

# The Macroeconomic Effects of the Federal Reserve's Conventional and Unconventional Monetary Policies

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# Motivation

- During and after the Great Recession, the Fed and other central banks conducted unconventional monetary policy on a large scale
- Extensive evidence that forward guidance, LSAPs had significant financial market effects (Swanson, 2021)
- But there is very little evidence on the macroeconomic effects of these policies
- Main problem: there are only about 8 FOMC announcements per year, interest rate changes around FOMC announcements are typically small (2–3bp)

# This Paper

- Measures monetary policy innovations using high-frequency interest rate changes around:
  - FOMC announcements
  - post-FOMC press conferences
  - FOMC meeting minutes releases
  - speeches, testimony by Fed Chair
  - speeches, testimony by Fed Vice Chair
- Decomposes these innovations into news about:
  - federal funds rate
  - forward guidance
  - large-scale asset purchases (LSAPs)
- Uses these components as external instruments in a monetary policy VAR to estimate effects of federal funds rate, forward guidance, and LSAPs on macroeconomic variables

## Related Literature

### Swanson (2021 JME)

- decomposes HF interest rate changes around FOMC announcements into federal funds rate, forward guidance, and LSAP components
- finds unconventional policies about equally effective as fed funds rate

### Swanson and Jayawickrema (2023 WP)

- measure HF interest rate changes around FOMC announcements, press conferences, minutes, Chair speeches, Vice Chair speeches
- decompose them into federal funds rate, forward guidance, and LSAP components

### Bauer-Swanson (2023 NBERMA)

- use SJ data to estimate effects of “monetary policy shock” in SVARs, LPs
- monetary policy shock is a hybrid of fed funds rate, forward guidance

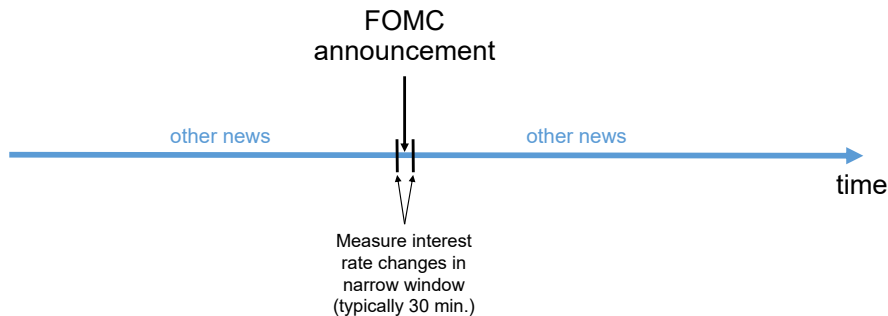
### Miranda-Agrippino and Ricco (2023 JME)

- use Swanson (2021) data to estimate effects of fed funds rate, forward guidance, LSAPs in a VAR
- weak instruments, robustness problems for unconventional policies

## Preview of Results

- Federal funds rate, forward guidance, and LSAPs all had significant effects on macro variables
- Federal funds rate effects are the largest and most robust — suggests that short-term interest rates should continue to be central banks' primary monetary policy tool going forward
- FOMC announcements alone are a weak instrument, especially for forward guidance and LSAPs
- There is a significant Bauer-Swanson (2023) “Fed Response to News” effect/bias in the data for all three monetary policy tools — important to correct for this bias in IRF estimates from VARs

# High-Frequency Monetary Policy Surprises



High-frequency monetary policy surprises are an important tool for estimating effects of monetary policy on asset prices and macroeconomic variables:

- asset prices: high-frequency OLS regressions
- macro variables: monetary policy surprises used as external instrument in structural VAR or LP

# Problems with Monetary Policy Surprises

- Surprises around FOMC announcements have become much smaller over time, are typically only 2–3bp
- Fed has become more transparent, tends to communicate decisions before FOMC meeting
- This trend accelerated after 2008, due to ZLB
- Many authors focus on changes in futures rates a few months or quarters ahead to better capture changes in overall stance of monetary policy around FOMC announcements  
Gürkaynak, Sack, Swanson (2005), Gertler-Karadi (2015), Nakamura-Steinsson (2018), Miranda-Agrippino-Ricco (2021), Swanson (2021), Bauer-Swanson (2023a,b)

# Five Types of Monetary Policy Announcements

From 1988 to 2019, Swanson and Jayawickrema collect all:

- **FOMC Announcements** (323 total)  
8 scheduled meetings per year, plus unscheduled intermeeting changes
- **Post-FOMC Press Conferences** (40 total)  
4 per year from 2011–18, 8 per year beginning in 2019
- **FOMC Meeting Minutes Releases** (184 total)  
8 per year from 1997–2019
- **Speeches and Congressional Testimony by Fed Chair** (847 total, not including press conferences)
- **Speeches and Congressional Testimony by Fed Vice Chair** (310 total)



# Forward Guidance and LSAPs

For this expanded set of monetary policy announcements, define forward guidance component as in Gürkaynak, Sack, Swanson (2005), using principal components:

$$\underbrace{X^{FOMC}}_{T \times N} = \underbrace{F}_{T \times 2} \underbrace{\Lambda}_{2 \times N} + \underbrace{\varepsilon}_{T \times N}$$

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Define LSAP component of each announcement as in Rogers, Scotti, Wright (2018) and Gilchrist, Yue, Zakrajsek (2019):

- before 2009: 0
- after 2009: change in the 10-year Treasury yield, orthogonalized with respect to changes in the federal funds rate and forward guidance

# VAR Specification

Reduced-form VAR:

$$Y_t = \alpha + B(L)Y_{t-1} + u_t$$

$Y_t$  includes:

- log Industrial Production
- log CPI
- log Commodity Price index
- Gilchrist-Zakrajsek (2012) credit spread
- Wu-Xia (2016) shadow federal funds rate
- 2-year Treasury yield
- 10-year Treasury yield

12 monthly lags, estimated from 1973:1–2020:2

# Structural Shocks in the VAR

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There are potentially many structural shocks in  $\varepsilon_t$ . Define first three elements of  $\varepsilon_t$  to be:

- federal funds rate shock:  $\varepsilon_t^{ff}$
- forward guidance shock:  $\varepsilon_t^{fg}$
- LSAP shock:  $\varepsilon_t^{lsap}$

# High-Frequency Identification of Structural Shocks

For each monetary policy tool  $i \in \{ff, fg, lsap\}$ , define monthly instrument  $z_t^i$  to be the sum each month of all the high-frequency innovations in policy tool  $i$

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Caveat: Fed Information Effect and Fed Response to News bias, discussed below, violate exogeneity

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Identify impact effect of  $\varepsilon_t^i$  on  $u_t$  by regressing  $u_t$  on  $u_t^i$  by 2SLS using  $z_t^i$  as an external instrument (sample 1988:1–2019:12):

$$u_t = \gamma + s_i u_t^i + \eta_t$$

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First-stage  $F$ -statistic for  $Y_t^i$  on instrument  $z_t^i$  measures instrument strength

# Predictability of Monetary Policy Surprises

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Several recent papers find evidence against this hypothesis:

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Miranda-Agrippino and Ricco (2021 AEJM), Karnaukh and Volkata (2022 JFE), Bauer and Swanson (2023 AER, NBERMA),  
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Bauer and Swanson (2023 AER, NBERMA): financial markets seem to have underestimated how aggressively the Fed would respond to incoming data (see also Cieslak, 2018, Schmeling et al, 2022)

# Correcting for Fed Response to News Bias

Orthogonalize the instruments  $z_t^i$  with respect to economic, financial data released in the weeks leading up to the announcements

$$z_t^i = \delta + \psi' X_{t-} + z_t^{i\perp}$$

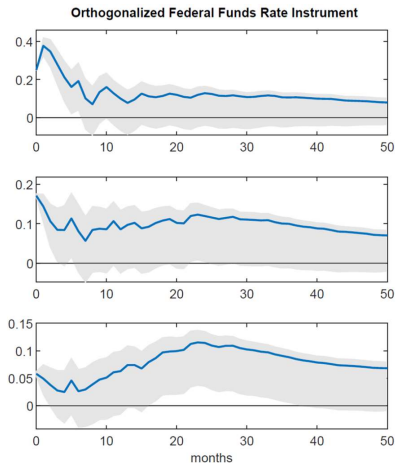
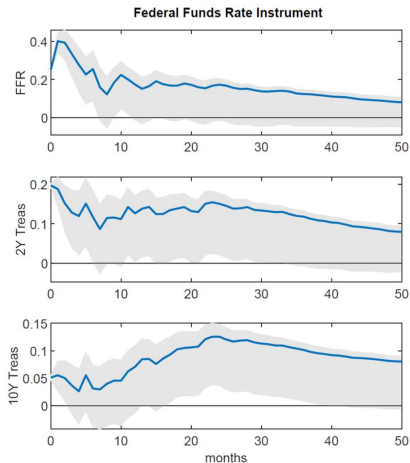
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Instrument  $z_t^{i\perp}$  should still be relevant, but now orthogonalized with respect to  $X_{t-}$ , more exogenous

# Response to Federal Funds Rate





Background  
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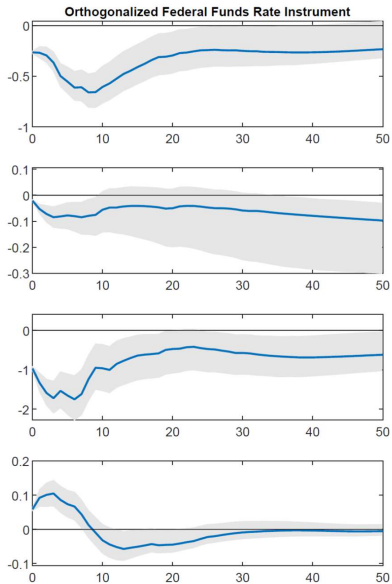
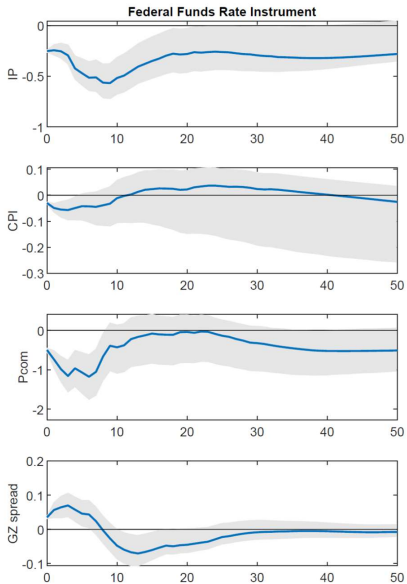
HF MP Surprises  
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Structural VAR  
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Results  
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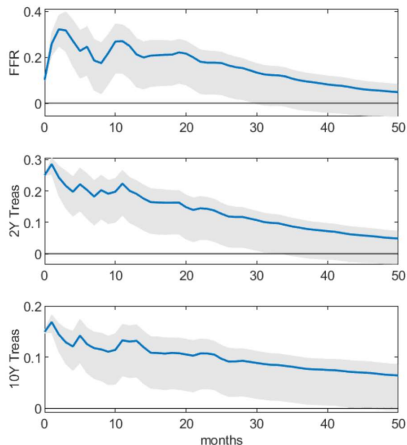
Conclusions  
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# Response to Federal Funds Rate (cont.)

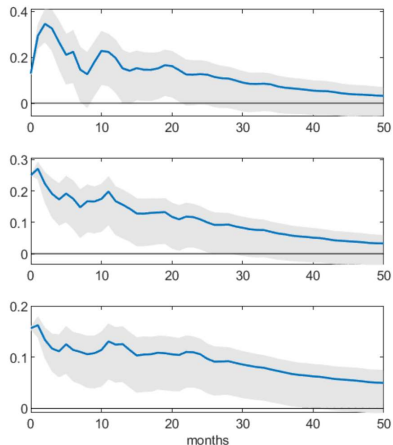


# Response to Forward Guidance

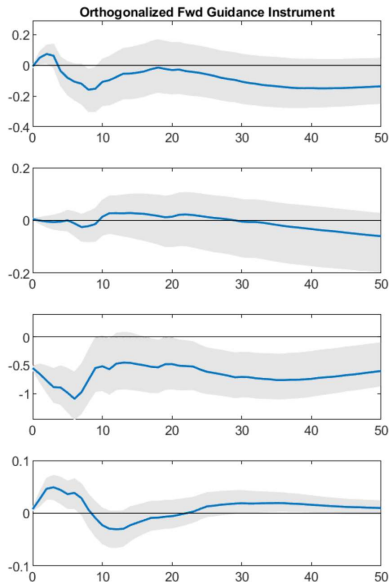
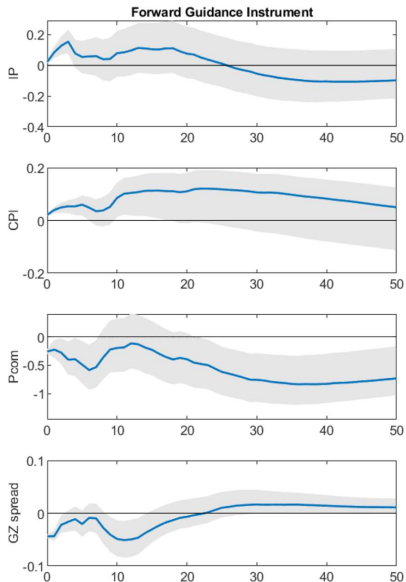
Forward Guidance Instrument



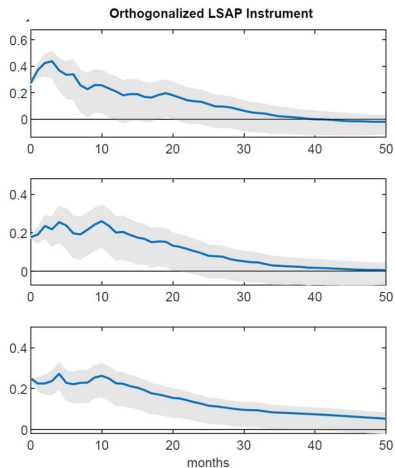
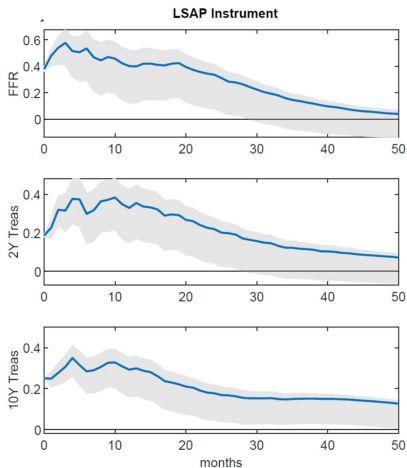
Orthogonalized Fwd Guidance Instrument



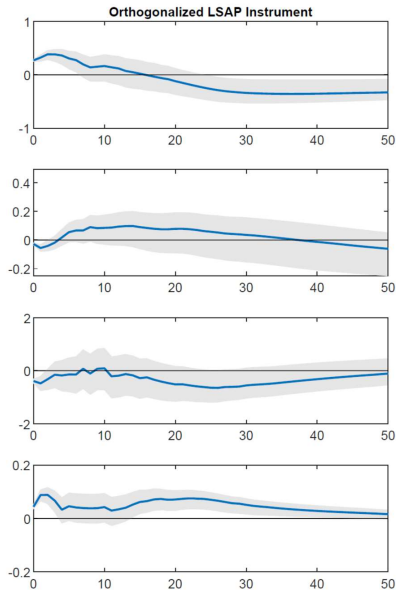
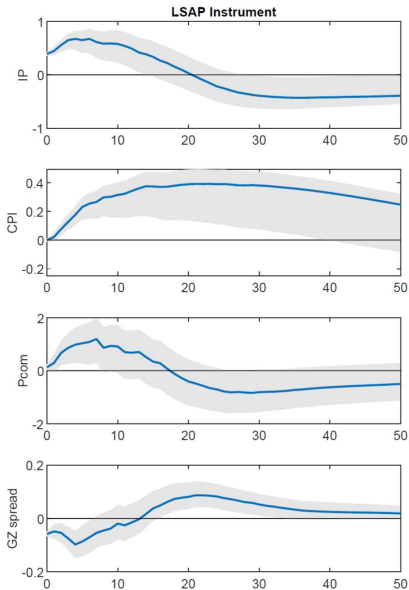
# Response to Forward Guidance (cont.)



# Response to LSAPs



# Response to LSAPs (cont.)



# Conclusions

- Federal funds rate, forward guidance, and LSAPs all had significant effects on macro variables
- Federal funds rate effects are the largest and most robust
  - suggests that short-term interest rates should continue to be the primary monetary policy tool going forward
  - contrasts with Swanson (2021), who found all three policies were about equally effective at moving financial markets
- FOMC announcements alone are a weak instrument, especially for forward guidance and LSAPs
- There is a significant Bauer-Swanson (2023) “Fed Response to News” effect/bias in the data for all three monetary policy tools
  - important to correct for this bias in IRF estimates