Comments on
G. Adler, N. Lisack and R. Mano, "Unveiling the Effects of Foreign Exchange Intervention: A Panel Approach"

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Outline

- The Adler, Lisack and Mano paper:
  - Studied "the effect of foreign exchange intervention on the exchange rate relying on an instrumental-variables panel approach"
  - Found "robust evidence that intervention affects the level of the exchange rate in an economically meaningful way. A purchase of foreign currency of 1 percentage point of GDP causes a depreciation of the nominal and real exchange rates in the ranges of [1.7-2.0] percent and [1.4-1.7] percent respectively instrumental-variables panel approach"

- Comments:
- Endogeneity
  - Reaction Function
  - Effectiveness of foreign exchange intervention (FXI)

- Measurement and Data:
- Frequency: Monthly
- Econometrics

Intervention Conceptual Issue

- Sterilized intervention vs. Unsterilized Intervention
  - Unsterilized intervention always works
    - Central Bank B/S expands, the interest rate becomes lower
    - Exchange rate depreciates
  - Unsterilized intervention, works or not,
    - In monetary model, it does not
    - In reality, it seems to work
      - Portfolio rebalance effects, signaling effects
      - Effective in minutes
  - With monthly data, one can differentiate the two

- Exchange rate determination
  - Random walk with many kinds of shocks
    - Then high-frequency effect → persistent effect
  - Mean reversion in the medium-term
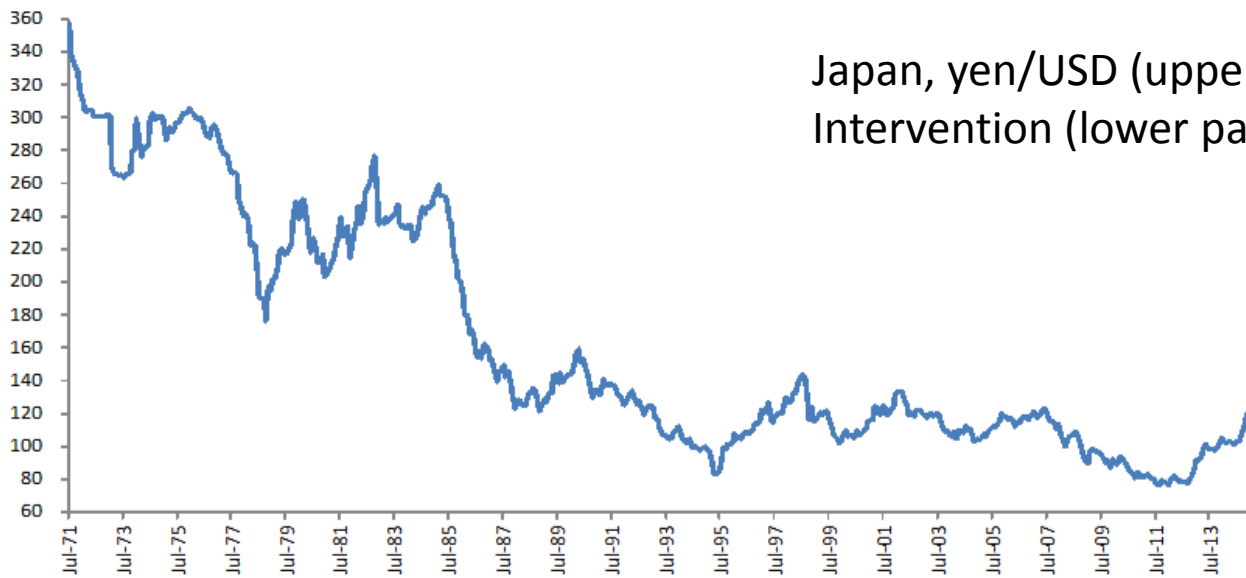   - The deviation from the Long-run average matters

Intervention

- Endogeneity Issue
  - Reaction Function
    - **You sell local currency (FXI>0), when it is appreciating**
    - Exch Rate regime
    - Exch Rate Movement (Δe), Level (e) $\rightarrow$ Intervention (FXI)
    - FXI = f[e, Δe]
      - Should be (e – e*) instead of e?
      - How often does the central bank intervene?
  - Effectiveness
    - **The exchange rate should depreciate when you sell local currency (FIX>0)**
      - **But depending on intention, could be appreciating, but lower speed**
    - Intervention $\rightarrow$ Exch Rate Movement
    - Intention of the authorities
    - Counter-factual
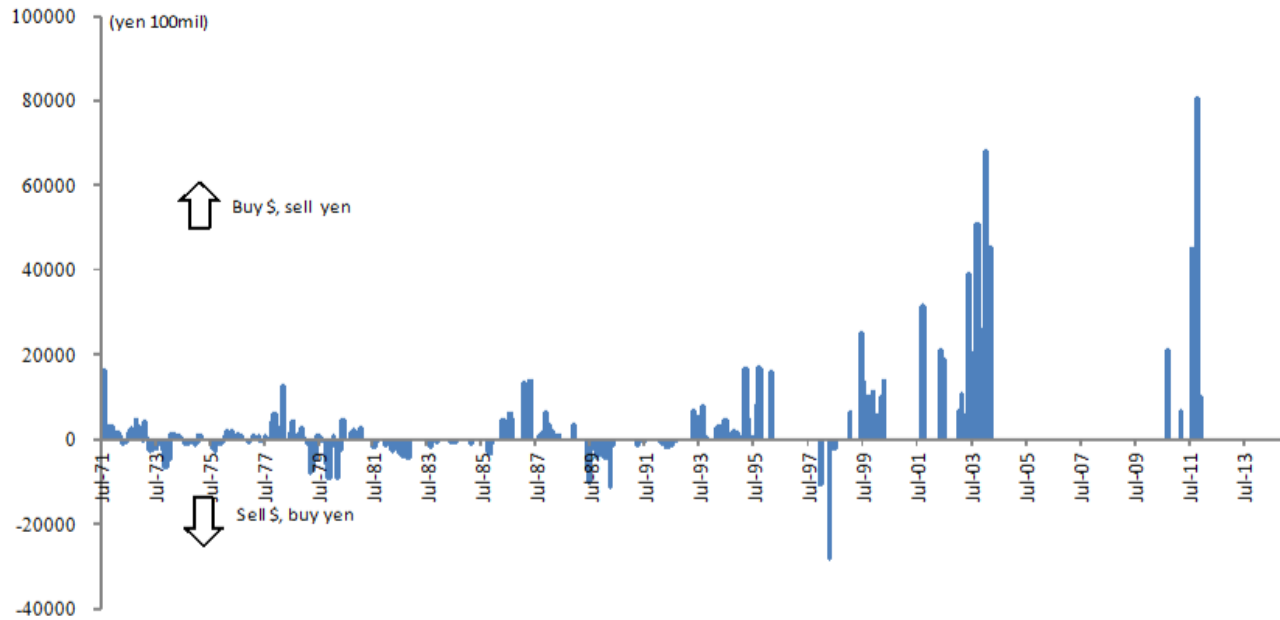   - Δe = g(X) + β(FXI)

Endogeneity and Data Frequency

- High-freq data (say, hourly data or at most daily data)

    - $FXI_t = f((e-e^*)_{t-1}, \Delta e_{t-1})$
    - $\Delta e_t = FXI_{t-1}$

- Monthly Data, this does not work

- Can instrumental variables solve this?

- C-N CHEN, T. WATANABE and T. YABU, (2012, JMCB)

(a) Yen/Dollar Exchange Rate

Japan, yen/USD (upper panel)
Intervention (lower panel)

(b) Amounts of Japananese Intervention

(yen 100mil)

Buy $, sell yen

Sell $, buy yen

Reaction Function: Exchange Rates → Intervention

- **Two variables are important (at least in Japan)**
  - **(e-e*), where e* is a long-run MA**
  - **⊿e**
- **Interventions are infrequent (lots of zeros)**
  - **Threshold regression; Tobit or Logit**

- **Ito, Takatoshi and Tomoyoshi Yabu, (2007, JIMF)**
  - Interventions are prompted when the exchange rate has deviated away from the equilibrium (long-run MA) and it has moved fast away from the equilibrium: a threshold regression
- **Ito, Takatoshi** (2003: in Mizen ed.)
  - Description of when the intervention is likely to occur and how the effectiveness should be measured

Effectiveness: Intervention → Exchange Rate

- Example. Fixed exchange rate $\Delta e = 0$, is a success of intervention, Hong Kong
  - Btw, if the LHS is log(e) like eq. (1), then a constant term should explain all for HK
- Interventions are very frequent or very infrequent (NZ, Japan after 2004.04)
- So, intention of the authorities and counter-factual is important
  - (a) Intervention to reverse the trend
  - (b) Intervention to smooth the change
  - The coefficient will have an opposite sign, depending on (a) & (b)
  - Counter-factual. What if there had not been interventions
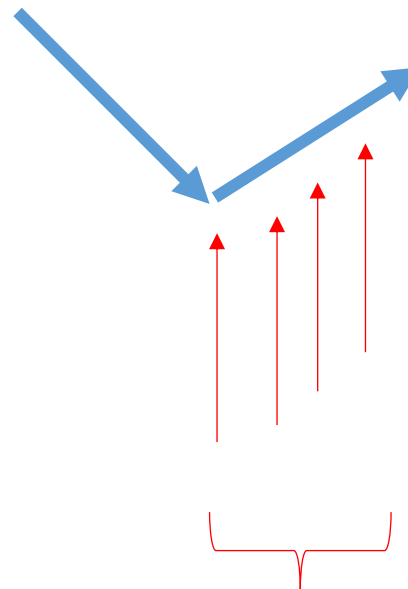- **Ito, Takatoshi, (2007, IJFE)**

Intention/result of interventions
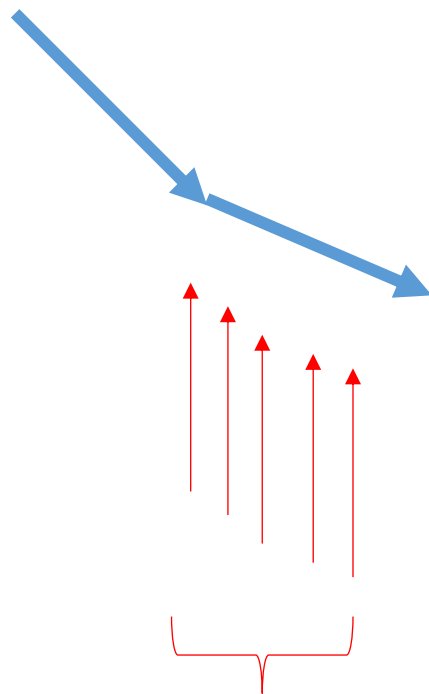
Intend to slow down

Intend to reverse the direction

Intervention

Intervention

Ito, Takatoshi (2003: in Mizen ed.)

Data

- Intervention
  - Daily data: Japan, US, Germany, Italy, Swiss, Australia, Turkey, Mexico
    - Source: FRED
  - Monthly data: Need PROXY: Δ（Forex Reserve）
    - NOT GOOD proxy
    - Source: IMF, SDDS
  - For the signaling channel the difference is large
- IR=ForexR + Gold + SDR + IMF + Other
- ForexR = SEC + DEPO
- **Dominguez, K.; Hashimoto, Y. and Ito, T., (2012, JIE)**

Define the sum of changes in Gold, SDRs, IMF reserves, and Other, as non-currency reserves (NonCR). Then,

$$IR = SEC + DEPO + NonCR. \tag{4.2}$$

$$\Delta IR = r^s \cdot SEC + r^d \cdot DEPO + \Delta SEC + \Delta DEPO + \Delta NonCR. \tag{4.3}$$

The $\Delta SEC + \Delta DEPO$ from period t to $t+1$ are the sum of the purchases and sales (Δ^{PS}) of reserve assets and valuation changes (Δ^{val}). We define the valuation changes as the *passive* component of foreign currency reserve management, while purchases and sales are the *active* component. We categorize these purchases and sales as "active management" because they are made at the discretion of authorities; they may be made for investment purposes, precautionary reasons, or for the purpose of influencing exchange rates. In equations:

$$\Delta IR = r^{s}SEC + r^{d}DEPO + \Delta SEC + \Delta DEPO + \Delta NonCR$$
$$= r^{s}SEC + r^{d}DEPO + \Delta^{PS}SEC + \Delta^{PS}DEPO + \Delta^{val}SEC + \Delta^{val}DEPO + \Delta NonCR$$

Interest income	Active management including intervention	Passive Management (valuation changes)	Changes in Gold, SDRs, IMF, and Other

$$\tag{4.4}$$

Why the ratio to GDP?

- The absolute amount to daily (monthly) turnover is a better measure
  - Use export and imports and capital flows as a proxy for the turnover

- Recommend: Separate regressions for the advanced countries (13) and EM countries (39)

Econometrics

- Is log(Exch R) stationary?
    - (ft 19, p.7) says yes
    - But, I have a double when I see the coeff. Of the lagged dependent variable is 0.97
    - Not rejecting one series for a unit root test does not prove it is stationary
- → Take the first difference
- Theory: The interest rate differential influences the change in the exchange rate, NOT the level of the exchange rate – interest rate parity
- Theory: When Intervention {0,0,1,0,0}
    - If the LHS is level log(e) then the level automatically goes back to the "before" level (except for coeff on log (e_{t-1})
    - If the LHS is $\triangle$log(e) then the intervention effect is permanent (given that the exchange rate follows a random walk
- Is the error term a white noise?

Instruments

- $logER\{t\} = \alpha y\{t-1\} + \gamma FXI\{t\} + \delta X\{t\} + \varepsilon\{t\}$
- $FXI\{t\} = a + b\ logER\ \{t-1\} + xZ\{t\} + dX\{t\} + v\{t\}$

- Is $\varepsilon\{t\}$ really a white noise?
- If not, and $\varepsilon\{t\} = \rho\varepsilon\{t-1\} + w\{t\}$）
- If Z{t} contains variables of t-1, then Z{t} and ε{t-1}has a correlation. Z{t} includes lagged trade balance、lagged gross (net) international reserved relative to GDP。

Instruments

- J Test(over-identifying restriction test) does not guarantee instrument exogeneity
  - Accepting the null does not guarantee …
- Weak instrument?

Suggestions

- [Intervention data] Follow the Dominguez, Hashimoto and Ito method to extract a best proxy
- [How good is a proxy] Test of proxy: compare your proxy to true intervention; and try the same method with a country where intervention data are disclosed, like Japan
- [Reaction function] Think when the authorities tend to intervene and use it in specification
- [LHS variable] For several reasons, the first difference is better than the level
- [Adv vs EM] Separate regressions for the advanced countries and EM countries

References

- **Ito, Takatoshi** (2003), "Is Foreign Exchange Intervention Effective?: the Japanese experiences in the 1990s" in Paul Mizen (ed.), *Monetary History, Exchange Rates and Financial Markets*, Essays in Honour of Charles Goodhart, Volume 2, CheltenhamU.K.; Edward Elgar Pub. 2003: 126-153. [NBER working paper no. 8914, April 2002]

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- **Dominguez, Kathryn; Hashimoto, Yuko; and Ito, Takatoshi, (2012)** "International Reserves and the Global Financial Crisis" *Journal of International Economics,* vol. 88, issue 2, November: 388-406.

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- **Ito, Takatoshi, (2007).** "Myths and reality of foreign exchange interventions: An application to Japan", *International Journal of Finance & Economics,* Volume 12, Issue 2, April 2007: 133-154.