The Effects of Foreign Exchange Intervention Using Intraday Data: Evidence from Peru

Marylin Choy, Erick Lahura and Marco Vega

Discussion: Cartagena, 30 November 2012

by Paolo Vitale

Ud'A

Overview

- Contribution: Provide analysis of CB intervention in Peruvian FX spot market.
  - ⋆ Describe the local FX market structure.
  - ⋆ Discuss mechanisms and motives of FX intervention.
  - ⋆ Propose estimation of VAR model for FX intervention and exchange rate dynamics.
- Comments: Paper interesting (analysis and results are clear)
  - ⋆ The identification restrictions for the VAR model are strong.
  - ⋆ Alternative ways to deal with reverse causality are available.
  - ⋆ Asymmetry of FX intervention needs analysis: could it suggest a different reaction function?

The Peruvian FX Market and CB Intervention

- FX market:
    - ⋆ Small size, most transactions are spot.
    - ⋆ Electronic limit book trading platform: trades are anonymous.
- Intervention is fully sterilized and aimed at reducing exchange rate volatility.
- Intervention is announced; details are published ex-post.
- Questions/Comments:
    - ⋆ What is the timing of sterilization? Could it suggest a different frequency for the analysis?
    - ⋆ What is the accuracy of the timing of the intervention data?
    - ⋆ Are intervention and market operations kept distinct?
    - ⋆ What about some descriptive statistics?

The Econometric Analysis

- Three-variate VAR model of spot return, r_t, purchase, P_t, and sale interventions, S_t:

$$\text{for } \mathbf{z}_t \equiv (r_t, P_t, S_t)' \quad \mathbf{A}\mathbf{z}_t = \mathbf{B}(L)\,\mathbf{z}_{t-1} + \epsilon_t\,.$$

- The VMA representation, $\mathbf{z}_t = \sum_{i=0}^{\infty} \mathbf{\Phi}(i)\,\epsilon_{t-i}$, is identified by imposing long-run restrictions, among which:
  - ⋆ Purchase intervention innovations, ϵ_t^P, have *no* permanent impact on the spot rate, $\sum_{i=0}^{\infty} \phi_{1,2}(i) = 0$.
  - ⋆ Sale intervention innovations, ϵ_t^S, have no permanent impact on the spot rate, $\sum_{i=0}^{\infty} \phi_{1,3}(i) = 0$.

Results

- Coefficients are as expected:
  - ⋆ Intervention innovations, ϵ_t^P and ϵ_t^S, have a *significant* impact on the spot rate.
  - ⋆ Sale interventions have a *larger* impact on the spot rate than purchase interventions.
  - ⋆ CB leans against the wind: a positive (negative) spot rate innovation, $\epsilon_t^r > 0$ ($\epsilon_t^r < 0$), generates official sales of USDs.
- Questions/Comments:
  - ⋆ What is the estimated impact of sale and purchase interventions on the spot rate?
  - ⋆ What about testing the individual long-run restrictions?

Portfolio-balance Effect and Signaling Channel

- Long-run restrictions contradict the the portfolio-balance effect and signaling channels of transmission of FX intervention.
- Assume $e_t = E\left[e_{t+1} \mid \Omega_t\right] + \left(i_t - i_t^*\right) + \rho_t$.
- As the information set contains intervention data, I_t,

$$e_t = \sum_{j=0}^{T-1} E\left[\left(i_{t+j} - i_{t+j}^*\right) + \rho_{t+j} \mid I_t\right] + E\left[e_T \mid I_t\right].$$

  - ⋆ If domestic and foreign assets are imperfect substitutes larger risk premia, ρ_{t+j}, are imposed to absorb FX purchases.
  - ⋆ If assets are perfect substitutes, FX intervention can signal future interest rates, $i_{t+j} - i_{t+j}^*$, or long-run spot rates, e_T.

The Portfolio-balance Effect Channel

- Dominguez and Frankel (I993a) and Gosh (1992) show that FX intervention presents a significant impact on risk-premia.
- Breedon and Vitale (2011) show that the strong contemporaneous correlation between order flow and exchange rates in the inter-dealer FX market is due to the portfolio-balance effect.
- The dimension of the Peruvian financial markets could mean the portfolio-balance effect is sizeable for the USD/PEN cross.

The Signaling Channel

- Payne and Vitale (2003) show that intervention operations have a much bigger impact on spot rates than market operations.
- Dominguez and Frankel (1993c) show that intervention operations affect market expectations of future spot rates.
- Lewis (1995), Kaminsky and Lewis (1996) show that intervention operations convey information on future monetary policy.
- Leahy (1995), Sweeney (2000) and Ito (2002) show that FX intervention is profitable.

Non-structural Analysis: An Event Study Approach

- Because of high frequency, simultaneity less of an issue.
- Apply an event study approach:

$$r_t = \alpha + \sum_{i=-k}^{k} \beta_j I_{t-j} + \sum_{i=1}^{m} \gamma_i r_{t-i} + \epsilon_t \,.$$

  - ⋆ Main advantage: the absence of identification restrictions.
  - ⋆ Main drawback: the reverse causality from r_t to I_t which may bias downward the estimated impact of FX intervention.

Structural Analysis: A VAR model à la Hasbrouck (1991)

- Because of high frequency, reverse causality only via lag terms.
- Identify the VAR model, $\mathbf{A}\mathbf{z}_t = \mathbf{B}(L)\mathbf{z}_{t-1} + \epsilon_t$, via Hasbrouck restrictions: $a_{2,1} = a_{3,1} = 0$ and $\text{Var}[\epsilon_t]$ diagonal.
  - ⋆ Main advantage: no long-run restrictions are required.
  - ⋆ Main drawback: the timing of intervention may be triggered by short-term spot rate movements.
- Hasbrouck's identification is appropriate for tick-by-tick data.
- To capture the contemporaneous feedback effect of r_t to I_t one should use instruments (Danielsson and Love (2006)).

A Structural Model à la Kearns and Rigobon (2005)

- Define a threshold model for FX intervention:

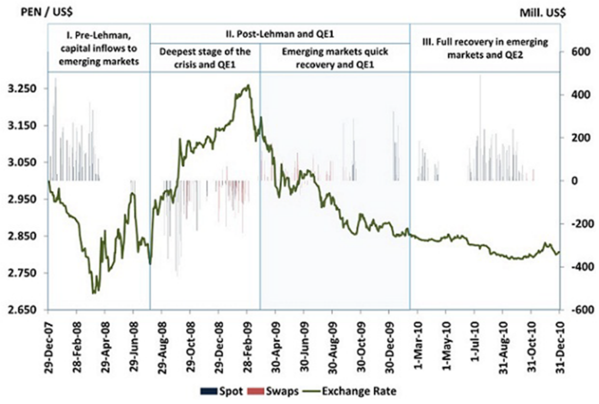
$$
\begin{aligned}
r_t &= \beta I_t + \gamma y_t + \epsilon_t^r \,, \\
I_t &= \mathcal{I}(\mid I_t^* \mid > \bar{I}) I_t^* \,, \\
I_t^* &= \lambda \, r_t + \theta y_t + \epsilon_t^I \,.
\end{aligned}
$$

- Identify it by assuming that the intervention reaction function shifts between *two* regimes (such as low and high $\bar{I}$):

$$
I_t = \begin{cases} (\mid I_t^* \mid > \bar{I}_l) I_t^* & t < \tau \\ (\mid I_t^* \mid > \bar{I}_h) I_t^* & t \geq \tau \end{cases} .
$$

- Could it be the case for Peru?

A model à la Kearns and Rigobon (2005) for Peru?



Does the CB policy shift from pure lean-against-the-wind (vis-a-vis a reference rate of 3) to a stabilizing one in the Spring of 2009?