Rapid Urbanization and Structural Transformation in India

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Research Agenda

- **Big picture**
  - Assembling new data on dynamics of rapid urbanization in India
  - Within-city distribution of poverty and economic opportunity
  - Economic structure and geography of spaces outside urban boundary

- **Narrow agenda**
  - How does rapid urban growth shape the entire industrial structure?
    - Rural population movement, occupational choice and poverty
  - How do infrastructure and land use policy shape location patterns of people and firms?
    - Slum formation, segregation
Motivation

- Majority of wealth generated in cities
- Majority of poor live outside of cities

### Urban Growth and the Rural Economy

**Research Question**
- When/how does urban growth benefit the hinterland?

<table>
<thead>
<tr>
<th></th>
<th>Urbanization Rate</th>
<th>Poverty Headcount (Rural)</th>
<th>Poverty Headcount (Urban)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India (1987)</td>
<td>23%</td>
<td>55%</td>
<td>35%</td>
</tr>
<tr>
<td>India (2011)</td>
<td>34%</td>
<td>24%</td>
<td>13%</td>
</tr>
<tr>
<td>China (2014)</td>
<td>54%</td>
<td>13%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>
Urban Growth and the Rural Economy

- **Traditional Structural Transformation Model**
  - Rural productivity drives urban growth
  - Improvements in agriculture release labor to work in cities
  - Increased rural incomes fuel demand for urban products

- **Open Economy Cities**
  - Globalization delinks cities from rural productivity
  - Rapid urbanization can arise from rural deprivation
  - Urban growth outpacing infrastructure and planning
  - Rural income and rural->urban migration affect path of cities

- Little evidence on urban -> rural growth channel
Urban to Rural Transmission Channels

- Increased demand for rural labor
- Increased demand for rural agricultural goods
  - May also raise demand for higher margin products
- Increased supply of capital / remittances
- Price effects
  - Cheaper consumer goods
  - Higher land prices

Key factors mitigating shock transmission:
  - Transportation infrastructure
  - Ease of migration
New Urban Data in India

  - Census of non-farm establishments, rural and urban, formal and informal
  - 42 million firms in 2005
  - 600,000 villages; 5,000 towns
  - Employment, ownership, product code
  - Neighborhood identifiers, geocoded at town and village level

- Asset censuses
  - All rural households (2002)
  - All rural and urban households (2012)
  - Household structure, education, parents’ education, occupation, durables, income and source of income
  - Geocoded at town and village, and neighborhood for one city

- Village- and town-level demographic censuses (1991-2011)
Empirical Strategy: Challenges

- Estimation challenges:
  - Reverse Causality is likely important
    - Effective states will promote rural and urban growth
    - Correlation between rural and urban growth insufficient
  - Selective movement of labor
    - Average change in rural poverty may not be average change for rural poor
Empirical Strategy: Our Approach

Our strategy:

- Estimate causal impact of urban growth on rural hinterland with two instruments:
  - National industrial composition and aggregate shocks
  - Heterogeneous impact of tariff liberalization on cities

Decomposition of effect:

- Infrastructure quality and other barriers to migration
- How does transmission decay across distance?
Distance to town predicts rural economic structure

- Share of Households with cultivation as main income source vs. Distance to town (km)
- Share of households with income >5,000 INR vs. Distance to town (km)
- Village non-farm employment growth (1998-2005) vs. Distance to town (km)
- Share of households with income >5,000 INR

All graphs include state fixed effects, size controls.
Town Growth Instruments

- Predicted growth from national shock
- Reduction in input tariff
Hinterland shock, AP (1998-2005)
### IV: First Stage Urban Labor Demand

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
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</thead>
<tbody>
<tr>
<td>Log town growth (IV)</td>
<td>0.651</td>
<td>0.576</td>
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<tr>
<td></td>
<td>(0.168)***</td>
<td>(0.156)***</td>
</tr>
<tr>
<td>Town baseline employment</td>
<td>-0.061</td>
<td>-0.083</td>
</tr>
<tr>
<td></td>
<td>(0.010)***</td>
<td>(0.011)***</td>
</tr>
<tr>
<td>Village baseline employment</td>
<td>0.022</td>
<td>0.000</td>
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<tr>
<td></td>
<td>(0.003)***</td>
<td>(0.002)</td>
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<tr>
<td>Village baseline population</td>
<td>0.004</td>
<td>0.003</td>
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<tr>
<td></td>
<td>(0.004)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>N</td>
<td>311644</td>
<td>311644</td>
</tr>
<tr>
<td>r2</td>
<td>0.05</td>
<td>0.16</td>
</tr>
<tr>
<td>State F.E.</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### IV: Reduced form urban->rural

<table>
<thead>
<tr>
<th></th>
<th>Non-Farm Emp Growth</th>
<th>Population Growth</th>
<th>Ag Source of Income</th>
<th>Income &gt; 10,000 INR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Town Growth (IV)</strong></td>
<td>-0.359</td>
<td>-0.026</td>
<td>0.110</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>(0.100)***</td>
<td>(0.011)**</td>
<td>(0.051)**</td>
<td>(0.015)*</td>
</tr>
<tr>
<td><strong>Baseline Log Rural Emp</strong></td>
<td>0.397</td>
<td>0.016</td>
<td>-0.021</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(0.006)***</td>
<td>(0.001)***</td>
<td>(0.002)***</td>
<td>(0.001)***</td>
</tr>
<tr>
<td><strong>Baseline Log Rural Pop</strong></td>
<td>0.587</td>
<td>0.919</td>
<td>-0.017</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(0.007)***</td>
<td>(0.001)***</td>
<td>(0.002)***</td>
<td>(0.001)***</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>169224</td>
<td>168530</td>
<td>162637</td>
<td>162637</td>
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<tr>
<td><strong>r2</strong></td>
<td>0.55</td>
<td>0.89</td>
<td>0.14</td>
<td>0.17</td>
</tr>
</tbody>
</table>

All estimates with state fixed effects and state-clusters
Who benefits most?

- Census Data -> wide scope for studying heterogeneity

Preliminary Findings:
- Growth shocks decay with distance
  - Predicted effect is zero after 30km (75th percentile)
- Small or zero effects in villages without roads
- Movement into agriculture declines monotonically in village size

Ahead:
- Composition of gains by education / caste / land ownership
- What firms exit?
Takeaways

- Urban-rural markets clearly linked, but distance remains an important barrier
- Can’t interpret urban-rural correlations as policy parameters
  - Research needed to identify mechanisms for rural gain from urban growth

Next steps

- Other outcomes:
  - Occupations, prices, crop choices
  - Within-town impacts
- Transmission channels: labor / goods / capital markets
Thank you!