Monetary Policy with Opinionated Markets

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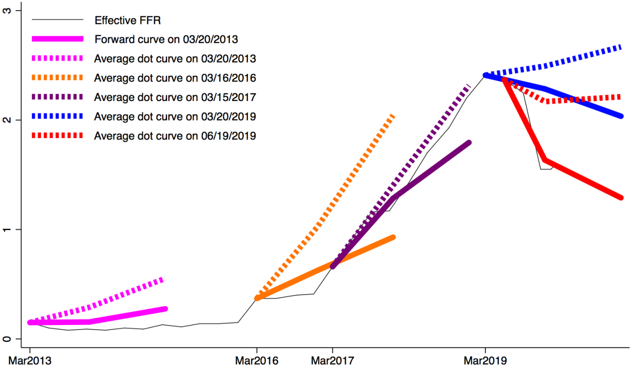
The Fed and markets disagree about interest rates



- Risk premium adjustment? But large gaps still remain
- Survey-based measures show qualitatively similar gaps

The Fed and markets disagree about interest rates

- Literature: Fed's signaling of superior info about actions/economy
- But market disagrees with Fed even **after** the FOMC announcements
- **Opinionated markets:** Dec 2007: "hawkish" interest rate cut. WSJ:

> *"From talking to clients and traders, there is in their view no question the Fed has fallen way behind the curve," said David Greenlaw, economist at Morgan Stanley.* **"There's a growing sense the Fed doesn't get it."**

This paper: A model with Fed-market belief disagreements

We develop a model with **opinionated markets.** Key features:

(i) **Fed and market disagree about future aggregate demand**

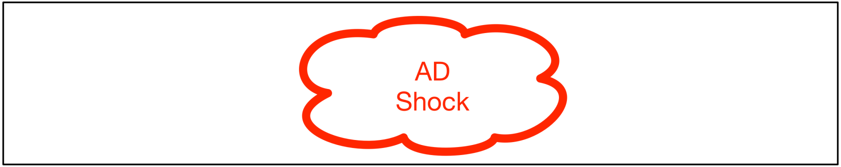
(ii) **They both learn from data**

Main findings:

- Natural explanation for disagreements about interest rates
- Disagreements matter for optimal monetary policy
- Heterogeneous data sensitivity (in learning) matters for:
  How asset prices and interest rates react to macro shocks

Setup: Fed sets rates under uncertainty about AD shocks

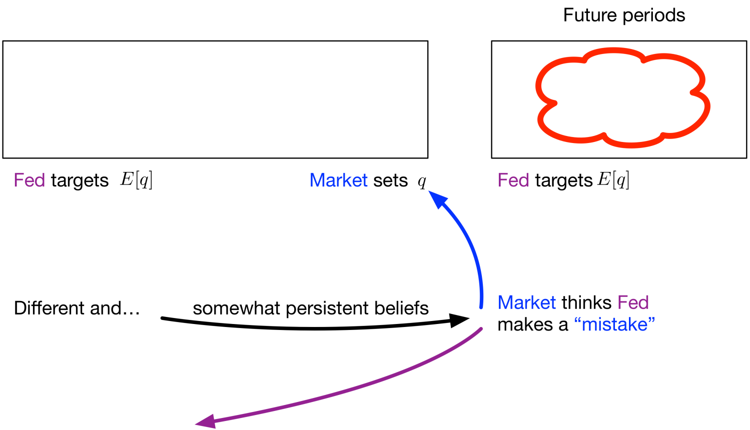
Current period



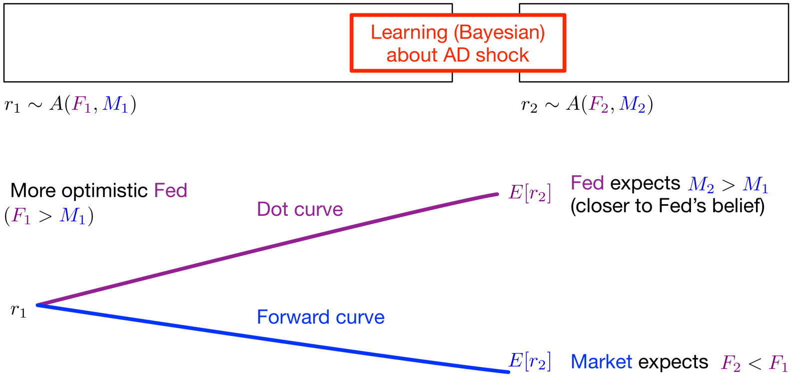
Fed sets rate to target
$E[y] \sim E[q] \sim q^*$

Market "sets" $y \sim q$

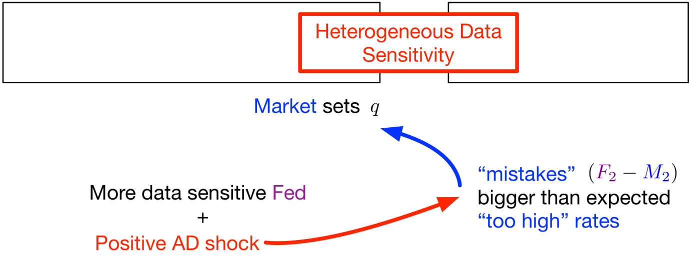
Different beliefs about AD shock
=> Market thinks Fed makes a "mistake"



Result: Fed partially accommodates Market to mitigate “mistake”s impact on asset prices



Result: Disagreement + Learning explains Dot-Forward gaps



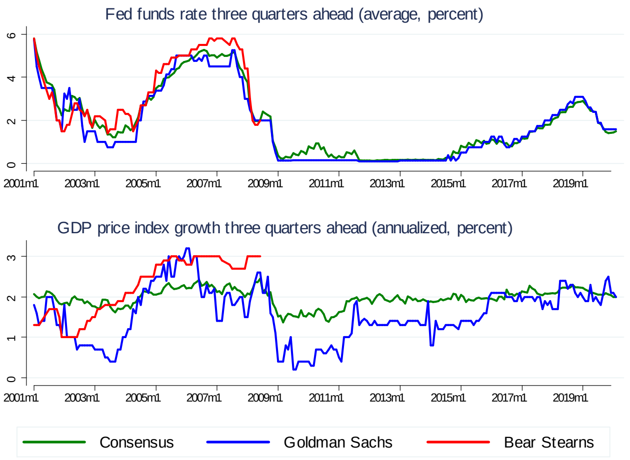
Result: With more data sensitive Fed

Shocks have dampened effect on asset prices

(Shocks are bundled with “mistakes”)

Blue Chip forecasts support our ingredients

1. **Rate forecasts correlate with AD (inflation) forecasts**
2. Forecasts feature **confident disagreement**



Blue Chip forecasts: Confident AD disagreement

Table 1: Correlates of interest rate predictions

	Fed funds rate (FFR) prediction						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP price index prediction	0.11**		0.11**				0.04**
	(0.02)		(0.02)				(0.01)
Real GDP prediction		0.03*	0.03+				0.01+
		(0.02)	(0.02)				(0.01)
FFR prediction last month				0.69**	0.69**	0.69**	0.68**
				(0.03)	(0.03)	(0.02)	(0.02)
FFR consensus last month				0.29**	-0.17**		
				(0.03)	(0.06)		
FFR futures last month					0.47**		
					(0.06)		
Time FE	Yes	Yes	Yes	No	No	Yes	Yes
Forecaster FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (adjusted, within)	0.03	0.00	0.03	0.96	0.97	0.48	0.49
Forecasters	110	111	110	108	108	108	107
Months	230	230	230	229	226	229	229
Observations	10,365	10,645	10,363	10,370	10,244	10,370	10,052

Summary of the Keynesian block

- Potential output A_t. Output y_t is demand determined
- Financial assets:
  - Market portfolio: Ex-dividend price $Q_t A_t$
  - Risk-free asset: Zero supply. Return r_t^f
- Rep agent (M) with log utility spends $y_t \simeq Q_t A_t$
- Targeting $y_t = A_t$ requires targeting $q_t = \log Q_t = q^*$
- Fed (F) sets r_t^f **under uncertainty** (about current AD shock):

$$E_t^F [q_t] = q^*$$

Summary of the asset pricing block

- **AD shocks** g_t (news about future $A_{t+1} = A_t + g_t$)
- Equilibrium asset price:

$$q_t \simeq \rho + \underbrace{g_t}_{\text{current AD shock}} + \overbrace{E^M_{t+1}\left[q_{t+1}\right]}^{\textbf{future AD + future policy}} - \underbrace{r^f_t}_{\text{current policy}}$$

Outcomes reflect MP "mistakes" and "mistake shocks"

- Equilibrium interest rate:

$$r_t^f \simeq \rho + \underbrace{E_t^F [g_t]}_{\text{expected AD}} + E_t^F \left[\tilde{q}_{t+1}^M \right] \text{ where } \overbrace{\tilde{q}_{t+1}^M \equiv E_{t+1}^M [q_{t+1}] - q^*}^{\textbf{perceived ``mistake''}}$$

- Equilibrium asset price:

$$q_t \simeq q^* + \underbrace{g_t - E_t^F [g_t]}_{\text{AD shock}} + \overbrace{\tilde{q}_{t+1}^M - E_t^F \left[\tilde{q}_{t+1}^M \right]}^{\textbf{``mistake'' shock}}$$

Beliefs: Persistent AD shock induces disagreement

$$g_t = g + \underbrace{u}_{\text{unknown component}} + v_t$$

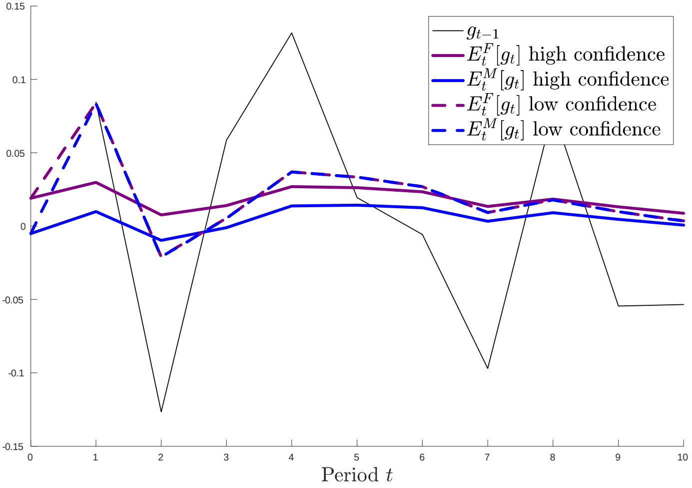
- **Heterogeneous prior beliefs (agree to disagree)**:

$$u \sim N\left(u_0^i, \quad \frac{var\left(v_t\right)}{C_0^i}\right) \text{ for } i \in \{F, M\}$$

- Bayesian updating: C_0^i ("confidence") controls data sensitivity
- Define relative confidence as $\mathbf{c}^i_{s,s+t} = \frac{C_0^i+s}{C_0^i+s+t}$

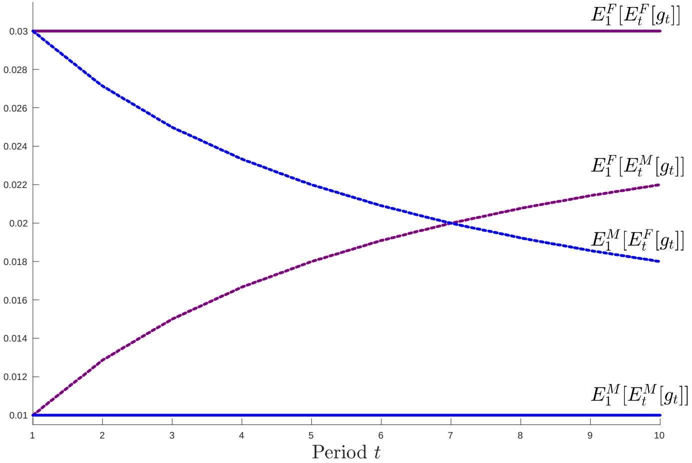
Agents learn over time

$$E_t^i\left[g_t\right] = \mathbf{c}_{t-1,t}^i E_{t-1}^i\left[g_{t-1}\right] + \left(1 - \mathbf{c}_{t-1,t}^i\right) g_{t-1}$$



Agents expect the other agent to "learn"

$$E_s^i\left[E_{s+t}^j\left[g_{t_2}\right]\right] = \mathbf{c}_{s,s+t}^j E_s^j\left[g_s\right] + \left(1 - \mathbf{c}_{s,s+t}^j\right) E_s^i\left[g_s\right]$$



Result: Disagreements affect current & expected rates

Suppose common C_0 but $u_0^F \neq u_0^M$

- **Fed is "constrained" by the market's belief:**

$$\begin{aligned} q_t &= q^* + g_t - E_t^F[g_t] \\ r_t^f &\simeq \rho + (1 - \mathbf{c}_{t,t+1}) E_t^F[g_t] + \mathbf{c}_{t,t+1} E_t^M[g_t] \end{aligned}$$

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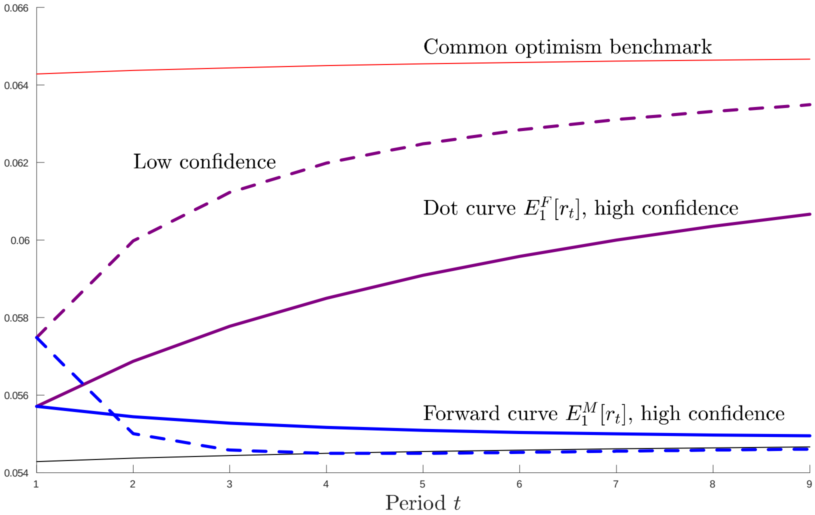
- **Dot and forward curves reflect disagreements:**

$$E_1^F \left[r_t^f \right] \simeq \rho + E_1^F [g_1] + \underbrace{\mathbf{c}_{1,t+1} \left(E_1^M [g_1] - E_1^F [g_1] \right)}_{\text{limits to zero as horizon } t \text{ increases}}$$

$$E_1^M \left[r_t^f \right] \simeq \rho + E_1^M [g_1] - \overbrace{\mathbf{c}_{1,t} (1 - \mathbf{c}_{t,t+1}) \left(E_1^M [g_1] - E_1^F [g_1] \right)}$$

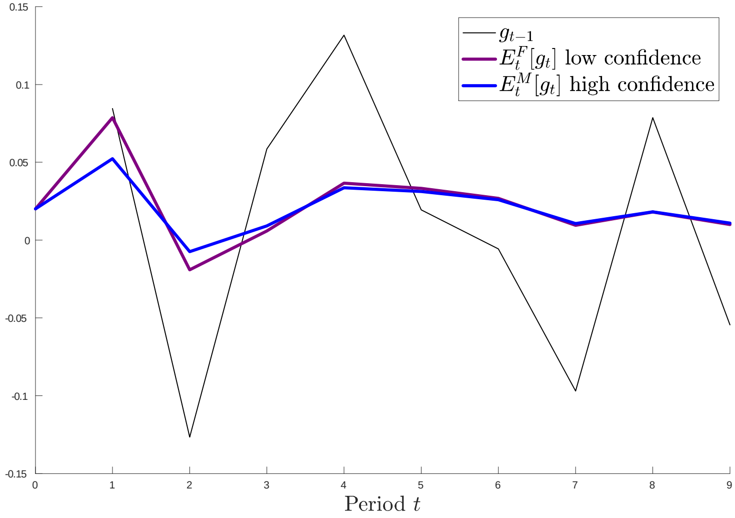
Fed optimism shock: Market expects "too high" rates



$$r_t^f \simeq \rho + E_t^F[g_t] + \tilde{q}_{t+1}^M$$

Heterogeneous data sensitivity: “MP mistake” shocks

Suppose heterogeneous data sensitivity, e.g., $C_0^F < C_0^M$



Shocks come bundled with a "MP mistake" shock

$$q_t \simeq q^* + \underbrace{g_t - E_t^F [g_t]}_{\text{AD shock}} + \underbrace{\tilde{q}_{t+1}^M - E_t^F \left[\tilde{q}_{t+1}^M\right]}_{\text{"mistake" shock}}$$

- **Result:** Heterogenous sensitivity affects price impact of shocks

$$q_t = q^* + \mathbf{D_t} \left(g_t - E_t^F [g_t] \right)$$

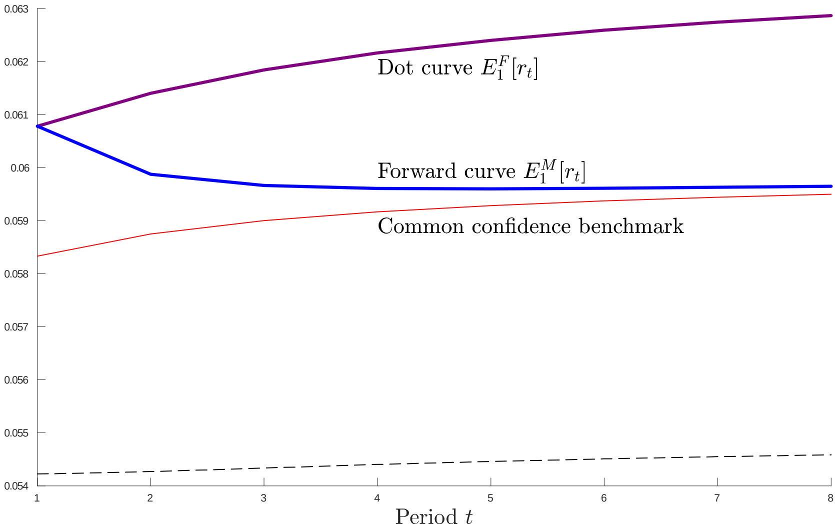
where

$$\underbrace{\mathbf{D_t} < 1}_{\textbf{price impact is dampened}} \quad \text{iff} \quad \underbrace{C_0^F < C_0^M}_{\textbf{when Fed is more data sensitive}}$$

- **Corollary:** Heterogeneous sensitivity affects the risk premium ($\tilde{\mathbf{D}}_{\mathbf{t+1}}^2$)

Data-sensitive Fed: Shocks are "absorbed more" by rates

Suppose Fed is more data-sensitive and initial shock positive $\Delta g_0 > 0$



Conclusion: Monetary policy with opinionated markets

Model with **opinionated disagreements** between markets and Fed:

- With learning, translates into **disagreements in expected rates**
- Disagreements affect current policy rate through MP "mistakes"
- Heterogeneous data sensitivity. **Shocks bundled w/ MP "mistakes"**
- Data-sensitive Fed: Dampened price impact/amplified rate impact

Extension with Fed's (some) superior information and signaling:

- Baseline results are robust
- New shocks: Signaling $\Longrightarrow$ information shock or "mistake" shock