Capital Flows and Foreign Exchange Intervention

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The Paper

- A micro-founded model of a SOE where the exchange rate is determined by capital flows.

- Study optimal monetary and FX intervention policies in response to exchange rate fluctuations driven by capital flows.

- An explicit, formal, micro-founded treatment of the costs (and benefits) of FX interventions.

FX interventions – Conventional or Unconventional Policy?

- The short interest rate is the main instrument at the disposal of central banks. Should central banks use additional tools in normal times?

- If the source of fluctuations is a "capital flow shock", FX intervention is the "natural" tool.
  - Should the CB use also the interest rate (and why)?

- How can we tell that the source of exchange rate fluctuations is a "capital flow shock"? What if it's not?

FX interventions: the natural instrument in response to "a capital flow shock"

$$\mathbb{L} = \frac{1}{2} \int_0^\infty e^{-\rho t} \left(\phi_x \hat{x}(t)^2 + \phi_\lambda \lambda(t)^2 + \phi_\pi \pi_H(t)^2 + \phi_y y(t)^2 \right) dt$$

$$\phi_x = 2\gamma(2-\alpha)(1-\beta) \quad \phi_\lambda = \alpha(1-\alpha)^2 \quad \phi_\pi = \frac{\epsilon}{\kappa}(1-\alpha) \quad \phi_y = (1-\alpha)(1+\varphi)$$

β=0.995

$$d\lambda(t) = -\gamma \left(\hat{a}(t) + \hat{f}_H^*(t) - \hat{x}(t) \right) dt$$

Excess return on domestic bonds (the deviation from pure UIP).
A function of the demand for domestic bonds.

Capital flows and FX intervention

- The direct effect of the capital flow shock is on $(d)\lambda$ – the excess return on domestic bonds (achieved through the nominal exchange rate).

- The CB can completely offset the f^* shock (by setting $x = f^*$)
  - hence avoid the resulting loss in terms of λ^2, π_H^2 and y^2.

- More generally, by purchasing FX the CB can reduce λ^2 (hence also π_H^2 and y^2) but increase x^2. The extent to which this is desirable depends on the coefficients in the loss function.

Costs of FX intervention

- Costs of FX interventions stem from the fact that by buying foreign bonds the CB moves the return on foreign bonds down.

- Costs depend on β – the share of domestic intermediaries.

- If β=1 there are no costs since CB's losses are also domestic intermediaries' (hence domestic households') gains. In this case, full absorption of the flows is optimal. No need to use the interest rate.

- In the calibration β=0.995.

- FX intervention the natural tool against a capital flow shock. The use of the interest rate in addition to FX purchases is needed to the extent that intervention is costly.

What drives capital flows?

- "Capital flow shocks" – "shocks to foreign investors demand for domestic assets" – the exogenous driver of everything in the model.

- Much of the flows of capital in recent years where understood against the background of economic developments in the source and recipient countries.

E.g. : *"The main goal of the Bank of Israel's policy regarding foreign exchange market intervention is the moderation of the overvaluation deriving from current global economic conditions and the very accommodative monetary policy worldwide."* (BoI Monetary Policy Report for the second half of 2016)

Implications for optimal policy?

- FX intervention – optimal response tailored to a specific shock?
- What if capital flows/FX fluctuations are a by-product of other types of shocks?
- Optimal policy given uncertainty w.r.t. the source of foreign exchange fluctuations?
- Identification of shocks/Robustness w.r.t. the shocks?
- Related: results in the empirical part.

- Example: in the model, λ is also the wedge between domestic production for domestic consumption and for exports:

$$\lambda\left(t\right) = c_H\left(t\right) - c_H^*\left(t\right)$$

- Optimal FX intervention may be guided by this wedge.

- More generally, changes in the composition of uses may be driven by other, more "fundamental" shocks. E.g., a shock to the demand for the economy's exports.

- Challenge to distinguish between "efficient" and "inefficient" fluctuations.

Empirical Evidence (VAR)

- Evidence of the effects of a portfolio flow shock.
- Use an equity volatility index as a proxy for foreign demand for Swiss assets.
- In the VAR, the risk aversion shock hurts also foreign output. An adverse global shock.
  - In the model: foreign variables not affected. Or we could expect a response in the opposite direction.
- Apparently not just fluctuations in foreign demand for Swiss assets.
- IRFs represent broader effects of global financial distress.
  - In particular, the decline in domestic output may be attributed to the decline in output in the EU.
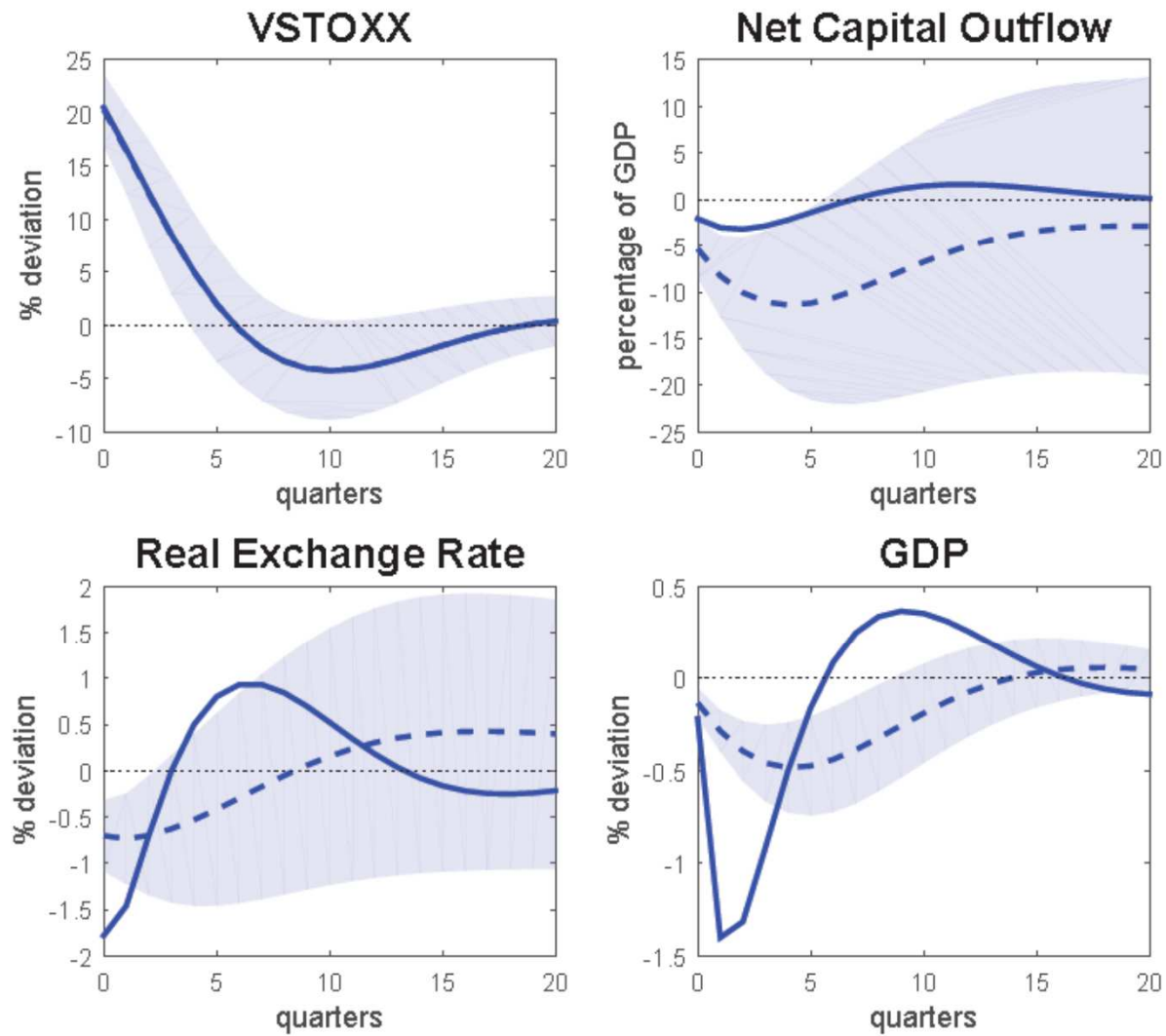
Figure 1: VAR-based Impulse Responses
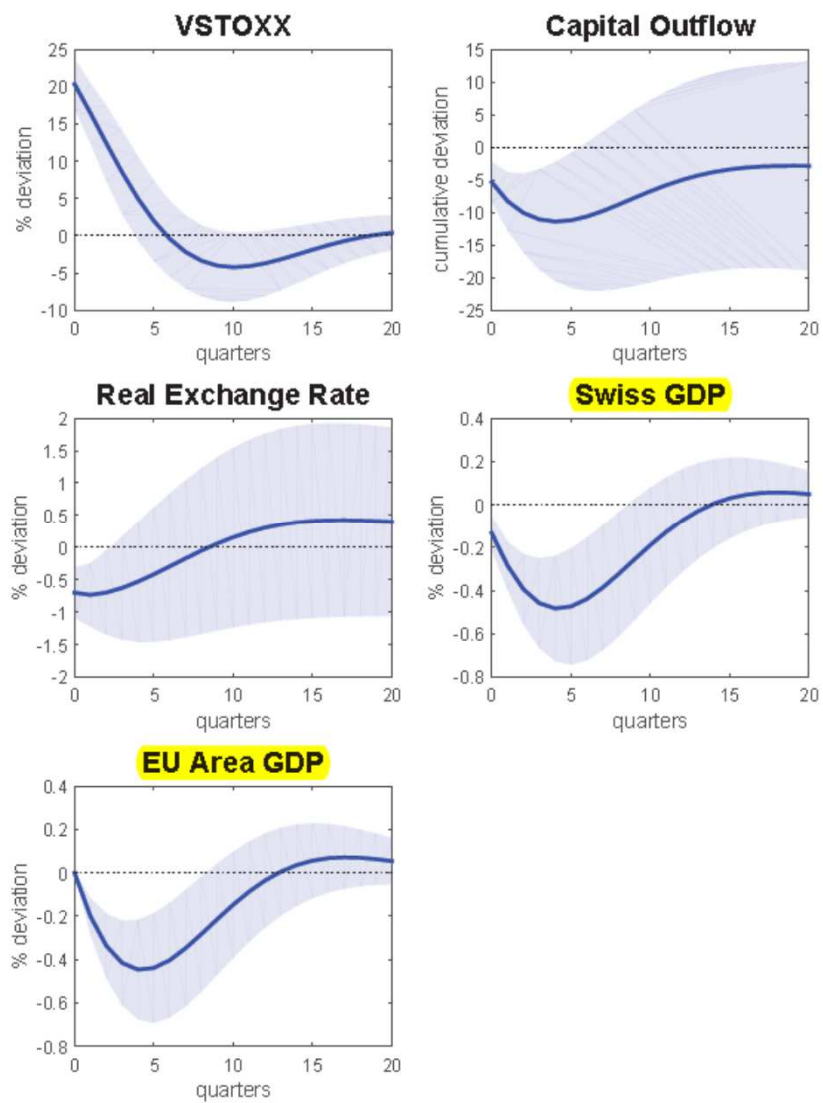
- Effects attributed to capital flows in the model may be too high?

- Implications for optimal FX intervention? Benefits of FX purchases may be overestimated?

[Compare to estimated cost: reserves close to 100% of GDP cost 0.25% of GDP per year.]

Figure 2: Model and VAR-based Impulse Responses

What domestic asset do foreign investors demand?

"Following an increase in the demand for domestic assets, the central bank increases their net supply…"

- In the model, the CB may supply the domestic asset foreign investors demand. (Short-term bonds are the only assets in the model.)

- But the FX market may be only part of the story…

- The CB may offset the effect of the capital flow shock in the FX market, yet the effects of the shock may be transmitted through the prices of other assets.
    - E.g., a shock to the demand for long-term government bonds.

- CB's capabilities in accommodating capital flows may be more limited.

Endogenous capital flows?

- FX purchases by the CB induce an expected appreciation of the domestic currency.

- This may attract more capital flows…

- Requiring more purchases…

- Exacerbating the costs for the CB.

- Implications for optimal policy?

Thank you

Nominal exchange rate fluctuations have real effects even when prices are flexible

- The financial friction matters. Not just "an exchange rate shock."
- The change in the nominal exchange rate must generate an expected excess return on foreign assets.
- If nominal prices adjust so that the terms of trade is preserved, and the nominal interest rate adjusts so that the real interest rate is untouched, then there won't be an excess return on foreign assets…