Discussion of How Important is the Global Financial Cycle (capital flows)

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2017
What is the Global Financial Cycle?

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  • Aspects of it analysed in Calvo et al. (1996), Forbes and Warnock (2012), Reinhart and Rogoff, Schularick and Taylor (2012), Bruno and Shin (2015)....

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• The Global Financial Cycle describes fluctuations in financial activity on a global scale.

• Like the Business Cycle, we study ups and downs, fluctuations and comovements of some variables (risk taking, credit, asset prices, capital flows, spreads, leverage) but on a global scale.
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- Like the Business Cycle, we study ups and downs, fluctuations and comovements of some variables (risk taking, credit, asset prices, capital flows, spreads, leverage) but on a global scale.

- There is a growing literature analysing drivers of financial cycles, amplification mechanisms, endogeneity of booms and busts on a global scale.
What is the Global Financial Cycle?

- Recent papers: Baskaya et al. (2017), Morais et al (2016), Bernanke (2016), Cerutti et al. (2016), Fahri and Werning (2016a,b), Caballero and Simsek (2016)...
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  - All capital flows should be highly correlated across all countries across all assets; high R2 when regressing flows on Fed Funds rate (mythical view).
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  - Transposed in Business Cycle literature would be: All investment flows in financial and physical assets should be highly correlated across sectors! High R2 when regressing investment flows on monetary policy rate!!!
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  - Transposed in Business Cycle literature would be: All investment flows in financial and physical assets should be highly correlated across sectors! High R2 when regressing investment flows on monetary policy rate!!!
- In theory, capital flows can but do not have to be the transmission channel of US monetary policy to the rest of the world (it can go through prices).
What does this paper do?

- It focuses on capital flows exclusively
- It runs a lot of regressions.
- It estimates common factors on capital inflows and outflows data (across advanced, emerging economies, type of assets, static, dynamic).
- It presents correlation matrices and simple panel regressions of flows on Fed Funds, factors, VIX etc... etc... etc...
- This is not big data, rather many different ways to cut the sample and estimate correlations.
What does this paper do?

- First part: Is there a global factor in flows?
What does this paper do?

• First part: Is there a global factor in flows?
• They estimate many, many factors based on different cuts of the data. Correlation matrices: low correlations.

• Second part: Are flows affected by “global variables”?
• Panel regressions of flows or factors on VIX, rates, etc...
• Authors measure magnitude of the potential effect using R^2.
• They are “low”.

• Conclusions: “Succintly, most variation in capital flows does not seem to be the result of common shocks nor stem from observables in a central country like the United States”.
• In other words: Exit the Global Flow Cycle and the effect of the US on it.
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Methodology

• First part: Is there a global factor in flows?
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- First part: Is there a global factor in flows?
- Is the methodology of the paper the right one for this question?

• We estimate a Dynamic Factor Model from a collection of world risky asset returns:

\[ \text{return} \ (i,t) = \text{common component} \ (t) + \text{idiosyncratic} \ (i,t) \]

• Using a set of restrictions on the coefficient matrices of the DFM we further decompose the common component in two:

\[ \text{common} \ (t) = \text{global factor} \ (t) + \text{regional factors} \ (t) \]

• Each return series is then the sum of three components:
  1. a global factor that is a common to all series in the set
  2. a region (or market) specific component common to many but not all series
  3. an idiosyncratic asset-specific component

• Formally:

\[ y_{i,t} = \mu_i + \lambda_{i,g} f^g_t + \lambda_{i,m} f^m_t + \xi_{i,t}. \]  

(1)
DFM for Risky Assets: Block Structure

- Let the variables in $y_t$ being univocally assigned to one of the $nB$ postulated blocks.
- Order them accordingly such that $y_t = [y^1_t, y^2_t, \ldots, y^{nB}_t]'$; then:

\[
y_t = \begin{pmatrix}
\Lambda_{1,g} & \Lambda_{1,1} & 0 & \cdots & 0 \\
\Lambda_{2,g} & 0 & \Lambda_{2,2} & & \\
& \vdots & \vdots & \ddots & 0 \\
\Lambda_{nB,g} & 0 & \cdots & 0 & \Lambda_{nB,nB}
\end{pmatrix}
\begin{pmatrix}
f^g_t \\
f^1_t \\
\vdots \\
f^{nB}_t
\end{pmatrix}
\] + $\xi_t$. 
Table: **Number of Factors**

<table>
<thead>
<tr>
<th>$r$</th>
<th>% Cov Mat</th>
<th>% Spec Den</th>
<th>Bai Ng (2002)</th>
<th>Onatski</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>$IC_p1$</td>
<td>$IC_p2$</td>
</tr>
<tr>
<td>(a) 1975:2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.662</td>
<td>0.579</td>
<td>-0.207</td>
<td>-0.204</td>
</tr>
<tr>
<td>2</td>
<td>0.117</td>
<td>0.112</td>
<td>-0.179</td>
<td>-0.173</td>
</tr>
<tr>
<td>3</td>
<td>0.085</td>
<td>0.075</td>
<td>-0.150</td>
<td>-0.142</td>
</tr>
<tr>
<td>4</td>
<td>0.028</td>
<td>0.033</td>
<td>-0.121</td>
<td>-0.110</td>
</tr>
<tr>
<td>5</td>
<td>0.020</td>
<td>0.024</td>
<td>-0.093</td>
<td>-0.079</td>
</tr>
<tr>
<td>(b) 1990:2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.215</td>
<td>0.241</td>
<td>-0.184</td>
<td>-0.183</td>
</tr>
<tr>
<td>2</td>
<td>0.044</td>
<td>0.084</td>
<td>-0.158</td>
<td>-0.156</td>
</tr>
<tr>
<td>3</td>
<td>0.036</td>
<td>0.071</td>
<td>-0.133</td>
<td>-0.129</td>
</tr>
<tr>
<td>4</td>
<td>0.033</td>
<td>0.056</td>
<td>-0.107</td>
<td>-0.102</td>
</tr>
<tr>
<td>5</td>
<td>0.025</td>
<td>0.049</td>
<td>-0.082</td>
<td>-0.075</td>
</tr>
</tbody>
</table>

**Notes:** For both sets and each value of $r$ the table shows the % of variance explained by the $r$-th eigenvalue (in decreasing order) of the covariance matrix of the data, the % of variance explained by the $r$-th eigenvalue (in decreasing order) of the spectral density matrix of the data, the value of the $IC_p$ criteria in [Bai, Ng (2002)] and the p-value for the [Onatski (2009)] test where the null of $r - 1$ common factors is tested against the alternative of $r$ common factors.
Global Factor in ASSET PRICES and Risk

Figure: Global Factor (bold line) and major volatility indices (dotted lines); clockwise from top left panel: US; EU; JP and UK. Source: Datastream, authors calculations.
Methodology: Global Factors

- First step: Specify model and test for the number of global factors.
- Second step: How much variance explained by each factor.
- For asset prices, Miranda Agrippino and Rey find that 1 global factor is a good representation of the data. This factor accounts for between 20% and 25% of the variance (852 variables). This is a lot.
- Cerruti et al. do not use this methodology:
  - Do not present an econometric model
  - Do not test for the number of global factors in capital flow data.
  - Do not present evidence on how much variance is explained by any of their factors.
  - No reason why there should be a high R2 when regressing capital flows on the global asset price factor.
  - A bit like regressing stock market index on some investment volume.
Methodology of the paper: bottom line

- Cerutti et al do not answer the following questions: Is there one (or 2 or 3) global factor in flows? How much of the variance does it (do they) explain?
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• So, is the Cerutti et al methodology of the paper the right one to estimate global factors in flows?
• Probably not.
• Second question Cerutti et al. ask: Are flows affected by “global variables”?
Effect of global variables on flows

- Paper regresses many measures of flows on Fed Funds rates and VIX and many other global variables.
- Finds low R2.
- Paper looks at correlation matrices between flows, factor estimated from flows and Fed Funds rates and VIX and many other variables.
- Finds correlations are low.
- Paper concludes: Neither US variables nor global variables are relevant to explain the Global Financial (Flow) Cycle.
- Let us apply their methodology to the Business Cycle....
Business Cycle

Figure: Correlations of changes in the Fed Funds rate and growth rate of GDP, consumption, investment, hours, wages and inflation.
**Business Cycle**

**Figure:** Correlations of changes in the Fed Funds rate and growth rate of GDP, consumption, investment, hours, wages and inflation.
Figure: Correlations of change in VIX and growth rate of GDP, consumption, investment, hours, wages and inflation.
Business Cycle

Figure: Correlations of change in VIX and growth rate of GDP, consumption, investment, hours, wages and inflation.
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Figure: Correlations of TFP and growth rate of GDP, consumption, investment, hours, wages and inflation.
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### Business Cycle

Figure: Effect of monetary policy, uncertainty and TFP on the business cycle.

<table>
<thead>
<tr>
<th></th>
<th>(1) infl</th>
<th>(2) inv</th>
<th>(3) gdp</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.ffr</td>
<td>0.182</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.218)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D.vix</td>
<td></td>
<td>-0.0483</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.102)</td>
<td></td>
</tr>
<tr>
<td>tfp</td>
<td></td>
<td></td>
<td>0.0469*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.0211)</td>
</tr>
<tr>
<td>_cons</td>
<td>0.499***</td>
<td>0.238</td>
<td>0.272***</td>
</tr>
<tr>
<td></td>
<td>(0.0214)</td>
<td>(0.220)</td>
<td>(0.0573)</td>
</tr>
<tr>
<td>N</td>
<td>109</td>
<td>109</td>
<td>110</td>
</tr>
<tr>
<td>adj. R-sq</td>
<td>-0.002</td>
<td>0.003</td>
<td>0.037</td>
</tr>
</tbody>
</table>

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001
Business Cycle: Conclusions

- Correlations low across the board. R2 low across the board.
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- Oh! wait...
Identification Strategy

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- Identifying US monetary policy shocks
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- Miranda-Agrippino and Rey: Bayesian BVAR with instruments: effects on standard macroeconomics and international financial variables (25 variables).
Monetary Policy and the Global Financial Cycle

- We estimate a Bayesian VAR (in levels) with 4 lags. Typical set of macroeconomic variables, including output, inflation, investment and labor data PLUS global credit, cross border credit flows, financial leverage, global factor in asset prices, term spread (25 variables)

- The monetary policy shock is identified using the effective federal funds rate as the instrument for monetary policy and (i) block-ordering the variables into slow-moving and fast-moving ones; (ii) using the Romer and Romer narrative approach as instrument (also experimented with high frequency instruments).
Response of domestic Business Cycle

**Figure:** Response of Business Cycle (% points) to a monetary policy shock inducing a 100bp increase in the Effective Fed Funds Rate.
Response of Global Credit, with and without US Domestic Credit

Figure: Response of Global Credit (% points) to a monetary policy shock inducing a 100bp increase in the Effective Fed Funds Rate.
Response of Global Credit and of Cross Border Credit

Figure: Response of Global Credit (% points) to a monetary policy shock inducing a 100bp increase in the Effective Fed Funds Rate.
Response of Banks Leverage in the US, Euro area, UK (GSIBs)

Figure: Response of Banking Sector Leverage (% points) to a monetary policy shock inducing a 100bp increase in the Effective Fed Funds Rate.
Conclusions

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Research Agenda

- Empirical work: Risk taking channel of monetary policy (Peydro et al.); Emerging markets and global financial cycle (Kalemli-Ozcan et al.); booms and busts: Jorda, Schularick and Taylor, Bruno and Shin, Borio; Krishnamurthy and Muir; global banks: Cetorelli and Goldberg (2009, 2010); capital flows (Fratzscher (2012), Forbes and Warnock (2014))

- Theoretical work: Bruno and Shin (risk taking and global banks); Laeven and Dell’Arricia; Mojon and Ragot, Farhi and Werning, Caballero Simsek (2017) (explaining gross flows); Coimbra and Rey (2017) (explaining endogenous risk build ups)

- Understanding better international channels of transmissions: time varying risk taking; frictions. We probably need models with heterogenous intermediaries.
BVAR results: Full Baseline