

Cluster Mapping in Europe and the United States

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The Role of Cluster Mapping

- Provide a **precise language** for discussing clusters and their role in regional economies
- Provide data for **regional economies** to develop competitiveness strategies reflecting their individual cluster portfolios
- Enable **regional clusters** to systematically compare their size and profile over time and with peers in other locations
- Guide the use of **policy instruments** tied to the presence of clusters across locations



- Cluster mapping is a key element in moving **cluster-based economic policy** to the next level

Cluster Policy Approaches

Europe

- Cluster effort often based on **national programs**
- Strong role of **government** in initiating cluster efforts
- **Lower** level of specialization across regional economies
- Business environments tend to be **strong on factor input conditions**, often weaker on context for strategy and rivalry

United States

- Cluster efforts based on **regional initiatives**
- Strong role of **private sector** from the outset of cluster efforts
- Many regional economies highly **specialized** around strong clusters
- Business environments tend to be very **open to cross-regional competition** and have access to **strong factor input conditions**

Use of Cluster Mapping

United States

- Identification of regional clusters
- Assessment of economic performance of regional clusters
- Development of regional strategies to mobilize clusters
- Analysis of the relationship between cluster presence and regional economic performance

Europe

- Intentions as above
- Intention to use cluster definitions to guide public policy programs

Cluster Mapping Approaches

HBS Cluster Mapping Project

- Based on actual co-location of industries; revealed impact of sum of locational factors on company decisions
- Use of U.S. data because the U.S. economy has been exposed to free cross-regional competition among the locations for the longest time
 - “a peek into the future of other locations”

Alternatives/complements

- Input – output relationships; supplier relationships
- Cross-company/institution career paths; social networks
- Co-publication/citation data; knowledge spill-overs

HBS Cluster Mapping Project

- Use of employment data at the 4-digit industry level for regional economies
- Calculation of regional concentration per industry across the U.S.
 - No concentration: Local industries
 - Significant concentration: Traded clusters and natural-resource driven clusters
- Calculation of correlation patterns among industries in the traded clusters-category
- Based on correlation patterns identification of 41 cluster groups (and >200 sub-cluster groups) that industries get assigned to
 - Narrow cluster definition: Each industry allocated to one cluster
 - Broad cluster definition: Industries can be allocated to more than one cluster

Composition of Regional Economies

United States, 2002

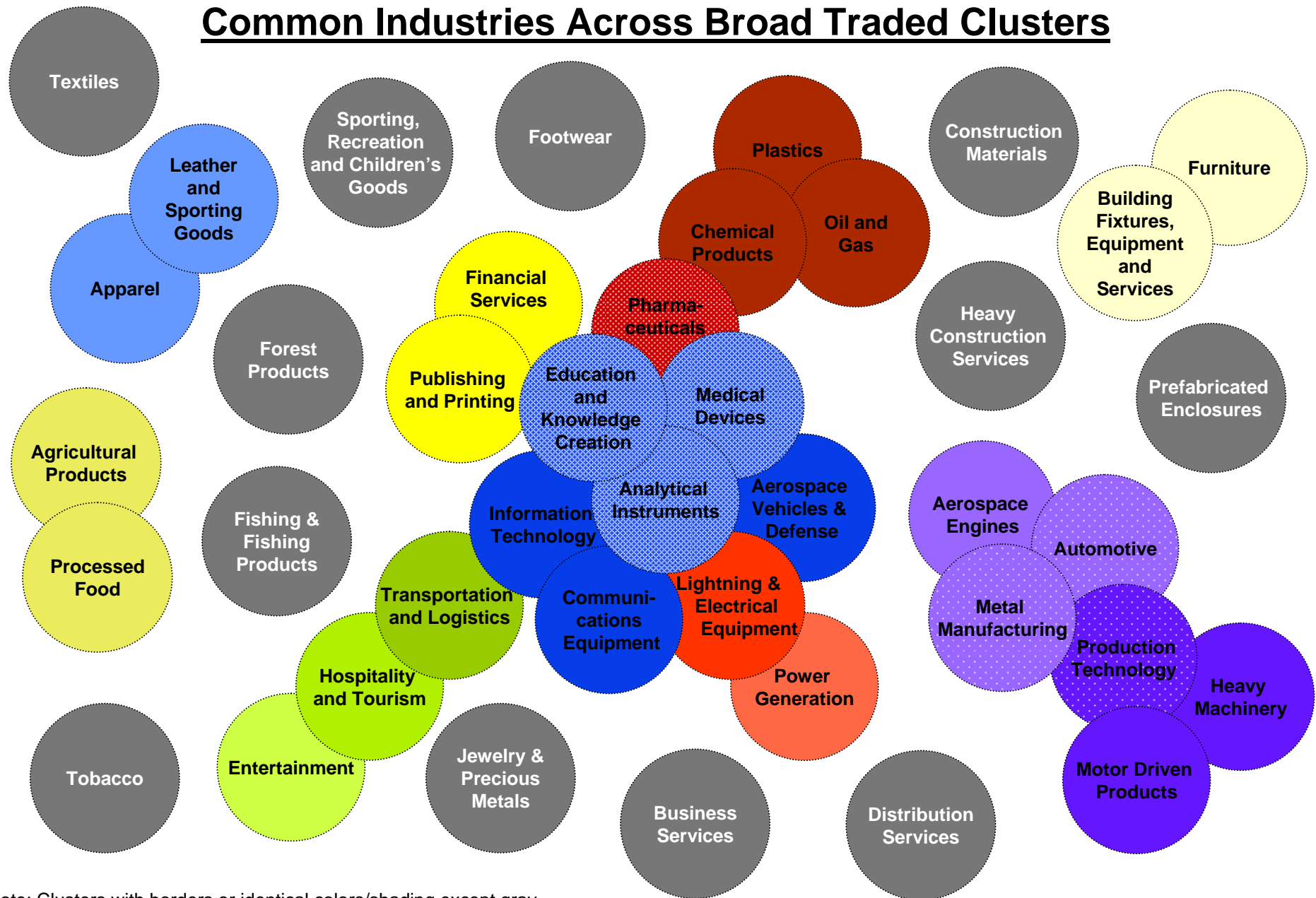
	Traded Clusters	Local Clusters	Natural Resource-Driven Industries
Share of Employment	30.5%	68.8%	0.7%
Employment Growth Rate, 1990 to 2002	0.9%	2.4%	-1.2%
Average Wage	\$45,511	\$29,010	\$33,066
Relative Wage	129.7%	82.7	94.3
Wage Growth	4.3%	3.6%	1.8%
Relative Productivity	144.1	79.3	140.1
Patents per 10,000 Employees	21.3	1.3	7.0
Number of SIC Industries	590	241	48

Note: 2002 data, except relative productivity which uses 1997 data.

Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Cluster Overlap in the United States Economy

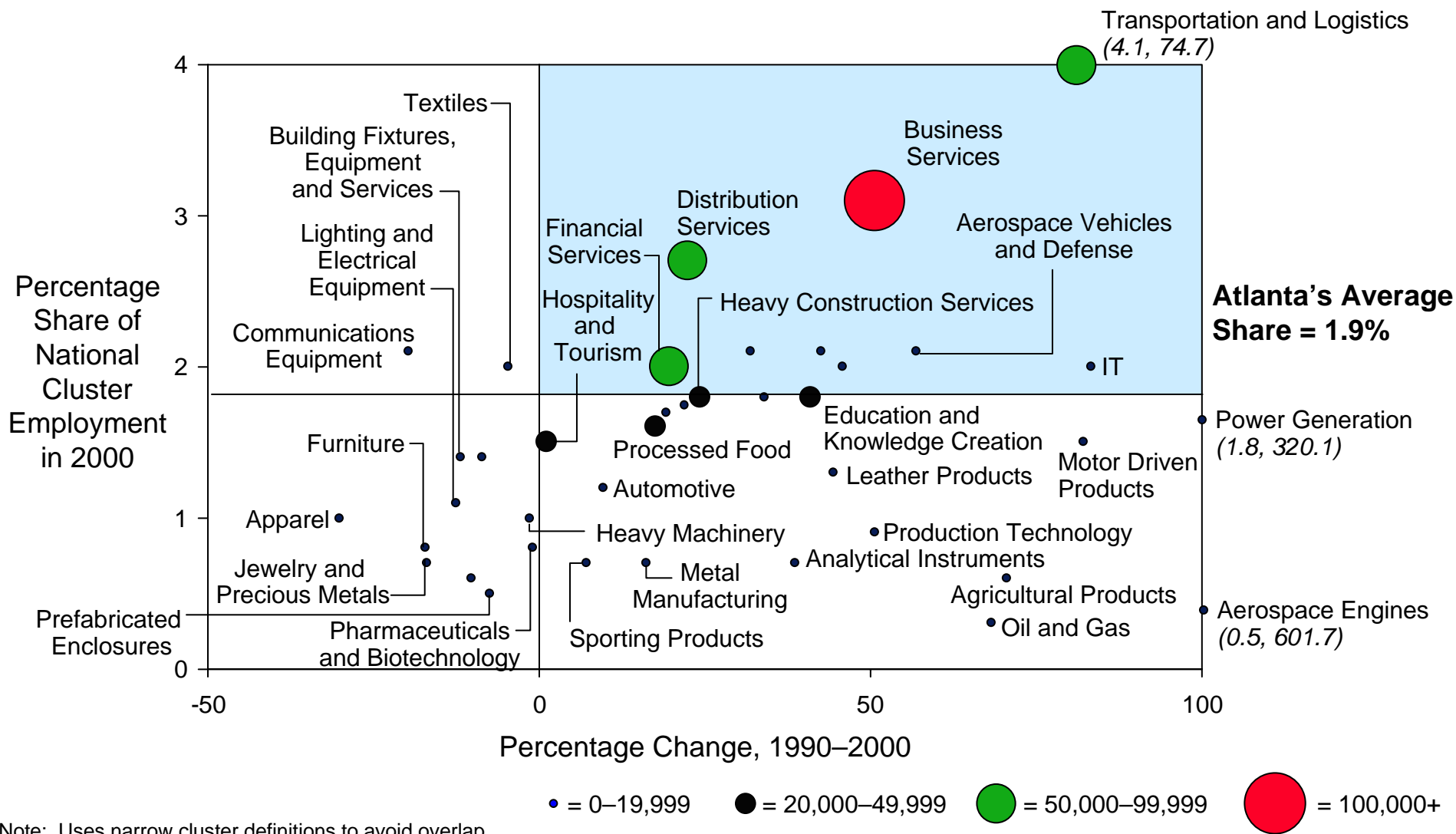
Common Industries Across Broad Traded Clusters



Note: Clusters with borders or identical colors/shading except gray have at least 20% overlap of industries by number in both directions

Specialization of Regional Economies

Atlanta Metro Area



Note: Uses narrow cluster definitions to avoid overlap

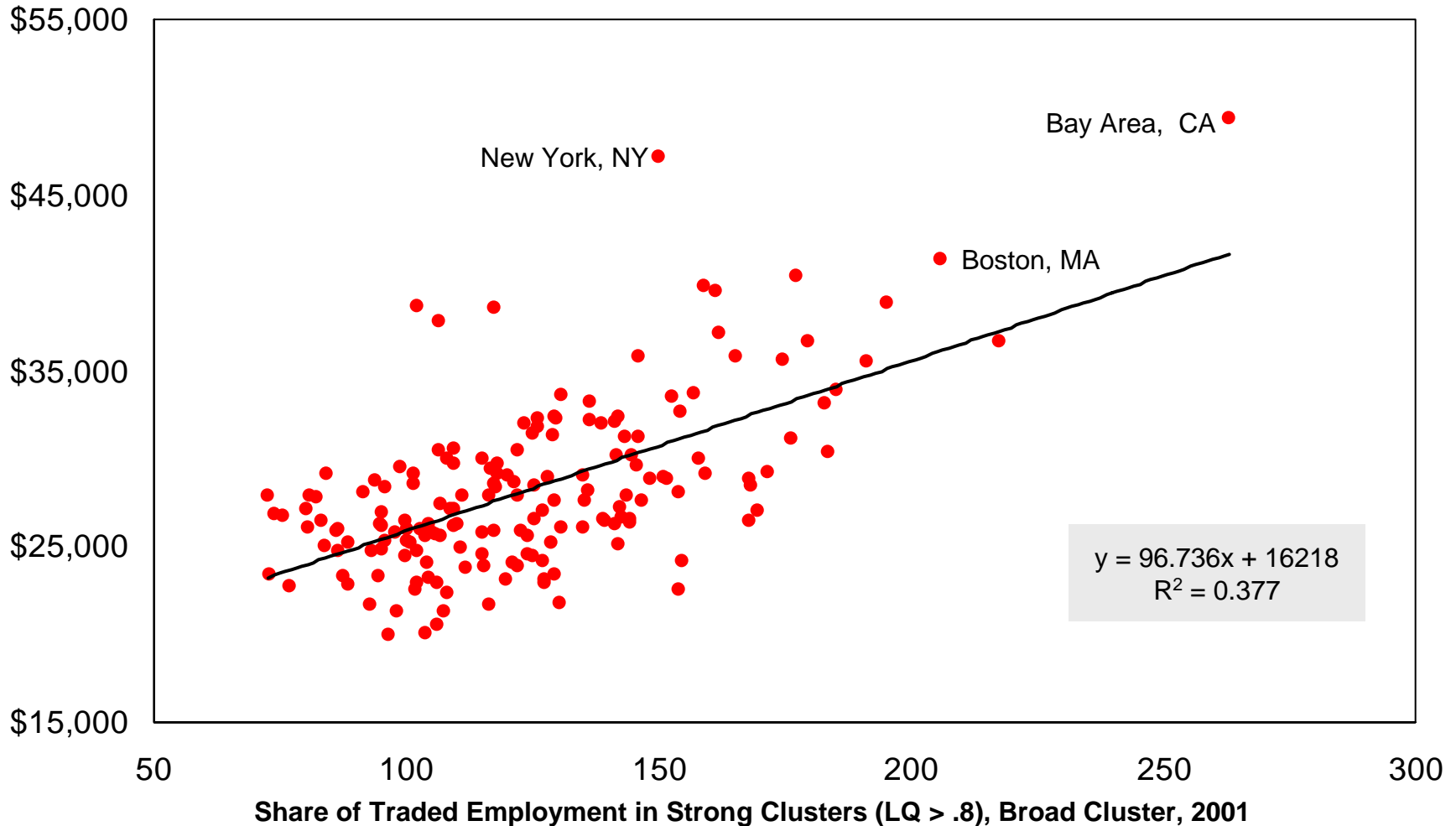
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

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Determinants of Regional Prosperity

Cluster Strength and Wage Levels, U.S. Regions

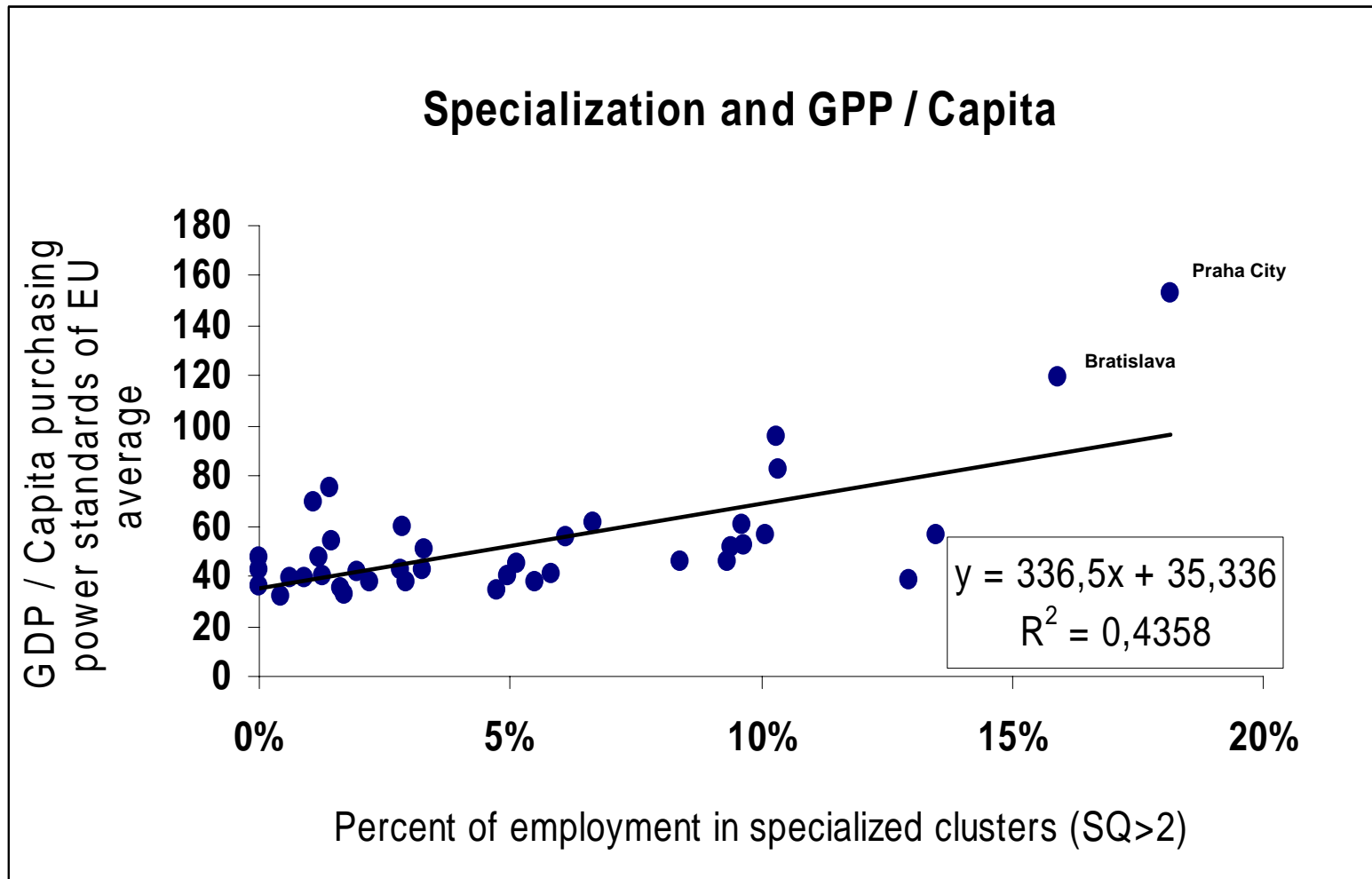
Average Regional
Wage, 2001



Source: County Business Patterns; Michael E. Porter, "The Economic Performance of Regions", *Regional Studies*, Vol. 37, 2003

Determinants of Regional Prosperity

Cluster Strength and GDP per Capita, EU-10 Regions

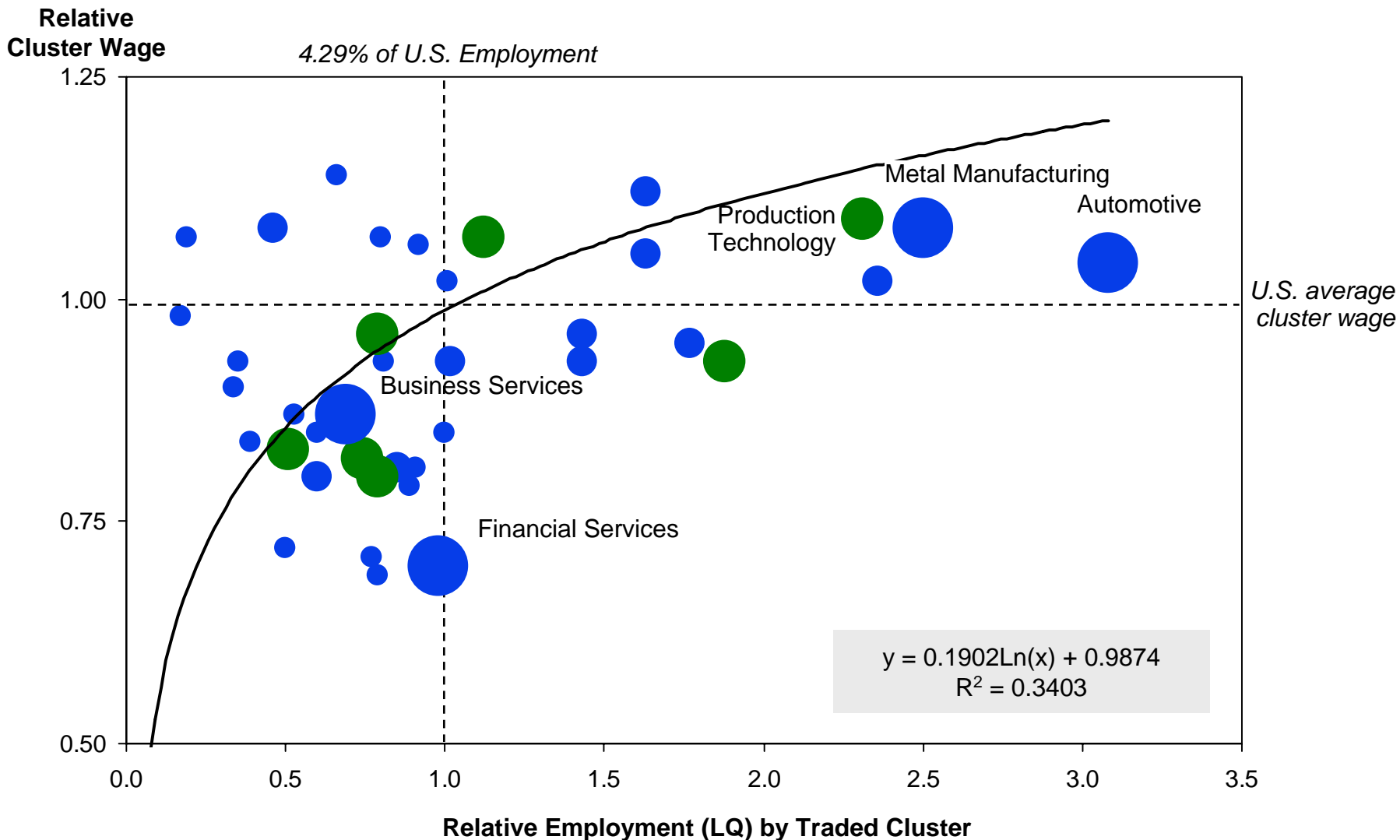


Source: Solvell/Ketels/Frederiksson, Regional clusters in the EU-10, 2005

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Determinants of Regional Prosperity

Traded Cluster Specialization and Relative Wage Levels: Ohio

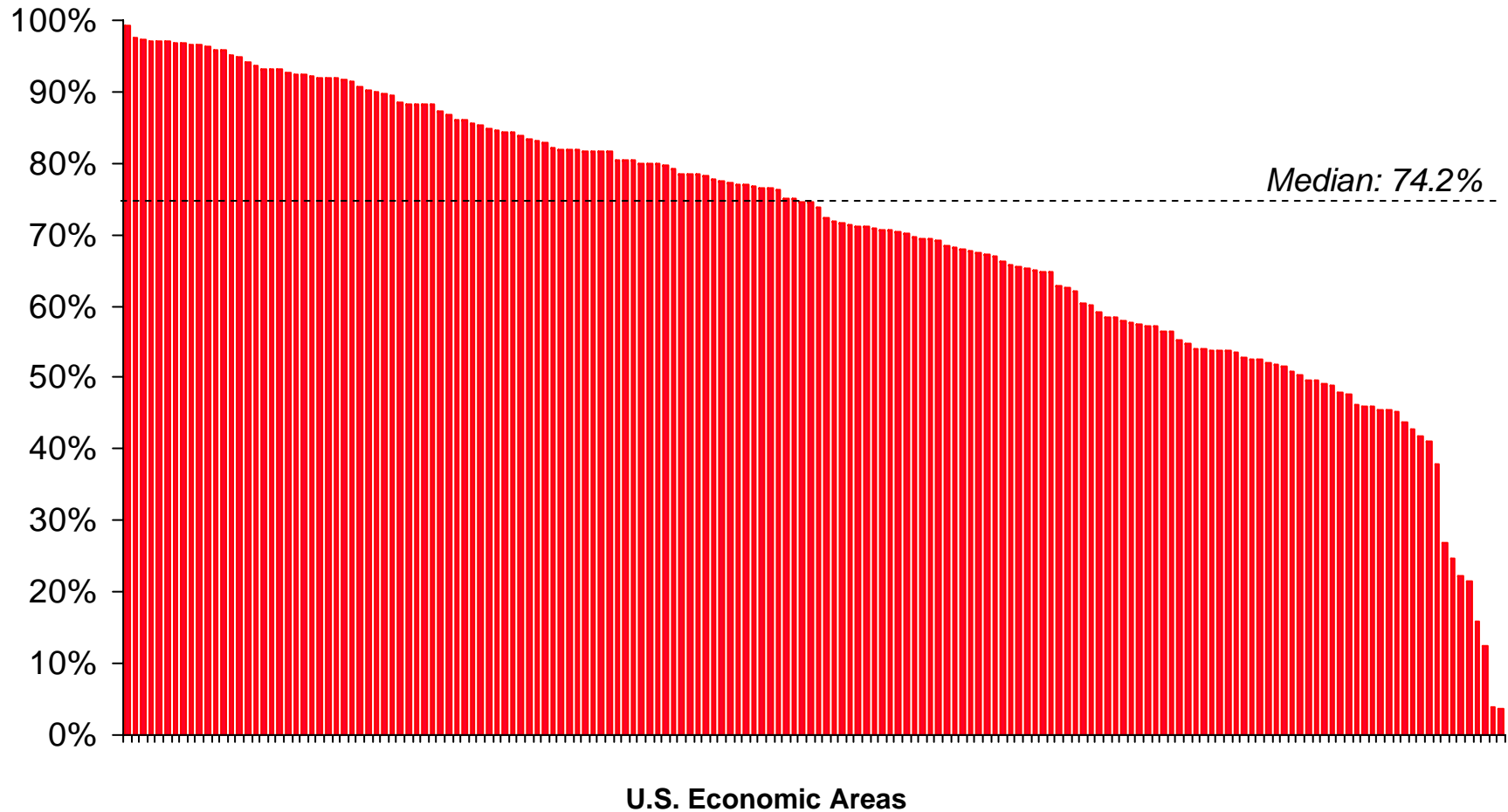


Note: Uses narrow cluster definitions to avoid overlap; bubble size proportional to employment bracket
 Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Determinants of Regional Prosperity

Level versus Mix Effect, U.S. Regions

Cluster Wage Level Effect
as % of Wage Gap, 2001

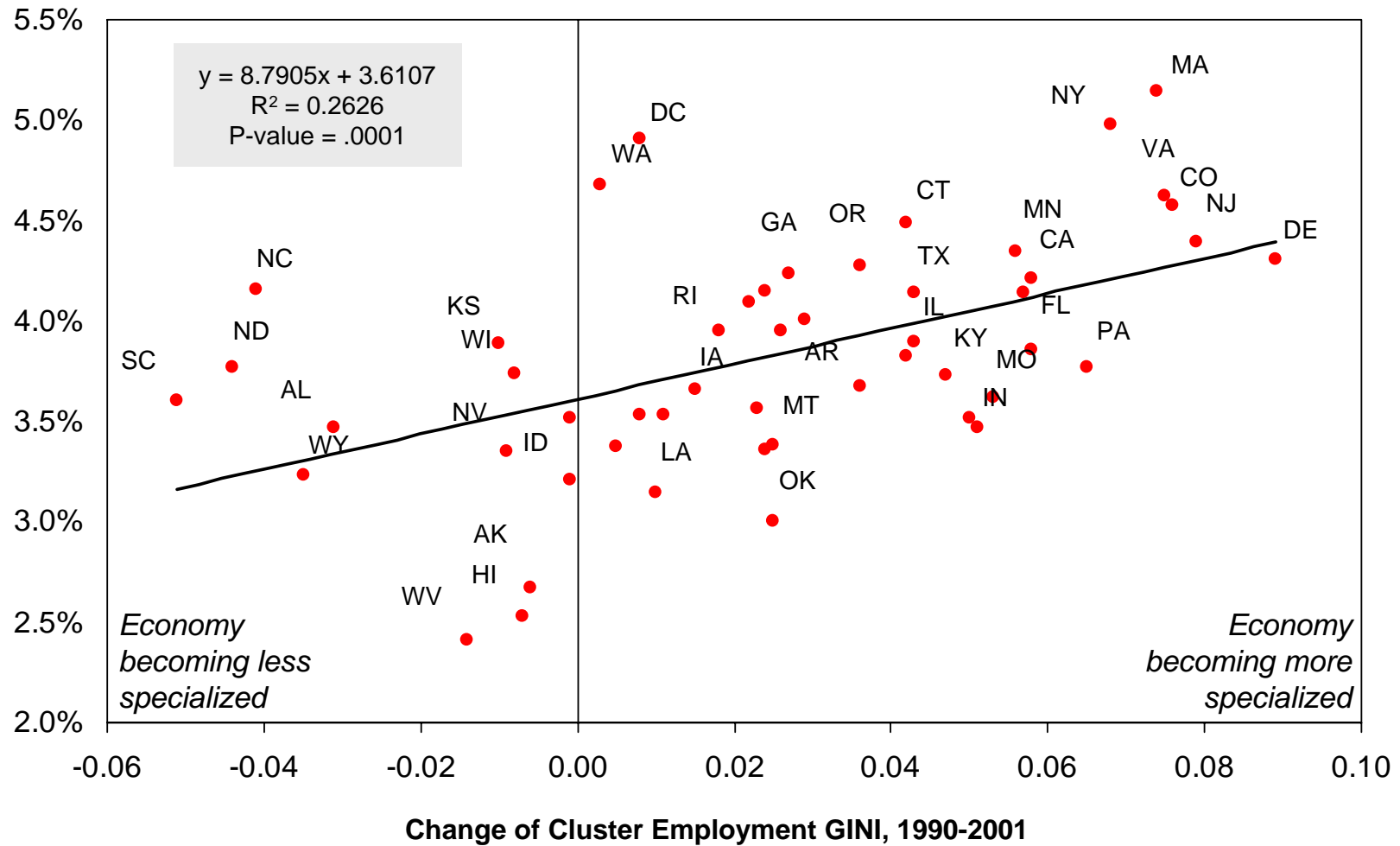


Source: County Business Patterns; Michael E. Porter, "The Economic Performance of Regions", *Regional Studies*, Vol. 37, 2003

Determinants of Regional Prosperity

Change in Cluster Specialization and Wage Growth, U.S. States

Annual Regional Wage
Growth Rate, 1990-2001



Source: County Business Patterns; Michael E. Porter, "The Economic Performance of Regions", *Regional Studies*, Vol. 37, 2003

Explaining Average Regional Wages

Multiple Regression Model

Dependent variable: Regional Average Wage

Independent Variable	Effect
• Total regional employment	Positive, significant
• Patents per capita	Positive, significant
• Patentor concentration	Negative, significant
• Share of strong clusters in regional employment	Positive, significant
• Cluster breadth	Positive, significant

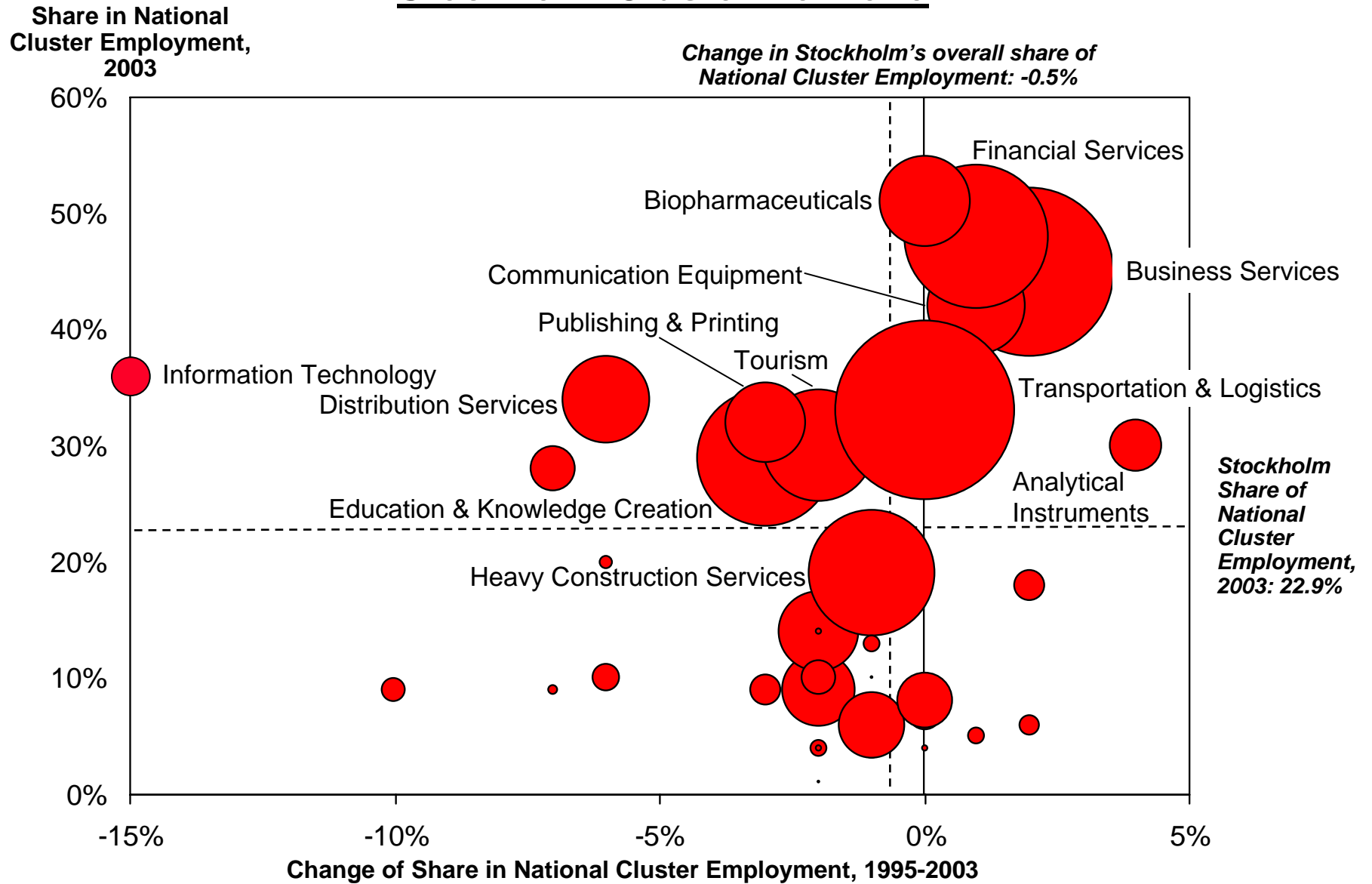
Explained Variation (adjusted R^2): 72.8%

Note: Regression uses 2001 data for 172 U.S. economic areas

Source: Michael E. Porter, The Economic Performance of Regions", *Regional Studies*, Vol. 37, 2003

Comparative Data on European Clusters

Stockholm Cluster Portfolio



Note: Bubble size is proportional to employment levels
 Source: Statistics Sweden (2005), author's calculations
 Cluster-Based Development 03-10-04 CK

3 STAR-Clusters in the Baltic Sea Region

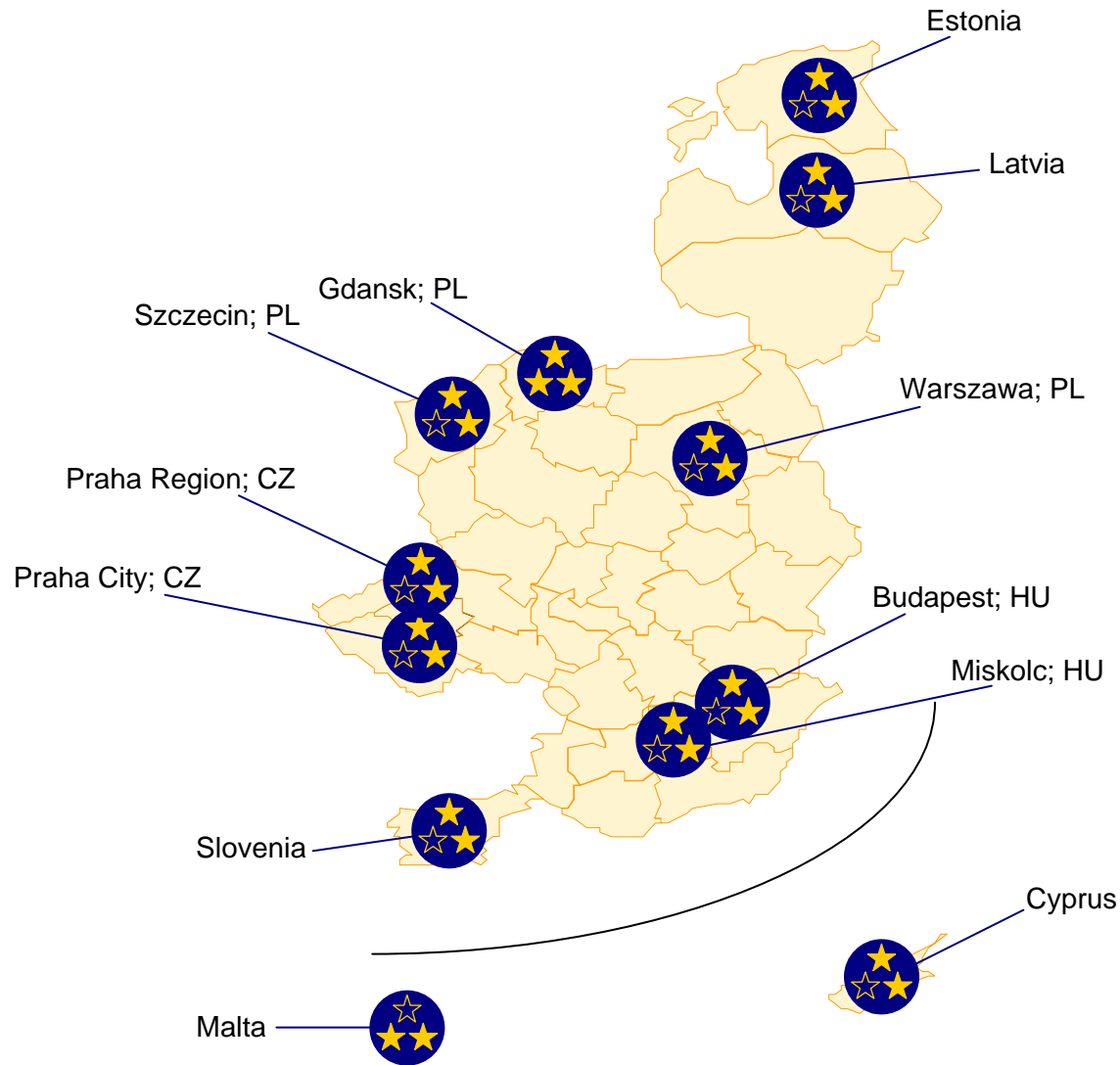


Region	Cluster	Employment
Schleswig-Holstein (DE)	Financial Services	60,423
Västsverige (SE)	Automotive	43,168
Hamburg (DE)	Financial Services	42,420
Etelä-Suomi (SF)	Forest Products	40,722
Stockholm (SE)	Business Services	38,283
Östra Mellansverige (SE)	Metal Manufacturing	28,706
Mecklenburg-Vorpommern (DE)	Hospitality and Tourism	26,538
Warminsko-Mazurskie (PL)	Processed Food	21,831
Norra Mellansverige (SE)	Metal Manufacturing	21,240
Oslo og Akershus (NO)	Business Services	17,966
Småland med öarna (SE)	Metal Manufacturing	16,995
Warminsko-Mazurskie (PL)	Building Fixtures, Equipment and Services	14,431
Norra Mellansverige (SE)	Forest Products	13,674
Islands (IS)	Fishing and Fishing Products	11,931
Agder og Rogaland (NO)	Oil and Gas Products and Services	10,752
Länsi-Suomi (SF)	Metal Manufacturing	10,090

Note: "3 Star" defined as >10.000 employees, > 10% of regional employment, and SQ > 2. Data set does not include Denmark and Russia
 Source: Institute for Strategy and Competitiveness, author's calculations

Comparative Data on European Clusters

Transportation and Logistics Clusters in the EU-10



Source: Solvell/Ketels/Frederiksson, Regional clusters in the EU-10, 2005

Conclusion

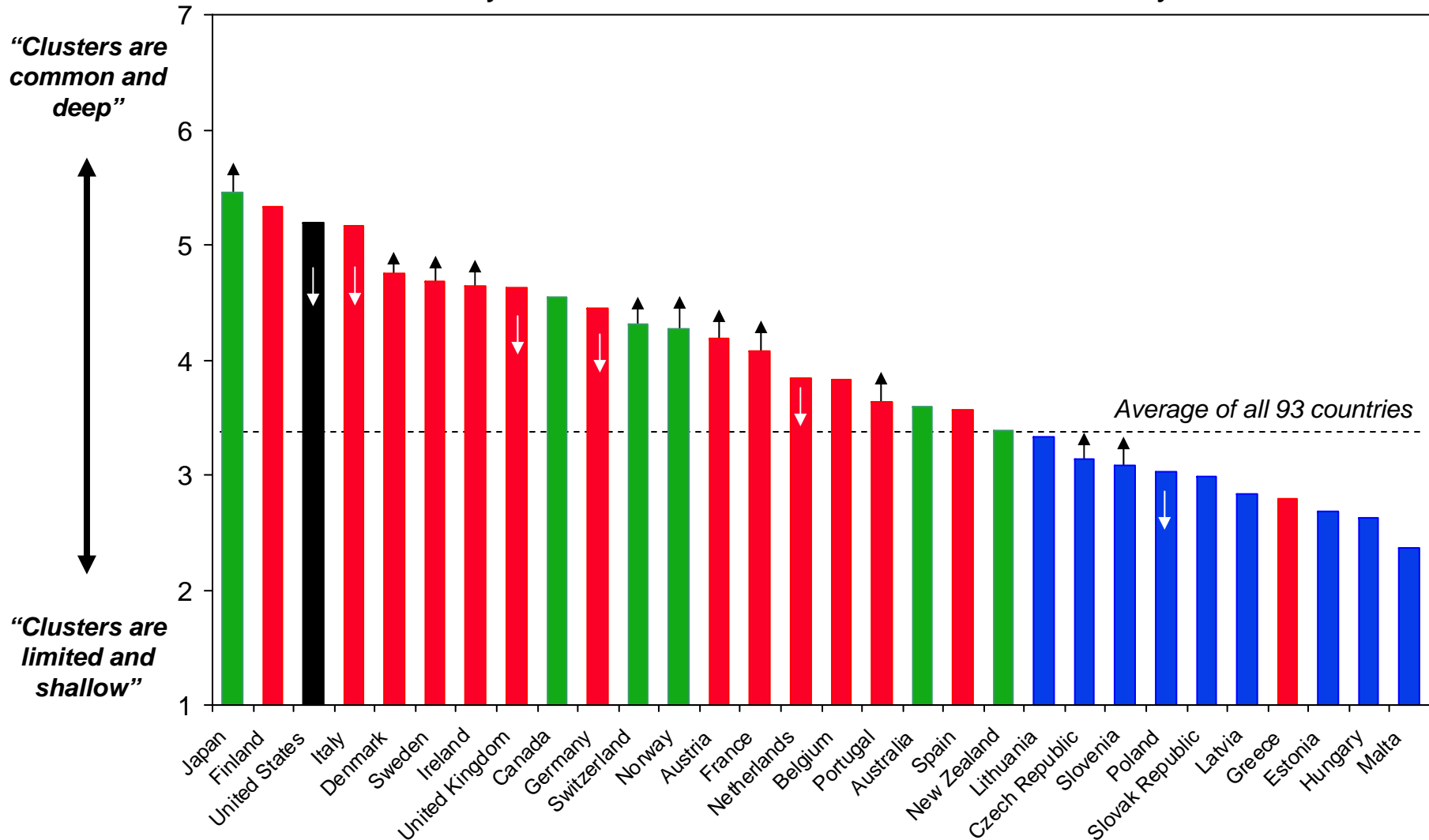
- Cluster mapping is a **tool**, not a solution; it is critical for a more fact-driven discussion about cluster-based economic policy
- Cluster mapping efforts should be part of a **wider cluster data infrastructure**
 - Cluster-specific business environment assessments
 - Impact assessment for cluster-based policy initiatives
- Creating this data infrastructure is a useful **task for the European Commission**; running cluster-based efforts themselves is not
- The available cluster mapping data suggests that Europe is in the midst of a **relocation process** that has already proceeded much further in the U.S.

Back-Up

Presence of Clusters Across Countries

Selected Countries

Survey Question: "How Common Are Clusters In Your Country?"



Note: EU members in red (EU-15) and blue (NMS), other countries in green; arrows indicate significant changes since 2002
 Source: Global Competitiveness Report 2004-2005, World Economic Forum