The Diminishing Impact of Monetary Policy on Asset Prices Around Non-FOMC Macroeconomic Announcements

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Outline

1. Intro
2. Data
3. Identification
4. Results
5. Further Investigation
6. Simple Model
7. Extension
8. Conclusion
Fed adjusts interest rates to fulfill its dual mandate: maximum employment; price stability.

Fed actions directly impact financial markets:
- Determine the discount rate which directly affect asset prices.
- Impact yield curve & firm borrowing costs.

Monetary policy is most effective when markets correctly anticipate it (Blinder et al, 2001).

This paper focuses on quantifying these expectations.
Motivation

- **Conventional (pre-GFC):** Fed sets Fed Funds Rate (FFR). Predictable by simple functions (e.g. Taylor Rule)

\[ FFR_t = r^* + 2\% + 1.5(infl_t - 2\%) + (GDP_t - GDP^*) \]

- **Unconventional (post-GFC):** Involve forward guidance; QE. Standard rules irrelevant » Complicate forecasting Fed actions.

"When policy is transparent and effective, people in the economy and financial markets respond to the data, not to the policymakers." (Cecchetti and Schoenholtz, 2019).
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  "When policy is transparent and effective, people in the economy and financial markets respond to the data, not to the policymakers." (Cecchetti and Schoenholtz, 2019).
In contrast to the literature, I focus on the expectation of policy (not its announcement). Thus, I examine non-FOMC announcements relevant to monetary policy.

Exploit stock-bond covariance to identify monetary news on these events.

Main Result: Find impacts around non-FOMC announcements fall post-GFC; similar around FOMC announcements » **Overall impact of MP on asset prices decreases post-GFC.**
Contributions

▶ Extant Lit. on Monetary Policy and Asset Prices does not find impacts decreased post-GFC (e.g. Gilchrist et al, 2015; Swanson, 2018; Ferrari et al, 2016). I focus on expectations of monetary policy and find these impacts reduced post-GFC.

▶ Propose a simple method to measure monetary news on non-FOMC days. Standard MP surprise measures in the literature don't "work" on non-FOMC announcements.

▶ Policy Implication: Inadvertent by-product of unconventional policies is the market’s reduced ability to anticipate central bank actions, which may have implications on MP’s transmission.
Sample Description

- Assets under investigation: Equity Prices (S&P 500), Nominal Effective Exchange Rate (NEER), Corporate Bond Yields (AAA, A, BBB, BAA), USTs (2y - 30y), Financial Conditions Index (FCI).

- NonFOMC Announcements: GDP, CPI, Unemployment, Industrial Production.
  1. Dual mandate: i) maximum employment; ii) price stability.
  2. GDP part of all major policy rules.
  3. IP statistics released by Fed.

- Sample Period: 1996 - 2019
  - Pre-GFC (CMP): 1996 - Jun 2008
  - Post-GFC (UMP): Jul 2009 onward

- Sources: FRED and Bloomberg Terminal.
One Method to Identify Monetary News on NonFOMC Days: Sign Restrictions

- Exploit different stock-bond reactions to monetary policy. (Matheson & Stavrev, 2014).
- Isolate movements in yields due to monetary news.
- However, raises set identification issue

### Sign Restriction Assumptions

<table>
<thead>
<tr>
<th></th>
<th>Yields</th>
<th>Equity Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansionary Monetary Policy</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Good Non-Monetary News</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

\[
Yield_t = \alpha_0 + \alpha_1 Yield_{t-1} + \alpha_2 Stock_{t-1} + \epsilon^Y_t
\]

\[
Stock_t = \delta_0 + \delta_1 Yield_{t-1} + \delta_2 Stock_{t-1} + \epsilon^S_t
\]

\[
\epsilon^Y_t = \alpha_3 MPNews_t + \alpha_4 NonMPNews_t
\]

\[
\epsilon^S_t = \delta_3 MPNews_t + \delta_4 NonMPNews_t
\]
Alternative Method: PCA Based

- Extract two components that explain yield changes and equity returns on non-FOMC days
- Interpret components using same identifying assumptions
- High correlation no matter what bond yield is selected for identification purposes

<table>
<thead>
<tr>
<th>PC1</th>
<th>PC2</th>
<th>Δ5yUST</th>
<th>Eq Return</th>
<th>Sign Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC1</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC2</td>
<td>0.00</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ5yUST</td>
<td>0.78</td>
<td>0.61</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Eq Return</td>
<td>0.79</td>
<td>-0.60</td>
<td>0.26</td>
<td>1.00</td>
</tr>
<tr>
<td>Sign Shock</td>
<td>0.04</td>
<td>0.99</td>
<td>0.65</td>
<td>-0.57</td>
</tr>
</tbody>
</table>
Event Analysis: Impact Lower Post-GFC

"MPNews\(_t\)" is the PCA based shock estimated using 5y USTs (and equity returns)

\[ \Delta y_{i,t} = \alpha + \beta_{i,1} MPNews_{t} + \beta_{i,2} MPNews_{t} \ast PostGFC_{t} + \beta_{i,3} PostGFC_{t} + \epsilon_{i,t} \]

<table>
<thead>
<tr>
<th></th>
<th>Eq Prices</th>
<th>10y UST</th>
<th>A-Rated Corp</th>
<th>NEER</th>
<th>FCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPNews ((\beta_{i,1}))</td>
<td>-0.838***</td>
<td>4.796***</td>
<td>4.635***</td>
<td>0.146***</td>
<td>0.063***</td>
</tr>
<tr>
<td></td>
<td>(-16.26)</td>
<td>(16.95)</td>
<td>(17.73)</td>
<td>(5.01)</td>
<td>(33.63)</td>
</tr>
<tr>
<td>MPNews * GFC ((\beta_{i,2}))</td>
<td>0.165**</td>
<td>-1.850***</td>
<td>-1.913***</td>
<td>0.073</td>
<td>-0.007**</td>
</tr>
<tr>
<td></td>
<td>(2.01)</td>
<td>(-3.74)</td>
<td>(-5.10)</td>
<td>(1.46)</td>
<td>(-2.23)</td>
</tr>
<tr>
<td>Observations</td>
<td>944</td>
<td>944</td>
<td>925</td>
<td>944</td>
<td>944</td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1
Beyond Event-Day: Future Asset Price Changes Regressed on Same Shock

"MPNews$_t$" is the PCA based shock estimated using 5y USTs (and equity returns)

\[
\Delta y_{t+h} = \alpha + \beta_{1,h} MPNews_t + \beta_{2,h} MPNews_t * PostGFC + PostGFC_t + \epsilon_{t+h}
\]

where for equities, NEER, FCI:

\[
\Delta y_{t+h} = (\left(\frac{y_{t+h}}{y_{t-1}}\right) - 1) * 100
\]

while for corporate bond yields:

\[
\Delta y_{t+h} = y_{t+h} - y_{t-1}
\]

and $h \in [0, 60]$
Beyond Event-Day: Impacts Decay Quicker Post-GFC
Main Results Summary

- Impacts significantly lower on event-day and decay quickly post-GFC.
- These results are robust across:
  1. Shock identification method: PCA vs sign restriction
  2. And asset choices in identification method (2y - 30y)
  3. Sample choices and GFC definition
  4. Across assets (except NEER)
  5. Across announcements (analyze individually; consider PCE instead of CPI)
- Non-FOMC announcements important as there are $4 \times 12 = 48$ non-FOMC vs. 8 FOMC announcements in a year.
- Next: Investigate how these announcements’ relation to bond markets changed.
- After That: Try to understand the underlying economic forces explaining this difference using a simple information framework
Bond Premium Around Non-FOMC Announcements

- Savor and Wilson (2013) show high bond premium around various macro announcements.
- Bond premium on macro announcements exists only pre-GFC.

\[
\Delta y_{i,t} = \alpha + \beta_1 \text{NonFOMC}_t + \beta_2 \text{NonFOMC}_t \times \text{PostGFC}_t + \beta_3 \text{PostGFC}_t + \epsilon_{i,t}
\]

where \(\Delta y_{i,t}\) is change in spread of bond of maturity "i" with 1m bill.

<table>
<thead>
<tr>
<th></th>
<th>1y</th>
<th>2y</th>
<th>5y</th>
<th>10y</th>
<th>30y</th>
</tr>
</thead>
<tbody>
<tr>
<td>NonFOMC</td>
<td>1.23**</td>
<td>1.43**</td>
<td>1.46**</td>
<td>1.52**</td>
<td>1.52**</td>
</tr>
<tr>
<td></td>
<td>(2.10)</td>
<td>(2.28)</td>
<td>(2.29)</td>
<td>(2.39)</td>
<td>(2.36)</td>
</tr>
<tr>
<td>NonFOMC*PostGFC</td>
<td>-1.11*</td>
<td>-1.36**</td>
<td>-1.55**</td>
<td>-1.61**</td>
<td>-1.54**</td>
</tr>
<tr>
<td></td>
<td>(-1.85)</td>
<td>(-2.05)</td>
<td>(-2.21)</td>
<td>(-2.29)</td>
<td>(-2.17)</td>
</tr>
<tr>
<td>Observations</td>
<td>5,787</td>
<td>5,787</td>
<td>5,787</td>
<td>5,787</td>
<td>5,782</td>
</tr>
</tbody>
</table>

t-statistics computed via Newey-West regressions with 14 lags in parentheses

*** p<0.01, ** p<0.05, * p<0.1
Interest Rate Uncertainty

- MOVE Index: Option implied vol. of UST yields (2y - 30y)
- Implied volatility falls significantly less post-GFC (84.6 pre vs. 45.1 post-GFC; unconditional avg. of index is 90.3).
- Similar findings for equity market uncertainty (VIX and VXO indices)

<table>
<thead>
<tr>
<th></th>
<th>Pre-GFC</th>
<th>Post-GFC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOMC</td>
<td>-2.18***</td>
<td>-1.73***</td>
</tr>
<tr>
<td></td>
<td>(-4.70)</td>
<td>(-3.96)</td>
</tr>
<tr>
<td>Non-FOMC</td>
<td>-1.40***</td>
<td>-0.65***</td>
</tr>
<tr>
<td></td>
<td>(-6.63)</td>
<td>(-3.83)</td>
</tr>
</tbody>
</table>

t-statistics via NW regressions (14 lags)
*** p<0.01, ** p<0.05, * p<0.1
Interest Rate Uncertainty & Monetary Policy Uncertainty

- Inability to reduce interest rate uncertainty may raise monetary policy uncertainty (MPU) (Husted, Rogers & Sun, 2019).

- Lower implied volatility and MPU lead to higher investment, GDP, employment etc (Husted, Rogers & Sun, 2019; Cremers, Fleckenstein & Gandhi, 2020).

- Thus, non-FOMC announcements’ inability to reduce interest-rate/MPU uncertainty can have real effects, as there are many more non-FOMC announcements vs. FOMC announcements each year (48 vs. 8).
Model Setup: Standard as in Goldstein & Yang (2017)

- Informed ($\lambda$), uninformed ($1 - \lambda$) and noise traders exchange a risky asset that has total supply of $Q$.

- Both informed and uninformed have CARA preferences with risk aversion $\gamma$.

- $t = 1$
  - Macro announcement released
  - All receive public signal about Fed economic outlook ($\theta$).
  - $n = \theta + \epsilon_n; \epsilon_n \sim N(0, \tau_n^{-1})$
  - Informed receive private signal about implied Fed monetary policy ($y$).
  - $m_i = y + \epsilon_{m,i}; \epsilon_{m,i} \sim N(0, \tau_m^{-1})$

- $t = 2$
  - Fed announcement released.
  - Asset payoff ($v$) influenced by Fed’s outlook ($\theta$) and monetary policy ($y$).
  - $v = \theta + y$

- Priors: $\theta \sim N(\mu_\theta, \tau_\theta^{-1}); y \sim N(\mu_y, \tau_y^{-1})$

- Noise traders demand $x$, where $x \sim N(0, \tau_x^{-1})$
Model Solution: How Price at $t = 1$ moves with Monetary Policy

- Regressions of asset price changes against monetary news were essentially:

$$\frac{dP_1}{dy} = \frac{\lambda \tau_m + \rho^2 \tau_x}{\lambda \tau_m + \tau_n + \rho^2 \tau_x + \tau_y + \tau_\theta}$$

- What explains a fall in this partial post-GFC?

1. Fall in MP Signal Precision ($\tau_m$)? Perhaps. UMPs harder to predict than CMP
2. Rise in MP Prior Precision ($\tau_y$)? Probably not. MPU indices of Baker, Bloom & Davis (2016) and Husted, Rogers & Sun (2019) are higher post-GFC
3. Rise in Outlook Prior Precision ($\tau_\theta$)? Probably not. Pre-GFC also overlaps with the "Great Moderation"
4. Rise in Outlook Signal Precision ($\tau_n$)? Probably not. Doesn’t appear that announcements have become more precise
Overall Impact of Monetary News on Asset Prices Falls Post-GFC
Collectively Analyzing FOMC and NonFOMC Announcements
Conclusion

▶ In this paper I:
  ▶ Show effect of monetary news on *NonFOMC days* declines post-GFC
  ▶ Discuss it seems to be driven by a declining ability of markets to anticipate Fed actions
  ▶ Develop a PCA based shock and to answer my research question

▶ **Main Takeaway:** The *inadvertent* byproduct of Unconventional MPs is the reduced ability of non-FOMC announcements to provide guidance regarding Fed actions. This can in turn affect the way monetary policy transmits to asset prices, and perhaps even to the real economy