Who cares about the Chinese yuan?

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Motivation

Methodology

Results

Conclusion
Motivation
Motivation

- China’s international trade is large
- Export competitiveness
- The great chain of production
- Renminbi invoicing and trade settlement has been introduced
### Motivation: Renminbi and global imbalances

- **Global aggregate demand could change with revaluation**

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>Newly Industrialised Asia</th>
<th>Developing Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>0.05</td>
<td>0.15</td>
<td>0.12</td>
</tr>
<tr>
<td>2005</td>
<td>0.35</td>
<td>0.17</td>
<td>0.37</td>
</tr>
<tr>
<td>2008</td>
<td>0.74</td>
<td>0.14</td>
<td>0.71</td>
</tr>
</tbody>
</table>

Source: World Economic Outlook Database
Questions

1. Do East Asian currencies care about the renminbi?
2. Who else care about the renminbi?
3. How large is the renminbi’s influence?
Methodology
The exchange rate regression

Example:

\[
d \log \left( \frac{\text{MYR}}{\text{CHF}} \right) = \beta_1 + \beta_2 d \log \left( \frac{\text{USD}}{\text{CHF}} \right) + \beta_3 d \log \left( \frac{\text{GBP}}{\text{CHF}} \right) \\
+ \beta_4 d \log \left( \frac{\text{JPY}}{\text{CHF}} \right) + \beta_5 d \log \left( \frac{\text{DEM}}{\text{CHF}} \right) + \epsilon
\]
Difficulty with the renminbi

Example:

\[
d \log \left( \frac{\text{MYR}}{\text{CHF}} \right) = \beta_1 + \beta_2 d \log \left( \frac{\text{USD}}{\text{CHF}} \right) + \beta_3 d \log \left( \frac{\text{GBP}}{\text{CHF}} \right) + \beta_4 d \log \left( \frac{\text{JPY}}{\text{CHF}} \right) \\
+ \beta_5 d \log \left( \frac{\text{DEM}}{\text{CHF}} \right) + \beta_6 d \log \left( \frac{\text{CNY}}{\text{CHF}} \right) + \epsilon
\]
Addressing multicollinearity

\[ d \log \left( \frac{\text{CNY}}{\text{CHF}} \right) = \gamma_1 d \log \left( \frac{\text{USD}}{\text{CHF}} \right) + \epsilon \]

We term \( \epsilon \) from this regression as \( d \log \left( \frac{\text{CNY}_0}{\text{CHF}} \right) \).
Orthogonalised Renminbi

Squared weekly returns of Orthogonalised CNY
Augmented exchange rate regression

Example:

\[
d \log \left( \frac{\text{MYR}}{\text{CHF}} \right) = \beta_1 + \beta_2 d \log \left( \frac{\text{USD}}{\text{CHF}} \right) + \beta_3 d \log \left( \frac{\text{GBP}}{\text{CHF}} \right) + \beta_4 d \log \left( \frac{\text{JPY}}{\text{CHF}} \right) \\
+ \beta_5 d \log \left( \frac{\text{DEM}}{\text{CHF}} \right) + \beta_6 d \log \left( \frac{\text{CNY}}{\text{CHF}} \right) + \epsilon
\]
Problem of structural change

- Role of currencies change over time
- The inferential framework used to study structural break as in Zeileis, Shah and Patnaik (2010).
Example: Three cases

1. Known US dollar peg: Hong Kong
2. *De jure* CNY watcher: Malaysia
3. Large emerging market: India
### Example: Hong Kong

<table>
<thead>
<tr>
<th>Start date</th>
<th>End date</th>
<th>$R^2$</th>
<th>USD</th>
<th>CNY₀</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-10-14</td>
<td>2009-03-20</td>
<td>1.00</td>
<td>1.00</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(77.93)</td>
</tr>
<tr>
<td>2009-03-27</td>
<td>2009-12-11</td>
<td>1.00</td>
<td>0.99</td>
<td>-0.02</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(175.68)</td>
</tr>
<tr>
<td>2009-12-18</td>
<td>2011-02-11</td>
<td>1.00</td>
<td>1.01</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(38.91)</td>
</tr>
</tbody>
</table>
Example: Ringgit with the Renminbi

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>$R^2$</th>
<th>USD</th>
<th>...</th>
<th>CNY(_o)</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-10-14</td>
<td>2007-06-01</td>
<td>0.89</td>
<td>1.23</td>
<td>...</td>
<td>1.13</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(5.31)</td>
</tr>
<tr>
<td>2007-06-08</td>
<td>2011-01-14</td>
<td>0.71</td>
<td>1.01</td>
<td>...</td>
<td>0.22</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(9.28)</td>
</tr>
</tbody>
</table>
## Methodology

**Example: Indian rupee with the Renminbi**

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>$R^2$</th>
<th>USD</th>
<th>$CNY_o$</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-10-14</td>
<td>2007-03-16</td>
<td>0.86</td>
<td>1.28</td>
<td>0.86</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4.30)</td>
</tr>
<tr>
<td>2007-03-23</td>
<td>2011-02-25</td>
<td>0.60</td>
<td>1.37</td>
<td>0.10</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(9.33)</td>
</tr>
</tbody>
</table>
Summary of methodology

1. Orthogonalise Renminbi returns
2. Use orthogonalised renminbi as explanatory variable
3. Run the augmented exchange rate regression
4. Test the coefficient on orthogonalised renminbi for significance
5. We are concerned only with the positive values of the coefficient, i.e., a one-tailed test of significance.
Analysis of many currencies

- Apply this methodology to 132 currencies since October 2005
- Data mining bias
Results
1. Do East Asian currencies care about the renminbi?
Data mining bias?

- East Asia is: Malaysia, Indonesia, Philippines, South Korea, Taiwan, Hong Kong, Singapore, Thailand and Viet Nam.
- Total currency-periods: 22
- Number of significant Renminbi coefficients: 3
- $H_0 = 0$ rejected rate: 13% – exceeds the size of the test
To whom in East Asia does the renminbi matter?

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>$R^2$</th>
<th>USD</th>
<th>CNY</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Malaysia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-10-14</td>
<td>2007-06-11</td>
<td>0.89</td>
<td>1.23</td>
<td>1.13</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(5.31)</td>
<td>(9.28)</td>
<td></td>
</tr>
<tr>
<td><strong>Taiwan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-10-14</td>
<td>2011-02-11</td>
<td>0.83</td>
<td>1.03</td>
<td>0.45</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(14.23)</td>
<td>(2.67)</td>
<td></td>
</tr>
<tr>
<td><strong>Vietnam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006-11-24</td>
<td>2008-03-21</td>
<td>0.98</td>
<td>1.04</td>
<td>0.12</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(14.97)</td>
<td>(1.45)</td>
<td></td>
</tr>
</tbody>
</table>
2. Who else cares about the renminbi?
Results

- Rest of the world currencies: 132
- Total currency-periods: 375
- Number of significant Renminbi coefficients: 85
- $H_0 = 0$ rejected for 22.66% of currency-periods
### Economies that ever tracked the renminbi

<table>
<thead>
<tr>
<th>Angola</th>
<th>Argentina</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosnia and Herzegovina</td>
<td>Burundi</td>
</tr>
<tr>
<td>Bolivia</td>
<td>Belarus</td>
</tr>
<tr>
<td>Algeria</td>
<td>Estonia</td>
</tr>
<tr>
<td>Eritrea</td>
<td>Fiji</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Gibraltar</td>
</tr>
<tr>
<td>Honduras</td>
<td>Israel</td>
</tr>
<tr>
<td>India</td>
<td>Kuwait</td>
</tr>
<tr>
<td>Libya</td>
<td>Madagascar</td>
</tr>
<tr>
<td>Macedonia</td>
<td>Maldives</td>
</tr>
<tr>
<td>Oman</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Serbia</td>
<td>Saudi Arabia</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>Suriname</td>
</tr>
<tr>
<td>Seychelles</td>
<td>Sao Tome and Principe</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Tanzania</td>
</tr>
</tbody>
</table>
Economies that track the renminbi
3. How large is the renminbi’s influence?
Renminbi’s influence

- Is renminbi’s influence economically significant?
- At each point in time we have a measure of renminbi’s influence on each currency.
- We use the cross-sectional GDP-weighted mean as the location estimator.
- We bootstrap this weighted mean to obtain 95% confidence intervals.
Results

GDP-weighted CNY coefficient: World

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GDP-weighted CNY coefficient: EMs and LDCs
GDP-weighted CNY coefficient: Asia
Conclusions

1. Do East Asian currencies care about the renminbi?
   Taiwan is the only large country to whom the CNY matters

2. Who else care about the renminbi?
   Since 2005, 30 currencies have tracked the renminbi at some point in time. Today, only 7 do so.

3. How large is the renminbi’s influence?
   Renminbi’s influence is small since its journey as a crawling peg