Regional Competitiveness in the Berkshire Region

Professor Michael E. Porter
Institute for Strategy and Competitiveness
Harvard Business School

Berkshire Regional Competitiveness Council Meeting
Ray Murray, Inc.
Lee, MA
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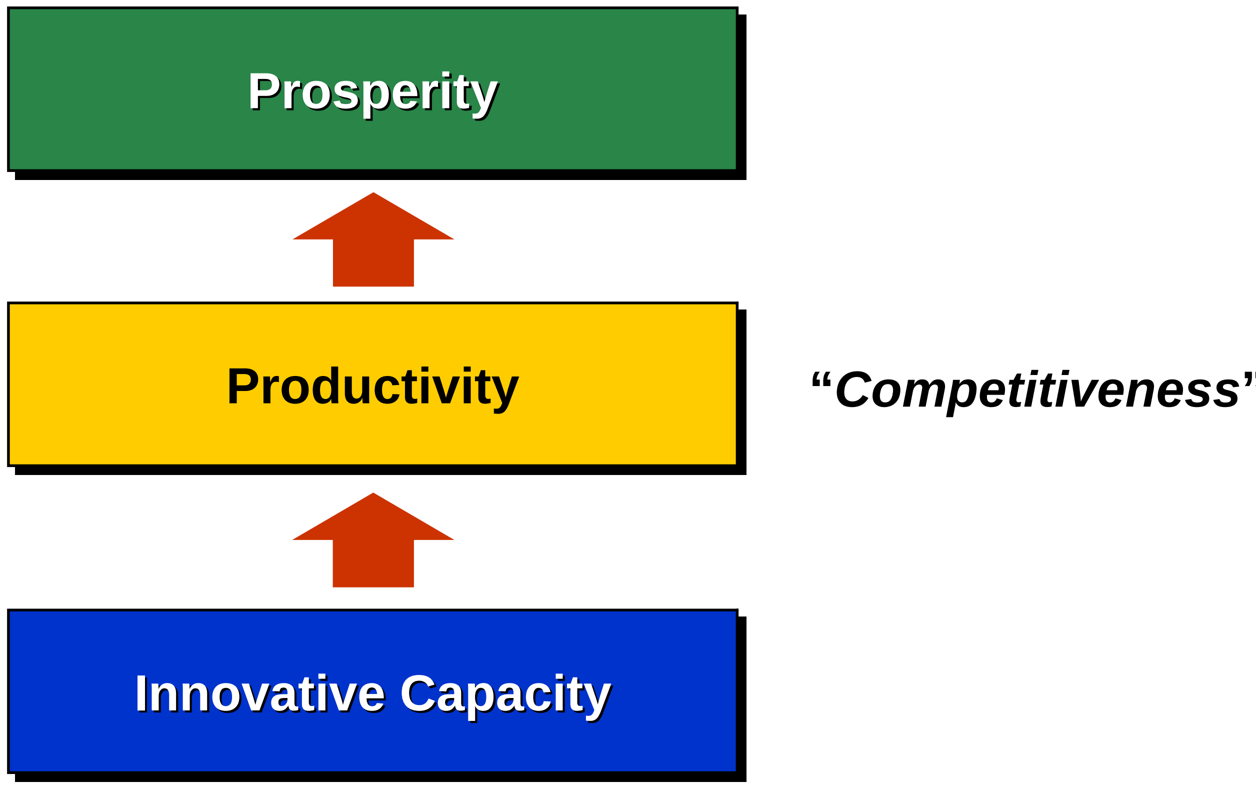
Sources of Prosperity



- 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

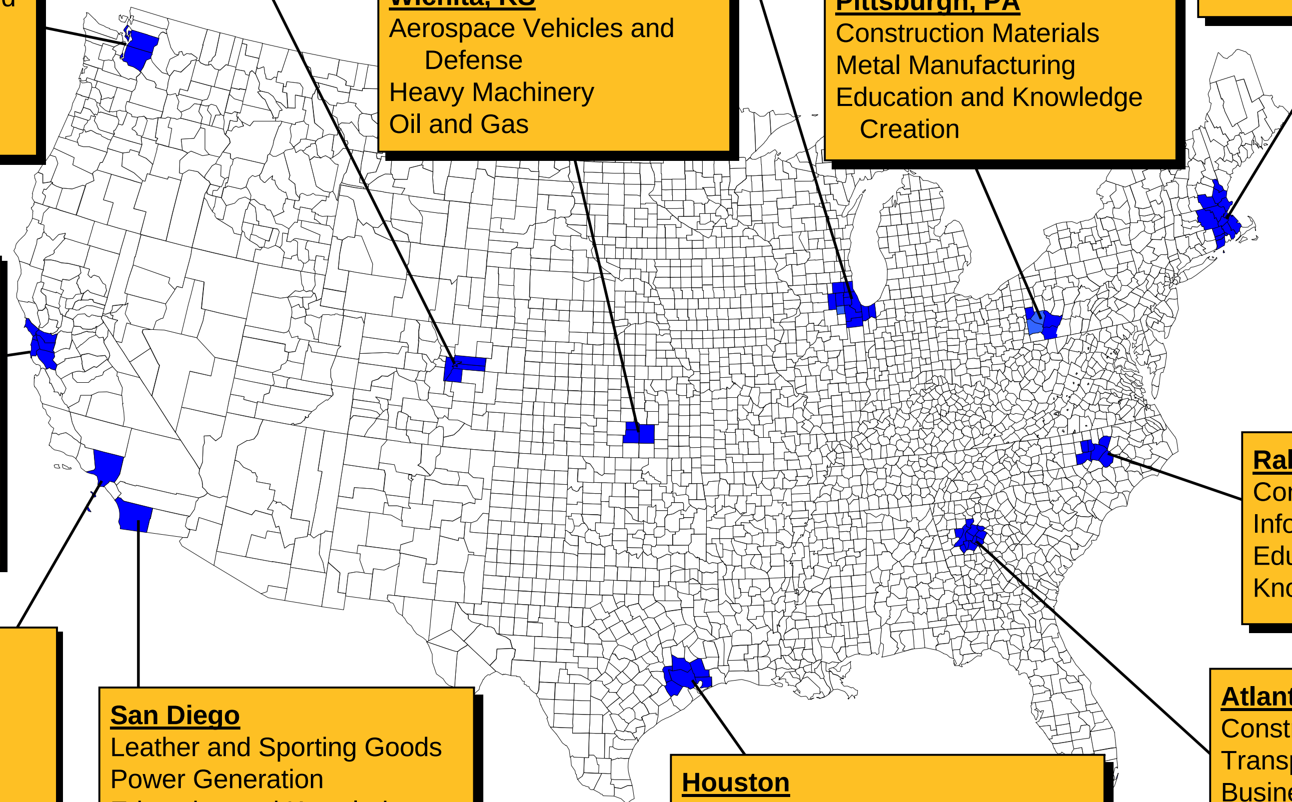
United States

	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



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

Chicago
Communications Equipment
Processed Food
Heavy Machinery

Boston
Analytical Instruments
Education and Knowledge Creation
Communications Equipment

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

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

Pittsburgh, PA
Construction Materials
Metal Manufacturing
Education and Knowledge Creation

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

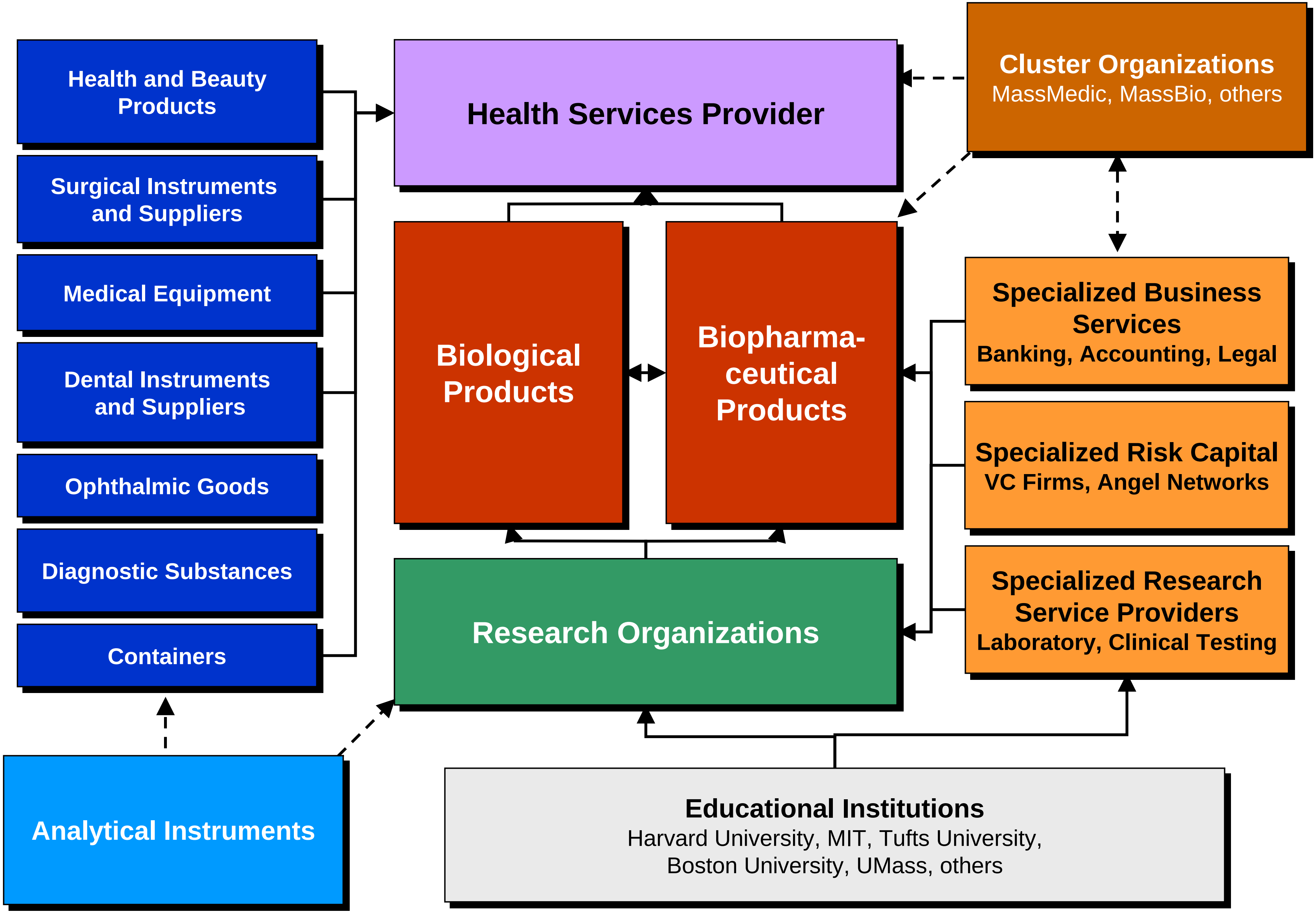
San Diego
Leather and Sporting Goods
Power Generation
Education and Knowledge Creation

Atlanta, GA
Construction Materials
Transportation and Logistics
Business Services

Houston
Heavy Construction Services
Oil and Gas
Aerospace Vehicles and Defense

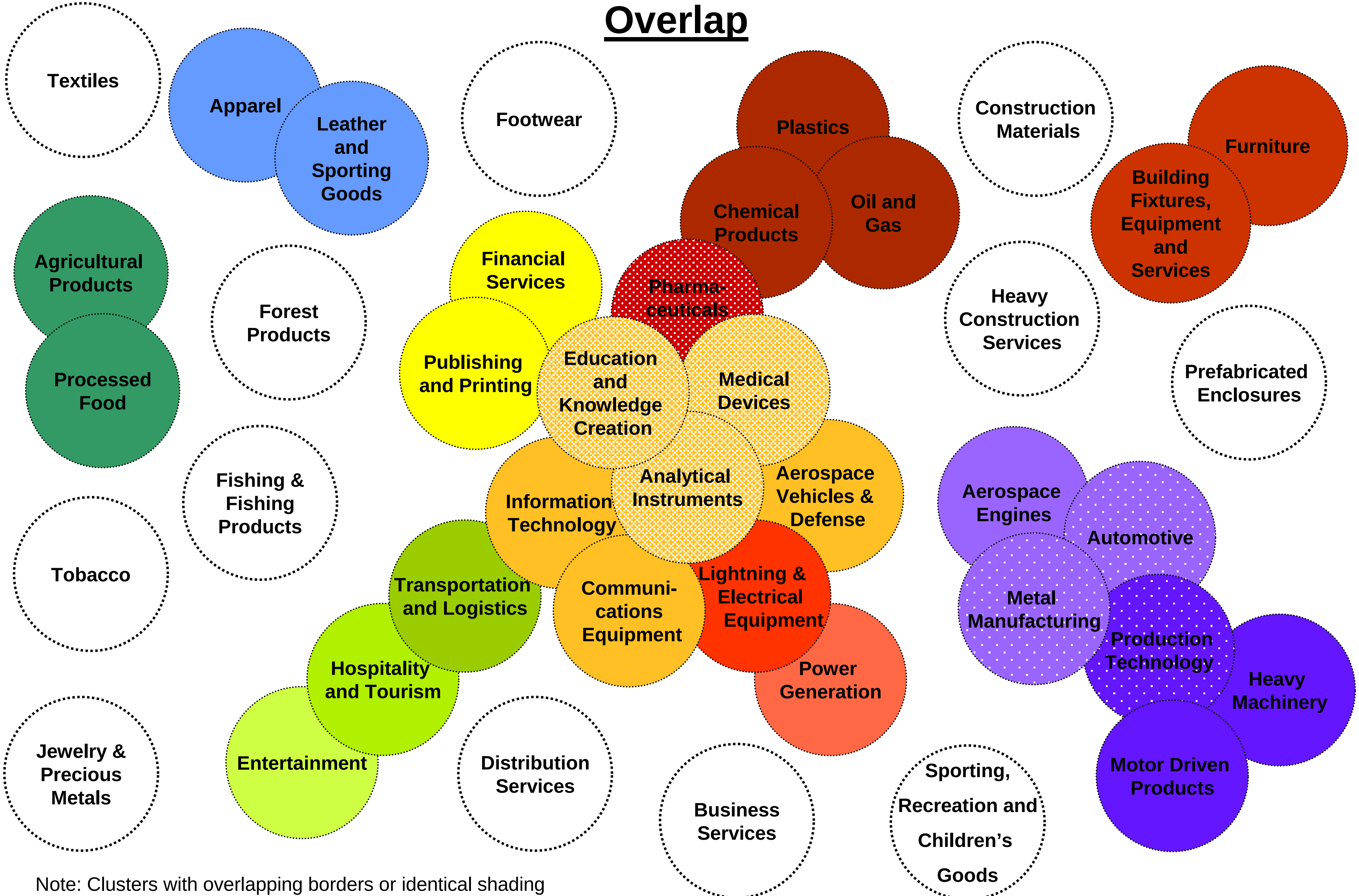
Note: Clusters listed are the three highest ranking clusters in terms of share of national employment
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Massachusetts Life Sciences Cluster



Traded Clusters

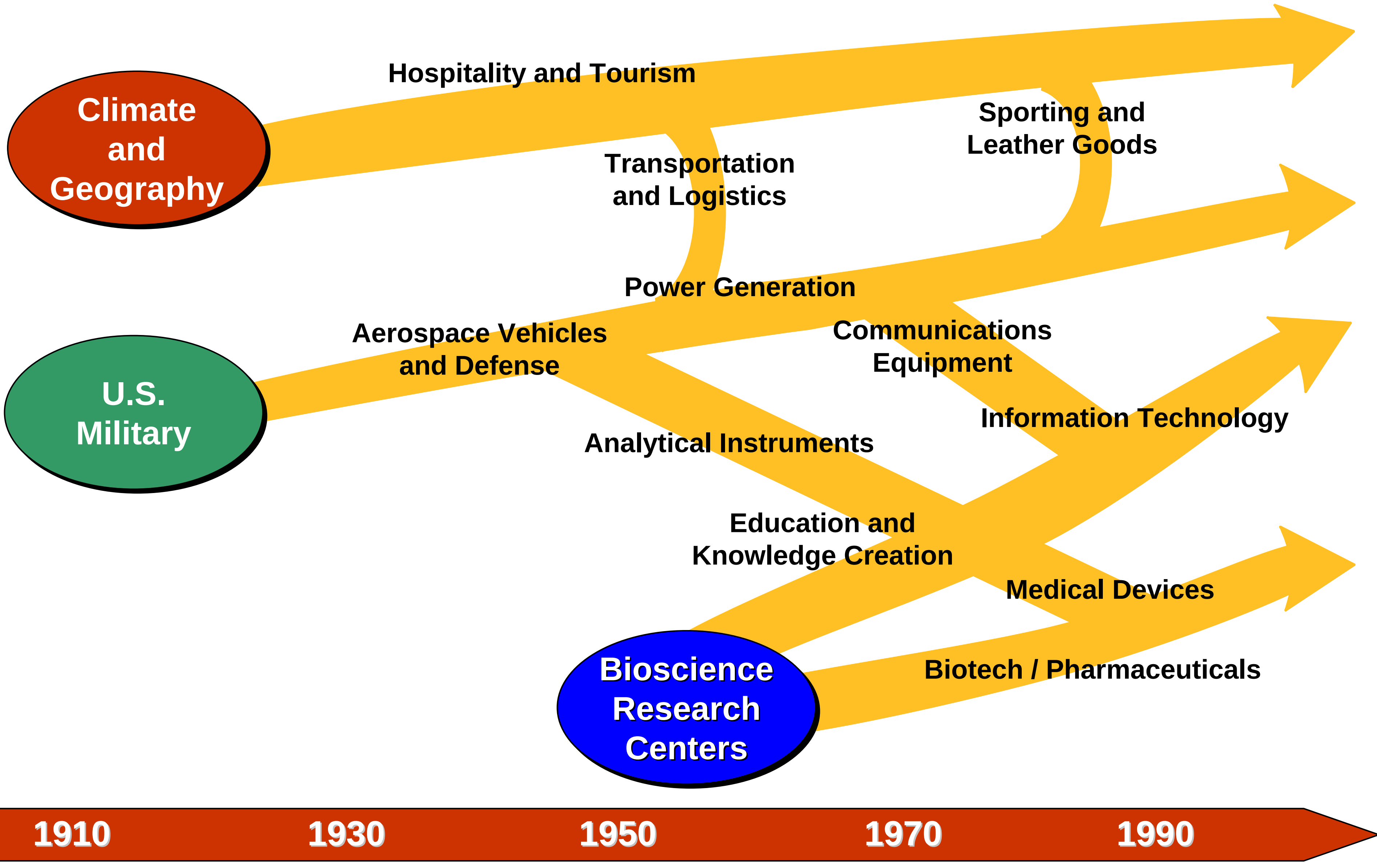
Overlap



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

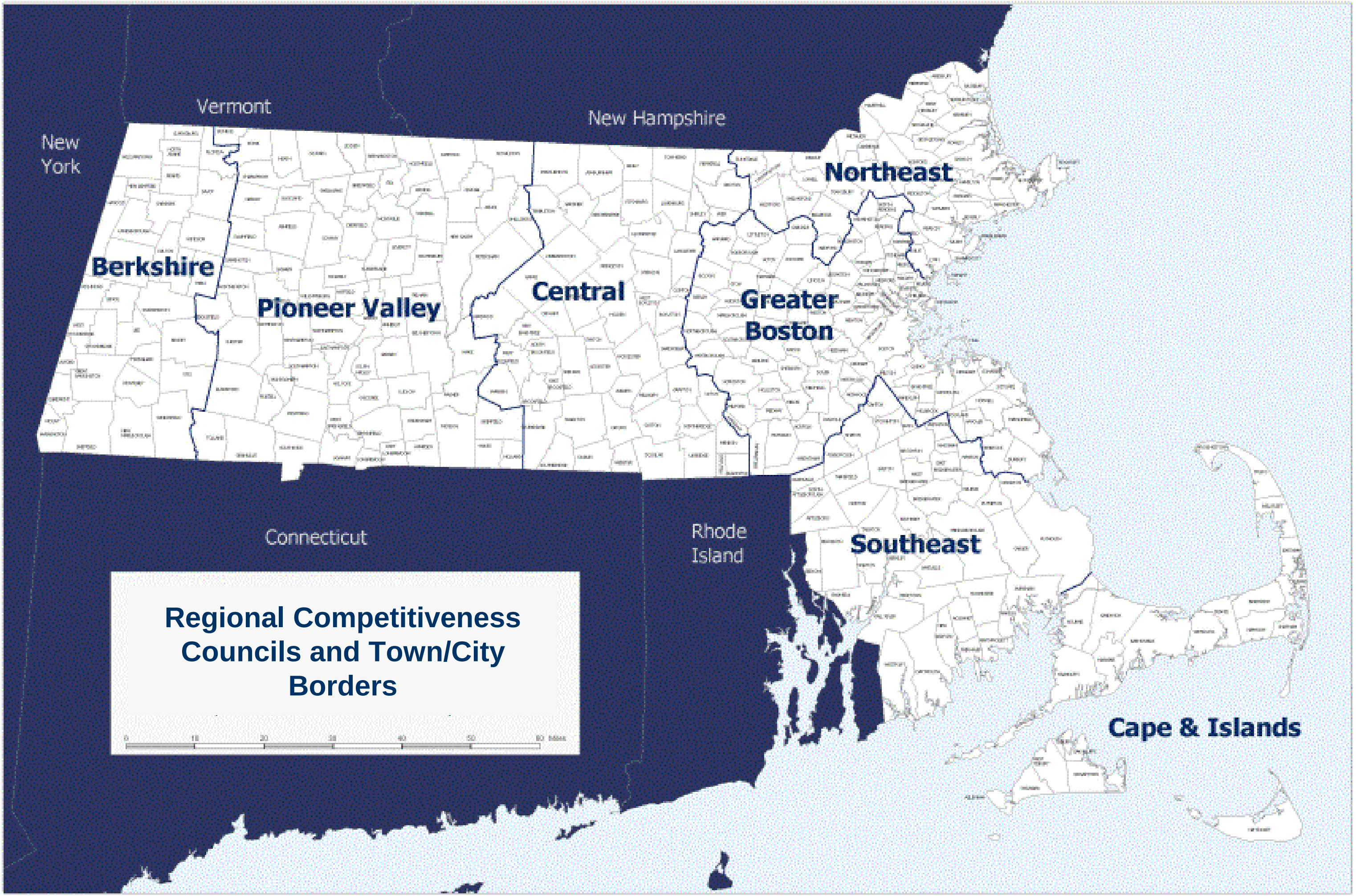
Nations

States, Provinces

Metropolitan Areas

Smaller Cities and Counties

Massachusetts Regional Competitiveness Council Regions



Regional Competitiveness

Berkshire Region

- Foundations of Regional Competitiveness
- **Assessing the Competitiveness of the Berkshire region**
- Action Agenda

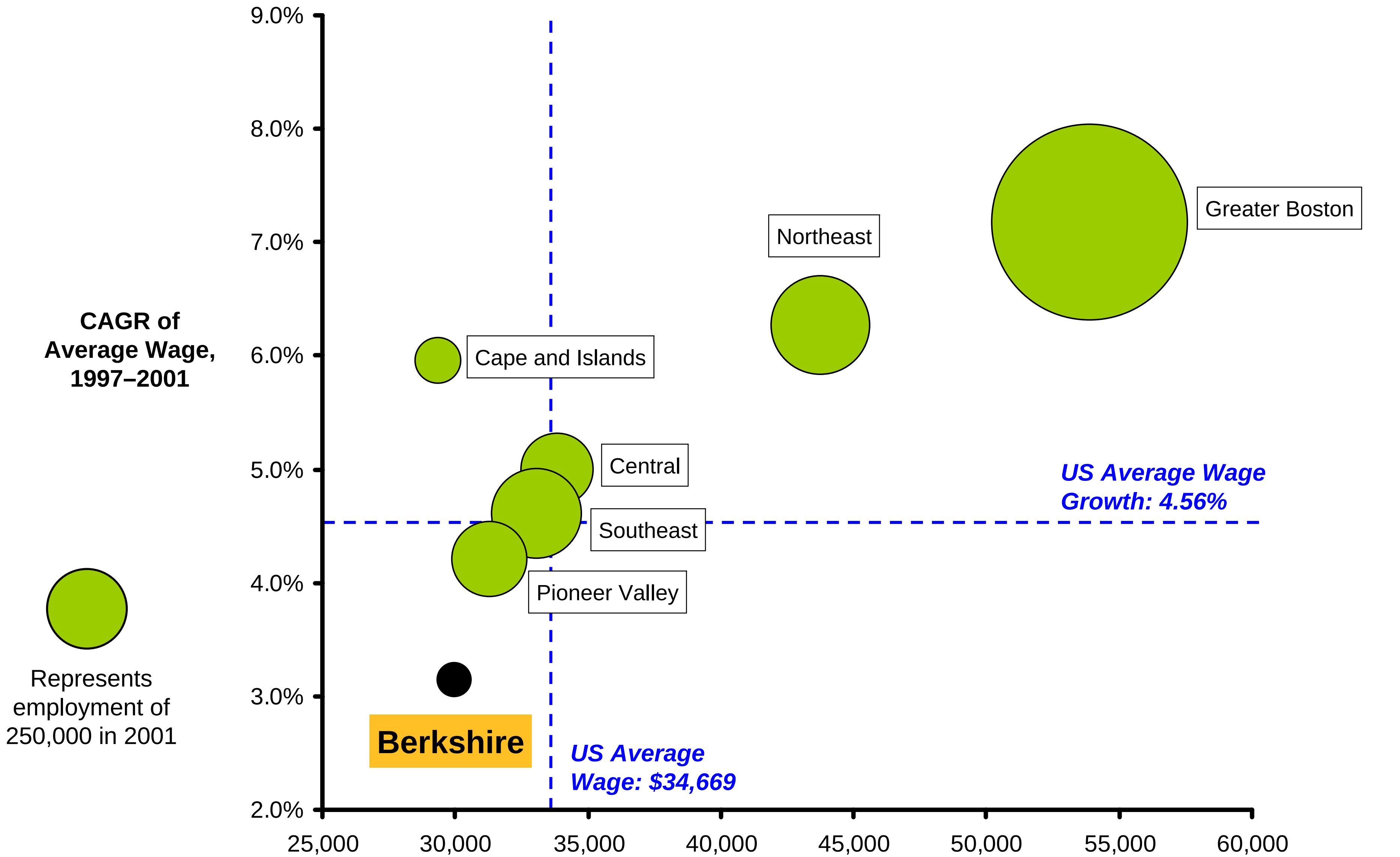
Economic Performance

Berkshire Region

- Wages are below the US and Massachusetts average, and lag both benchmarks in growth
  - Local wages are even slightly lower than expected given the region's overall wage level
- Employment has been essentially flat over the last five years growing at 0.6% annually, far below the US and Massachusetts average
  - The Berkshire region is the smallest of all Massachusetts region in terms of employment
- The Berkshire region registered establishment growth in line with the U.S. average and above most other Massachusetts regions
- Patenting rates of 5.2 patents per 10,000 employees in 2001 put the region behind most other Massachusetts regions

Comparative Performance of Regions

Wage Growth and Wages

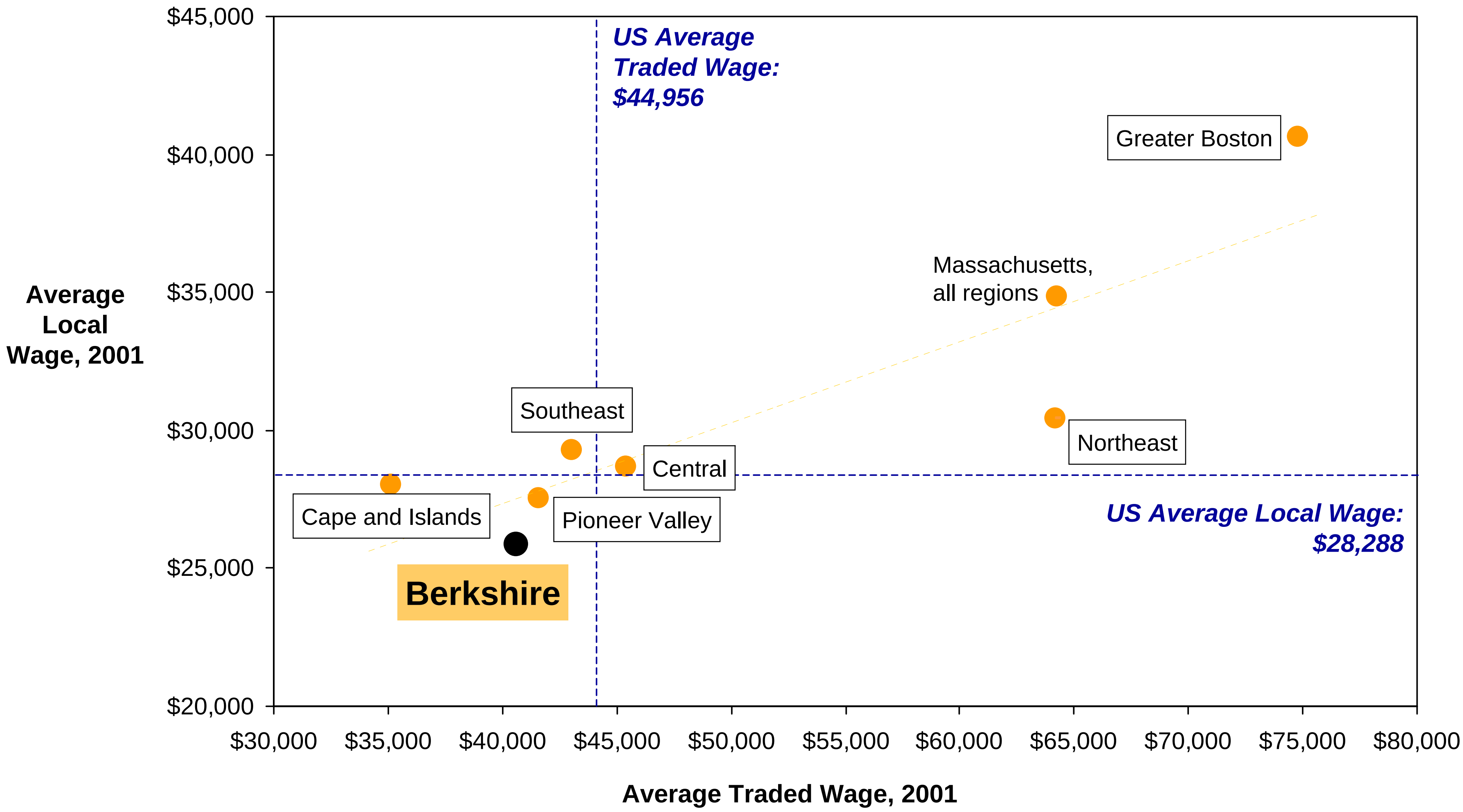


Data: private, non-agricultural employment

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

Wages in Traded and Local Industries

Massachusetts Regions



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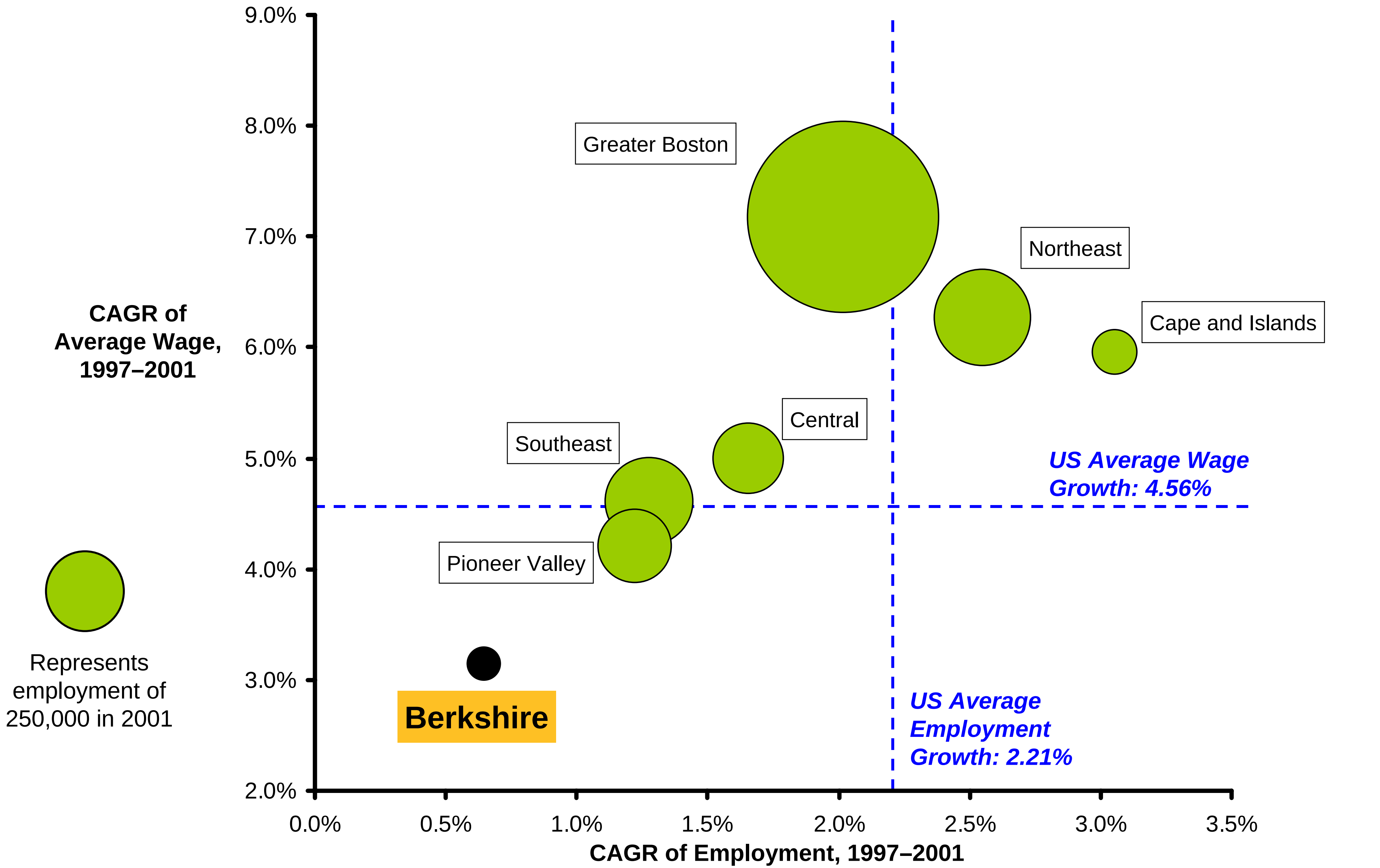
Comparative Performance of Regions

Wage Growth and Employment Growth



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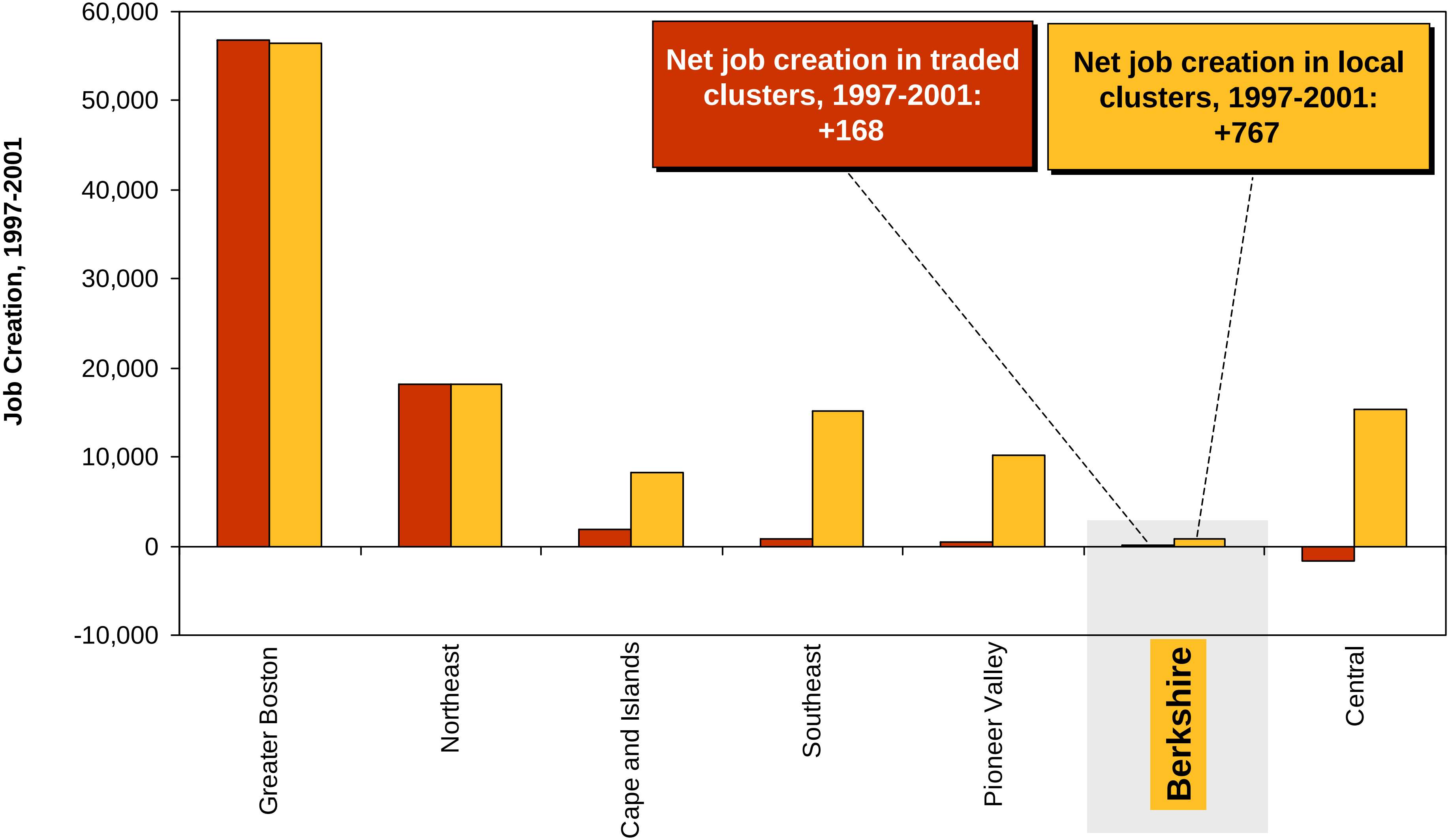
Job Creation

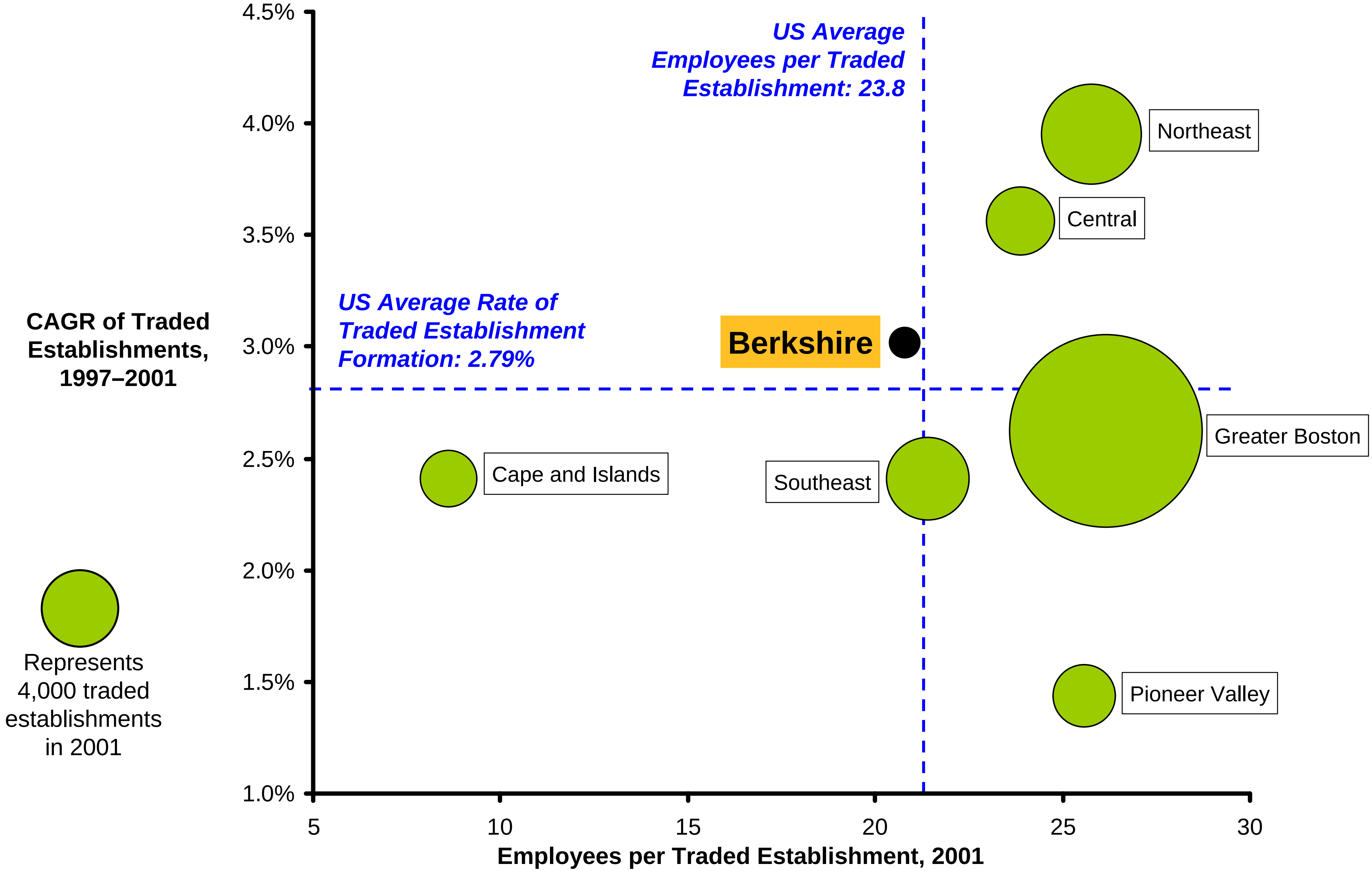
Massachusetts Regions



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

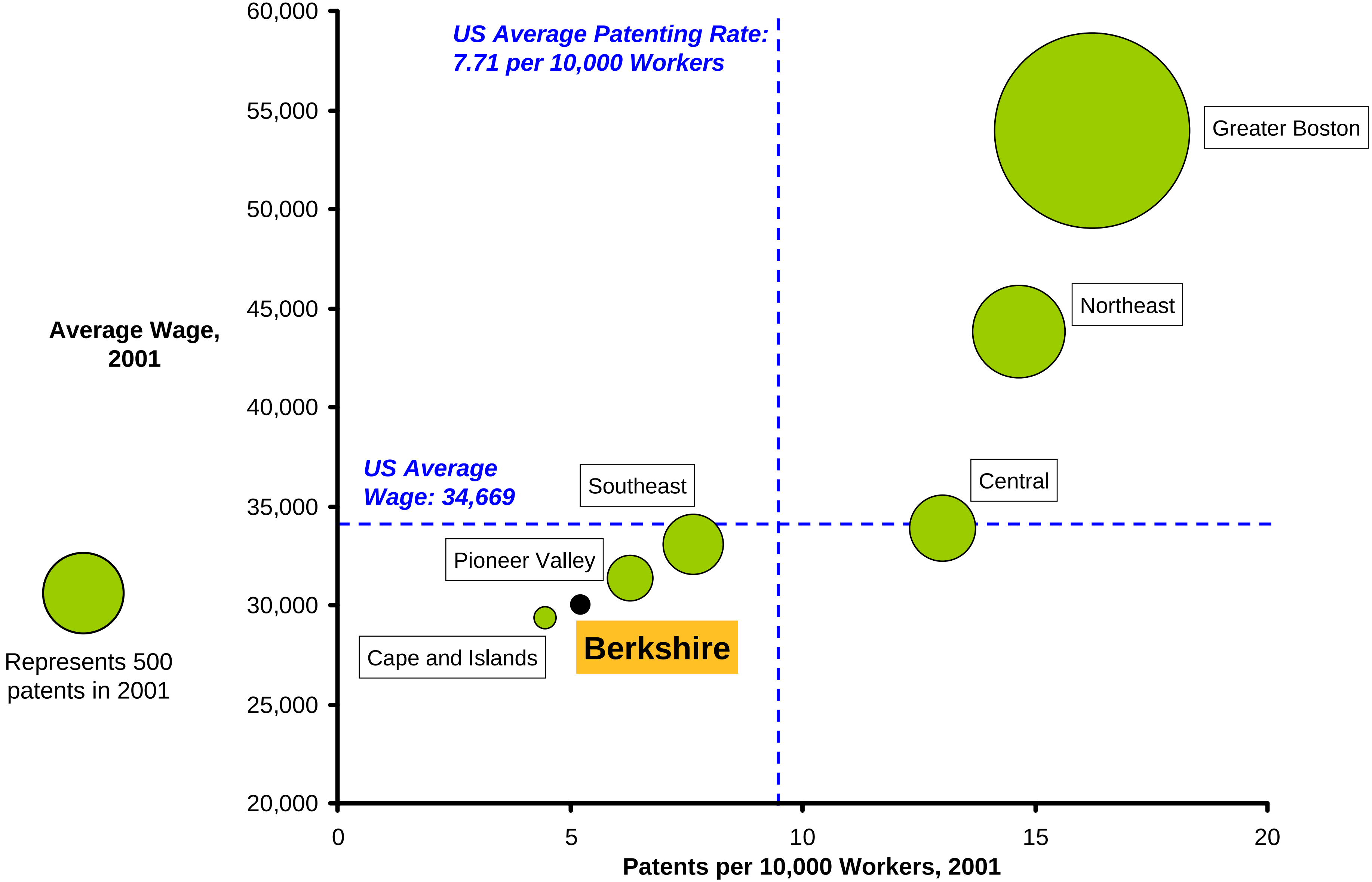
Establishment Formation in Traded Clusters



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

Comparative Performance of Regions

Wages and Patenting Rates



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

Patents by Organization

Berkshire Region

	Organization	Patents Issued from 1997 to 2001
1	GENERAL ELECTRIC COMPANY	21
2	GENERAL DYNAMICS	9
3	FOLSOM TECHNOLOGIES, INC.	7
4	BELOIT TECHNOLOGIES, INC.	7
5	MORRISON BERKSHIRE, INC.	6
6	LAKEWOOD INDUSTRIES, INC.	6
7	MARTIN-MARIETTA CORPORATION	6
8	MRA LABORATORIES, INC.	4
9	KAI TECHNOLOGIES, INC.	4
10	BERKSHIRE CORPORATION	4
11	MAGNA-LASTIC DEVICES, INC.	3
12	LENOX INSTITUTE OF WATER TECHNOLOGY, INC.	3
13	MEAD CORPORATION	3
14	MARLAND MOLD, INC.	2
15	MAGNETOELASTIC DEVICES, INC.	2
16	DISPLAY SCIENCE, INC.	2
17	INTERNATIONAL BUSINESS MACHINES CORPORATION	2
18	FUSION LIGHTING, INC.	2

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

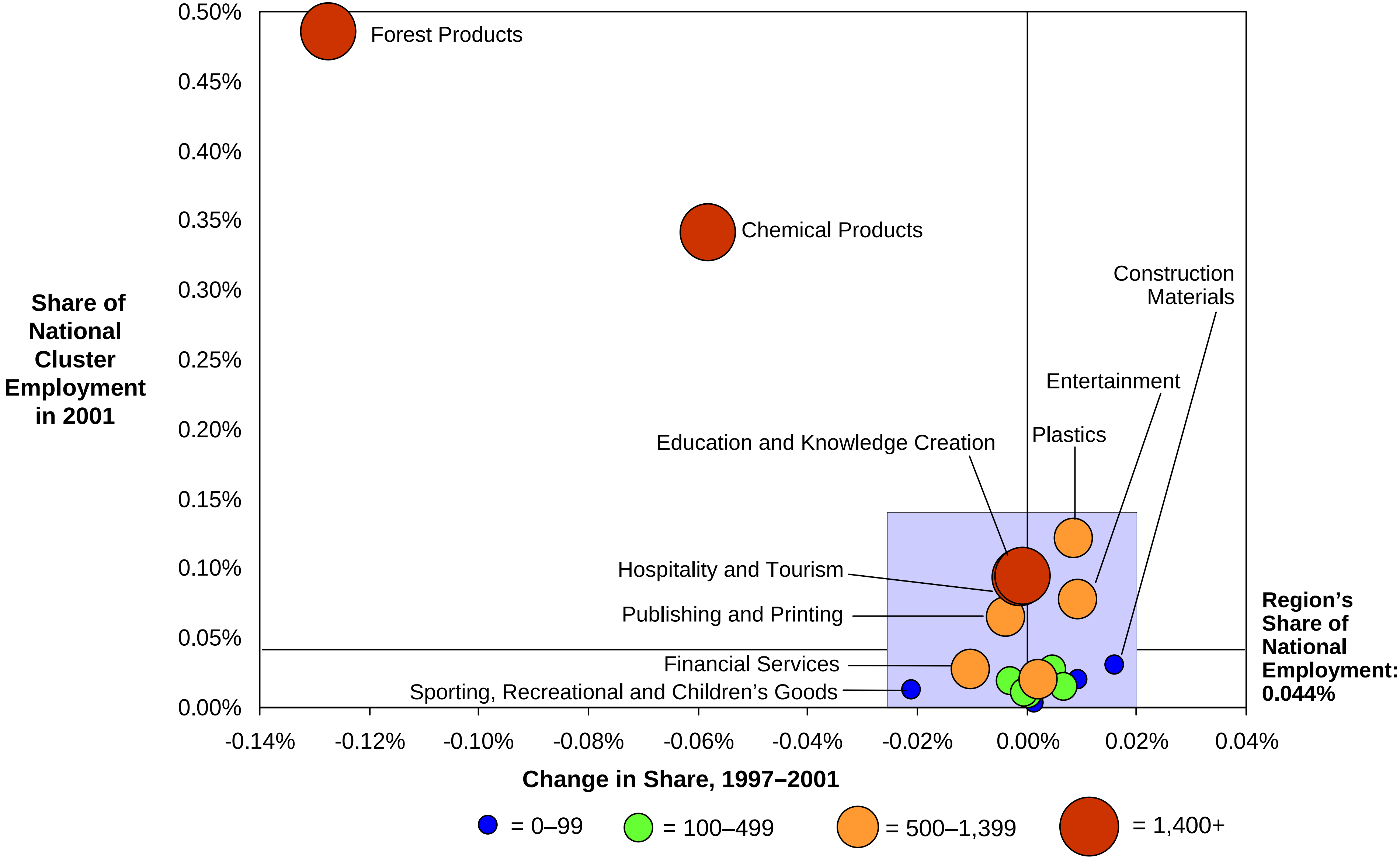
Composition

Berkshire Region

- The Berkshire region has a strong position in a number of clusters
  - Forest Products
  - Chemical Products, Plastics
  - Hospitality and Tourism
  - Education and Knowledge Creation
  - Entertainment, Printing and Publishing
- The Berkshire region is losing position in almost all of its traditionally strong clusters
  - Largest losses in forest products and chemicals
  - Plastics is the only cluster with job growth and increasing national share
- Among local clusters, local health care employment has dropped significantly against the trend across the state
- Chemical products and forest products are the only clusters of significance in which wages in the region exceed the state average

Specialization By Traded Cluster

Berkshire Region



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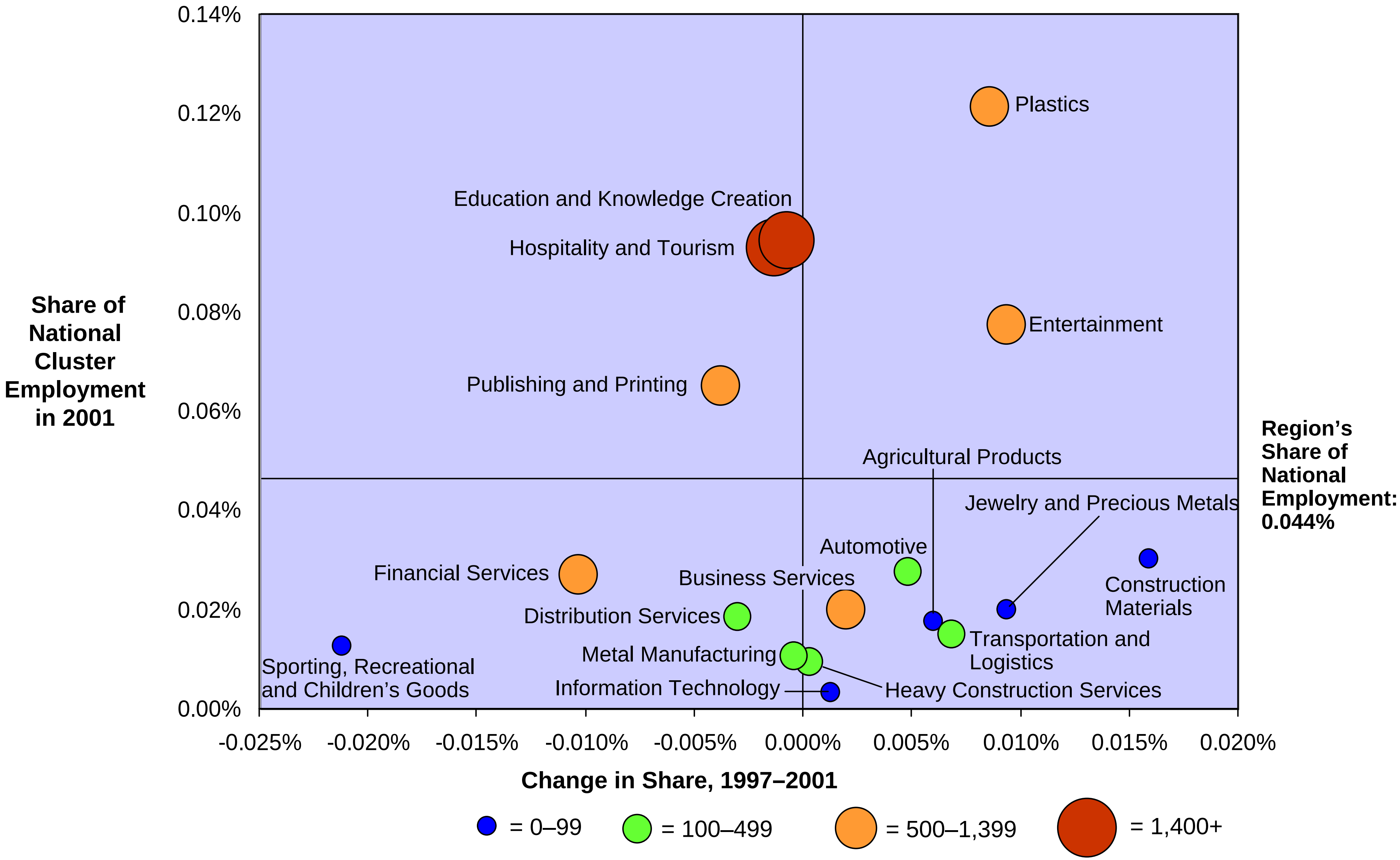
Specialization By Traded Cluster

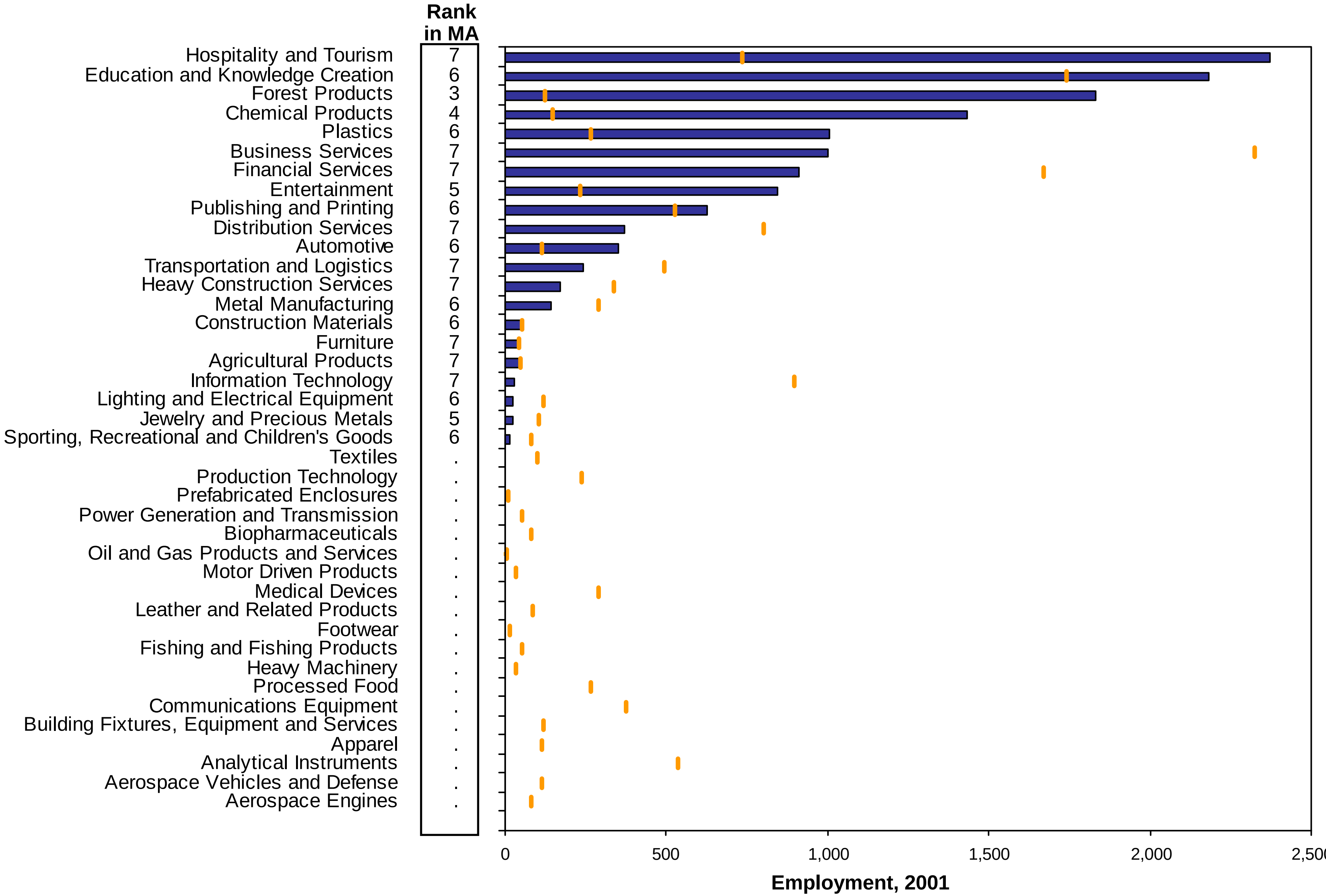
Berkshire Region



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

Employment By Traded Cluster

Berkshire Region

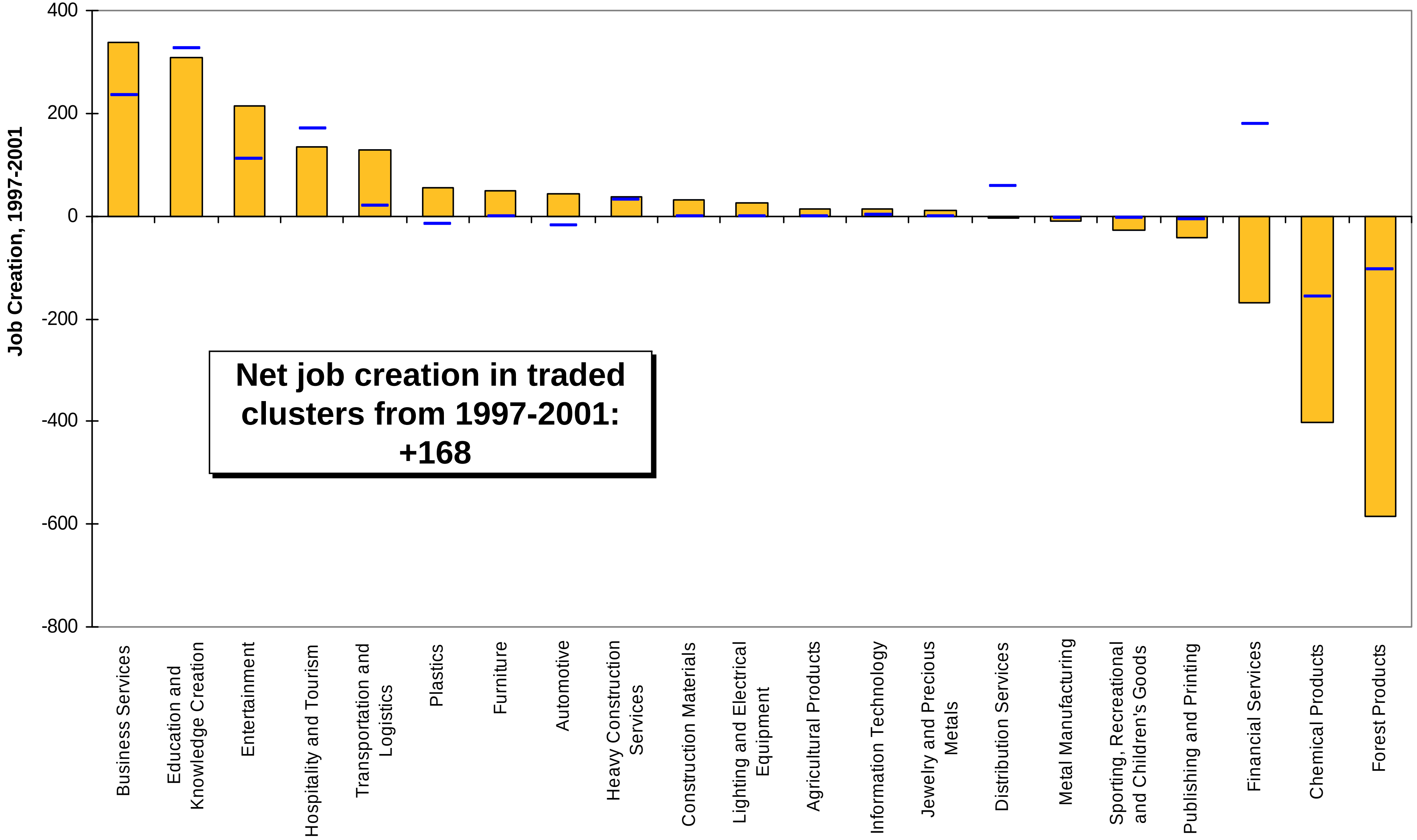


| - Indicates expected employment at rates in the **state benchmark for traded clusters**. Rank is across 7 state regions.

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

Job Creation By Traded Cluster

Berkshire Region

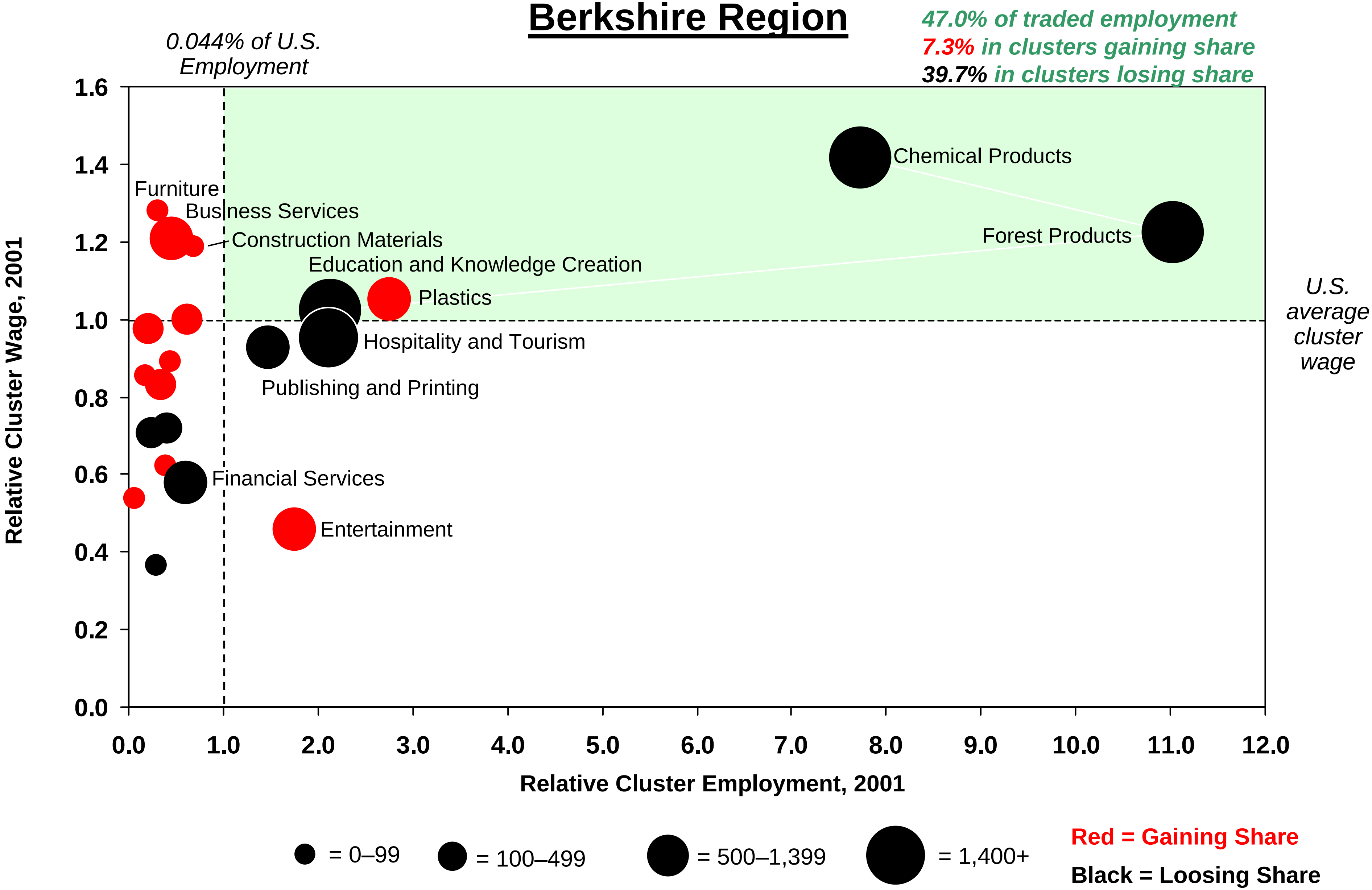


— Indicates expected job creation at rates achieved in **national benchmark** clusters, i.e. % change in national benchmark times initial employment.

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

Relative Cluster Performance

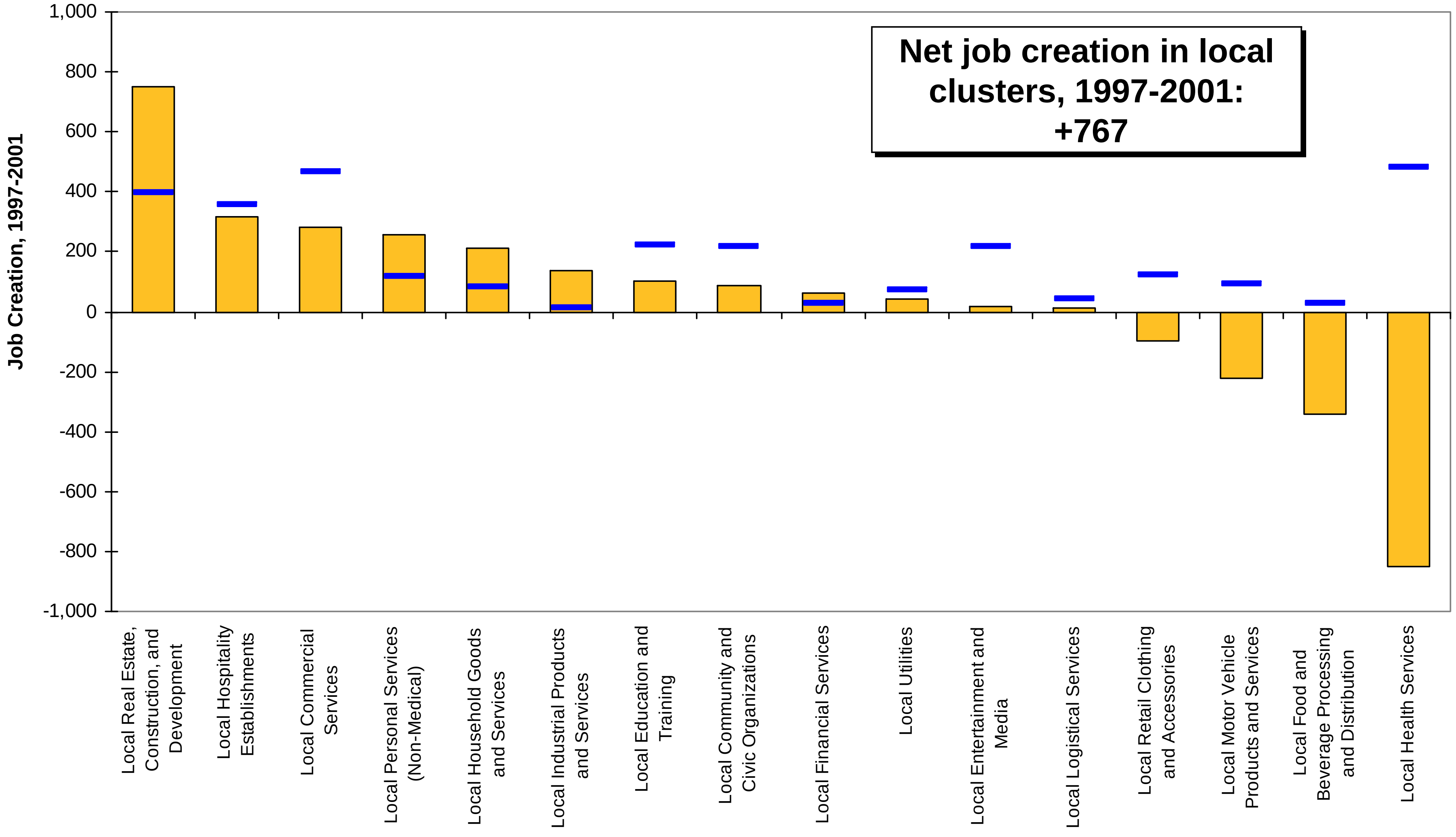
Berkshire Region



Note: US wage and employment benchmarks
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Job Creation By Local Cluster

Berkshire Region

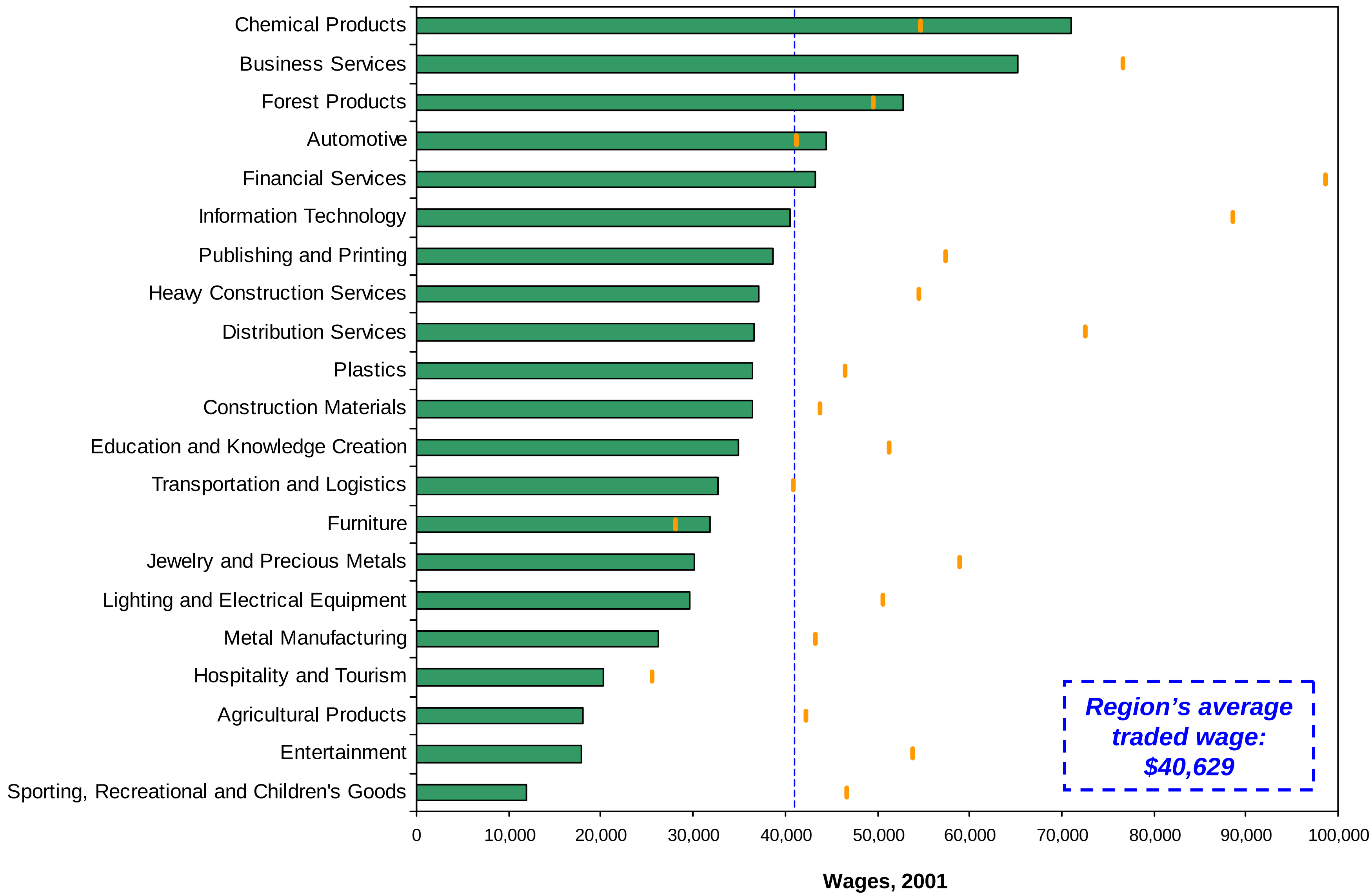


— Indicates expected job creation at rates achieved in **national benchmark** clusters, i.e. % change in national benchmark times initial employment.

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

Wages By Traded Cluster

Berkshire Region with State Benchmarks



| - Indicates Massachusetts average wage in the cluster.

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

Leading Sub-Clusters by Location Quotient

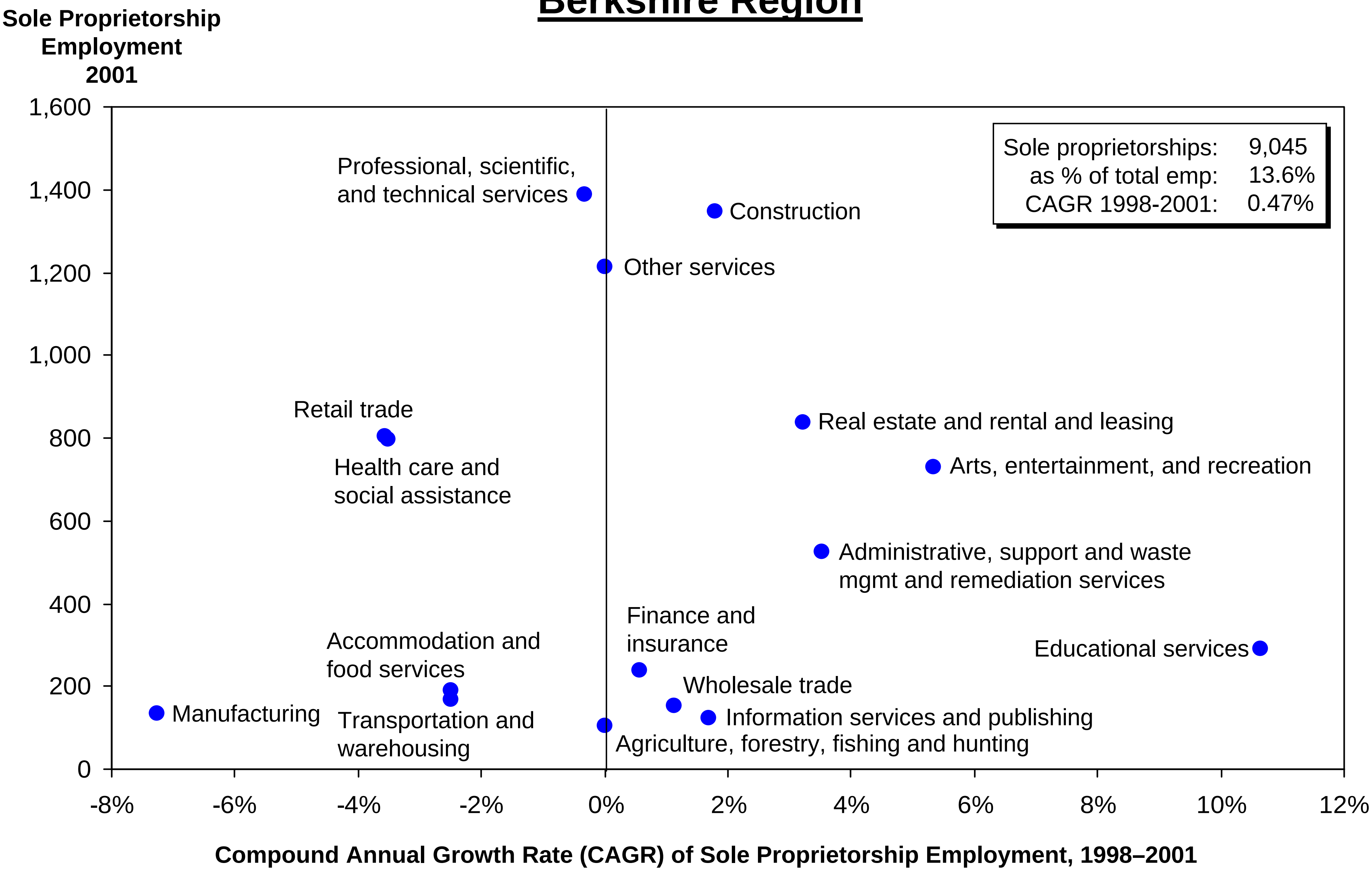
Berkshire Region, 2001

Cluster	Subcluster	Location Quotient	Share of National Employment	Rank among Massachusetts Regions	Employment
Hospitality and Tourism	Accommodations and Related Services	2.67	0.12%	4	2,135
	Tourism Attractions	1.61	0.07%	7	197
Education and Knowledge Creation	Educational Facilities	6.76	0.30%	4	439
	Educational Institutions	2.19	0.10%	6	1,580
	Research Organizations	0.74	0.03%	6	162
Forest Products	Paper Industries Machinery	25.00	1.10%	4	145
	Paper Mills	16.28	0.72%	1	1,688
Chemical Products	Ammunition	509.55	22.44%	1	1,433
Plastics	Plastic Materials and Resins	5.20	0.23%	5	359
	Plastic Products	2.41	0.11%	6	648
Business Services	Online Information Services	1.52	0.07%	4	135
	Computer Programming	0.96	0.04%	6	500
	Engineering Services	0.43	0.02%	7	161
Financial Services	Depository Institutions	1.92	0.08%	7	788
Entertainment	Entertainment Venues	2.93	0.13%	6	566
	Entertainment Related Services	2.27	0.10%	5	272
Publishing and Printing	Printing Services	3.54	0.16%	6	402
	Publishing	1.37	0.06%	6	190
	Signs and Advertising Specialties	0.85	0.04%	6	33
Distribution Services	Catalog and Mail-order	2.46	0.11%	4	248
	Apparel and Accessories Wholesaling	0.59	0.03%	6	57
Automotive	Production Equipment	5.37	0.24%	4	322
Transportation and Logistics	Airports	0.68	0.03%	6	41
	Air Transportation	0.40	0.02%	7	152
Heavy Construction Services	Primary Construction Materials	0.66	0.03%	6	33
Metal Manufacturing	Metal Processing	1.20	0.05%	6	143
Construction Materials	Cut and Crushed Stone	3.27	0.14%	3	37
	Wood Products	0.87	0.04%	4	22
Furniture	Wood Materials and Products	1.00	0.04%	1	34
Agricultural Products	Farm Management and Related Services	1.13	0.05%	7	48
Lighting and Electrical Equipment	Lighting Fixtures	1.55	0.07%	3	26
Jewelry and Precious Metals	Jewelry and Precious Metal Products	0.54	0.02%	5	24
Sporting, Recreational and Children's Goods	Games, Toys, and Children's Vehicles	1.35	0.06%	5	13

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

Sole Proprietorship Employment and Growth

Berkshire Region



Source: U.S. Census Bureau, Nonemployer Statistics

Business Environment

Berkshire

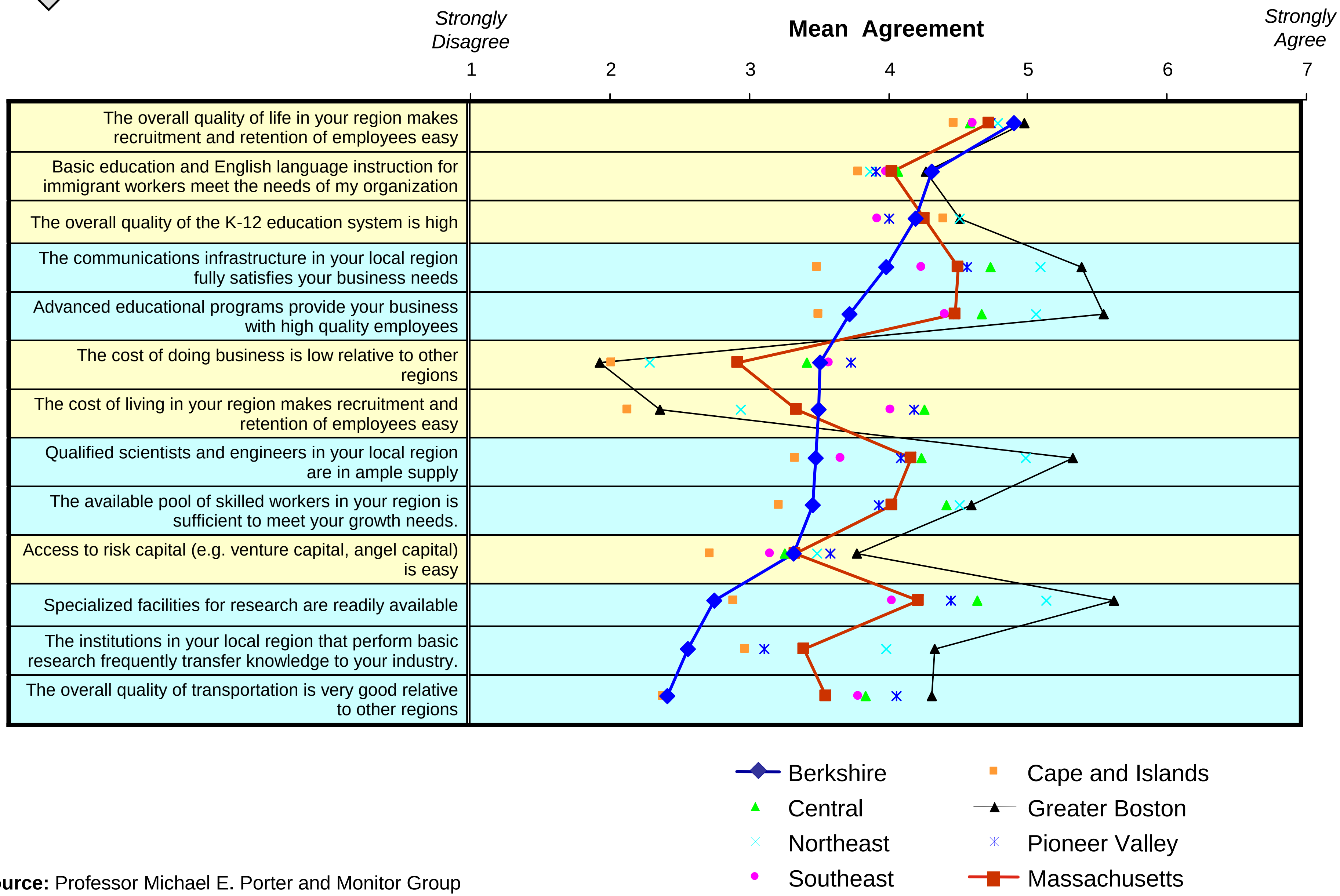
- Companies in the Berkshire region view their location as significantly different from the state average
  - Key disadvantages include the quality of **physical infrastructure**, the available **skill pool**, the access to specialized **research institutions**, the strengths of **clusters**, and local **demand conditions**
    - Educational institutions get comparatively low ratings, consistent with the reported skill shortages in the region
  - Key advantages include high **quality of life** and relatively **low cost of doing business**
    - Cost of living, however, is not seen as a relative advantage compared to neighboring regions in western Massachusetts or the Southeast region

- The weaknesses in the business environment are reflected in the reported **key priorities for government** and future threats to the region
  - Skill base, infrastructure, and retaining the region's cost position

- Business leaders in the region report the highest capability and willingness to **contribute** to an economic development strategy across all regions in the state; they also feel most strongly that currently **no such strategy exists**

Regional Comparisons

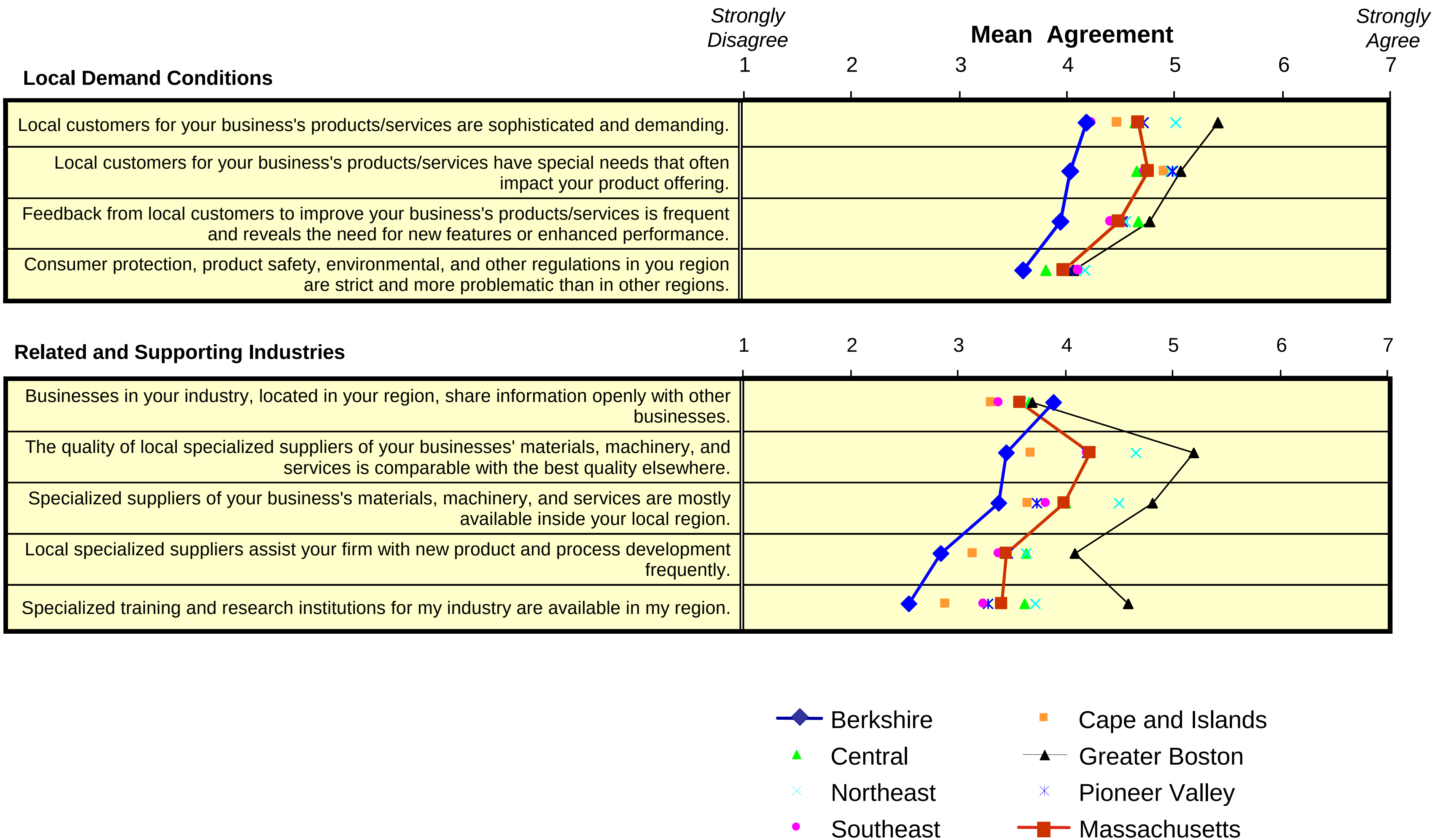
Availability of Inputs



Source: Professor Michael E. Porter and Monitor Group

Regional Comparisons

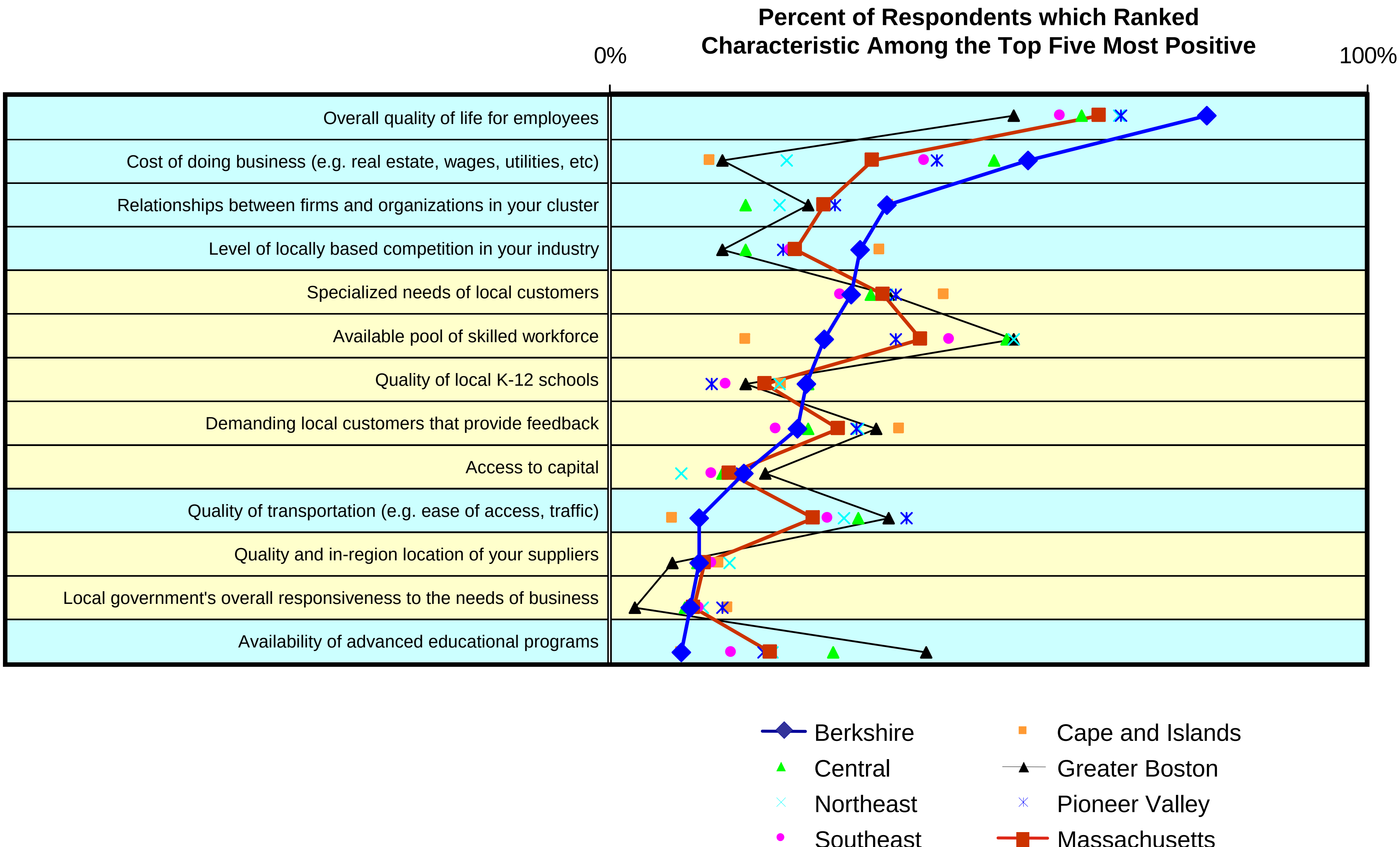
Local Demand Conditions & Related and Supporting Industries



Source: Professor Michael E. Porter and Monitor Group

Regional Comparisons

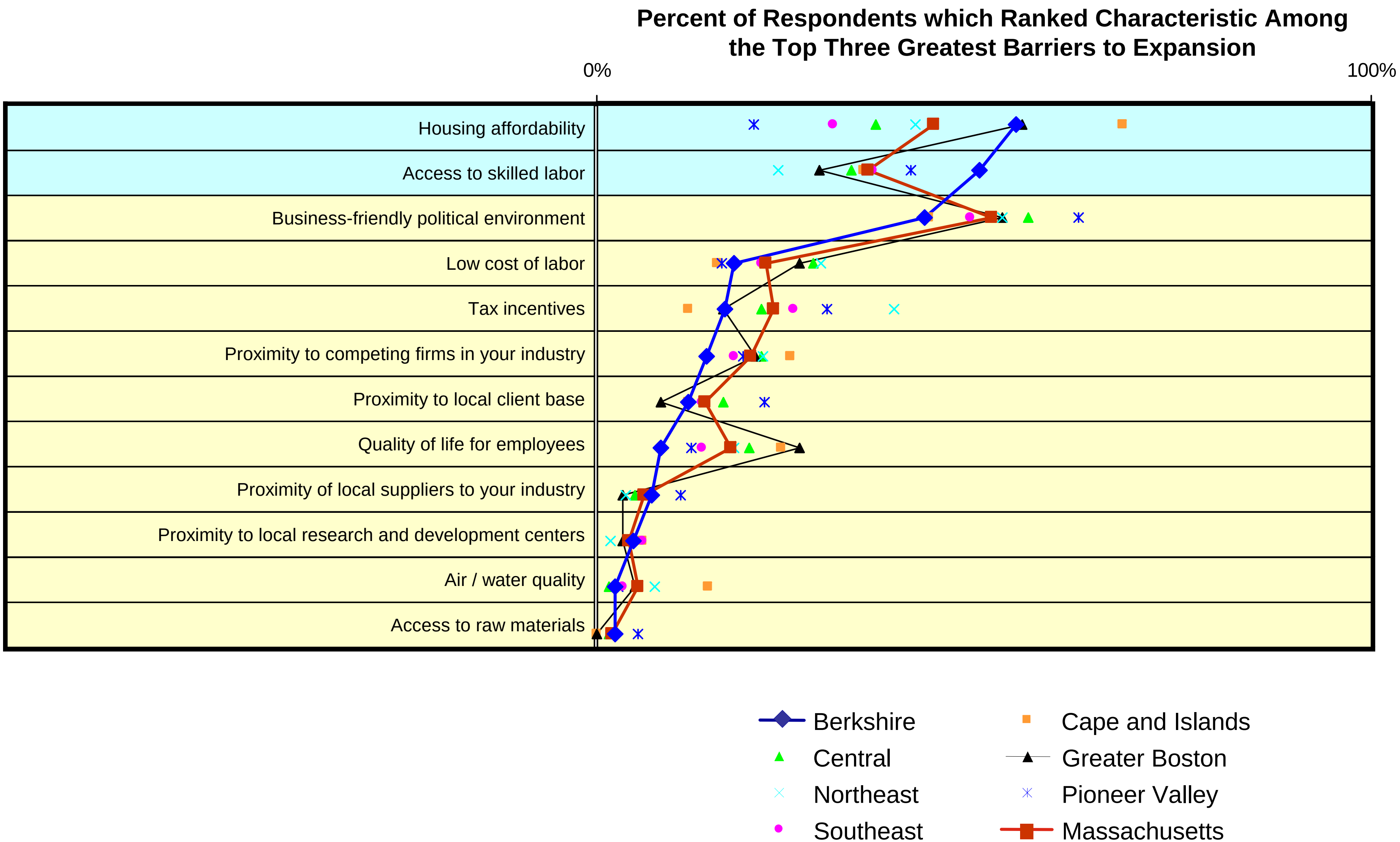
Positive Impact on the Local Business Environment



Source: Professor Michael E. Porter and Monitor Group

Regional Comparisons

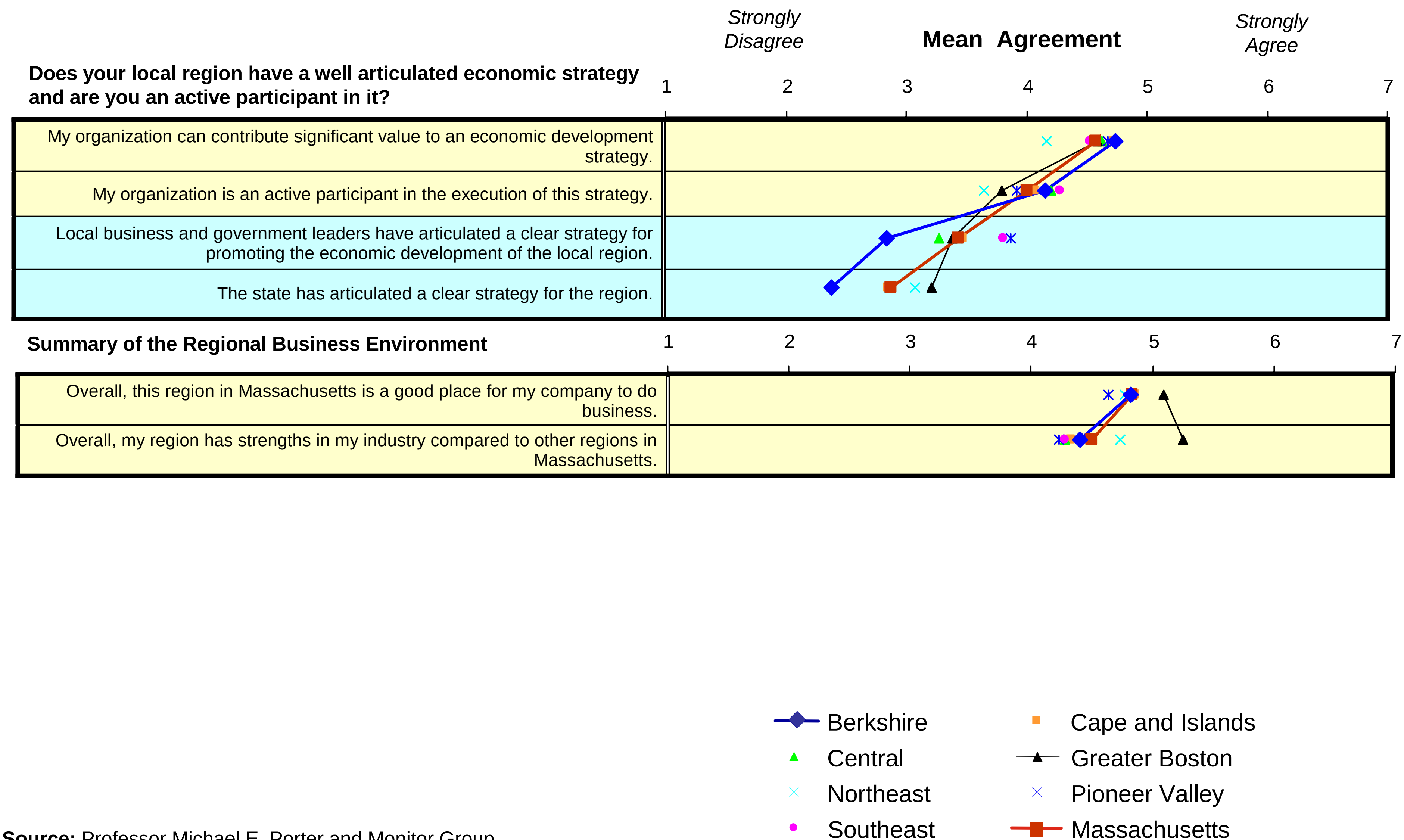
Barriers to Expansion in the Next Five Years



Source: Professor Michael E. Porter and Monitor Group

Regional Comparisons

Regional Strategy & Summary of the Regional Business Environment



Source: Professor Michael E. Porter and Monitor Group

Regional Competitiveness

Berkshire Region

- Foundations of Regional Competitiveness
- Assessing the Competitiveness of the Berkshire region
- **Action Agenda**

Shifting Responsibilities for Economic Development

Old Model	New Model
• **Government** drives economic development through policy decisions and incentives	• Economic development is a **collaborative process** involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration

Role of the Private Sector in Economic Development

- A company's competitive advantage is partly the result of the **local environment**
- Company membership in a cluster offers **collective benefits**
- Private investment in **"public goods"** is justified

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- Take an **active role** in upgrading the local infrastructure
- Nurture **local suppliers** and attract new supplier investments
- Work closely with local **educational and research institutions** to upgrade **quality and create specialized programs addressing cluster needs**
- Provide government with **information** and **substantive input** on regulatory issues and constraints bearing on cluster development
- Focus **corporate philanthropy** on enhancing the local business environment

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- An important role for **trade associations**
  - Greater influence
  - Cost sharing

Public / Private Cooperation in Cluster Upgrading

Minnesota's Medical Device Cluster

Context for Firm Strategy and Rivalry

- Aggressive **trade associations** (Medical Alley Association, High Tech Council)
- Effective **global marketing** of the cluster and of Minnesota as the "The Great State of Health"
- Full-time **"Health Care Industry Specialist"** in the department of Trade and Economic Development

Factor (Input) Conditions

- Joint development of **vocational-technical college curricula** with the medical device industry
- Minnesota **Project Outreach** exposes businesses to resources available at university and state government agencies
- Active medical technology licensing through **University of Minnesota**
- State-formed Greater Minnesota Corp. to **finance applied research**, invest in new products, and assist in technology transfer

Demand Conditions

- State sanctioned **reimbursement policies** to enable easier adoption and reimbursement for innovative products

Related and Supporting Industries

Towards an Action Agenda for the Berkshire Region

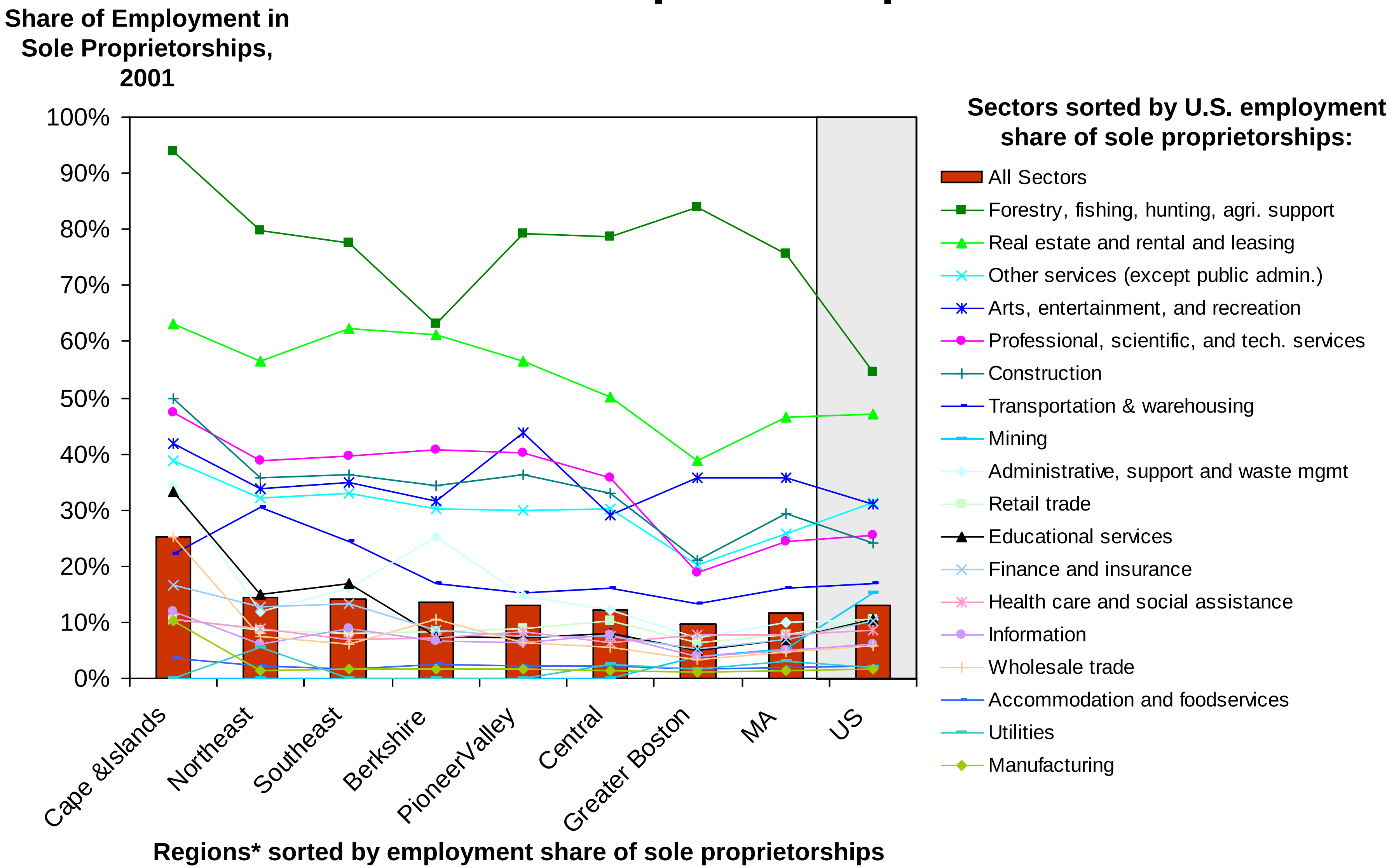
- Mount **cluster development efforts** for strong and emerging traded clusters, especially those that are under pressure
  - Chemicals, Plastics
  - Forest products
  - Tourism and hospitality
  - Publishing and printing

- Prioritize actions to overcome weaknesses in the **business environment**
  - Workforce skills
  - Physical infrastructure
  - Cluster-specific research institutions
  - Housing

- Develop the **institutional structure** to leverage the existing willingness in the region to implement a competitiveness strategy

Regional Sole Proprietorship Data

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

NAICS Sectors, Employment 2001, CAGR 1998-2001

	Berkshire		Central		Pioneer Valley		MA		US	
All Sectors	9,045	0.5%	41,991	1.4%	37,648	0.5%	412,941	0.8%	16,979,498	2.6%
Forestry, fishing, hunting, agri. support	103	0.0	350	-0.3	453	0.2	5,427	-1.3	220,623	-0.7
Mining	N/A	N/A	N/A	N/A	0	N/A	96	5.0	87,699	2.5
Utilities	N/A	N/A	71	-15.8	0	N/A	424	-12.5	13,581	-2.5
Construction	1,348	1.8	6,397	1.0	5,016	1.8	54,157	0.5	2,067,266	2.7
Manufacturing	134	-7.3	806	-3.8	776	-3.1	5,992	-4.7	280,171	-1.9
Wholesale trade	151	1.1	927	-2.5	759	-4.3	8,034	-3.6	386,313	-1.1
Retail trade	804	-3.5	4,189	-0.5	3,429	-2.7	29,557	-2.0	1,738,854	-0.4
Transportation & warehousing	166	-2.5	1,238	2.2	1,074	4.3	13,849	2.0	764,708	4.9
Information	122	1.7	567	10.5	429	0.2	6,984	7.1	241,860	7.4
Finance and insurance	239	0.6	1,351	3.3	1,056	0.0	15,748	-1.1	714,897	0.3
Real estate and rental and leasing	838	3.2	3,583	4.0	3,242	3.3	40,769	3.6	1,791,570	4.6
Professional, scientific, and tech. services	1,389	-0.3	7,144	-0.7	6,034	-0.4	83,723	0.0	2,445,677	0.4
Administrative, support and waste mgmt	525	3.5	2,725	5.5	2,055	4.4	23,396	3.7	1,075,747	5.2
Educational services	290	10.7	1,145	10.1	1,306	3.2	12,275	6.8	305,448	7.8
Health care and social assistance	798	-3.5	3,651	-0.4	4,109	-2.1	38,263	0.0	1,381,729	5.2
Arts, entertainment, and recreation	728	5.3	1,796	2.2	2,515	3.1	25,204	2.6	804,626	4.1
Accommodation and foodservices	190	-2.5	500	0.9	495	0.0	4,714	2.1	225,970	4.4
Other services (except public admin.)	1,213	0.0	5,529	2.8	4,733	0.2	44,329	0.9	2,432,759	3.3

Note: Sole proprietorship employment is estimated from the number of establishments. Also includes some partnerships.
Source: US Census Bureau http://www.census.gov/epcd/nonemployer/

Sole Proprietorship Employment and Growth

NAICS Sectors, Employment 2001, CAGR 1998-2001

	Cape & Islands		Northeast		Southeast		MA		US	
All Sectors	27,821	1.7%	47,485	1.0%	58,088	0.9%	412,941	0.8%	16,979,498	2.6%
Forestry, fishing, hunting, agri. support	1,242	0.7	891	-4.4	1,729	-0.4	5,427	-1.3	220,623	-0.7
Mining	0	N/A	N/A	0.8	0	0.7	96	5.0	87,699	2.5
Utilities	0	-100	59	-5.7	0	-4.3	424	-12.5	13,581	-2.5
Construction	6,062	6.0	6,374	-1.2	9,955	-2.8	54,157	0.5	2,067,266	2.7
Manufacturing	392	-2.4	771	-1.1	1,004	-1.7	5,992	-4.7	280,171	-1.9
Wholesale trade	556	-2.5	1,119	2.8	1,330	2.7	8,034	-3.6	386,313	-1.1
Retail trade	1,899	-1.8	3,692	7.5	5,177	8.5	29,557	-2.0	1,738,854	-0.4
Transportation & warehousing	624	5.1	1,466	-2.2	2,194	2.9	13,849	2.0	764,708	4.9
Information	296	6.7	695	3.0	752	4.6	6,984	7.1	241,860	7.4
Finance and insurance	689	-7.1	1,593	-0.3	1,924	-0.1	15,748	-1.1	714,897	0.3
Real estate and rental and leasing	2,979	2.6	4,351	3.3	5,416	4.2	40,769	3.6	1,791,570	4.6
Professional, scientific, and tech. services	3,957	0.5	9,537	7.6	9,105	6.9	83,723	0.0	2,445,677	0.4
Administrative, support and waste mgmt	1,990	6.0	2,695	2.9	3,440	-2.1	23,396	3.7	1,075,747	5.2
Educational services	547	7.4	1,233	2.4	1,281	2.2	12,275	6.8	305,448	7.8
Health care and social assistance	1,687	1.0	4,292	4.1	4,190	4.2	38,263	0.0	1,381,729	5.2
Arts, entertainment, and recreation	1,740	4.4	2,619	1.9	2,612	1.2	25,204	2.6	804,626	4.1
Accommodation and foodservices	493	-6.5	524	1.0	607	0.9	4,714	2.1	225,970	4.4
Other services (except public admin.)	2,619	-55.0	5,564	-4.4	7,285	-0.4	44,329	0.9	2,432,759	3.3

Note: Sole proprietorship employment is estimated from the number of establishments. Also includes some partnerships.
Source: US Census Bureau http://www.census.gov/epcd/nonemployer/

Sole Proprietorship Share of Total Employment

NAICS Sectors, 2001

	Berkshire	Cape & Islands	Central	Greater Boston	Northeast	Pioneer Valley	Southeast	MA	US
All Sectors	13.6%	25.3%	12.3%	9.6%	14.3%	13.0%	14.2%	11.7%	12.9%
Forestry, fishing, hunting, agri. support	63.2	93.9	78.7	83.9	79.8	79.1	77.5	75.6	54.6
Mining	0.0	0.0	N/A	3.9	N/A	0.0	0.0	5.2	15.3
Utilities	0.0	0.0	2.5	1.6	5.6	0.0	0.0	3.0	2.0
Construction	34.4	50.0	33.1	21.1	35.7	36.2	36.2	29.4	24.2
Manufacturing	1.7	10.3	1.5	1.2	1.4	1.7	1.7	1.5	1.7
Wholesale trade	10.5	25.2	5.6	3.2	7.4	6.4	6.0	4.7	5.9
Retail trade	8.4	10.4	10.3	6.3	8.7	8.8	7.9	7.7	10.5
Transportation & warehousing	16.9	22.2	16.1	13.2	30.4	15.2	24.4	16.1	16.9
Information	6.7	11.8	7.7	4.0	6.2	6.5	9.0	5.1	6.1
Finance and insurance	8.7	16.7	7.4	5.4	12.7	7.4	13.4	6.8	10.3
Real estate and rental and leasing	61.2	63.2	50.2	38.8	56.5	56.4	62.3	46.4	47.1
Professional, scientific, and tech. services	40.7	47.5	35.8	18.9	38.9	40.3	39.7	24.5	25.5
Administrative, support and waste mgmt	25.3	34.3	12.3	7.1	12.0	14.7	16.1	9.9	10.6
Educational services	7.6	33.3	7.9	5.1	14.9	7.3	17.0	6.8	10.5
Health care and social assistance	7.3	10.5	6.5	7.7	9.0	8.4	7.0	7.8	8.7
Arts, entertainment, and recreation	31.6	41.7	29.2	35.7	33.9	43.8	35.0	35.7	31.1
Accommodation and foodservices	2.6	3.6	2.3	1.6	2.2	2.3	1.8	2.0	2.2
Other services (except public admin.)	30.2	38.8	30.3	20.1	32.1	30.0	32.9	25.9	31.2

Note: Sole proprietorship employment is estimated from the number of establishments. Also includes some partnerships.
Source: US Census Bureau http://www.census.gov/epcd/nonemployer/