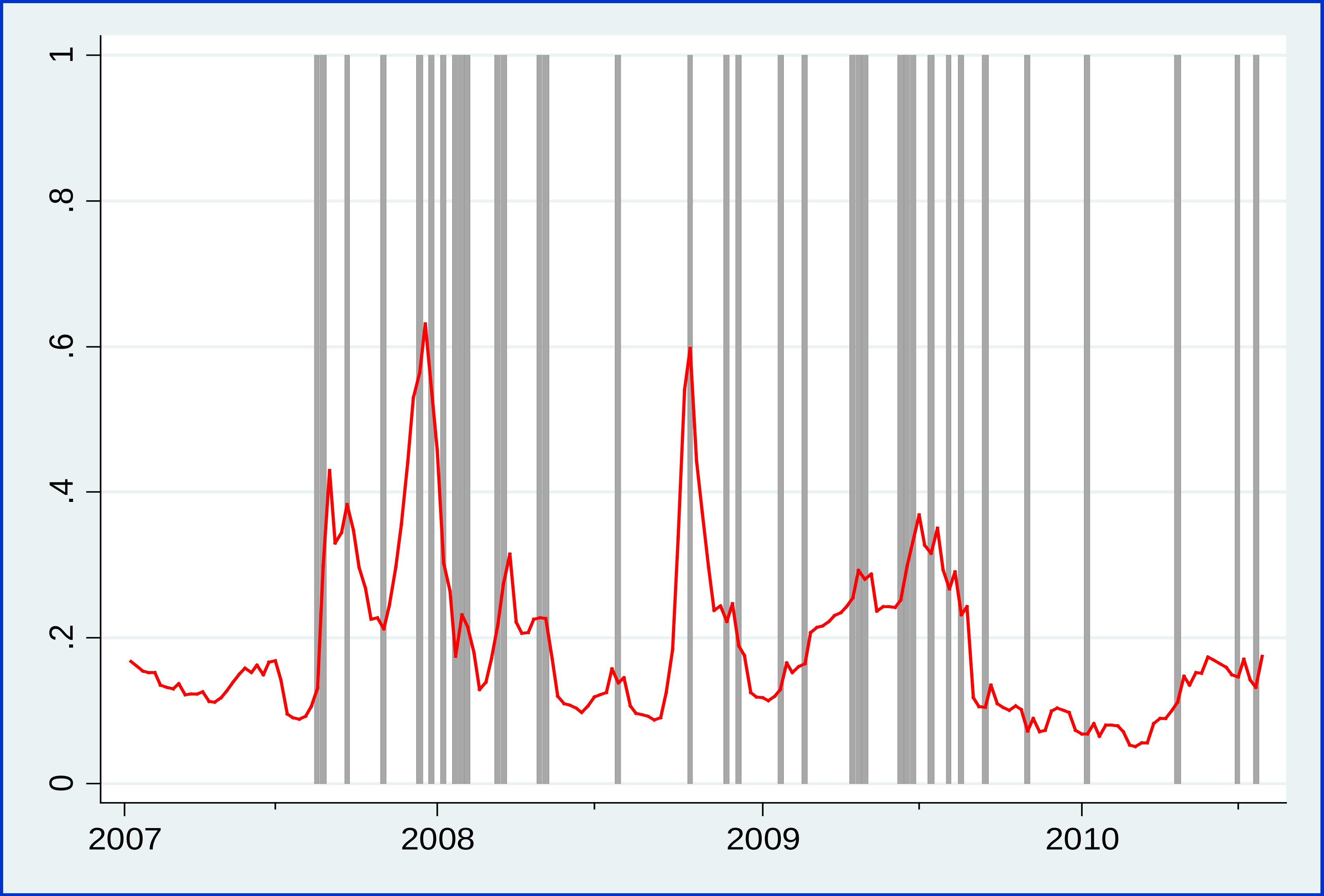
Definition of Policy Events

Alternative Models

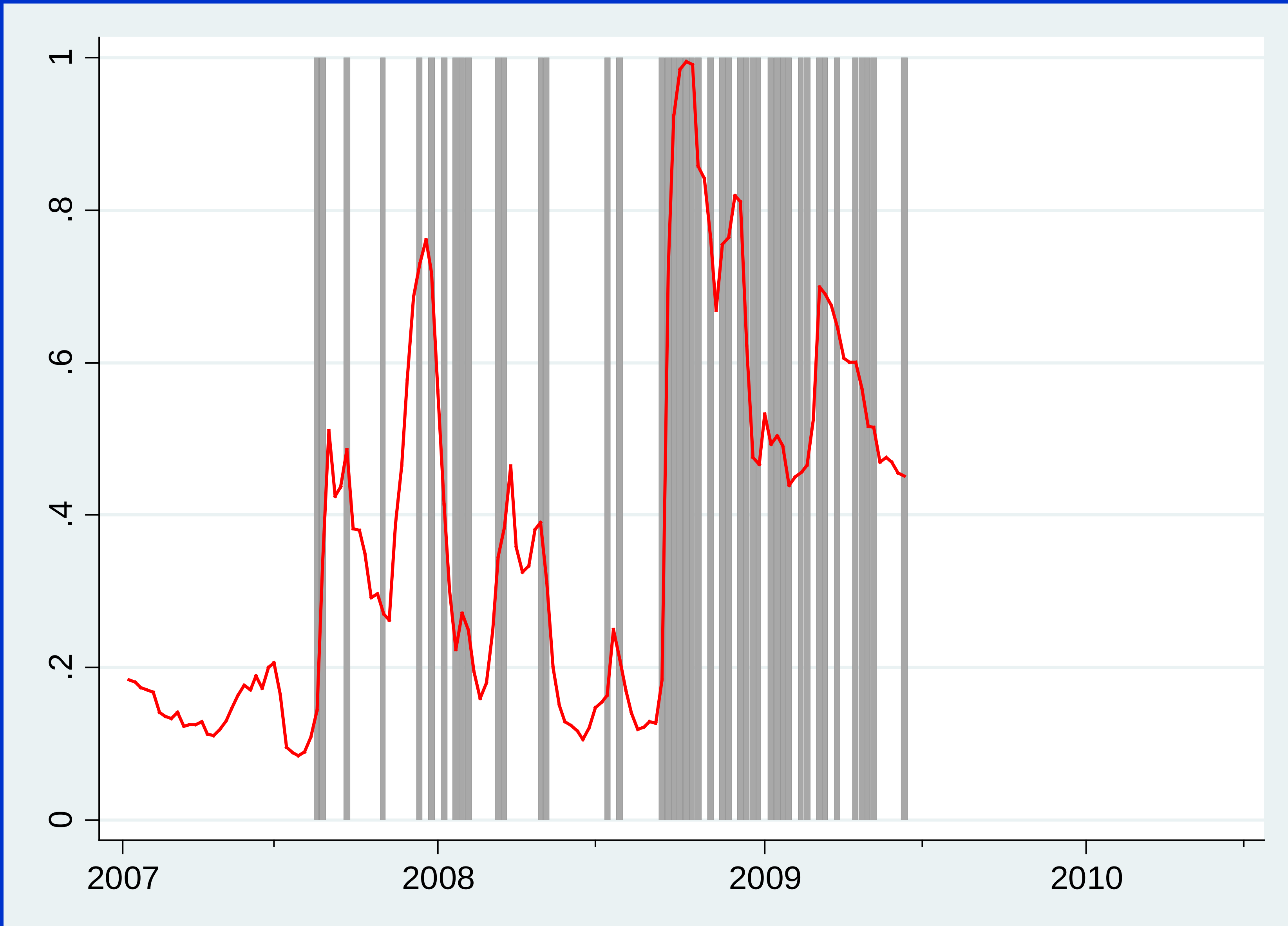
- initiations, expansions, and extensions
  - January 2007 – June 2009

- Fed only
  - excludes Fed actions during weeks with actions by multiple agencies

Predicted Probability of Fed Policy Actions Only



Predicted Probability of Program Introductions



Average Treatment Effects

Maximum Likelihood Estimates	All Policy Actions	FR-only
All Events	-0.35**	-0.24**
Number of Events	56	35
Expansions/Extensions	-0.39**	-0.33**
Number of Events	44	24
****p<0.05**		

Model Simulations – All Events