Did QE Unleash a Monetary Tsunami?
An Exchange Market Pressure Approach

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Impact of QE on EMs
Main channels of adjustment are...

1. Allowing exchange rate movement, $\Delta e_t$
2. Central bank intervention, $I_t$
3. Interest rate changes, $\Delta(i_t - i_t^*)$
4. Capital controls
Exchange rates appreciated for some time

Nominal exchange rates, Indexed to 100 in 2006
Many EM central banks intervened

Foreign exchange reserves

USD Billion

Korea
India
Brazil
Mexico
Thailand
South Africa
EM Average
Initially, they cut interest rate

EM treasury bill rates, 3M to 6M
Not all EMs imposed capital controls

**Chinn-Ito Score**

<table>
<thead>
<tr>
<th>Year</th>
<th>Chile</th>
<th>Brazil</th>
<th>Mexico</th>
<th>Thailand</th>
<th>Egypt</th>
<th>EM Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
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<td>2009</td>
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<td>2010</td>
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<td>2011</td>
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What was the overall impact?

- Some appreciation, some intervention and some rate cuts...how do they add up?
- We need a measure that combines the effect on exchange rates, reserves and interest rate
- We use a measure of exchange market pressure (EMP) that is comparable across countries and across time.
Unit consistent exchange market pressure measure

- **Counterfactual**: EMP measures the change in the exchange rate that takes place, or would have taken place, had it not been for intervention or interest rate changes.
- **Units**: Change in the exchange rate.
- **Challenge**: Measuring the change in the exchange rate that was prevented by intervention.
- **Estimation**: Effectiveness of intervention on the exchange rate market depends on the size of its foreign exchange market.
- **Assumption**: The impact of interest rate changes on the exchange rate depends on the openness of financial markets.
Measuring exchange market pressure

- The EMP is measured as:

\[ \text{EMP}_t = \Delta e_t + \rho_t l_t + \eta_t \Delta (i_t - i_t^*) \]

- where \( \Delta e_t \) is the *percentage change in the exchange rate*
- \( l_t \) is the intervention measured in billion dollars
- where \( \rho \) is the *change in the exchange rate associated with $1 billion of intervention*
- \( \eta_t \) is the percentage change in exchange rates caused by a one percent change in the interest differential
- \( \Delta (i_t - i_t^*) \) is the change in the interest differential between domestic and foreign interest rates
- All quantities on the right hand side are measured in units of percentage change of the exchange rate.
QE led to appreciation pressure for EMs. But it was short-lived...
### Table: EM response to EMP after QE

<table>
<thead>
<tr>
<th>EMP absorbed by</th>
<th>Share (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate</td>
<td>41</td>
</tr>
<tr>
<td>Intervention</td>
<td>53</td>
</tr>
<tr>
<td>Interest rates</td>
<td>6</td>
</tr>
</tbody>
</table>
What lies ahead?

• The US Fed has to start tightening sooner or later.
• Two possibilities:
  • Markets have already factored in tapering?
  • Another round of high volatility?
Capital Flows to EMs have fallen
Capital Flows and output: Correlation

![Graph showing G-20 Emerging: Net Capital Inflows and Growth

Real GDP growth (percent; yoy; sa) vs. Net capital inflows (percent of GDP; 4-quarter moving average)

Sources: IMF, Balance of Payments Statistics; and IMF staff calculations.](image-url)
Capital Flows and output: Causation?

- EM forecasts for growth have declined due to structural and cyclical problems.
- Will a decline in capital flows hurt growth?
- What are the channels?
- Balance sheet effects, inflationary expectations, macro vulnerabilities.
Balance Sheet Effects: Mexico

Mexico: Financial Indicators of the Corporate Sector
(in percent)

- On-balance sheet currency mismatches
- Share of short term liabilities (RHS)
- Leverage (RHS)

Source: IMF staff estimates based on data from Economatica.
Poorly Anchored Expectations?

- Then, depreciation leads to inflation
- Implication: increase in i, compared to baseline
- Key: are expectations generally fragile?
Inflation Expectations

Inflation Expectations, 5-year
(percent)

Sources: Consensus Forecasts; and IMF, World Economic Outlook.
1/ Data in Apr. 1996 for Russia and Turkey is from the May 1996 WEO.
Macro Vulnerabilities?

Key EMs Under Pressure Today vs. 1997 Asian Financial Crisis EMs (percent)

Sources: IMF, World Economic Outlook, April 2013.
1/ Indonesia, Korea, Thailand, Malaysia, and Philippines. Data shown for 1996.
2/ Brazil, Indonesia, India, Turkey, and South Africa. Data shown for 2012.
This time is different

- EM world has changed since the 1990s
- Many central banks target inflation
- Exchange rates are largely floating
- Macro stability has improved
- Low unheded currency exposure
Capital outflows a serious problem when...

- Fx debt exposures significant
- Inflation expectations poorly anchored
- Macro vulnerabilities
- Conditions now less prevalent
- Policy response can be very different.
- Less need to increase i
- More scope for depreciation
- Can decumulate some reserves
Thank you.