Monetary Policy News in the US: Effects on Emerging Market Capital Flows

Discussion by James D. Hamilton

- What happens to capital flows to emerging markets when U.S. interest rates go up?
- Want to distinguish whether U.S. rates went up because of:
  - Stronger U.S. output growth
  - U.S. monetary contraction

- Identify monetary policy effect using both zero restrictions and sign restrictions as in Baumeister and Benati (IJCB, 2013)
- Sign restrictions:
  - U.S. monetary contraction raises 3-year fed funds futures and lowers U.S. inflation and output growth
- Zero restriction:
  - U.S. monetary contraction has no immediate effect on current fed funds rate

$\mathbf{y}_t =$ (fed funds rate, 36-month futures,

U.S. inflation, U.S. ind prod growth,

VIX, first PC of emerging mkt cap flows)

Step 1: Estimate reduced-form VAR(1)

$$\mathbf{y}_t = \hat{\mathbf{c}} + \hat{\mathbf{\Phi}}\mathbf{y}_{t-1} + \hat{\mathbf{e}}_t \qquad t = 1, 2, \ldots, T$$

$$\hat{\mathbf{\Omega}} = T^{-1} \sum_{t=1}^{T} \hat{\mathbf{e}}_t \hat{\mathbf{e}}_t'$$

Step 2: Draw $\mathbf{\Omega}^{(m)}$ and $\mathbf{\Phi}^{(m)}$ from asymptotic distribution of $\hat{\mathbf{\Omega}}$ and $\hat{\mathbf{\Phi}}$

Step 3: Generate $\mathbf{Q}^{(m)}$ from Haar distribution of orthonormal matrices ($\mathbf{Q}^{(m)}\mathbf{Q}^{(m)\prime} = \mathbf{I}_n$) and propose to interpret $\boldsymbol{\varepsilon}_t^{(m)} = \mathbf{P}^{(m)}\mathbf{Q}^{(m)}\mathbf{v}_t^{(m)}$ for $\mathbf{P}^{(m)}\mathbf{P}^{(m)\prime} = \boldsymbol{\Omega}^{(m)}$

$$E(\mathbf{v}_t^{(m)}\mathbf{v}_t^{(m)\prime}) = \mathbf{I}_n$$

$$\Rightarrow E(\boldsymbol{\varepsilon}_t^{(m)}\boldsymbol{\varepsilon}_t^{(m)\prime}) = \mathbf{P}^{(m)}\mathbf{Q}^{(m)}\mathbf{Q}^{(m)\prime}\mathbf{P}^{(m)\prime} = \boldsymbol{\Omega}^{(m)}$$

$\Rightarrow \mathbf{v}_t^{(m)}$ is a proposed structural shock perfectly consistent with observed $\mathbf{y}_t$

Step 4: Check if $\mathbf{P}^{(m)}\mathbf{Q}^{(m)}$ is consistent with sign and zero restrictions

If yes, keep $\mathbf{v}_t^{(m)}$ as plausible structural shock.

If no, discard $\mathbf{v}_t^{(m)}$ and try again.

Retained set $\mathbf{v}_t^{(m_1)}, \mathbf{v}_t^{(m_2)}, \ldots, \mathbf{v}_t^{(m_D)}$ represent D plausible structural shocks and $[\mathbf{\Phi}^{(m_i)}]^s \mathbf{P}^{(m_i)}\mathbf{Q}^{(m_i)}$ a set of D plausible structural IRFs at horizon s.

Step 2: draw $\mathbf{\Omega}^{(m)}$ from $f(\hat{\mathbf{\Omega}})$:

randomness comes from sampling uncertainty ($\mathbf{\Omega}$ might differ from estimate $\hat{\mathbf{\Omega}}$)

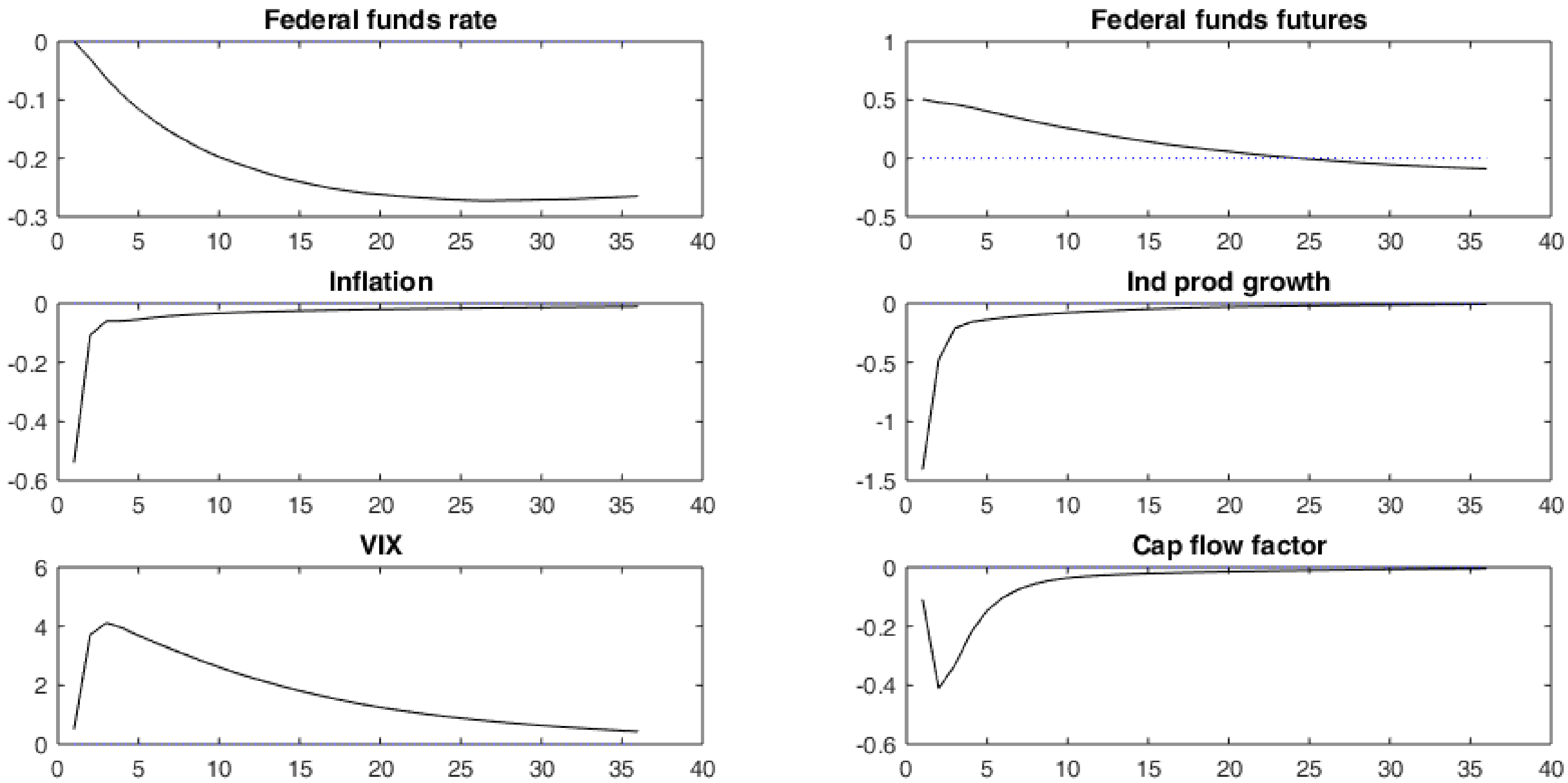
Step 3: draw $\mathbf{Q}^{(m)}$ from Haar distribution:

randomness comes entirely from researcher’s random number generator

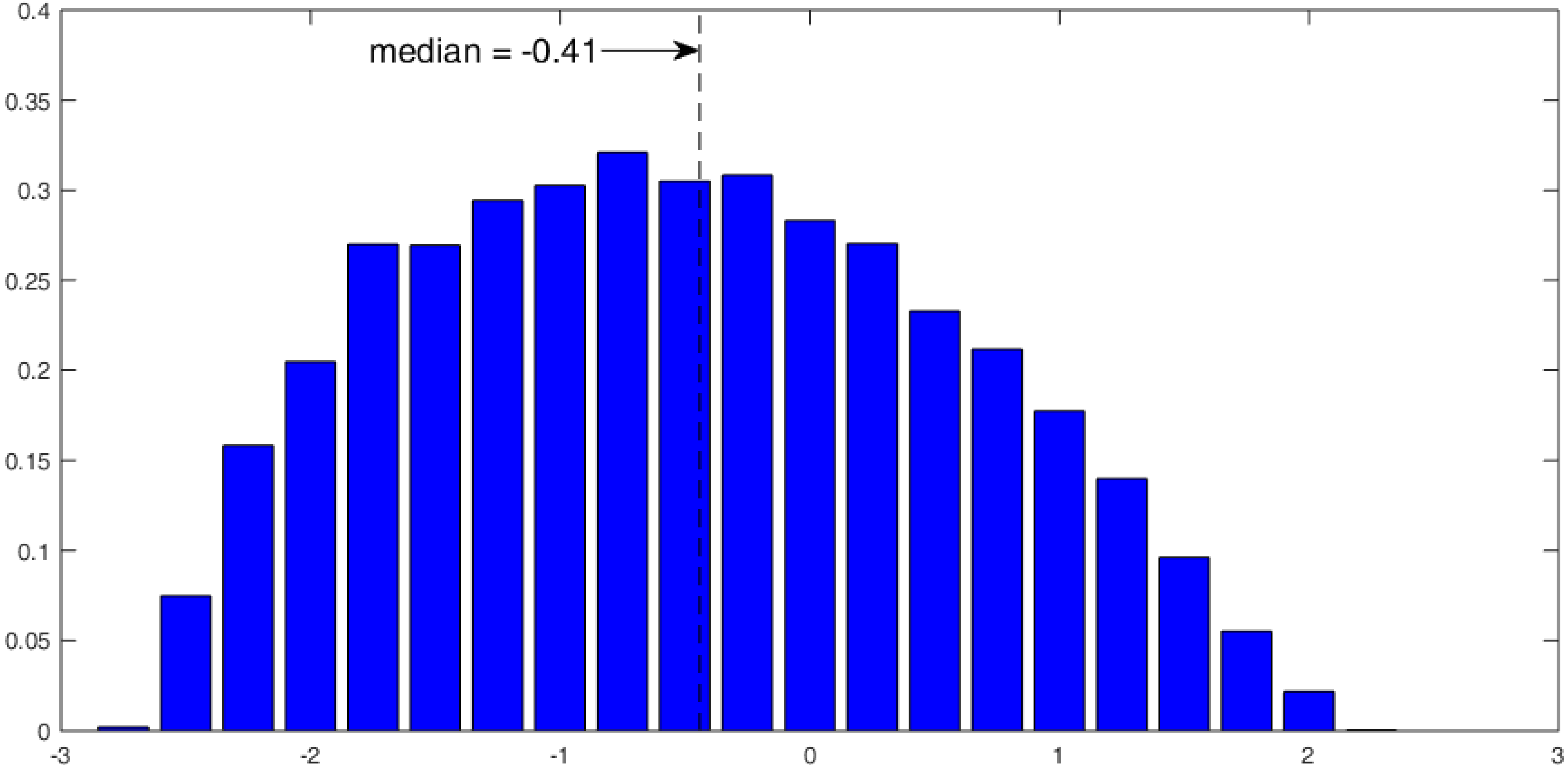
Let's shut down first effect (fix $\mathbf{\Omega}^{(m)} = \hat{\mathbf{\Omega}}$ and $\mathbf{\Phi}^{(m)} = \hat{\mathbf{\Phi}}$ for all m), as if we had an infinite sample size $T \longrightarrow \infty$ and had no sampling uncertainty.

Plot median value of structural IRF from retained draws that satisfy sign restrictions when $\mathbf{\Omega}^{(m)} = \hat{\mathbf{\Omega}}$ and $\mathbf{\Phi}^{(m)} = \hat{\mathbf{\Phi}}$ for all m.

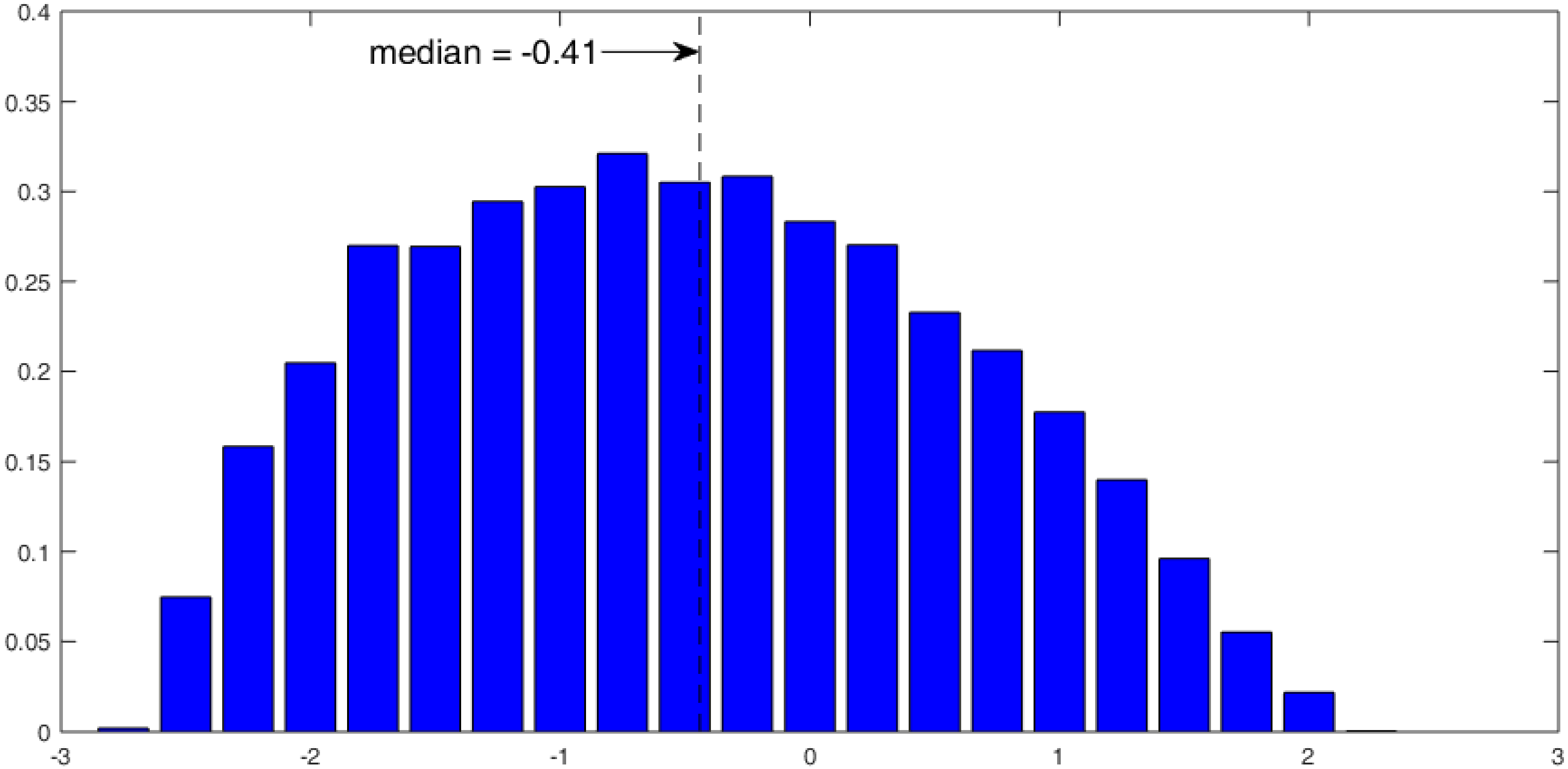
Median structural IRFs when there is no sampling uncertainty



Distribution of retained draws for effect on cap flows after 1 period (no sampling uncertainty)

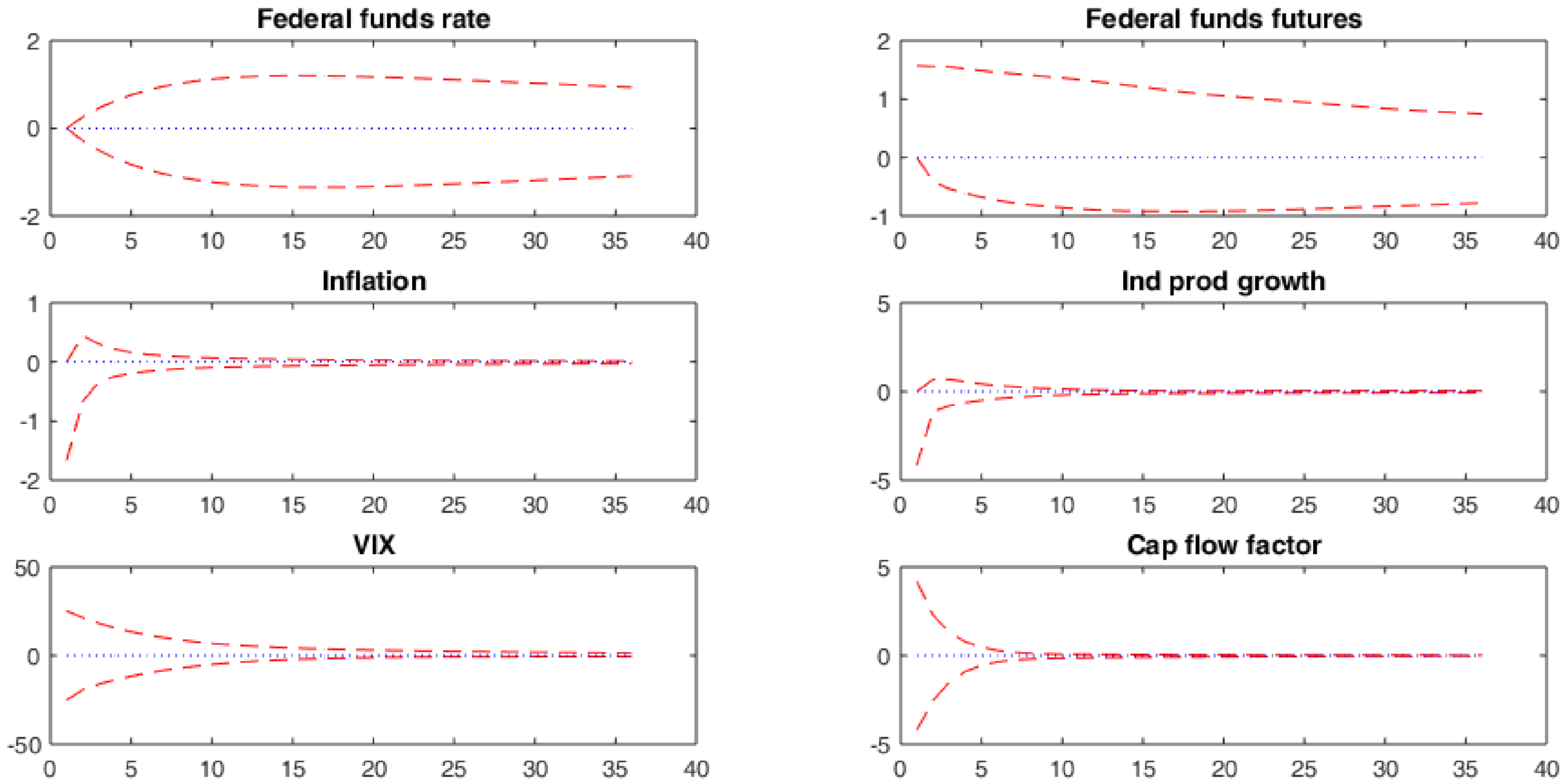


The Haar distribution amounts to implicit prior belief that some answers are more plausible than others



- Option 1: If we have no prior information beyond the sign restrictions, we should report the identified set (the boundaries of the set of *all* retained draws)

Identified set of structural IRFs (no sampling uncertainty)



- Option 2: Acknowledge source of prior information that some answers are more likely than others
  - Unlikely to take the form of Haar distribution
  - Economic examples of how to do this: Baumeister and Hamilton (JME, 2018; AER, 2019)

- Option 3: Bring in additional information (e.g., changes on days of FOMC announcements) as instrument
  - Proxy SVAR (Mertens and Ravn, AER 2013; Stock and Watson, BPEA 2012, Econ J 2018)
  - Additional variable in VAR with zero restrictions (Eul Noh, UCSD 2019)
  - Instrumental variable in VAR with sign restrictions (Lam Nguyen, UCSD 2019)