The Rise of the “Redback” and China’s Capital Account Liberalization: An Empirical Analysis of the Determinants of Invoicing Currencies

Hiro Ito
Portland State University

Menzie D. Chinn
Univ. of Wisconsin, Madison and NBER

G2 at GW 2013: U.S.-China Economic Relations and China’s Economic Development
November 8, 2013
RMB in Foreign Exchange Trading

Source: BIS Triennial Survey (2013)
# Roles of an International Currency

Table 1: Function of money

<table>
<thead>
<tr>
<th>Function of money</th>
<th>Governments</th>
<th>Private actors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Store of value</strong></td>
<td>International reserve holdings</td>
<td>Currency substitution (private dollarization)</td>
</tr>
<tr>
<td><strong>Medium of exchange</strong></td>
<td>Vehicle currency for foreign exchange intervention</td>
<td>Invoicing trade and financial transactions</td>
</tr>
<tr>
<td><strong>Unit of account</strong></td>
<td>Anchor for pegging local currency</td>
<td>Denominating trade and financial transactions</td>
</tr>
</tbody>
</table>

Source: Kenen (1983)
The Role of RMB as an International Currency

- 14% of China’s trade is settled in RMB (as of 2012Q4)
- $1.9 billion of “dim-sum” bonds are in circulation (as of 2013)
- China accounts for 27% of the world’s money supply (2012) cf. 8% of the world’s GDP
Underused RMB?

Exports share in the world (%), 2007-11

Share of exports invoicing in home currency (%) 2007-11
The Dollar Dominance

Dollar share of export invoicing (%), 2007-11

Exports to the United States (%), 2007-11

United Kingdom
Euro Area
Japan

Australia
Indonesia
Thailand

Indonesia
Australia
Is the arrival of the multipolar international currency system a long way off?

Whether and how fast the RMB becomes an international currency depends on:

- Exchange rate reform – The currency needs to be able to convey market signals
- Internal and external financial reforms – The transaction cost of acquiring or redeeming RMB-denominated assets must be low
  - Chinese authorities have been extremely cautious on these issues
In this paper,

- We analyze the link between financial liberalization and the potential path for RMB’s internationalization.
- Particularly, we investigate how China’s liberalization efforts would affect the use of RMB invoicing.
- RMB’s becoming a major invoicing currency is not a sufficient condition for the RMB internationalization.
- But we focus on this issue because:
  - Data are limited.
  - RMB’s becoming an invoicing currency is an important first step.
Three Questions

1. What factors, including capital account liberalization, affect the use of currencies in terms of invoicing in international trade?

2. How does the RMB’s recent experience differ from that of other currencies in terms of their use for invoicing exports?

3. How would foreseeable capital account liberalization China may implement affect the level of use of the RMB in international trade?
Empirical Analysis

- Investigate the determinants of the use of three currencies, the U.S. dollar, the Euro, and the home country’s currency for export invoicing by using the dataset that encompasses 50 countries.
- Show the implied share of RMB based on the model estimation.
- Predict the (out-of-period) path of RMB shares for different scenarios of CA liberalization.
Data on the Shares of Currencies in Trade Invoicing

- The empirical literature on trade invoicing is thin, esp. in terms of the cross-country analysis, due to data limitations.
- We augment the Kamps dataset by resorting to past and recent papers and gov’t reports on trade invoicing.
  - We expand the data coverage from 43 countries for 1990s through 2004 to 50 countries for 1970s through 2012.
  - Our dataset is probably the most comprehensive one.
Some Observations of the Data

Figure 2-1: Shares of Currencies Invoiced in Exports

Figure 2-2: Shares of Currencies Invoiced in Imports
Some Observations of the Data

Figure 3-1: Shares of Currencies in Export Invoicing – EU Countries

Note: The countries in the EU subsample are: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, and the United Kingdom.

Figure 3-2: Shares of Currencies Invoiced in Exports – ex-Japan Asian and Pacific Countries

Note: The countries in this subsample are: Australia, China, India, Indonesia, Korea, Malaysia, Pakistan, and Thailand.
Some Observations of the Data

Figure 4: In Japan’s and China’s Trade

Figure 5: In Japan’s Exports

Figure 6: In Japan’s Imports

Figure 7: In China’s and Euro Area’s Trade Invoicing
Formal Empirical Analysis

- Conduct panel data analysis to investigate the determinants of export invoicing
- We use the augmented trade invoicing data that encompass 50 countries for 1970s through 2012 (though very unbalanced)
- The model follows Kamps (2006)

\[ \lambda_{EXit}^C = \beta_1 + \beta_2 X_{it}^C + \beta_3 D_{it}^C + \gamma_1 FL_{it}^C + \varepsilon_{it}^C \]
\[ \lambda_{E_Xit}^C = \beta_1 + \beta_2 X_{it}^C + \beta_3 D_{it}^C + \gamma_1 FL_{it}^C + \epsilon_{it}^C \]

**\( X_{it}^C \)**
- Share of exports to the US or Euro area to total exports, or to the world trade
- Commodity exports as a percentage of total exports
- Relative income
- Exchange rate volatility and inflation differentials
- Financial Development = Fin_Size = PCGDP × Priv_size

**\( FL_{it}^C \)** = Financial openness, Chinn-Ito index (i.e., de jure index based on IMF’s AREAER)

**\( D_{it}^C \)** = Dummies for Monetary union and pegs to USD or Euro
Table 2: Determinants of Currency Shares in Export Invoicing

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of exports</td>
<td>0.434 (0.121)***</td>
<td>0.620 (0.107)***</td>
<td>2.655 (0.703)***</td>
</tr>
<tr>
<td>Commodity exports (%)</td>
<td>0.362 (0.080)***</td>
<td>-0.100 (0.083)</td>
<td>0.178 (0.113)</td>
</tr>
<tr>
<td>Relative income</td>
<td>-0.097 (0.052)*</td>
<td>0.134 (0.100)</td>
<td>0.383 (0.088)***</td>
</tr>
<tr>
<td>Exchange rate volatility</td>
<td>0.016 (0.033)</td>
<td>-0.028 (0.029)</td>
<td>-0.005 (0.024)</td>
</tr>
<tr>
<td>Financial Development</td>
<td>(0.091)***</td>
<td>(0.168)</td>
<td>(0.088)</td>
</tr>
<tr>
<td>Inflation diff.</td>
<td>0.206 (0.123)*</td>
<td>-0.083 (0.083)</td>
<td>-0.200 (0.166)</td>
</tr>
<tr>
<td>Financial openness</td>
<td>0.004 (0.034)</td>
<td>0.101 (0.028)***</td>
<td>0.059 (0.031)*</td>
</tr>
<tr>
<td>EU states</td>
<td>-0.304 (0.042)***</td>
<td>0.071 (0.067)</td>
<td>0.171 (0.080)**</td>
</tr>
<tr>
<td>Years after 2002</td>
<td>-0.032 (0.013)**</td>
<td>0.069 (0.011)***</td>
<td>0.015 (0.012)</td>
</tr>
<tr>
<td>Bretton Woods</td>
<td>-0.031 (0.031)</td>
<td>-0.080 (0.025)***</td>
<td></td>
</tr>
<tr>
<td>Pegged to USD</td>
<td>0.056 (0.034)*</td>
<td>0.069 (0.020)***</td>
<td>-0.041 (0.040)</td>
</tr>
<tr>
<td>Pegged to Euro Constant</td>
<td>0.570 (0.050)***</td>
<td>-0.062 (0.066)</td>
<td>-0.120 (0.082)</td>
</tr>
<tr>
<td>N</td>
<td>329</td>
<td>280</td>
<td>323</td>
</tr>
<tr>
<td># of countries</td>
<td>43</td>
<td>33</td>
<td>37</td>
</tr>
<tr>
<td>Overall R²</td>
<td>0.72</td>
<td>0.66</td>
<td>0.54</td>
</tr>
<tr>
<td>W/in R²</td>
<td>0.21</td>
<td>0.37</td>
<td>0.27</td>
</tr>
</tbody>
</table>
What about the impact of legal development?

Use $LEGAL = \text{principal component of } LAO, BQ, \text{ and } CORRUPT$

$\rightarrow$ Insignificantly negative for the U.S. dollar share estimation, significantly negative for the Euro share estimation, and insignificantly positive for the home currency share estimation.
Extended Analyses

- What about financial crisis? We include the dummy for currency, banking, or debt crisis individually
  - Countries that experience a banking crisis tend to increase the share of the U.S. dollar for their export invoicing by 2.8 percentage points while they also tend to decrease the share of the Euro by 2.3 percentage points
  - The effect of banking crisis on the home currency share or that of other types of crises turn out to be insignificant

- When we include a dummy for the GFC
  - Countries on average increase the share of dollar invoicing by 4.1 percentage points, although the crisis does not affect other currency shares
Do appreciation expectations of the home currency lead to more use of the currency for export invoicing? We include in the time trend of the exchange rate

Significantly positive for the U.S. dollar share estimation = Appreciation trend of the home currency leads to less use of the USD for export invoicing
Extended Analyses

- Does net investment position matter? We include the NIP variable based on the Lane and Milesi-Ferretti dataset
  - Significantly positive for the home currency share estimation = Countries with better net investment positions tend to be able to invoice their exports in their own currency
  - Endogeneity issues?: Countries with int’l currencies often turn into debtor countries
Methodological Robustness Checks

- Tobit estimation
- Seemingly Unrelated Regression (SUR) Estimation

→ The estimates are mostly robust, including the financial openness variable

→ While financial development continues to be a negative contributor to USD invoicing, it also becomes a significantly negative contributor to home currency invoicing
Predicted vs. Actual Currency Shares

(a) RMB in Chinese Exports

(b) Japanese Yen in Japan’s Exports

(c) USD in Japan’s Exports

(d) Euro Share in Euro Area’s Exports
The baseline assumption: KAOOPEN=0.35 for 2015 (c.f., the current level of 0.16), but not as high as the level of Brazil, Columbia, and Indonesia (0.41). 0.50 for 2018, more financially open than Turkey (0.45).

Under the pessimistic scenario: no change in KAOOPEN in 2015 (i.e., 0.16). 0.25 In 2018

Under the optimistic scenario, 0.60 in 2015 and to 0.80 in 2018
Concluding Remarks

- The U.S. dollar still plays an important role as the vehicle currency
- Asian countries in particular have relied heavily on the U.S. dollar
- The share of the RMB use for trade transactions has been rapidly rising
- Interestingly, the Chinese RMB has been more used for import invoicing rather than for export invoicing
- Countries with more developed financial markets tend to invoice less in the U.S. dollar
- Countries with a more open capital account tend to invoice in either the Euro or their home currency
Concluding Remarks

- A currency with expected appreciation tends to be used for export invoicing.
- The use of the RMB in export invoicing should have been higher, around low to mid-20s as a percentage of total exports.
- The underperformance of the RMB export invoicing can be attributed to the inertia of the choice of currency for trade invoicing.
- The share of RMB invoicing for China’s exports may rise up to 27.5% in 2015 and 33.5% in 2018.