

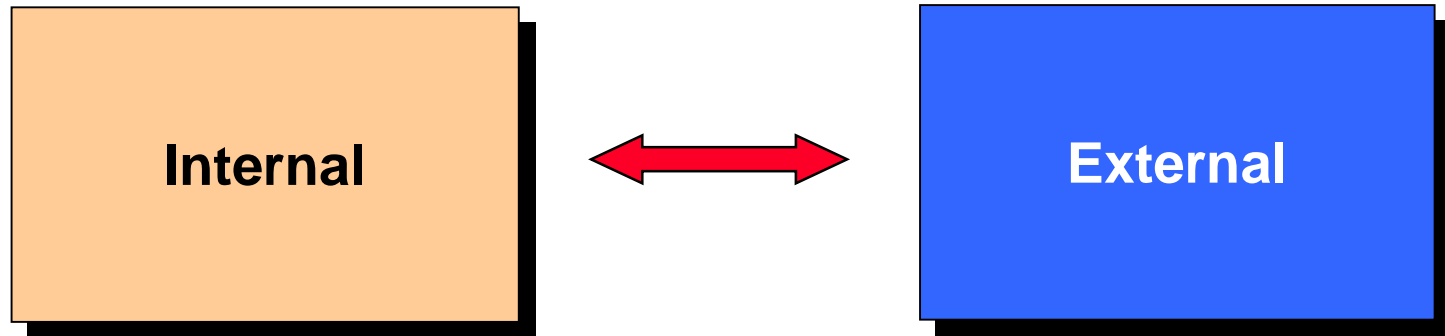
Clusters and Competitiveness: Findings from the Cluster Mapping Project

Professor Michael E. Porter
Harvard Business School

Corporate Strategies for the Digital Economy
Sloan Industry Centers, Cambridge
April 12, 2001

This presentation draws on ideas from Professor Porter's articles and books, in particular, [The Competitive Advantage of Nations](#) (The Free Press, 1990), "The Microeconomic Foundations of Economic Development," in [The Global Competitiveness Report 2000](#), (World Economic Forum, 2000), "Clusters and the New Competitive Agenda for Companies and Governments" in [On Competition](#) (Harvard Business School Press, 1998) and ongoing statistical study of clusters, [Competing for Prosperity: The Microeconomic Foundations of Development](#), forthcoming, and "What is Strategy?" (Harvard Business Review, Nov/Dec 1996). No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means - electronic, mechanical, photocopying, recording, or otherwise - without the permission of Michael E. Porter.

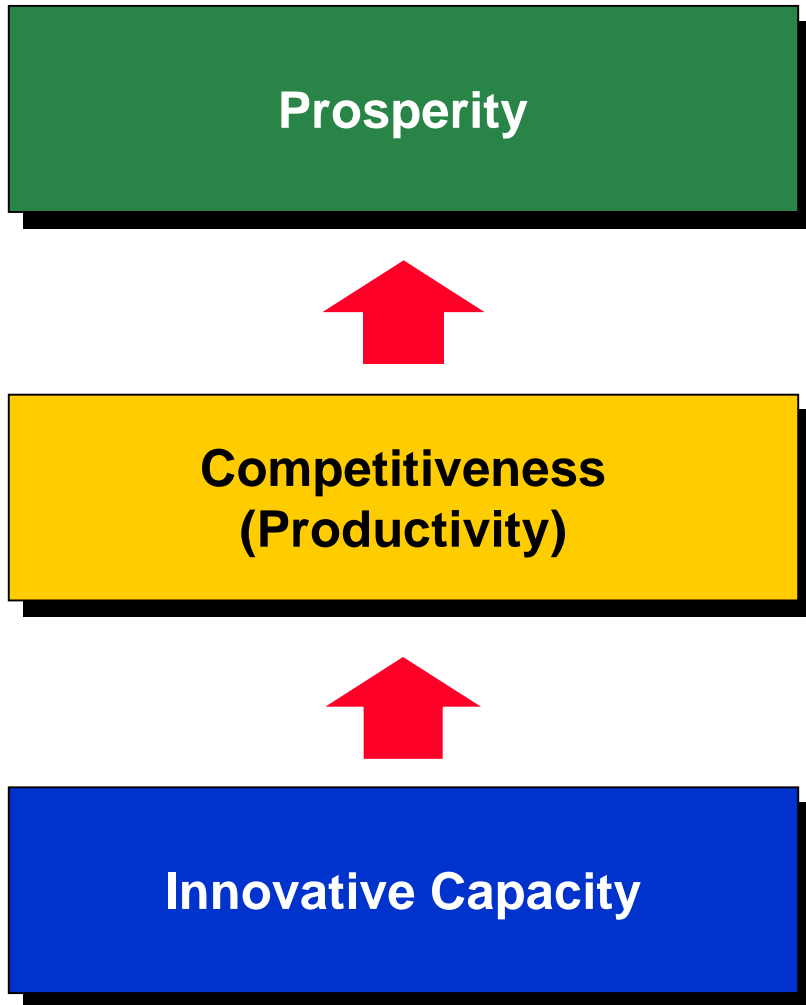
Perspectives on the Sources of Company Success



- Competitive advantage resides **inside a company or in its industry**
- Competitive success depends primarily on **company choices**

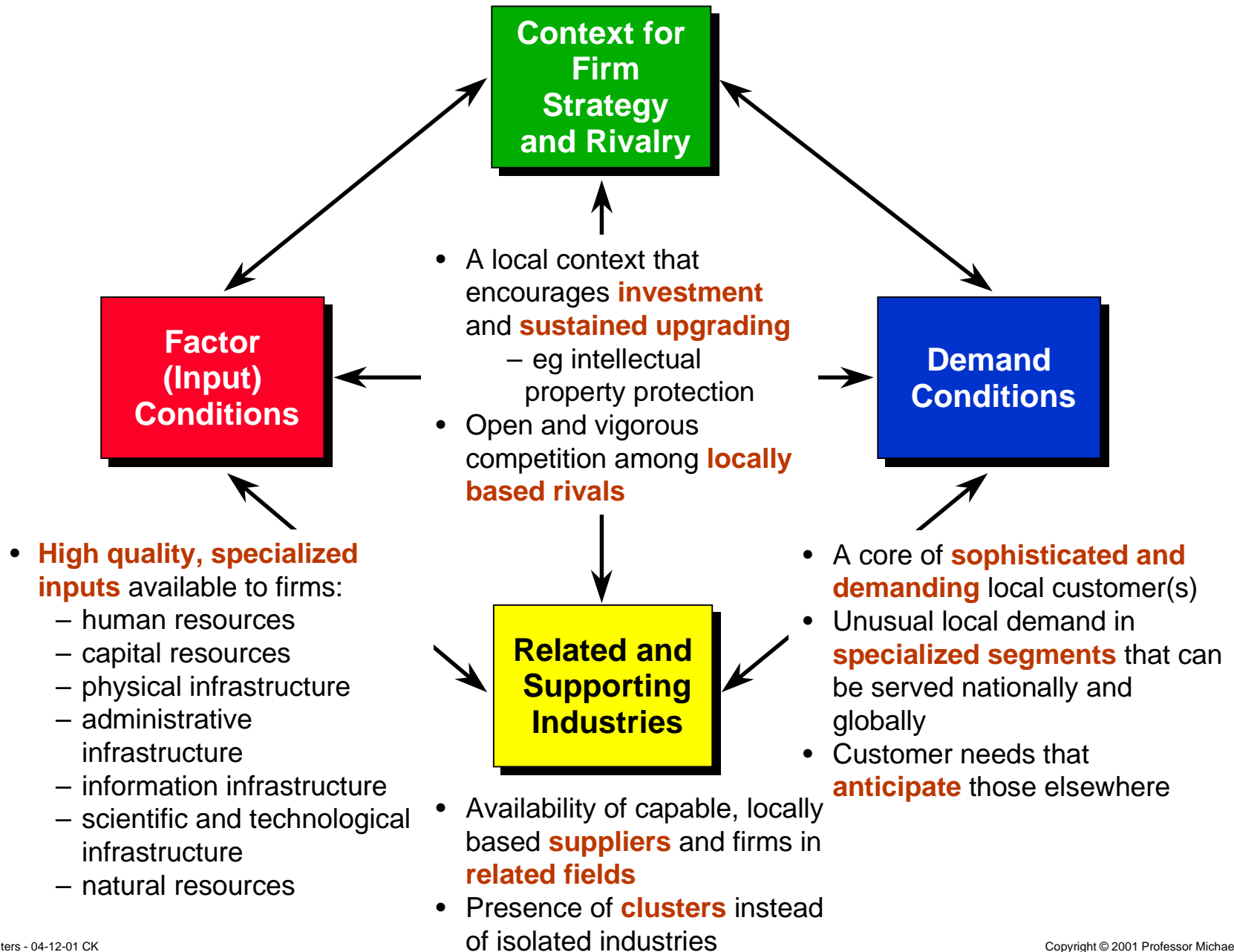
- Competitive advantage resides partly in the **locations** at which a company's business units are based
- **Cluster participation** is an important contributor to company success

Sources of Locational Prosperity

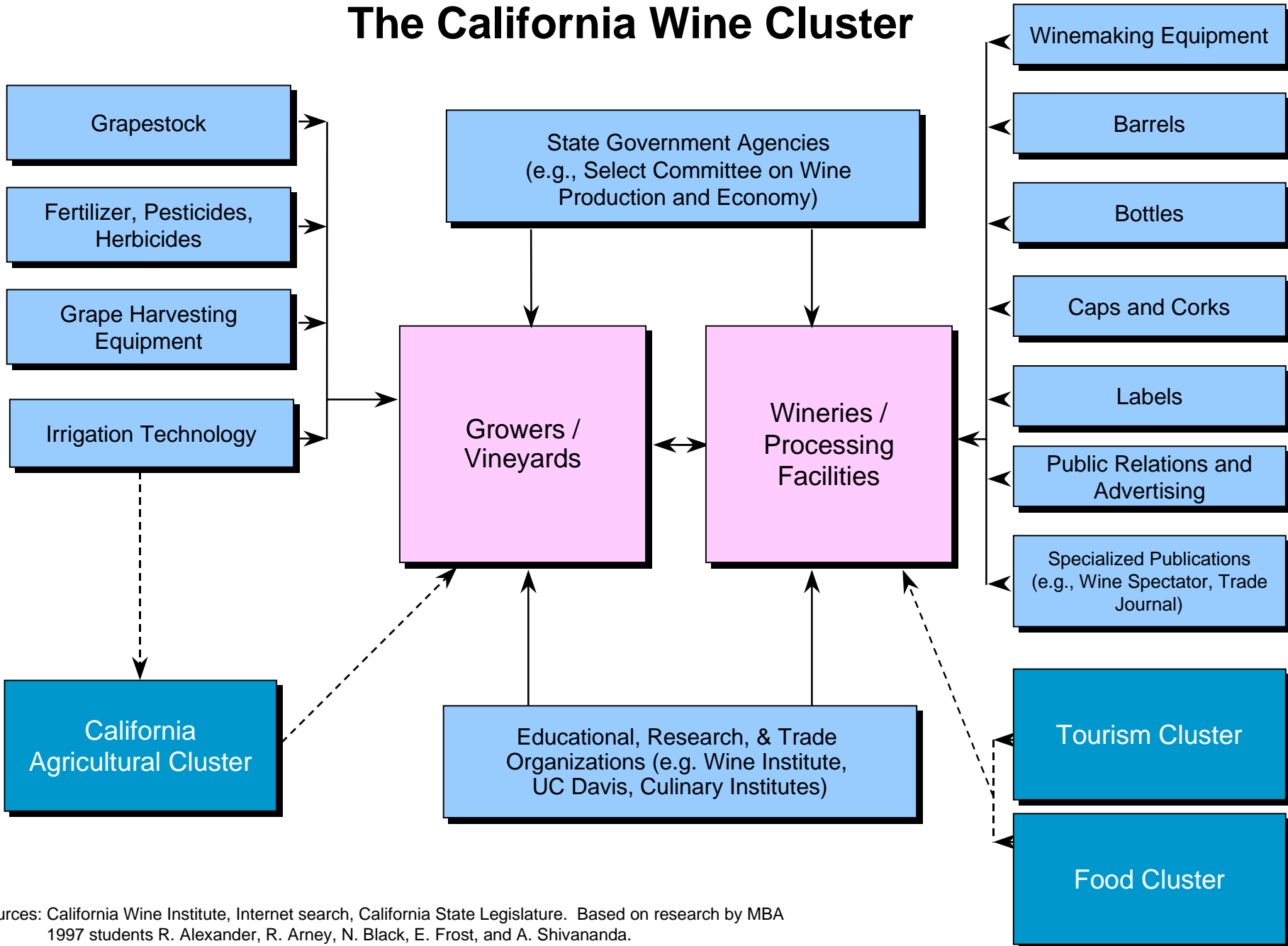


- The most important sources of prosperity are **created** not inherited
- Productivity does not depend on **what** industries a region competes in, but on **how** it competes
- The prosperity of a region depends on the productivity of **all** its industries
- There are no low-tech industries, only **low-tech firms**

Productivity and the Business Environment



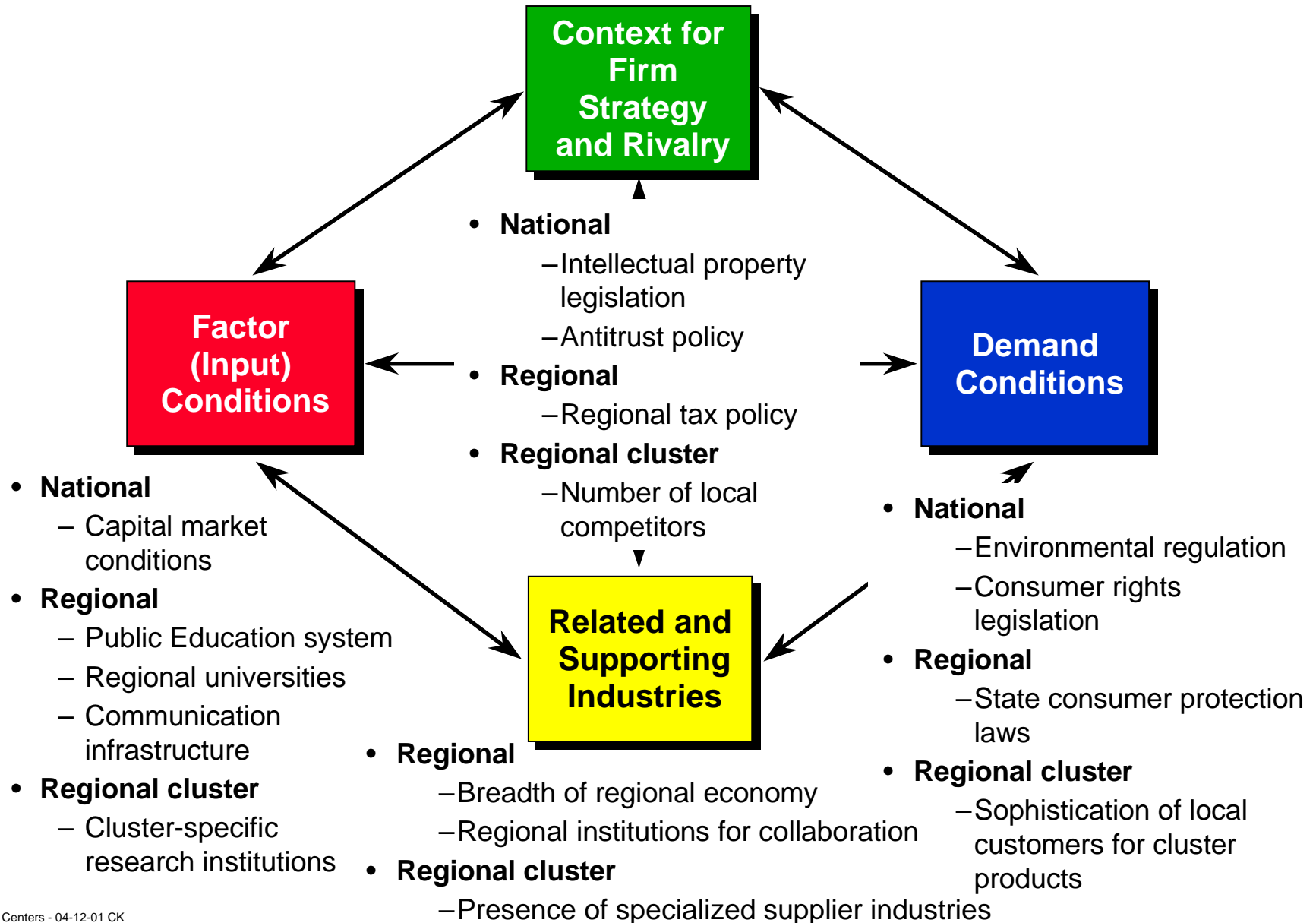
The California Wine Cluster



Sources: California Wine Institute, Internet search, California State Legislature. Based on research by MBA 1997 students R. Alexander, R. Arney, N. Black, E. Frost, and A. Shivananda.

Determinants of Regional Competitiveness and Innovation

Illustrative Levels of Influence



Institutions for Collaboration

Selected San Diego Institutions

Private Sector

General

- UCSD CONNECT
- San Diego Chamber of Commerce
- Corporate Director's Forum
- San Diego Dialogue
- Service Corps of Retired Executives, San Diego

Cluster Specific

- BIOCOM
- Telecom Council

Joint Private / Public

- San Diego Regional Economic Development Corporation
- Center for Applied Competitive Technologies
- San Diego World Trade Center

Informal Networks

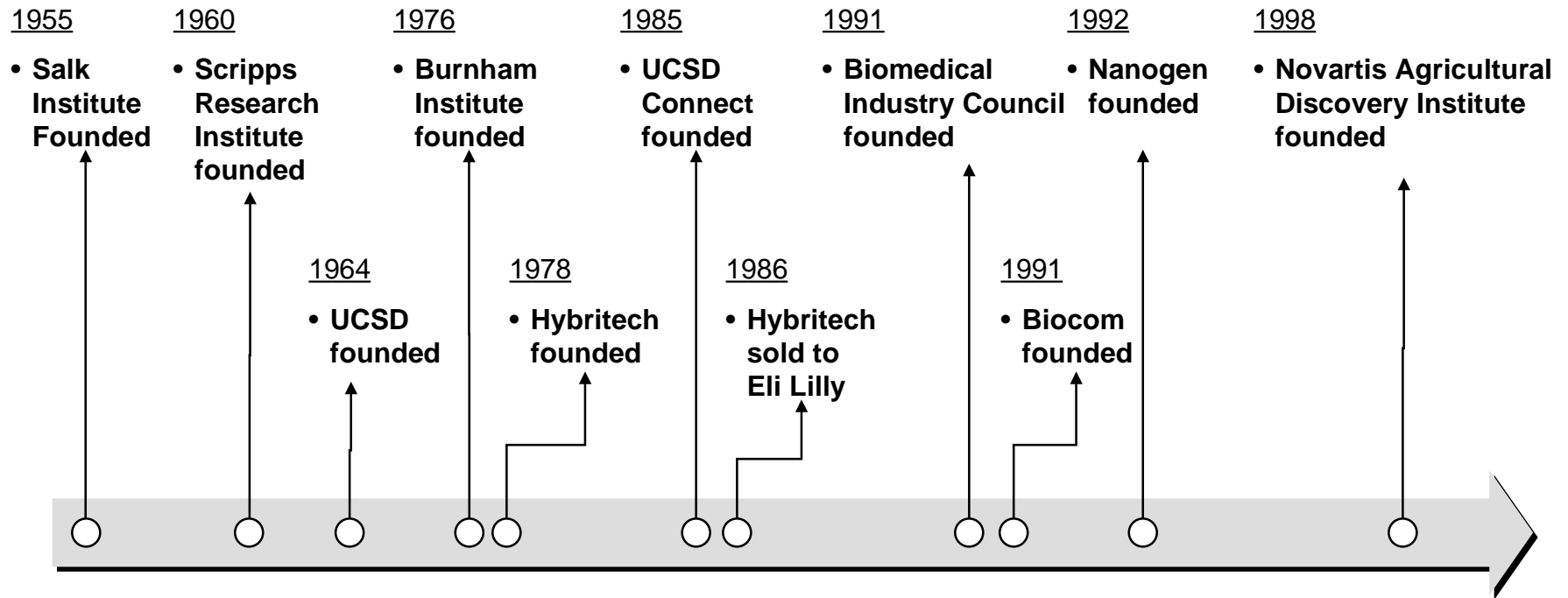
- Linkabit Alumni
- Hybritech Alumni
- UCSD Alumni
- Scripps Research Institute Alumni

Public Sector

- San Diego Association of Governments
- San Diego Regional Technology Alliance
- San Diego Science and Technology Council
- Office of Trade and Business Development
- Small Business Development and International Trade Center

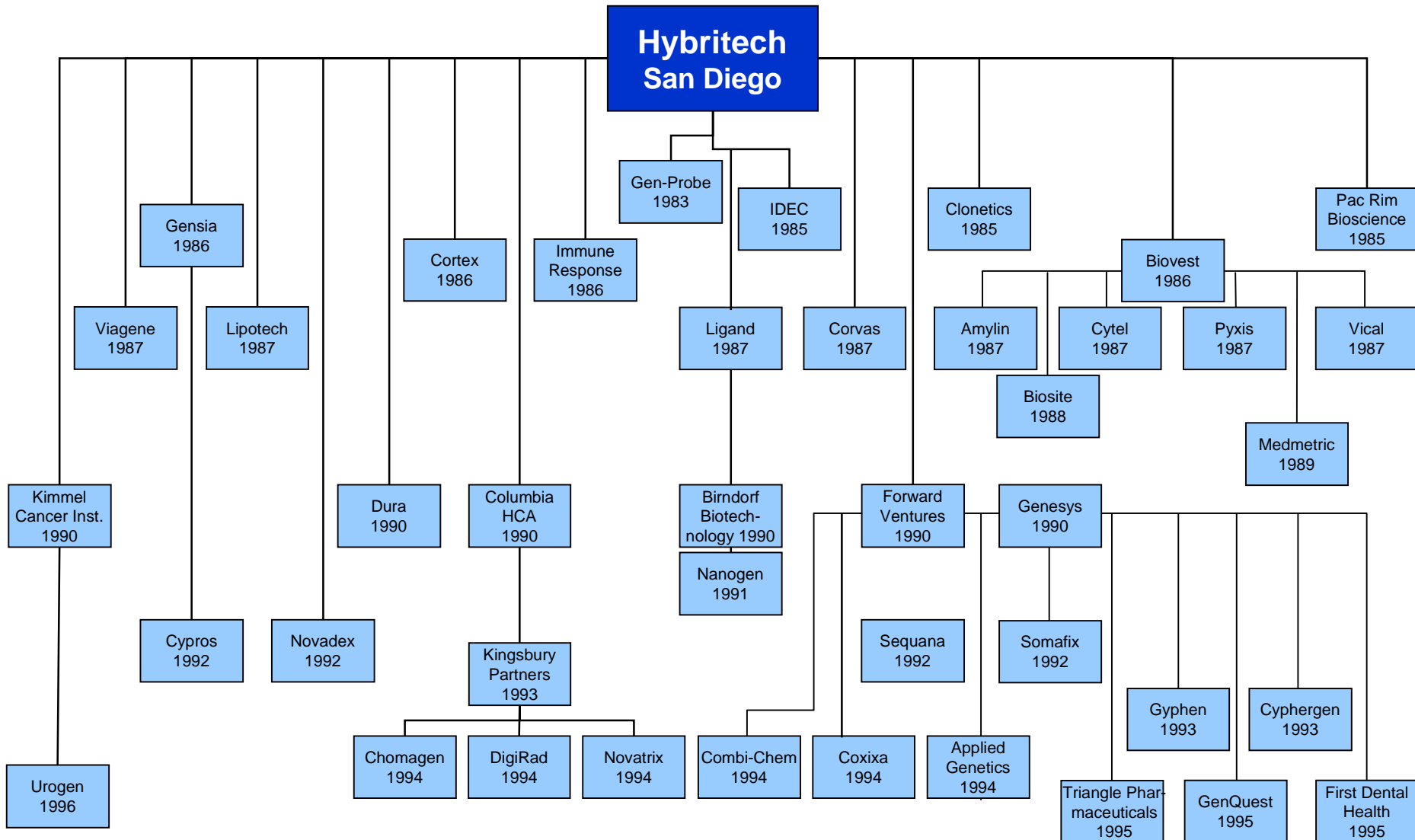
The Process of Cluster Development

History of the San Diego Biotech / Pharma Cluster



The Process of Cluster Development

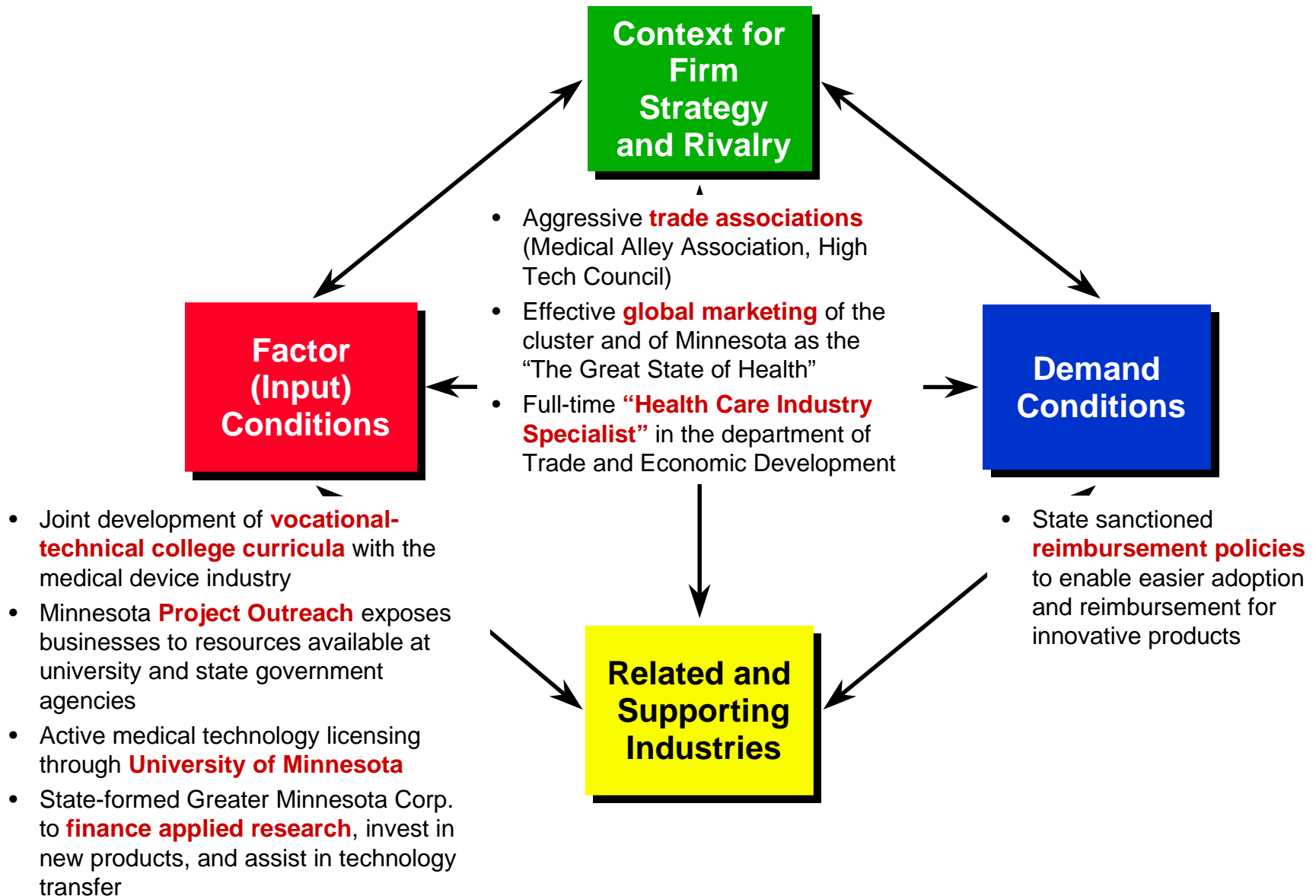
The Role of Anchor Companies



Source: CONNECT, University of California, San Diego

Public / Private Cooperation in Cluster Upgrading

Minnesota's Medical Device Cluster



Organizing for Competitiveness

Commonwealth of Massachusetts

Governor's Council on Economic Growth and Technology

Functional Task Forces

- International Trade
- Marketing Massachusetts
- Tax Policy and Capital Formation
- Technology Policy and Defense Conversion

Issue Groups

- Cost of Doing Business
- Financing of Emerging Companies
- Health Care Restructuring
- Revitalizing Western Massachusetts

Industry Cluster Working Groups

- Advanced Materials
- Biotechnology and Pharmaceuticals
- Defense
- Marine Science and Technology
- Medical Devices
- Software
- Telecommunications
- Textiles

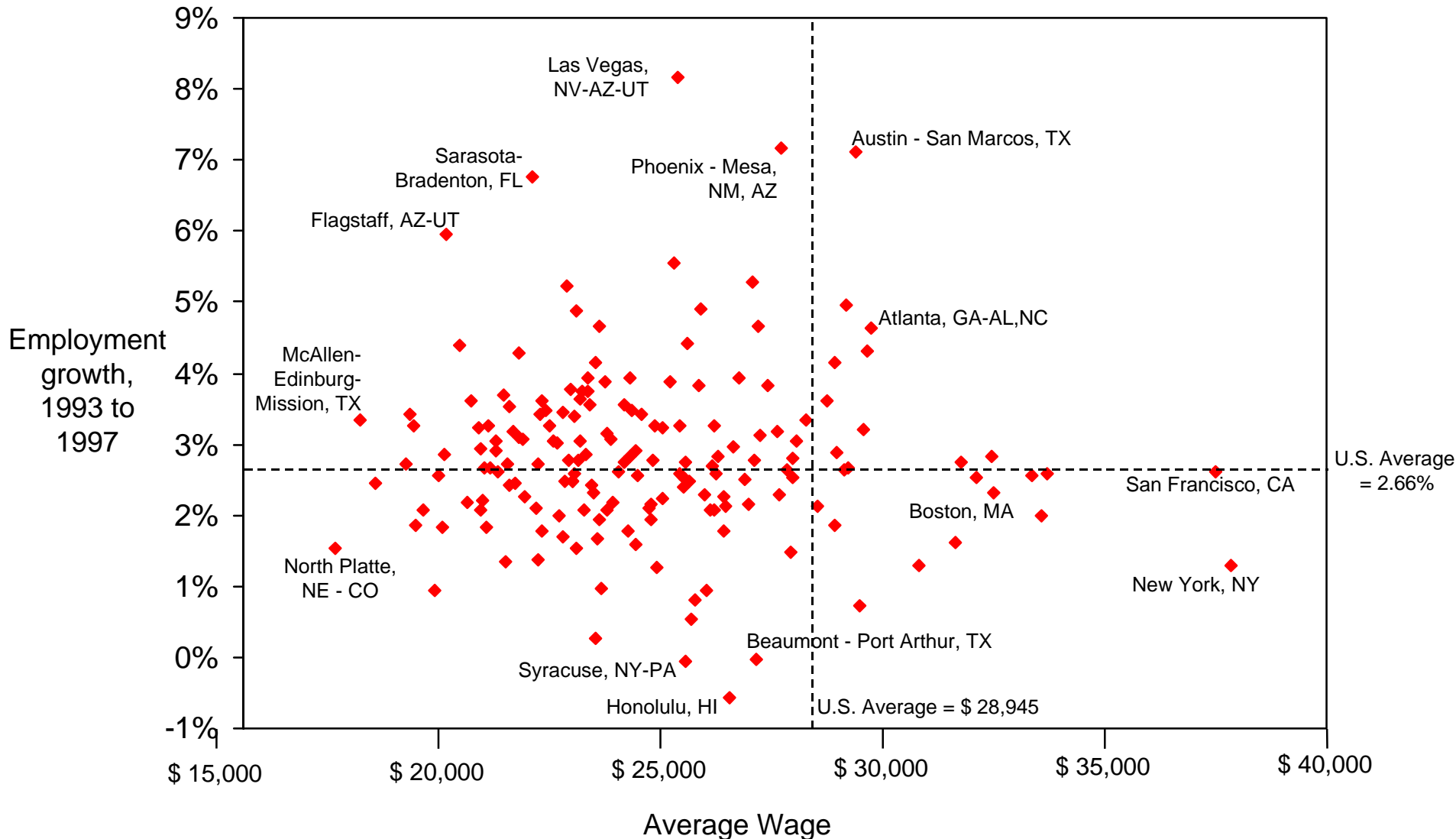
Location and Competition

Summary

- Part of competitive advantage lies **outside** the firm
- Traditional input (factor) comparative advantages are playing a **diminishing** role in international competitiveness
- Conditions in the diamond shape the potential for **productivity and innovation** at a location
 - Many are counterintuitive to managers and governments
- Clusters represent an **efficient organizational form** compared to global outsourcing and vertical integration
- The broader locational advantages of clusters are **difficult to access** without full local presence
- Cluster development is **not automatic** though clusters often arise spontaneously
 - Chance often has an influence
- Clusters represent a new way for firms and governments to **view the economy**
- There are **new roles for firms** in enhancing locational advantages, including collective private activities
- Clusters suggest **new priorities for government** that must be reinforced by the private sector

Economic Performance Across Regions

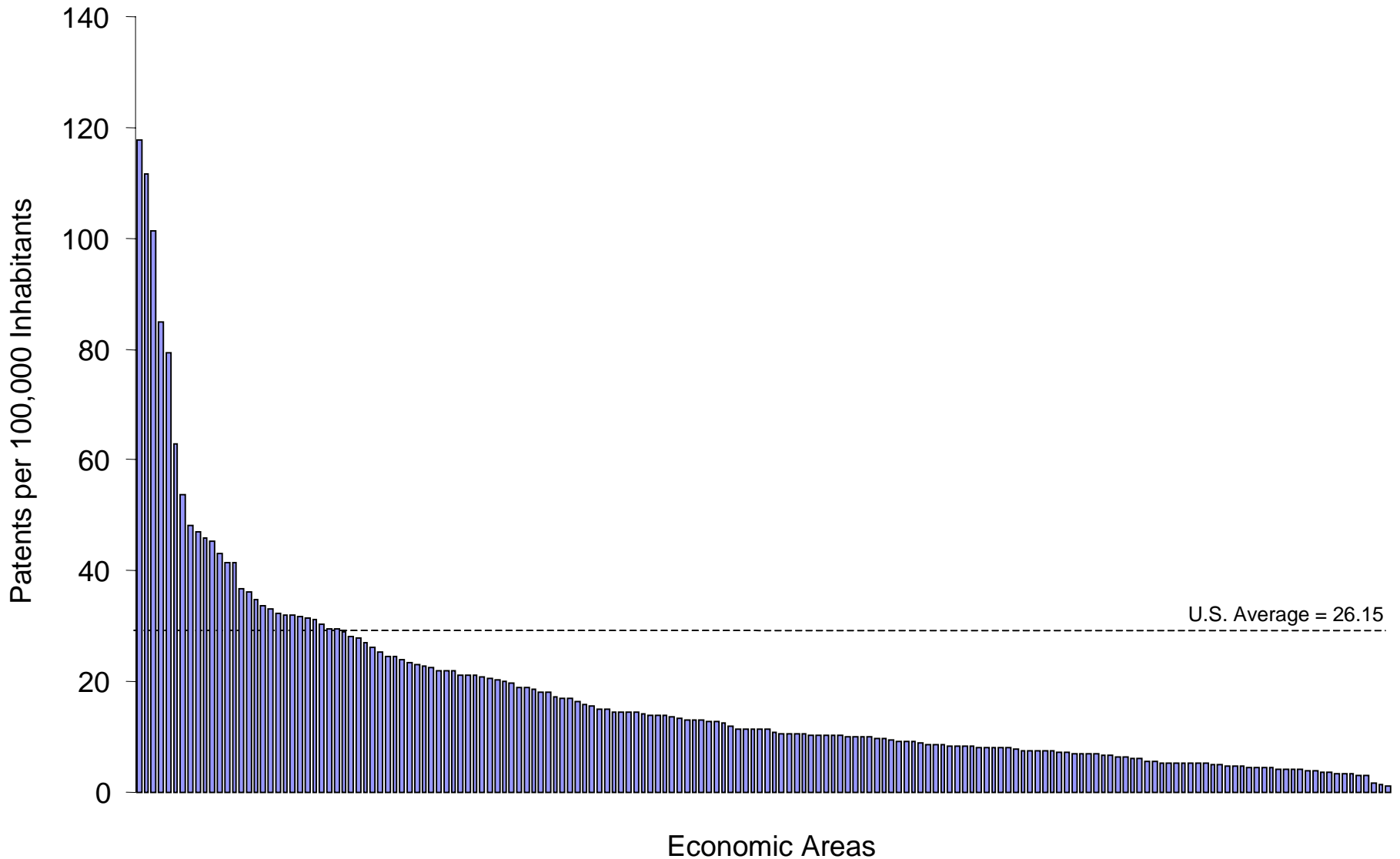
Compound Annual Employment Growth, 1993 to 1997



Note: There are 172 Economic Areas in the United States
 Source: Cluster Mapping Project, Harvard Business School
 Sloan Industry Centers - 04-12-01 CK

Economic Performance Across Regions

Patents per Capita, 1997

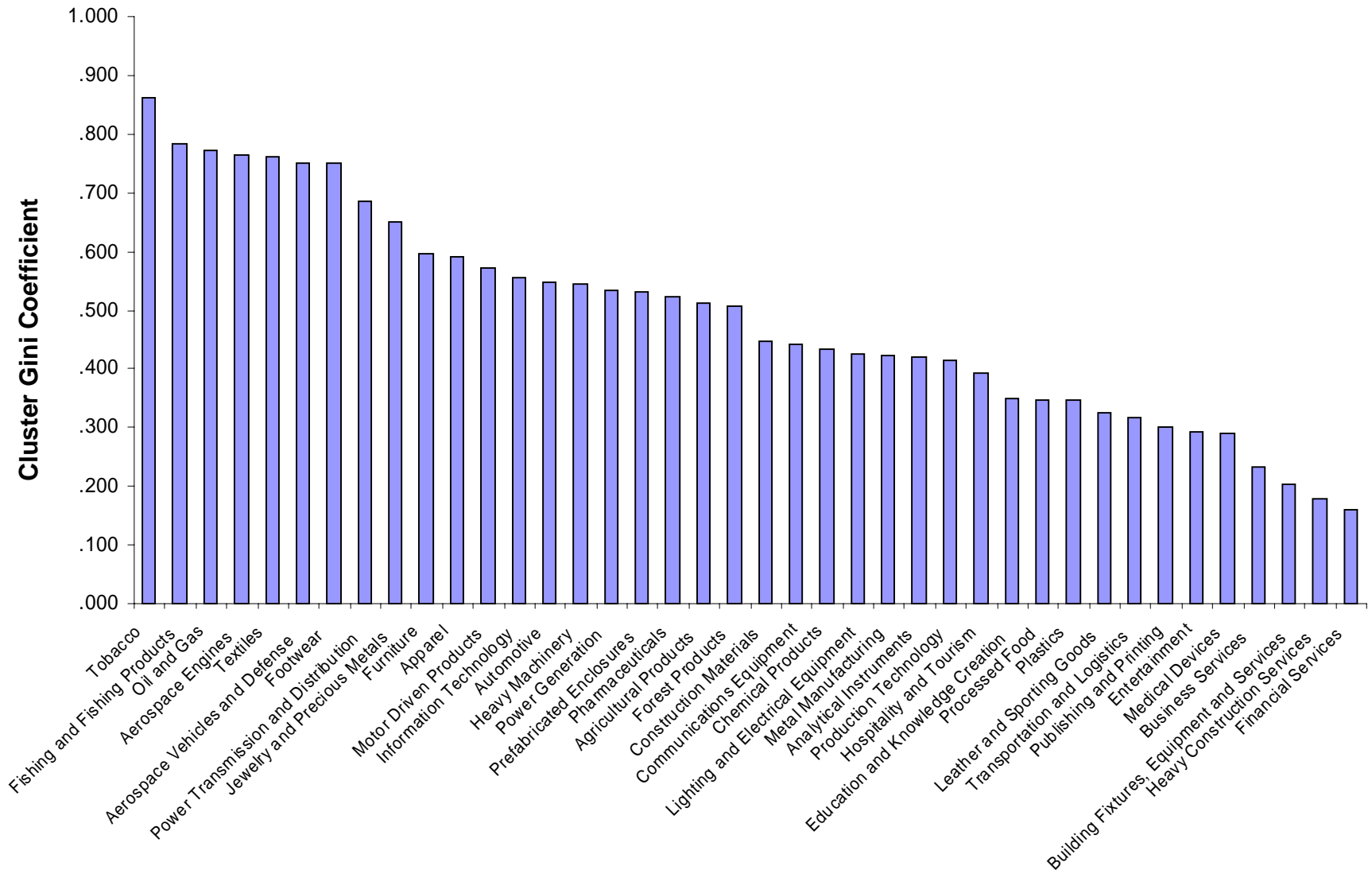


U.S. Average = 26.15

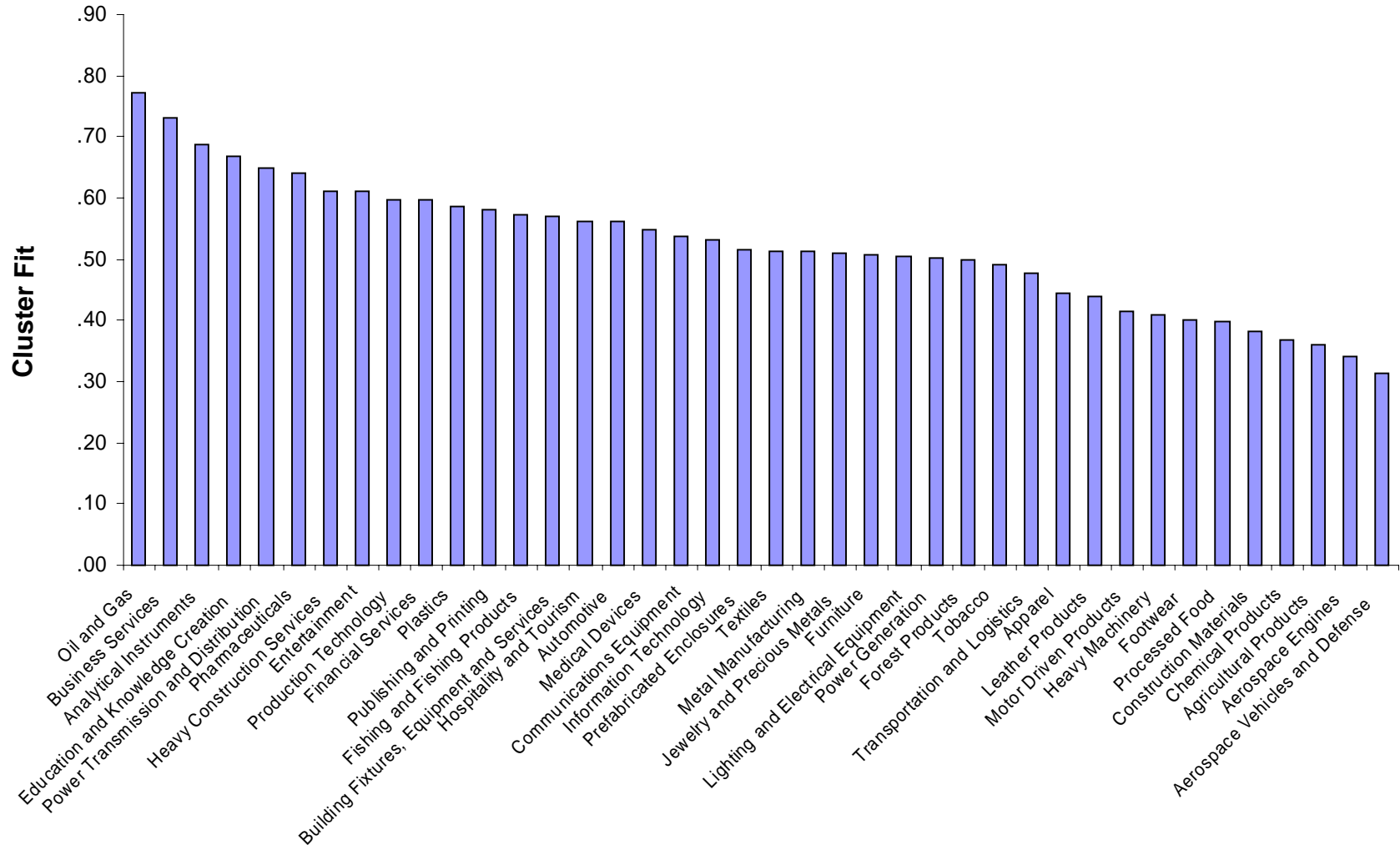
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Regional Cluster Concentration, Average 1999 to 1997

Tier 1 Industries



Average Cluster Fit, Average 1988 to 1997

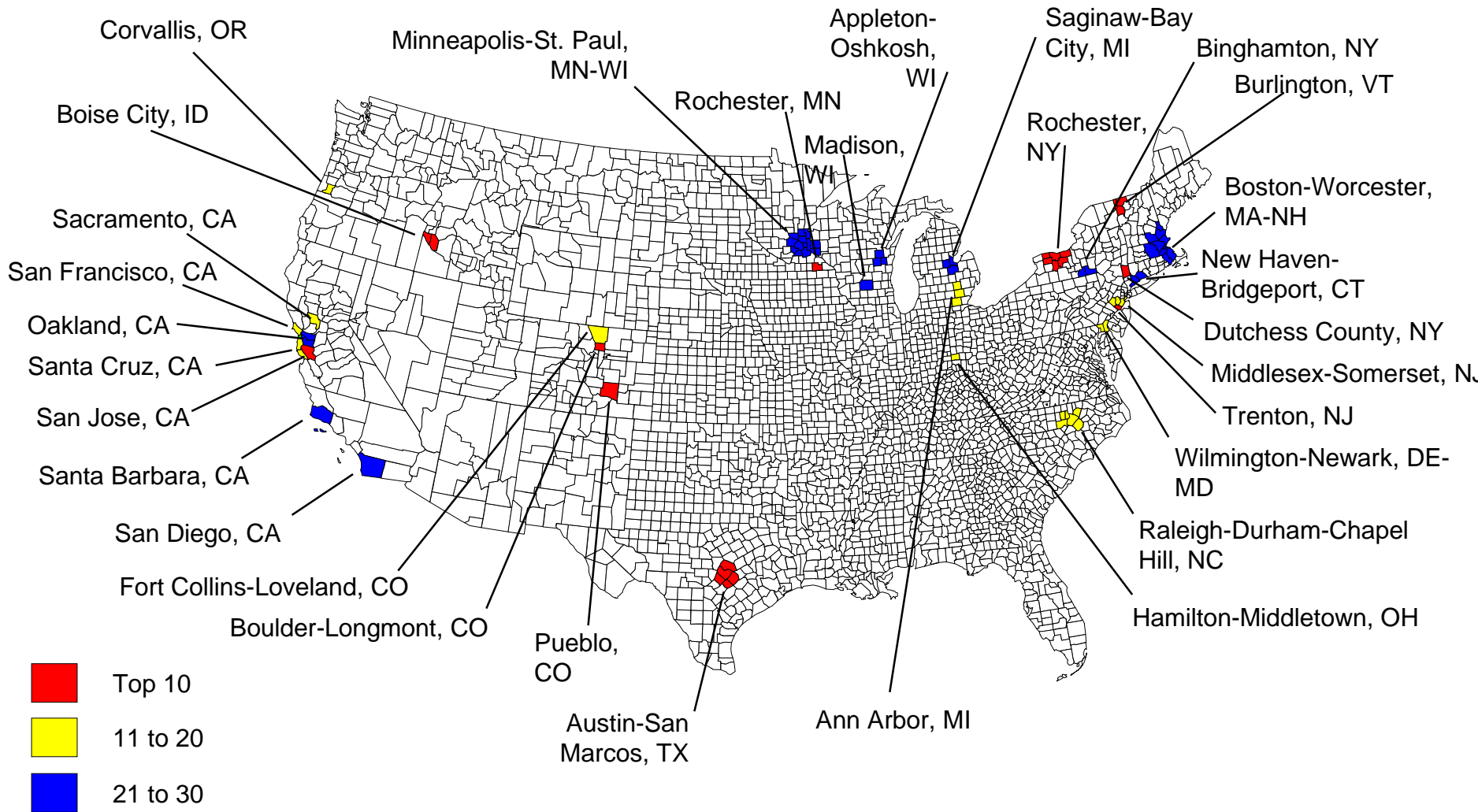


Note: Cluster Fit = Average Bilateral Locational Correlation of Employment, Tier 1 Industries.

Source: Cluster Mapping Project, Harvard Business School

Top 30 Metropolitan Areas By Patenting Intensity

Patenting Per Capita, 1997



Composition of Regional Economies

Traded Clusters (40)

e.g., Medical Devices, Financial Services

32.4% of employment

Natural Resource- Driven Industries

e.g., Forestry, Coal

0.9 % of employment

Local Clusters (19)

e.g., Personal Services, Local Construction and Development

66.7% of employment

Note: 1997 data

Source: Cluster Mapping Project, Harvard Business School

Sloan Industry Centers - 04-12-01 CK

Composition of Regional Economies (cont.)

	Traded Clusters	Local Clusters	Natural Resource-Driven Industries
Share of Employment	32.4%	66.7%	0.9%
Employment Growth, 1993 to 1997	2.2%	3.1%	0.8%
Average Wage	\$36,920	\$23,800	\$30,390
Relative Wage	131.4	84.7	108.2
Wage Growth	4.4%	3.4%	3.0%
Relative Productivity	126.2	87.5	138.2
Patents per 10,000 Employees	15.97	1.14	5.40
Number of SIC Industries	574	258	46

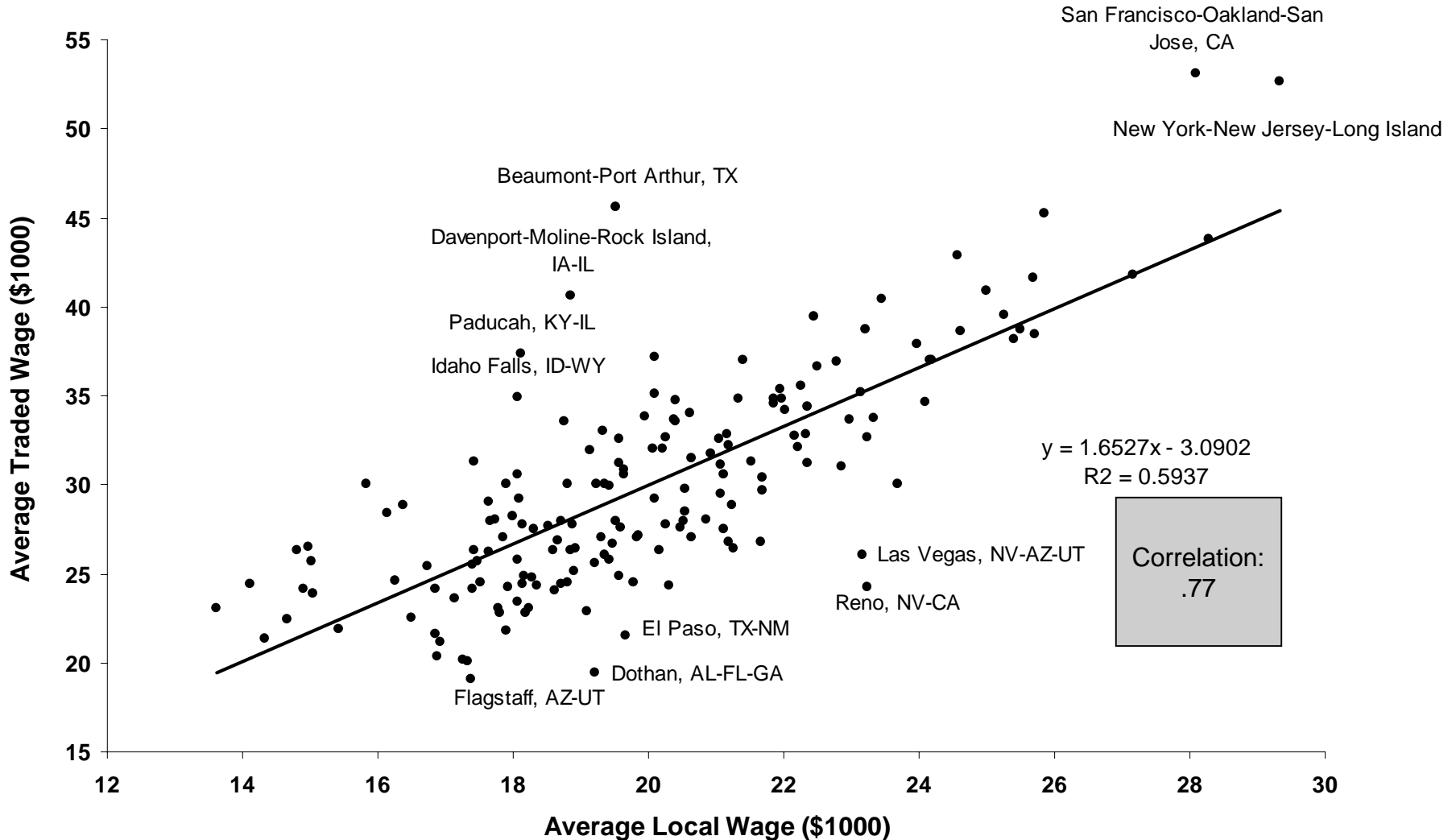
Note: 1997 data

Source: Cluster Mapping Project, Harvard Business School

Sloan Industry Centers - 04-12-01 CK

Economic Importance of Traded Clusters

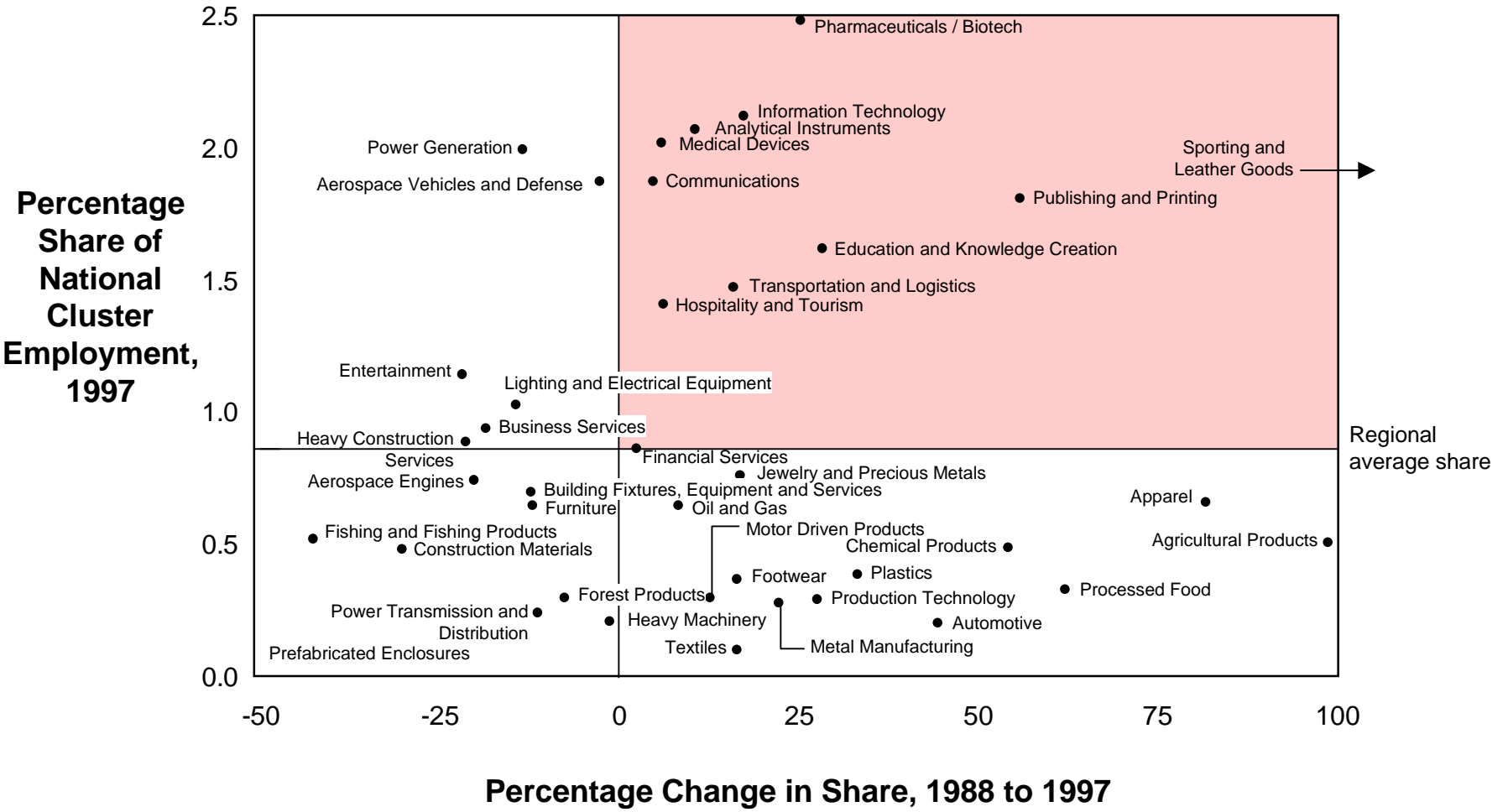
Traded vs. Local Wages by Economic Area, 1997



Note: There are 172 Economic Areas in the United States
 Source: Cluster Mapping Project, Harvard Business School

Specialization of the San Diego Economy

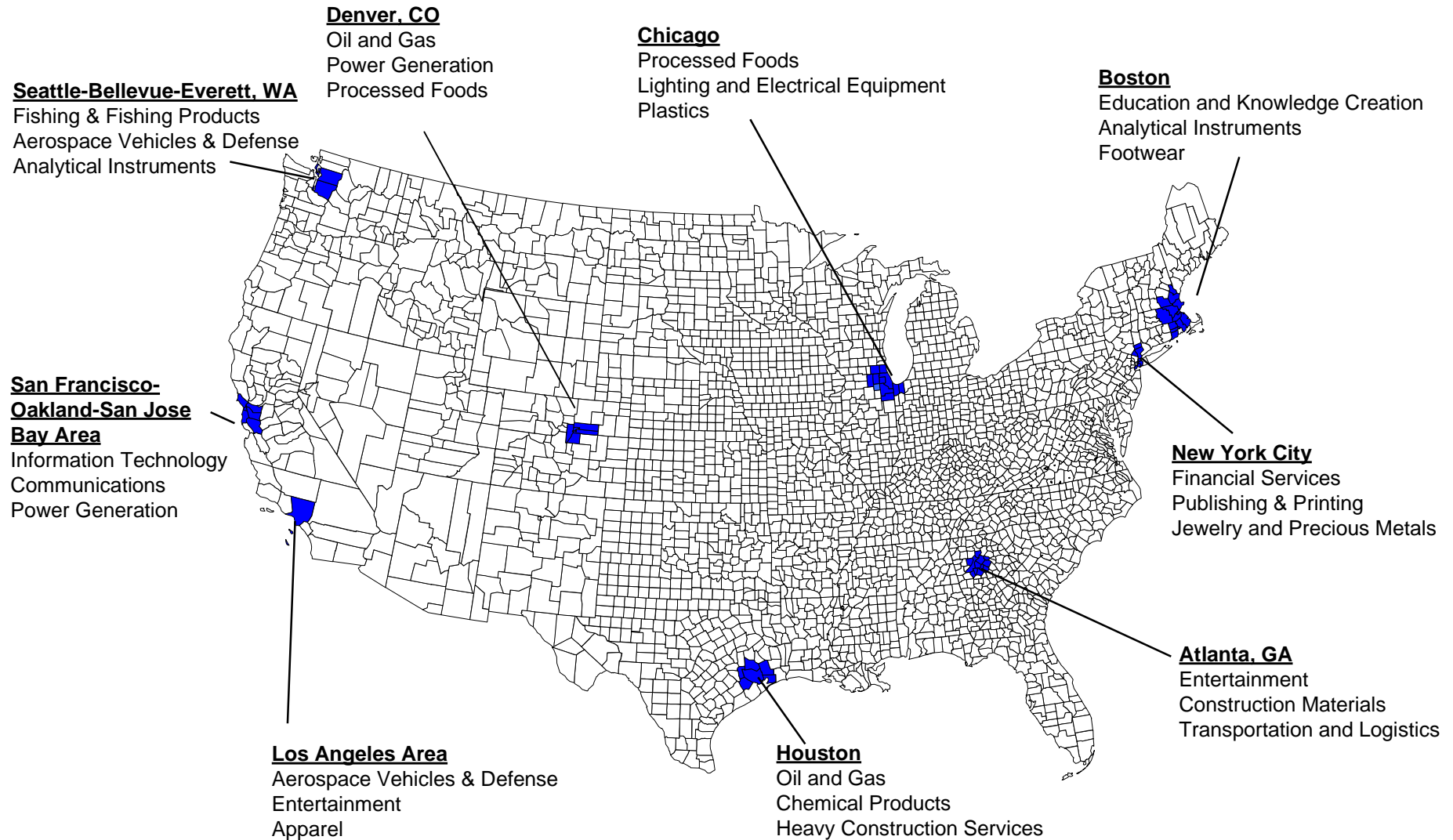
Traded Clusters by Size and Relative Growth Rate



Source: Cluster Mapping Project, Harvard Business School
 Sloan Industry Centers - 04-12-01 CK

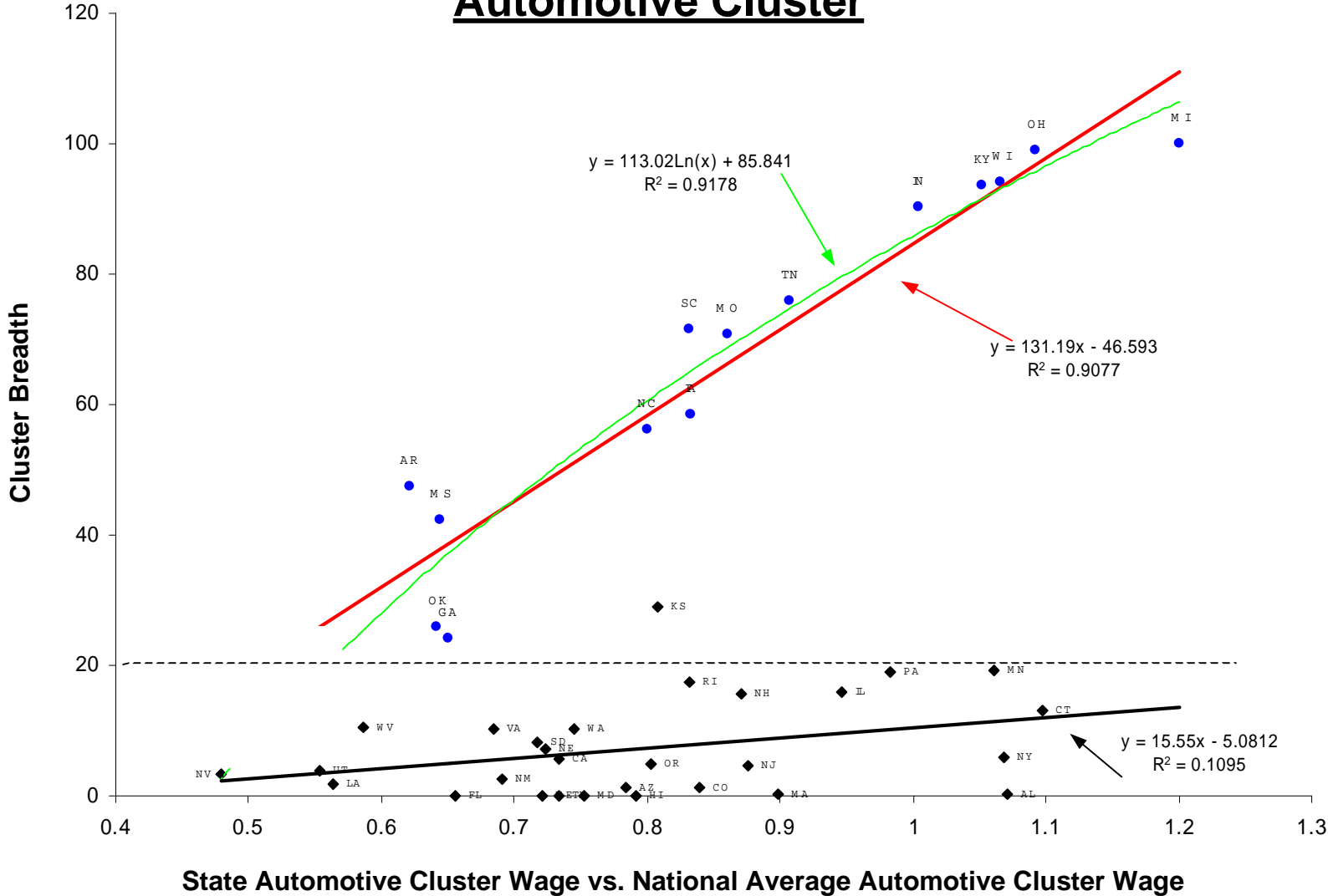
Top Three Clusters by National Rank

Selected Metropolitan Areas



The Effect of Cluster Breadth on Wages

Automotive Cluster



*Cluster breadth = weighted percentage of number of industries in the cluster with location quotient ≥ 1 .

**Tier 1 industries.

Source: Cluster Mapping Project, Harvard Business School