Accounting for Growth: Comparing China & India

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GDP per Capita
Constant 2000 International (PPP) Dollars

China
India
This Study

- Contrasts growth performance in China vs. India based on construction of growth accounts for 1978-2004
  - Supply side sources of growth: Physical capital, Labor, Education & Land
- Highlights the very different growth patterns by disaggregating:
  - 3 sectors - primary, industry & services
  - Efficiency gains associated with factor reallocation
- Draws implications for future prospects
Construction of Growth Accounts

\[ K_t = K_{t-1} (1 - d) + I_t \]

\[ d = 0.05 \]

\[ H_t = (1.07)^{s_t} \]

\[ Y = AK^\alpha (LH)^{1-\alpha} \]

\[ \frac{y}{l} = \alpha \left( \frac{k}{l} \right) + (1 - \alpha)h + \alpha \]

\[ \Box = 0.40 \]
Some Data Issues

- India:
  - Large informal sector — 5 yr. household surveys

- China:
  - Large industrial enterprises, HH surveys for some services
  - 2 employment indicators at sectoral level
  - Concerns national accounts overstate growth
  - We explored alternative price indices & prefer:
    - Official series for primary & tertiary sectors
    - Alternative for industry (reduces growth by 1.3 p.p)
Aggregate Growth

- **Entire Period: 1978-2004**
  - Similar annual employment growth
  - Chinese growth (Y/L) much more rapid
  - Gains in (Y/L) equally split between capital deepening & TFP in both countries

- **China:**
  - 1978-1993: stands out for strong TFP gains
  - 1993-2004: employment growth slows, faster growth is primarily from increased capital deepening
  - We do NOT find evidence of slowing TFP growth

- **India:**
  - 1978-93: Gains from (K/L) & TFP similar to global averages
  - 1993-2004: (Y/L) growth matches E Asia –but strong TFP contribution, not dominated by increased (K/L)
### Sources of Economic Growth, Total Economy, 1980-2004

Annual percentage rates of change

<table>
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<tr>
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Sources of Growth in Output per Worker, Total Economy

<table>
<thead>
<tr>
<th></th>
<th>Physical Capital</th>
<th>Land</th>
<th>Education</th>
<th>Factor Productivity</th>
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<td>India 1978-1993</td>
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<tr>
<td>China 1993-2004</td>
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<td>1.1</td>
<td>2.2</td>
<td>2.3</td>
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</tbody>
</table>

Graph showing the sources of growth in output per worker for China and India from 1978 to 2004.
Contributions from Education

☐ Neither China nor India has achieved gains comparable to East Asia

☐ India:
  ■ Illiteracy rates remain very high, just 60% primary students reach 5th grade
  ■ Estimated returns to primary school surprisingly low
  ■ Significant pool of highly educated – but rising returns suggest shortages

☐ China:
  ■ Largely eliminated illiteracy, 98% reach 5th grade
  ■ Significant urban-rural divide
  ■ Estimates also suggest low returns to schooling
Sectoral Growth Patterns

- **Primary Sector:**
  - Both benefited from Green Revolution – but labor force share in agriculture remains surprisingly high in both economies.
  - China’s growth remarkably rapid, esp. given declining employment
  - Employment continued to **rise** in India

- **Industry:**
  - **China**: Truly spectacular performance, esp. post 1993 with doubling of gains from both K/L and TFP; now accounts for **over 50%** of output
  - **India**: Growth also rose post 1993, but ½ due to employment, and TFP gains were modest
Sources of Growth in Output per Worker, Primary Sector

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<td>Factor Productivity</td>
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Sources of Growth in Output per Worker, Industry

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<tr>
<td>Factor Productivity</td>
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**Notes:**
- The values represent the contribution of each factor to the growth in output per worker over the specified periods.
Sectoral growth patterns (cont)

- Services:
  - **India**: strong recent performance is well-known – largely TFP, modest (K/L)
  - **China**: strong growth began in 78-93; but gains primarily from (K/L) with weak TFP improvements

- Services is the sector where India comes closest to achieving China’s growth rates
Sources of Growth in Output per Worker, Services

<table>
<thead>
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<th>Physical Capital</th>
<th>Land</th>
<th>Education</th>
<th>Factor Productivity</th>
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<td>3.9</td>
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Labor force share in agriculture remains surprisingly high in both economies.
Reallocation Effects

- Output growth arises from both:
  - Productivity gains within sectors
  - Resource reallocation among sectors

- Output per worker in services & industry vs. agriculture:
  - 1978: roughly 3x for both countries
  - 2004: 4-5x for India, 5-7x for China

- Aggregate output growth can be decomposed:
  - sectoral contributions (sector’s growth x VA share)
  - residual due to reallocation
Output per worker by sector

China

India
Growth in Output per Worker, Sector and Reallocation Effects, 1978-2004

Growth in Output per Worker by Sector and Reallocation

- **China**
  - 1978-1993
  - 1993-2004

- **India**
  - 1978-1993
  - 1993-2004

**Legend**
- Agriculture
- Industry
- Services
- Reallocation
### Sectoral Growth in Output/Worker

(ALL of the recent difference between China’s & India’s performance can be attributed to industry)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Primary</th>
<th>Secondary</th>
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<td>1993-04</td>
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<td>Difference</td>
<td>3.9</td>
<td>0.2</td>
<td>4.1</td>
<td>-0.4</td>
</tr>
</tbody>
</table>
Strong Future Growth Prospects

Both still poor countries:
- 15% (China), 8% (India) US GNI/capita (PPP)
- Further gains from moving labor out of agriculture

China:
- Slowing labor force growth but improvements in human capital
- 40% national saving – but concerns about over-investment in some sectors
- Impressive expansion of trade and FDI inflows
- Problems include inefficient financial sector, need to develop domestic markets and address imbalances.
Future Growth Prospects (cont)

- **India:**
  - Growing labor force, still concentrated in agriculture
  - Room for expansion of services & esp. **manufacturing**
  - **BUT** Educational institutions need to be strengthened and access expanded
  - Moderate investment rates will need to be increased to sustain growth >7%
    - Private saving has been increasing- but much is absorbed by high public sector deficits
    - Increased FDI could raise investment, promote access to global markets & technology
    - Also concerns about inadequate infrastructure
  - China provides a model for using global market stimulus to increase and sustain growth
Summary & Conclusions

- Growth accounts uncover sources of:
  - Truly extraordinary Chinese growth from both TFP and capital deepening
  - India’s recent performance, matching E Asia, but with greater evidence of TFP
- Central difference: China’s stellar performance in industry vs. India’s relatively weak manufacturing growth.
  - Goods production and trade will be essential for India to fully employ its workers.
- India’s recent services growth matches that for China.
- We see strong prospects for continued growth in both.