Financial Development, Financial Inclusion and Human Capital: How Close is the Link? A Study of India

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Financial sector reforms in India

- Financial sector reforms started in 1991
- Reforms gradual & cautious in nature
- Objectives of Reforms:
  » Efficient allocation of resources
  » Rise in the productivity of private sector
  » Enhance financial stability
  » To adopt prudential norms; international benchmarks and strengthen market discipline

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Major financial sector reforms:

- Deregulation of interest rates
- Introduction of prudential norms
- Transparency
- Improved disclosures
Outcome of Reforms:

» Banks profitability, efficiency and competition within the banking sector increased.
» Capital base strengthened
» Non-performing loans as ratio of assets declined

- Increase in Inequality
  » Rural-urban
  » High inter-state disparities
  » Closure of many rural bank branches
  » Reforms focused on banking institutions and profitability and not on spread of banking services
Financial Inclusion

- What is Financial Inclusion?
- Benefits of Financial Inclusion
  - Inclusive Balanced Growth
  - Increase savings
  - Provides business opportunity to banks and other intermediaries
- Several measures taken to increase financial inclusion
- In the pre-reform period: Opening of bank branches; nationalisation of bank branches; directed lending, still large no of people are unbanked

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Recent Indian approach to Financial Inclusion

- Commitment to Financial Inclusion both by Govt & RBI
- All villages with population more than 2000 to be provided access to financial services by March 2012
- Establishment of Financial Stability and Development Council
- Financial Inclusion and Financial Inclusion Technology Fund set up
- Banks asked to formulate Financial Inclusion Plan for 3 years till March 2013
- Financial Literacy and Credit Counselling centres set up by banks

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Delivery Model

- Multichannel approach (Handheld devices, mobiles, cards, Micro ATMs, Branches, Kiosks)
- Business Correspondent Model
  - Corporates are allowed
  - Interest rates on loans totally deregulated
- Know Your Customer requirements liberalised for small value accounts
- Availability of banking service conceptually implies:
  - A savings cum Overdraft account
  - A Remittance Product for EBT
  - A Savings Product –recurring or variable recurring deposit

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Challenges facing Financial Inclusion

- Despite efforts to increase financial inclusion a number of challenges exist:
  
  » Financial Inclusion perceived as obligation rather than a business opportunity
  » Poor delivery model
  » Inadequate number of Business Correspondents
  » Development of Infrastructure
  » Digital and Physical Connectivity of Banks
Limitations of financial inclusion approach

- Existing approach however, is supply centric
- Presumes that increasing supply of financial services will increase financial inclusion
- Ignores demand side constraints
- Poor human development and low literacy in many states may prevent population from financial inclusion efforts
Objectives of Study

- In this study we examine associational relationship between finance and human capital
- Our study does not examine causality between finance and human capital
Theoretical Literature on finance and human capital

- Role of human capital in economic development has been firmly established (Benhabib and Spiegal, 1992)
- Strong relationship between financial development and human capital (Evans, Green, & Murinde, 2002)
- Physical capital combined with poor human development may produce low growth and poor development outcomes (Bergheim, 2005)
- Accumulation of physical capital takes place in the early stages and human capital accumulation follows (Graca, Jafarey, & Philippopoulos, 1995)
Empirical Literature on Finance and Human Capital

- Evans *et al.* (2002) - study for 82 countries; findings that credit and human capital both contribute to growth

- Seghers *et al.* (2009) – survey data of 125 Belgian firms - findings that entrepreneurs with business education had better knowledge of financial products; basic (low) education had no effect on knowledge

- Brown, Earle and Lup (2004) – survey of 297 new small enterprises in Romania showed that access to external credit increases firms’ sales and employment

- Kendall (2009) – the only study done for India for 9 states at the district level; examines role of human capital and financial development in growth; findings show that low financial development constrains growth; increases in human capital promote growth
Table 1: Population Per Bank Branch (in thousands) at National level

<table>
<thead>
<tr>
<th>Year</th>
<th>Population Per Bank Branch</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1969</td>
<td>64</td>
</tr>
<tr>
<td>March 2002</td>
<td>16</td>
</tr>
<tr>
<td>March 2003</td>
<td>16</td>
</tr>
<tr>
<td>March 2004</td>
<td>16</td>
</tr>
<tr>
<td>March 2005</td>
<td>16</td>
</tr>
<tr>
<td>March 2006</td>
<td>16</td>
</tr>
<tr>
<td>March 2007</td>
<td>15</td>
</tr>
<tr>
<td>March 2008</td>
<td>15</td>
</tr>
<tr>
<td>March 2009</td>
<td>14.5</td>
</tr>
<tr>
<td>March 2010</td>
<td>13.8</td>
</tr>
</tbody>
</table>
### Table 2: Regional Financial Development of India

<table>
<thead>
<tr>
<th>Region</th>
<th>Per Capita Income (Rs)</th>
<th>NDP per branch (Rs crore)</th>
<th>Population per branch (in 000s)</th>
<th>No of bank branches</th>
<th>Branches per sq km</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>50105</td>
<td>27.6</td>
<td>10</td>
<td>2376</td>
<td>4.3</td>
</tr>
<tr>
<td>North-Eastern</td>
<td>27162</td>
<td>34.0</td>
<td>20</td>
<td>304</td>
<td>.01</td>
</tr>
<tr>
<td>Eastern</td>
<td>28482</td>
<td>28.6</td>
<td>16</td>
<td>2225</td>
<td>.03</td>
</tr>
<tr>
<td>Central</td>
<td>23774</td>
<td>19.5</td>
<td>17</td>
<td>4650</td>
<td>.03</td>
</tr>
<tr>
<td>Western</td>
<td>63101</td>
<td>37.3</td>
<td>11</td>
<td>2468</td>
<td>.07</td>
</tr>
<tr>
<td>Southern</td>
<td>44786</td>
<td>34.6</td>
<td>10</td>
<td>3726</td>
<td>.13</td>
</tr>
</tbody>
</table>
Table 3: Bank Services Across Regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Income per capita (Rs)</th>
<th>Deposits/NDP</th>
<th>Credit/NDP</th>
<th>Deposit per capita</th>
<th>Credit per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>50105</td>
<td>198.2</td>
<td>147.0</td>
<td>102883</td>
<td>85693 (16944)</td>
</tr>
<tr>
<td>North-Eastern</td>
<td>27162</td>
<td>94.5</td>
<td>32.9</td>
<td>17059</td>
<td>5817</td>
</tr>
<tr>
<td>Eastern</td>
<td>28482</td>
<td>120.5</td>
<td>49.1</td>
<td>24264</td>
<td>10061</td>
</tr>
<tr>
<td>Central</td>
<td>23774</td>
<td>129.5</td>
<td>51.2</td>
<td>21671</td>
<td>7953</td>
</tr>
<tr>
<td>Western</td>
<td>63101</td>
<td>211.5</td>
<td>129.4</td>
<td>94051</td>
<td>48008</td>
</tr>
</tbody>
</table>
Data Sources

- Our study focuses at national and subnational level (23 states)

- Data sources:
  - Reserve Bank of India
  - Government of India
  - Handbook of Statistics on Indian Economy
  - World Bank
Indicators at National Level

- **Time Frame:** 1975 to 2007
- **FD Indicator:**
  - M3/national GDP
- **Human Capital:**
  - Gross Enrolment Ratio (6-14 years)
  - Expenditure on education as a percentage of total public spending
- **Infrastructure:**
  - Electric power consumption (kWh per capita)
  - Fixed telephone lines per 100 inhabitants

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Methodology- National

- We estimate a model of the form:

\[ F_{I_t} = \alpha + \beta_1 G_{E_t} + \beta_2 E_{E_t} + \beta_3 E_{C_t} + \beta_4 T_{P_t} + \varepsilon_t \]

- Where:

  - \( G_{E_t} \) is the gross primary enrolment rates as a percentage of the total population in age category of 6-14 years at the \( t^{th} \) year.

  - Expenditure on education as a percentage of total government expenditure at the \( t^{th} \) year is denoted by \( E_{E_t} \)

  - \( E_{C_t} \) is the per capita consumption of electricity at the \( t^{th} \) year.

  - Number of fixed telephone lines per 100 inhabitants in India at the \( t^{th} \) year is given by \( T_{P_t} \).

  - Error term \( \varepsilon_t \) in the model below has usual properties.
Sub-national indicators:

- Regressions at two levels:
  - Excluding Infrastructure
  - Including Infrastructure
First level : Finance and Human Capital: Sub-national level:

- Financial development indicator : Regional M3/GDP

- Education indicator:
  » Gross enrolment ratio
  » Teacher-pupil ratio

- Controlling variables:
  » Population per bank branch
  » Per capita income
First level (Finance and Human Capital): Subnational level

- In our equation:

\[ \ln F_{it} = a + \beta_1 G_{it} + \beta_2 T_{it} + \beta_3 P_{it} + \beta_4 I_{it} + \epsilon_{it} \]

Where:

- \( G_{it} \) - gross enrolment rates in age category of 6-14 years in \( i \)th state at \( t \)th year.
- \( T_{it} \) is a proxy measure that represents the quality of human capital development.
- Number of population per bank branch in \( i \)th state at \( t \)th year is given by \( P_{it} \).
- Average per capita income of the households is given by \( I_{it} \).
- The error term \( \epsilon_{i} \) in the model below has usual properties.

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Second Level: Finance and Infrastructure

- In our second exercise we have:
  Infrastructure variables:
  \[
  \ln FI_{it} = a + \beta_1 RD_{it} + \beta_2 TF_{it} + \beta_3 EC_{it} + \beta_4 PB_{it} + \beta_5 I_{it} + \epsilon_t
  \]

- Indicators
  » Road length (RD),
  » Telephone facilities (TF),
  » Electricity installed capacity (EC),
  » Number of bank branches per population (PB), and
  » Per capita income (I).
Sub-national Regressions

- For both our estimates, we use a panel data set of 23 states, extending over a period of 1999 - 2008.

- We estimate the above model using the Pooled OLS, state specific fixed effects and Random Effects specifications.

- Our results are shown in Tables 5 and 6.
## Table 4: Relationship between financial development, human capital and infrastructure development – National

<table>
<thead>
<tr>
<th>Variables</th>
<th>OLS regression</th>
<th>Feasible Generalized Least Squares method (Praise-Winston method)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lin-Lin</td>
</tr>
<tr>
<td><strong>Gross enrolment (primary)</strong></td>
<td>0.108*</td>
<td>-0.010</td>
</tr>
<tr>
<td></td>
<td>(2.02)</td>
<td>(-0.16)</td>
</tr>
<tr>
<td><strong>Expenditure on education</strong></td>
<td>5.339***</td>
<td>2.889**</td>
</tr>
<tr>
<td></td>
<td>(4.71)</td>
<td>(2.24)</td>
</tr>
<tr>
<td><strong>Electricity consumption per capita</strong></td>
<td>0.017**</td>
<td>0.030**</td>
</tr>
<tr>
<td></td>
<td>(2.32)</td>
<td>(2.32)</td>
</tr>
<tr>
<td><strong>Fixed telephone lines per 100 inhabitants</strong></td>
<td>6.110***</td>
<td>6.194***</td>
</tr>
<tr>
<td></td>
<td>(11.44)</td>
<td>(6.23)</td>
</tr>
<tr>
<td><strong>Constants</strong></td>
<td>5.532</td>
<td>20.719</td>
</tr>
<tr>
<td></td>
<td>(1.28)</td>
<td>(3.33)</td>
</tr>
<tr>
<td><strong>DW statistics</strong></td>
<td>1.1711</td>
<td>1.7782</td>
</tr>
<tr>
<td><strong>Adjusted R square</strong></td>
<td>0.9830</td>
<td>0.8799</td>
</tr>
<tr>
<td><strong>No of observations</strong></td>
<td>31</td>
<td>31</td>
</tr>
</tbody>
</table>
Results at National Level

- Positively significant relationship between expenditure on education and financial development indicator: M3/GDP

- Both infrastructure variables—fixed telephones lines and electricity consumption per capita are positively and significantly related to financial development

- Gross enrolment ratio at the national level was not found to be significant.

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Table 5: Relationship between Financial Development and Human Capital at the sub-national level (First Exercise)

<table>
<thead>
<tr>
<th>Variables</th>
<th>OLS</th>
<th>Random effect</th>
<th>Fixed effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross enrolment (GE)</td>
<td>0.197*</td>
<td>0.239***</td>
<td>0.254***</td>
</tr>
<tr>
<td></td>
<td>(1.67)</td>
<td>(4.23)</td>
<td>(4.49)</td>
</tr>
<tr>
<td>Teacher pupil ratio (TP)</td>
<td>0.533***</td>
<td>-0.139**</td>
<td>-0.191***</td>
</tr>
<tr>
<td></td>
<td>(6.34)</td>
<td>(-2.17)</td>
<td>(-2.91)</td>
</tr>
<tr>
<td>Average population per bank branch (PB)</td>
<td>-0.322***</td>
<td>-0.007**</td>
<td>-0.007**</td>
</tr>
<tr>
<td></td>
<td>(-3.00)</td>
<td>(-2.37)</td>
<td>(-2.33)</td>
</tr>
<tr>
<td>Income (I)</td>
<td>0.508***</td>
<td>0.374***</td>
<td>0.319***</td>
</tr>
<tr>
<td></td>
<td>(5.26)</td>
<td>(4.56)</td>
<td>(3.72)</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.713</td>
<td>-0.038</td>
<td>0.619</td>
</tr>
<tr>
<td></td>
<td>(-2.05)</td>
<td>(-0.04)</td>
<td>(0.67)</td>
</tr>
<tr>
<td>Adjusted R-square</td>
<td>0.318</td>
<td>0.1005</td>
<td>0.0725</td>
</tr>
<tr>
<td>Number of observations</td>
<td>208</td>
<td>214</td>
<td>214</td>
</tr>
</tbody>
</table>
Results at the sub-national level: First Exercise

- Higher gross enrolment ratio is associated with higher financial development

- Significantly negative relationship between Pupil Teacher ratio teacher and financial development.

- Accessibility to financial services measured in terms of number of population per bank branch (PB) also indicates a negative relationship

- Positive relationship between states per capita income and financial development
Results contd. (First Exercise)

- Hausman test results suggest that probability of chi-square test is 0.0002

- This indicates that fixed effects estimators are more appropriate

- Next, we included infrastructure variables in our analysis at the sub-national level
Table 6: Relationship between Infrastructure and Financial Development (Second Exercise)

<table>
<thead>
<tr>
<th>Variable</th>
<th>OLS-Linear model</th>
<th>Random effect</th>
<th>Fixed effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td>0.327 (1.34)</td>
<td>0.517*** (4.10)</td>
<td>0.532*** (4.10)</td>
</tr>
<tr>
<td>Installed capacity</td>
<td>0.009*** (13.82)</td>
<td>0.007*** (5.39)</td>
<td>0.005*** (3.18)</td>
</tr>
<tr>
<td>Income</td>
<td>0.001* (2.12)</td>
<td>0.001* (1.73)</td>
<td>0.001* (1.87)</td>
</tr>
<tr>
<td>Constant</td>
<td>27.613 (5.75)</td>
<td>37.421 (5.35)</td>
<td>41.997 (7.34)</td>
</tr>
<tr>
<td>R-square</td>
<td>0.6361</td>
<td>0.6330</td>
<td>0.6049</td>
</tr>
<tr>
<td>Number of observations</td>
<td>163</td>
<td>163</td>
<td>163</td>
</tr>
</tbody>
</table>
Results of the Second Exercise at Sub-national level

- As at the national level, results at the sub-national level too suggest positively significant relationship between infrastructure variables—electricity and telephones and financial development.

- Hausman test results suggest that probability of chi-square test is 0.294. This indicates that random effects estimators are more appropriate.
Conclusion

- Our results both at the national and sub-national level showed positively significant relationship between Financial development and Human Capital.
- Infrastructure variables too were found to be positively associated with financial development.
- Our results also showed that richer the states, higher the financial development.
- Obviously higher the population covered per branch, lower the financial development.
Policy Implications

- As our results showed a supply centric approach to financial inclusion is not enough.

- Human capital was found to be positively associated with financial development.

- Thus human capital needs to be improved simultaneously along with efforts to increase financial inclusion.

- Improving infrastructure too will influence financial development.

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• Thank You!