US-EU WORKSHOP:

Cluster Mapping and Cluster-Based Economic Development

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US-EU Cluster Workshop
Harvard Business School
November 17th, 2015
A Research Effort that Started Three Decades Ago…

Enduring Questions

• What drives differences in economic performance across locations?
  – Role of location in competition

• Why do leading companies in specific industries concentrate in a small number of places?
  – How do clusters matter?

• How can nations, states, and regions achieve sustainable improvements in economic performance?
What is Competitiveness?

A nation or region is competitive to the extent that firms operating there are able to compete successfully in the regional and global economy while maintaining or improving wages and living standards for the average citizen.

- Competitiveness depends on the long-run productivity of a location as a place to do business
  - For existing firms and workers
  - Enabling high participation of citizens in the workforce

- Competitiveness is not:
  - Low wages
  - A weak currency
  - Jobs per se
What Determines Competitiveness?

Microeconomic Competitiveness

- Quality of the Business Environment
- State of Cluster Development
- Sophistication of Company Operations and Strategy

Macroeconomic Competitiveness

- Sound Monetary and Fiscal Policies
- Human Development and Effective Public Institutions

Endowments

- Productivity ultimately depends on improving the microeconomic capability of the economy and the sophistication of local competition revealed at the level of firms, clusters, and regions
- Macroeconomic competitiveness sets the economy-wide context for productivity to emerge, but is not sufficient to ensure productivity
- Endowments, including natural resources, geographical location, population, and land area, create a foundation for prosperity, but true prosperity arises from productivity in the use of endowments
Assessing the Quality of the Business Environment
The Diamond Model

Factor (Input) Conditions

- Improving access to high quality business inputs
  - Qualified human resources
  - Capital availability
  - Physical infrastructure
  - Scientific and technological infrastructure
  - Administrative and regulatory infrastructure

Demand Conditions

- Sophisticated and demanding local needs
  - e.g., Strict quality, safety, and environmental standards
  - Sophisticated demand in the private sector or government

Context for Firm Strategy and Rivalry

- Local rules and incentives that encourage investment and productivity
  - e.g. incentives for capital investments, IP protection
- Sound corporate governance
- Open and vigorous local competition
  - Openness to competition
  - Strict competition laws

Related and Supporting Industries

- Availability and quality of suppliers and supporting industries

- Many things in the business environment matter for competitiveness
- Successful economic development is a process of successive upgrading, in which the business environment improves to enable increasingly sophisticated ways of competing
Clusters and Competitiveness
Massachusetts Life Sciences

Cluster Organizations
MassMedic, MassBio, others

Specialized Business Services
Banking, Accounting, Legal

Specialized Risk Capital
VC Firms, Angel Networks

Specialized Research Service Providers
Laboratory, Clinical Testing

Educational Institutions
Harvard, MIT, Tufts, Boston University, UMass

Teaching and Specialized Hospitals

Biological Products

Biopharmaceutical Products

Research Organizations

Containers

Diagnostic Substances

Dental Instruments and Suppliers

Medical Equipment

Surgical Instruments and Suppliers

Health and Beauty Products

Analytical Instruments Cluster
Why Clusters Matter?

- Clusters increase productivity and operational efficiency
- Clusters stimulate and enable innovations
- Clusters facilitate commercialization and new business formation
- Clusters reflect the fundamental importance to productivity and innovation of linkages and spill-overs across firms and associated institutions that occur within geographic areas
### Institutions for Collaboration
#### Selected Massachusetts Organizations, Life Sciences

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<th>Life Sciences Industry Associations</th>
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<tr>
<td>• Massachusetts Biotechnology Council</td>
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<td>• Massachusetts Medical Device Industry Council</td>
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<td>• Massachusetts Hospital Association</td>
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<th>University Initiatives</th>
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<tr>
<td>• Harvard Biomedical Community</td>
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<tr>
<td>• MIT Enterprise Forum</td>
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<td>• Biotech Club at Harvard Medical School</td>
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<td>• Technology Transfer offices</td>
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<th>General Industry Associations</th>
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<tr>
<td>• Associated Industries of Massachusetts</td>
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<td>• Greater Boston Chamber of Commerce</td>
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<td>• Massachusetts High Tech Council</td>
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<th>Informal networks</th>
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<td>• Company alumni groups</td>
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<td>• Venture capital community</td>
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<td>• University alumni groups</td>
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<th>Economic Development Initiatives</th>
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<td>• Massachusetts Technology Collaborative</td>
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<td>• Mass Biomedical Initiatives</td>
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<td>• Mass Development</td>
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<td>• Massachusetts Alliance for Economic Development</td>
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<td>• Massachusetts Life Sciences Center</td>
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<th>Joint Research Initiatives</th>
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<td>• Network for Excellence in Health Innovation</td>
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<td>• The Massachusetts Technology Transfer Center</td>
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<tr>
<td>• Whitehead Institute For Biomedical Research</td>
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<tr>
<td>• Center for Integration of Medicine and Innovative Technology (CIMIT)</td>
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U.S. Cluster Mapping

• **National economic initiative** commencing in 2010, based at HBS, and sponsored by the U.S. Department of Commerce’s Economic Development Administration. To help drive better regional economic strategy, the interactive website provides data to:

  – Help **regions** understand their current competitiveness and sources of potential differentiation
  
  – Help **clusters** assess their competitive position and highlight areas for potential growth
  
  – Help **Institutions for Collaboration** engage with peers within and beyond their home region and cluster
The Composition of Regional Economies

- Serve almost exclusively the **local** market
- **Little exposure** to international or cross-regional competition for employment

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<th>Local Clusters</th>
<th>Traded Clusters</th>
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<td>64% of U.S. Employment</td>
<td>36% of U.S. Employment</td>
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- Serve **national** and **global** markets
- **Exposed to competition** from other regions and nations
  - Much higher average wages with 51% of payroll
  - Much higher rate of innovation with 91% of patents issued

How Important are Traded Clusters in the U.S. Economy?

• Traded clusters account for **36% of all US employment, 45% of payroll,** and more than **90% of all US patenting**
  – About **25% of U.S. payroll is earned in strong clusters**; i.e. regional clusters with significant critical mass

• These industries exhibit **productivity levels and growth significantly above the average of the US economy**

• There is **significant variation** in cluster presence and portfolio composition across US regions

• Regions at all stages of development **have economies concentrated in clusters**; cluster strength and cluster mix improve with overall economic development
Strong Traded Clusters Drive Regional Economic Performance

Research Findings

- Presence of **strong clusters**
- **Breadth** of industries within each cluster
- **Job** growth
- Higher **wages**
- Higher **patenting** rates
- Greater **new business** formation, growth and survival
- **Resilience** in downturns
- Build on the region’s **existing** and **emerging** clusters rather than chase hot fields
- Economic diversification usually occurs **within clusters** and **across related clusters**

Related Clusters and Economic Diversification

Note: Clusters with overlapping borders or identical shading have at least 20% overlap (by number of industries) in both directions.
Strong Traded Clusters Drive Regional Economic Performance
Research Findings

- Presence of **strong clusters**
- **Breadth** of industries within each cluster
- Strength in **related clusters**
- Presence of a region’s clusters in **neighboring regions**

- **Job** growth
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Clusters as a Tool for Economic Policy

- **Leverages** the power of spillovers and linkages to drive rapid economic development

- A vehicle for policies and investments that strengthen **multiple related firms/institutions** simultaneously

- Enhances the efficiency and effectiveness of **traditional economic policy** areas, such as training, R&D, export promotion, FDI attraction, etc.
Clusters provide a framework for organizing the implementation of many public policies and public investments directed at economic development.
Clusters as a Tool for Economic Policy

• Leverage the power of *spillovers* and *linkages* to drive rapid economic development

• A vehicle for policies and investments that strengthen *multiple related firms/institutions* simultaneously

• Enhances the efficiency and effectiveness of *traditional economic policy* areas, such as training, R&D, export promotion, FDI attraction, etc.

• A forum for *collaboration* between the private sector, trade associations, government, educational, and research institutions
  – A *mechanism* for *constructive* business-government dialog

• Brings together *firms of all sizes*, including SME’s

• Clusters initiatives are a powerful private/public vehicle to identify and get alignment on *problems* and *action recommendations*

• Cluster upgrading fosters *greater* and *more sophisticated* competition rather than distorting the market

• Sound cluster policy addresses *all existing and emerging clusters*, and does not pick winners
Towards a New Economic Development Model

• Traditional approaches to economic development are not working

• We must reshape the approach to economic development in the U.S. based on a deeper understanding of the drivers of competitiveness in the modern global economy

The New Direction

• Focus on competitiveness, not job creation per se

• Cluster-based, reflecting the core drivers of jobs and wages

• Build on existing and potential strengths, versus rely on reducing weakness

• Develop an overall strategy rather than a list of actions

• Prioritized and sequenced, not treating all weaknesses equally

• Data driven, not political or based on wishful thinking