Clusters and Regional Performance: Implications for Inner Cities

Mercedes Delgado

MIT Sloan & Institute for Strategy and Competitiveness

Kimberly Zeuli

The Initiative for a Competitive Inner City

Revisiting the Promise and Problems of Inner City Economic Development

Detroit, September 16, 2015

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

Preview of Findings: Clusters Matter for Job Creation in Inner Cities

- 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**

Outline

- ✓ 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
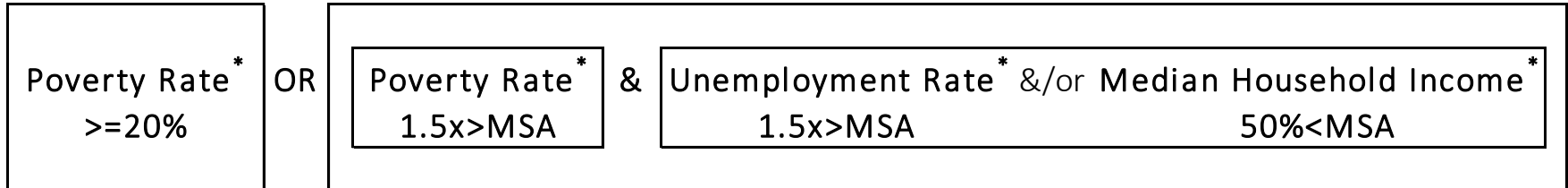
- Conclusions and Future Directions

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**:

| Poverty Rate* >=20% | OR | Poverty Rate* 1.5x>MSA | & | Unemployment Rate* &/or Median Household Income* 1.5x>MSA 50%<MSA |

*Excludes currently-enrolled undergraduate/graduate students. Source: ICIC and American Community Survey 2011.

Mapping MSAs with Inner Cities: Inner Cities are Located Across the US

● Inner City   □ MSA
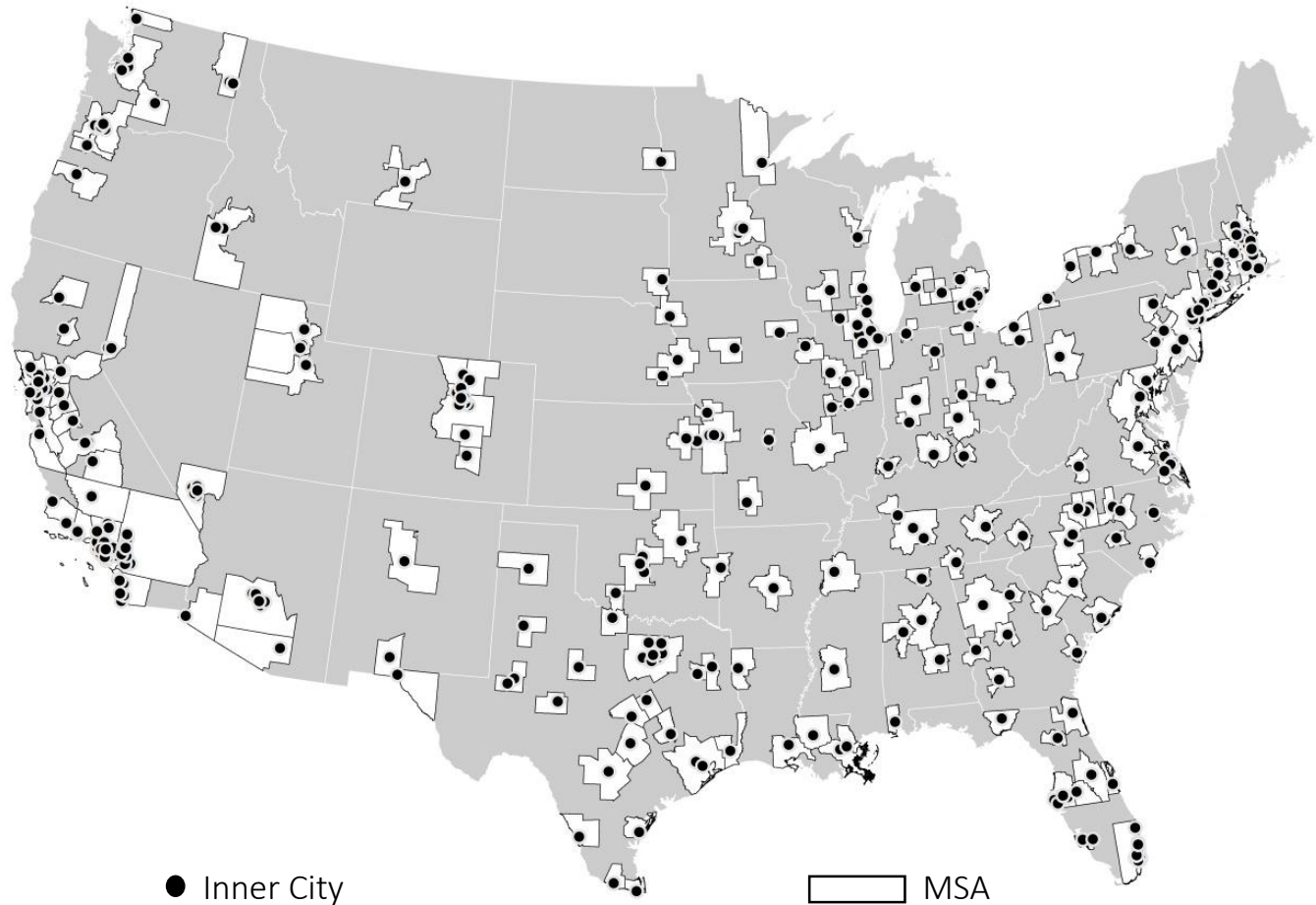
- In 2011, **ICs accounted for 12 mill jobs (11% of US), 30 mill people (10% of US)**, and their MSAs accounted for +70% of jobs and people in the US

- 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

Indianapolis, Indiana

Indianapolis-Carmel-Anderson MSA

| Inner City | Central City | MSA |
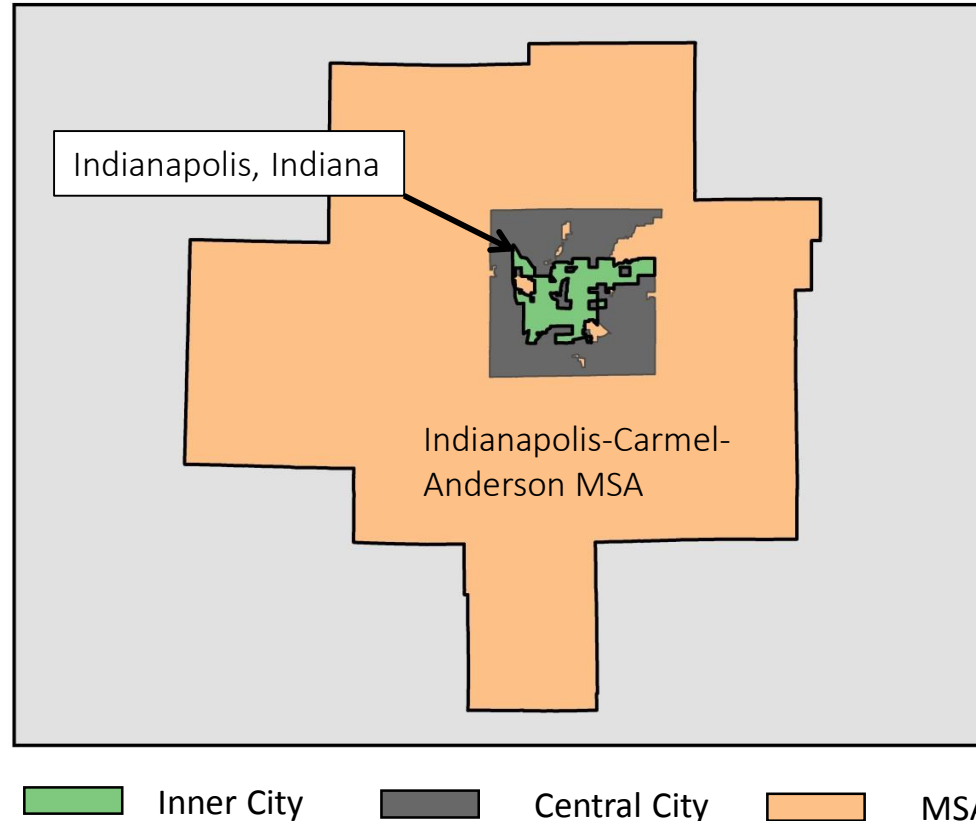
- Inner City ∈ Central City ∈ Metro Area (MSA)
  - The Indianapolis central city contains the inner city (IC); and the Indianapolis-Carmel-Anderson MSA contains the central city (CC)
- We measure the presence of a cluster in the 3 mutually exclusive geographies:
  IC (green area), the surrounding CC (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
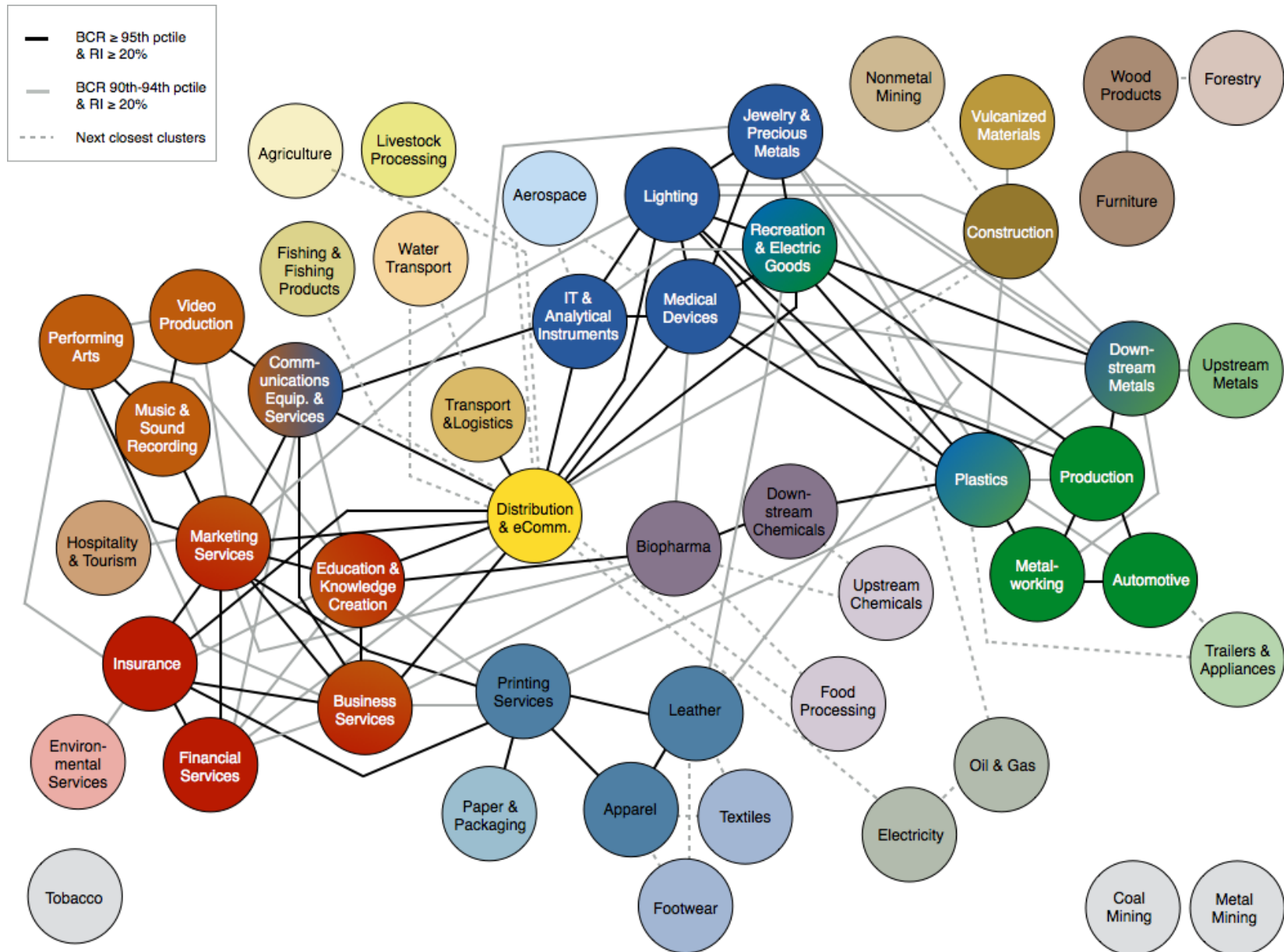
Source: Delgado, Porter, and Stern (2015)

Outline

✓ Motivation

✓ Inner City and Cluster Definitions

- **Findings: The Cluster Composition of Inner Cities**

- Findings: Cluster Connectivity and job creation in inner cities
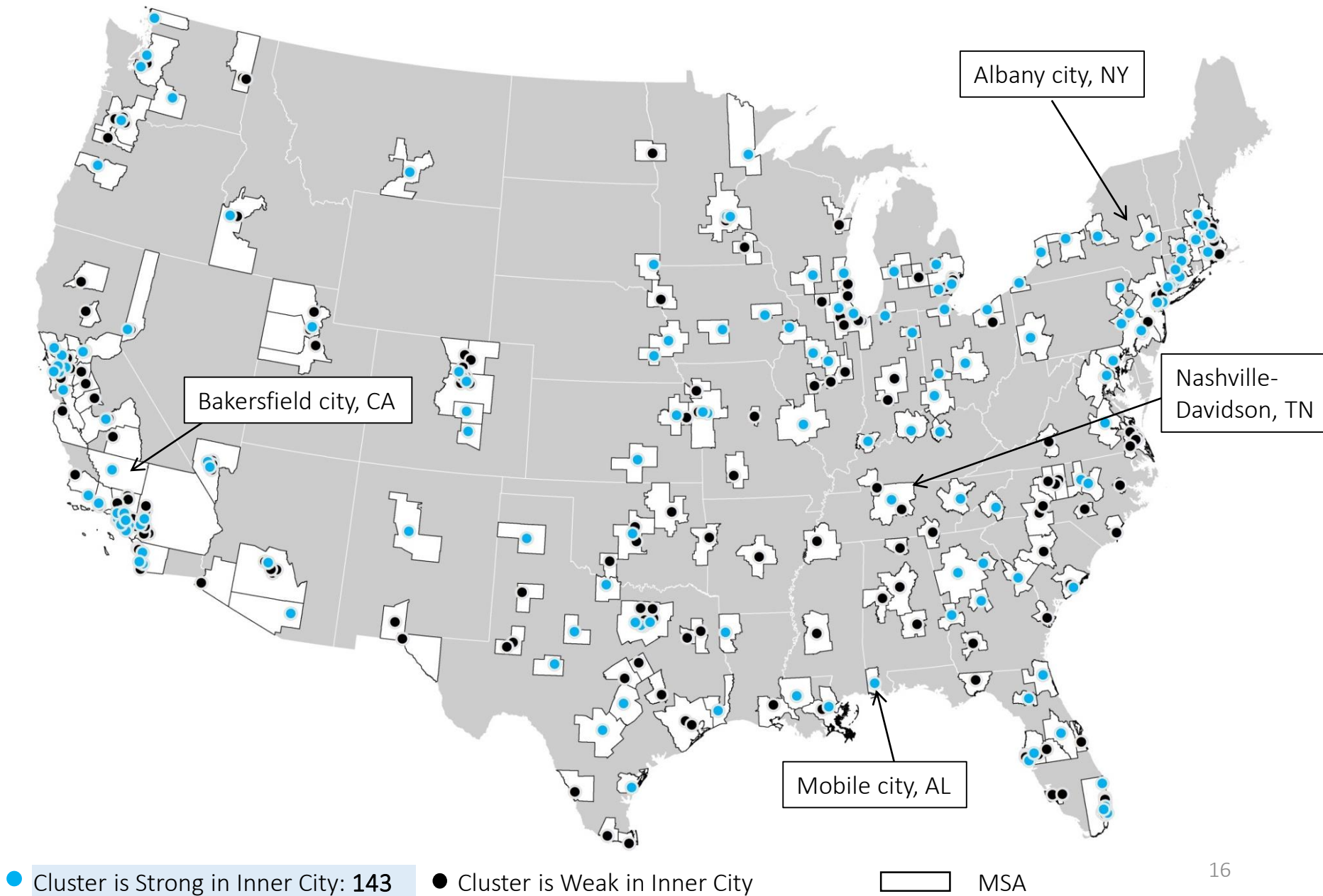
- Conclusions and Future Directions

Clusters with Large Presence in Inner Cities

Cluster Name	Total (328 Inner Cities)		
	Employment 2011	Share of IC Traded Employment >4%	Share of US Cluster in ICs 15-25%
Business Services	839,489	**21.9%**	8.3%
Distribution and Electronic Commerce	590,610	**15.4%**	11.4%
Hospitality and Tourism	348,276	**9.1%**	12.0%
Education and Knowledge Creation	259,047	6.7%	8.6%
Financial Services	202,083	5.3%	10.7%
Transportation and Logistics	160,673	4.2%	10.4%
Apparel	33,342	0.9%	**25.0%**
Performing Arts	72,890	1.9%	**24.0%**
Jewelry and Precious Metals	4,283	0.1%	**16.6%**
Music and Sound Recording	3,660	0.1%	16.2%
Leather and Related Products	5,278	0.1%	16.1%
Tobacco	2,399	0.1%	15.9%
		63%	

- 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
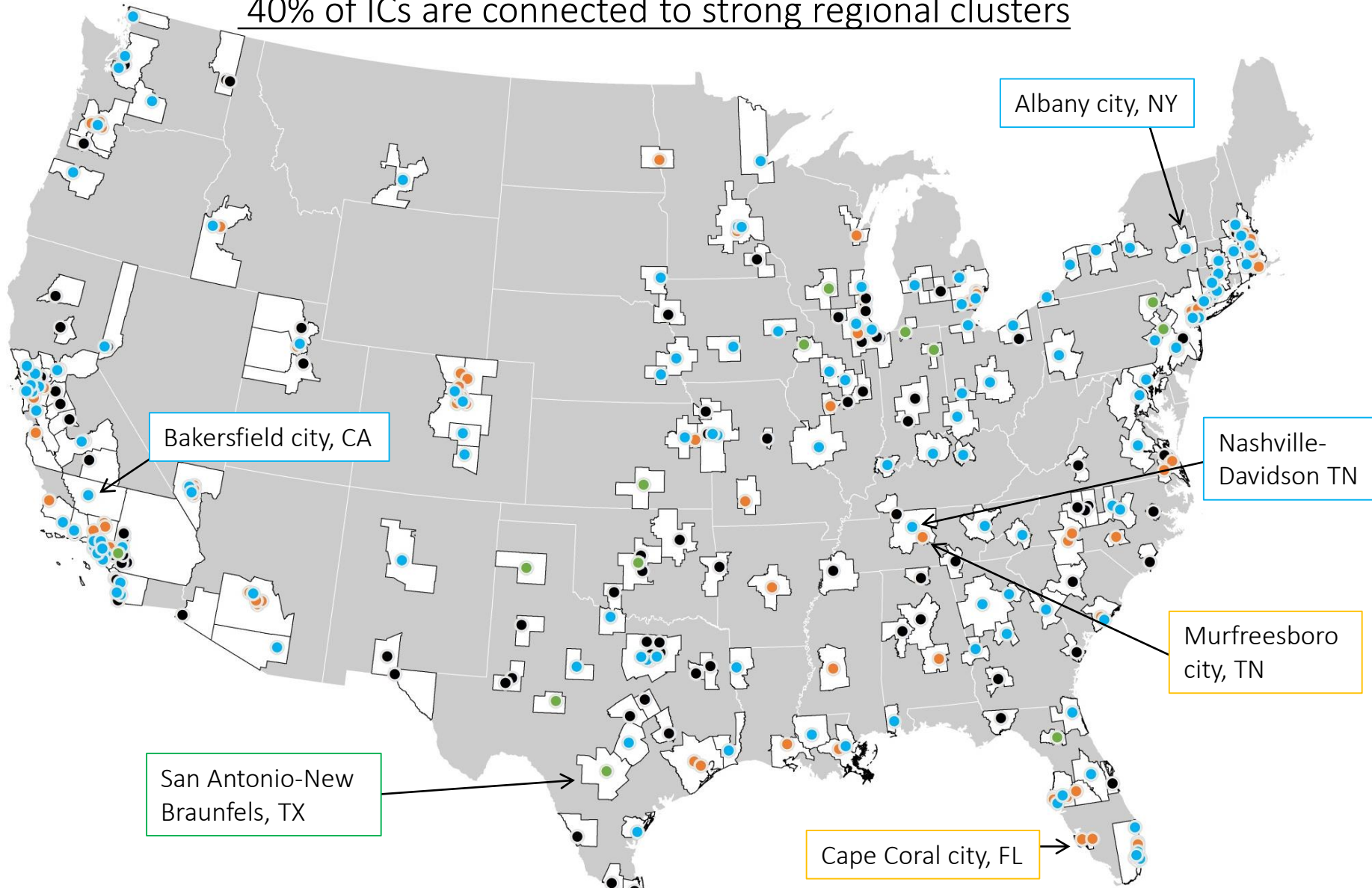- But not all ICs are specialized in these clusters: ICs vary in their cluster composition

Inner Cities Specialize in Clusters: E.g., Performing Arts
44% of ICs have some cluster strength (LQ>1, 2011)

Albany city, NY

Bakersfield city, CA

Nashville-Davidson, TN

Mobile city, AL

● Cluster is Strong in Inner City: **143**   ● Cluster is Weak in Inner City   ☐ MSA

Inner Cities Vary in their Connectivity to Regional Clusters: Performing Arts

40% of ICs are connected to strong regional clusters

Albany city, NY

Bakersfield city, CA

Nashville-Davidson TN

Murfreesboro city, TN

San Antonio-New Braunfels, TX

Cape Coral city, FL

● Cluster is Strong in Inner City & CC or MSA: 130   ● Cluster is Weak in Inner City & Strong in CC or MSA: 90

● Cluster is Strong in Inner City & Weak in CC & MSA: 13   ● Cluster is Weak in the region (IC, CC, & MSA): 95

Cluster Specialization across IC, CC, and MSA: Connected Clusters
Odessa, Texas

Cluster name	Inner City (IC): Odessa				Central City (CC)		MSA	
	Spec (LQ)	Employ	% of CC	% of MSA	Spec (LQ)	Employ	Spec (LQ)	Employ
Oil & Gas Production & Transportation	14.1	598	20%	10%	16.5	2962	19.3	6112
Construction Products & Services	8.0	404	21%	13%	9.1	1934	8.3	3120
Distribution & Electronic Commerce	2.2	807	30%	16%	1.8	2718	1.8	4894
Transportation & Logistics	0.8	85	15%	6%	1.2	564	1.6	1342
Production Technology & Heavy Machinery	1.1	70	26%	9%	1.0	272	1.6	765
Coal Mining	2.1	14	50%	23%	1.0	28	1.2	60
Printing Services	1.1	36	40%	33%	0.6	89	0.4	108

"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

Econometric Model: Inner-City-Industry Employment Growth, 2003-11

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)

Econometric Model: Inner-City-Industry Employment Growth, 2003-11

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)

$$\ln\left(\frac{\text{IC-Industry Employment}_{icr_1,2011}}{\text{IC-Industry Employment}_{icr_1,2003}}\right) = \alpha_0 + \delta\ln(\text{IC-Industry Employment}_{icr_1,2003})$$

$$+ \beta_1\ln(\text{IC-Cluster Specialization}_{icr_1,2003}^{\text{outside i}})$$

$$+ \beta_2\ln(\text{CC-Cluster Specialization}_{icr_2,2003}^{\text{outside i, outside IC}})$$

$$+ \beta_3\ln(\text{MSA-Cluster Specialization}_{icr_3,2003}^{\text{outside i, outside CC}})$$

$$+ \alpha_i + \alpha_{r_1} + \varepsilon_{icr_1}.$$

- **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 FEs and IC FEs
- **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)

	Inner-City Industry Employment Growth, 2003-2011
Ln IC-Industry Employment$_{2003}$	-0.264**
	(0.009)
Ln IC-Cluster Specialization$_{2003}$	0.087**
(Outside the Industry)	(0.011)
Ln CC-Cluster Specialization$_{2003}$	0.062**
(Outside the Industry and IC)	(0.011)
Ln MSA-Cluster Specialization$_{2003}$	0.023**
(Outside the Industry and CC)	(0.009)
Industry FEs (755 industries)	Yes
IC FEs (327 ICs)	Yes
R-Squared	0.237
Obs.	35,641

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