International Reserves and Underdeveloped Capital Markets

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Why Does Capital flow from Poor Countries to Rich Countries?

• International reserve accumulation by developing countries is just one example of the puzzling behavior of international capital flows.
• Capital should flow to where its return is highest, which ought to be where capital is scare.
• Yet recent data suggests the opposite – net capital flows from developing countries to industrialized countries.
A Data-Theory Mismatch?

• The recent upsurge in foreign reserve accumulation by developing countries has been difficult to reconcile with standard theories of why countries hold reserves.

• It may be that reserve accumulation is serving a new role, especially in East Asia and China (where accumulations have been most dramatic), in helping to mitigate distortions created by underdeveloped financial markets.
The Recent Upward Trend in Foreign Reserve Accumulation

Foreign Reserves as a Percent of GDP

Official foreign reserves as a percent of GDP

- **Industrialized Countries**
- **Developing Countries**
China

China’s Foreign Reserves (minus Gold)

US $ billions


China's Foreign Reserves (minus Gold)
China

- In October 2006, China's foreign exchange reserves exceeded a trillion dollars for the first time.
- By mid-2007, the reserves had reached $1,000 per head for the entire population of China.
<table>
<thead>
<tr>
<th>Rank</th>
<th>Country/Monetary Authority</th>
<th>billion USD (end of month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>People's Republic of China</td>
<td>$1333 (June)</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>$932 (August)</td>
</tr>
<tr>
<td>—</td>
<td>Eurozone</td>
<td>$451 (July)</td>
</tr>
<tr>
<td>3</td>
<td>Russia</td>
<td>$421 (September 14)</td>
</tr>
<tr>
<td>4</td>
<td>Republic of China (Taiwan)</td>
<td>$261 (August)</td>
</tr>
<tr>
<td>5</td>
<td>South Korea</td>
<td>$255 (July)</td>
</tr>
<tr>
<td>6</td>
<td>India</td>
<td>$230 (September 07)</td>
</tr>
<tr>
<td>7</td>
<td>Brazil</td>
<td>$162 (September 13)</td>
</tr>
<tr>
<td>8</td>
<td>Singapore</td>
<td>$148 (August)</td>
</tr>
<tr>
<td>9</td>
<td>Hong Kong</td>
<td>$138 (August)</td>
</tr>
<tr>
<td>10</td>
<td>Germany</td>
<td>$117 (July)</td>
</tr>
</tbody>
</table>

These few holders account for more than 50% of total world foreign currency reserves.
Why Do Countries Hold Reserves?

- **Foreign Reserves** are typically defined as foreign currency deposits, gold and SDRs held by monetary authorities.

- **Motivations** for accumulating foreign reserves may include:
  - Precautionary motives
  - Mercantilist motives
  - Financial market motives
Original Rationale for Holding Reserves?

- International reserves held by government authorities are part of national wealth, and were originally important for countries with fixed exchange rates that wanted to avoid costly adjustments to disturbances in the external sector of the economy.
  - For example, if a country ran a current account deficit, reserves could be used by the government to forestall an exchange rate depreciation that might otherwise occur.
- Many countries have moved toward more flexible exchange rate regimes, but continue to hold reserves despite the disappearance of their original purpose which was to help finance current account imbalances.
Costs of Holding Foreign Reserves

- Foregone domestic consumption
- Foregone domestic investment
- Sterilization (cost of offsetting the growth of the domestic monetary base that occurs when governments purchase reserves)
- False sense of confidence in the domestic economy (even a large reserve stockpile can evaporate in times of crisis)
- Potential valuation losses (if the currency denominations of reserves lose value relative to the domestic currency)
The Precautionary Motive for Accumulating Reserves

- The precautionary motive suggests that governments acquire reserves to serve as a cushion against adverse economic shocks.
- In practice there seem to have evolved a number of “rules of thumb” to determine optimal precautionary reserve levels.
- These rules included maintaining reserves equivalent to:
  1. 3 months of imports (to offset current account shocks);
  2. 5-20 percent of M2 (to be able to shore up confidence in the value of the domestic currency in the event of a currency crisis);
  3. the value of all debt obligations falling due within the following year (in the event of a sudden disappearance of short-term capital inflows)
Challenges to the Precautionary View

- Countries with large accumulations of reserves have often not been able to forestall crises.
An alternative view of reserve accumulation is that it is the byproduct of a government strategy to keep the international value of the domestic currency low in order to boost export growth. In this (mercantilist) view, purchases of foreign reserves are not motivated by a desire to smooth consumption in the face of external shocks, but rather they are the unintended consequence of sterilized interventions in the foreign exchange market.
Challenge to the Mercantilist View

• Data timing: export-led growth is not a new phenomenon – yet reserve accumulation has dramatically increased since the late 1990s.
The Data Challenge

- Any theory of official reserve accumulation that hopes to explain the recent data will need to match the timing of the dramatic increase in reserve accumulations by developing countries over the 1990s and early 2000s.
- Even if we allow for an increase in precautionary holdings in the aftermath of the developing country crises of the 1990s, studies suggest that current reserve accumulations far exceed warranted levels (Jeanne (2007)).
Reserves and Crises

Foreign Reserves as a Percent of GDP

- Mexico
- East Asia
- Argentina
- Russia/Brazil

Official foreign reserves as a percent of GDP

Currency Crises
- Industrialized Countries
- Developing Countries
## Financial Account Data (1990-2004)

<table>
<thead>
<tr>
<th>Financial Account Category</th>
<th>Industrial Countries</th>
<th>Developing Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Composition of the increase in gross foreign assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDI</td>
<td>22.90</td>
<td>14.87</td>
</tr>
<tr>
<td>Portfolio</td>
<td>19.19</td>
<td>9.99</td>
</tr>
<tr>
<td>Other</td>
<td>55.64</td>
<td>33.38</td>
</tr>
<tr>
<td>Reserves</td>
<td>2.27</td>
<td>41.76</td>
</tr>
</tbody>
</table>

For developing countries over 40 percent of foreign asset accumulation consists of official reserves, while for industrialized countries official reserves make up only 2 percent of gross foreign assets.
Decomposition of foreign assets for developing countries

Reserves and Net Liabilities for Developing Countries

Billions of US Dollars

Capital Account Balance (>0=liability) - Net Debt Liabilities - Net FDI Liabilities - Total Reserves
Asia: China, Hong Kong, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Singapore, Taiwan, Thailand
Emerging Europe: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Russia, Slovak Republic, Slovenia, Turkey
Latin America: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela
Developing countries rely much more heavily on foreign direct investment (FDI) than do the industrialized countries. The “Other” category includes transactions in currency and bank deposits.
Reserves as a fraction of FDI

Reserves as a Share of Net FDI Liabilities, 1970-2004

Reserves/Net FDI Liabilities (pct)

-200 -150 -100 -50 0 50 100 150 200


Developing Industrialized
Private Sector Connection?

• When official reserves are measured as a fraction of net FDI liabilities the recent dramatic upsurge in reserves for developing countries (seen when reserves are measured as a fraction of GDP), is no longer apparent.

• If one views reserves in the context of private sector (FDI) liabilities, the trend patterns of reserve accumulation across industrial and developing countries are not so starkly divergent.
The Role of Capital Markets

• Standard (neoclassical) closed-economy growth models assume that:
  – savings is equal investment,
  – investment produces capital
  – additional capital leads to higher output

• Once we allow for international capital flows (we relax the closed-economy assumption), domestic investment need not be constrained by domestic savings, and indeed we would expect savings to flow from countries with low investment opportunities to countries with high investment opportunities.
Investment and Reserves

- It is instructive to consider how measures of capital flows are related to aggregate investment rates.
- Cross-country scatter plots show that higher investment rates are associated with lower net capital inflows for developing countries.
- Further, the component of capital flows that is driving this counterintuitive result is official foreign reserves.
Investment and Reserves


\[ y = 0.237x - 0.057 \]

\[ R^2 = 0.241 \]
Investment and Reserves

• On average a 100 percent increase in investment is correlated with an (17 to 28 percent) increase in reserve accumulation (depending on the sample of included countries and sample period) for developing countries.

• This positive relationship between investment and reserves accumulation does not exist for industrialized countries.
The Financial Market Development Motive for Accumulating Reserves

• The negative relationship between rates of investment and capital inflows for developing countries most likely reflects credit constraints.

• The pace of financial market development, like reserve accumulation, has diverged markedly between industrialized countries, where markets have generally deepened and broadened, and developing countries, where this deepening has yet to take place.

• In this context the government’s accumulation of reserves may act as a substitute for what would otherwise be private sector capital outflows.
Constraints on the Private Sector

• If firms in countries with less developed financial markets understand that they risk being financially constrained, they should optimally borrow less in good times in order to save resources for bad times (capital shortfalls).

• Yet the data suggest that firms in developing countries often take on excessive external debt which increases their exposure to potential capital flow reversals.

• Why is this?

• The return to savings in these countries may be under-valued because of the distortions caused by financial constraints.
Reserve Accumulation as a Solution to the Underinsurance Problem

• Governments can purchase foreign reserves and sterilize the effects of these purchases on the home money supply by issuing domestic bonds.

• If the interest rate offered on these domestic bonds is high enough to induce the private sector to hold them, the government is essentially subsidizing savings, which is exactly what is needed to mitigate the underinsurance problem.
  – In the case of China, banks have essentially been “forced” to hold these domestic bonds.
The Financial Market Development Motive for Accumulating Reserves

• The financial market development rationale for reserve accumulation makes two predictions:

1. The private sector in reserve accumulating countries will be underinsured against future capital shortfalls.

2. Financial markets in these countries will be underdeveloped.
Measuring Financial Market Development

• There is a large literature devoted to measuring financial market development.

• Relevant market characteristics include:
  1. the extent of state ownership in the economy,
  2. the amount of firm-specific information in domestic stock returns,
  3. legal protections for minority investors,
  4. corruption

• The overall size of a country’s financial market (the sum of portfolio equity liabilities plus total debt liabilities divided by GDP) is likely to be highly correlated with these characteristics.
The size of financial markets in industrialized & developing countries
The size of financial markets in industrialized & developing countries

- Financial markets have grown steadily in the industrialized countries
- The growth rate of financial markets has been substantially slower for developing countries.
- It is also the case that the divergence in growth rates between the two groups of countries widens at around the same time as reserve accumulation by developing countries start to accelerate.
Results of Panel Regressions

- Wealthier countries hold more reserves than do poorer countries.
- Countries that have more open capital markets (potentially making them more vulnerable to sudden stops) hold greater reserves.
- Countries with more flexible exchange rates hold fewer reserves.
- Countries experiencing crises hold fewer reserves during their crises.
Results of Panel Regressions (cont.)

- Countries with higher levels of private sector liabilities hold *greater* reserves, while countries with higher levels of public sector liabilities hold *fewer* reserves.
- Countries with less developed financial markets are hold *greater* reserves.
- Financial market development matters more for fast growing countries (suggesting that the constraints of financial market underdevelopment may be particularly severe for countries experiencing lower levels of economic growth).
Conclusions

- The accumulation of foreign reserves by governments of developing countries may not be so puzzling after all.

- Reserve accumulation may represent a sensible response by developing country governments to prevailing financial market conditions.