Comments on
“Empirical Application of a Flow of Funds Model for India”
by Tomoe Moore and Christopher J. Green

CFSP Workshop on Savings and Flow of Funds:
Enhancing and Improving Flow of Funds Accounts
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Summary of the Paper

- Two contents
  - Positive: Construct flow of funds data / model
  - Normative: Evaluate policy (financial liberalization)
- What’s unique?
  - Not just “educational guess”
  - Not just running simple regressions on agg variables.
  - Not construct a dynamic general equilibrium model for a few key macro variables and calibrate/simulate it.
  - Static model, but look at fund flows among key sectors, by incorporating structural restrictions based on theory.
  - Future: combining both—dynamic sectoral movements (hope to see them in this conference!)
Background: Financial Repression / Liberalization
(For India 1980-94, from WP version of Abiad, Oomes, and Ueda, 2008)

INDIA

Credit Controls/Reserve Requirements
Cash and statutory reserve requirements remain high, and more than 40 percent of lending is still directed toward "priority sectors". Rates on small loans are still provided at lower-than-market rates. 0 throughout sample.

Interest Rates
Lending and deposit rates were regulated beginning in 1962 and 1964, respectively. In October 1988 the lending rate ceiling was converted to a floor, which was eliminated in October 1994. Term deposit rates were liberalized subject to a ceiling in 1992, and were completely freed between 1995-97. Controls remain on small loans (25 percent of total lending), on savings/postal deposits, and non-resident FX deposits. 0 from 1973-87, 1 from 1988-91, 2 in 1992.

Entry Barriers
Entry of private banks was deregulated in January 1993, resulting in the licensing of nine new domestic and twenty-two new foreign banks. Joint Indian-foreign ventures are allowed, but foreign banks can own only up to 20 percent of equity. Some restrictions on foreign bank branching remain. 2 from 1993 onwards.

Regulations
Narasimham Committee recommendations on prudential norms and standards are phased in from 1993-96. The regulatory framework was strengthened significantly in 1992. 1 from 1992, 2 from 1993 onwards.

Privatization
Bank nationalization took place in 1969. The banking sector is still dominated by state-owned banks, which hold some 80 percent of total assets. 0 throughout sample.

International Transactions
Liberalization began with the easing of some restrictions on portfolio and direct investment in 1991-1993. In 1993 the exchange rate system was unified. Most remaining restrictions on current account transactions were eliminated in 1994, culminating in India’s formal acceptance of the IMF’s Article VIII. Foreign exchange regulations are still significant, as are restrictions on the short-term flows. 1 in 1991, 2 from 1994 onwards.
Flow of Funds: Data and Model

- Data: Flow of Funds for 9 sectors, 9 fin. instruments.
- Model: Flow of Funds for 5 sectors, 6 instruments + NW.

**Table 4. India: theoretical flow of funds model**

<table>
<thead>
<tr>
<th></th>
<th>Government and RBI</th>
<th>Banks</th>
<th>Other Financial Institutions (OFIs)</th>
<th>Private Corporate Business (PCBs)</th>
<th>Households</th>
<th>Market-clearing Endogenous Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>+ (-)</td>
<td>Excess reserves</td>
</tr>
<tr>
<td>Excess Reserves</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Deposits</td>
</tr>
<tr>
<td>Deposits</td>
<td></td>
<td>-</td>
<td></td>
<td>+ (-)</td>
<td>+ (-)</td>
<td>Gov. debt (R1) or Gov. debt yd. (R2)</td>
</tr>
<tr>
<td>Government Debt</td>
<td>-</td>
<td></td>
<td></td>
<td>+ (-)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company Securities</td>
<td></td>
<td></td>
<td></td>
<td>- (-)</td>
<td>+ (-)</td>
<td>Return on shares</td>
</tr>
<tr>
<td>Loans</td>
<td></td>
<td></td>
<td></td>
<td>+ (-)</td>
<td>- (-)</td>
<td>Lending rate</td>
</tr>
<tr>
<td>Net Worth</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Estimation

- Estimation for relationships among sectors using theoretical restrictions (AIDS model based on demand theory / aggregation restrictions).

- Regressors include policy variables:
  - Cash Reserve Ratio (CRR, Reserve Requirement)
  - (Central) Bank Rate
  - Statutory Liquidity Ratio (SLR)
  - Deposit Rate
  - Government Bond Yields
  - Open Market Purchase of Government Bonds
Policy Evaluation

- Policy evaluation by simulation
  - Deterministic (using the point estimate of coeff) or
  - Stochastic (using random draws of coeff based on both point estimate and estimated std. errors)
- (R1) Bond yield is controlled (bond amount adjusts) or
  (R2) yield is set by market (bond amount is given)
- Experiments to see effects on (i) lending rate, (ii) loans
  - CRR: reduce 2%
  - Bank Rate: reduce 2%
  - SLR: reduce 2%
  - Deposit Rate: increase 2%
  - Government Bond Yields: reduce 2%
  - Open Market Purchase of Gov Bonds: 2% of outstanding
Interesting Findings: loan rate and amount

- SLR reduction does not necessarily lower lending rate.
  - SLR reduction $\rightarrow$ lower demand for gov bond $\rightarrow$ switch to corp securities (not necessarily increase bank loans) + overall effects on interest rate

- Increase in deposit rate does not necessarily increase lending rate.

- SLR reduction tends to lower loan outstanding in R1, but not in R2.

- Deposit rate increase tends to lower loan outstanding in R2, but not in R1.

- Conclusion: To evaluate a financial reform, need to understand G.E. flows of funds, which depends on regimes and specific policy actions.
Some Concerns

- Static model, stable coefficients to be estimated.
  - Flows b/w HH and Firms may switch over time (Chari?)

- Policy Objectives
  - Lower lending rate or larger loan amount?
    - Better financial system offers better risk insurance, and may lower savings, creating potentially higher loan rate and lower loan amount.

- Efficiency
  - Abiad, Oomes, and Ueda (2008) show that the variation among listed firms’ Q (proxy for ex ante MPk) is reduced after financial liberalization for several countries (incl. India, Thailand, etc)

- Welfare
Deeper Questions

- Industrial policy
  - Should gov allocate capital?
  - Gerschenkron (1962): UK vs Germany, Japan vs Soviet Now China: Perhaps there are externalities among firm investments (growth models since Romer, 1986)
    \[\leftrightarrow\] Ueda (forthcoming) shows that banks can internalize externalities by aggressively seeking the monopoly rents.

- One more hidden link between gov fiscal problem and financial repression (difficult to do separate experiment)
  - In R1, yield is chosen by gov / amount is endogenous.
  - Usually both are chosen by gov (Rogoff-Reinhart, Japan)
  - Coming back! (Europe, Japan, etc)
Thailand example: Efficiency
Measure of Fin Intermediation Cost
Calibration without cost change
Calibration with cost change
Welfare Evaluation

Value Functions
- (Low Cost) $V(K)$
- $Z(K)$ (High Cost)

Utility Compensation
- Utility (model unit)

Wealth Compensation (Fitted)
- Wealth (1000 baht)
- $k^* = 200$ (low cost)
- $k^* = 300$ (high cost)

Wealth Compensation (%)
- Percent of wealth