Is China or India more financially open?

Guonan Ma and Robert McCauley*
Bank for International Settlements

NIPFP-DEA-JIMF Conference, Rajasthan, India
12-13th December, 2012

* Views expressed are those of the authors and not necessarily the views of the BIS
Mainstream de jure and de facto measures

Capital account openness

Chinn-Ito indices

International assets and liabilities (% of GDP)

I. Roadmap

- **Two widely used measures**
  - Chinn-Ito index: CN & IN equally closed and not moving
  - Lane/Milesi-Ferretti: China more open & both opening

- **Three questions**
  - Is capital internationally mobile in China and India?
  - Which is financially more open?
  - Are they liberalising over time?

- **Eight de facto measures**
  - Four price-based indicators
  - Four non-price indicators
Three takeaways

- Our evidence challenges both mainstream measures
  - None of our measures strongly supports Chinn-Ito verdicts
  - Only 1 or 2 fully back Lane/Milesi-Ferretti conclusions

- On balance, India financially more open than China
  - All four price-based indicators consistently favour India
  - Non-price measures are mixed

- Both China and India are liberalising over time but still have a long way to go, with two surprises:
  - India faces consistent inflow pressures but not China
  - Currency internationalisation: the unheralded rupee matches in some way the much discussed renminbi
II. Four price-based measures

- Cross-border deviations from the law of one price
  - Smaller gap indicates less market segmentation
  - A positive value of the gap suggests the underlying financial contract is priced cheaper onshore

- On/offshore price gaps for four financial markets
  - FX forward market: \((F-NDF)/S\)
  - Money market: \((i - r)\)
  - Bond market: \((i - NDS)\)
  - Equity market: \(\log(H/A)\), or \(\log(ADR/M)\)
II.1 On/offshore forward currency premium gap

Onshore foreign exchange forward less offshore NDF
As a percentage of spot rate

Sources: Bloomberg; CEIC.
India’s forward premium gap is smaller

Table 1: Onshore less offshore foreign exchange forward premiums

As a percentage of the spot

<table>
<thead>
<tr>
<th></th>
<th>CNY</th>
<th></th>
<th></th>
<th>INR</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-month</td>
<td>12-month</td>
<td>3-month</td>
<td>12-month</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full sample</td>
<td>Excl. crisis</td>
<td>Full sample</td>
<td>Excl. crisis</td>
<td>Full sample</td>
<td>Excl. crisis</td>
</tr>
<tr>
<td>Maximum</td>
<td>1.89</td>
<td>1.89</td>
<td>5.67</td>
<td>5.67</td>
<td>1.89</td>
<td>1.89</td>
</tr>
<tr>
<td>Average</td>
<td>0.33</td>
<td>0.38</td>
<td>1.20</td>
<td>1.31</td>
<td>-0.09</td>
<td>-0.01</td>
</tr>
<tr>
<td>Average of abs. value</td>
<td>0.46</td>
<td>0.44</td>
<td><strong>1.49</strong></td>
<td><strong>1.48</strong></td>
<td>0.41</td>
<td>0.34</td>
</tr>
<tr>
<td>Annualised volatility</td>
<td>8.05</td>
<td>6.82</td>
<td>23.03</td>
<td>21.20</td>
<td>11.55</td>
<td>7.59</td>
</tr>
<tr>
<td>Corr (F_t, NDF_t)</td>
<td>1.00</td>
<td>1.00</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
</tr>
</tbody>
</table>

1 Daily data of forward premium gap is calculated as the difference between onshore forward and offshore non-deliverable forward as a percentage of spot price. The full sample period is between April 7, 2003 and June 30, 2012 while the period of September to December 2008 is excluded for the sample excluding crisis.

Sources: Bloomberg, CEIC.
II.2 On/offshore money market yield gap

Onshore money market yield less offshore NDF-implied yield

In basis point

China

India

1 Weekly data. For China: 3-month (12-month) NDF, three-month CHIBOR (one-year PBOC bill auction yield before Jul 2008; secondary market yield thereafter), and 3-month (12-month) LIBOR. For India: 3-month (12-month) NDF, 91-day (364-day) treasury bill implicit yield, and 3-month (12-month) LIBOR.


Sources: Bloomberg; CEIC
India’s yield gap is again smaller

Table 2: Onshore money market yield less offshore NDF-implied yield

<table>
<thead>
<tr>
<th></th>
<th>CNY</th>
<th></th>
<th>INR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-month</td>
<td>12-month</td>
<td>3-month</td>
<td>12-month</td>
</tr>
<tr>
<td></td>
<td>Full sample</td>
<td>Excl.</td>
<td>Full sample</td>
<td>Excl.</td>
</tr>
<tr>
<td>Maximum</td>
<td>2117</td>
<td>1336</td>
<td>735</td>
<td>552</td>
</tr>
<tr>
<td>Minimum</td>
<td>-1397</td>
<td>-796</td>
<td>-3904</td>
<td>-1173</td>
</tr>
<tr>
<td>Average</td>
<td>-399</td>
<td>-312</td>
<td>-31</td>
<td>-56</td>
</tr>
<tr>
<td></td>
<td>Average of abs. value</td>
<td>437</td>
<td>345</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>438</td>
<td>332</td>
<td>56</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>345</td>
<td>348</td>
<td>56</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>438</td>
<td>56</td>
<td>56</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>4734</td>
<td>4030</td>
<td>3652</td>
<td>2303</td>
</tr>
<tr>
<td></td>
<td>-0.12</td>
<td>-0.32</td>
<td>0.56</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>-0.17</td>
<td>-0.38</td>
<td>0.63</td>
<td>0.69</td>
</tr>
</tbody>
</table>

1 Daily data. For China: 3-month (12-month) NDF, three-month CHIBOR (one-year PBOC bill auction yield before Jul 2008; secondary market yield thereafter), and 3-month (12-month) LIBOR. For India: 3-month (12-month) NDF, 91-day (364-day) treasury bill implicit yield, and 3-month (12-month) LIBOR. The full sample period is between May 26, 2003 and June 30, 2012 while the period of September to December 2008 is excluded for the sample excluding crisis.

Sources: Bloomberg, CEIC.
II.3 On/offshore bond yield gap

Domestic government bonds less non-deliverable cross-currency swaps

In basis points

1 Three-year maturity.
Again, India’s cross-border gap is smaller

<table>
<thead>
<tr>
<th></th>
<th>CNY</th>
<th>INR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full sample</td>
<td>Excl. crisis</td>
</tr>
<tr>
<td>Maximum</td>
<td>824.00</td>
<td>824.00</td>
</tr>
<tr>
<td>Minimum</td>
<td>-583.00</td>
<td>-368.00</td>
</tr>
<tr>
<td>Average</td>
<td>213.32</td>
<td>229.77</td>
</tr>
<tr>
<td>Average of abs. value</td>
<td><strong>246.61</strong></td>
<td><strong>247.62</strong></td>
</tr>
<tr>
<td>Corr (Onshore, offshore)</td>
<td>-38.83</td>
<td>-39.67</td>
</tr>
</tbody>
</table>

1 Daily data. Bond premium is calculated as the difference between three-year onshore government bond yield and three-year offshore non-deliverable swaps rate. The full sample period is between March 28, 2003 and June 30, 2012 while the period of September to December 2008 is excluded for the sample excluding crisis.

Source: Bloomberg.
Local-currency CGB yields: Shanghai & HK

Chinese government renminbi bond yields, onshore and offshore
In per cent

Source: Bloomberg.
II.4 Shanghai premium & Mumbai discount

Ratios of overseas share prices to equivalent local share prices
In per cent; weekly average

- ADR–Indian (9 companies)
- H–A (9 companies)
- Hang Seng AH Premium Index (lhs; reversed)
- ADR–A (9 companies)

Graph showing the ratios from 2002 to 2012.
\[
\Delta q_{i, t} = \alpha + \beta q_{i, t-1} + \sum \varphi_n \Delta q_{i, t-n} + \varepsilon_{i, t}
\]

**Table 4: Stock share price premium and convergence of cross-listed companies**

<table>
<thead>
<tr>
<th></th>
<th>H-A premium 41 dual-listed companies</th>
<th>H-A premium 9 triple-listed companies</th>
<th>ADR-A premium 9 triple-listed companies</th>
<th>ADR-H premium 9 triple-listed companies</th>
<th>ADR-India premium 9 dual-listed companies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
<td>(a)</td>
<td>-0.262***</td>
<td>-0.378***</td>
<td>-0.381***</td>
<td>-0.051***</td>
<td>0.104***</td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.062)</td>
<td>(0.066)</td>
<td>(0.010)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>(\beta)</td>
<td>-0.003***</td>
<td>-0.005***</td>
<td>-0.006***</td>
<td>-0.552***</td>
<td>-0.014***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.009)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>(\varphi_1)</td>
<td>-0.020***</td>
<td>-0.012</td>
<td>-0.051***</td>
<td>-0.179***</td>
<td>-0.293***</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.008)</td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>(\varphi_2)</td>
<td>-0.048***</td>
<td>-0.037***</td>
<td>-0.038***</td>
<td>-0.089***</td>
<td>-0.174***</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.008)</td>
<td>(0.008)</td>
<td>(0.007)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Half-life (days)</td>
<td>233.1</td>
<td>128.3</td>
<td>114.0</td>
<td><strong>0.9</strong></td>
<td>48.6</td>
</tr>
<tr>
<td>Adjusted (R^2)</td>
<td>0.004</td>
<td>0.004</td>
<td>0.007</td>
<td>0.359</td>
<td>0.101</td>
</tr>
<tr>
<td>DW statistics</td>
<td>2.001</td>
<td>1.988</td>
<td>1.998</td>
<td>2.010</td>
<td>2.023</td>
</tr>
</tbody>
</table>
III. Non-price measures

- Four non-price indicators of financial integration

- Two old ones:
  - Feldstein-Horioka saving coefficient
  - Generalised Lane/Milesi-Ferretti indicator
    - Gross external investment positions
    - Gross balance of payments flows

- Two new ones:
  - BIS banking data on banking market openness and debt market integration
  - Three dimensions of currency internationalisation
III.1 Feldstein-Horioka regression

China’s coefficient falls to 0.3, comparable to EU in the 1990s
India’s coefficient has risen towards unity

Year-on-year change as a percentage of lagged GDP

- Gross capital formation
- Gross national saving

The estimated betas of gross national saving

- Recursive
- Rolling window

84 87 90 93 96 99 02 05 08 11

1995 1997 1999 2001 2003 2005 2007 2009 2011
III.2 Stock version of Lane/Milesi-Ferretti

International investment positions
As a percentage of GDP

China

India

0 20 40 60 80 100 120

2004 2005 2006 2007 2008 2009 2010

Assets
Liabilities
Flow version of Lane/Milesi-Ferretti

Gross balance of payment flows\(^1\)
As a percentage of GDP

1. Sum of credit and debit flows of current account and capital account.

Sources: IMF WEO; CEIC.
III.3 Foreign share in banking market

Foreign bank share of bank credit¹

In per cent

China

India

¹ Foreign bank claims on non-banks in domestic and foreign currency as a percentage of domestic credit and cross-border claims on non-banks. ² External claims of all reporting banks vis-à-vis the non-bank sector of China/India.
Chinese & Indian banks’ footprint in global market

Chinese and Indian banks’ foreign claims

In billions of US dollars

As a share of global credit

As a share of domestic lending

Graph 11
Involvements in international debt market

International debt securities of China and India

By residence and nationality

In billions of US dollars

As a percentage of global debt securities

As a percentage of domestic debt securities

Graph 12
III.4 Currency internationalisation

Geography of turnover in renminbi and rupee in April 2010

Indian rupee

- Strictly offshore
- Onshore
- Futures
- Onshore-offshore

Chinese renminbi

- Futures are traded onshore between residents.
Foreign exchange turnover to trade in relation to GDP per capita

2007

2010

INR, ZAR, BRL, MXN, RUB, TRY, KRW, JPY, EUR, USD

INR, ZAR, BRL, TRY, MXN, RUB, KRW, JPY, EUR, USD
International banking in domestic currency

RMB deposits in Hong Kong banks and non-resident INR deposits in Indian banks

In billions of US dollars equivalent

- CNH deposit
- INR deposit by non-residents

As a percentage of M2

- CNH deposit
- INR deposit by non-residents

Source: Hong Kong Monetary Authority; Reserve Bank of India; authors’ calculations.
International bonds in domestic currency

International debt securities outstanding denominated in renminbi and Indian rupee
IV. Summary: pulling things together

- All four price measures suggest greater integration of India in the global financial system
  - The same holds when excluding turbulent episodes
- The BIS consolidated foreign bank share identifies India as financially more open, while Feldstein/Horioka coefficient favours China
- Other measures send mixed messages.....
  - Stock and flow version of Lane/Milesi-Ferretti
  - Dimensions of currency internationalisation
- None strongly supports Chinn-Ito; only one or two lend some backing to Lane/Milesi-Ferretti
- In sum, India financially more open than China. Both are liberalising over time but still have a way to go