Discussion of

Does a Big Bazooka Matter? Central Bank Balance-Sheet Policies and Exchange Rates

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*The views expressed here do not necessarily reflect the position of the Bank of England.

An “explosive” paper

SOURCE: http://www.visualcapitalist.com/ecbs-big-bazookas-tltro-qe/.

- **Great paper, important contribution**. Despite the fact that balance sheet policies are the norm, we still know little about how they work.

What this paper does

- Assess the impact of (relative) central bank balance-sheet policies on the exchange rate
- Investigate explicitly channels of transmission
  - Signalling channel, interest rate, differentials and frictions in FX swap markets

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- Assess the impact of (relative) central bank balance-sheet policies on the exchange rate
- Investigate explicitly channels of transmission
  - Signalling channel, interest rate, differentials and frictions in FX swap markets
- Approach: 2SLS
  1. **Indep. variable** Changes in relative CB balance sheets ($\Delta BS_{t+1} + \Delta BS_t$)
  2. **Instrument** Lagged UMP announcements (a_t, a_{t-1})
  3. **Dep. variable** Changes in the nominal exchange rate (Δs_t)
     - Interest rate differentials, CIP deviations, currency risk premium
     - Other asset prices, IP, CPI,...

My discussion

- Review of 2SLS specification (as I understand it)
- Three comments
  1. First stage
  2. Stock vs Flow
  3. Role of expectations
- One suggestion

The logic of the 2SLS specification

Naive approach (mine, not the authors')

- **Assumption** Law of motion of CB balance sheet

$$\Delta BS_t = \varepsilon_t^{ump} + \varepsilon_t^{other} + \rho X_{t-1}$$

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$$COV[a_t, \varepsilon_t^{ump}] \neq 0 \quad COV[a_t, \varepsilon_t^{other}] = 0$$

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- **Issue** Reasonable to assume that $COV[a_t, \varepsilon_t^{other}] = 0$?
  - Not really... announcement could be endogenous response to ε_t^{other}

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- **Issue** Power of instrument?
  - Might be low as actually $\varepsilon_t^{ump} = \eta_{t|t} + \eta_{t+1|t}$

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This paper's (smart) approach

- Consider balance sheet in $t+1$

$$\Delta BS_{t+1} = \eta_{t+1|t+1} + \eta_{t+1|t} + \varepsilon_{t+1}^{other} + \rho X_t$$

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- Then can run

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- **Note** Role of X_t is crucial $\Rightarrow$ Controls for ε_t^{other} (exclusion restriction) and $\eta_{t|t}$ (endogeneity bias)

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- Then can run

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- Now can safely estimate second stage

$$\Delta s_t = \gamma(\hat{b}_1 a_t) + \xi$$

Comment No.1: First stage equation

- Baseline first stage equation

$$\Delta BS_{t+1} + \Delta BS_t = b_1 a_t + b_2 X_t + b_3 a_{t-1} + b_4 X_{t-1} + \zeta_t$$

- Controlling for X_t is roughly equivalent to a Cholesky-type of identification

$$Y = \left[\underbrace{VIX_t, ESI_t}_{X_t}, a_t, \left(\Delta BS_{t+1} + \Delta BS_t\right), \Delta s_t \right]$$

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- With financial variables this can be problematic (Gertler and Karadi, 2015)
  - Implicit assumption is that causation goes $VIX_t / ESI_t \rightarrow a_t$
  - Likely two-way relation between these variables $VIX_t / ESI_t \leftrightarrows a_t$

Comment No.2: Stock vs Flow

- As authors note, asset prices respond to both contemporaneous and anticipated UMP shocks

$$\begin{aligned} \Delta BS_t &= \varepsilon_t^{ump} + \varepsilon_t^{other} + \beta_3 X_{t-1} \\ \varepsilon_t^{ump} &= \eta_{t|t} + \eta_{t+1|t} + ... + \eta_{t+h|t} \end{aligned}$$

- Define total "stock effect" announced at time t as $BS_{t+h|t} = \sum_{i=0}^{t+h} \eta_{t+i|t}$
- Paper instruments $\Delta BS_{t+1} + \Delta BS_t$ only $\Rightarrow$ How about the remaining $BS_{t+h|t} - (\Delta BS_{t+1} + \Delta BS_t)$?

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- Underestimation of the total effect? Lower power of the instrument?

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A parallel with the conventional monetary policy literature

- Consider a short x-minutes window around the announcement on day t at time τ

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- High frequency identification of balance sheet shocks

$$Z_t = \begin{cases} BS_{t+h|t,\tau+x} - \mathbb{E}_{\tau-x}[BS_{t+h|t}] & \text{on an announcement day} \\ 0 & \text{otherwise} \end{cases}$$

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  - What matters is the surprise relative to expectations!

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    - Outlook for inflation worsens
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FINANCIAL TIMES
myFT
Europe Quantitative Easing
+ Add to myFT
Investors look to Fed for relief after ECB disappoints

SOURCE: https://www.ft.com/content/3e617908-9d0a-11e5-b45d-4812f209f861.

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- On announcement day ECB disappoints expectations $BS_{t+h,t} - \mathbb{E}_t[BS_{t+h,t}] \downarrow$
- Contractionary UMP shock, exchange rate appreciates $\Rightarrow$ **Downward bias!**

SOURCE: https://www.bloomberg.com/news/articles/2016-03-10/euro-drops-most-since-november-as-ecb-cuts-rates-expands-qe.

Suggestion

- Construct an instrument Z_t with high frequency data

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- But virtually any variable for which you have high frequency data would do the trick
    - Long-term government bonds, equity, etc
- Given small number of announcements, could even do it do it narratively...

Suggestion (cont'd)

- Then, can run following first stage equation

$$BS_{t+h,t} = \beta_0 + \beta_1 Z_t + \zeta_t$$

- What you would gain
  - More defendable exclusion restriction
  - No need for assumption on direction of causation $VIX_t / ESI_t \leftrightarrows a_t$
  - Full account of stock effect
  - No downward bias due to expectations
  - Richer time variation in the instrument
  - Instrument proportional to size of the surprise

(Very) minor issues

- Hard to follow the derivation of the 2SLS specification
- Plot CIP deviations and λ_t
- Puzzling that a_t^{FED} is ‘weak’ instrument
- Notation: sometimes you use ΔBS, BS, or ΔB

Summing up

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- **Great paper** Provides new insights on (unconventional) monetary policy transmission
    - Very much welcome, need more of this type of papers
- Somewhat puzzlingly small and/or insignificant impact of balance sheet policies
- Underestimation the "bazooka effect"?
    - Expectations + Stock effect (downward bias)
    - Cholesky (unknown)
- Results could be even sharper

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