Regional Competitiveness in Northeast Massachusetts

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Northeast Regional Competitiveness Council
North Shore Community College, Danvers
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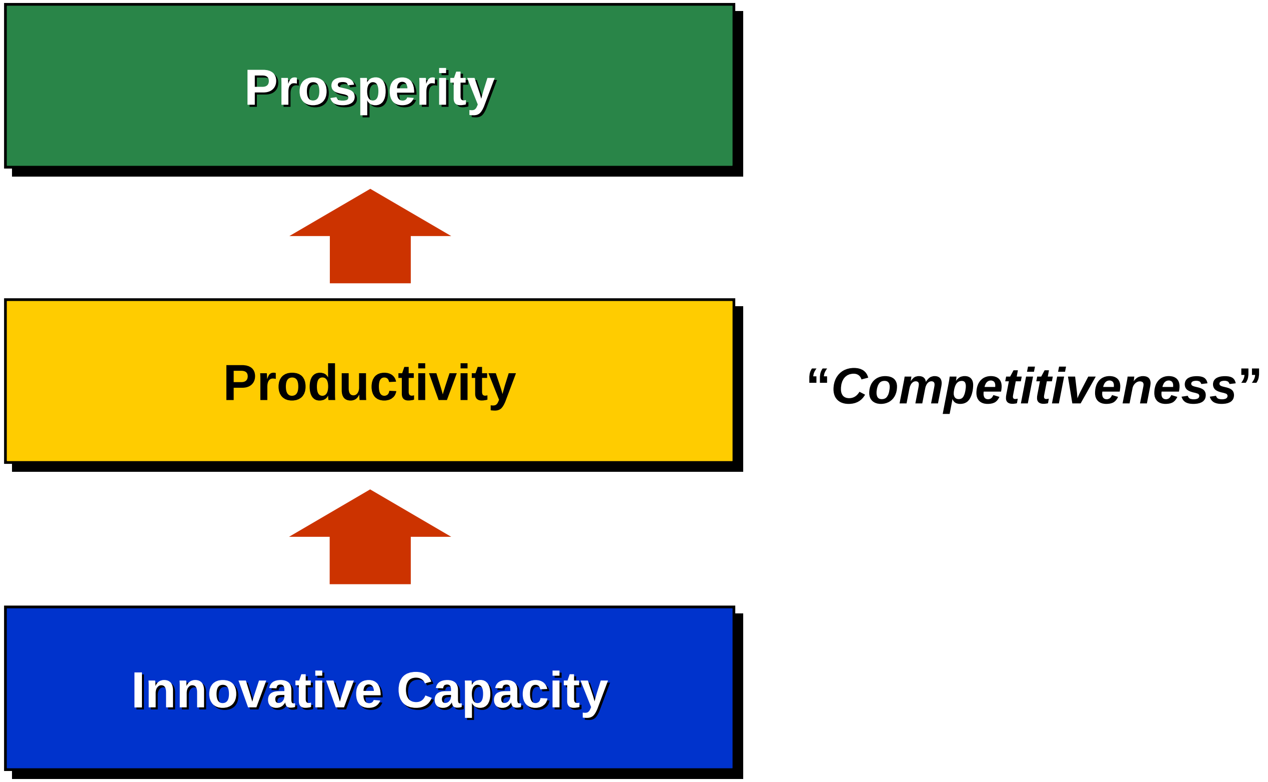
Sources of Prosperity



- The most important sources of prosperity are **created** not inherited
- Productivity does not depend on **what** industries a region competes in, but on **how** it competes
- The prosperity of a region depends on the productivity of **all** its industries
- Innovation is vital for long-term increases in productivity

Productivity, Innovation, and the Business Environment

Context for Firm Strategy and Rivalry

- A local context and rules that encourage **investment** and **sustained upgrading**
  - –e.g., Intellectual property protection
- **Meritocratic** incentive systems across all major institutions
- Open and vigorous competition among **locally based rivals**

Factor (Input) Conditions

- **Presence of high quality, specialized inputs** available to firms
  - –Human resources
  - –Capital resources
  - –Physical infrastructure
  - –Administrative infrastructure
  - –Information infrastructure
  - –Scientific and technological infrastructure
  - –Natural resources

Demand Conditions

- **Sophisticated and demanding** local customer(s)
- Local customer needs that **anticipate** those elsewhere
- Unusual local demand in **specialized segments** that can be served nationally and globally

Related and Supporting Industries

- Access to capable, locally based **suppliers** and firms in **related fields**
- Presence of **clusters** instead of isolated industries

- Successful economic development is a process of **successive economic upgrading**, in which the business environment in a nation or region evolves to support and encourage increasingly sophisticated ways of competing

Composition of Regional Economies

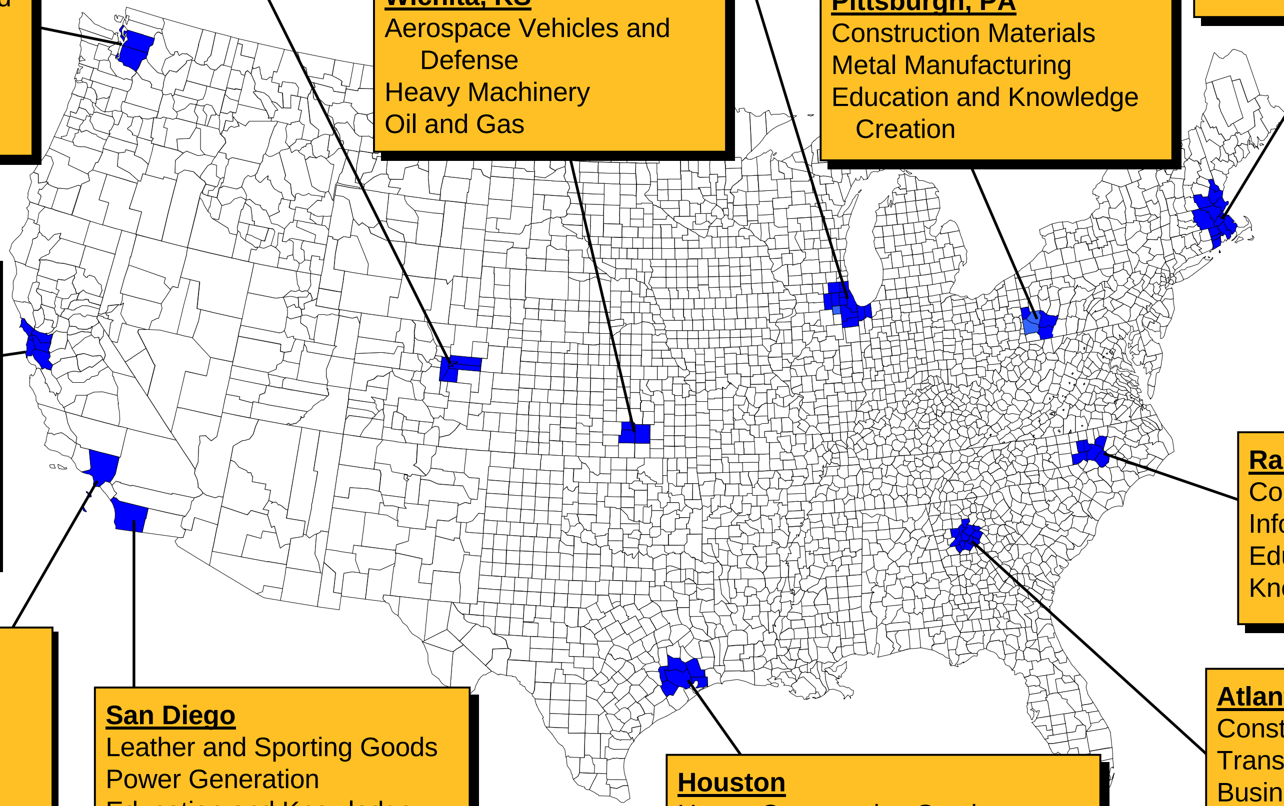
United States

	Traded Clusters	Local Clusters	Natural Resource-Driven Industries
Share of Employment	31.6%	67.6%	0.8%
Employment Growth, 1990 to 2001	1.7%	2.8%	-1.0%
Average Wage	$46,596	$28,288	$33,245
Relative Wage	133.8	84.2	99.0
Wage Growth	5.0%	3.6%	1.9%
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: 2001 data, except relative productivity which is 1997 data.
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Specialization of Regional Economies

Select U.S. Geographic Areas



Seattle-Bellevue-Everett, WA
Aerospace Vehicles and Defense
Fishing and Fishing Products
Analytical Instruments

Denver, CO
Leather and Sporting Goods
Oil and Gas
Aerospace Vehicles and Defense

Wichita, KS
Aerospace Vehicles and Defense
Heavy Machinery
Oil and Gas

Chicago
Communications Equipment
Processed Food
Heavy Machinery

Pittsburgh, PA
Construction Materials
Metal Manufacturing
Education and Knowledge Creation

Boston
Analytical Instruments
Education and Knowledge Creation
Communications Equipment

San Francisco-Oakland-San Jose Bay Area
Communications Equipment
Agricultural Products
Information Technology

Raleigh-Durham, NC
Communications Equipment
Information Technology
Education and Knowledge Creation

Los Angeles Area
Apparel
Building Fixtures, Equipment and Services
Entertainment

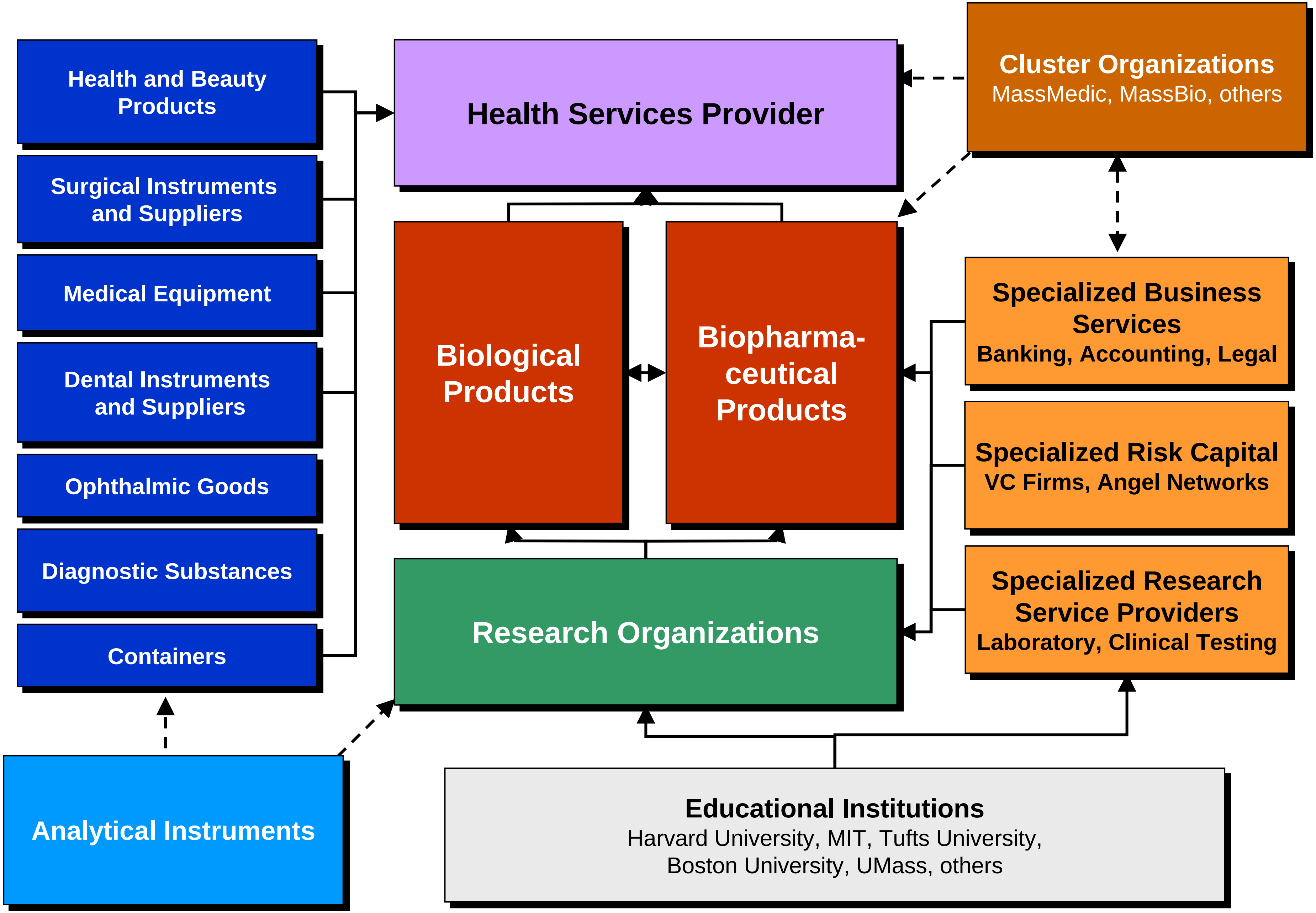
San Diego
Leather and Sporting Goods
Power Generation
Education and Knowledge Creation

Houston
Heavy Construction Services
Oil and Gas
Aerospace Vehicles and Defense

Atlanta, GA
Construction Materials
Transportation and Logistics
Business Services

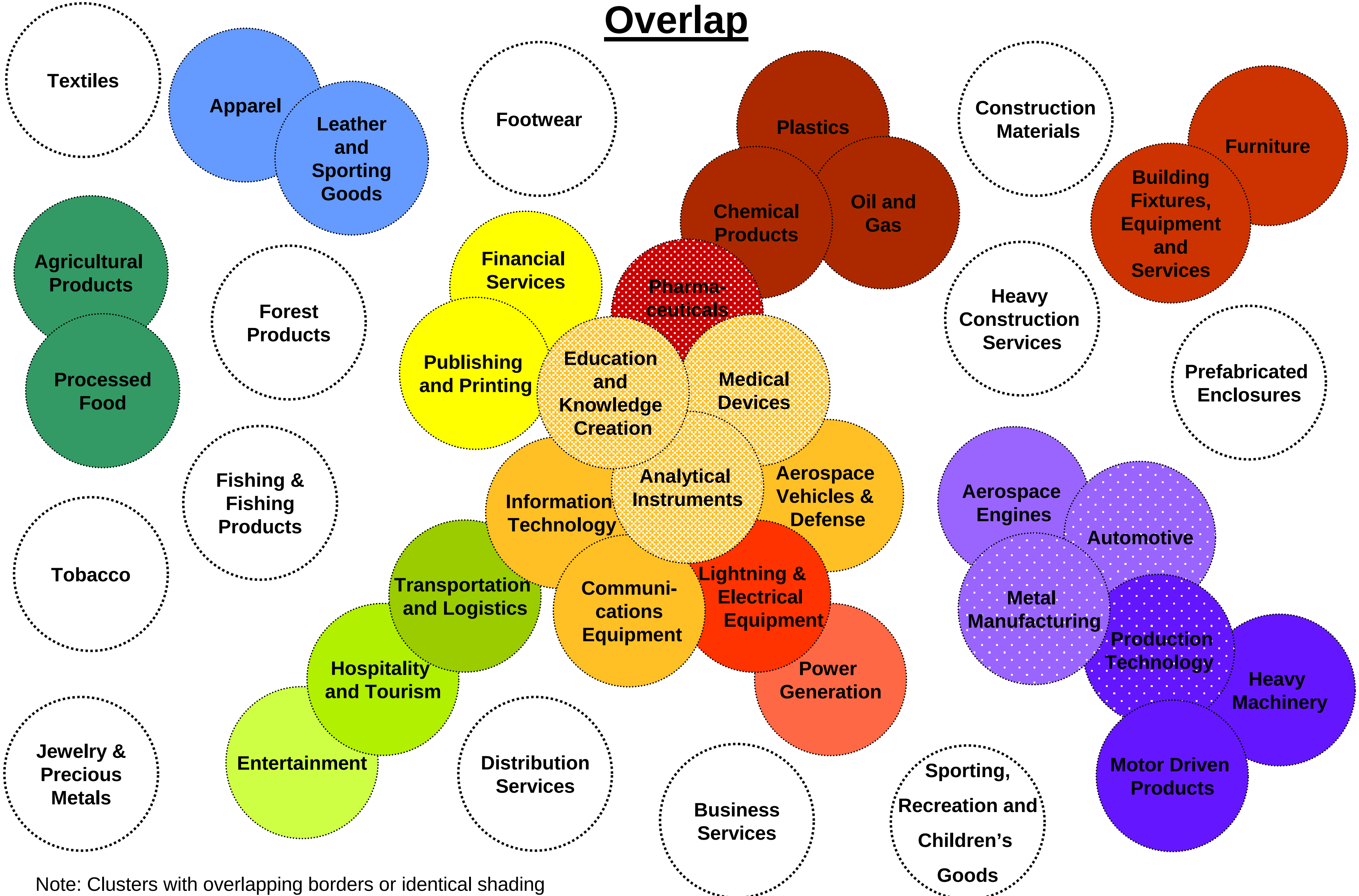
Note: Clusters listed are the three highest ranking clusters in terms of share of national employment
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Massachusetts Life Sciences Cluster



Traded Clusters

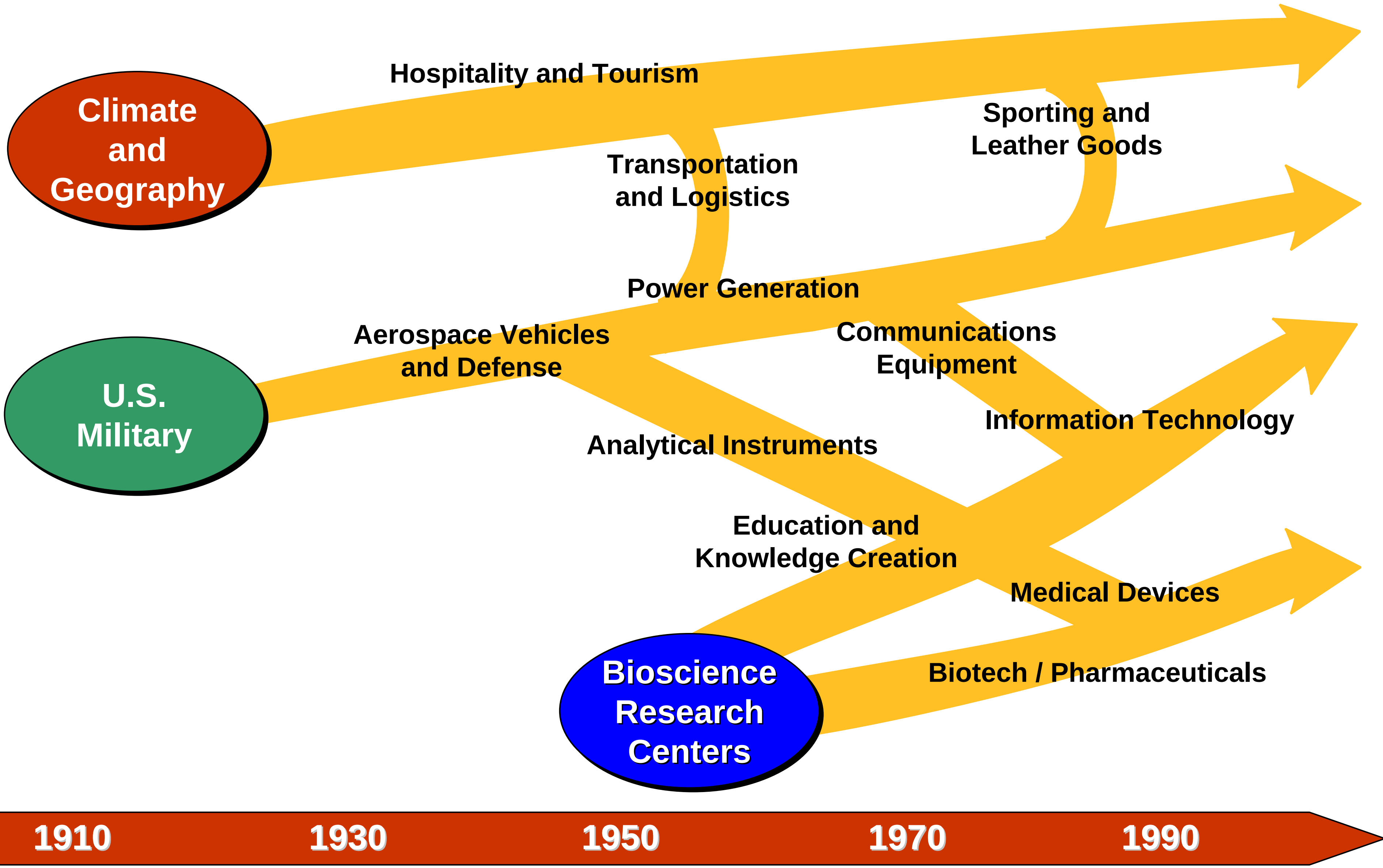
Overlap



Note: Clusters with overlapping borders or identical shading have at least 20% overlap (by number of industries) in both directions

The Evolution of Regional Economies

San Diego



Institutions for Collaboration

Selected Massachusetts Organizations. Life Sciences

Life Sciences Industry Associations

- Massachusetts Biotechnology Council
- Massachusetts Medical Device Industry Council
- Massachusetts Hospital Association

University Initiatives

- Harvard Biomedical Community
- MIT Enterprise Forum
- Biotech Club at Harvard Medical School
- Technology Transfer offices

General Industry Associations

- Associated Industries of Massachusetts
- Greater Boston Chamber of Commerce
- High Tech Council of Massachusetts

Informal networks

- Company alumni
- Venture Capital community
- University alumni

Economic Development Initiatives

- Massachusetts Technology Collaborative
- Mass Biomedical Initiatives
- Mass Development
- Massachusetts Alliance for Economic Development

Joint Research Initiatives

- New England Healthcare Institute
- Whitehead Institute For Biomedical Research
- Center for Integration of Medicine and Innovative Technology (CIMIT)

Influences on Competitiveness

Multiple Geographic Levels

World Economy

Groups of Neighboring Nations

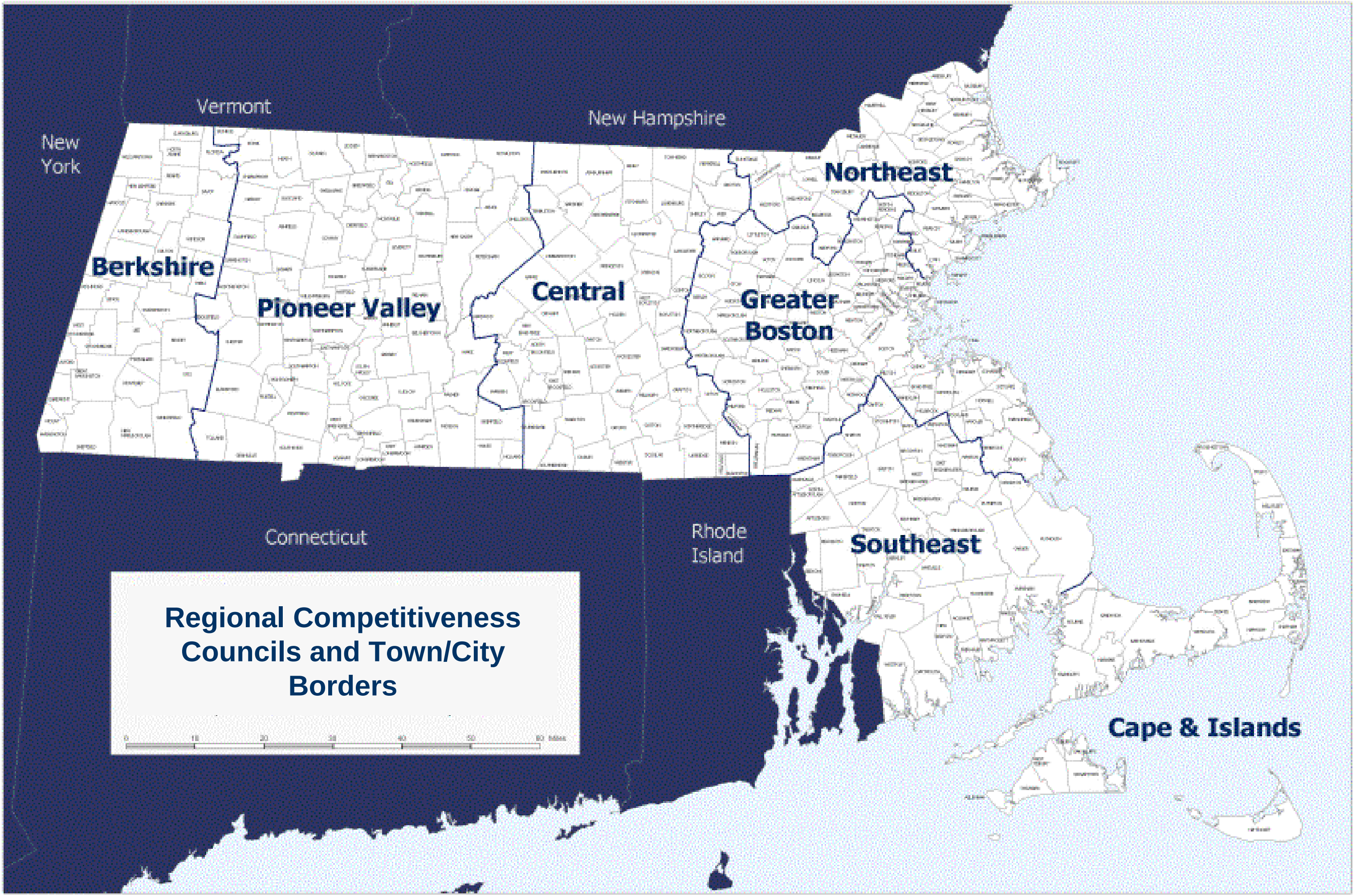
Nations

States, Provinces

Metropolitan Areas

Smaller Cities and Counties

Massachusetts Regional Competitiveness Council Regions



Regional Competitiveness

Northeastern Massachusetts

- Foundations of Regional Competitiveness

- **Assessing the Competitiveness of Northeastern Massachusetts**

- Action Agenda

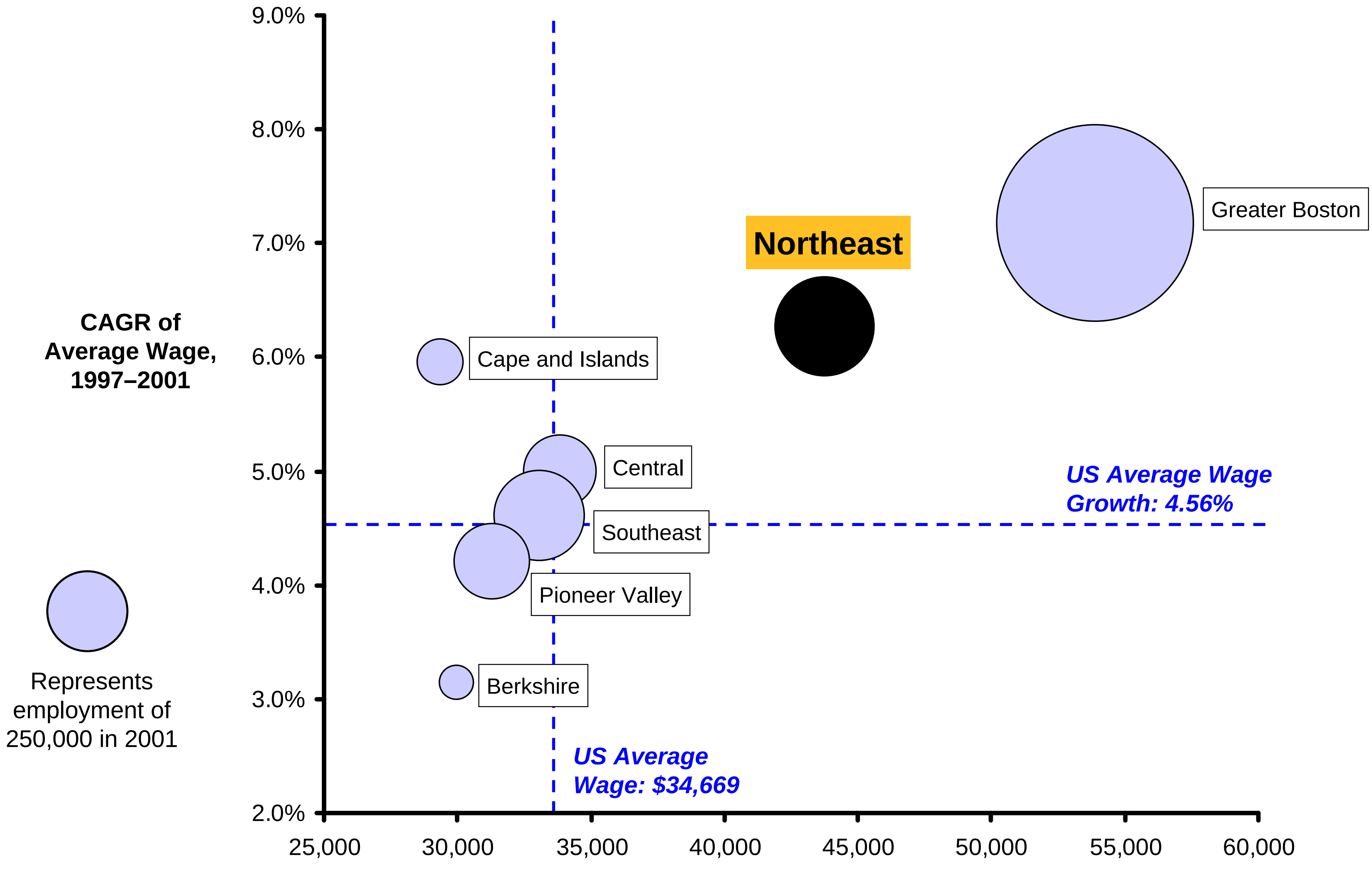
Economic Performance

Northeastern Massachusetts

- Wages are high and have been growing at 6.3% annually over the last five years, above the US and Massachusetts average
  - Local wages, however, are somewhat lower than expected given the region's overall wage level
- Employment has growing at 2.6% annually over the last five years, above the US and Massachusetts average
  - The Northeast was the only Massachusetts region outside of Boston that added jobs in traded clusters
- The Northeast registered the strongest growth of establishments of all Massachusetts regions
- Patenting rates of 14.7 patents per 10,000 employees in 2001 close to Boston

Comparative Performance of Regions

Wage Growth and Wages

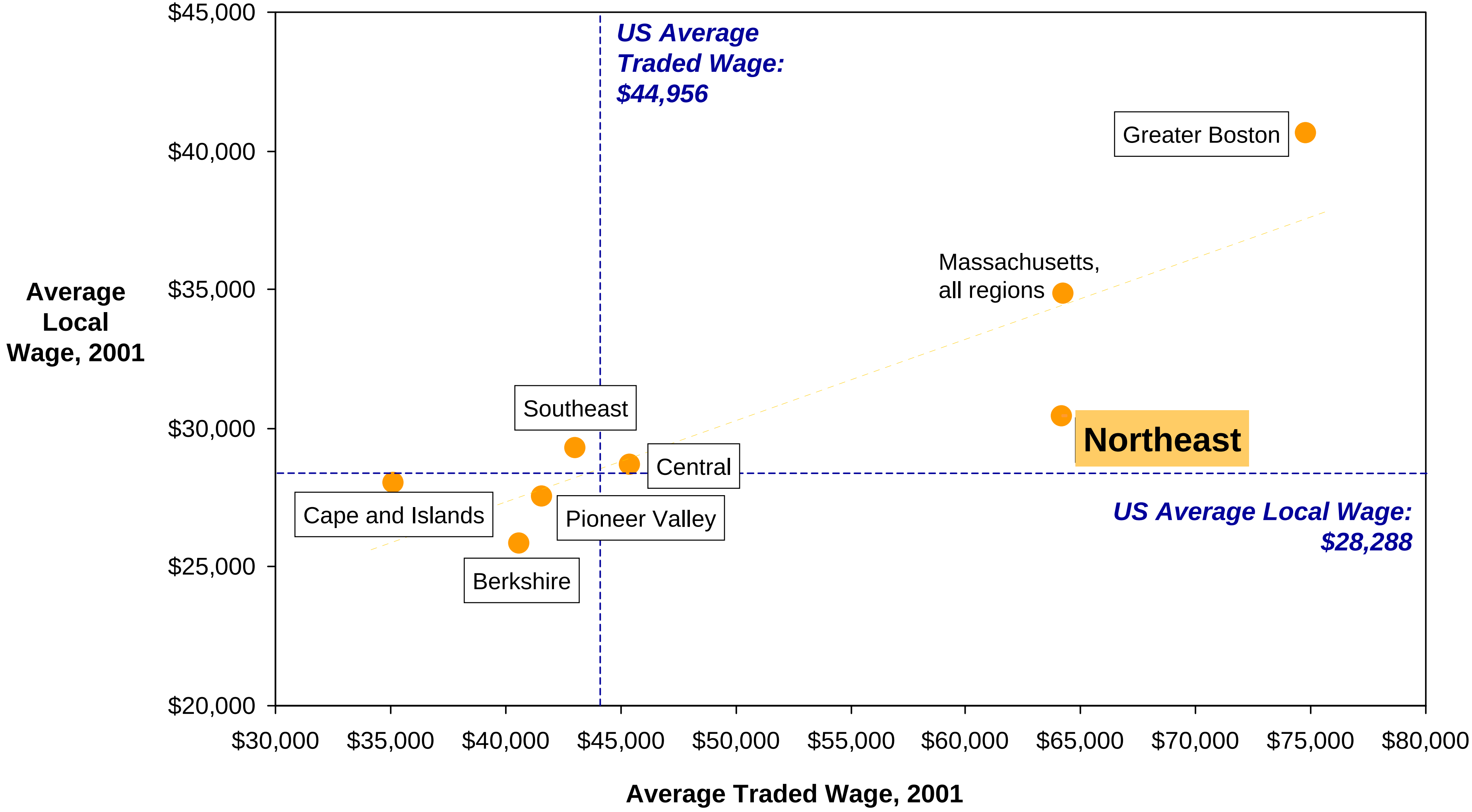


Data: private, non-agricultural employment

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

Wages in Traded and Local Industries

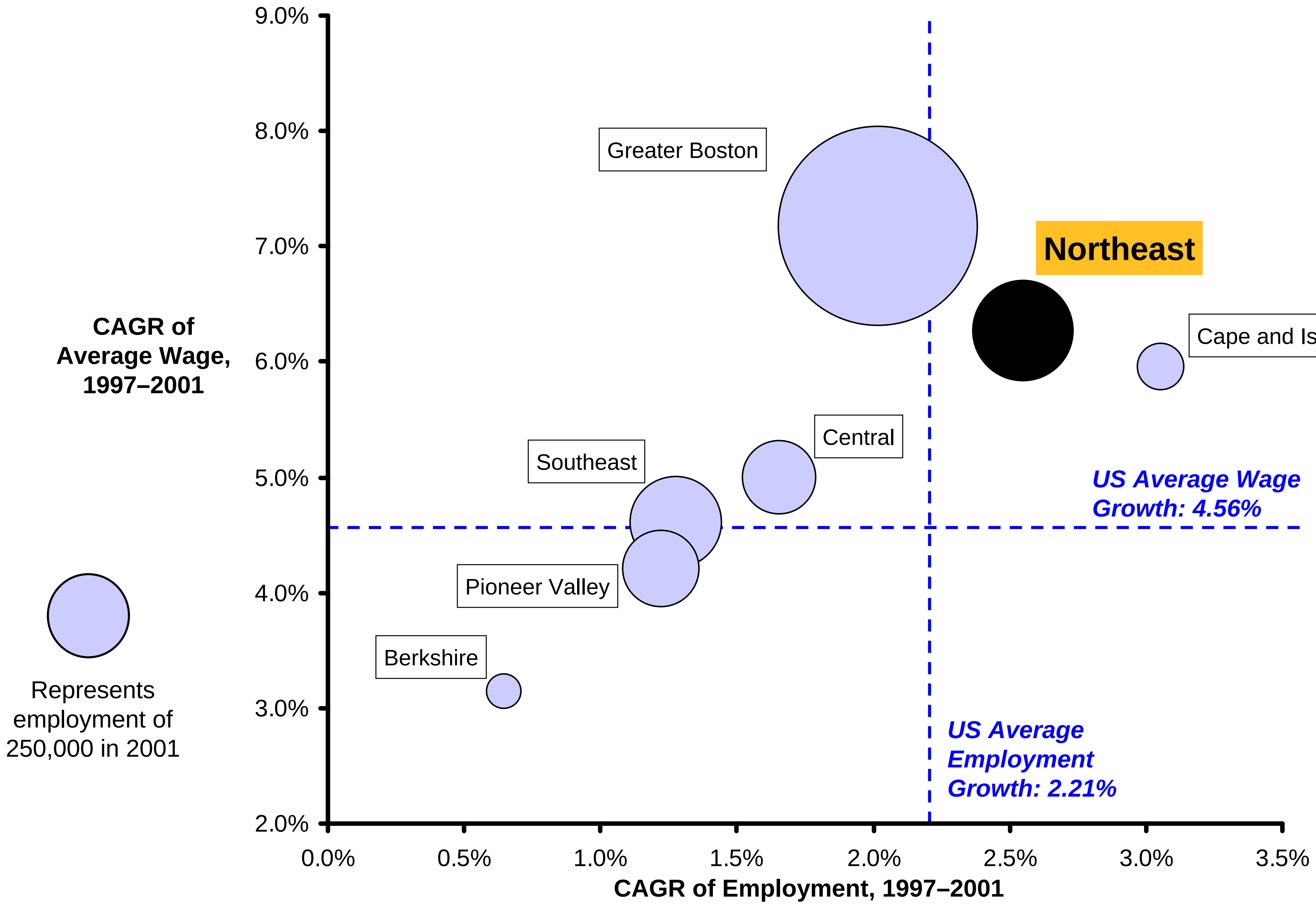
Massachusetts Regions



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

Comparative Performance of Regions

Wage Growth and Employment Growth



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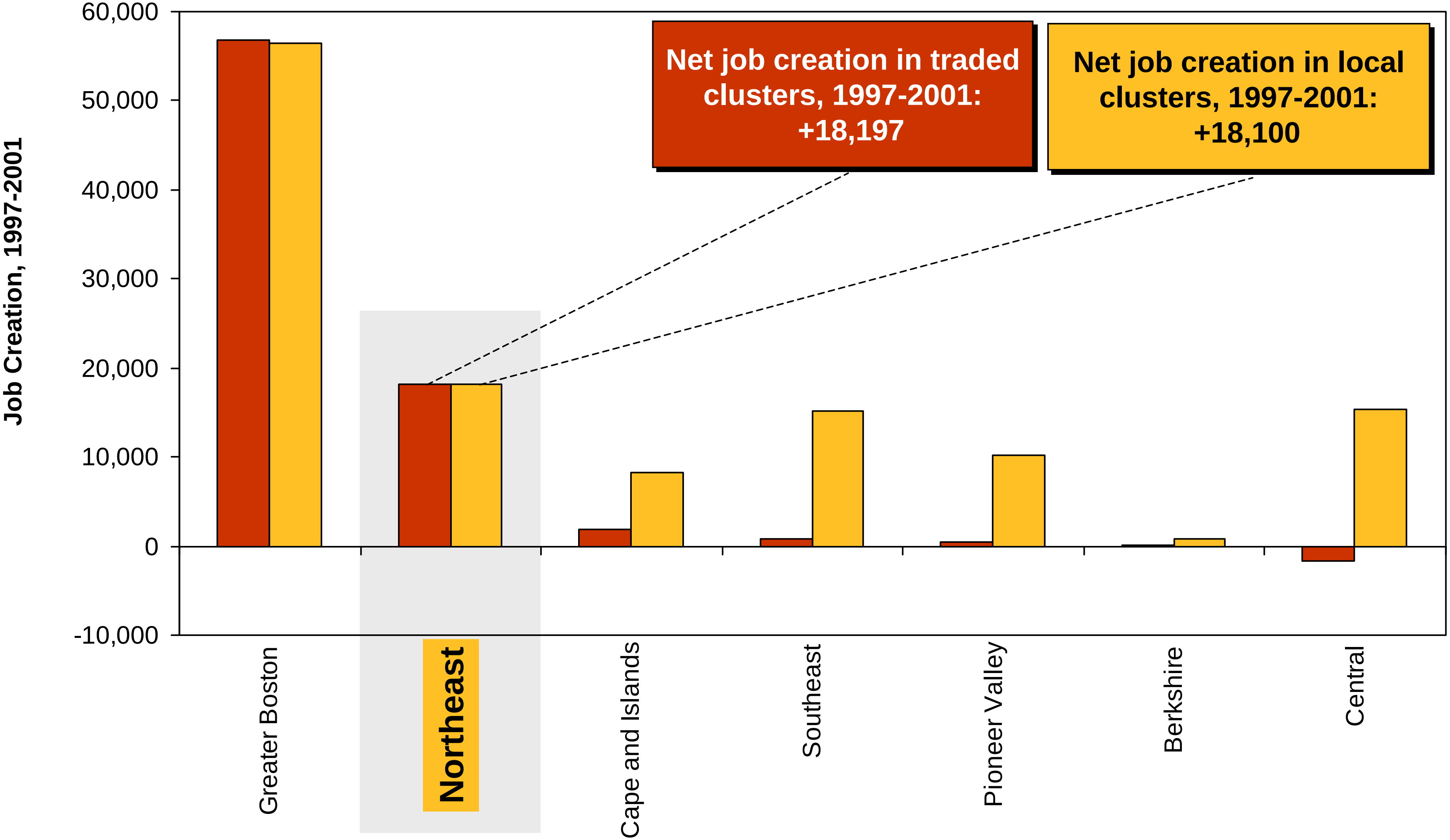
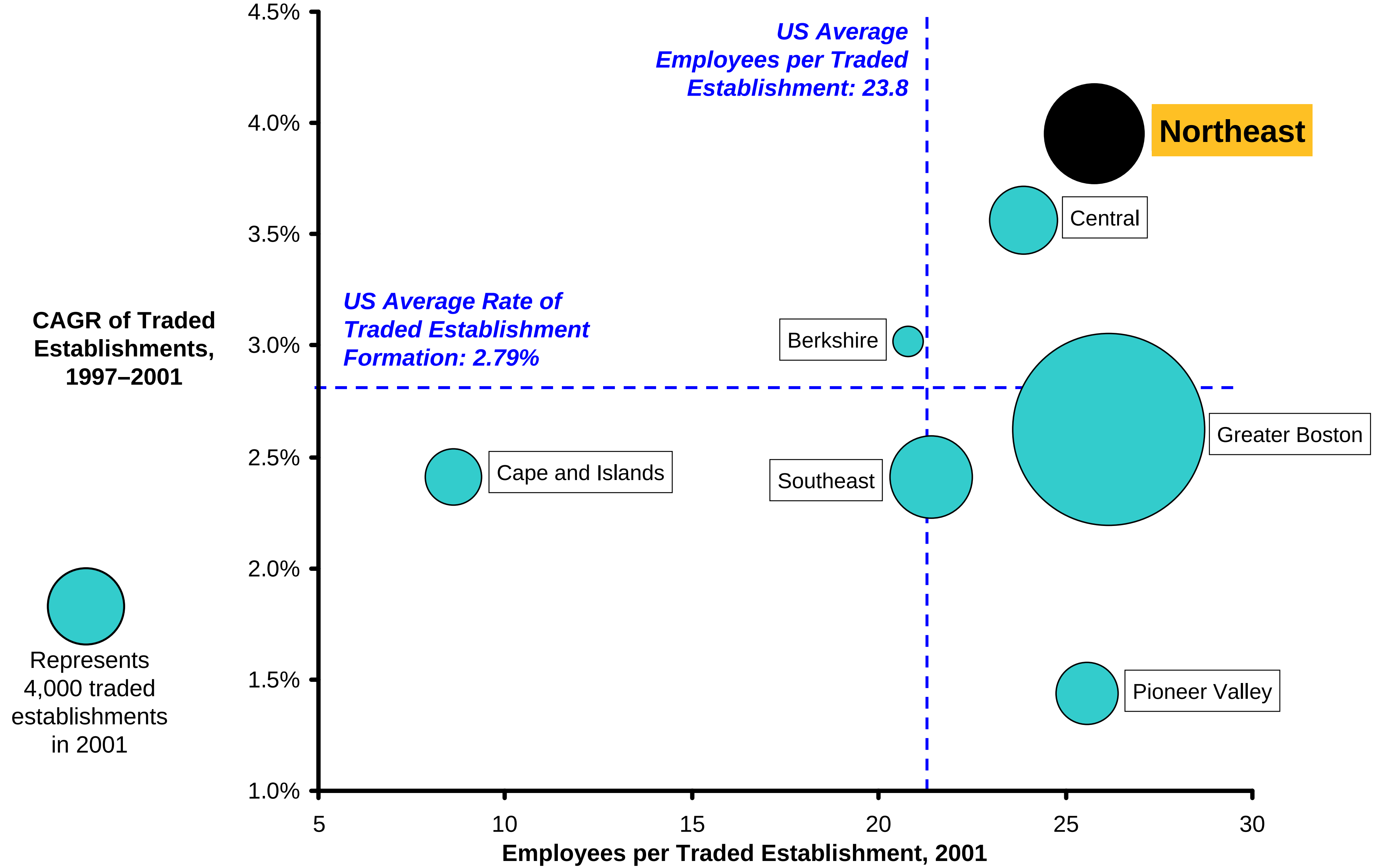
Job Creation
Massachusetts Regions



Data: private, non-agricultural employment. Note: Regional data does not total precisely to statewide data due to omissions for confidentiality in the regions.
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Comparative Performance of Regions

Establishment Formation in Traded Clusters



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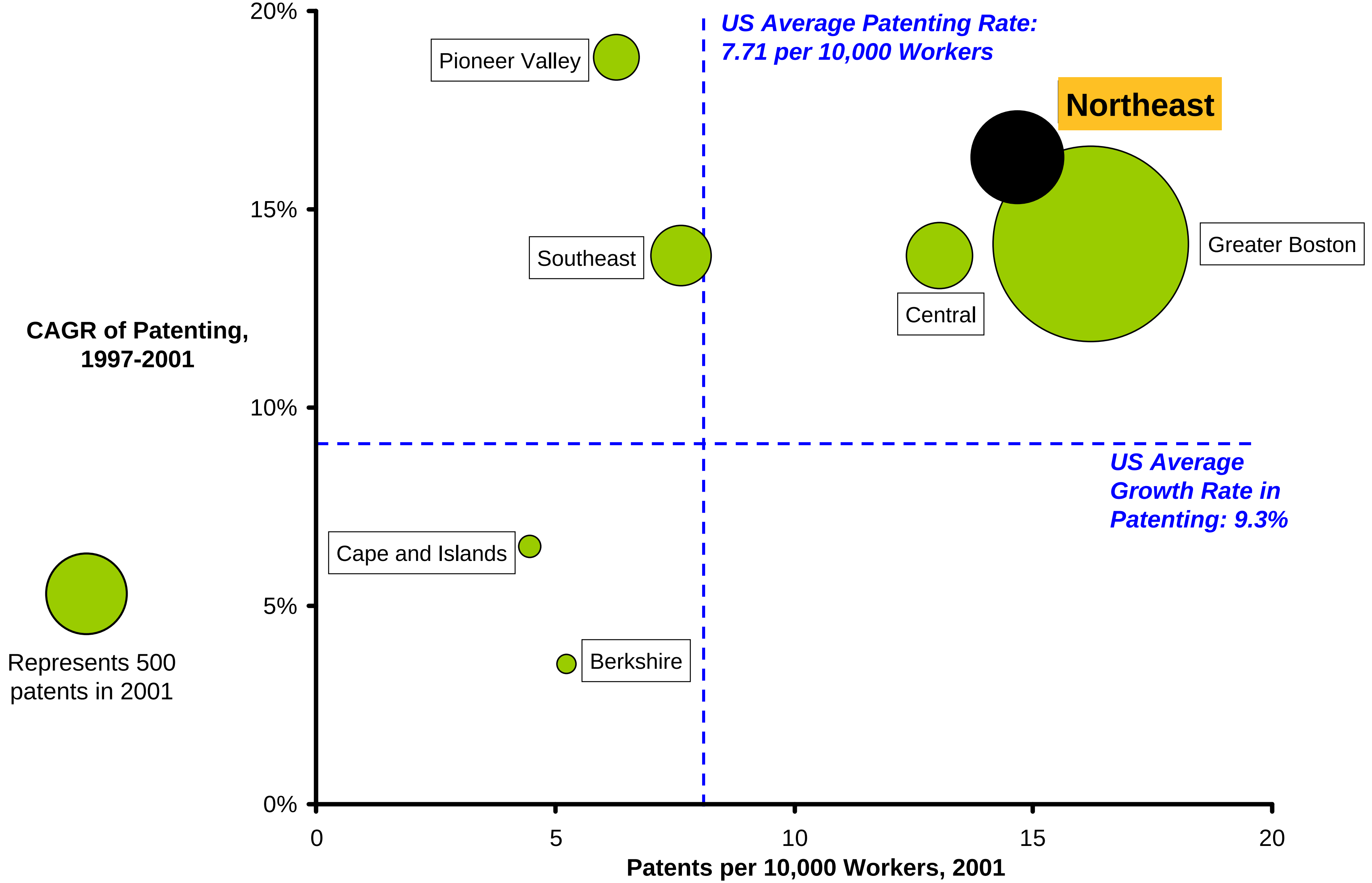
Comparative Performance of Regions

Patenting Rates



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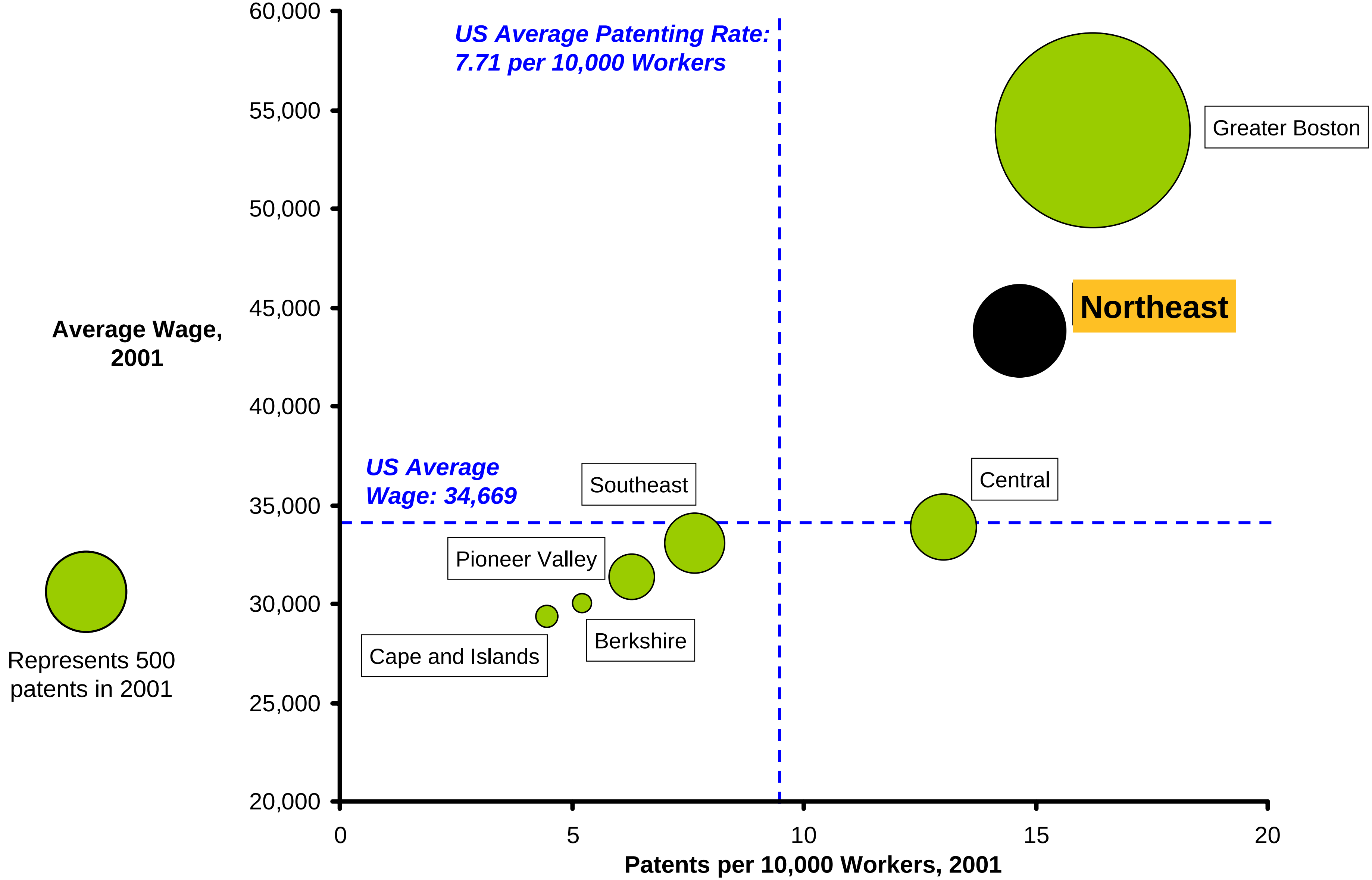
Comparative Performance of Regions

Wages and Patenting Rates



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

Patents by Organization

Northeast Region

	Organization	Patents Issued from 1997 to 2001
1	ANALOG DEVICES, INC.	62
2	GENERAL ELECTRIC COMPANY	59
3	OSRAM SYLVANIA INC.	43
4	HEWLETT-PACKARD COMPANY	42
5	ANALOGIC CORPORATION	37
6	POLAROID CORPORATION	35
7	SUN MICROSYSTEMS, INC.	34
8	EATON CORPORATION	27
9	AGFA CORPORATION	27
10	NEW ENGLAND BIOLABS, INC.	27
11	DIGITAL EQUIPMENT CORPORATION	25
12	WHITAKER CORPORATION	24
13	AGFA DIVISION, BAYER CORPORATION	22
14	RAYTHEON COMPANY	21
15	C. R. BARD, INC.	19
16	UNIVERSITY OF MASSACHUSETTS	19
17	SPEEDLINE TECHNOLOGIES, INC.	18
18	GENETICS INSTITUTE, INC.	18
19	GELTEX PHARMACEUTICALS, INC.	18
20	LUCENT TECHNOLOGIES INC.	18
21	AVID TECHNOLOGY, INC.	17
22	NORTEL NETWORKS CORPORATION	16
23	CABOT CORPORATION	16
24	BROOKS AUTOMATION INC.	15
25	MILLENNIUM PHARMACEUTICALS, INC.	15
26	MILLIPORE CORPORATION	14

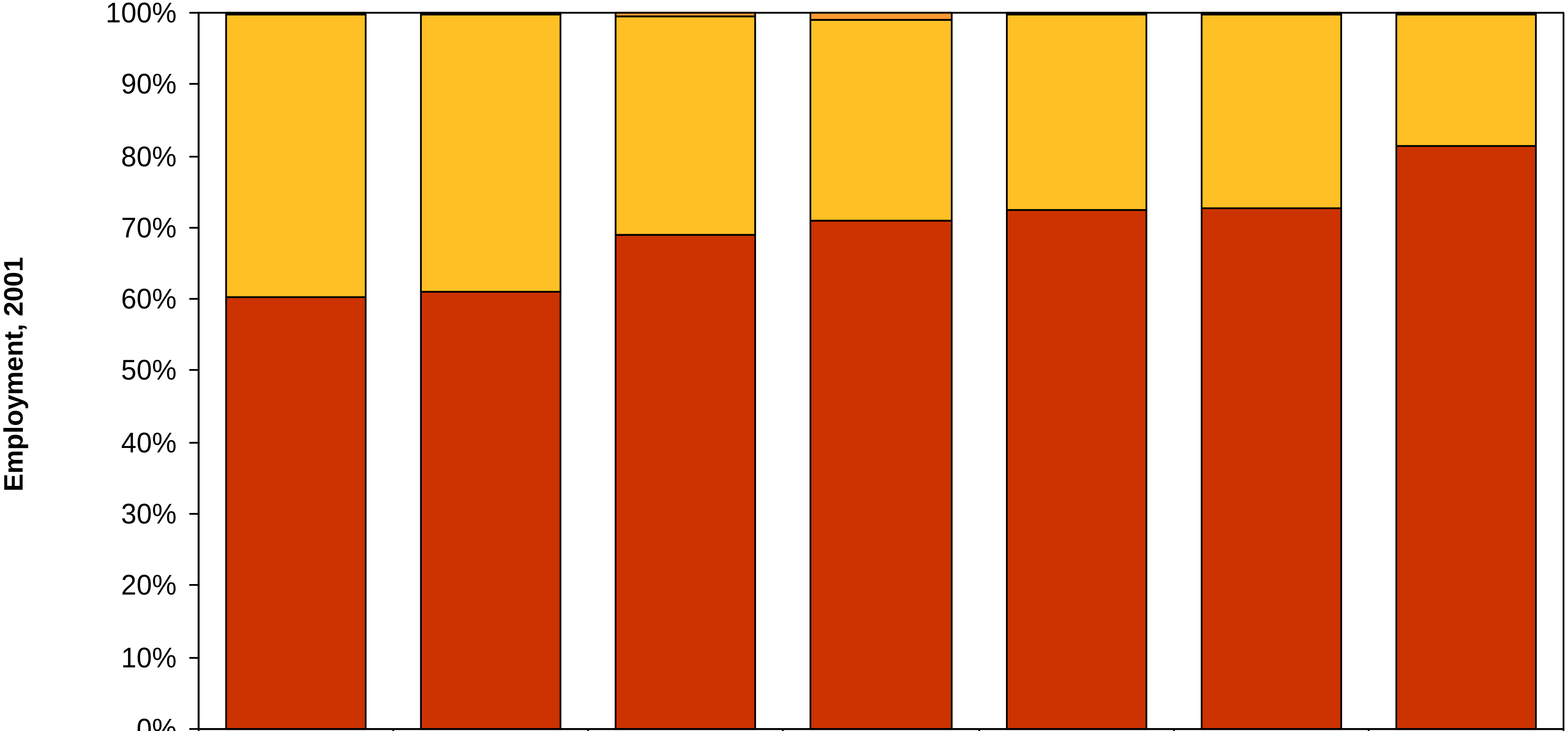
Note: The USPTO assigns location based on the inventor's address rather than that of the institutional owner.
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Composition
Northeastern Massachusetts

- The Northeast has with 39.4% the highest share of traded employment of all Massachusetts regions
- Among traded clusters, the Northeast has a strong position in a number of technology-intensive clusters
  - Information Technology
  - Analytical Instruments
  - Communication Equipment
  - Aerospace Engines, Aerospace Vehicles and Defense
- The Northeast is strengthening its position in some traditionally strong clusters but is losing out in others
  - Growing clusters include Analytical Instruments and Equipment but also Business Services, Financial Services, and Education and Knowledge Creation
  - Shrinking clusters include Aerospace Engines and Information Technology
    - Clusters with currently higher than average wages and employment concentration that are losing position account for more than 40% of that group
- Among local clusters, real estate development has added the most significant number of jobs between 1997 and 2001

Employment by Cluster Type

Massachusetts Regions

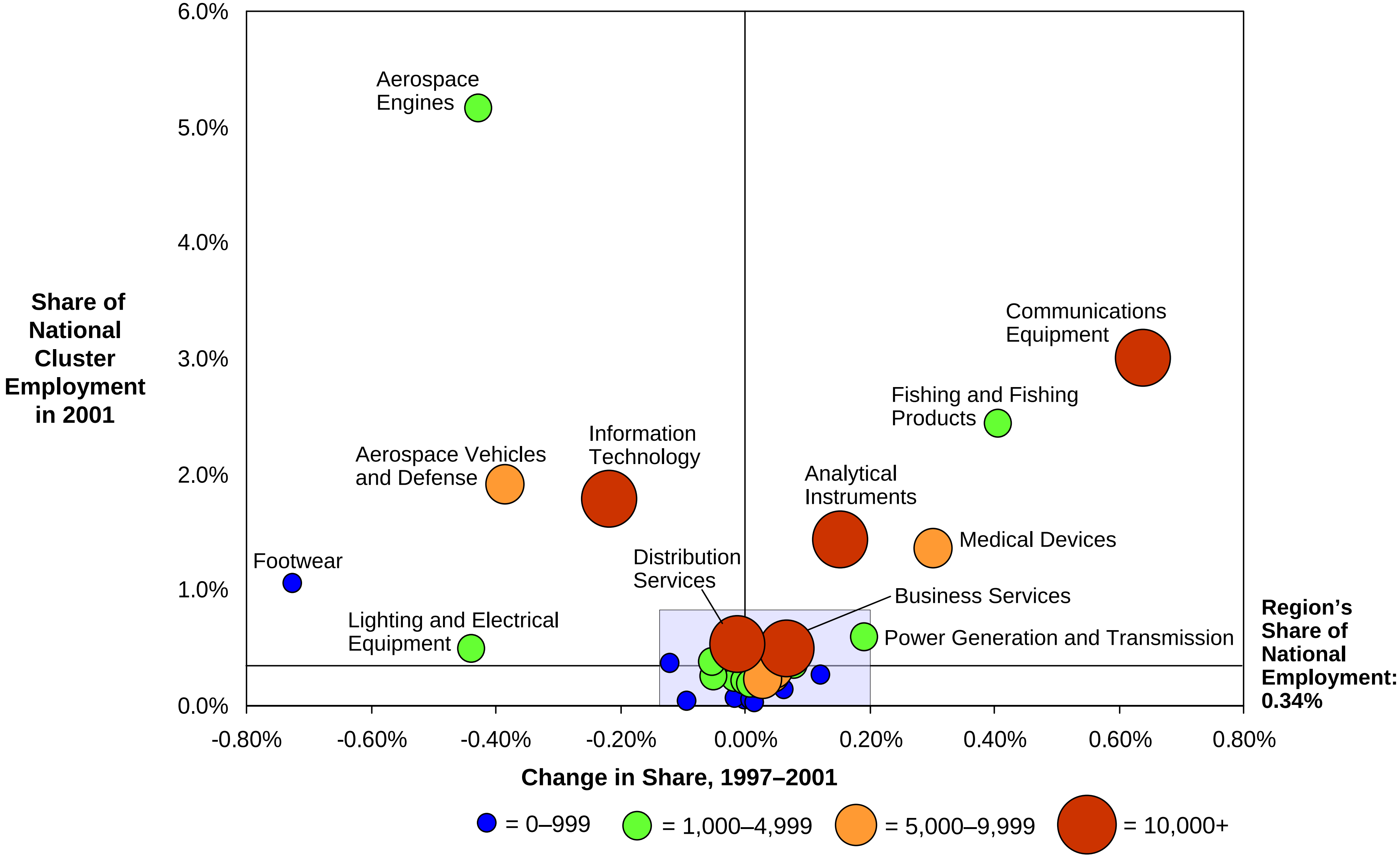


	Northeast	Greater Boston	Central	Berkshire	Southeast	Pioneer Valley	Cape and Islands
NED	0.20%	0.20%	0.40%	1.10%	0.20%	0.40%	0.30%
Traded	39.40%	38.80%	30.60%	28.00%	27.40%	27.00%	18.30%
Local	60.30%	61.00%	69.00%	70.90%	72.40%	72.70%	81.40%

Data: private, non-agricultural employment. Note: Regional data does not total precisely to statewide data due to omissions for confidentiality in the regions.
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Specialization By Traded Cluster

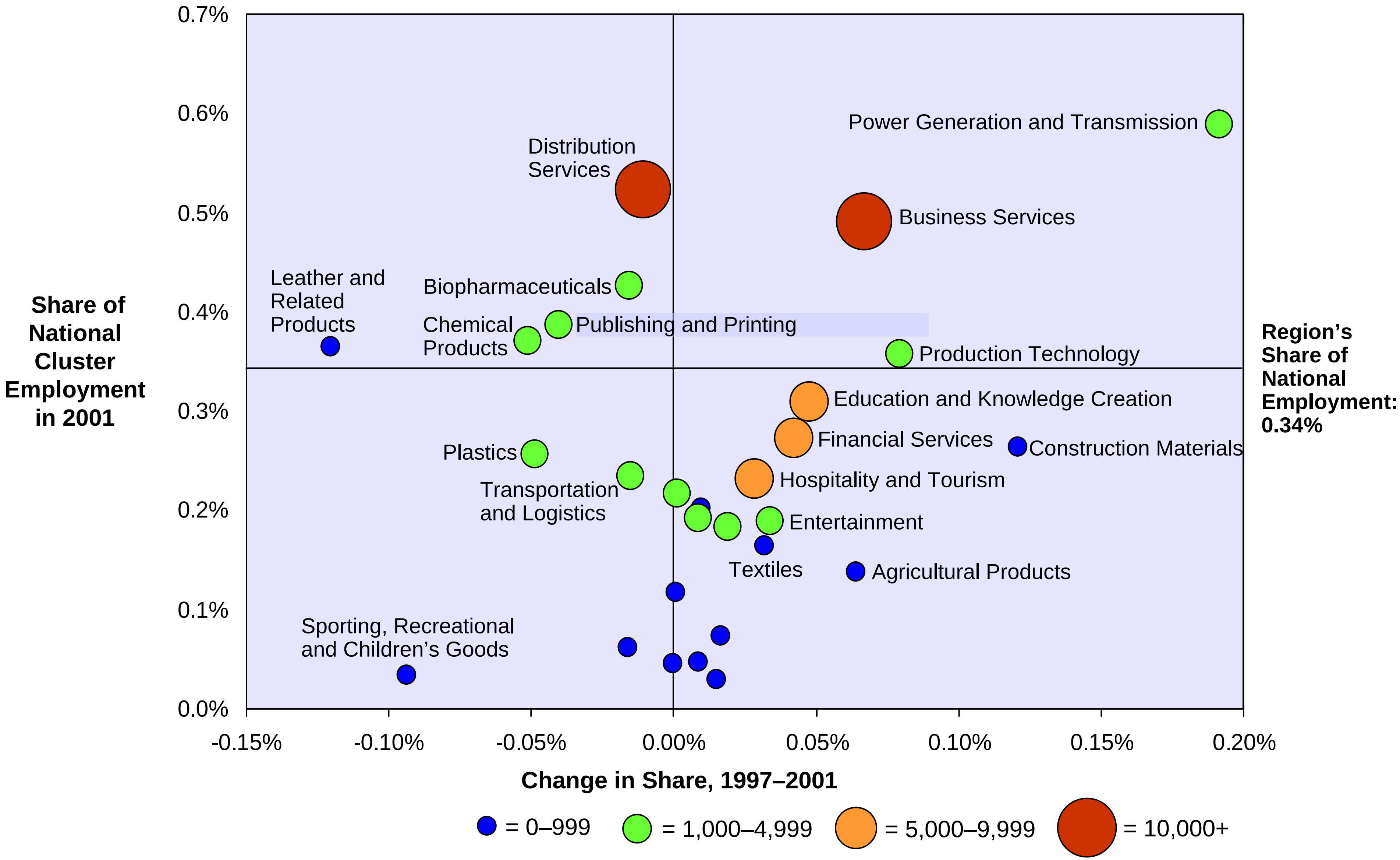
Northeast Region



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

Specialization By Traded Cluster

Northeast Region



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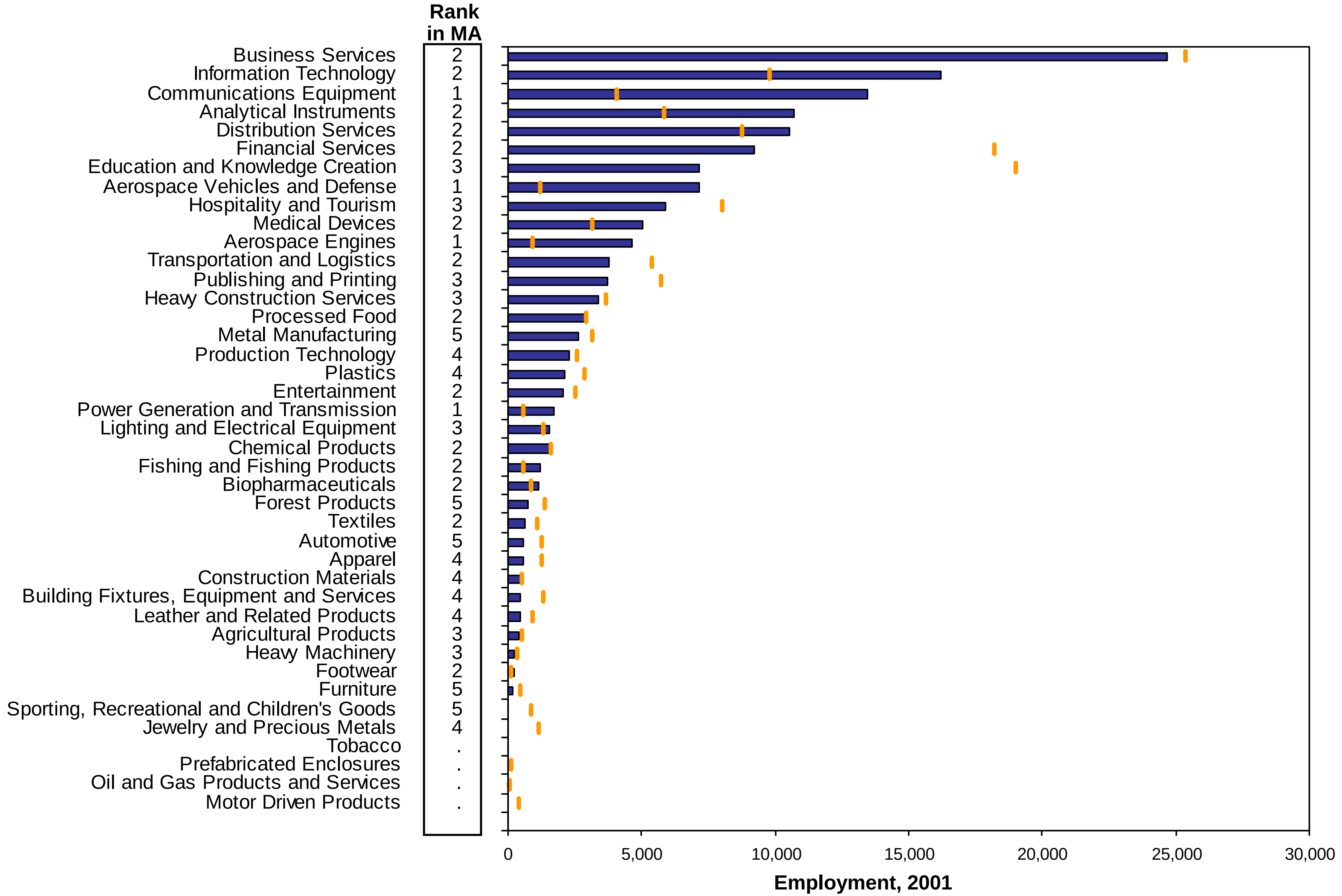
Employment By Traded Cluster

Northeast Region

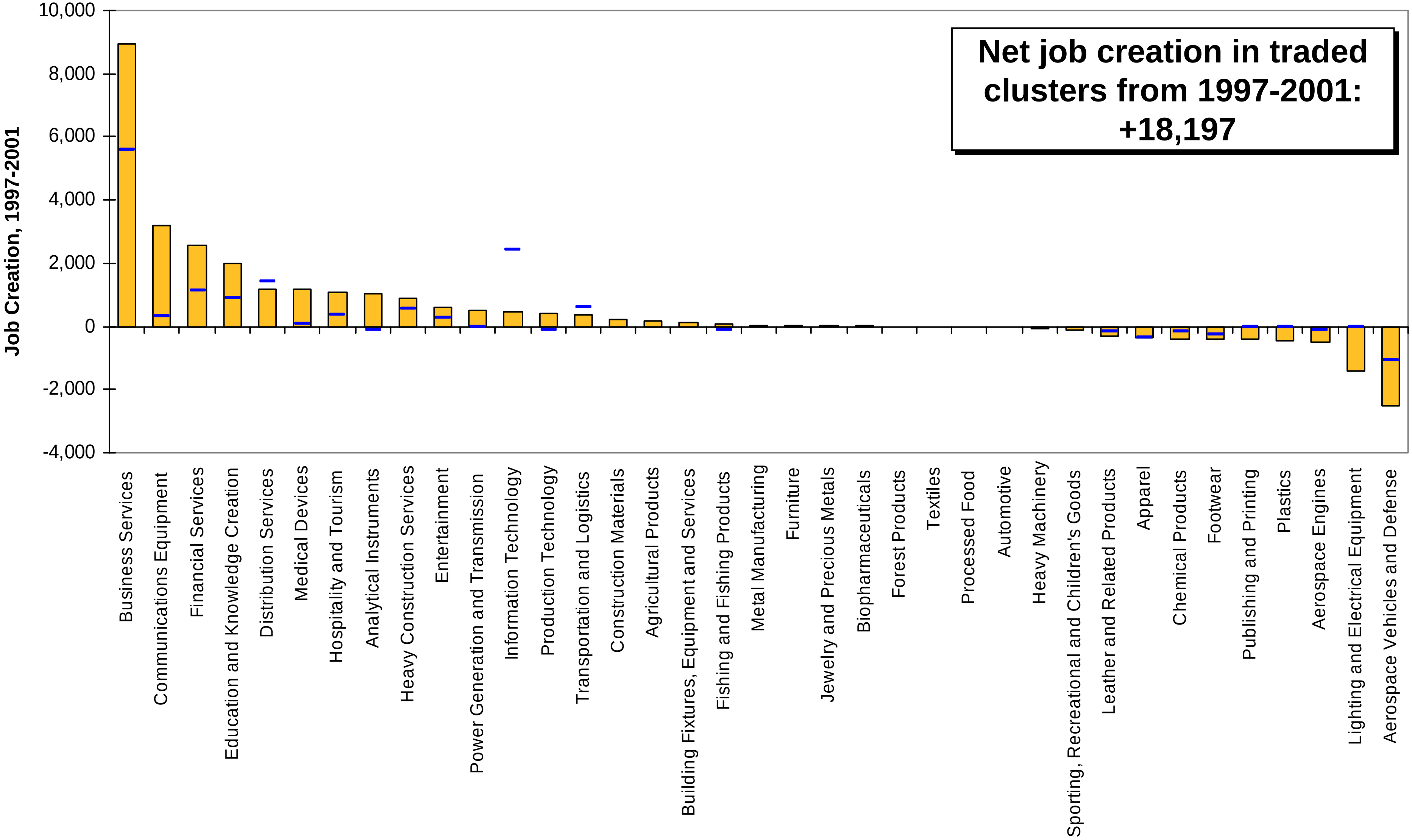


| - Indicates expected employment at rates in the **state benchmark** for traded clusters. Rank is across 7 state regions.

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

Job Creation By Traded Cluster

Northeast Region

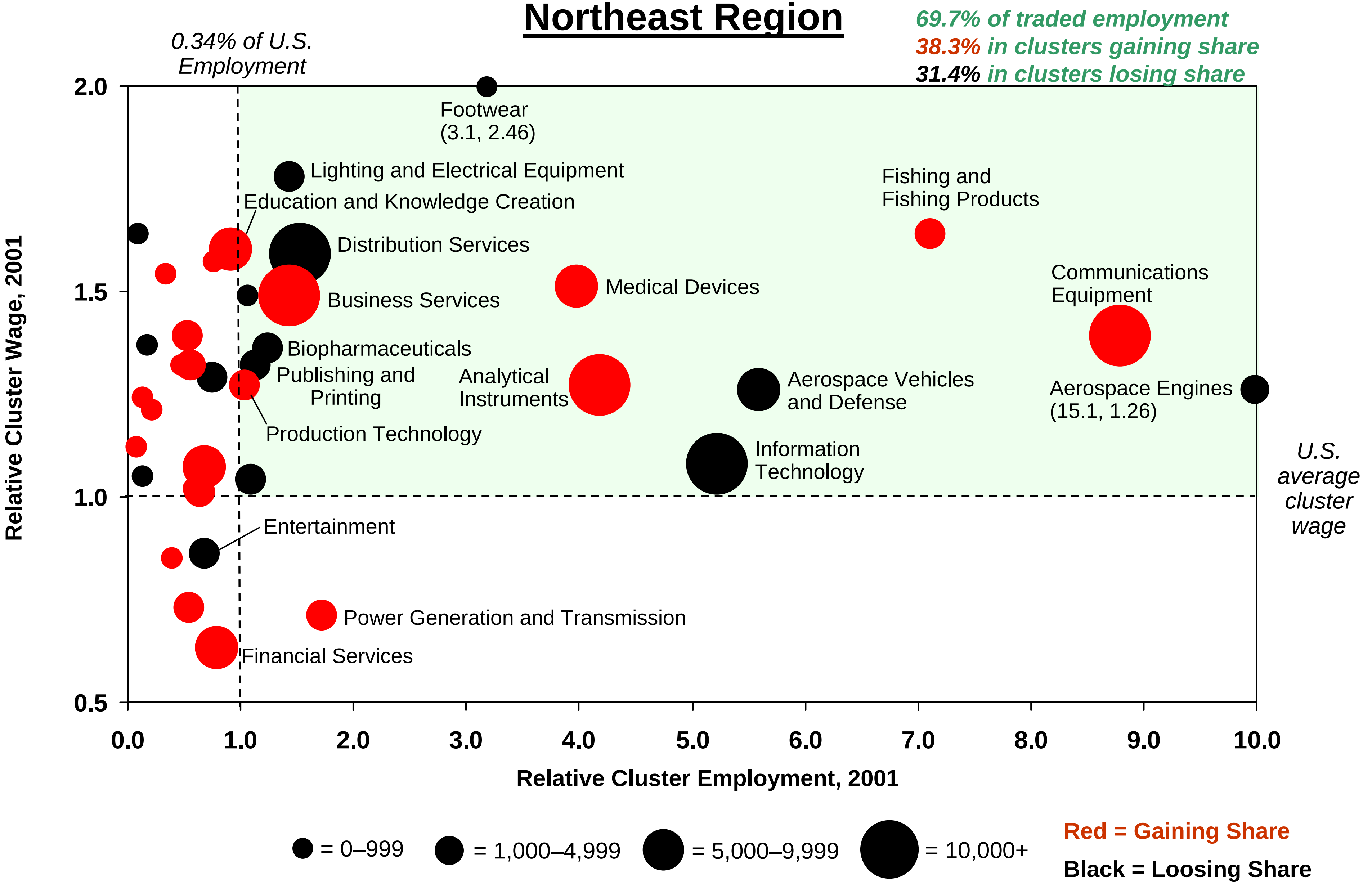


— Indicates expected job creation at rates achieved in **national benchmark** clusters, i.e. % change in national benchmark times initial employment.

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

Relative Cluster Performance

Northeast Region

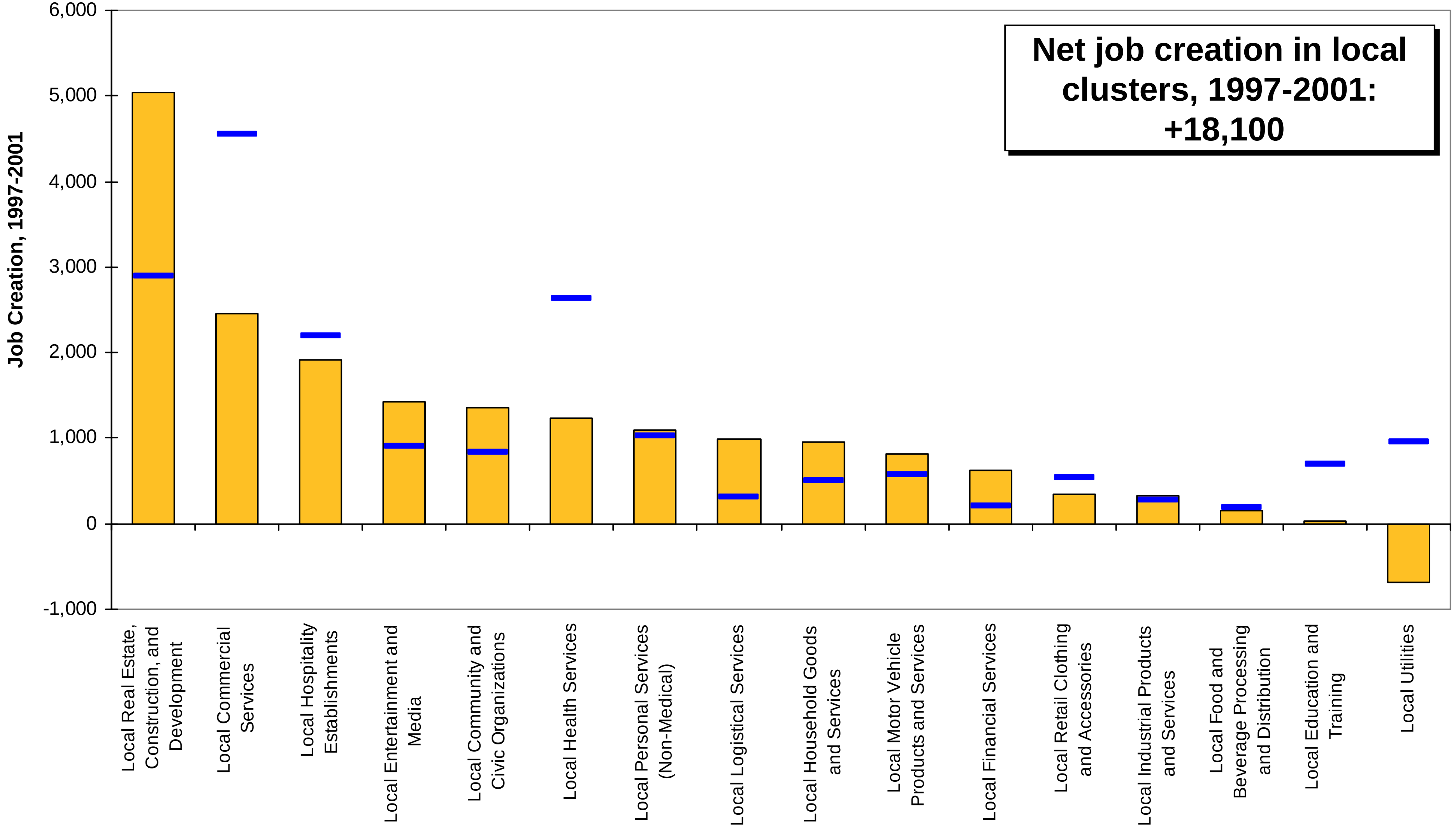


Note: Data points that fall outside the graph are placed on the borders with their values given in parentheses (Employment, Wage)

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

Job Creation By Local Cluster

Northeast Region

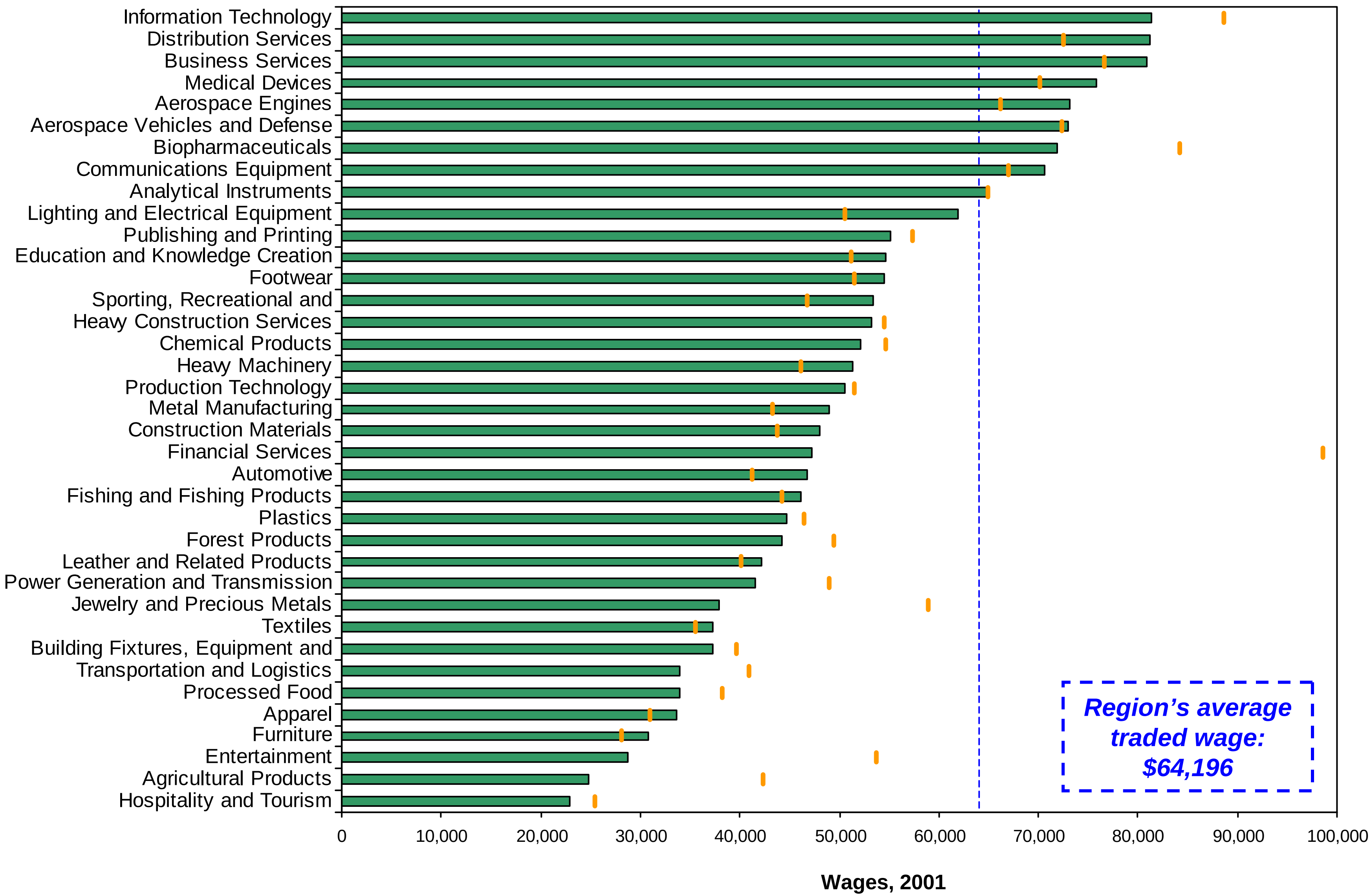


— Indicates expected job creation at rates achieved in **national benchmark** clusters, i.e. % change in national benchmark times initial employment.

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

Wages By Traded Cluster

Northeast Region with State Benchmarks



| - Indicates Massachusetts average wage in the cluster.

Note: Wages are not available in all clusters due to data suppression to protect confidentiality.

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

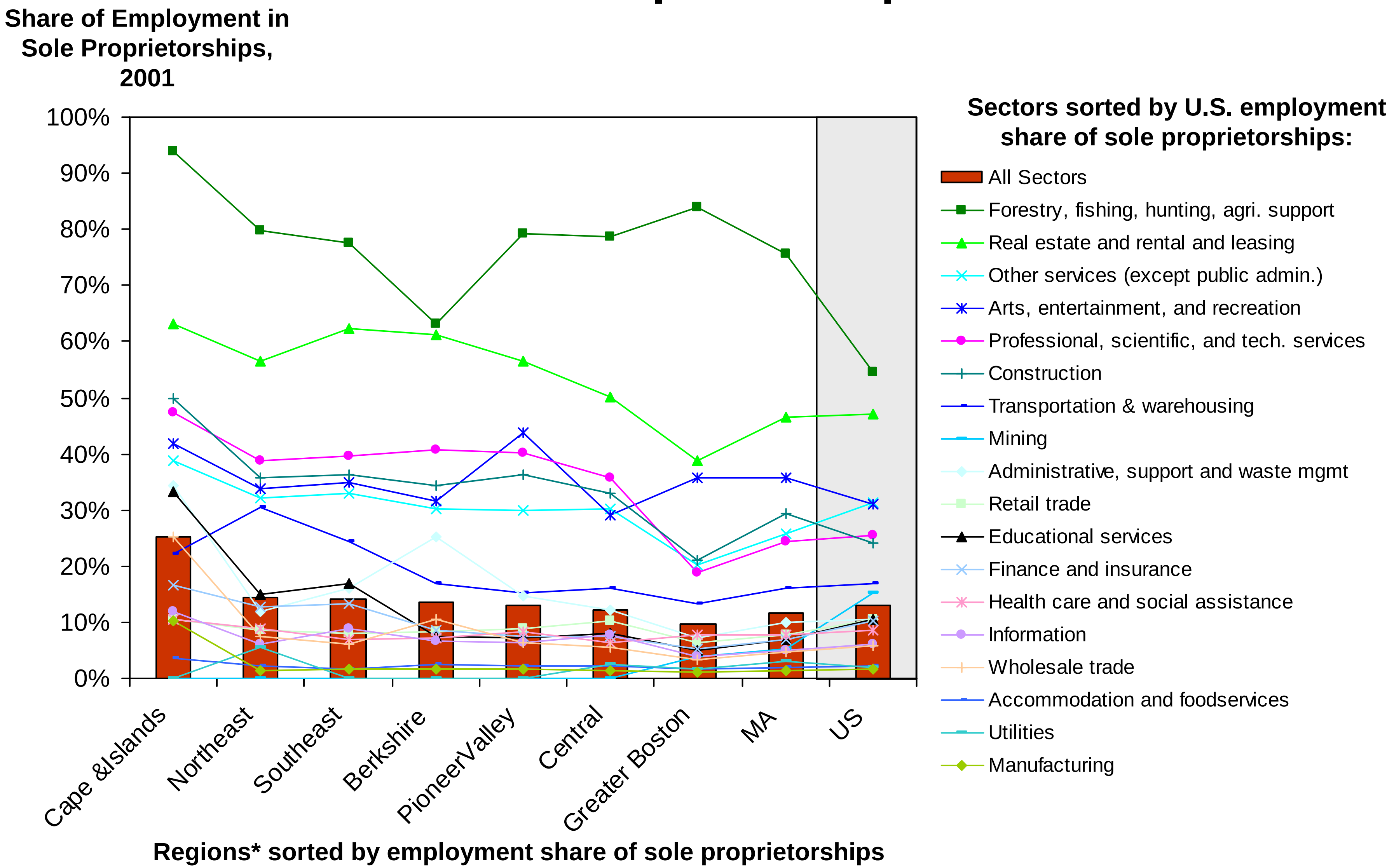
Leading Sub-Clusters by Location Quotient

Northeast Region, 2001

Cluster	Subcluster	Location Quotient	Share of National Employment	Rank among Massachusetts Regions	Employment
Business Services	Laundry Services	5.47	1.87%	2	264
	Computer Programming	2.23	0.76%	2	9,045
Information Technology	Computers	21.37	7.30%	1	5,294
	Electronic Components and Assemblies	4.31	1.47%	2	4,489
	Software	4.08	1.39%	2	4,924
	Peripherals	3.65	1.25%	2	1,514
Communications Equipment	Specialty Office Machines	12.52	4.28%	2	879
	Communications Equipment	10.75	3.67%	1	9,776
	Electrical and Electronic Components	5.06	1.73%	1	2,785
Analytical Instruments	Optical Instruments	9.34	3.19%	2	727
	Laboratory Instruments	8.23	2.81%	2	3,308
	Process Instruments	7.50	2.56%	1	4,844
Financial Services	Passenger Car Leasing	4.05	1.38%	1	133
Aerospace Vehicles and Defense	Missiles and Space Vehicles	30.29	10.35%	1	7,074
Medical Devices	Medical Equipment	14.83	5.07%	1	3,017
	Biological Products	4.60	1.57%	1	402
	Surgical Instruments and Supplies	2.39	0.82%	3	1,605
Aerospace Engines	Aircraft Engines	16.93	5.78%	1	4,640
Transportation and Logistics	Trucking Terminal	72.79	24.86%	1	146
Processed Food	Milk and Frozen Desserts	2.99	1.02%	2	781
Metal Manufacturing	General Industrial Machinery	6.07	2.07%	1	1,030
Production Technology	Process Machinery	3.36	1.15%	2	928
Entertainment	Entertainment Equipment	3.66	1.25%	2	556
Power Generation and Transmission	Transformers	17.12	5.85%	1	1,514
	Porcelain, Carbon and Graphite Components	2.94	1.01%	1	194
Lighting and Electrical Equipment	Electric Lamps	15.32	5.23%	1	692
Chemical Products	Leather Tanning and Finishing	3.82	1.30%	1	151
	Special Packaging	2.75	0.94%	3	101
	Packaged Chemical Products	2.70	0.92%	2	820
Fishing and Fishing Products	Fish Products	7.81	2.67%	1	937
	Fishing and Hunting	7.71	2.63%	2	262
Leather Products	Coated Fabrics	13.13	4.49%	2	393
Footwear	Specialty Footwear	31.56	10.78%	2	213

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

Sole Proprietorships

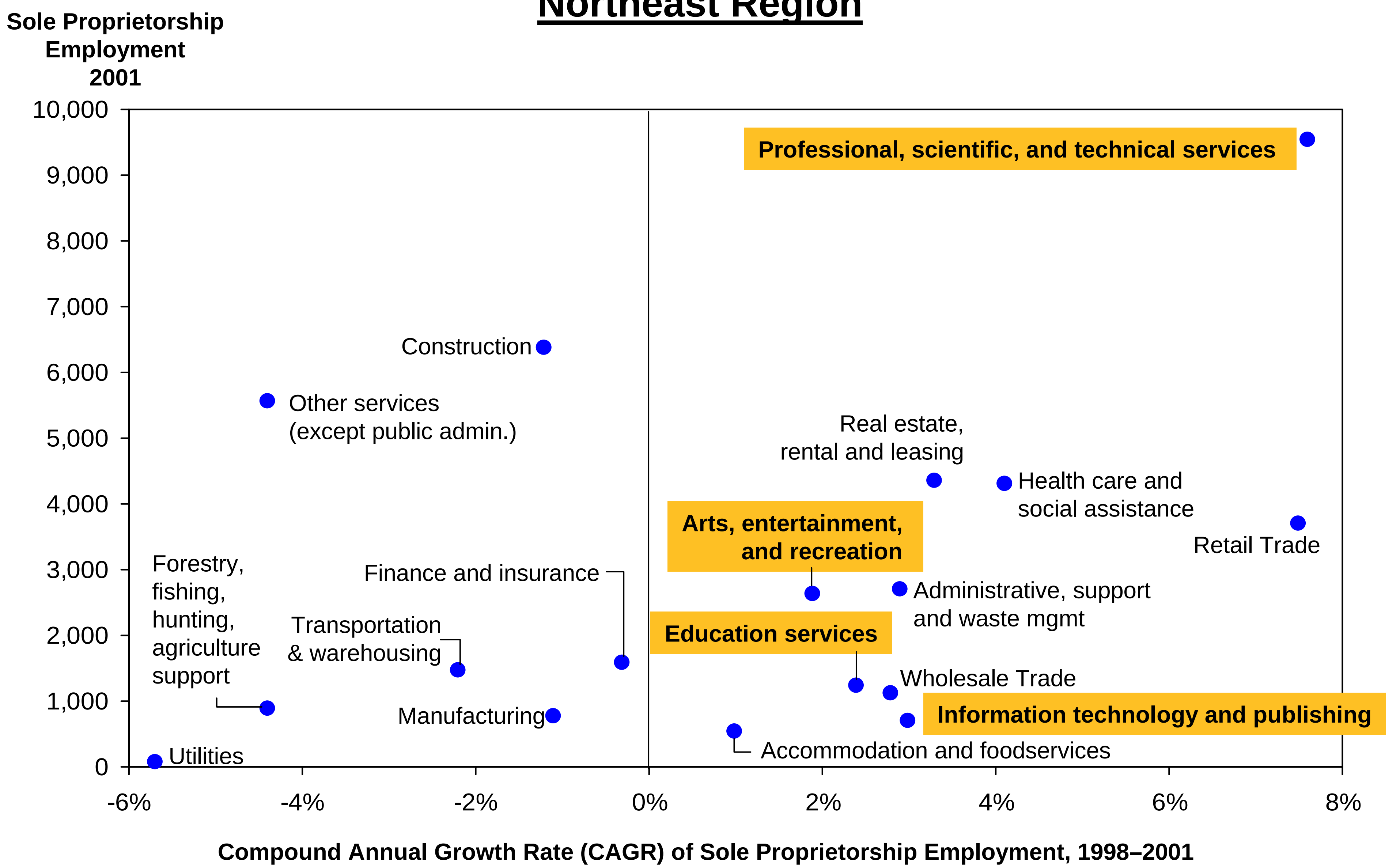


- Sole proprietorships are, as agriculture and government employees, not included in the dataset available for the cluster mapping project

*Note: Data available on county basis only; the allocation to Massachusetts regions is only approximate

Sole Proprietorship Employment and Growth

Northeast Region



Source: U.S. Census Bureau, Nonemployer Statistics

Business Environment

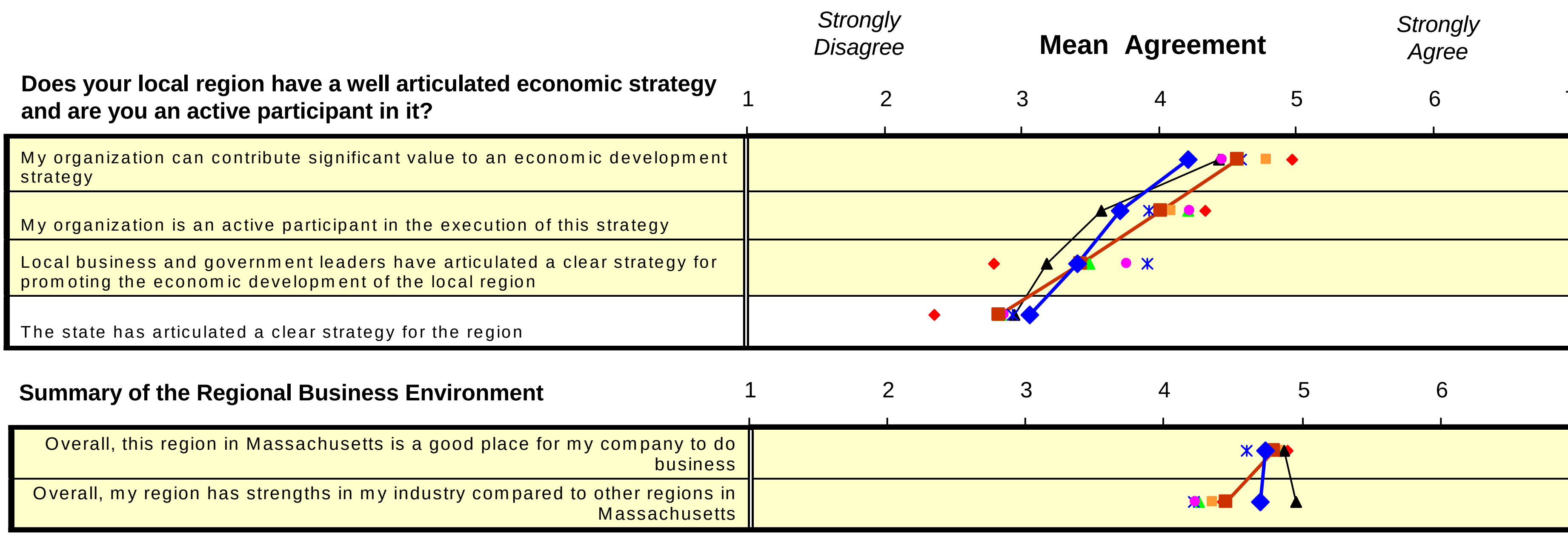
Northeastern Massachusetts

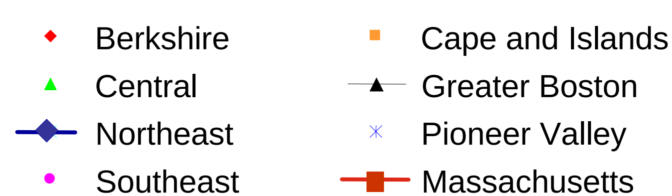
- Overall, the Northeast region is seen as an attractive location to do business, number two in Massachusetts behind Boston
  - The region is perceived as providing very strong input conditions; only Boston can match the region within Massachusetts
    - Specific advantages are communication infrastructure, the quality of advanced education and specialized research facilities, and access to specialized researchers
    - Critical disadvantages are the **cost of living** and the **cost of doing business**
  - Educational institutions get comparatively strong ratings and are seen relatively well equipped to provide the skills needed in the future

- Poor responsiveness by government is seen as one of the main challenges to create more employment in the future
  - Lack of effective tax incentives is listed as a barrier to expansion
  - Priorities for government include securing basic education and streamlining administrative procedures

Regional Comparisons

Regional Strategy & Summary of the Regional Business Environment

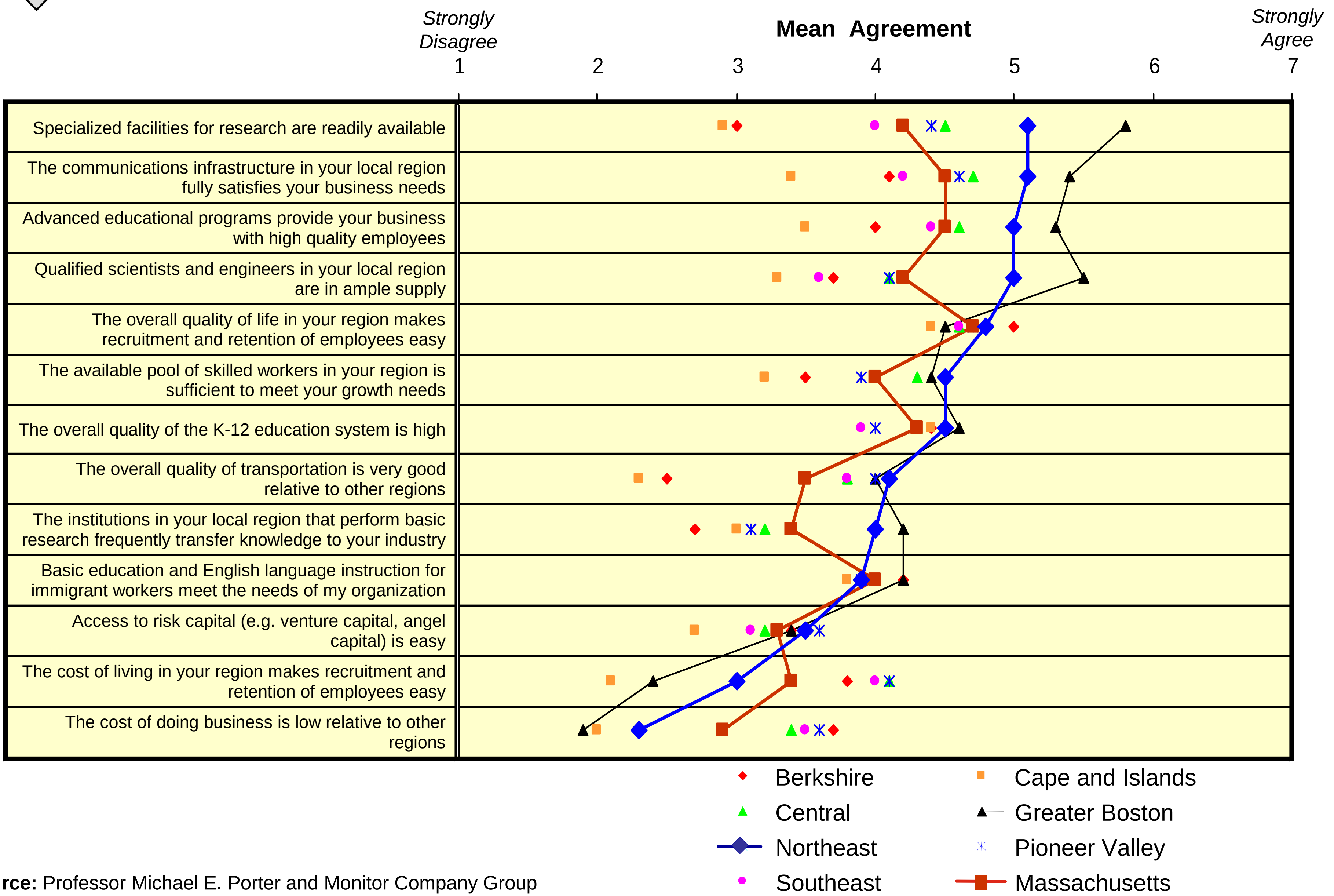




Source: Professor Michael E. Porter and Monitor Company Group

Regional Comparisons

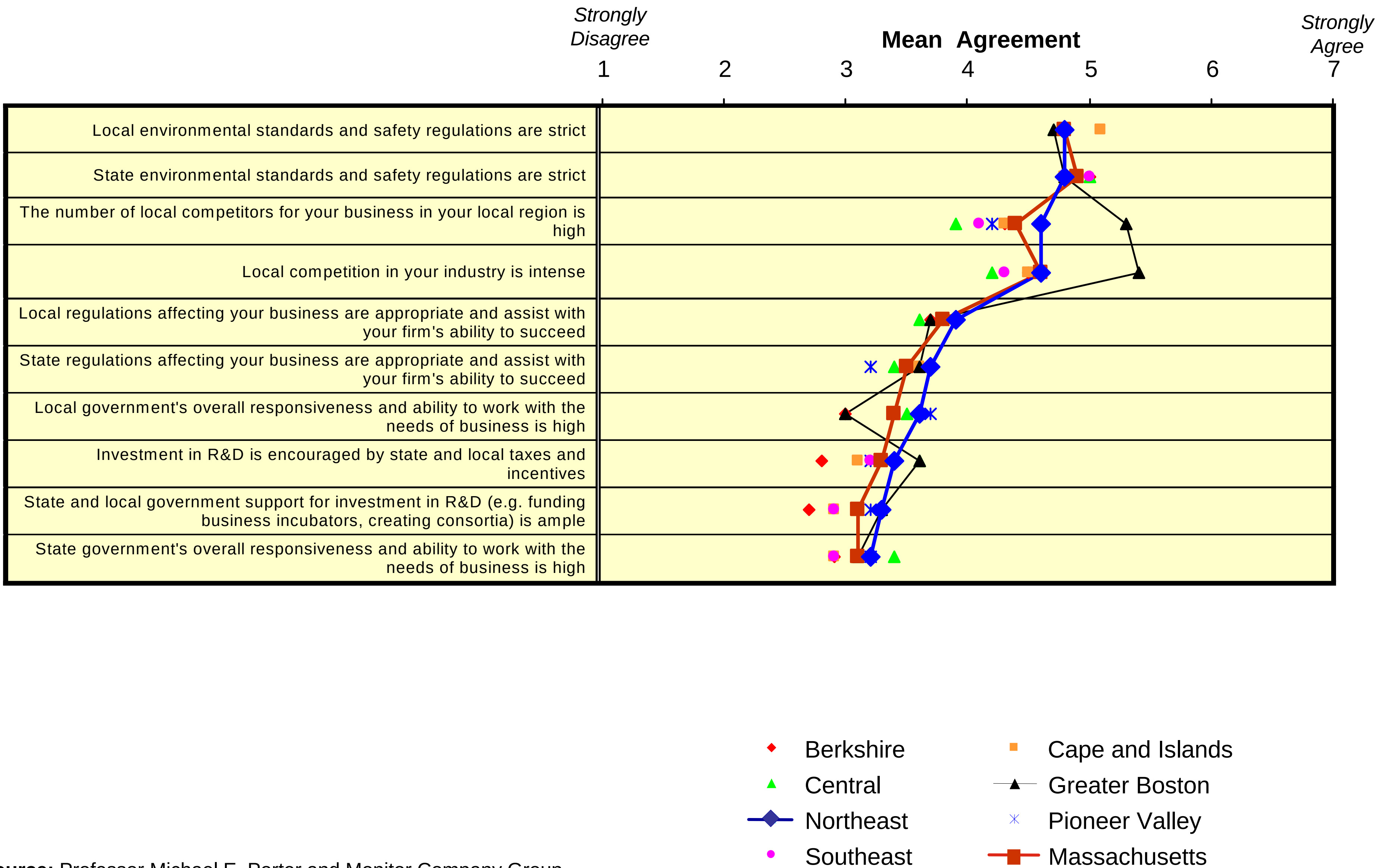
Availability of Inputs



Source: Professor Michael E. Porter and Monitor Company Group

Regional Comparisons

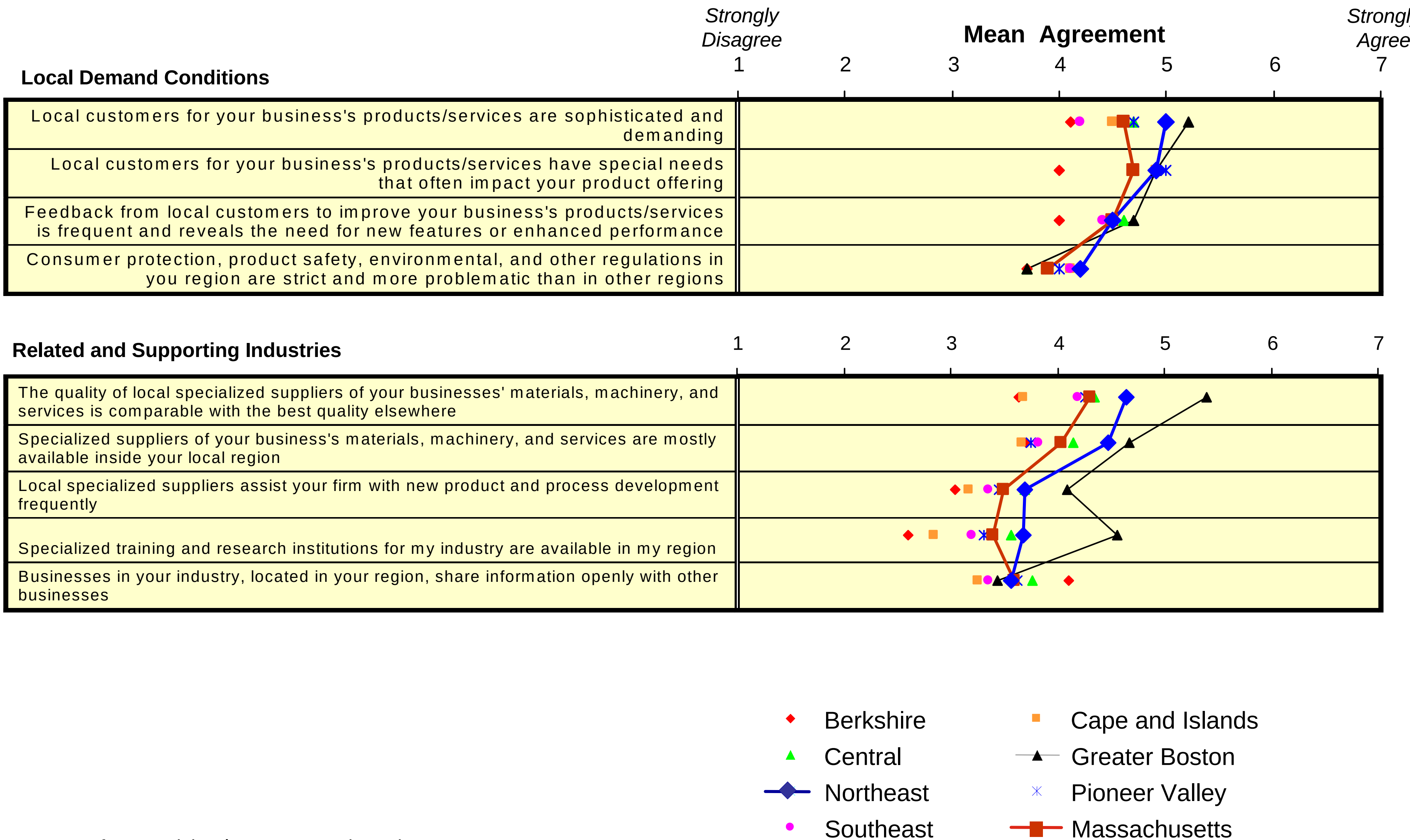
Rules and Incentives Governing Investment and Competition



Source: Professor Michael E. Porter and Monitor Company Group

Regional Comparisons

Local Demand Conditions & Related and Supporting Industries

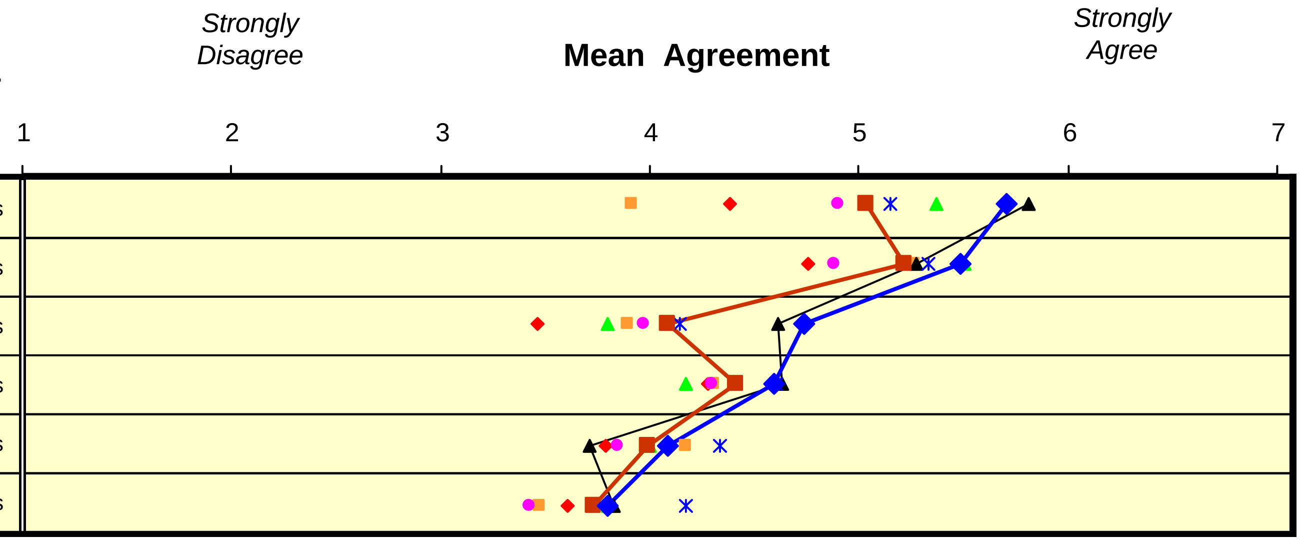


Source: Professor Michael E. Porter and Monitor Company Group

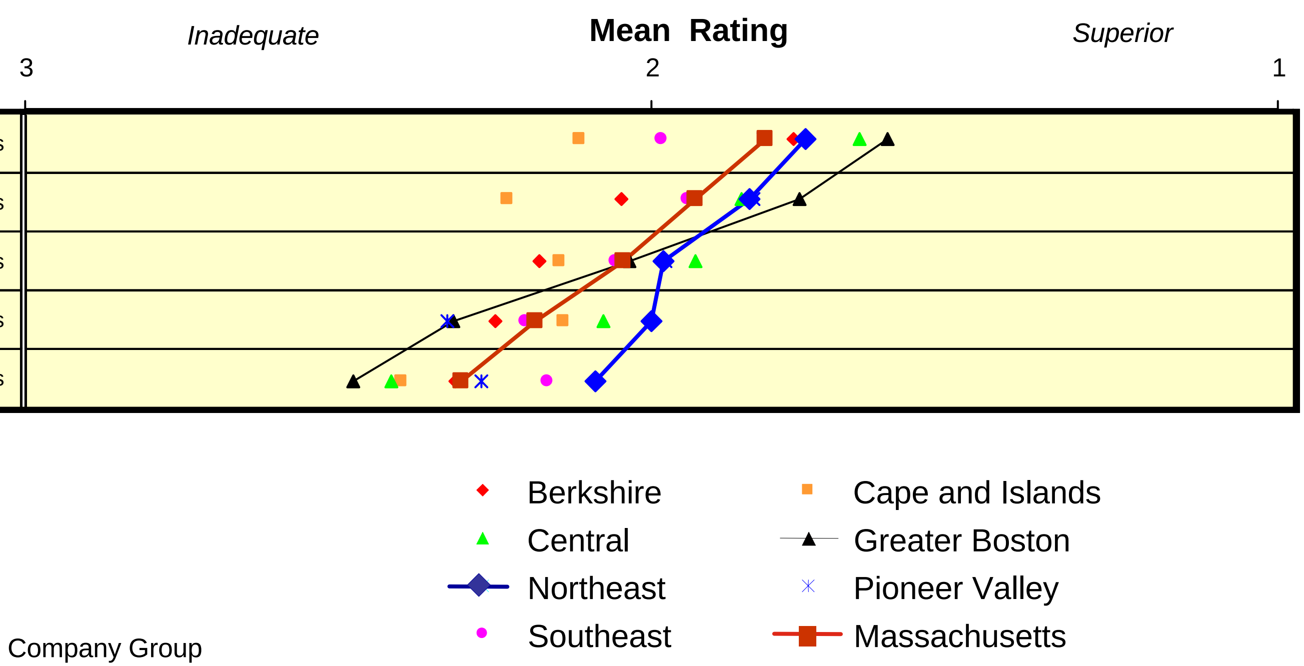
Regional Comparisons

Institutions & Education

How satisfied are you with the impact of the following institutions, in your region, on your company?



How would you best describe the quality of new workers from these sources?

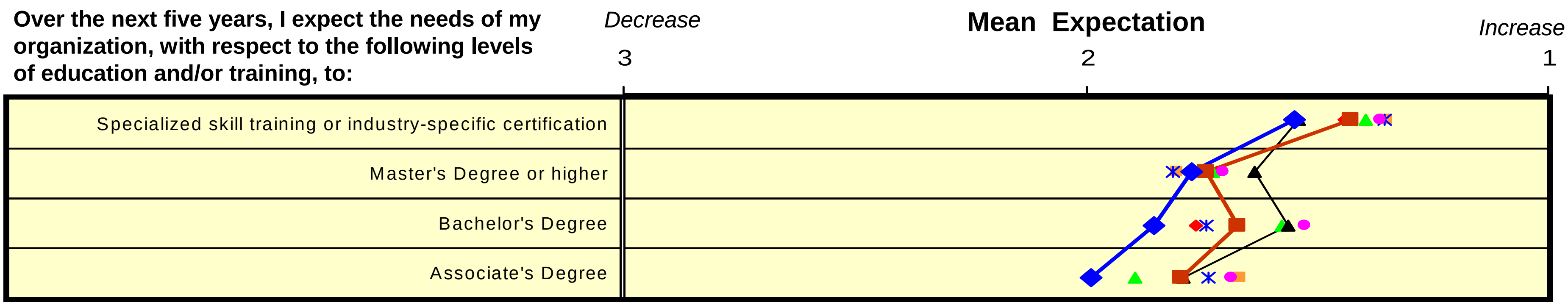


Source: Professor Michael E. Porter and Monitor Company Group

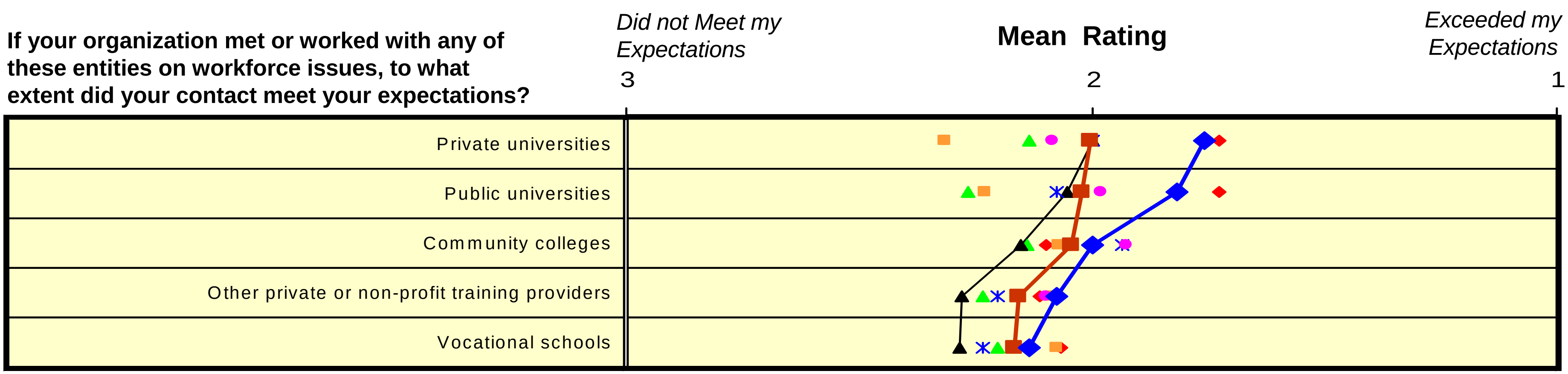
Regional Comparisons

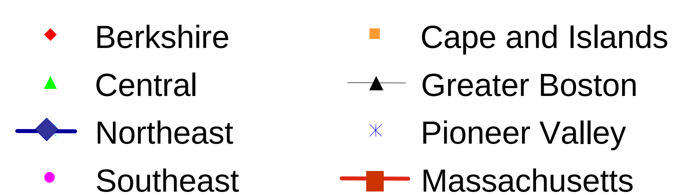
Institutions & Education (Cont.)

Over the next five years, I expect the needs of my organization, with respect to the following levels of education and/or training, to:



If your organization met or worked with any of these entities on workforce issues, to what extent did your contact meet your expectations?

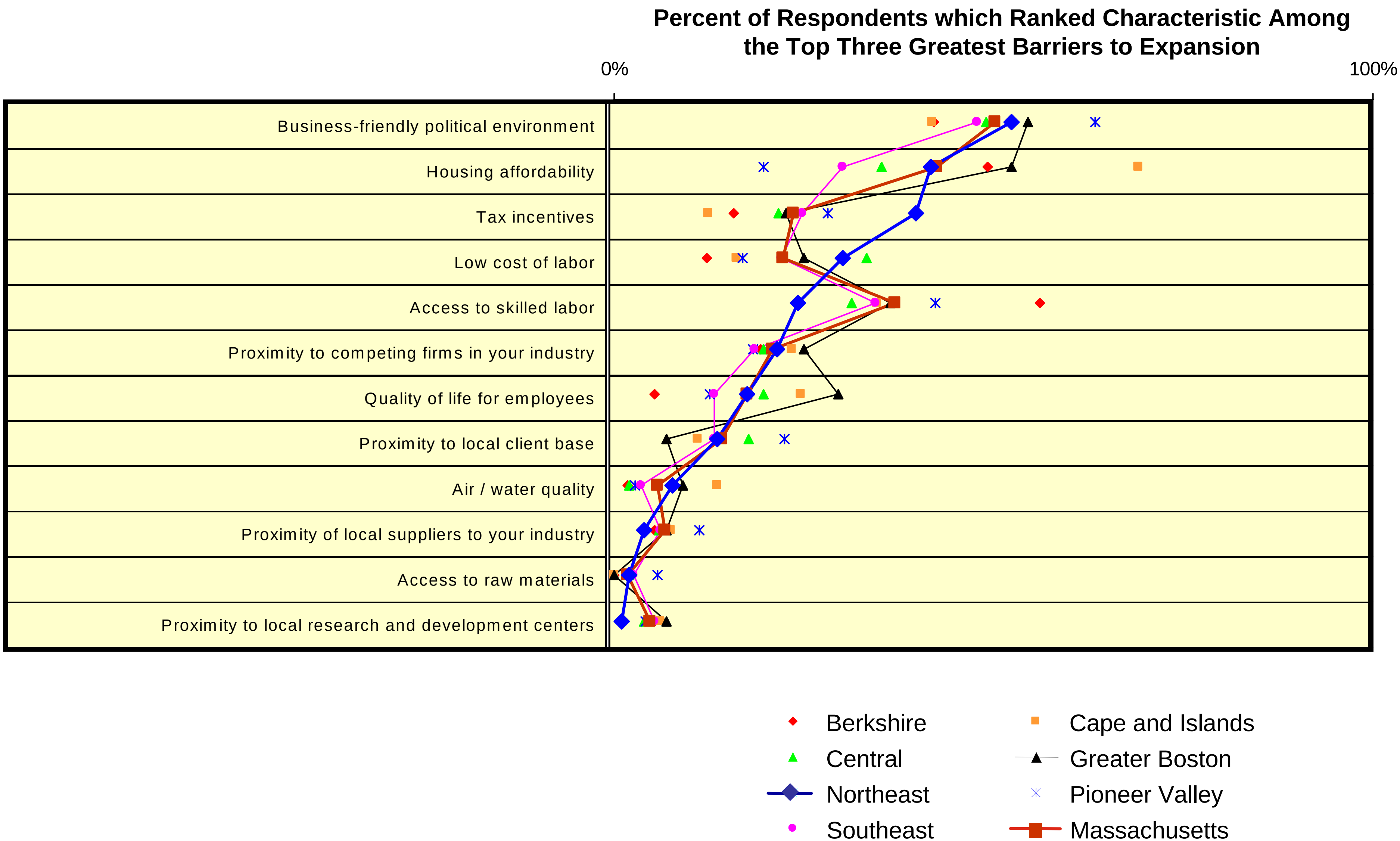




Source: Professor Michael E. Porter and Monitor Company Group

Regional Comparisons

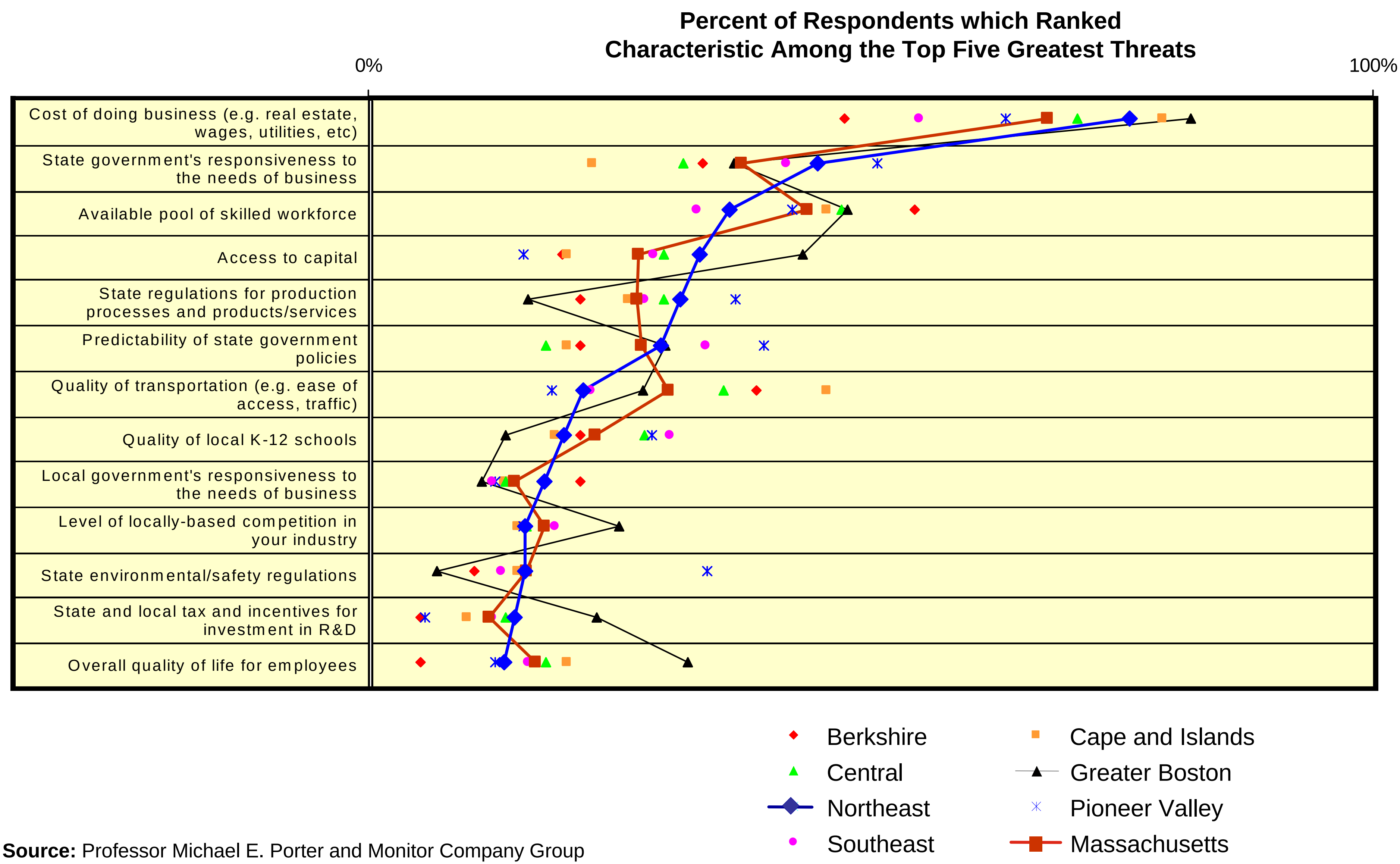
Barriers to Expansion in the Next Five Years



Source: Professor Michael E. Porter and Monitor Company Group

Regional Comparisons

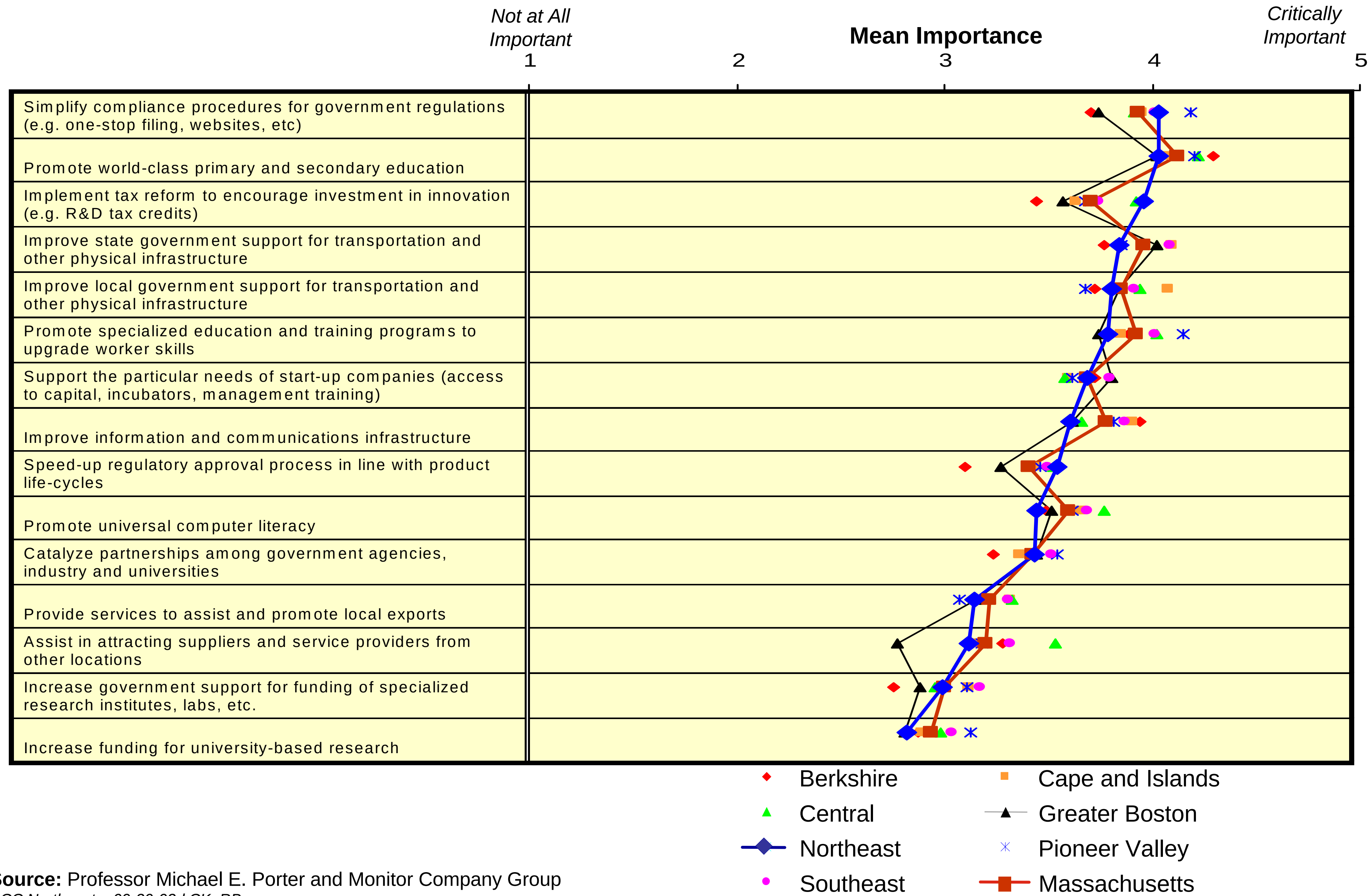
Future Threats in the Local Business Environment



Source: Professor Michael E. Porter and Monitor Company Group

Regional Comparisons

Priorities for Government



Source: Professor Michael E. Porter and Monitor Company Group

Regional Competitiveness

Northeastern Massachusetts

- Foundations of Regional Competitiveness
- Assessing the Competitiveness of Northeastern Massachusetts
- **Action Agenda**

Shifting Responsibilities for Economic Development

Old Model

- **Government** drives economic development through policy decisions and incentives

New Model

- Economic development is a **collaborative process** involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration

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Visit the home page of the Institute, http://www.isc.hbs.edu/, for copies of all materials presented today plus further supporting data on the regions.

See the section for "Competitiveness of States and Region" or to go directly to today's material at: www.isc.hbs.edu/MA_RCC.htm.