Clusters and Regional Performance: Implications for Inner Cities

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Revisiting the Promise and Problems of Inner City Economic Development
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Motivation and Research Question

• The distribution of economic success within regions is uneven, and areas of concentrated poverty and unemployment (i.e., inner cities) persist in American cities. In 2011, 30 million people lived in inner cities.

• This project evaluates Porter’s (1997) premise that inner-city job creation could be facilitated by integrating inner cities into regional clusters (groups of closely related industries co-located in a region).

• Building on prior work (Delgado, Porter, and Stern, 2010, 2014), we develop a framework to examine the role of regional clusters on job creation in the inner city.
Preview of Findings: Mapping the Cluster Composition of Inner Cities

• An important contribution of this paper is **measuring the cluster composition of inner cities and their nearby regions (cities and Metro Areas)**

  • Some clusters have a large presence in inner cities
    • E.g., Apparel, Distribution and eCommerce, Performing Arts, ...

  • **Inner cities are unique:** They vary in their cluster composition

  • **Inner-city clusters vary in their degree of connectivity to the regional clusters**
    • E.g. Some clusters are strong in the inner cities and also in their nearby region(“connected clusters”), while others are not
• We examine the employment growth during 2003-2011 of industries located in the inner city as a function of the cluster strength in the region (inside and outside the inner city)

• We find that the initial strength of the cluster in the inner city, in the proximate central city (outside the inner city), and in the rest of the Metropolitan Statistical Area are all positively associated with the employment growth of the industries within the inner-city cluster

• These findings suggest that policy interventions to create jobs in inner cities should focus on connecting clusters in the inner cities to the strong regional clusters
Motivation and Research Question

- Hypothesis
- Inner City and Cluster Definitions
- Findings
- Conclusions and Future Directions
Clusters and Job Creation in Inner Cities

• Prior work shows that strong regional clusters create agglomeration economies of various types (knowledge, input-output, and labor links) that improve regional employment (Delgado, Porter, and Stern, 2014)

• But will agglomeration benefits arise in Inner Cities?

• Agglomeration economies could be hindered in inner cities because of their smaller size (population, businesses), lower skills of residents, and worse social conditions (Wilson, 1987; Moreti, 2012)

• Agglomeration economies could be fostered in inner cities because of their high density of population and employment, and proximity to the city (Ciccone and Hall, 1996; Porter, 1997; Glaeser, Kahn, and Rappaport, 2008)

• Hypothesis: An industry located in an inner city with a cluster that is strong in both the inner city and in the nearby region (“connected”) will grow faster than the same industry located in an inner city with a cluster that is weak in the inner city and/or the nearby region
Outline

✓ Motivation and Research Question

✓ Hypothesis

• Inner City and Cluster Definitions

• Findings

• Conclusions and Future Directions
Data

• We use unique datasets from the Initiative for a Competitive Inner City (ICIC) and from the U.S. Cluster Mapping Project

• To estimate employment by industry and cluster for 3 levels of proximate geographies within an urban region:

  • 188 Metropolitan Statistical Areas (MSAs) that contain

    • 328 Central Cities (CCs) that contain

    • 328 Inner Cities (ICs)
What is an Inner City?

• Inner city is not necessarily downtown!

• ICIC defines inner cities as **economically distressed parts of the city** with high concentration of poverty and unemployment

• Inner city is a set of **contiguous census tracts** in a central city that have higher poverty and unemployment rates than the surrounding region and, in aggregate, represent at least 5% of a city’s population

• Each inner-city census tract must meet either of two criteria:

<table>
<thead>
<tr>
<th>Poverty Rate*</th>
<th>OR</th>
<th>Poverty Rate* &amp;</th>
<th>Unemployment Rate* &amp;/or Median Household Income*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=20%</td>
<td></td>
<td>1.5x&gt;MSA</td>
<td>50%&lt;MSA</td>
</tr>
</tbody>
</table>

*Excludes currently-enrolled undergraduate/graduate students. Source: ICIC and American Community Survey 2011.
In 2011, **ICs accounted for 12 mill jobs (11% of US), 30 mill people (10% of US), and their MSAs accounted for +70% of jobs and people in the US**

- Well-known ICs: Flint, Dearborn, Detroit, Camden, Peoria, Albany, but many others
- Each IC is linked to only one MSA, but some MSAs have multiple ICs
Example of the Inner City and Surrounding Region
Indianapolis, Indiana: Inner City, Central City and MSA

- Inner City $\subseteq$ Central City $\subseteq$ Metro Area (MSA)
  - The Indianapolis central city contains the inner city (IC); and the Indianapolis-Carmel-Anderson MSA contains the central city (CC)
  - We measure the presence of a cluster in the 3 mutually exclusive geographies: IC (green area), the surrounding CC (grey area) and the rest of the MSA (orange area)
Cluster Data

- We use the US Cluster Mapping Project dataset to measure **employment at the region-industry-cluster level**
  - The analysis focuses on a dataset for 2003 and 2011
  - incorporates **778 traded industries** (6-digit NAICS)
    - Manufacturing and service industries that concentrate in particular regions and sell products/services across regions and countries
  - grouped into **51 clusters** of related industries
    - **U.S. Benchmark Cluster Definitions** developed by Delgado, Porter, and Stern (2015) grouping related and complementary industries based on input-output links, shared labor occupations, and co-location patterns.
  - The **51 clusters are mapped to the three regional units** (IC, CC, and MSA)
Portfolio of 51 Traded Clusters and their Connections

Outline

✓ Motivation

✓ Inner City and Cluster Definitions

• Findings: The Cluster Composition of Inner Cities

• Findings: Cluster Connectivity and job creation in inner cities

• Conclusions and Future Directions
Clusters with Large Presence in Inner Cities

<table>
<thead>
<tr>
<th>Cluster Name</th>
<th>Employment 2011</th>
<th>Share of IC Traded &gt;4%</th>
<th>Share of US Cluster in ICs 15-25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Services</td>
<td>839,489</td>
<td>21.9%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Distribution and Electronic Commerce</td>
<td>590,610</td>
<td>15.4%</td>
<td>11.4%</td>
</tr>
<tr>
<td>Hospitality and Tourism</td>
<td>348,276</td>
<td>9.1%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Education and Knowledge Creation</td>
<td>259,047</td>
<td>6.7%</td>
<td>8.6%</td>
</tr>
<tr>
<td>Financial Services</td>
<td>202,083</td>
<td>5.3%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Transportation and Logistics</td>
<td>160,673</td>
<td>4.2%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Apparel</td>
<td>33,342</td>
<td>0.9%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Performing Arts</td>
<td>72,890</td>
<td>1.9%</td>
<td>24.0%</td>
</tr>
<tr>
<td>Jewelry and Precious Metals</td>
<td>4,283</td>
<td>0.1%</td>
<td>16.6%</td>
</tr>
<tr>
<td>Music and Sound Recording</td>
<td>3,660</td>
<td>0.1%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Leather and Related Products</td>
<td>5,278</td>
<td>0.1%</td>
<td>16.1%</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2,399</td>
<td>0.1%</td>
<td>15.9%</td>
</tr>
</tbody>
</table>

- These national clusters tend to have a large presence in ICs
  - **By Share of IC Employment**: E.g., Business Svcs accounts for 22% of IC employment
  - **By Share of the US Cluster**: E.g., 25% of all apparel jobs are located in ICs
- But not all ICs are specialized in these clusters: ICs vary in their cluster composition
Inner Cities Specialize in Clusters: E.g., Performing Arts
44% of ICs have some cluster strength (LQ>1, 2011)
Inner Cities Vary in their Connectivity to Regional Clusters: Performing Arts

40% of ICs are connected to strong regional clusters
Cluster Specialization across IC, CC, and MSA: Connected Clusters
Odessa, Texas

<table>
<thead>
<tr>
<th>Cluster name</th>
<th>Inner City (IC): Odessa</th>
<th>Central City (CC)</th>
<th>MSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spec (LQ)</td>
<td>Employ</td>
<td>% of CC</td>
<td>% of MSA</td>
</tr>
<tr>
<td>Oil &amp; Gas Production &amp; Transportation</td>
<td>14.1</td>
<td>598</td>
<td>20%</td>
</tr>
<tr>
<td>Construction Products &amp; Services</td>
<td>8.0</td>
<td>404</td>
<td>21%</td>
</tr>
<tr>
<td>Distribution &amp; Electronic Commerce</td>
<td>2.2</td>
<td>807</td>
<td>30%</td>
</tr>
<tr>
<td>Transportation &amp; Logistics</td>
<td>0.8</td>
<td>85</td>
<td>15%</td>
</tr>
<tr>
<td>Production Technology &amp; Heavy Machinery</td>
<td>1.1</td>
<td>70</td>
<td>26%</td>
</tr>
<tr>
<td>Coal Mining</td>
<td>2.1</td>
<td>14</td>
<td>50%</td>
</tr>
<tr>
<td>Printing Services</td>
<td>1.1</td>
<td>36</td>
<td>40%</td>
</tr>
</tbody>
</table>

“Connected” cluster: the cluster is strong inside and outside the inner city
- Odessa inner city in Texas is specialized in clusters that have a high strength in the region: E.g., Oil and Gas Production and Transportation; Construction Products & Services; Distribution & Electronic Commerce clusters
- These IC-clusters are connected to the region and this can facilitate intra-regional linkages between the cluster in the inner city and in the rest of the region that result in higher growth in the inner-city cluster
- We evaluate this relationship in the econometric model
Outline

✔ Motivation

✔ Hypothesis

✔ Inner City and Cluster Definitions

✔ Findings: The Cluster Composition of Inner Cities

• Findings: Cluster Connectivity and job creation in inner cities

• Conclusions and Future Directions

We examine the employment growth during 2003-2011 of industries located in the inner city as a function of the size of the industry and the cluster strength in the region (in the IC, the surrounding CC, and the rest of the MSA)

We examine the employment growth of industries located in the inner city as a function of the size of the industry and the cluster strength in the region (inside and outside the inner city)

\[
\ln \left( \frac{\text{IC-Industry Employment}_{icr_i,2011}}{\text{IC-Industry Employment}_{icr_i,2003}} \right) = \alpha_0 + \delta \ln(\text{IC-Industry Employment}_{icr_i,2003}) + \beta_1 \ln(\text{IC-Cluster Specialization}_{icr_i,2003}) + \beta_2 \ln(\text{CC-Cluster Specialization}_{icr_i,2003}) + \beta_3 \ln(\text{MSA-Cluster Specialization}_{icr_i,2003}) + \alpha_i + \alpha_{icr_i} + \varepsilon_{icr_i}
\]

- **Dep. Variable:** Annual employment growth of industry \( i \) at IC \( r_1 \)
- **The explanatory variables (in logs in 2003) are**
  - Level of employment in the IC-industry
  - Employment specialization in the cluster (outside the industry) at 3 levels of geography: the IC, the CC (outside the IC), and the MSA (outside the CC)
- **Controls:** Industry FE\( s \) and IC FE\( s \)
- **Estimate OLS model with standard errors clustered by IC-cluster.**
Cluster Connectivity and Job Creation in Inner Cities

Industries within strong inner-city-clusters create more jobs, specially if the cluster is also strong in the nearby region (city, MSA)

<table>
<thead>
<tr>
<th>Inner-City Industry Employment Growth, 2003-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln IC-Industry Employment$_{2003}$</td>
</tr>
<tr>
<td>(Outside the Industry)</td>
</tr>
<tr>
<td>Ln IC-Cluster Specialization$_{2003}$</td>
</tr>
<tr>
<td>(Outside the Industry)</td>
</tr>
<tr>
<td>Ln CC-Cluster Specialization$_{2003}$</td>
</tr>
<tr>
<td>(Outside the Industry and IC)</td>
</tr>
<tr>
<td>Ln MSA-Cluster Specialization$_{2003}$</td>
</tr>
<tr>
<td>(Outside the Industry and CC)</td>
</tr>
<tr>
<td>Industry  FE (755 industries)</td>
</tr>
<tr>
<td>IC FE (327 ICs)</td>
</tr>
<tr>
<td>R-Squared</td>
</tr>
<tr>
<td>Obs.</td>
</tr>
</tbody>
</table>

Notes: ** refers to coefficients significant at 1% level. Standard errors are clustered by inner-city-cluster. Sample includes IC-industries with at least 10 employees in 2003.
What Makes an Inner City Competitive?

• The ability to economically connect to the rest of the urban region by having clusters that are integrated into the regional clusters (Porter, 1997)

Areas for Future Research:

• What mechanisms are important to create cluster benefits in ICs? What to prioritize?
  • Access to inputs
  • Access to demand
  • Labor and skill linkages
  • Knowledge linkages
  • Supporting Institutions (Universities, Chamber of Commerce, Accelerators, ...)
  • Cluster literature will suggest that all of the above

• Role of related clusters?
  • ICs may specialize in clusters distinct but related to those in the region (e.g., Distribution & eCommerce is related to numerous clusters)
Policy Implications: Connect the Inner City to the Regional Clusters

What to do

• **Step 1**: Map the cluster composition of the region
• **Step 2**: Identify strong and emerging clusters in the region that have some strength in the inner city
• **Step 3**: Develop initiatives to connect and grow the inner-city clusters:
  • Connecting by **skills** needed by the strong regional clusters
  • Connecting by **infrastructure** that increases proximity to the region
    • Circulation of ideas, people, goods and services
  • Connecting through **entrepreneurship**
    • How do we support high-quality startups (Stern/Guzman, 2015)?
    • The local economy can support e-ship: the presence of suppliers of business services and the presence of amenities (restaurants, retail)

What *Not* to do

• Choosing **generic clusters** (e.g., high-tech clusters) is ineffective. The policy should be based on the comparative advantage of the region
• **Generic place-based policies to attract any type of firms** (e.g., Empowerment Zones) may not be effective in connecting the IC to the regional clusters