

Competitiveness and Economic Development: Where Does Texas Stand?

Professor Michael E. Porter
Harvard Business School

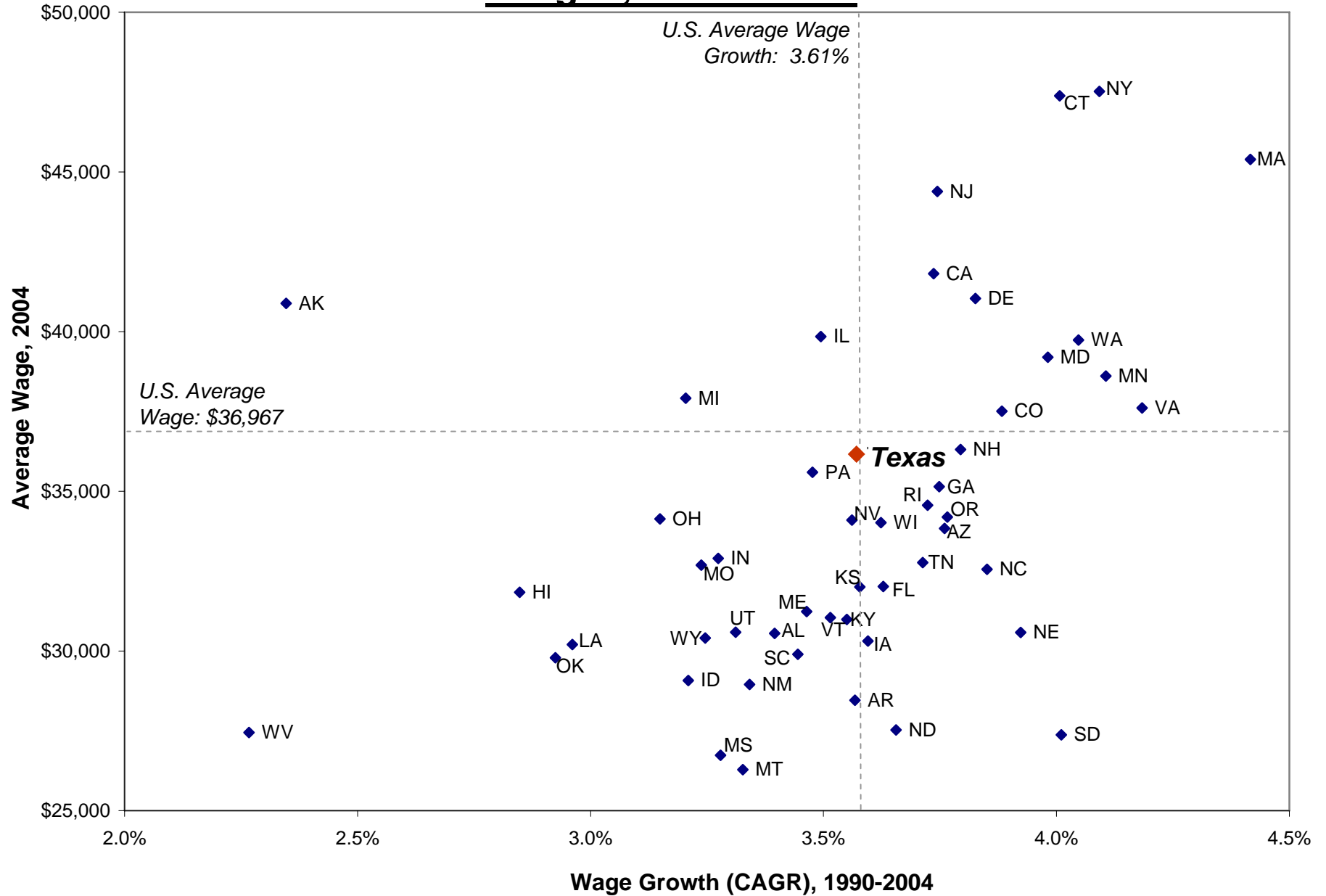
*Texas Economic Summit
San Antonio, Texas
November 14, 2006*

This presentation draws on ideas from Professor Porter's articles and books, in particular, [The Competitive Advantage of Nations](#) (The Free Press, 1990), "Clusters and the New Competitive Agenda for Companies and Governments" in [On Competition](#) (Harvard Business School Press, 1998), the *Clusters of Innovation Initiative* (www.compete.org), a joint effort of the Council on Competitiveness, Monitor Group, Professor Porter, and the Cluster Mapping Project at Harvard Business School, and on "Competitiveness in U.S. Rural Regions: Learning and Research Agenda," a project report on rural economic development for the EDA with Christian Ketels, Kaia Miller, and Richard Bryden.

Additional information may be found at the website of the Institute for Strategy and Competitiveness, www.isc.hbs.edu

Comparative Performance of U.S. States

Wages, 1990 – 2004

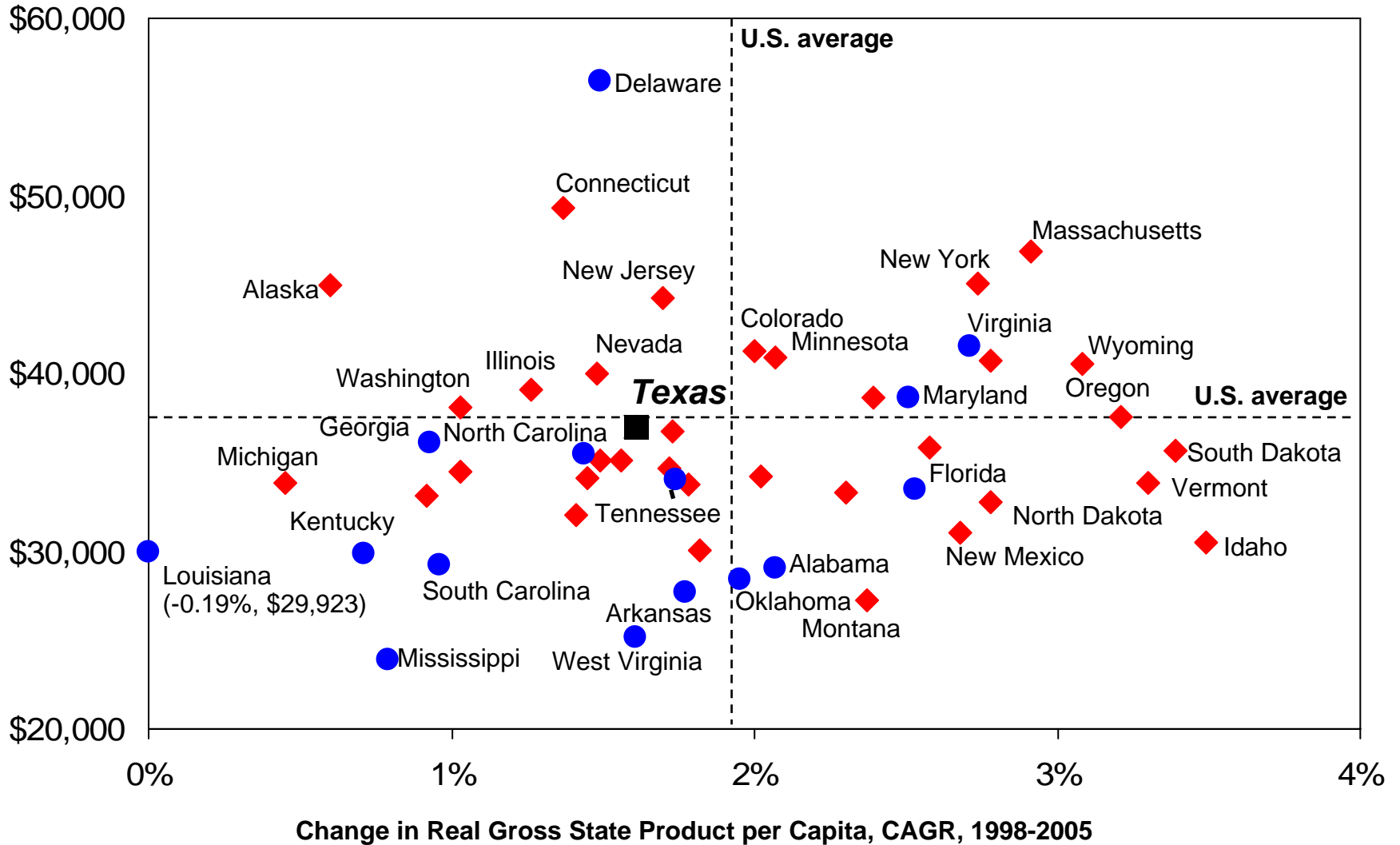


Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director.

Comparative Performance of U.S. States

Gross State Product per Capita, 1998 – 2005

Real Gross State Product per Capita, 2005



Note: Southern states as defined by the U.S. census highlighted in blue. All figures in chained 2000 dollars.

Source: BEA, 2006.

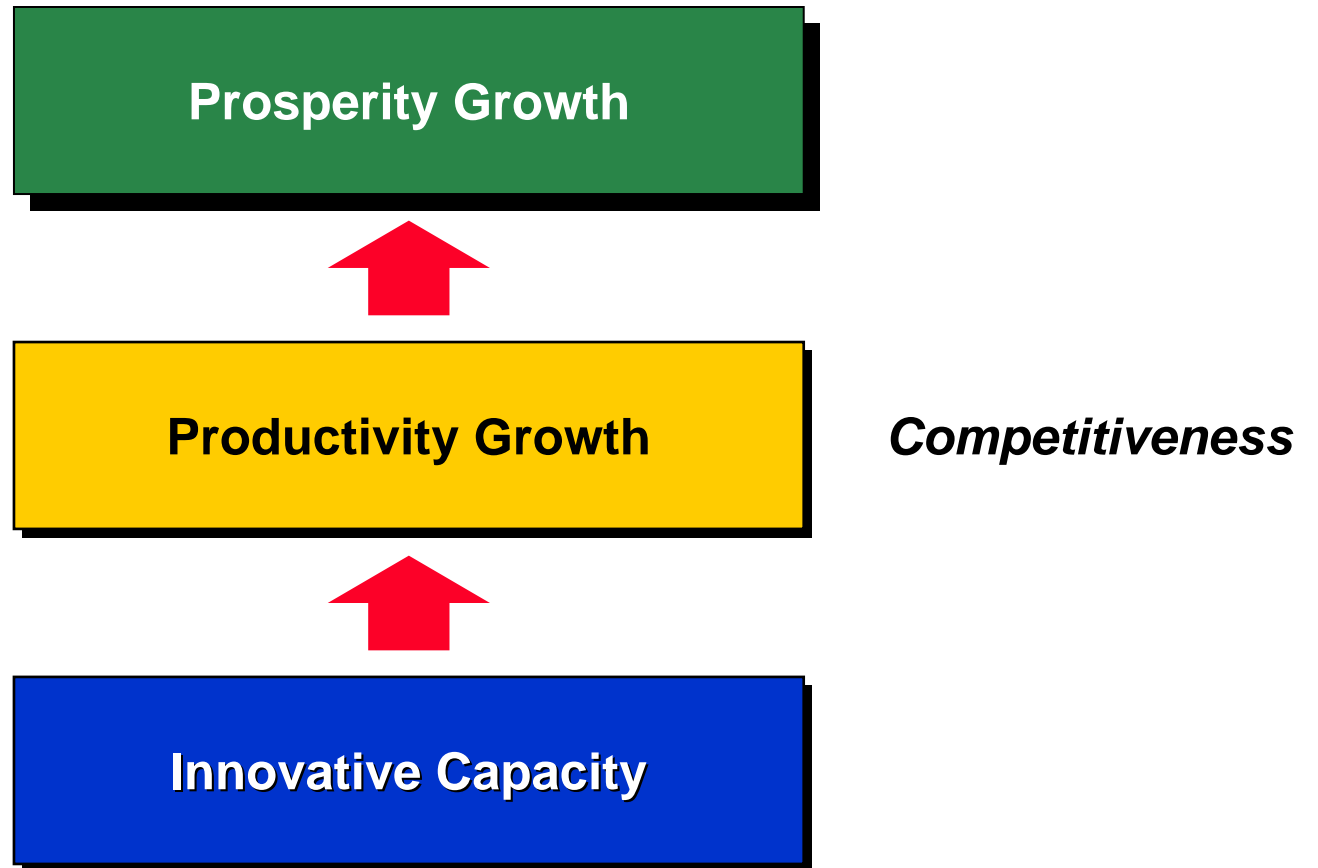
What is Competitiveness?

- Competitiveness is the **productivity (value per unit of input)** with which a nation, region, or cluster utilizes its human, capital, and natural resources. Productivity sets a nation's or region's standard of living (wages, returns on capital, returns on natural resources)
 - Productivity depends both on the **value** of products and services (e.g. uniqueness, quality) as well as the **efficiency** with which they are produced.
 - It is not **what** industries a nation or region competes in that matters for prosperity, but **how** firms compete in those industries
 - Productivity in a nation or region is a reflection of what both domestic and foreign firms **choose to do in that location**. The location of ownership is secondary for prosperity.
 - The productivity of **“local”** industries is of fundamental importance to competitiveness, not just that of traded industries

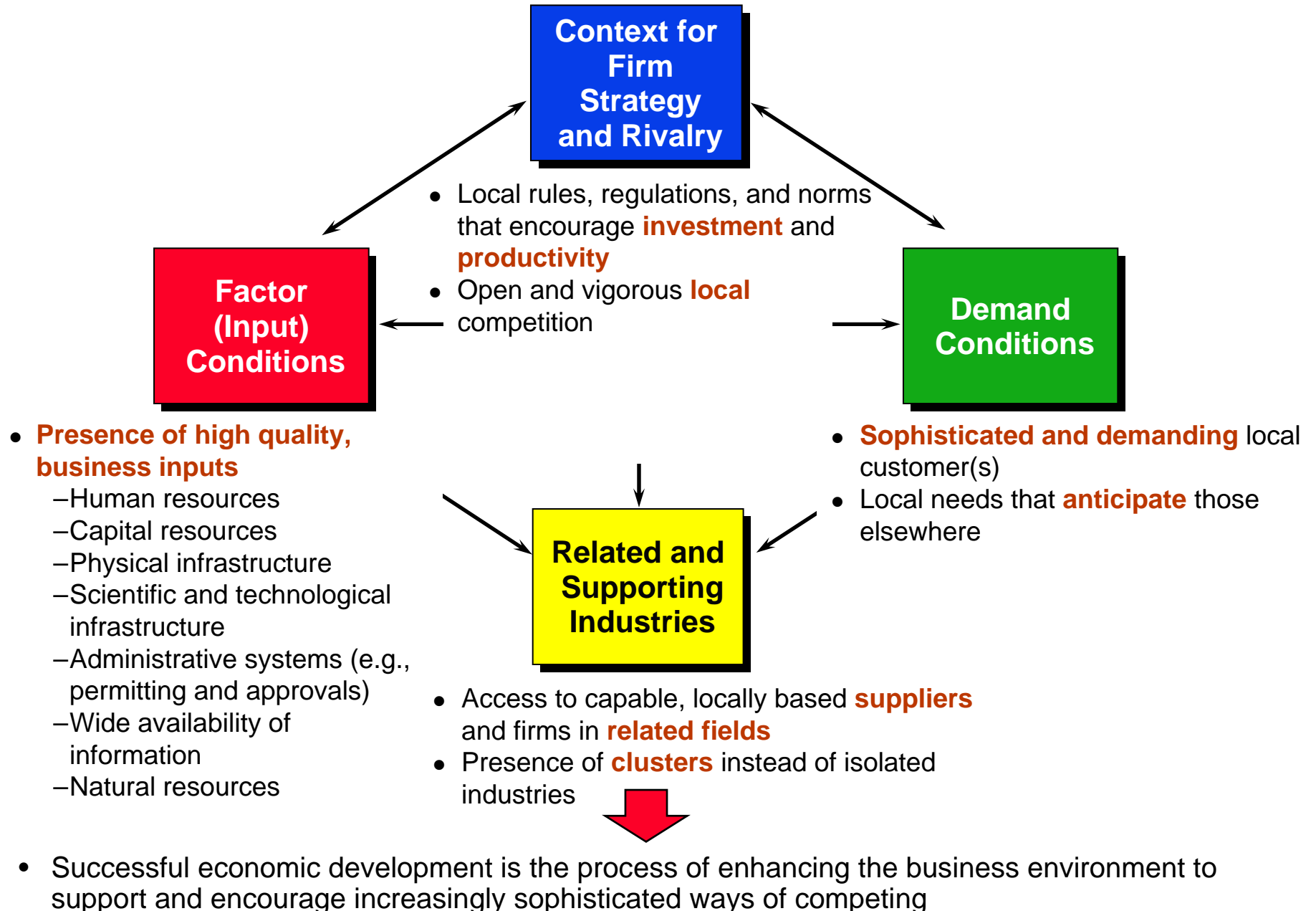


- Nations or regions compete in offering the **most productive environment** for business

Innovation and Competitiveness

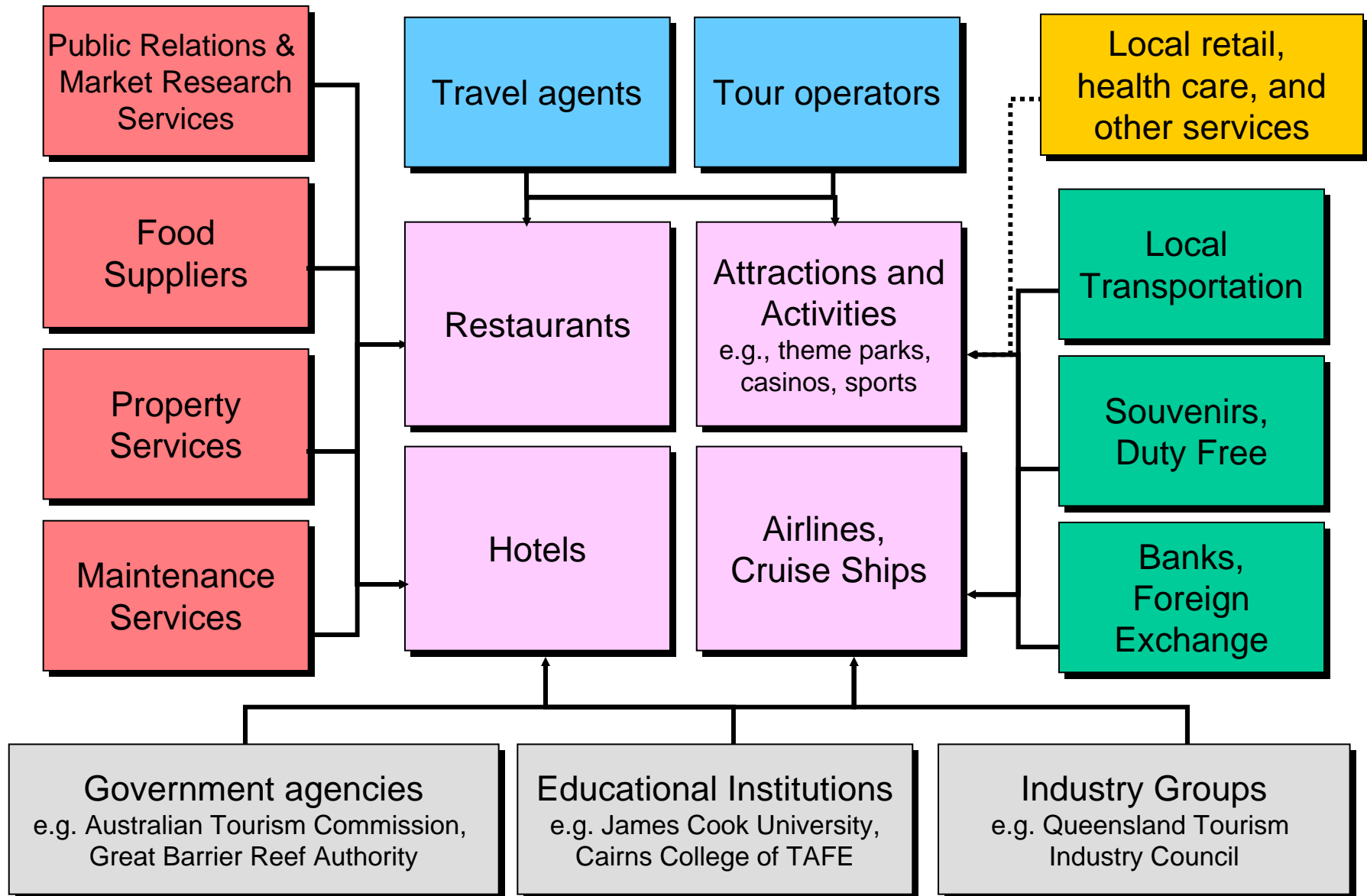


Enhancing Competitiveness: Improving the Business Environment



Enhancing Competitiveness: Developing Clusters

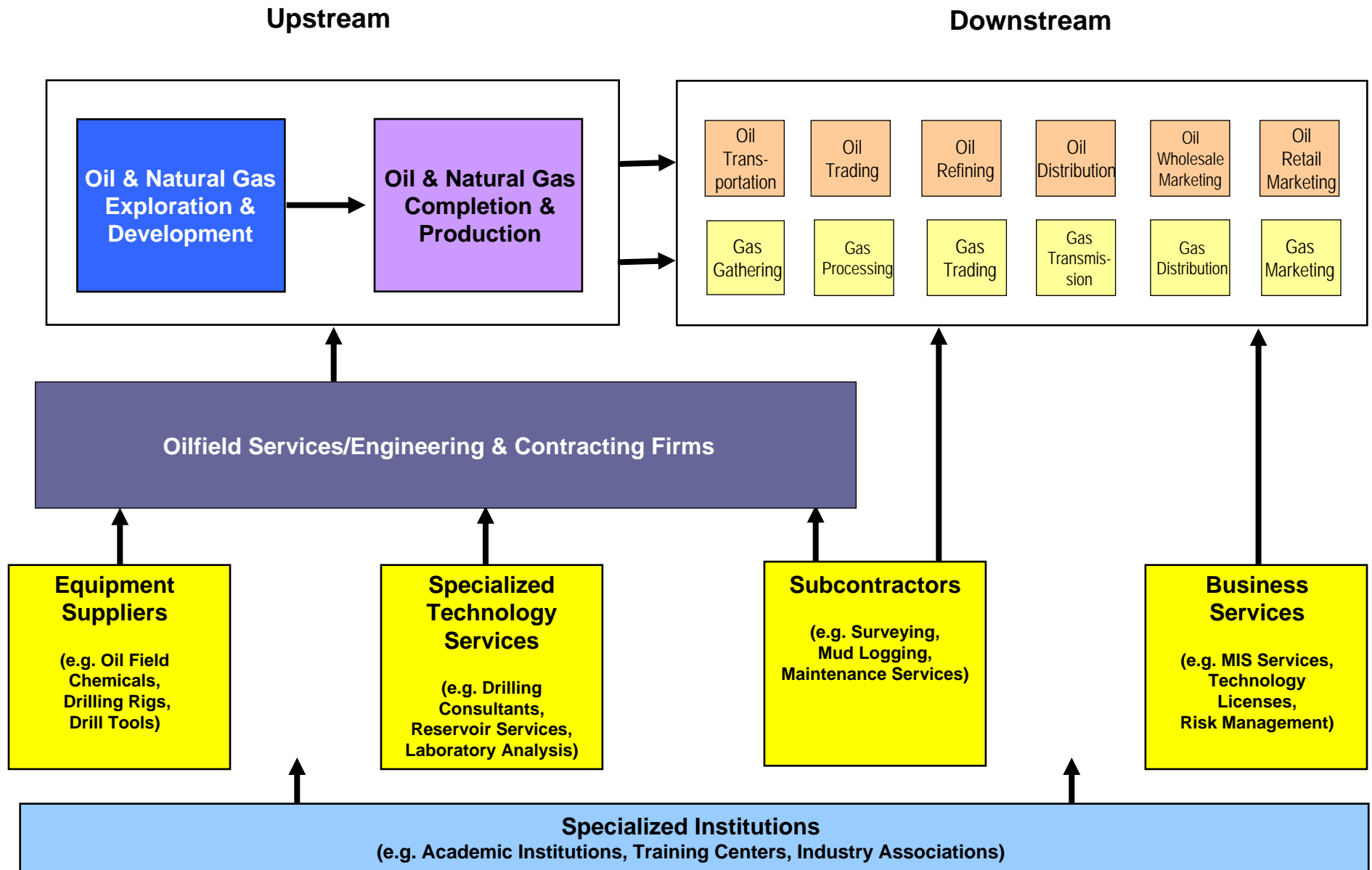
Hospitality and Tourism in Cairns (Australia)



Sources: HBS student team research (2003) - Peter Tynan, Chai McConnell, Alexandra West, Jean Hayden

Enhancing Competitiveness: Developing Clusters

Oil and Gas in Houston



Clusters and Competitiveness

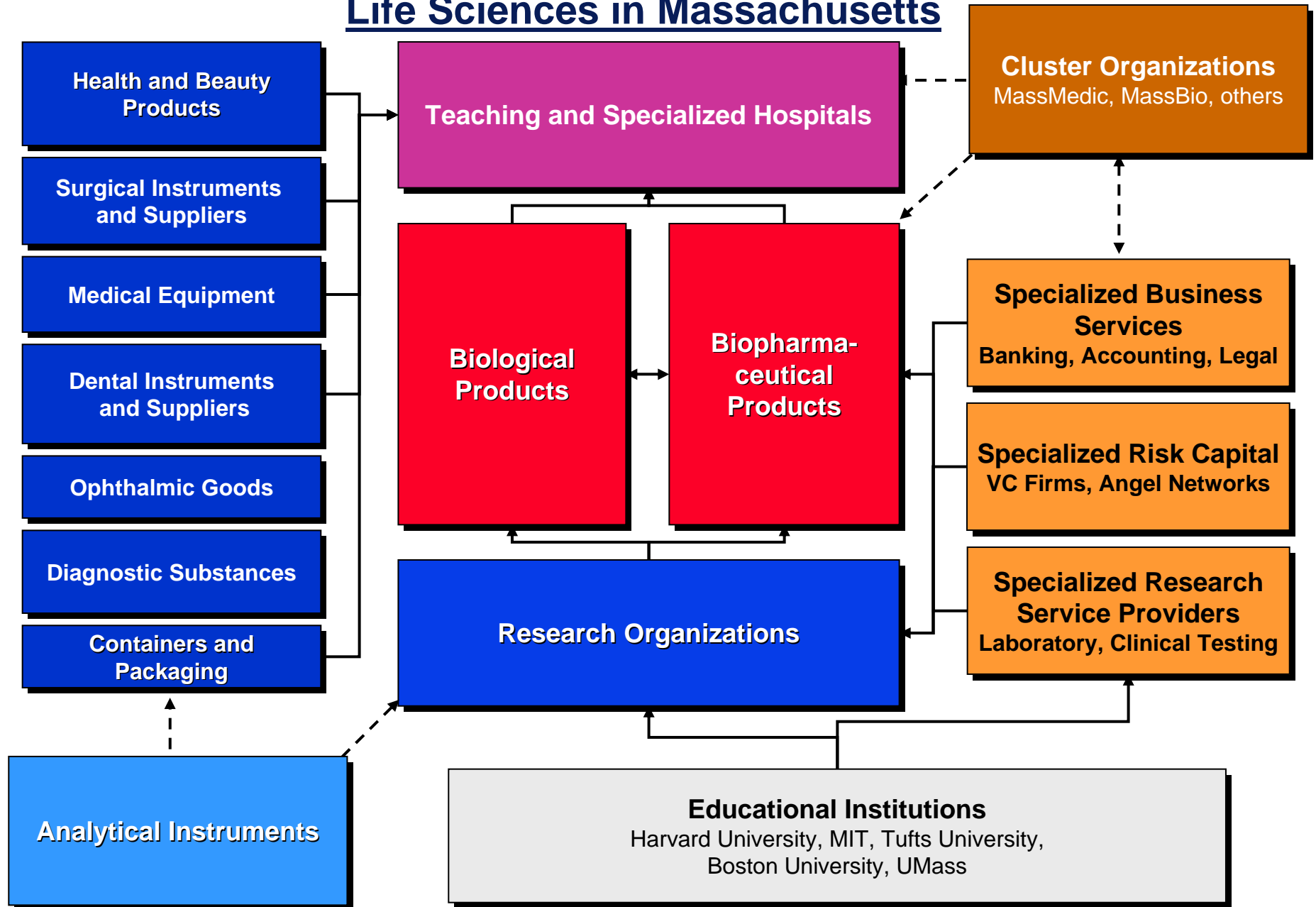
- **Clusters Increase Productivity**
 - Efficient **access** to specialized inputs, services, employees, information, institutions, and “public goods” (e.g. training programs)
 - Ease of **coordination** and transactions across firms
 - Rapid **diffusion** of best practices
 - Ongoing, visible **performance comparisons** and strong incentives to improve vs. local rivals
- **Clusters Stimulate and Enable Innovations**
 - Enhanced ability to **perceive innovation opportunities**
 - Presence of multiple entities involved in specialized **knowledge creation**
 - Ease of **experimentation** given locally available resources
- **Clusters Facilitate Commercialization and New Business Formation**
 - Opportunities for **new companies** and **new lines of established business** are more apparent
 - **Commercializing** new products and starting new companies is easier because of available skills, suppliers, financing, etc.



Clusters reflect the fundamental influence in competition of **linkages and spill-overs** across firms and associated institutions

Cluster Development

Life Sciences in Massachusetts



Institutions for Collaboration

Massachusetts Life Sciences, Selected Organizations

Life Sciences Industry Associations

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

General Industry Associations

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

Economic Development Initiatives

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

University Initiatives

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

Informal networks

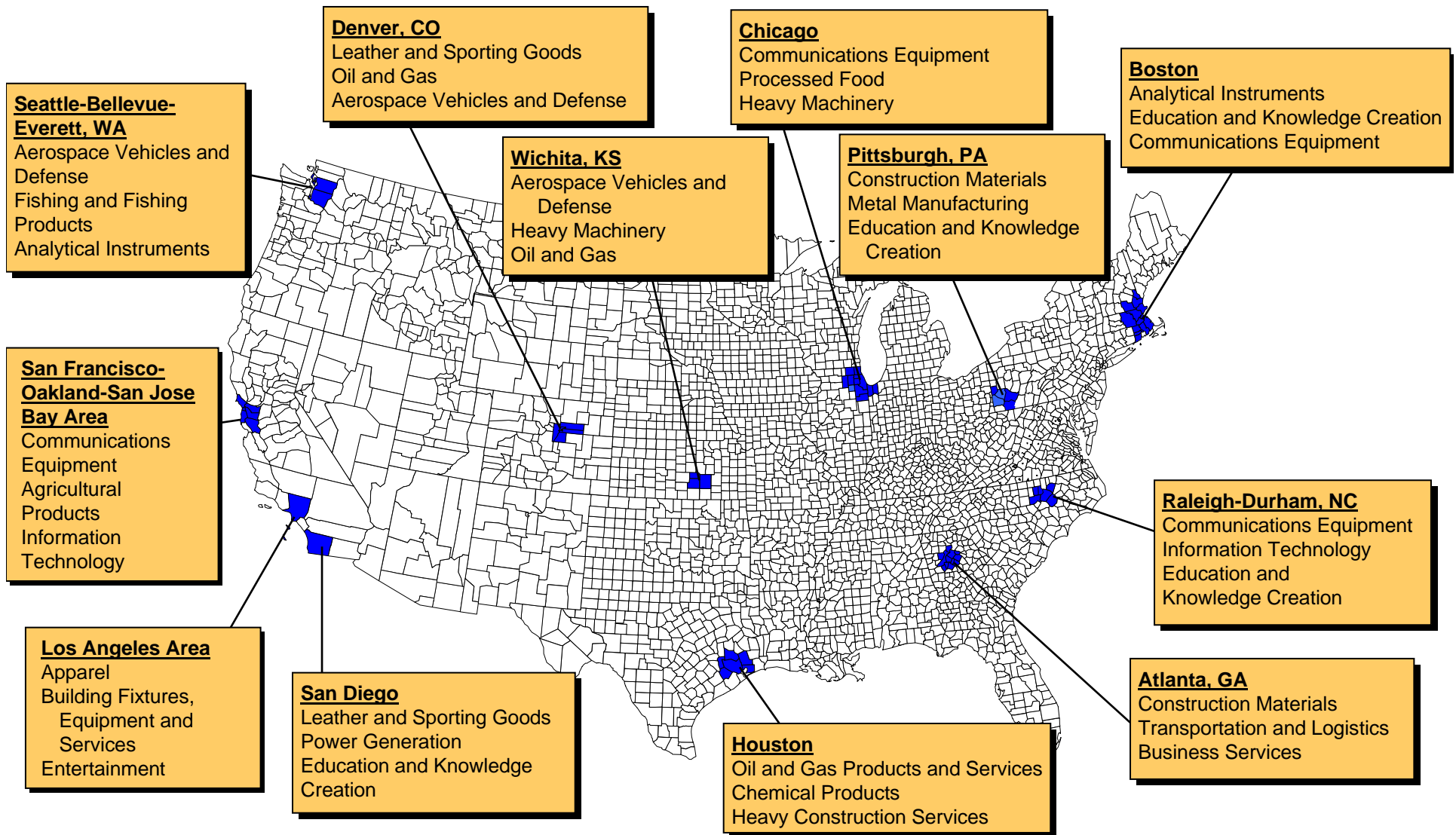
- Company alumni groups
- Venture capital community
- University alumni groups

Joint Research Initiatives

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

Specialization of Regional Economies

Select U.S. Geographic Areas



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

The Composition of Regional Economies

United States, 2004

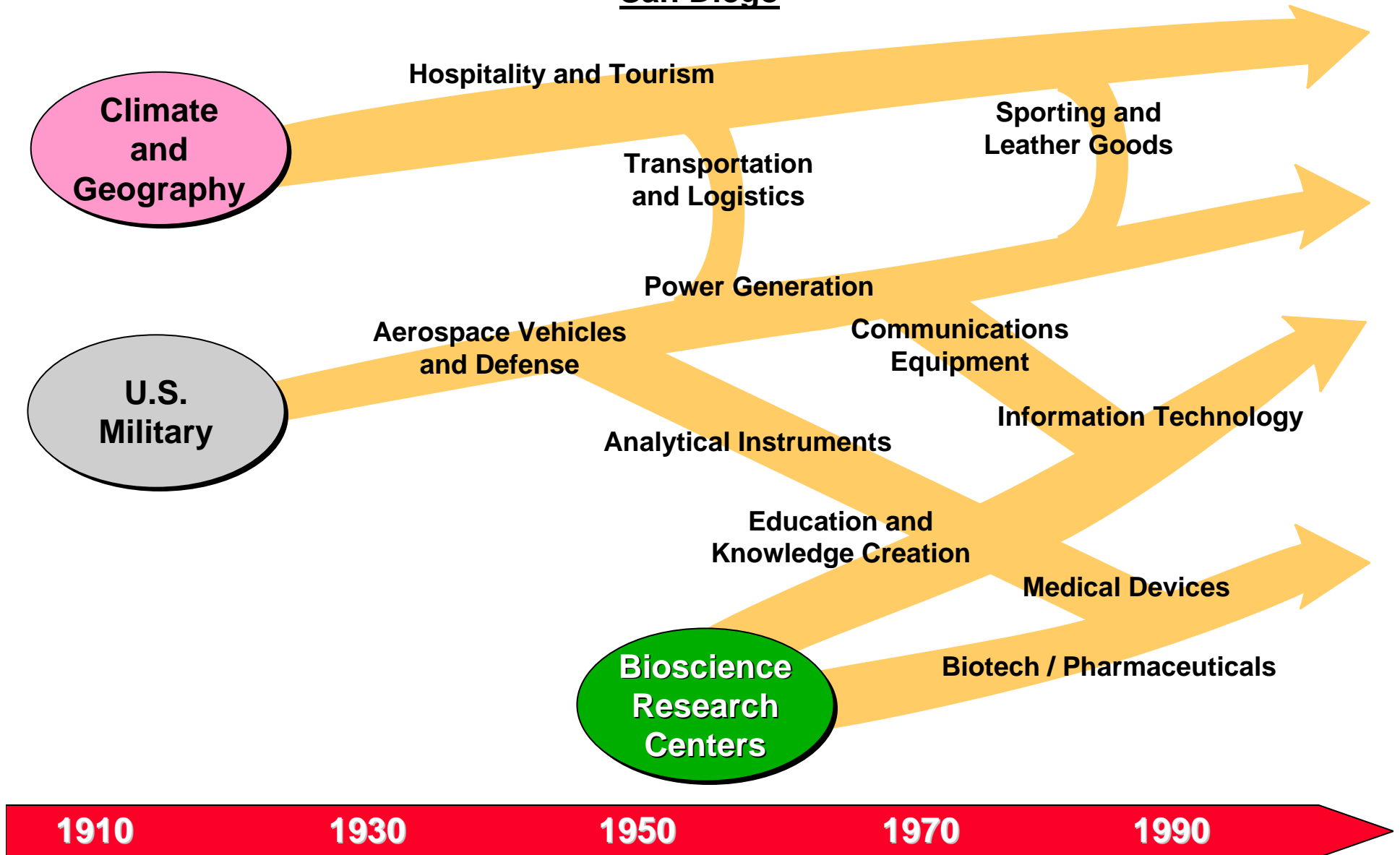
	Traded	Local	Natural Resource-Driven
Share of Employment	29.3%	70.0%	0.7%
Employment Growth Rate, 1990 to 2004	0.7%	2.4%	-1.2%
Average Wage	\$49,367	\$30,416	\$35,815
Relative Wage	137.2%	84.5	99.5
Wage Growth	4.2%	3.4%	2.1%
Relative Productivity	144.1	79.3	140.1
Patents per 10,000 Employees	20.4	0.4	3.0
Number of SIC Industries	590	241	48

Note: 2004 data, except relative productivity which uses 1997 data.

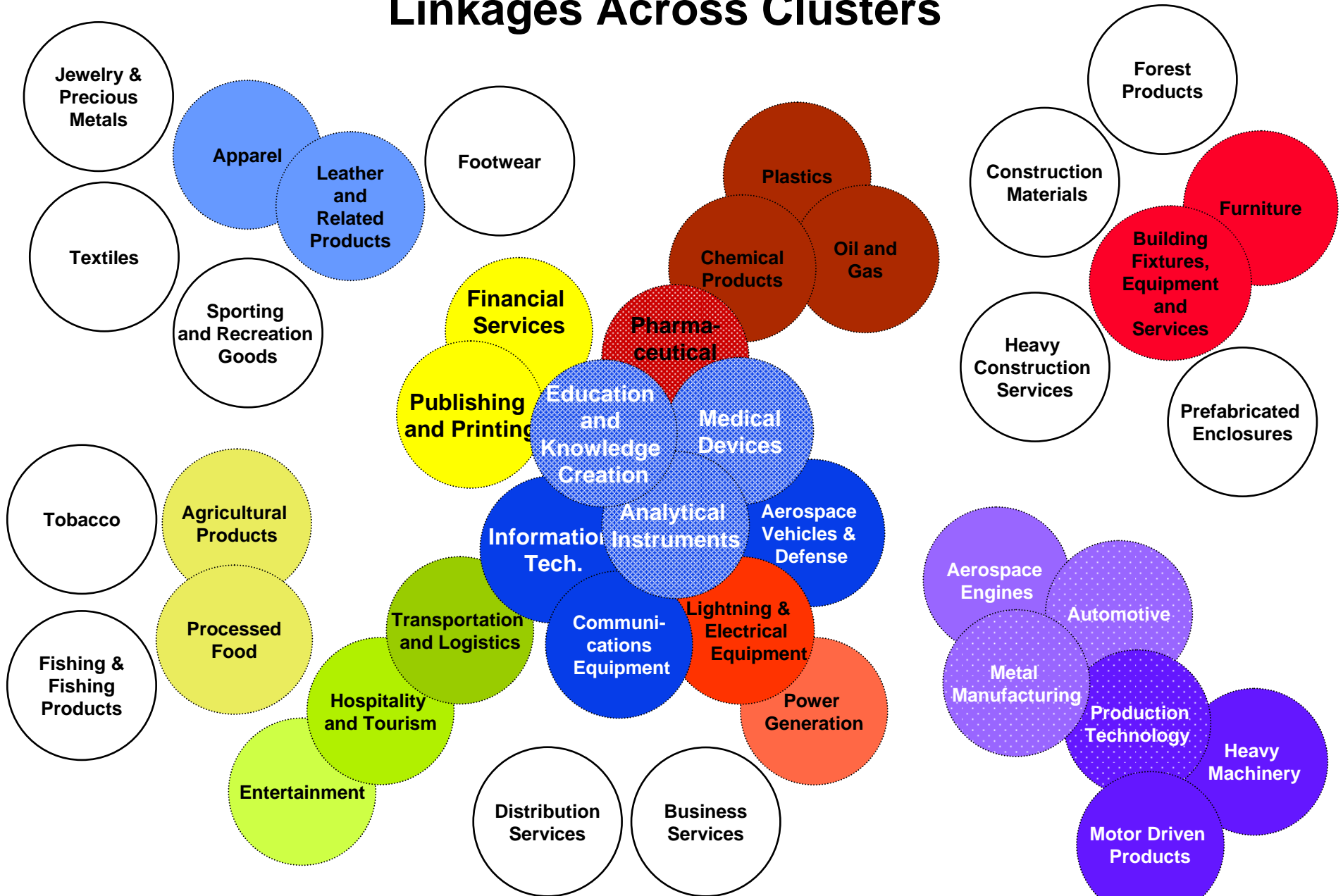
Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

The Evolution of Regional Economies

San Diego



Linkages Across Clusters



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

The Process of Economic Development

Shifting Roles and Responsibilities

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

- Competitiveness must become a **bottom-up process** in which many individuals, companies, clusters, and institutions take responsibility
- **Every** region and cluster can take steps to enhance competitiveness

Economic Performance Indicators

Texas

Economic Performance

Employment, 2004

- in Texas: 8,118,483 (rank 2)
- % of US: 7.05%

Employment, annual growth rate, 1990 to 2004

- in Texas: 2.35% (rank 12)
- in the US: 1.50%

Gross State Product per capita, 2005

- in Texas: \$42,975 (rank 16)
- in the US: \$41,844
- Texas % above US: 2.70%

Average wage, 2004

- in Texas: \$36,161 (rank 17)
- in the US: \$36,967
- Texas % below US: 2.18%

Real Gross State Product per capita, annual growth rate, 1997- 2005

- in Texas: 1.66% (rank 24)
- in the US: 1.83%

Average wage, annual growth rate, 1990 to 2004

- in Texas: 3.57% (rank 28)
- in the US: 3.61%

Share of Employment in Traded Clusters, 2004

- in Texas: 27.4% (rank 33)
- in the US: 29.3%

Change in Share of Employment in Traded Clusters, 1990 to 2004

- in Texas: -2.6% (rank 23)
- in the US: -4.8%

Innovation Output

Patents per 10,000 employees, 2004

- in Texas: 7.35 (rank 16)
- in the US: 7.29

Total patents, annual growth rate, 1990 to 2004

- in Texas: 5.41% (rank 15)
- in the US: 4.36%

Traded establishment formation, annual rate, 1990 to 2004

- in Texas: 3.33% (rank 22)
- in the US: 3.15%

Total establishment formation, annual rate, 1990 to 2004

- in Texas: 1.58% (rank 18)
- in the US: 1.29%

Demographic Profile

Population, 2005

- in Texas: 22,859,968 (rank 2)
- % of US: 7.71%

Population, annual growth rate, 1990 to 2005

- in Texas: 1.98% (rank 8)
- in the US: 1.16%

Population Density, inhabitants per square mile, 2005

- in Texas: 64.9 (rank 30)
- US state median: 94.4

Includes private, non-agricultural employment. Ranks are among the 50 US states plus the District of Columbia

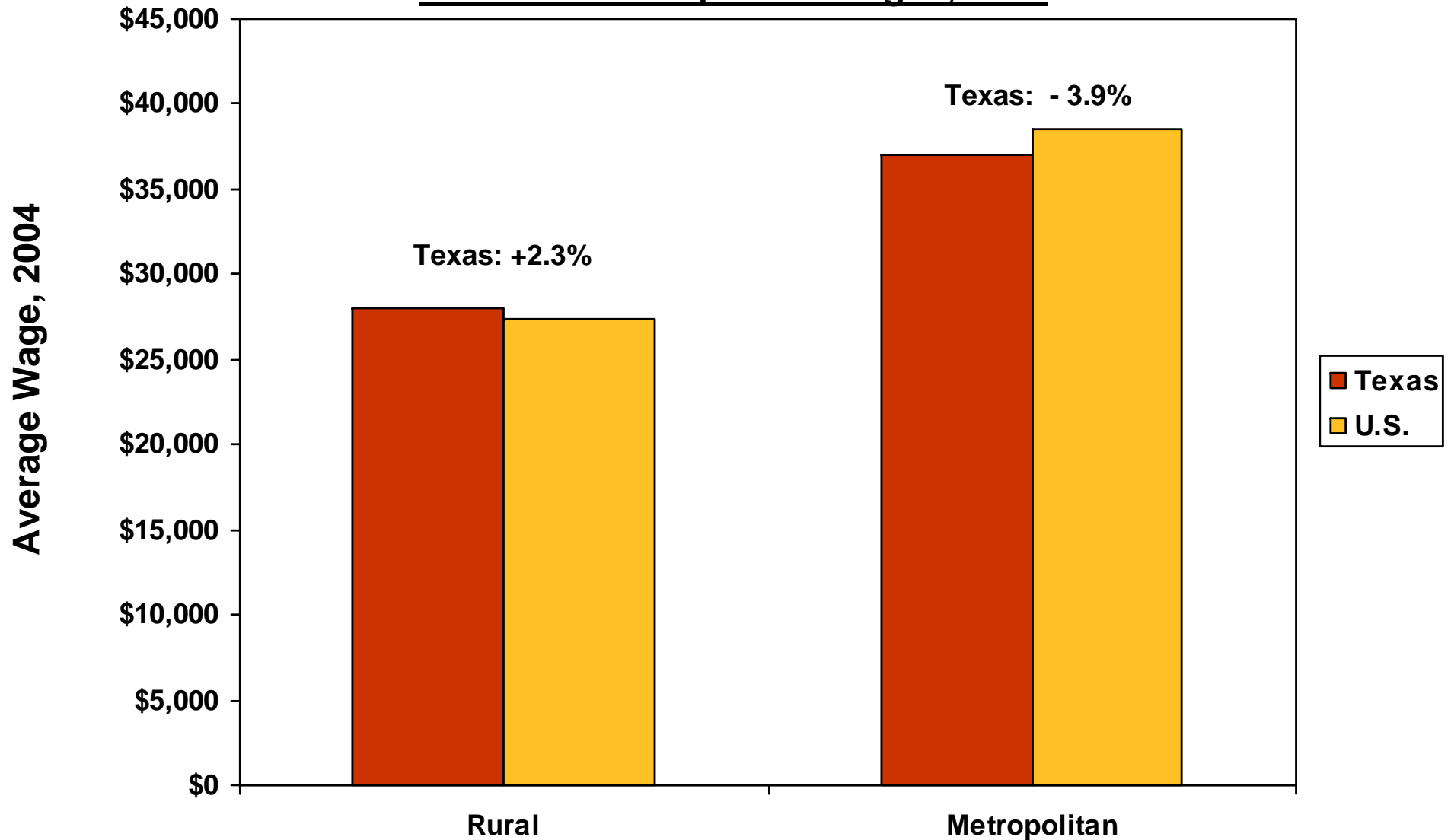
Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director.

20061114 Texas

Copyright © 2006 Professor Michael E. Porter

Texas

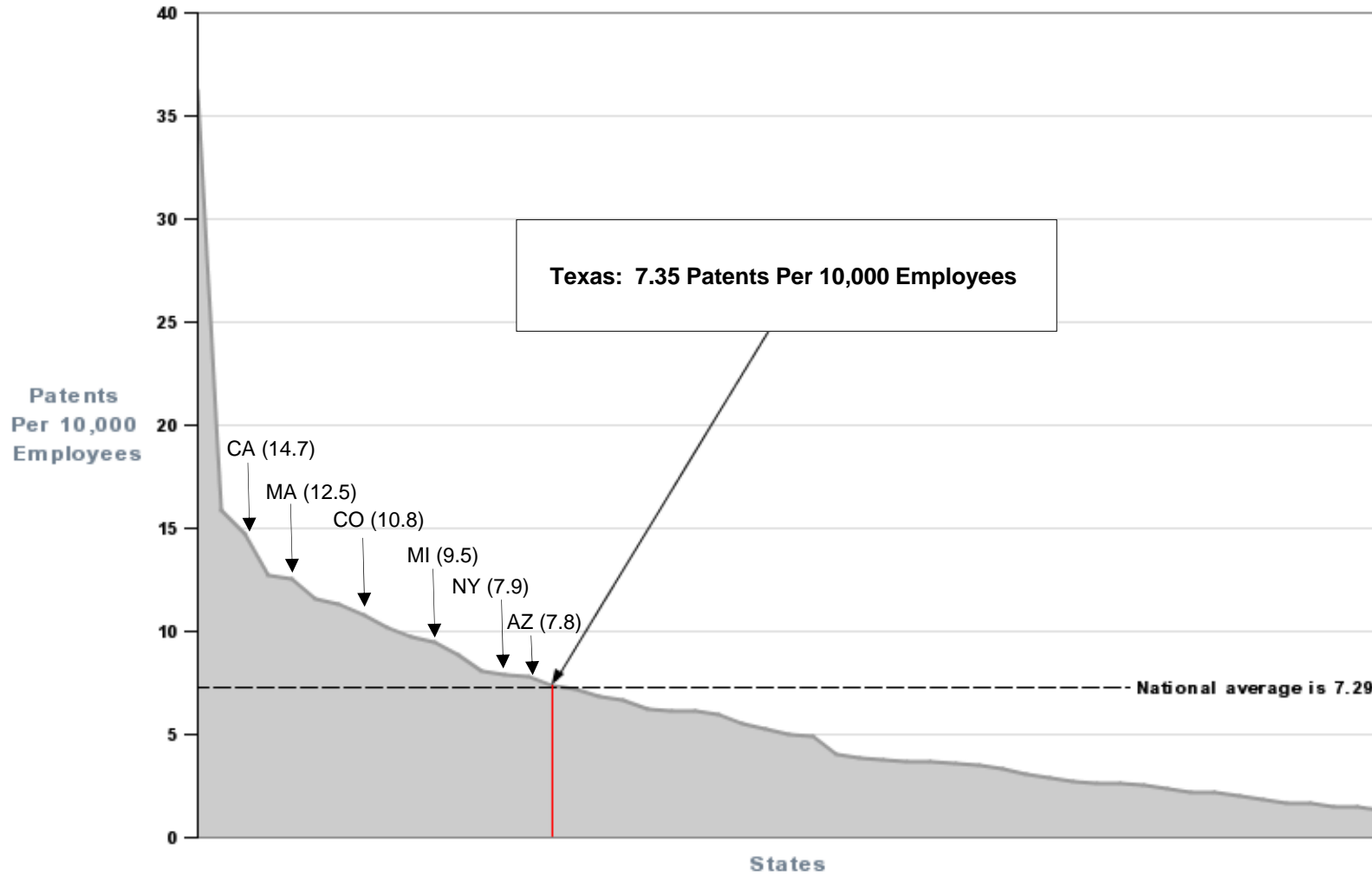
Rural and Metropolitan Wages, 2004



- Rural employment is 10.5% percent of total in Texas versus 16.0% nationwide.
 - Texas is less rural than the US by this measure
- The average wage in the Texas is higher than the national benchmark.

Texas

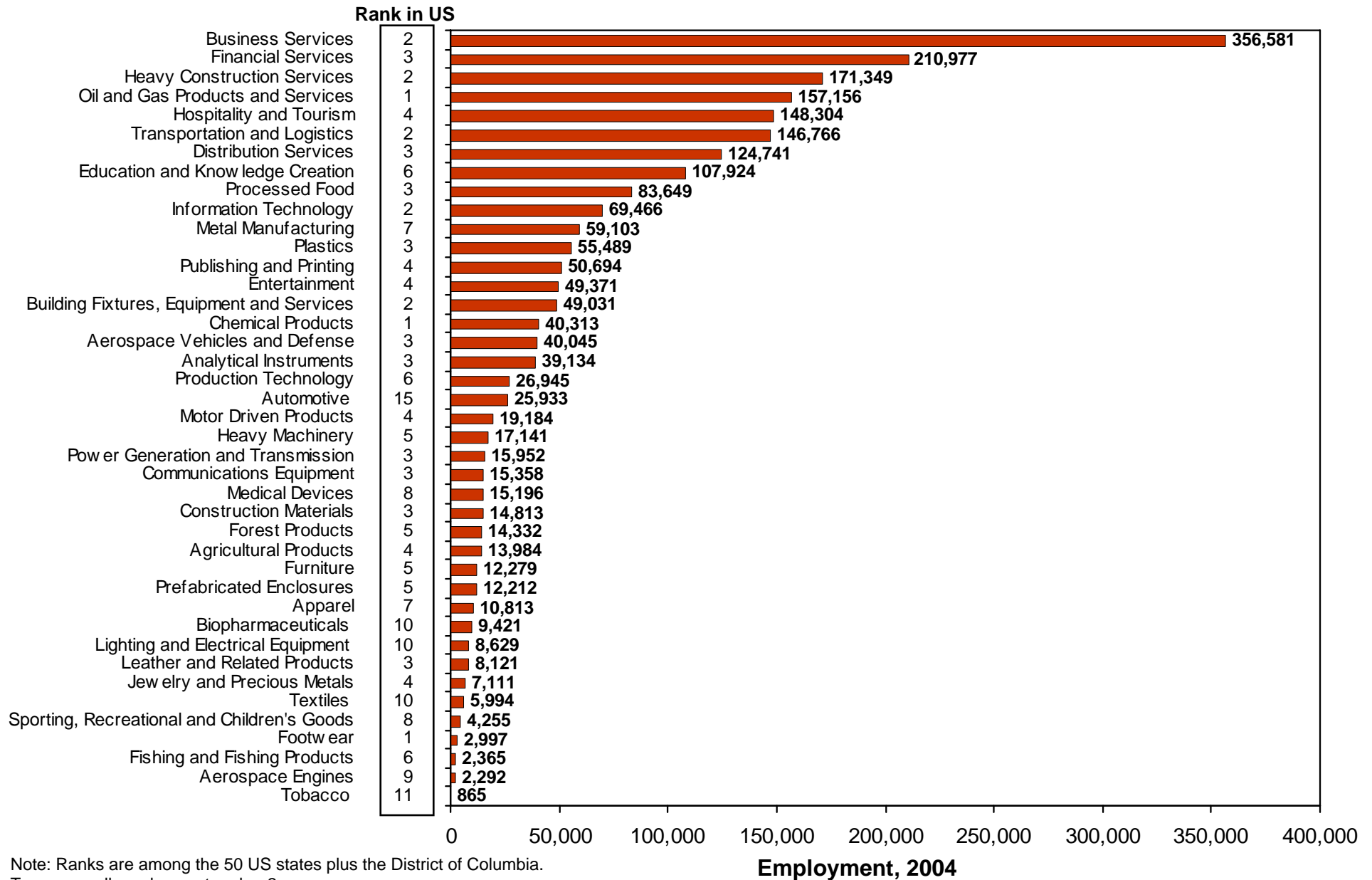
Patenting per 10,000 Employees, 2004



Texas patenting per employee rank: **16** of 51 states plus D.C.

Composition of the Texas Economy

Employment by Traded Cluster, 2004



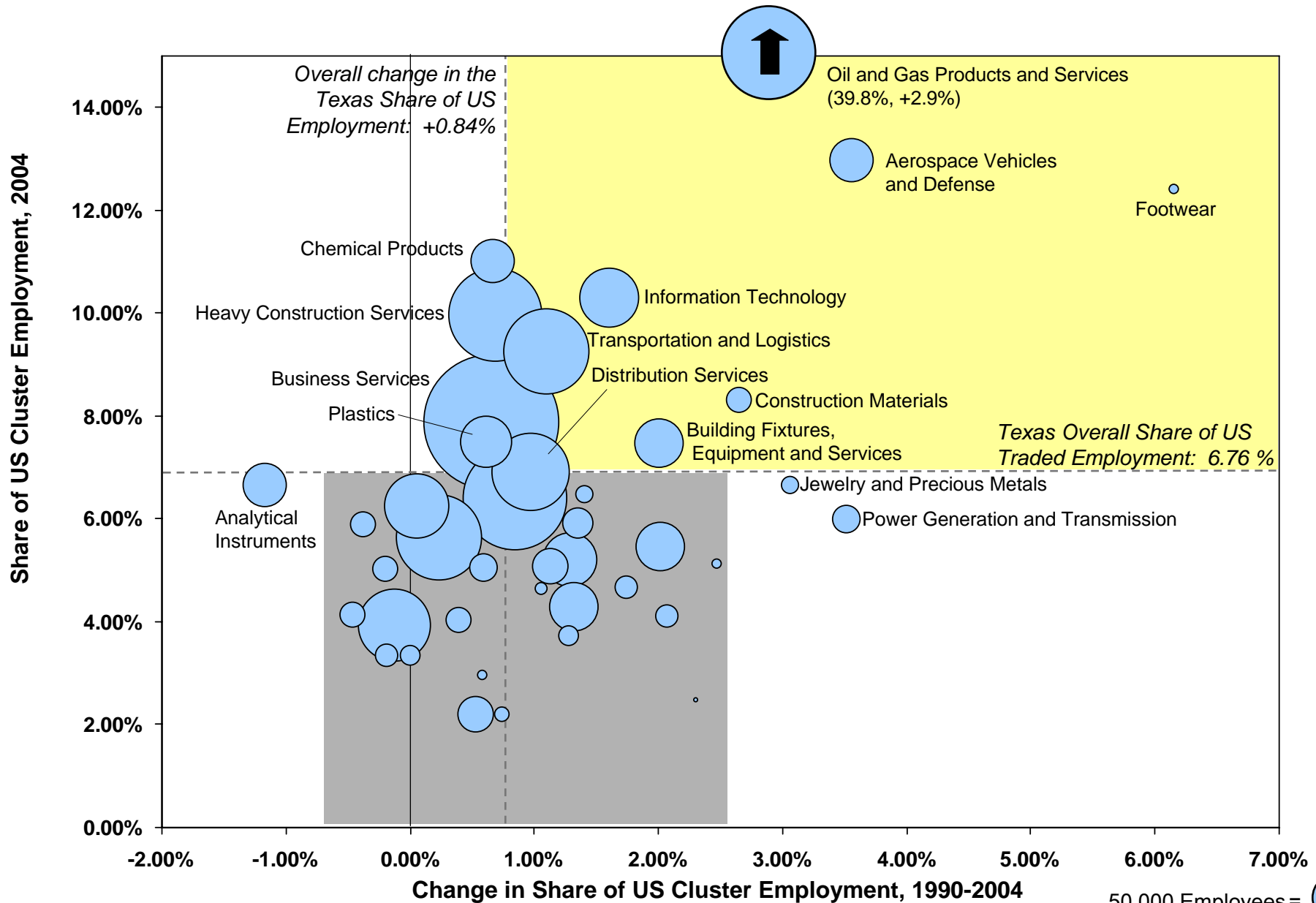
Note: Ranks are among the 50 US states plus the District of Columbia.

Texas overall employment rank = 2.

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

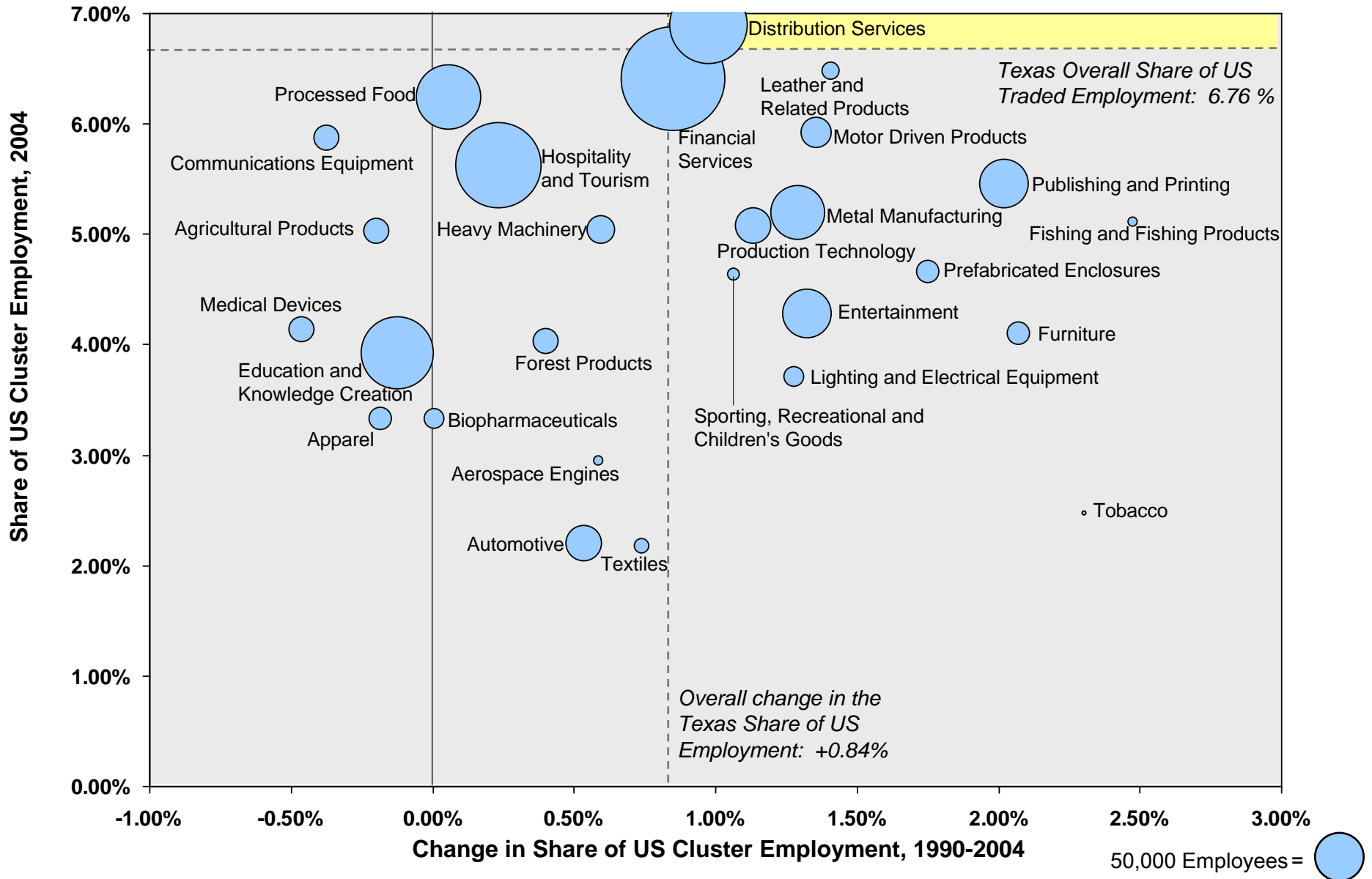
Texas

Specialization by Traded Cluster, 1990-2004



Texas

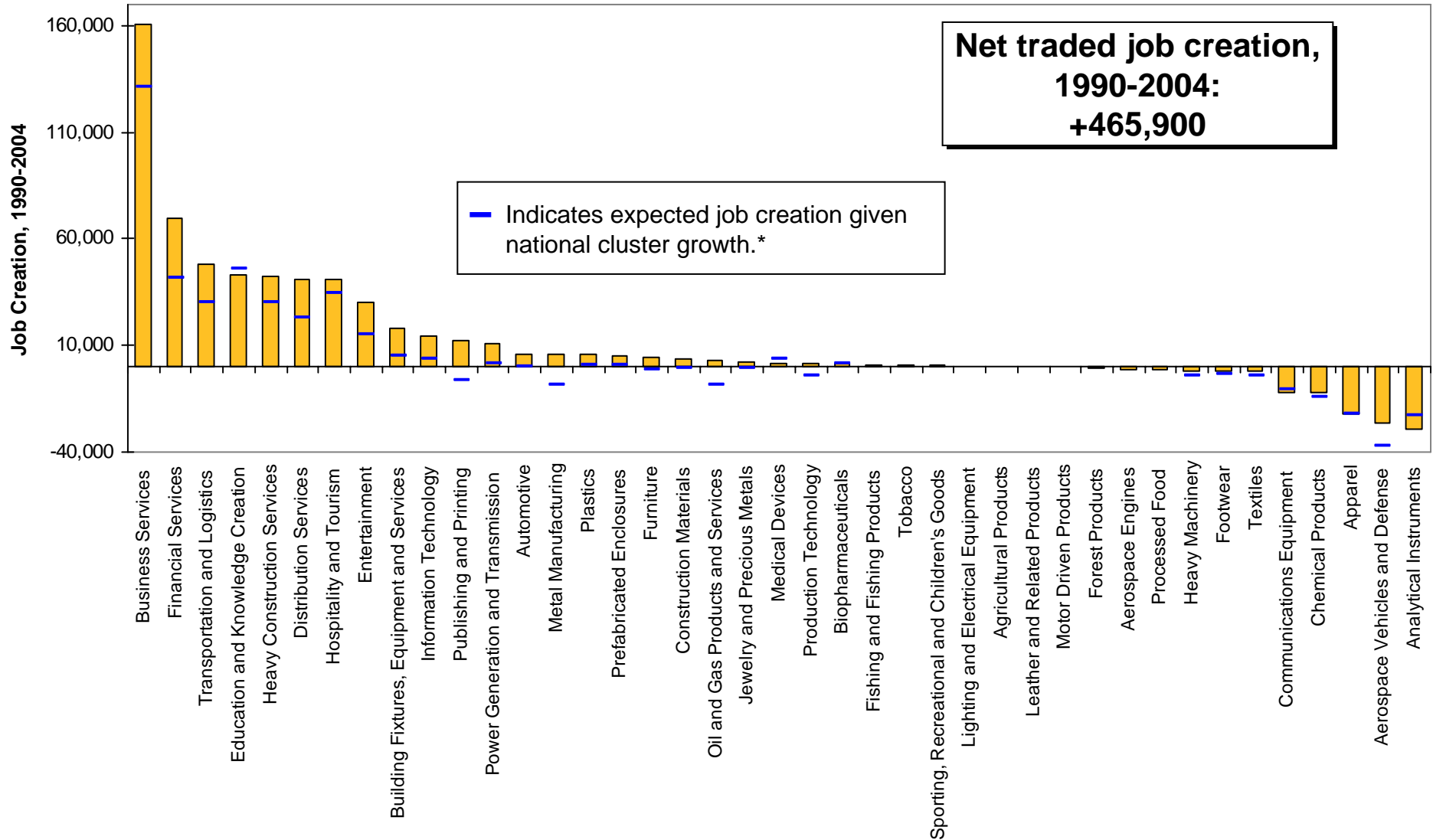
Specialization by Traded Cluster, 1990-2004 (continued)



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

Texas Economic Growth

Job Creation by Traded Cluster, 1990-2004

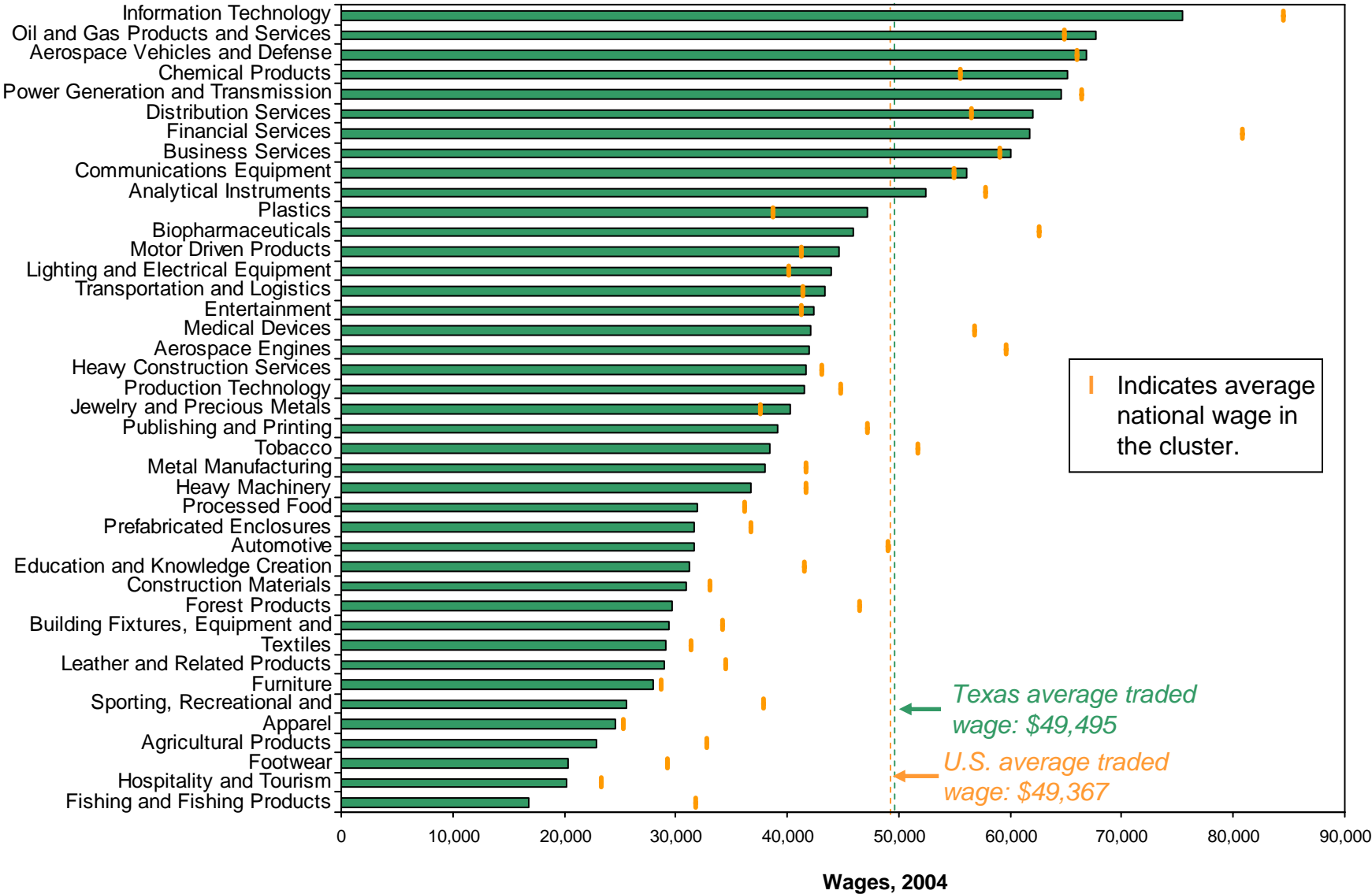


* Percent change in national benchmark times starting regional employment. Overall traded job creation in Texas, if it matched national benchmarks, would be +205,776.

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

Composition of the Texas Economy

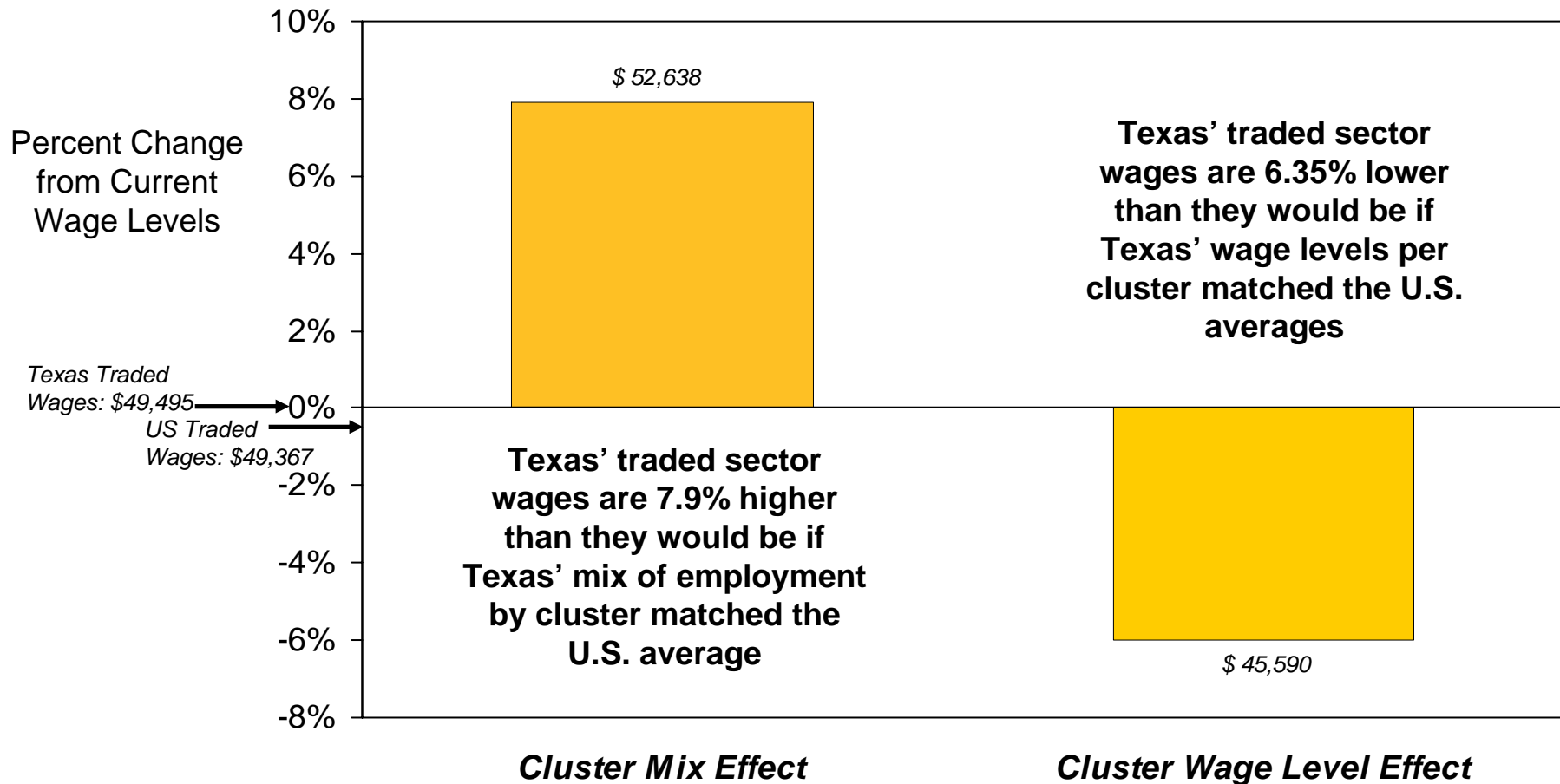
Wages by Traded Cluster vs. National Benchmarks



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

Impact of Cluster Mix on Average Wages

Texas Traded Clusters, 2004



Top Patenting Universities and Research Institutes

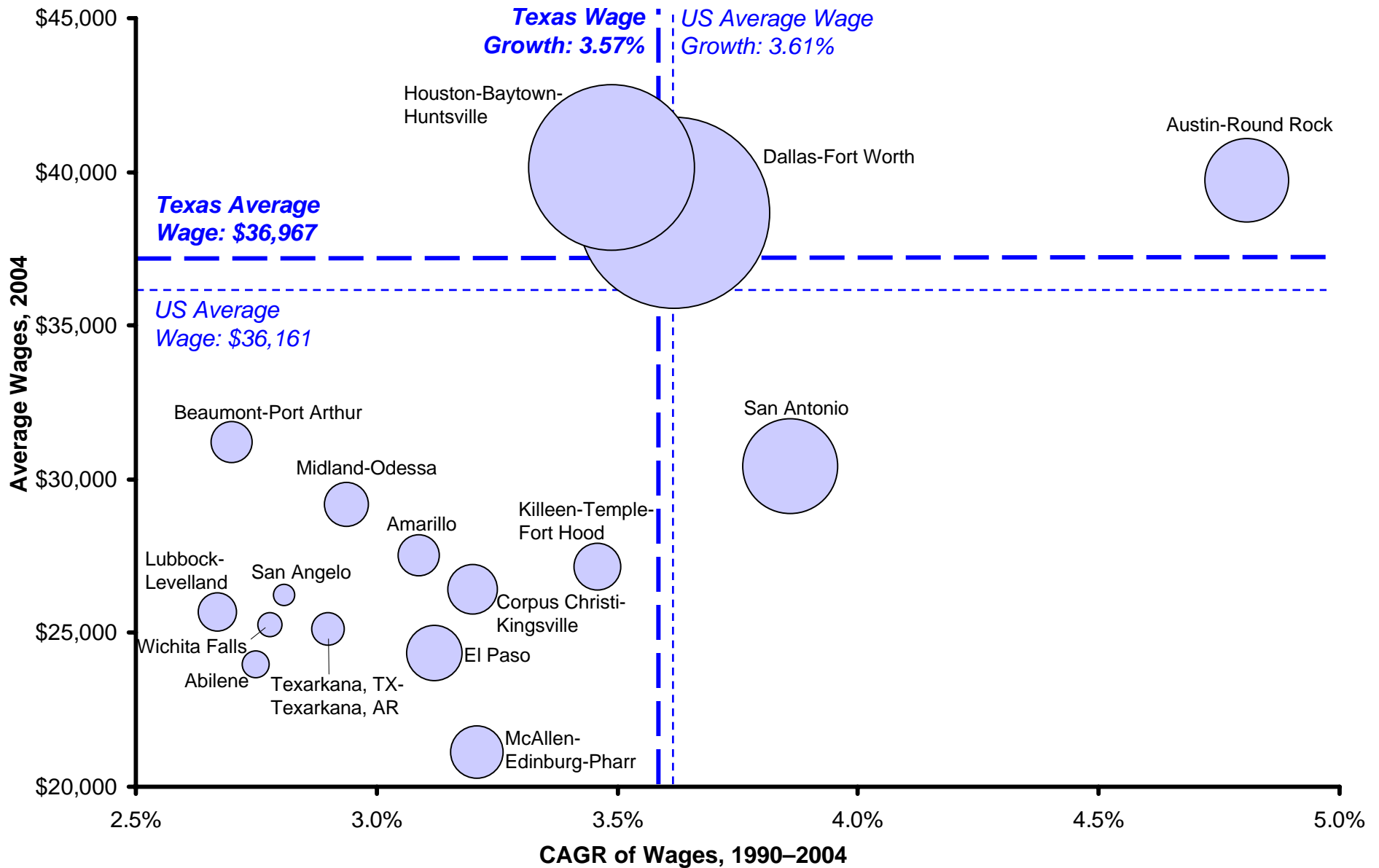
Rank	Organization	Patents Issued from 2000 to 2004
1	UNIVERSITY OF CALIFORNIA, THE REGENTS OF	2107
2	HARVARD UNIVERSITY	698
3	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	614
4	CALIFORNIA INSTITUTE OF TECHNOLOGY	586
5	UNIVERSITY OF TEXAS	454
6	STANFORD UNIVERSITY, LELAND JUNIOR, THE BOARD OF TRUSTEES OF	434
7	JOHNS HOPKINS UNIVERSITY	397
8	WISCONSIN ALUMNI RESEARCH FOUNDATION	361
9	UNIVERSITY OF MICHIGAN	293
10	COLUMBIA UNIVERSITY	266
11	BATTELLE MEMORIAL INSTITUTE	257
12	CORNELL RESEARCH FOUNDATION INC.	235
13	PENN STATE RESEARCH FOUNDATION, INC.	220
14	RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK	215
15	UNIVERSITY OF WASHINGTON	209
16	MICHIGAN STATE UNIVERSITY	205
17	UNIVERSITY OF MINNESOTA, THE REGENTS OF	200
18	DUKE UNIVERSITY INC.	188
19	UNIVERSITY OF ILLINOIS	187
20	GEORGIA TECH RESEARCH CORP.	184
21	UNIVERSITY OF PENNSYLVANIA	184
22	UNIVERSITY OF FLORIDA BOARD OF REGENTS	170
23	NORTH CAROLINA STATE UNIVERSITY	167
24	THE SCRIPPS RESEARCH INSTITUTE	165
25	SOUTHWEST RESEARCH INSTITUTE	155
40	TEXAS A&M UNIVERSITY SYSTEM	116
59	BAYLOR COLLEGE OF MEDICINE	81
120	TEXAS TECH UNIVERSITY	24

Note: Texas organizations highlighted.

Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director.
20061114 Texas 26 Copyright © 2006 Professor Michael E. Porter

Regions in the Texas Economy

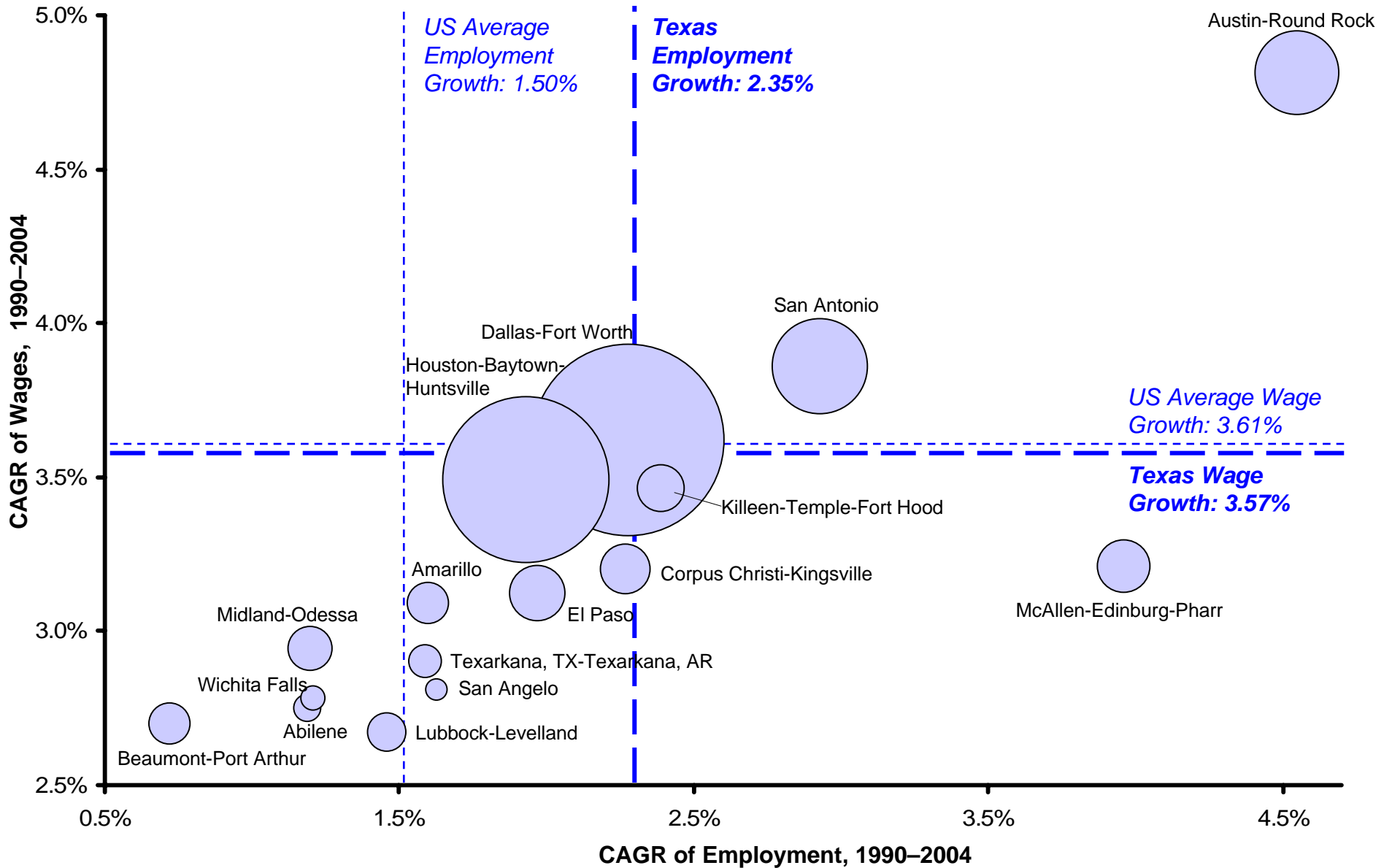
Comparative Wage Performance of Economic Areas



Data: private, non-agricultural employment. Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Regions in the Texas Economy

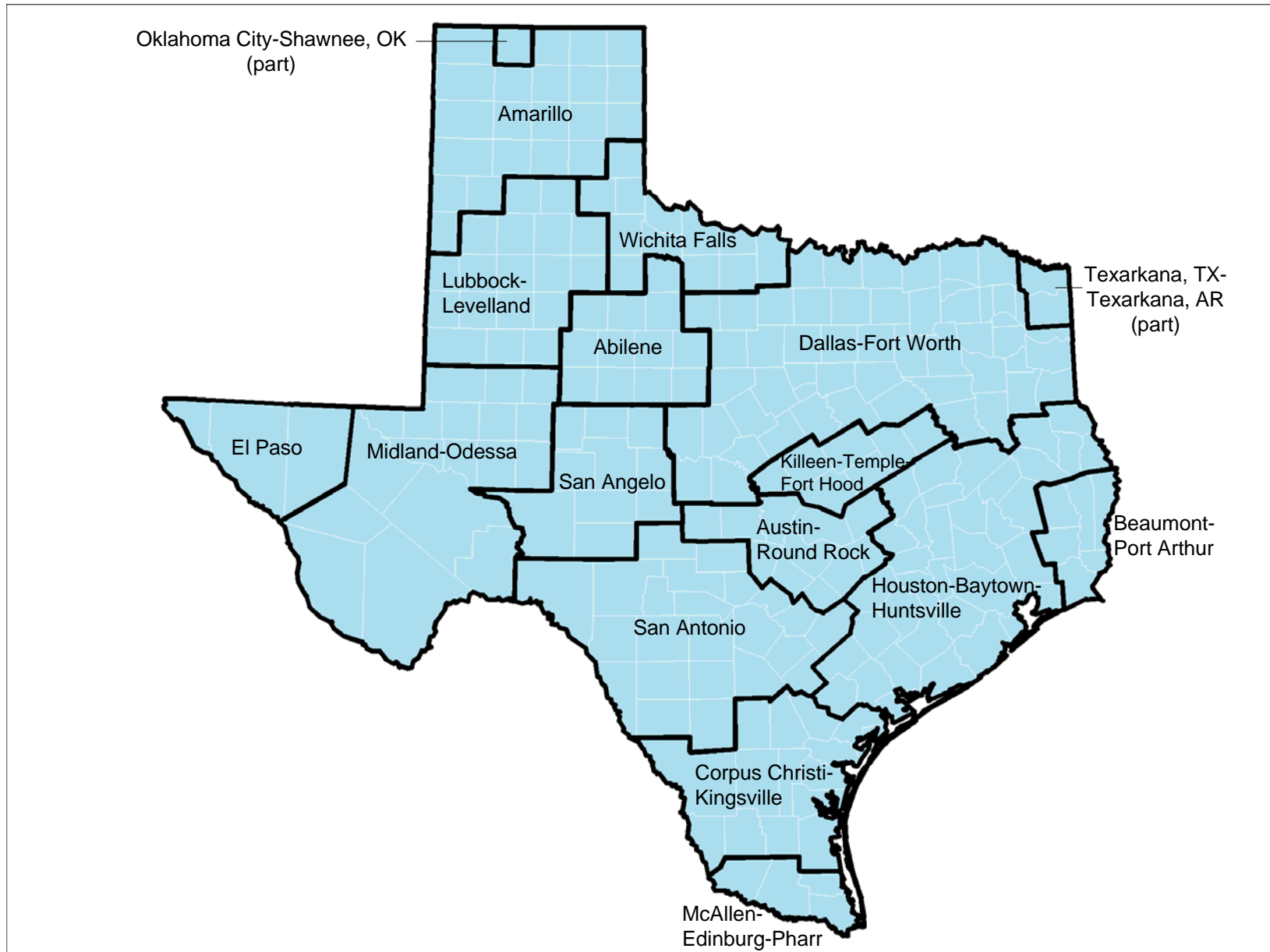
Comparative Employment Performance of Economic Areas



Data: private, non-agricultural employment. Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School

Texas

Economic Areas



Texas Economic Development Strategy

Cluster Initiatives

Advanced Technologies and Manufacturing

Aerospace and Defense

Biotechnology and Life Sciences

- Nanotechnology and Materials
- Micro-electromechanical Systems
- Semiconductor Manufacturing
- Automotive Manufacturing

Information Technology and Computer Technology

Energy

Petroleum Refining and Chemical Products

- Communications Equipment
- Computing Equipment and Semiconductors
- Information Technology

- Oil and Gas Production
- Power Generation and Transmission
- Manufactured Energy Systems

Financing Mechanism

Emerging Technology Fund

Cross-Cutting Initiatives

Business Climate

Education

Workforce

Texas Economic Development Strategy

Next Steps

- Refine **cluster definitions**

Texas Economic Development Strategy

Next Steps

- Refine **cluster definitions**
- Widen the **range of participating clusters**

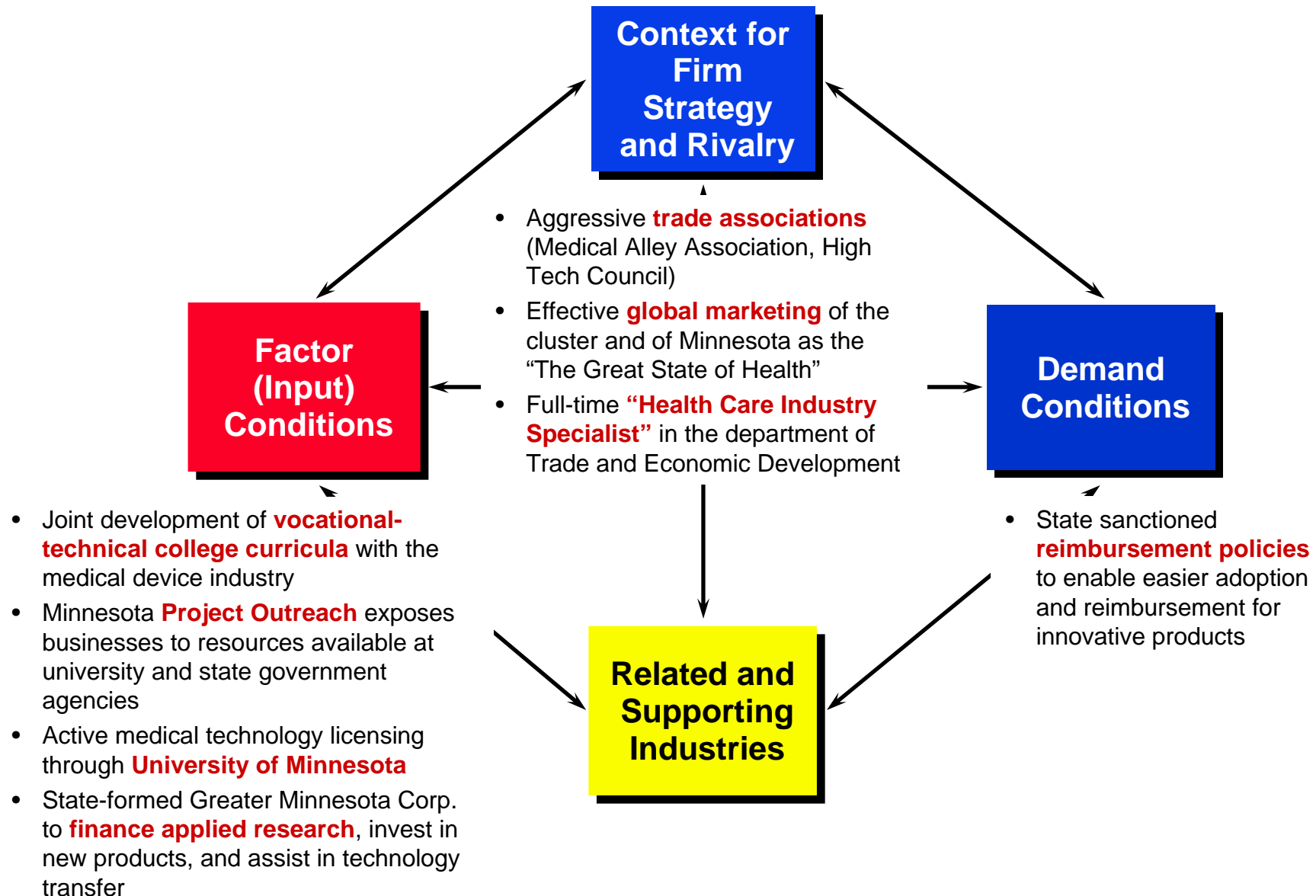
Texas Economic Development Strategy

Next Steps

- Refine **cluster definitions**
- Widen the **range of participating clusters**
- **Activate** and **institutionalize** the cluster development process
 - Upgrade institutions for collaboration
 - Matching funds for action plans
 - Organization of Department of Economic Development and Tourism

Public / Private Cooperation in Cluster Upgrading

Minnesota's Medical Device Cluster

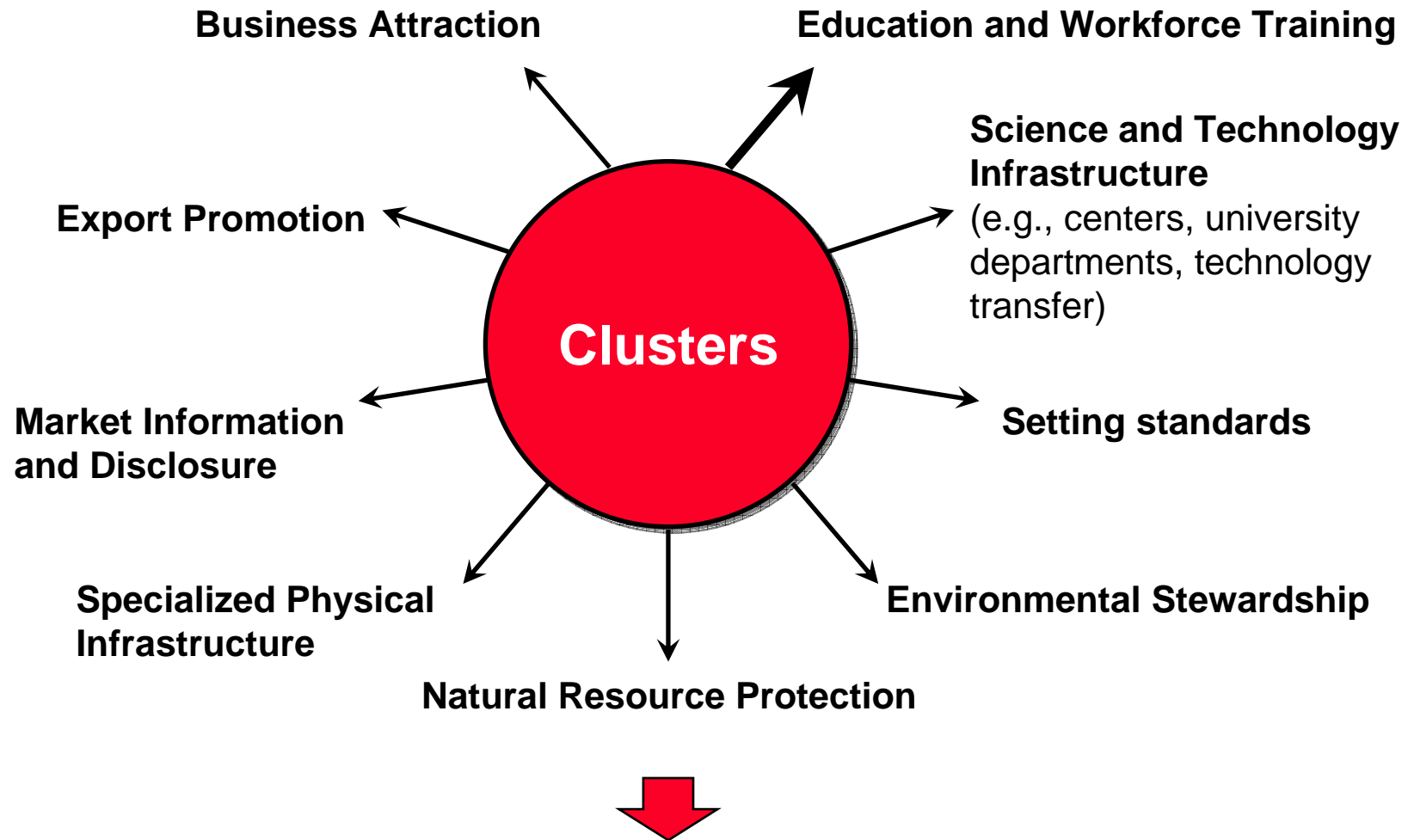


Texas Economic Development Strategy

Next Steps

- Refine **cluster definitions**
- Widen the **range of participating clusters**
- **Activate** and **institutionalize** the cluster development process
 - Upgrade institutions for collaboration
 - Matching funds for action plans
 - Organization of Department of Economic Development and Tourism
- Focus **public policy** implementation around clusters

Clusters and Public Policy



- Clusters provide a framework for **organizing the implementation** of public policy and public investments towards economic development

Texas Economic Development Strategy

Next Steps

- Refine cluster definitions
- Widen the range of participating clusters
- Activate and institutionalize the cluster development process
 - Upgrade institutions for collaboration
 - Matching funds for action plans
 - Organization of Department of Economic Development and Tourism
- Focus **public policy** implementation around clusters
- Develop explicit action plans around **cross-cutting initiatives**
 - General education system

Texas Economic Development Strategy

Next Steps

- Refine cluster definitions
- Widen the range of participating clusters
- Activate and institutionalize the cluster development process
 - Upgrade institutions for collaboration
 - Matching funds for action plans
 - Organization of Department of Economic Development and Tourism
- Focus **public policy** implementation around clusters
- Develop explicit action plans around **cross-cutting initiatives**
 - General education system
- Drive economic development to the regional level

Texas Economic Development Strategy

Next Steps

- Refine cluster definitions
- Widen the range of participating clusters
- Activate and institutionalize the cluster development process
 - Upgrade institutions for collaboration
 - Matching funds for action plans
 - Organization of Department of Economic Development and Tourism
- Focus **public policy** implementation around clusters
- Develop explicit action plans around **cross-cutting initiatives**
 - General education system
- Drive economic development to the regional level
- Create an explicit strategy for addressing **economically distressed urban and rural communities**

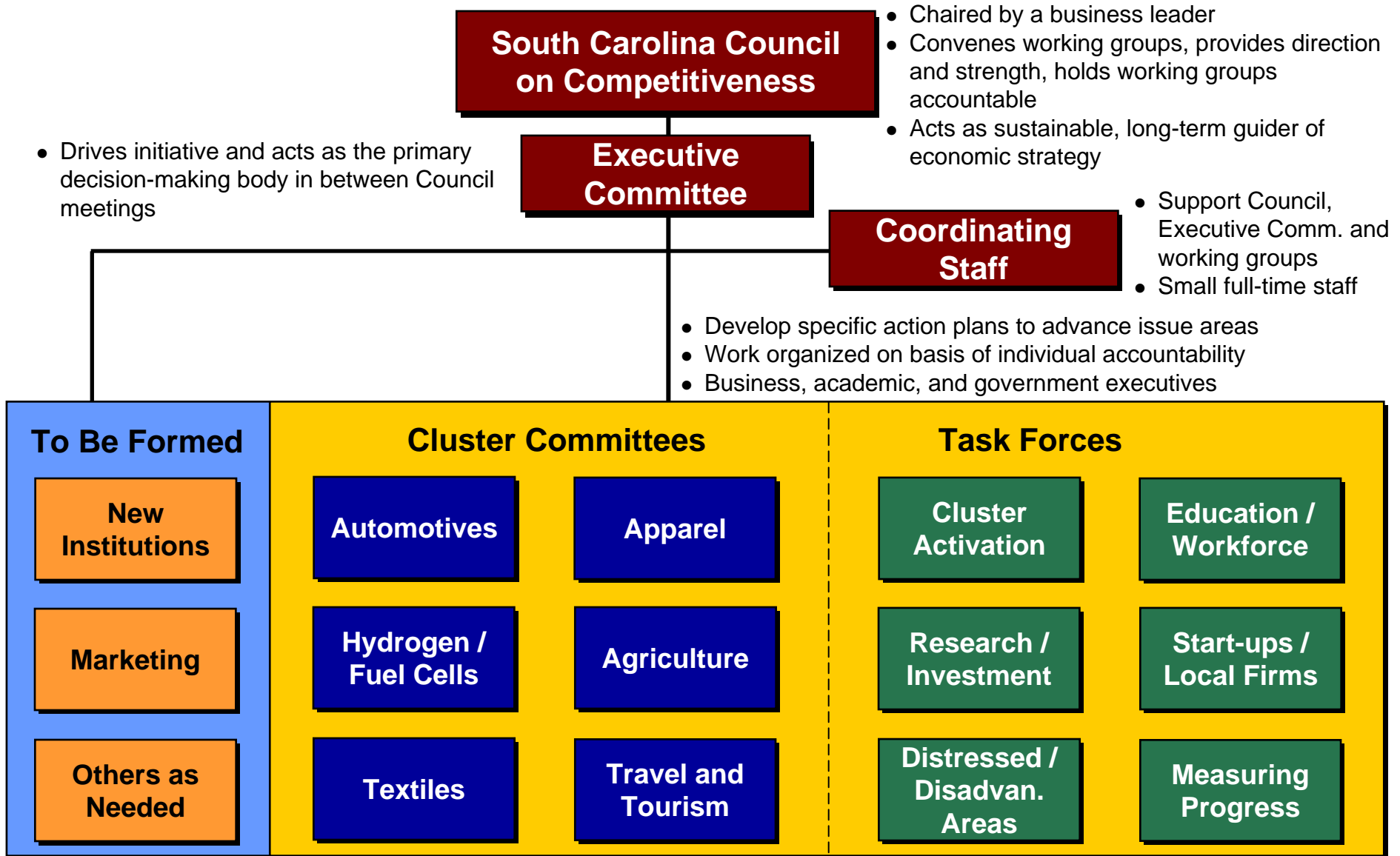
Texas Economic Development Strategy

Next Steps

- Refine cluster definitions
- Widen the range of participating clusters
- Activate and institutionalize the cluster development process
 - Upgrade institutions for collaboration
 - Matching funds for action plans
 - Organization of Department of Economic Development and Tourism
- Focus **public policy** implementation around clusters
- Develop explicit action plans around **cross-cutting initiatives**
 - General education system
- Drive economic development to the regional level
- Create an explicit strategy for addressing **economically distressed urban and rural communities**
- Create an overall **organizational structure** for economic development
 - Public-private collaboration
 - Coordinating mechanism for state agencies

Organizing to Compete

South Carolina Council on Competitiveness



Organizing to Compete Massachusetts Governor's Council

