The macroeconomic effects of bank regulation: New evidence from a high-frequency approach

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Motivation

- Bank regulation
  - mitigates risk in the financial system
  - might constrain economic activity

  $\Rightarrow$ important tradeoff

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- Difficult to estimate the *macroeconomic* effects of bank regulation
  - changes are not random
  - tighter regulation follows crises, e.g. Dodd-Frank Act in 2010

This paper: high-frequency identification strategy

1. Market surprises in narrow windows around Fed speeches
    - Existing literature: speeches about monetary policy $\rightarrow$ surprises in yields
    - This paper: speeches about bank regulation $\rightarrow$ surprises in bank stock price index

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2. Elicit variation in market surprises that reflects **bank regulation news shocks**
   - Sign restriction approach: distinguish "regulation news" from "bank health news"
   - Intuition: tighter regulation lowers bank profitability AND bank risk

Preview of results

- News about tighter bank regulation
  - Lowers bank stock prices
  - Increases banks' distance to default (lowers bank risk premia)
  - Reduces bank loan supply
  - Increases unemployment
  - Mildly increases inflation
- Quantifying the tradeoff
  - 10 basis point (bp) decrease in CDS premium raises unemployment rate by 15 bp
  - 10 bp decrease corresponds to 16.67 bp lower annual probability of bank default

Contribution to the literature

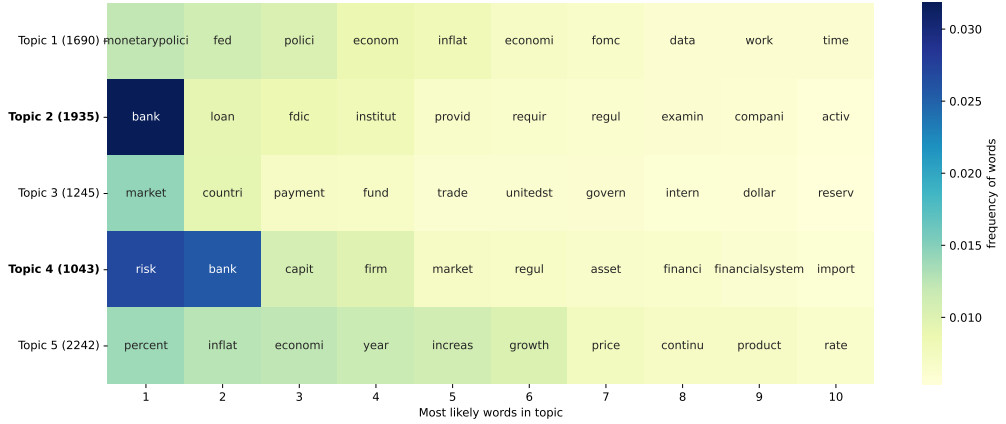
- Macro impact of bank regulation widely studied with structural models
  - E.g. Corbae and D'Erasmo (2021)
- Well-identified empirical estimates exist at the micro level
  - E.g. Jiménez, Ongena, Peydró, and Saurina (2017)
- Empirical macro-level estimates typically based on cross-country analyses
  - E.g. Jordà, Richter, Schularick, and Taylor (2021)
- We are the first to apply a high-frequency approach to the question
  - Contribution to the recent empirical macro literature: Nakamura and Steinsson (2018), Bauer and Swanson (2023), Känzig (2021), Hazell and Hobler (2024), Jayawickrema and Swanson (2023), ...
  - Ottonello and Song (2025) identify shocks to bank net worth using HF approach

Data and methodology

Construction of speech data base

- Download all speeches and testimony from St. Louis Fed's FRASER data base
- Includes speeches by FOMC members, other senior Fed staff & FDIC leadership
- Use algorithm of Hansen, McMahon, and Prat (2018) to find "topics"
- Select speeches in which main topic is bank related

Results of NLP-based speech classification



- Our NLP based classification of monetary policy speeches turns out to be very similar to Jayawickrema and Swanson (2023)

Bank stock price index

- Tick prices for 18 large US banks from Trade and Quote (TAQ) data base
  - Same data source as Ottonello and Song (2025)
- Largest: JP Morgan, Citi, Bank of America
- Smallest: Northern Trust, Bankboston, First Chicago, Ameriprise Financial
- Sample: 1998–2023
- Aggregate using market cap weights

Bank risk measure

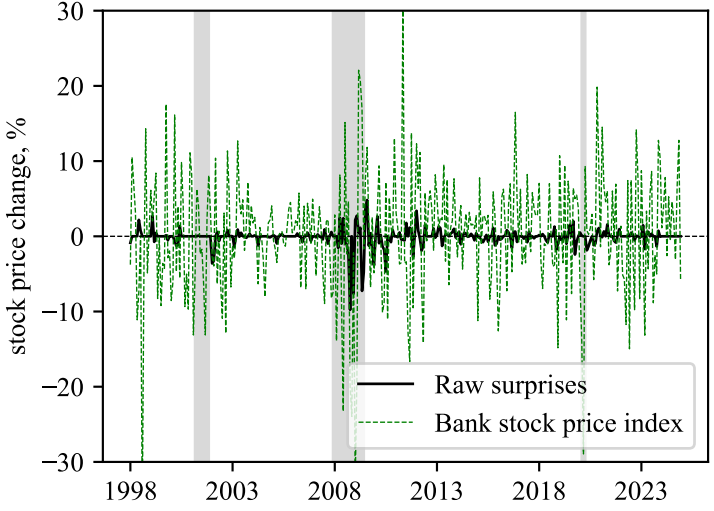
- For same 18 banks, construct *distance to default* following Merton's methodology
- Idea: interpret bank equity as contingent claim on underlying assets; measure the buffer against insolvency implied by market prices
- Data needed: equity prices, option-implied equity volatility, book value of liabilities
- Widely used, e.g. in Ottonello and Winberry (2020) for firms
- Alternative measure: bank CDS premia

Construction of high-frequency surprises

$$s_i = \log p_{t_i, h_i + \Delta_i} - \log p_{t_i, h_i} \tag{1}$$

- p: bank stock price index
- t_i: date of a bank-related Fed speech
- h_i: time stamp of speech - 15 minutes
- Δ_i: 2h for speeches, 3.5h for testimony (Jayawickrema and Swanson, 2023)

“Raw” market surprises



Identifying bank regulation news shocks

Identification challenge

- HF approach should exclude news other than those coming from a speech
- But Fed speeches probably reveal multiple types of information
  - News about bank regulation
  - News about health of banking system
  - ...
- Analogy in monetary policy literature: "Fed information effect" (Nakamura and Steinsson, 2018; Bauer and Swanson, 2023)

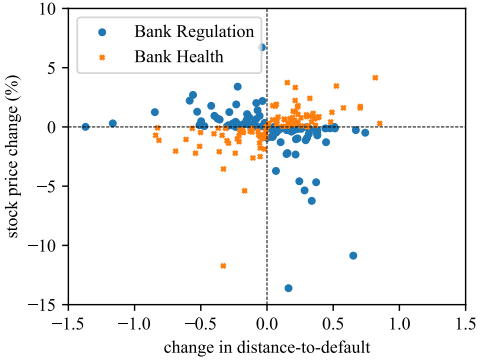
Refinement - sign restrictions

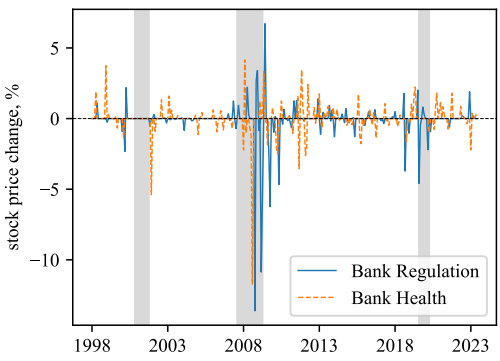
	Bank stock prices	Bank distance to default
Bank regulation news shock	$-$	$+$
Bank health news shock	$-$	$-$

- Idea is similar to Jarocinski and Karadi (2020) in monetary literature

Sign restriction-based shocks

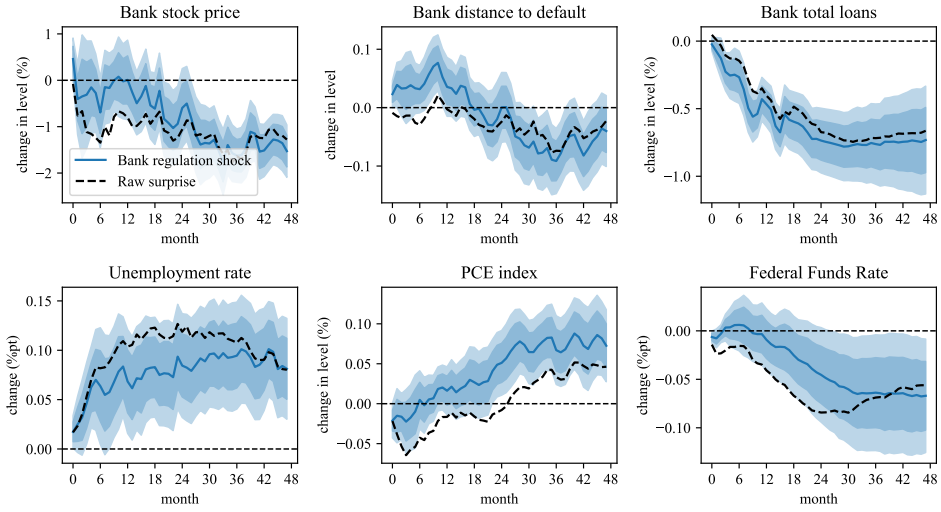
validation



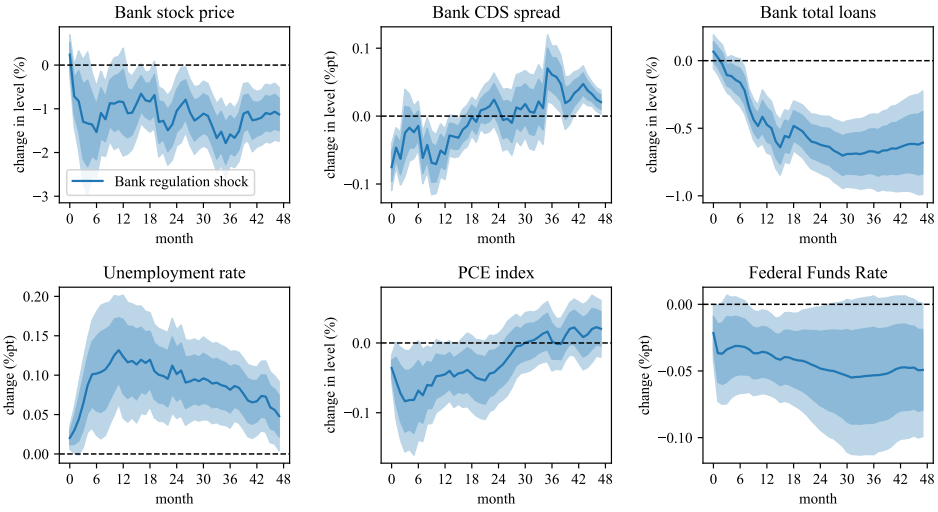


Main results

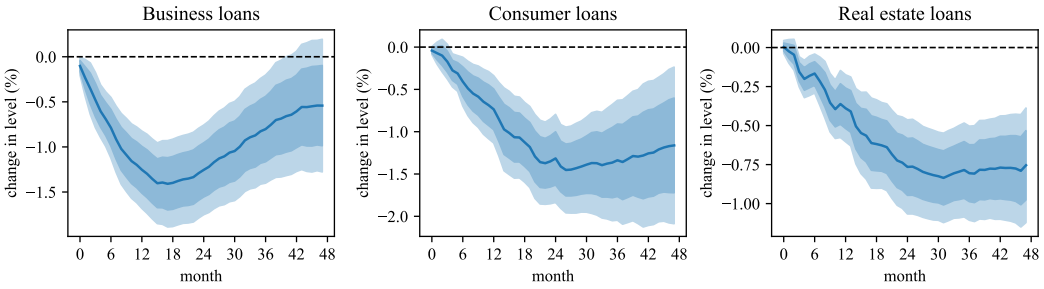
IRFs to tighter than expected bank regulation news



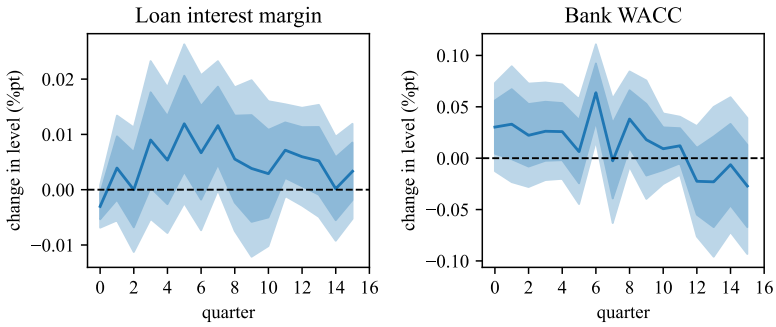
CDS premia instead of D2D



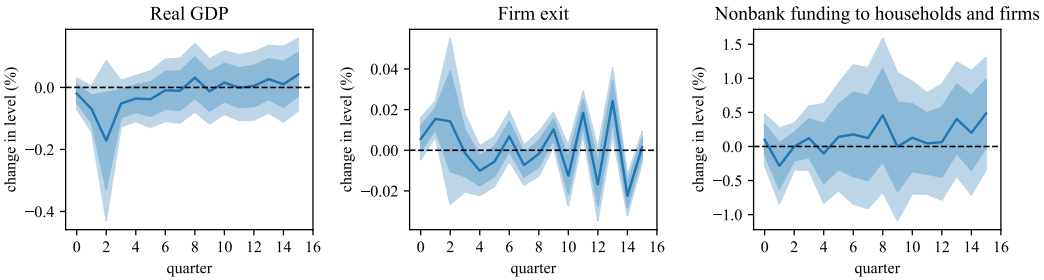
Results on the mechanism: loan types



Results on the mechanism: loan pricing and bank funding costs

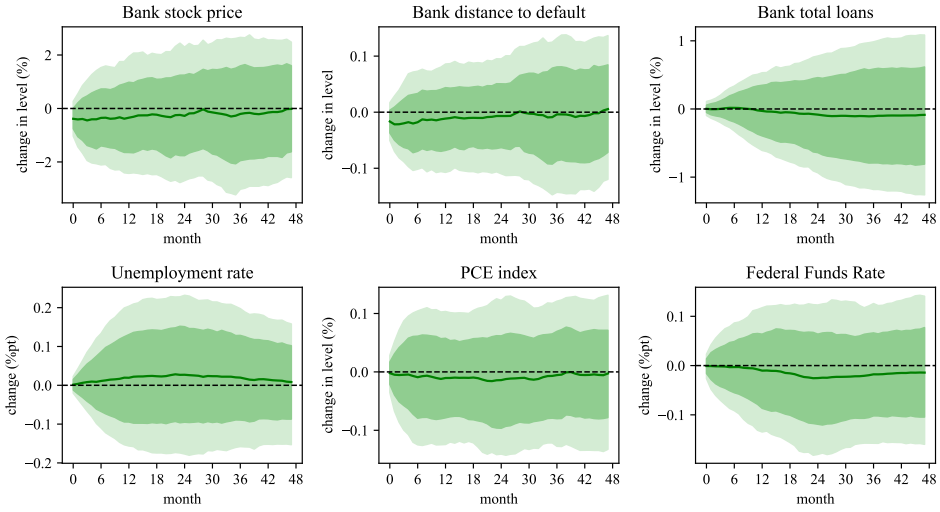


Results on the mechanism: GDP, firm exit, nonbank funding

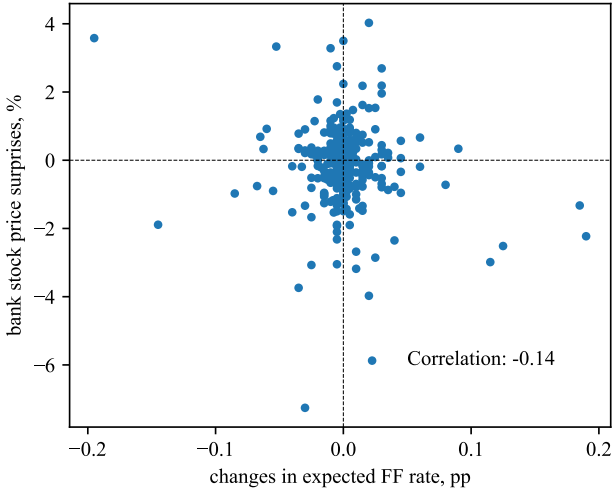


Validation results

Placebo test



Bank surprises vs. monetary policy surprises



Relation with macro shocks from the literature

Shock type	Correlation	p-value	Sample
Monetary (Bauer and Swanson, 2023)	0.095	0.218	1998M1-2023M8
Uncertainty (Bloom, 2009)	-0.001	0.987	1998M1-2023M8
Oil supply news (Känzig, 2021)	0.080	0.301	1998M1-2023M8
Fiscal (Ramey and Zubairy, 2018)	0.086	0.580	1998Q1-2015Q4

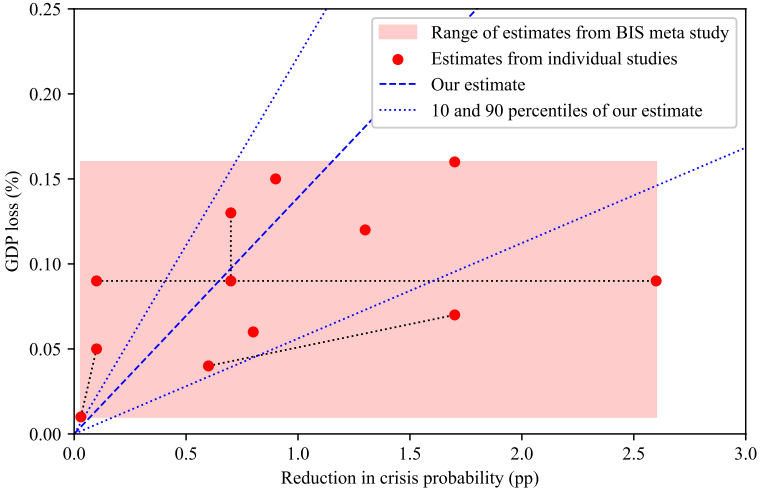
More results

- Speeches corresponding to large shocks
- Excluding the GFC
- Leave-one-out exercise
- Speeches about state of the economy
- Daily version from 1971
- IRFs for bank health news
- IRFs for individual banks

Quantifying the tradeoff

- 10 bp decrease in CDS premium raises unemployment rate by 15 bp
- 10 bp decrease corresponds to 16.67 bp lower annual probability of default
- The average annual probability of default is around 1.5% (std. dev. is 1.2 pp)
  - Excluding the GFC, average is 1.2% (std. dev. is 0.36 pp)

Magnitudes relative to the literature



Magnitudes relative to the literature - discussion

- Comparisons are very tricky
- Comparisons suggest we estimate sizable costs of regulation
- Our estimates capture short-run effects
- Stable financial sector supports growth in the long run, despite short-run costs (Mendicino, Nikolov, Suarez, and Supera, 2020)
- Our estimates can be useful to discipline short-run dynamics of structural models that can speak to longer-term economic effects

Conclusion

Conclusion

- Important to understand costs and benefits of bank regulation
- We use a high-frequency identification approach
- We study news about bank regulation revealed by Fed speeches
- While mitigating risk, news about bank regulation slows activity quite markedly

We make our estimated shock series available online!

Appendix

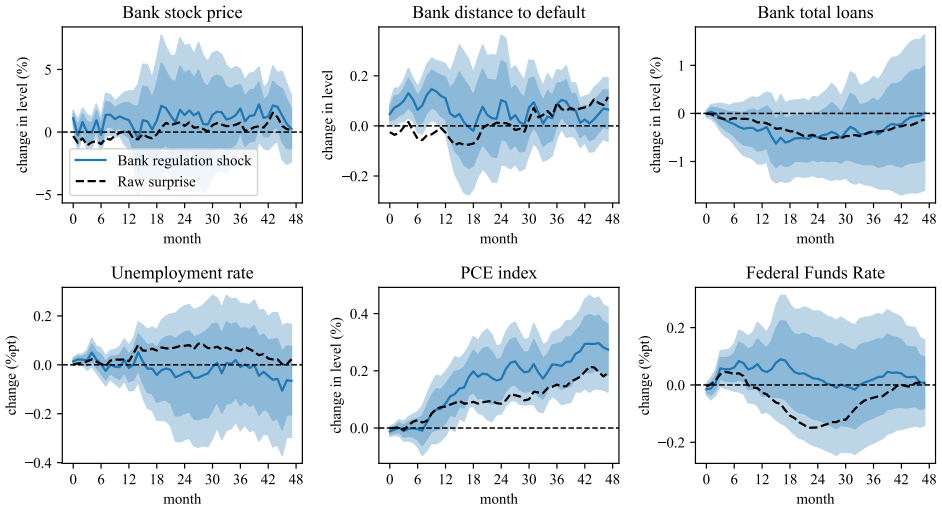
Large regulation news shocks

back

Rank	Date	Shock (%)	Speaker name	Speaker title (at time of speech)
1	3/24/2009	4.03	Ben Bernanke	Chairman of the Federal Reserve
2	3/18/2009	3.58	Roger T. Cole	Director, Banking Supervision and Regulation
3	6/19/2008	1.96	Donald L. Kohn	Vice Chair of the Federal Reserve
4	12/3/2009	-1.89	Ben Bernanke	Chairman of the Federal Reserve
5	10/14/2008	-1.89	Ben Bernanke	Chairman of the Federal Reserve
6	7/9/2019	1.54	Randal Quarles	Vice Chair for Supervision
7	7/10/2008	1.53	Ben Bernanke	Chairman of the Federal Reserve
8	3/23/2021	-1.26	Lael Brainard	Member of the Board of Governors
9	4/8/2010	1.24	Ben Bernanke	Chairman of the Federal Reserve
10	6/3/2010	-1.22	Ben Bernanke	Chairman of the Federal Reserve

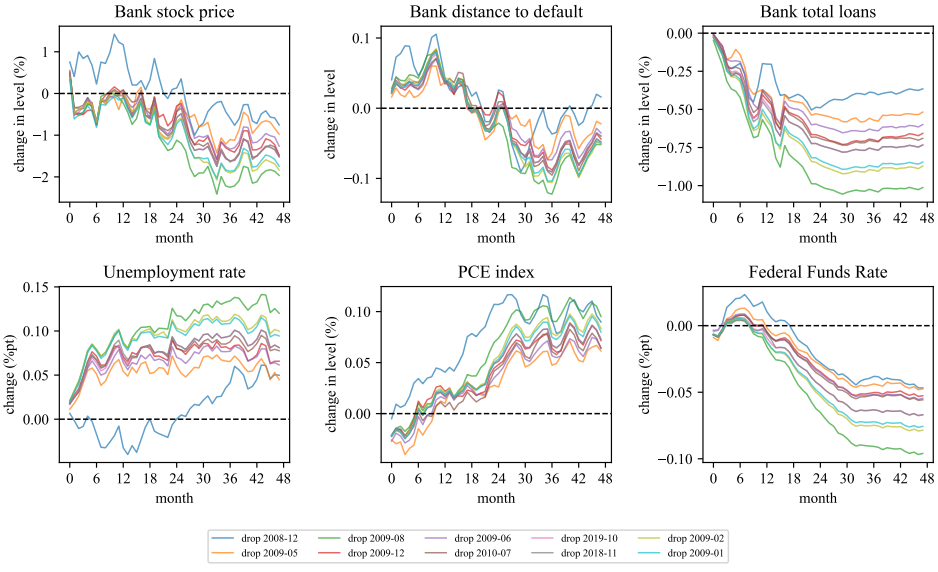
Excluding GFC

back



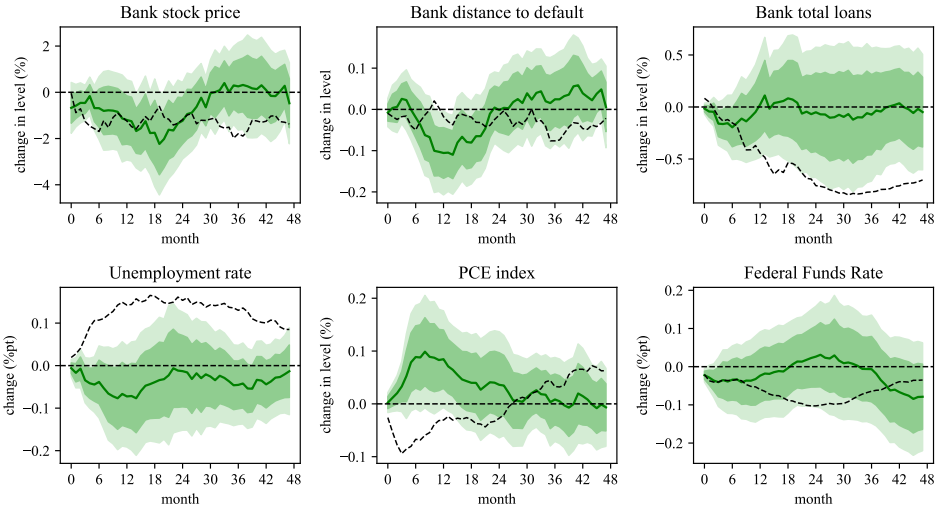
Leave-one-out exercise

back



Using speeches about state of the economy (topic 5)

back



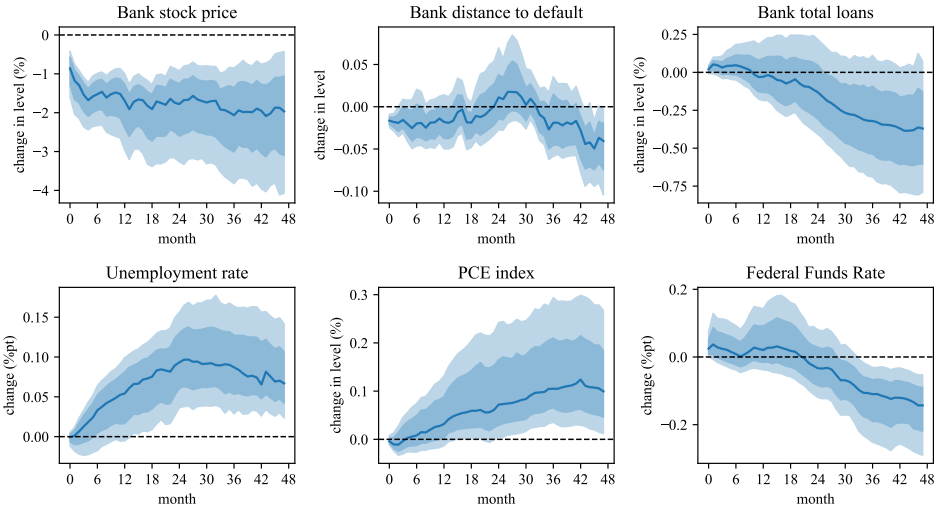
Daily version from 1971 - setup

back

- Tick data start in 1998, so sample for high-frequency analysis relatively short
  - Typical problem in the monetary policy literature
- Can use daily data (NASDAQ Bank Index) from 1971
- At daily frequency, high-frequency identification less credible
- We instead employ identification via heteroskedasticity (Rigobon and Sack, 2004)

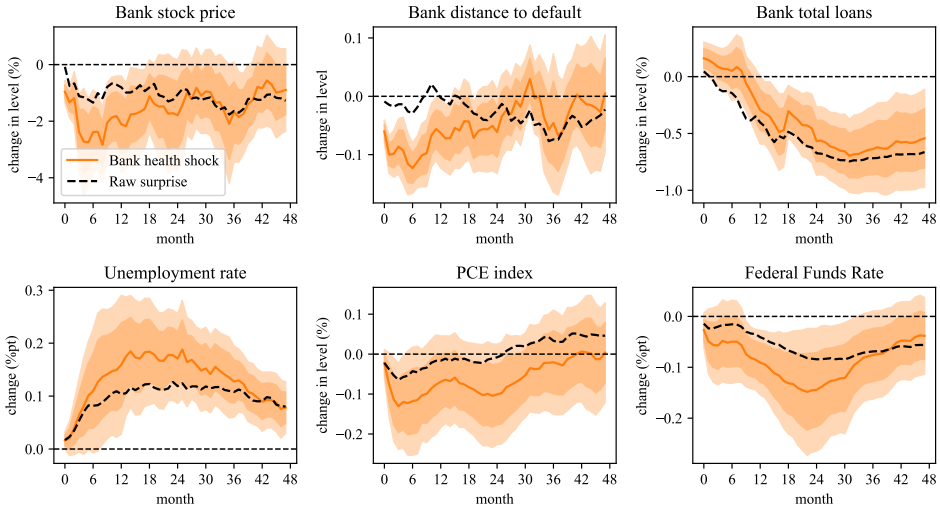
Daily version from 1971 - results

back



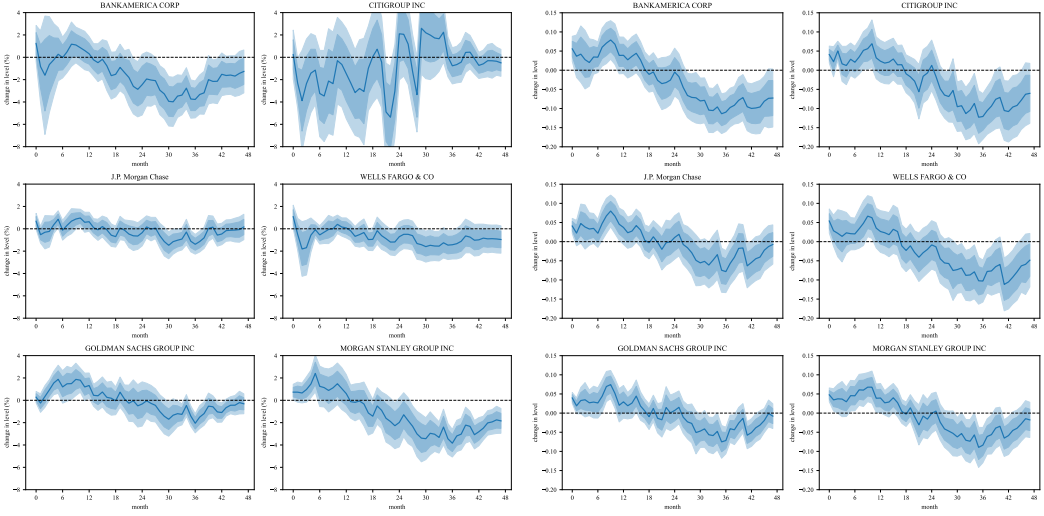
IRFs to bank health shocks

back



Responses of individual banks - stock prices (left) and D2D (right)

back



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