Uncertainty Betas and International Capital Flows
by Francois Gourio, Michael Siemer and Adrien Verdelhan

Discussion by: Fabrizio Perri
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The general research question

- What are the effects of volatility shocks in an open economy?
- In particular what are the effects on capital flows?
Outline

- On the empirical exercise
- On the model
- On gross v/s net capital flows
Uncertainty betas v/s relative volatility

• The paper estimates $\sigma_{it} = \beta_i \sigma_{wt} + \epsilon_{it}$

• Shocks to global volatility ($\Delta \sigma_{w}$) induce country specific volatility changes

• In high $\beta$ countries volatility increases relative to low $\beta$ countries, by $(\beta_H - \beta_L) \Delta \sigma_{w}$

• Why not focus on relative volatility (i.e. $\sigma_i - \sigma_w$) directly? (except for the fact that uncertainty betas sounds cool)
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Advantages of using relative volatility

- If idiosyncratic variations in volatility (i.e. $\varepsilon_{it}$) are large, empirical exercise misses some informative variation.
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• Might argue $\beta$'s pick up “exogenous" variation in volatility; not necessarily the case as some relative volatility is incorporated in $(\beta^H - \beta^L) \Delta \sigma_w$

• Asian countries during the 1997 crisis are high $\beta$: most likely causation runs from idiosyncratic Asian volatility to world volatility.
Figure 2: Uncertainty Betas—Country-level volatilities are obtained at the quarterly frequency as the standard deviations of daily real stock market returns over one quarter. Likewise, a measure of aggregate volatility is obtained from the MSCI world stock market index. For each country $i$, uncertainty betas are then obtained by regressing that country $i$’s stock market volatility on the world stock market volatility. The uncertainty betas, denoted $\beta_i$, are obtained on rolling window regressions of 20 quarters. The subscript $t$ on $\beta_i$ indicates that it is obtained on a time window that ends at date $t$, e.g. from period $t-20$ to $t$. 
Suggestion

- Repeat VAR exercise using shocks to relative uncertainty
- Should be easy enough to do
- Interesting regardless of the results
Main finding

- In response to an increase in domestic volatility:
  - Foreigners sell domestic assets
  - Domestic agents sell foreign assets
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  - Domestic agents sell foreign assets
  - Large and significant decline in gross positions
  - Small (non significant) net accumulation of FA by domestic
On the theory

- Why is there a decline in gross position?
- Model suggests not uncertainty per se driving portfolio shifts; rather asset taxes that respond to uncertainty
- Key element: domestic residents not subject to taxes, but foreign agents are
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An alternative model?

- Households exposed to labor income risk, correlated with domestic asset risk; can buy domestic safe asset (bond), domestic and foreign risky asset

- Domestic risk increase -> foreigners reduce their share of domestic assets (immediate)

- If increase in labor income risk large enough, domestic agents reduce their share of foreign asset (in favour of safe): want reduce overall risk exposure

- Reduction in gross positions

- For foreign agents driven by reallocation within the risky portfolio, for domestic driven by flight to safety
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Why the alternative model?

- Complementary story for why both countries reduce their exposure to foreign assets
- More direct link between volatility and portfolio decision
On volatility and net positions

- Fogli and Perri (2014) focus on relation between relative volatility and net positions (imbalances)
- Main finding is that increase in relative volatility strongly associated with accumulation of foreign assets
Relative volatility and external imbalances
## Relative volatility and external imbalances

<table>
<thead>
<tr>
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<th>Dependent variable is Net Foreign Assets</th>
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<tbody>
<tr>
<td>Volatility of GDP Growth</td>
<td>19.70*** 16.94*** 16.89*** 17.36*** 14.59** 15.20*** 15.56***</td>
</tr>
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<td>(3.74) (4.91) (4.58) (5.87) (5.11) (4.97) (4.83)</td>
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<tr>
<td>Average GDP Growth</td>
<td>-11.78 -10.82 -12.08 -15.78* -10.44 -15.07 -22.90**</td>
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<td>(7.32) (7.34) (7.54) (8.22) (8.53) (9.22) (9.52)</td>
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<tr>
<td>Average Inflation</td>
<td>1.33 3.04 3.04 2.06 2.95 2.30</td>
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<td>(1.64) (2.06) (2.16) (2.22) (2.27) (2.55)</td>
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<tr>
<td>Volatility of Inflation</td>
<td>-0.07 -1.63 -1.19 -0.81 -1.43 -0.46</td>
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<td>(3.74) (3.61) (3.39) (3.38) (3.12) (3.29)</td>
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<tr>
<td>Volatility of Govm. Cons. Growth</td>
<td>-3.48 -6.17 -6.35 -5.01 -5.89</td>
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<td>(4.21) (4.77) (4.94) (4.85) (5.46)</td>
</tr>
<tr>
<td>Financial Openness 1</td>
<td>0.74 1.40 0.44 1.13</td>
</tr>
<tr>
<td></td>
<td>(3.81) (4.20) (4.56) (4.95)</td>
</tr>
<tr>
<td>Financial Openness 2</td>
<td>2.85 1.66 1.71 2.15</td>
</tr>
<tr>
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<td>(4.64) (4.04) (3.95) (3.93)</td>
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<tr>
<td>Trade Openness</td>
<td>-6.69 -5.91 -5.52</td>
</tr>
<tr>
<td></td>
<td>(7.01) (6.37) (6.57)</td>
</tr>
<tr>
<td>Share Young</td>
<td>1.25 1.36</td>
</tr>
<tr>
<td></td>
<td>(1.27) (1.30)</td>
</tr>
<tr>
<td>Share Old</td>
<td>-2.24 -2.04</td>
</tr>
<tr>
<td></td>
<td>(2.95) (3.01)</td>
</tr>
<tr>
<td>N</td>
<td>647 647 647 631 618 618 618</td>
</tr>
<tr>
<td>adj. $R^2$</td>
<td>0.820 0.824 0.824 0.828 0.806 0.814 0.819</td>
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All regressions include country and year fixed effects. Robust standard errors, clustered at the country level, in parentheses

* $p < 0.10, ** p < 0.05, *** p < 0.01$
What explains this relationship?

- Increase in domestic risk/volatility
- Domestic agents increase precautionary saving (more patient)
- Because domestic capital is more risky and has decreasing returns
  -> accumulate more foreign assets
Model’s impulse response to a volatility shock

- In simple (only net position), calibrated open macro business cycle model response quantitatively consistent with data
Why stronger effect of volatility on net positions?

- Different measure of volatility (GDP based v/s stock market based) possibly more connected with precautionary motive
Conclusions

• Interesting and clear paper
• Contributes to growing literature showing that risk/uncertainty/volatility important determinant of allocation of resources, especially in open, integrated economies