Discussion of “Exchange Rate Policies at the Zero Lower Bound” by Amador, Bianchi, Bocola, Perri

Marco Del Negro
Federal Reserve Bank of New York

SNB-IMF Conference on “Exchange Rates and External Adjustment” Zurich, Switzerland; June 2016

Disclaimer: The views expressed are ours and do not necessarily reflect those of the Federal Reserve Bank of New York or the Federal Reserve System
How Timely!

Swiss central bank confirms FX intervention after Brexit

12 Hours Ago

REUTERS

- Definitely a timely paper – especially after yesterday’s events – and very appropriately presented at this conference!

- Alternative titles: “On the unpleasant consequences of Brexit for the Swiss National Bank” or “The analytics of the SNB predicament”
The Paper

- This (very nice) theoretical paper discusses the predicament in which a central bank finds itself when trying to **manage the exchange rate** in an environment featuring **limits to arbitrage** in international capital markets.

  - If nominal interest rates are **above** the ZLB, the central bank should not intervene in the FX market: It is either **bad or irrelevant** (the latter case when limits to arbitrage are small).

- If nominal interest rates are **at** the ZLB, the central bank is forced to intervene in the FX market: Then it’s in trouble: 1) it suffers balance sheet losses, and 2) it harms the domestic economy.
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→ it’s in trouble: 1) it suffers balance sheet losses, and 2) it harms the domestic economy.
Monetary Policy and the Central Bank’s Balance Sheet

- Title of the paper I was asked to discuss: “Sustainable exchange rates: currency pegs and the central bank’s balance sheet”
Monetary Policy and the Central Bank’s Balance Sheet

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• Central banks have their own balance sheet and if capital losses are such that it needs recapitalization from the fiscal authority, their independence may be at risk

• Hall and Reis (2013), Carpenter et al. (2013), Greenlaw et al. (2013) ... study the Fed’s balance sheet under various *exogenous* scenarios for interest rates

• Del Negro and Sims (2015) consider the *endogenous* response of monetary policy in a simple closed economy model (see Benigno and Nisticó, 2016):

\[
\text{Mkt value of assets - reserves} + \text{PDV seigniorage} = \text{PDV remittances}
\]
The Model

- Two period model, in which **domestic agents** want to consume today, but can only borrow in domestic bonds

- **Foreign agents** can invest in domestic bonds, and are happy to do so as long as these pay at least as much as foreign bonds, but only up to some amount (limits to arbitrage)

- **Central bank** sets the exchange rate (a given) and can intervene (buy foreign bonds)

- **Fiscal authority**: Ricardian equivalence (separation of budget constraints btw CB and FA is a bit of a side show in the current draft)

- LOP
The Model

- “Monetary” model – only in as much as quantities are expressed in nominal terms, and there is the ZLB – but the model is very “real”

... Why would the central bank try to manage the exchange rate otherwise?
The Model

- “Monetary” model – only in as much as quantities are expressed in nominal terms, and there is the ZLB – but the model is very “real”

- Not monetary in the New Keynesian sense – meaning deflation has real effects

- This is fine as it keeps the model very clean and simple, and is not necessary to understand the mechanism – but some nominal rigidities must be at work in the background

- ... Why would the central bank try to manage the exchange rate otherwise?
This lemma shows that there are only two possible equilibrium outcomes. The cases are shown in Figure 1.

Panel (a) corresponds to the case when there is enough foreign wealth to cover the difference between the endowment $\tilde{y}_1$ and the first period level of first-best consumption, $c_{fb1}$. In this case, the domestic real rate equals the foreign one, and the first-best consumption allocation, point A, is the unique equilibrium outcome.

Panel (b) illustrates the case when the wealth is not enough to reach the first period level of first-best consumption from the endowment $\tilde{y}_1$, that is $c_{fb1} - \tilde{y}_1 > \bar{w}$. Competition for these limited external resources results in a higher domestic real interest, which is a rent for foreign investors.

Note that the equilibrium point in this case, point B, lies strictly within the feasibility frontier for the small open economy, as the domestic interest rate is higher than the foreign one, and the country is a borrower. Given point $(\tilde{y}_1, \tilde{y}_2)$, consumption in the first period is determined by $\tilde{c}_1 = \tilde{y}_1 + \bar{w}$, while consumption in the second period, $\tilde{c}_2$, is such that the budget line with slope $1 + r$ is tangent to the utility function. As we discussed above, there is only one such $\tilde{c}_2$.

As in Fanelli and Straub (2015), another way of representing the losses faced by domestic households is to rewrite the intertemporal budget constraint solving out for foreign reserve holdings, using that $a^\star (r - i^\star) = \bar{w} (r - i^\star)$ together with the market clearing condition, which is related to Costinot et al. (2014), who emphasize the benefits of interest rate manipulation for a large country.

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• $i = -0.75\%$ (1 year, CHF) and $i^* = -0.62\%$ (1 year, Germany), but $\pi \sim 0\%$ while $\pi^* \sim 1.3\%$

• LOP does not quite hold ...


Monetary Economy – No ZLB

\[ (\tilde{y}_1, \tilde{y}_2) \]

\[ (y_1, y_2) \]

\[ F \left( \frac{r - i^*}{1 + r} \right) \]

\[ (\tilde{y}_1, \tilde{y}_2) \]

\[ (y_1, y_2) \]

\[ F \]

\[ 1 + i^* \]

\[ 1 + r \]

\[ c_1 \]

\[ c_2 \]

- Intervention is bad (borrow at \( r \) to invest at \( i^* \)) or irrelevant

- If \((1 + r) \frac{s_2}{s_1} > 1 \) → Exchange rate policy is (almost) neutral
## SNB Assets

### Table of SNB Assets

<table>
<thead>
<tr>
<th>Period</th>
<th>Gold holdings and claims from gold transactions</th>
<th>Foreign currency investments</th>
<th>Reserve position in the IMF</th>
<th>International payment instruments</th>
<th>Monetary assistance loans</th>
<th>Claims from CHF repo transactions</th>
<th>Claims from USD repo transactions</th>
<th>Balances from swap transactions against CHF</th>
<th>Domestic money market claims</th>
<th>Secured loans</th>
<th>Amounts due from domestic correspondents</th>
<th>CHF securities</th>
<th>Loan to stabilisation fund</th>
<th>Changes in international reserves</th>
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### SNB Liabilities

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<th>Other assets</th>
<th>Liabilities</th>
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<td>Total</td>
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<td>584,212.2</td>
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<td>573,294.0</td>
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<td>2015-07</td>
<td>596,703.3</td>
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<td>2015-08</td>
<td>605,550.6</td>
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<td>613,933.0</td>
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<td>2015-10</td>
<td>620,824.9</td>
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<td>2015-11</td>
<td>634,877.3</td>
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<td>2015-12</td>
<td>640,151.8</td>
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<td>2016-01</td>
<td>649,287.2</td>
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<td>2016-02</td>
<td>642,152.4</td>
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<tr>
<td>2016-03</td>
<td>646,378.6</td>
</tr>
<tr>
<td>2016-04</td>
<td>668,578.1</td>
</tr>
</tbody>
</table>

- Intervention financed via **interest bearing** reserves!
Monetary Economy – At ZLB

- If \((1 + r) \frac{S_2}{S_1} < 1\), if the CB keeps the same \(\frac{S_2}{S_1}\) objective it **has to** intervene in order to raise the real rate \(r\).

- CB forced to take **balance sheet losses** \(F(1 - (1 + i^*) \frac{S_2}{S_1})\).
Monetary Economy – At ZLB

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- In the model the fiscal authority recapitalizes the CB in the second period. What if it does not, that is, the CB is on its own?
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• Negative rates are a good idea – \(r\) has to increase less
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• Negative rates are a good idea – \(r\) has to increase less

• Naive question: How about \(\frac{S_2}{S_1} \uparrow\)?
Conclusions

• Nice paper!