

A Reassessment of Monetary Policy Surprises and High-Frequency Identification

Michael D. Bauer
Universität Hamburg

Eric T. Swanson
University of California, Irvine

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High-Frequency Monetary Policy Surprises

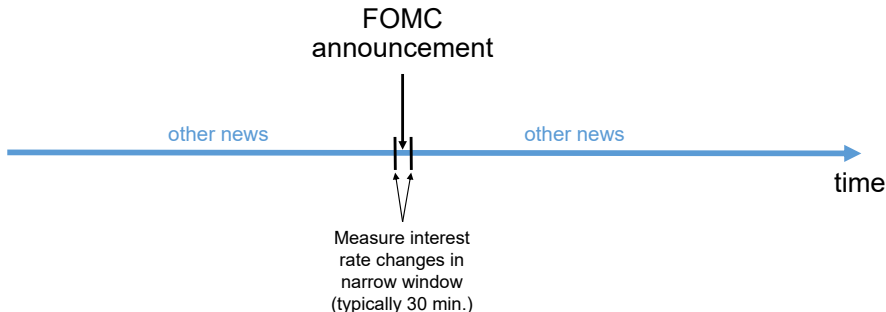
High-frequency monetary policy surprises are an important tool for estimating effects of monetary policy on asset prices and macroeconomic variables:

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

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High-Frequency Monetary Policy Surprises

However, there are two growing concerns:

- **exogeneity:** monetary policy surprises are *predictable* with macroeconomic and financial data that *pre-dates* the FOMC announcement:
 - Cieslak (2018), Miranda-Agrippino (2017), Miranda-Agrippino-Ricco (2021), Karnaukh (2020), Sastry (2021), Bauer-Swanson (2021), Bauer-Chernov (2021)

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- **relevance:** monetary policy surprises are a small fraction of interest rate changes each month
 - Ramey (2016), Bauer-Swanson (2021)

Monetary Policy Surprises Are Predictable

Predictive Regressions $mps_t = \alpha + \beta' X_{t-} + \varepsilon_t$

Nonfarm payrolls surp.	0.094** (2.442)
Empl. growth (12m)	0.005** (2.108)
$\Delta \log$ S&P 500 (3m)	0.084 (1.433)
Δ Slope (3m)	-0.010 (-1.406)
$\Delta \log$ Comm. price (3m)	0.120** (2.392)
Treasury skewness	0.032*** (3.006)
R^2	0.161
Sample	1988:1–2019:12
N	322

What We Do

- Present a simple model that explains the predictability in terms of imperfect information: the “Fed response to news” channel of Bauer-Swanson (2021)
- Address the **exogeneity** concern by projecting out the correlation with the publicly observed data X_{t-}
- Address the **relevance** concern by including speeches by the Fed Chair in the set of monetary policy announcements

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- Revisit high-frequency asset price regressions and macroeconomic SVARs, LPs to assess effects of these changes

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Then:

$$\begin{aligned} mps_t &\equiv i_t - E[i_t | x_t, \mathcal{H}_{t-1}] \\ &= (\alpha_t - a_t) x_t + \varepsilon_t \end{aligned}$$

Implications of the Simple Model

- $m\psi_t$ can be correlated with x_t *ex post* even though it was unpredictable *ex ante*
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- High-frequency OLS regressions of asset price changes on m_{ps}_t remain valid
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- But correlation of mps_t with x_t violates exogeneity assumption of high-frequency IV regressions in macro SVARs and LPs
- To eliminate this correlation, we recommend using orthogonalized $mps_t^\perp \equiv mps_t - \hat{\alpha} - \hat{\beta}X_{t-}$

High-Frequency Asset Price Regressions

$$\Delta y_t = \alpha + \beta mps_t + \varepsilon_t,$$

	mps_t	mps_t^\perp
Two-year yield	0.73	0.74
t -stat.	(18.6)	(16.7)
R^2	0.784	0.689
Five-year yield	0.63	0.64
t -stat.	(14.4)	(13.8)
R^2	0.626	0.550
Ten-year yield	0.41	0.41
t -stat.	(9.5)	(9.9)
R^2	0.435	0.363
30-year yield	0.25	0.25
t -stat.	(6.3)	(6.7)
R^2	0.206	0.173
S&P500	-5.39	-5.50
t -stat.	(-7.7)	(-6.6)
R^2	0.304	0.266
Observations	322	322

High-Frequency Identification of SVARs, LPs

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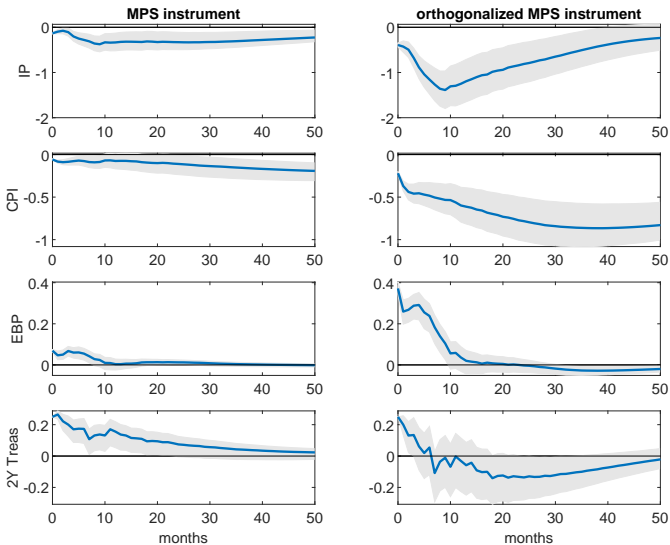
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instrument **relevance**: $E[mps_t \varepsilon_t^{mp}] \neq 0,$

instrument **exogeneity**: $E[mps_t \varepsilon_t^{-mp}] = 0,$

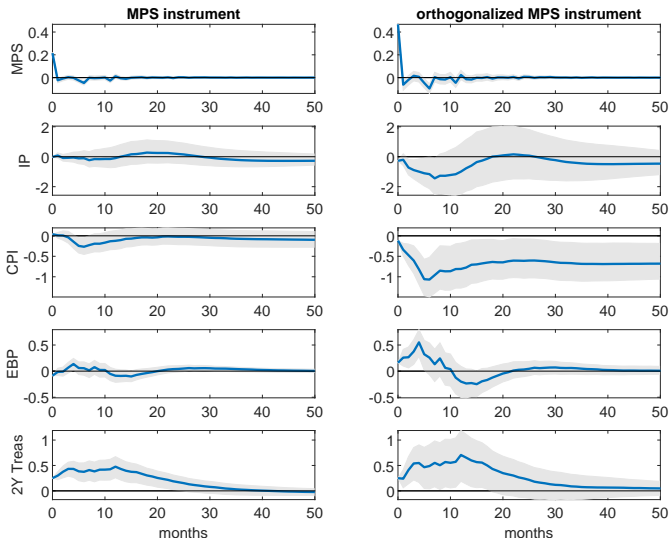
Revisiting Gertler-Karadi (2015)



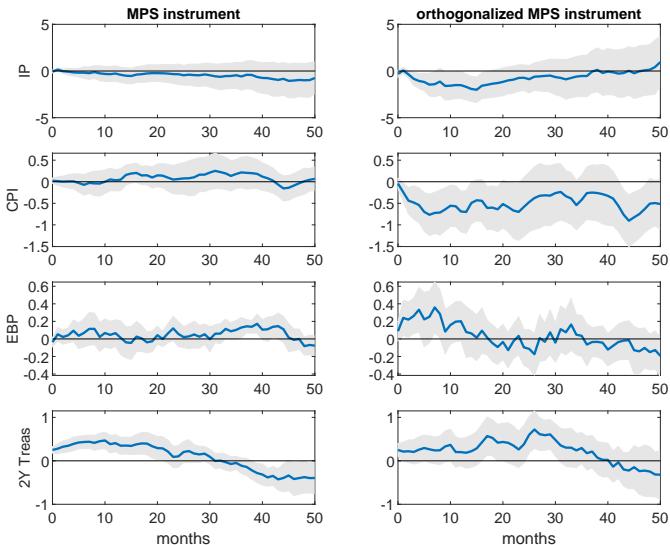
Revisiting Gertler-Karadi (2015)

- unadjusted *mps* instrument is correlated with output, inflation
- estimated effects of monetary policy are attenuated or can even have opposite, puzzling sign if *mps* is unadjusted
- orthogonalized *mps* reduces this bias—IRFs about 4 times larger
- including Fed Chair speeches in *mps* instrument leads to similar IRFs but much larger first-stage *F*-statistics
- results are similar using Plagborg-Møller-Wolf (2021) or LP approaches
- but LP results are imprecisely estimated

Revisiting Plagborg-Møller-Wolf (2021)



Revisiting Ramey's (2016) Local Projections



Lessons Learned and Best Practices

- HF monetary policy surprises need to be orthogonalized wrt macro and financial data to avoid biased SVAR, LP estimates
- Including additional MP announcements such as Chair speeches improves instrument relevance and IRF precision
- Estimated IRFs from SVARs tend to be more precise and less erratic than LPs, but the two are qualitatively similar
- Using a longer sample period for reduced-form VAR improves precision of estimates, but results are qualitatively similar
- Including the instrument in a recursive SVAR does not fix the endogeneity bias problem
- Including additional variables in the VAR (e.g., unemployment, commodity prices) makes little difference for the IRFs of other variables, but the effect of monetary policy on these additional variables may be interesting for their own sakes