

Identifying Monetary Policy Shocks: A Natural Language Approach

By: Aruoba and Drechsel

Discussion by Miguel Acosta
Federal Reserve Board

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A new measure of monetary shocks built on Romer and Romer (2004)

Romer and Romer shock: ε_t^{RR}

$$\Delta i_t = \alpha + \beta [\text{Fed staff forecast of GDP, unemp., inflation}]_t + \varepsilon_t^{RR}$$

This paper: ε_t^{AD}

$$\Delta i_t = \alpha + f\left(\left\{ \begin{array}{l} [\text{Fed staff's forecast of GDP, unemp., inflation}]_{t-\ell}, \\ [\text{Fed staff's forecast of other variables}]_{t-\ell}, \\ [\text{Text of Fed staff's briefing book}]_{t-\ell} \end{array} \right\}_{\ell=0}^4\right) + \varepsilon_t^{AD}$$

My Discussion

1. Issues with the Romer and Romer shocks that the authors *already fix* (the contribution)
2. An exercise to help explain the difference between ε_t^{RR} and ε_t^{AD}
3. Inherited issues from the Romer and Romer shocks that the authors *could fix*

1. Issues with the Romer and Romer approach that the authors fix

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Recall: $\Delta i_t = \alpha + \beta [\text{Fed staff forecast of GDP, unemp., inflation}]_t + \varepsilon_t^{\text{RR}}$

Omitted variables bias: Fed responds to a lot more than just GDP, unemployment, inflation

- E.g. credit conditions, equity prices
- So, $\varepsilon_t^{\text{RR}}$ may not be exogenous when regressing e.g. credit on $\varepsilon_t^{\text{RR}}$.
- By controlling for a huge vector of text (positive/negative mentions of “credit,” “banks,” “consumption,” etc.) and additional numerical forecasts, OVB concerns are reduced

Mode vs. mean forecast

- More subtle (a new insight): Greenbook presents the staff’s “baseline” forecast—the most likely (modal) path of GDP, inflation, etc. But the Romer & Romer approach is only valid when working with the forecast of the average path.
- Doesn’t matter if the mode and mean coincide... but they don’t
- Authors’ claim: flexible specification controls for skew in the forecasts

2. An exercise to help explain the difference between $\varepsilon_t^{\text{RR}}$ and $\varepsilon_t^{\text{AD}}$

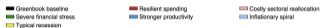
Risks and uncertainties (alternative scenarios) – August 2008

Class II FOMC – Restricted (FR)

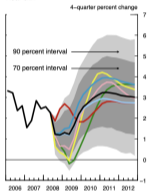
I-22

Forecast Confidence Intervals and Alternative Scenarios under the Assumption that Monetary Policy Follows an Estimated Taylor Rule

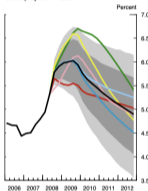
Confidence Intervals based on FRB/US Stochastic Simulations



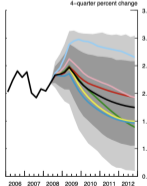
Real GDP



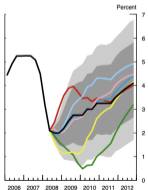
Unemployment Rate



PCE Prices excluding Food and Energy



Federal Funds Rate



Domestic Developments

Class II FOMC—Restricted (FR) I-17

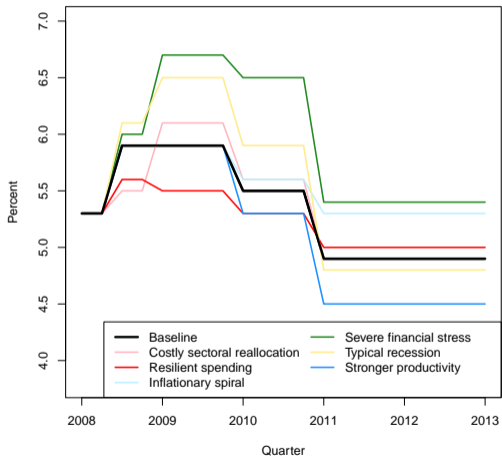
Alternative Scenarios

(Percent change, annual rate, from end of preceding period except as noted)

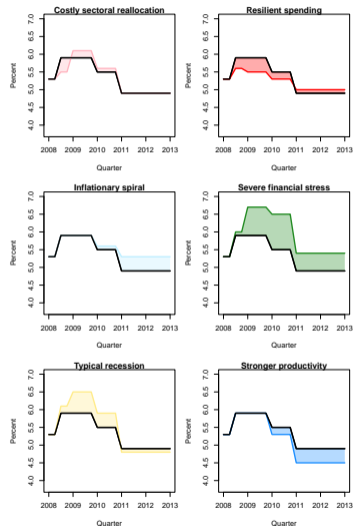
Measure and scenario	2008		2009	2010	2011-12
	H1	H2			
<i>Real GDP</i>					
Greenbook baseline	1.8	0.6	2.2	3.1	3.1
Severe financial stress	1.8	-0.4	0.5	2.6	3.6
Typical recession	1.8	-1.1	1.5	4.1	3.6
Resilient spending	1.8	3.1	1.8	2.5	2.8
Stronger productivity	1.8	0.8	2.7	3.8	3.7
Costly sectoral reallocation	1.8	-0.5	1.9	3.4	3.3
Inflationary spiral	1.8	0.5	2.2	2.9	2.8
<i>Unemployment rate¹</i>					
Greenbook baseline	5.3	5.9	5.9	5.5	4.9
Severe financial stress	5.3	6.0	6.7	6.5	5.4
Typical recession	5.3	6.1	6.5	5.9	4.8
Resilient spending	5.3	5.6	5.5	5.3	5.0
Stronger productivity	5.3	5.9	5.9	5.3	4.5
Costly sectoral reallocation	5.3	5.5	6.1	5.6	4.9
Inflationary spiral	5.3	5.9	5.9	5.6	5.3
<i>Core PCE inflation</i>					
Greenbook baseline	2.1	2.6	2.2	2.0	1.8
Severe financial stress	2.1	2.6	2.2	1.9	1.5
Typical recession	2.1	2.6	2.1	1.8	1.5
Resilient spending	2.1	2.6	2.3	2.1	2.0
Stronger productivity	2.1	2.5	2.0	1.7	1.5
Costly sectoral reallocation	2.1	2.7	2.4	2.3	2.0
Inflationary spiral	2.1	2.8	2.9	2.9	2.7
<i>Federal funds rate¹</i>					
Greenbook baseline	2.1	2.0	2.8	3.3	4.1
Severe financial stress	2.1	1.6	0.8	1.1	3.2
Typical recession	2.1	1.2	1.2	2.7	4.2
Resilient spending	2.1	3.0	3.8	3.5	4.0
Stronger productivity	2.1	1.9	2.8	3.4	4.4
Costly sectoral reallocation	2.1	2.0	2.7	3.5	4.4
Inflationary spiral	2.1	2.0	3.4	4.4	4.9

1. Percent, average for the final quarter of the period.

Get deviations from baseline (unemployment)

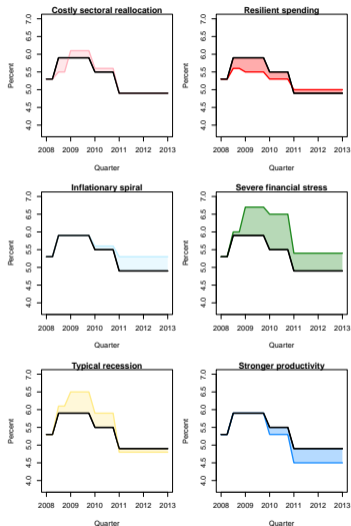


(a) Unemployment rate in scenarios

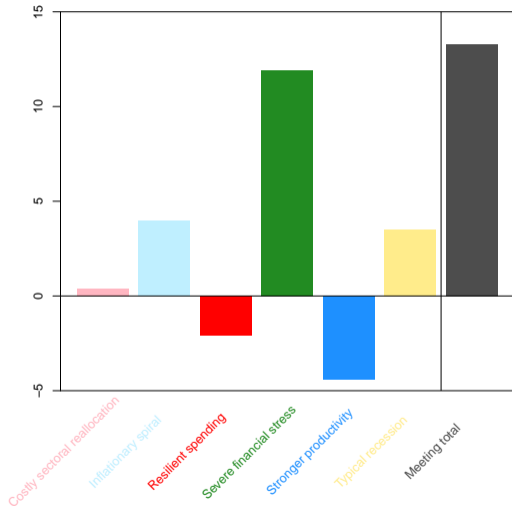


(b) Deviations from baseline

Cumulative deviations from baseline (unemployment)



(a) Deviations from baseline



(b) Cumulative deviation by scenario

What explains difference between A&D and R&R shocks?

Regression

Left-hand side

- Difference between Aruoba & Drechsel shock and Romer & Romer shock

Right-hand side

- Lag of Romer & Romer shock
(How much is explained by removing serial correlation?)
- Change in “skew” of Greenbook unemployment and inflation in alternative scenarios
(How much is explained by mean vs. mode?)
- Intermeeting change in S&P 500, BAA yields, 10-year treasury yield
(How much is explained by adding control for Fed’s response to financial markets?)

Most of the difference is reduction of autocorrelation and “mean vs. mode”

Lagged Romer & Romer	-0.53 (0.06)	-0.60 (0.04)	-0.52 (0.06)	-0.58 (0.04)
Change in unemp. skew, alt. scenarios		-0.11 (0.03)		-0.11 (0.03)
Change in inflation skew, alt. scenarios		-0.12 (0.02)		-0.14 (0.03)
S&P 500, intermeeting change			-0.26 (0.54)	-0.42 (0.53)
BAA yield, intermeeting change			-0.03 (0.08)	-0.01 (0.07)
10-year Treasury, intermeeting change			0.04 (0.08)	0.04 (0.06)
Observations	70	70	70	70
R^2	0.39	0.53	0.39	0.55
Sample	2000–2008	2000–2008	2000–2008	2000–2008

3. Issues with the Romer and Romer approach that still apply

Issue: Greenbook is prepared at least a week before the meeting

Problem

- Greenbook is somewhat stale by the time of the meeting
- Shocks between Greenbook publication and the meeting are a “shock” in this framework

Potential solution

- Top brass of the staff present the staff forecast at the FOMC meeting
- Likely incorporates events between Greenbook publication and meeting
- Text is available in the meeting transcripts — control for this too!

Issue: Staff forecast \neq FOMC forecast

Problem

- If the FOMC and staff have different forecasts, the difference is a “monetary policy shock” in this framework. Indeed, this causes the largest shock that the authors discuss:

“The largest shock in absolute value is estimated for the November 7, 1984 FOMC meeting... When we read the transcript of the FOMC meeting, it becomes clear that several participants find the staff forecast too optimistic.”

- This isn't necessarily a problem, if, e.g.
 1. those differences are random, or
 2. relationship between FOMC and staff forecasts is constant
- Potential problem: If the FOMC agrees with the staff in good times, but is more pessimistic in bad times (time variation in f), shocks may be correlated with the state of the economy.

Potential Solution

Use text of FOMC members' discussion during the “economic go-round” of the meeting

Issue: This approach misses forward guidance

- Since about 2003, communication about the *path* of future interest rates has been an important component of monetary policy
- Starting with [Gürkaynak et al.](#), the high-frequency literature measures forward guidance by using longer-term rates on the LHS of the “regression” used to measure the shocks
- Is there a way to capture forward guidance in this framework? I can see several complications but it seems worth exploring.
- Fun fact
 - ▶ The authors estimate shocks over the recent tightening cycle using the Fed’s “Beige Books” and find a cumulative 21bps contractionary shock
 - ▶ The shocks of [Nakamura and Steinsson \(2018\)](#) also add up to 21bps over this cycle!

Conclusion

- Great paper! Sheds new light on what a monetary policy shock is
- Makes a lot of improvements to [Romer and Romer](#)-style shocks
- These tools can allow the authors to make even more improvements!

END

THANKS!

APPENDIX

References I

- Gürkaynak, Refet S., Brian P. Sack, and Eric T. Swanson**, “Do Actions Speak Louder Than Words? The Response of Asset Prices to Monetary Policy Actions and Statements,” *International Journal of Central Banking*, 2005.
- Nakamura, Emi and Jón Steinsson**, “High Frequency Identification of Monetary Non-Neutrality,” *Quarterly Journal of Economics*, 2018, 133 (3), 1283–1330.
- Romer, Christina D. and David H. Romer**, “A New Measure of Monetary Shocks: Derivation and Implications,” *American Economic Review*, 2004, 94 (4), 1055–1084.

Lagged Romer & Romer	-0.30 (0.08)	-0.53 (0.06)	-0.33 (0.08)	-0.52 (0.06)
S&P 500, intermeeting change			-0.22 (0.26)	-0.26 (0.54)
BAA yield, intermeeting change			0.04 (0.06)	-0.03 (0.08)
10-year Treasury, intermeeting change			-0.04 (0.04)	0.04 (0.08)
Observations	210	70	182	70
R^2	0.14	0.39	0.18	0.39
Sample	1982–2008	2000–2008	1986–2008	2000–2008

▶ back