

# Basque Competitiveness

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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 2001/02, (World Economic Forum, 2001), "Clusters and the New Competitive Agenda for Companies and Governments" in On Competition (Harvard Business School Press, 1998), ongoing statistical study of clusters, and "What is Strategy?" (Harvard Business Review, Nov/Dec 1996). For further information check the web site of the Institute at [www.isc.hbs.edu](http://www.isc.hbs.edu). 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.

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# The Basque Economy

## Situation in 1990

- High unemployment rates
- Reliance on heavy industries that were contracting, e.g. Steel and Shipyards
- The crisis led to a concerted effort to improve competitiveness



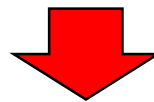
- A competitiveness strategy was put in place and implemented over a **sustained** period
- As of 2002, the Basque Country has made **significant progress**
  - Unemployment rates are down
  - Prosperity levels are up
  - Industrial structure has been upgraded
- At higher income levels, the Basque country faces **the next set of challenges** for the competitiveness of its business environment

# Agenda

- **Foundations of competitiveness and the role of regions**
- Basque competitive performance
- Basque competitiveness: The next agenda

# Sources of Rising Prosperity

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



- Regions or nations compete in offering the **most productive environment** for business
- The public and private sectors play **different but interrelated roles** in creating a productive economy

# Determinants of Productivity and Productivity Growth

Macroeconomic, Political, Social, and Legal  
Context for Development

## Microeconomic Foundations of Development

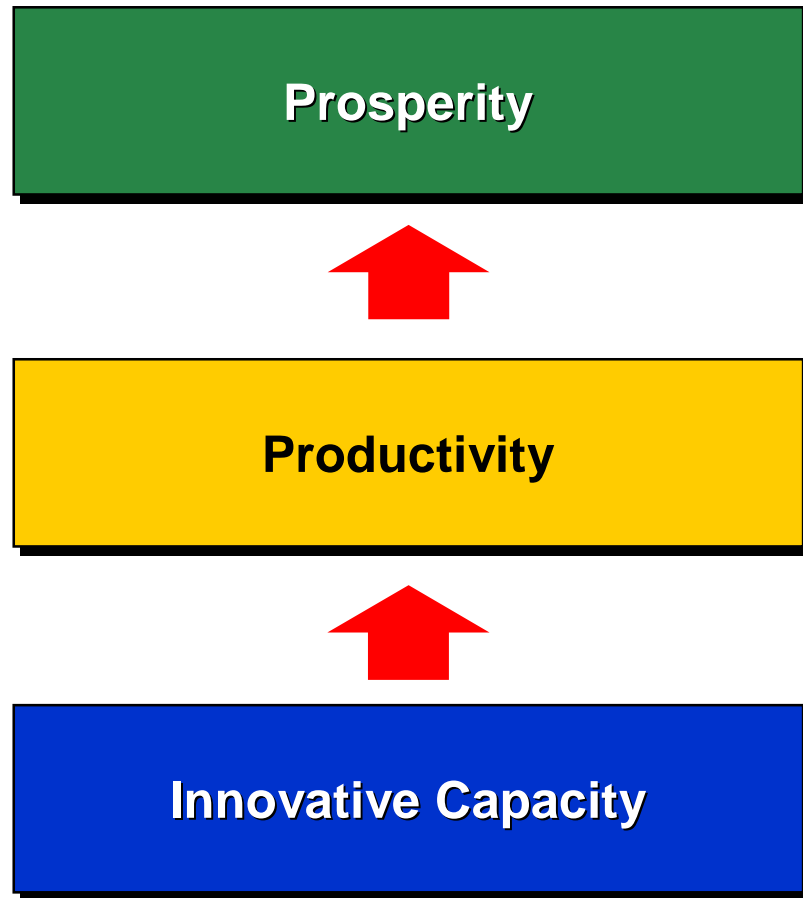
Sophistication  
of Company  
Operations and  
Strategy



Quality of the  
Microeconomic  
Business  
Environment

- A sound macroeconomic, political, social, and legal context creates the potential for competitiveness, **but is not sufficient**
- Competitiveness ultimately depends on improving the **microeconomic capability** of the economy and the **sophistication of local competition**

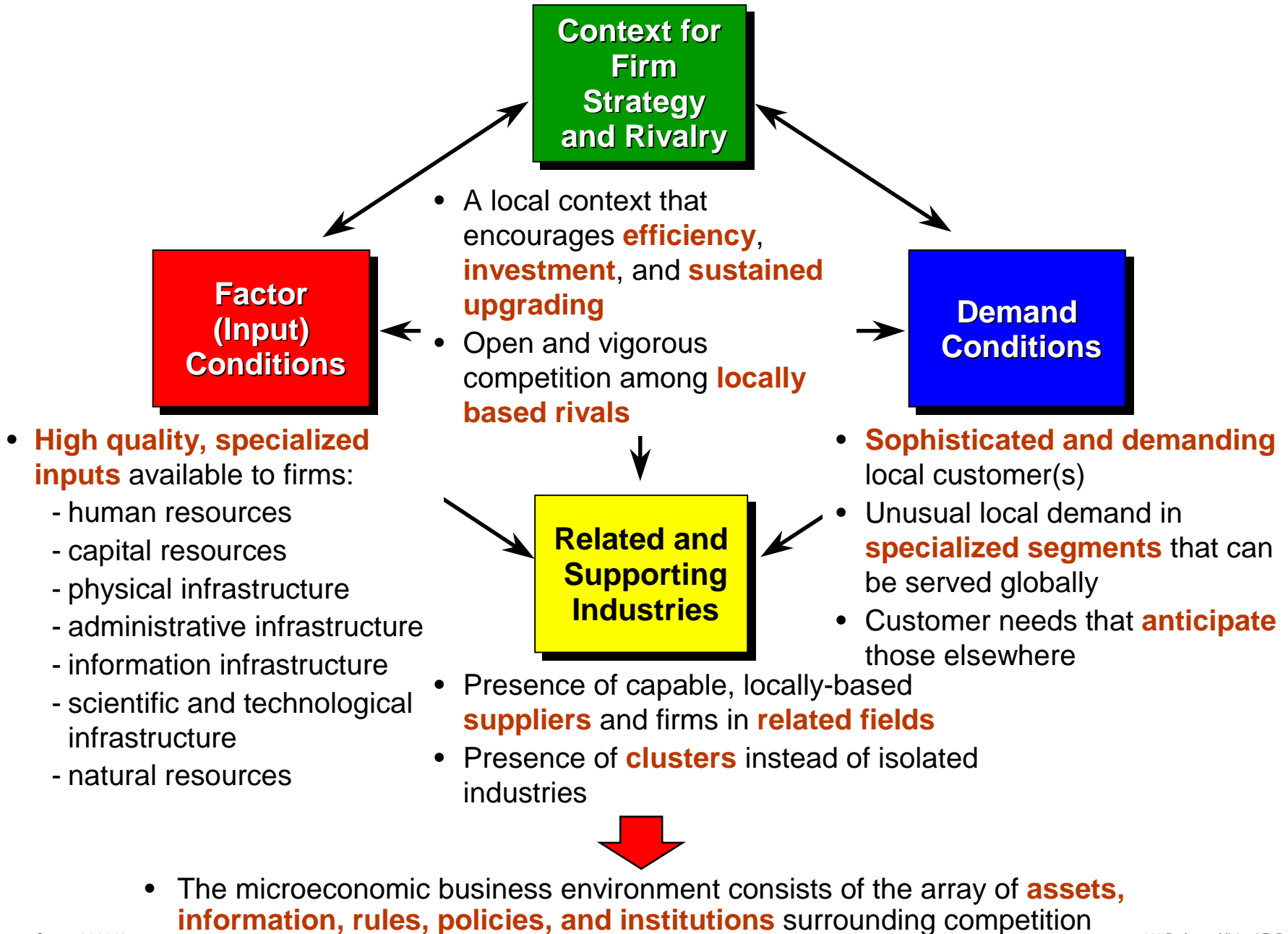
# Innovation and Prosperity



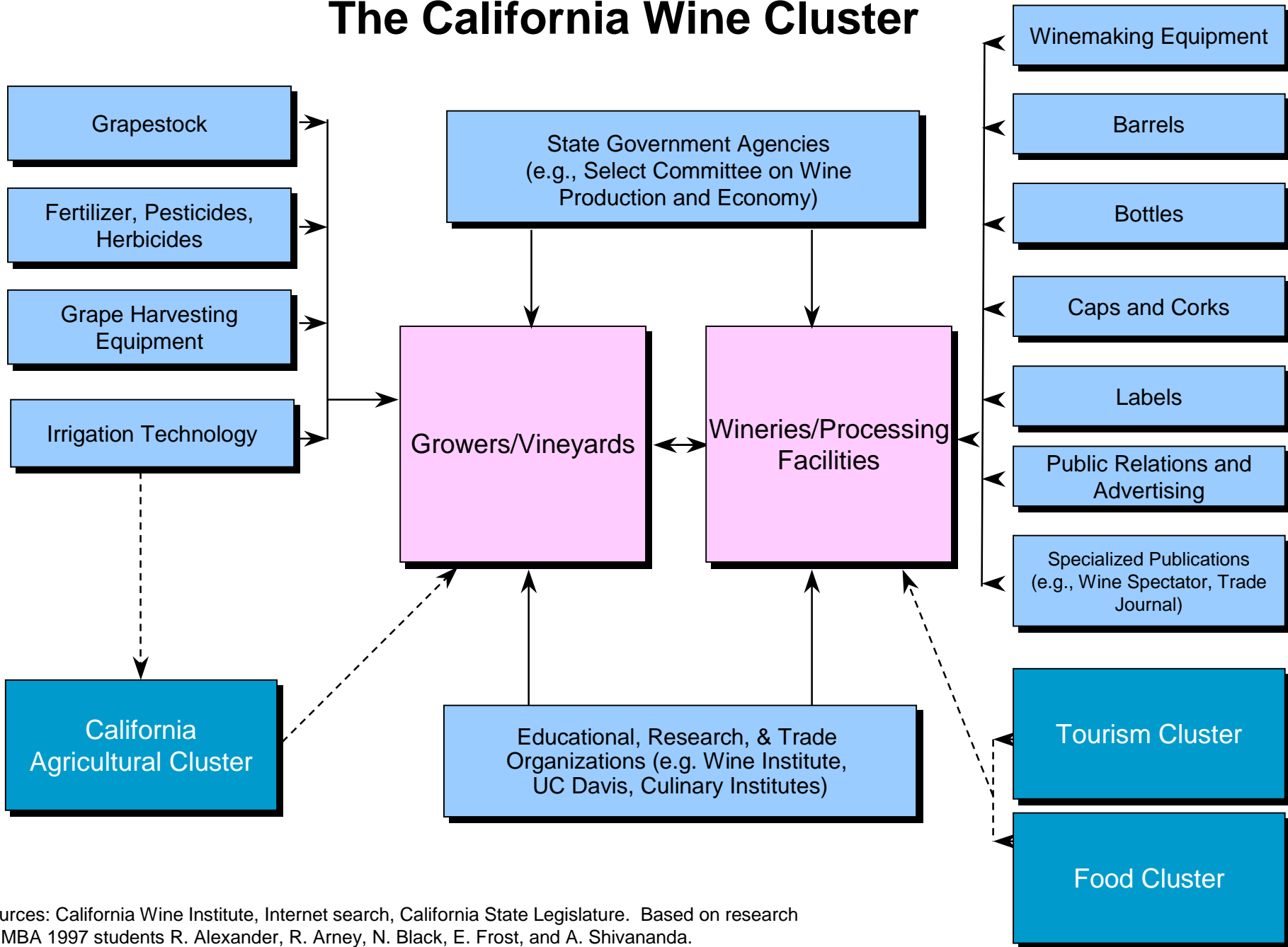
*“Competitiveness”*

- Innovation is **more than just scientific discovery**
- There are **no low-tech industries**, only low-tech firms

# Productivity and the Microeconomic 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.



# Institutions for Collaboration

## Selected Institutions for Collaboration in San Diego

### Private Sector

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

### 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

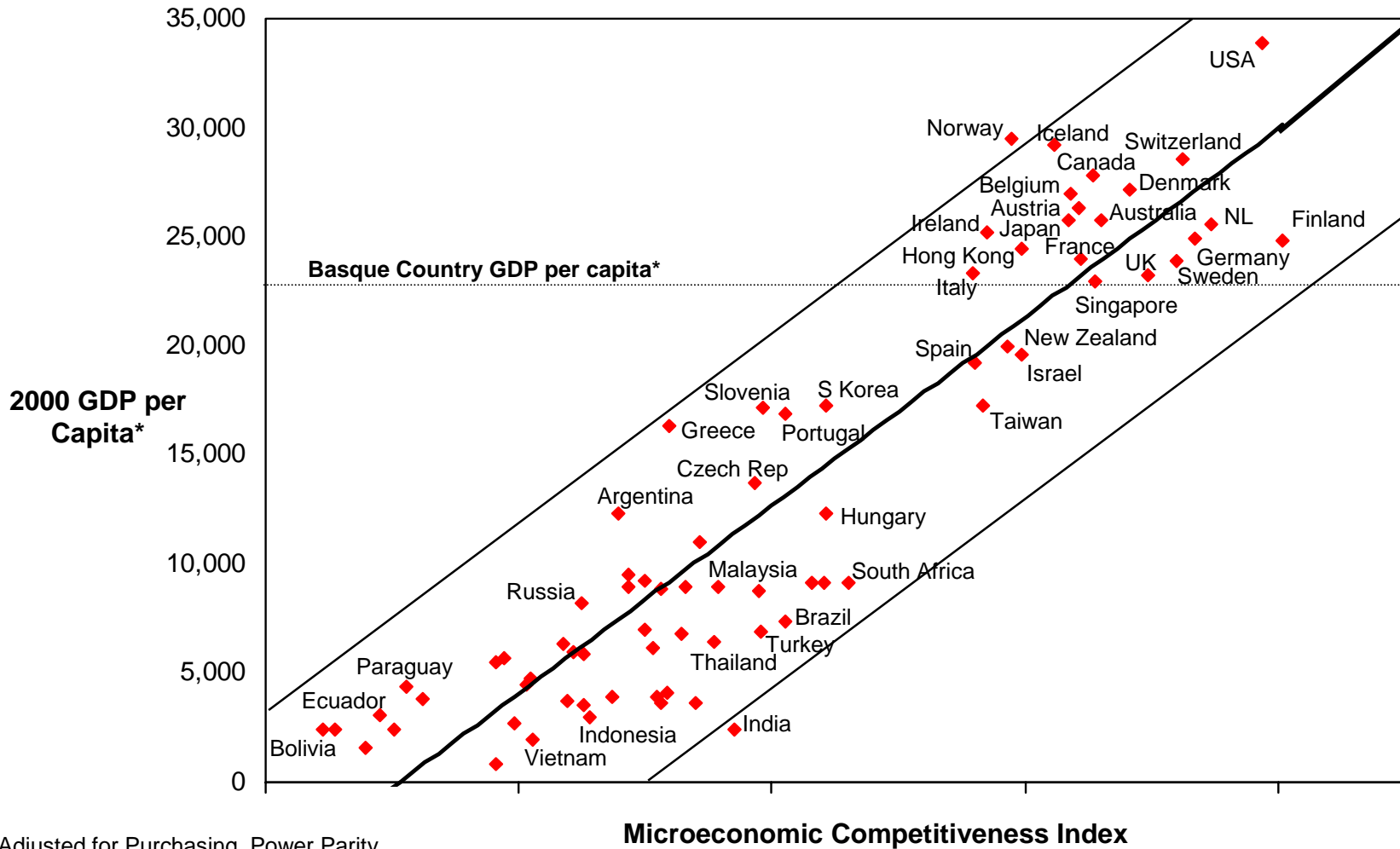
- San Diego Association of Governments
- San Diego Regional Technology Alliance
- San Diego Science and Technology Council
- Office of Trade and Business Development
- Small Business Development and International Trade Center

# Stages Of Competitive Development



# Global Competitiveness Report 2001

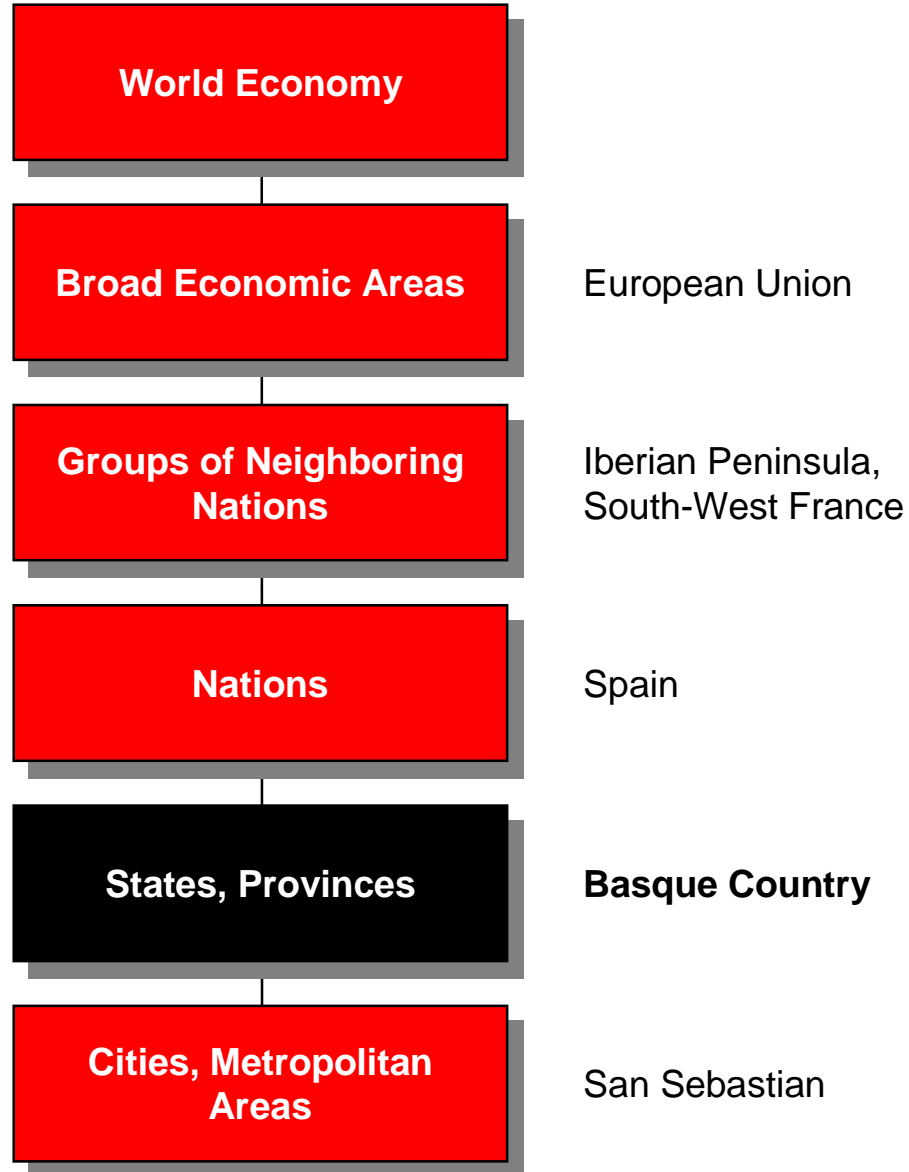
## The Relationship Between Microeconomic Competitiveness and GDP Per Capita, 2000 Data



\* Adjusted for Purchasing Power Parity

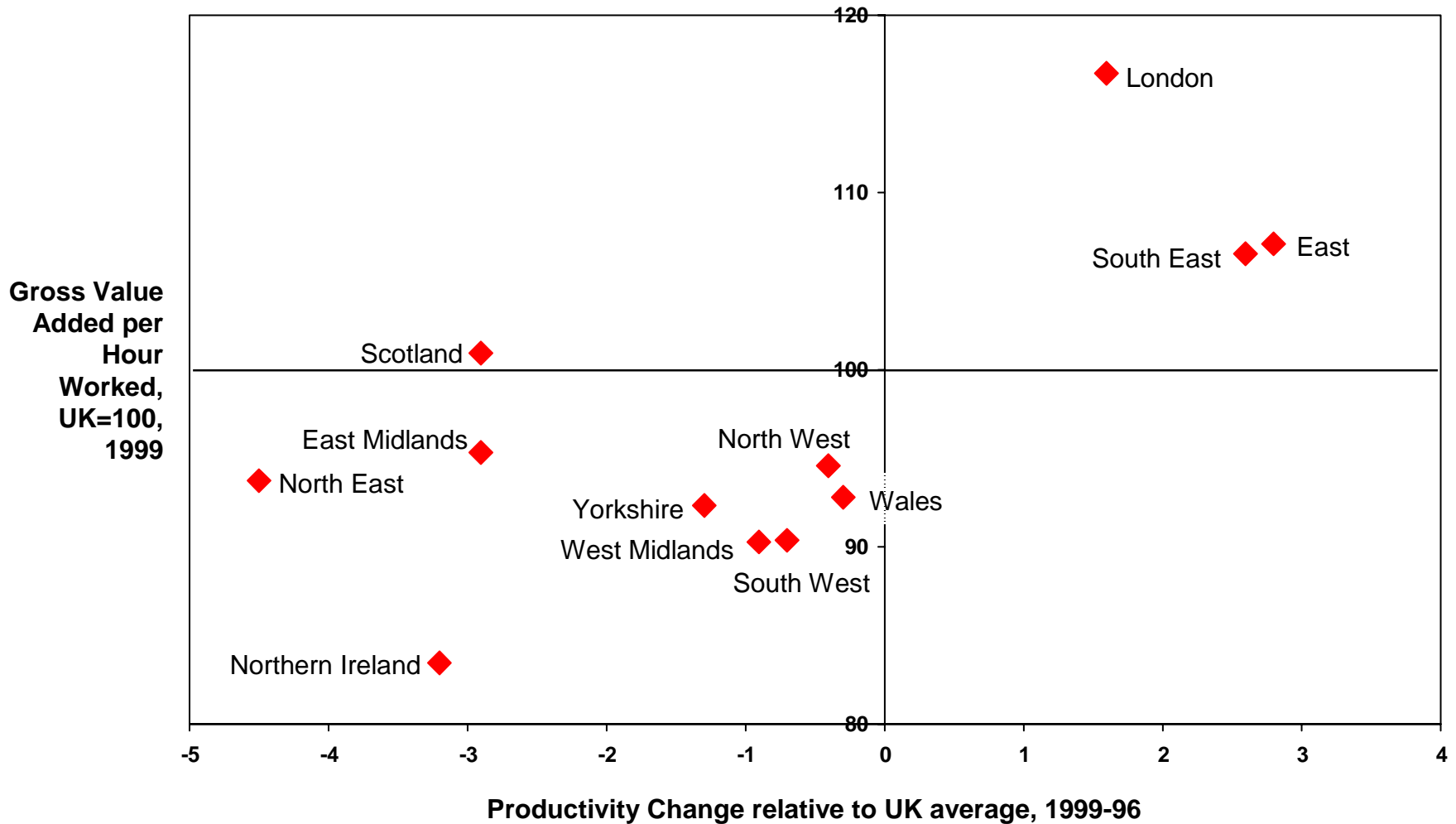
Source: Porter, Michael E. "The Current Competitiveness Index: Measuring the Microeconomic Foundations of Prosperity." *The Global Competitiveness Report 2001*, Oxford University Press, European Union

# Geographic Levels and Competitiveness



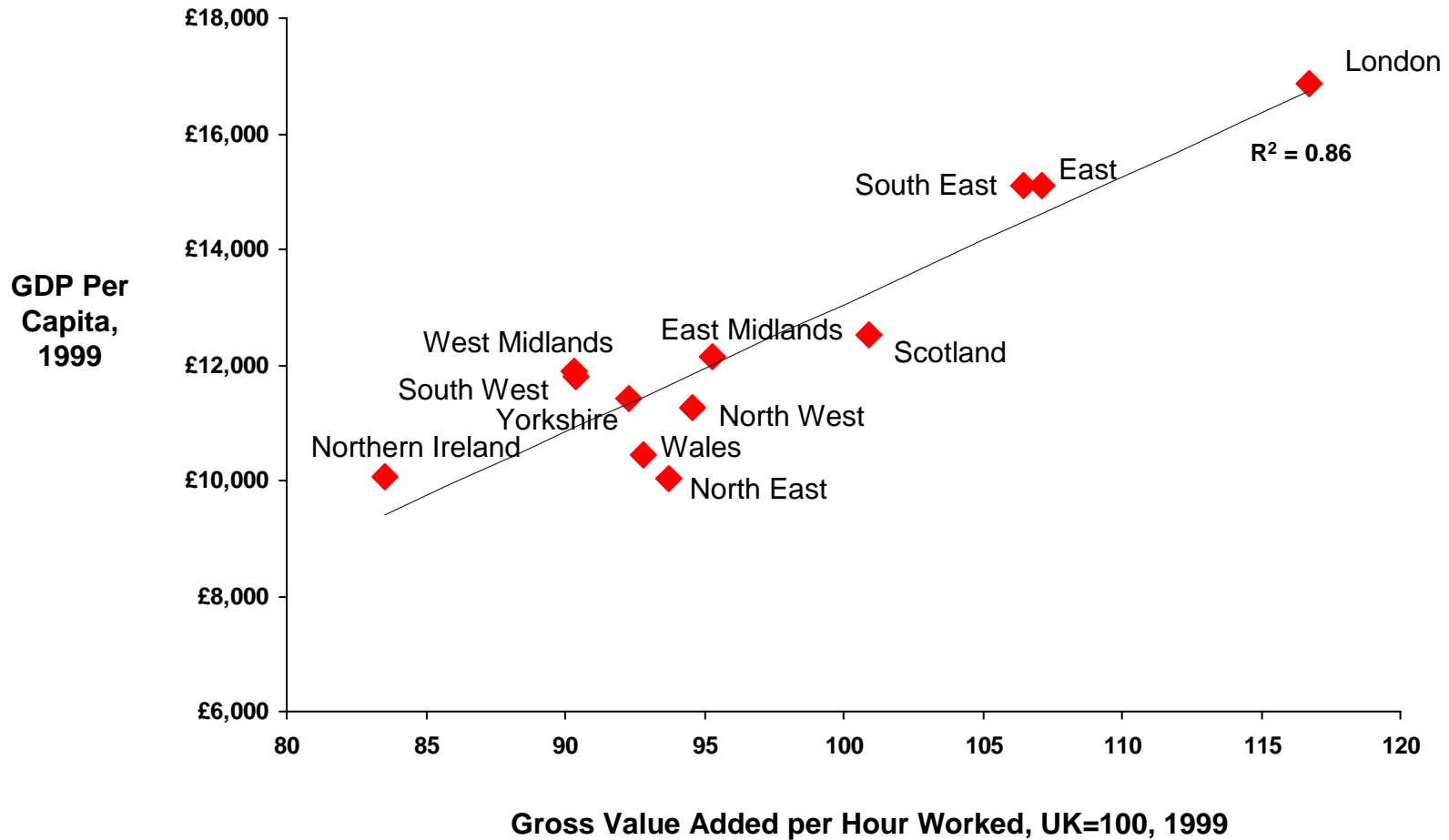
# Economic Performance

## Productivity Levels by UK Region



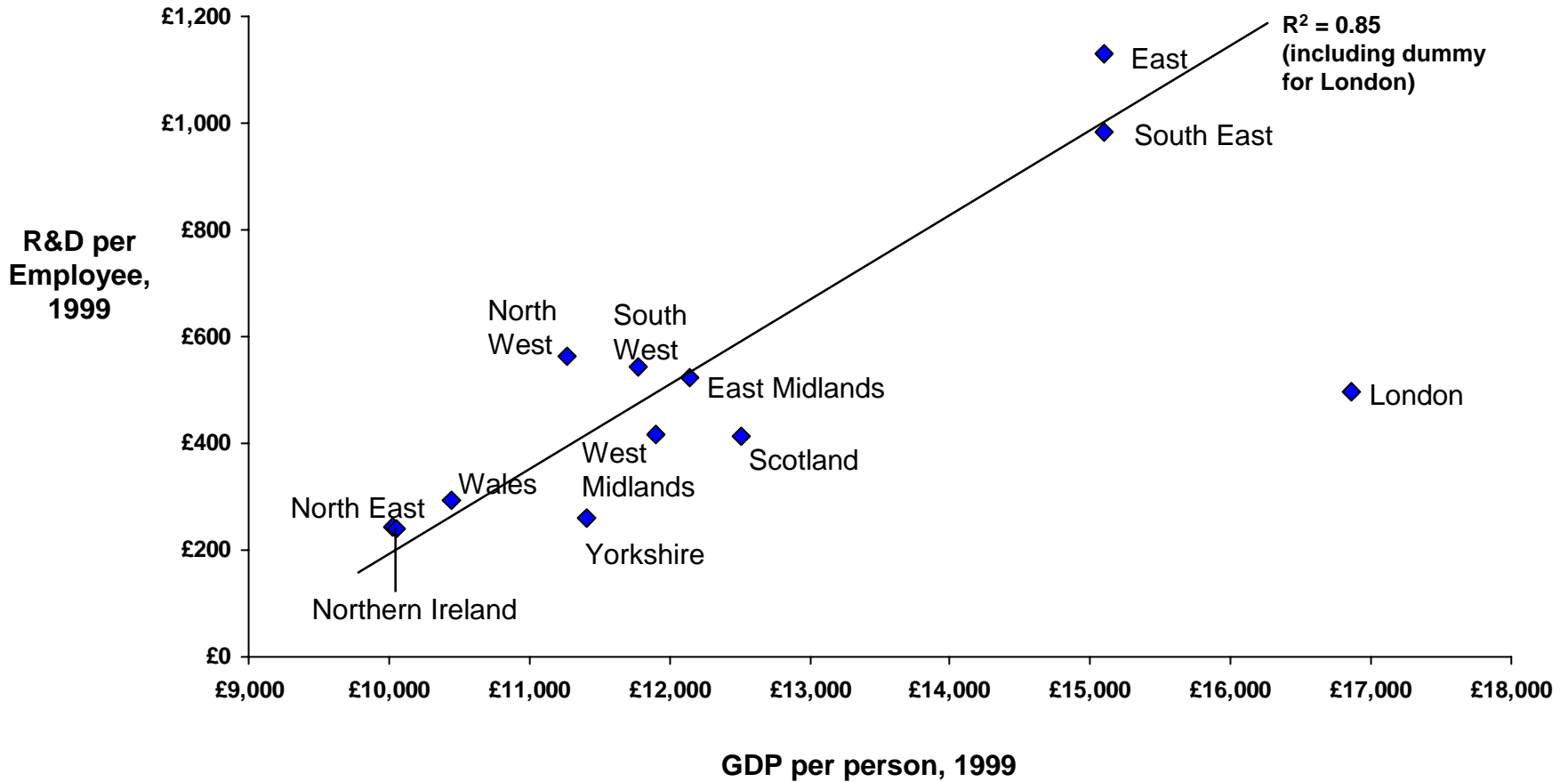
# Economic Performance

## Prosperity and Productivity by UK Region



# Innovation and Prosperity

## R&D per Employee vs. Average Wages by UK Region



# Regional Economic Performance Measures

## Overall Economy

### Employment Growth

- Rate of employment growth

### Unemployment

- Percentage of persons unemployed

### Workforce Participation

- Proportion of population in the workforce

### Average Wages

- Payroll per person

### Wage Growth

- Growth rate of payroll per person

### Cost of Living

- Cost of living index

### Productivity

- Output per employee or total factor productivity

### Exports

- Value of manufactured and commodity exports per worker

## Innovation Output

### Patents

- Number of patents and patents per worker

### Establishment Formation

- Growth rate of establishments

### Venture Capital Investments

- Value of venture capital invested

### Fast Growth Firms

- Number of firms on the Inc. 500 list

### Initial Public Offerings

- Number of initial public offerings

### Productivity growth

- Growth in output per employee or total factor productivity



# Top 50 Patent Holders in Massachusetts

## Total of 1995-1998

Rank	Organization Title	Patentor Type	Total Patents, 1995-1998
1	DIGITAL EQUIPMENT CORPORATION	Corporation	382
2	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	University	369
3	POLAROID CORPORATION	Corporation	220
4	MASSACHUSETTS GENERAL HOSPITAL	Institute	138
5	ANALOG DEVICES, INC.	Corporation	136
6	HARVARD COLLEGE, PRESIDENT AND FELLOWS	University	105
7	GENETICS INSTITUTE, INC.	Corporation	82
8	EMC CORPORATION	Corporation	82
9	GENERAL ELECTRIC COMPANY	Corporation	79
10	MOTOROLA, INC.	Corporation	79
11	QUANTUM CORP. (CA)	Corporation	79
12	BOSTON SCIENTIFIC CORPORATION	Corporation	77
13	HEWLETT-PACKARD COMPANY	Corporation	69
14	CHARLES STARK DRAPER LABORATORY, INC.	Corporation	66
15	SAINT GOBAIN/NORTON INDUSTRIAL CERAMICS CORP.	Corporation	65
16	RAYTHEON COMPANY	Corporation	64
17	BOSTON UNIVERSITY	University	63
18	BRIGHAM AND WOMEN'S HOSPITAL	Institute	62
19	DANA-FARBER CANCER INSTITUTE, INC.	Institute	60
20	TEXAS INSTRUMENTS, INCORPORATED	Corporation	59
21	GILLETTE COMPANY	Corporation	57
22	SHIPLEY COMPANY INC.	Corporation	52
23	UNITED STATES OF AMERICA, AIR FORCE	U.S. Government	52
24	LISCO, INC.	Corporation	50
25	HYBRIDON, INC.	Corporation	48

Rank	Organization Title	Patentor Type	Total Patents, 1995-1998
26	CHILDREN'S MEDICAL CENTER CORPORATION	Institute	47
27	JOHNSON & JOHNSON PROFESSIONAL INC.	Corporation	47
28	SUN MICROSYSTEMS, INC.	Corporation	47
29	OSRAM SYLVANIA INC.	Corporation	47
30	ACUSHNET COMPANY	Corporation	45
31	NORTHEASTERN UNIVERSITY	University	44
32	SEPRACOR INC.	Corporation	42
33	GENZYME CORPORATION	Corporation	41
34	AGFA DIVISION, BAYER CORPORATION	Corporation	40
35	ANALOGIC CORPORATION	Corporation	40
36	AVERY DENNISON CORPORATION	Corporation	39
37	BETH ISRAEL HOSPITAL ASSOCIATION	Institute	37
38	C. R. BARD, INC.	Corporation	34
39	UNITED STATES OF AMERICA, NAVY	U.S. Government	34
40	AMOCO CORPORATION	Corporation	33
41	GTE LABORATORIES, INC.	Corporation	33
42	CHIRON DIAGNOSTICS CORPORATION	Corporation	32
43	KOPIN CORPORATION	Corporation	32
44	COGNEX CORPORATION	Corporation	30
45	W. R. GRACE & CO.-CONN.	Corporation	30
46	CIBA CORNING DIAGNOSTICS CORP.	Corporation	29
47	FOXBORO COMPANY	Corporation	29
48	UNITED TECHNOLOGIES CORPORATION	Corporation	28
49	VLT CORPORATION	Corporation	28
50	TROPIX, INC.	Corporation	28

Data Source: CHI Research, USPTO

# The Composition of Regional Economies

## United States

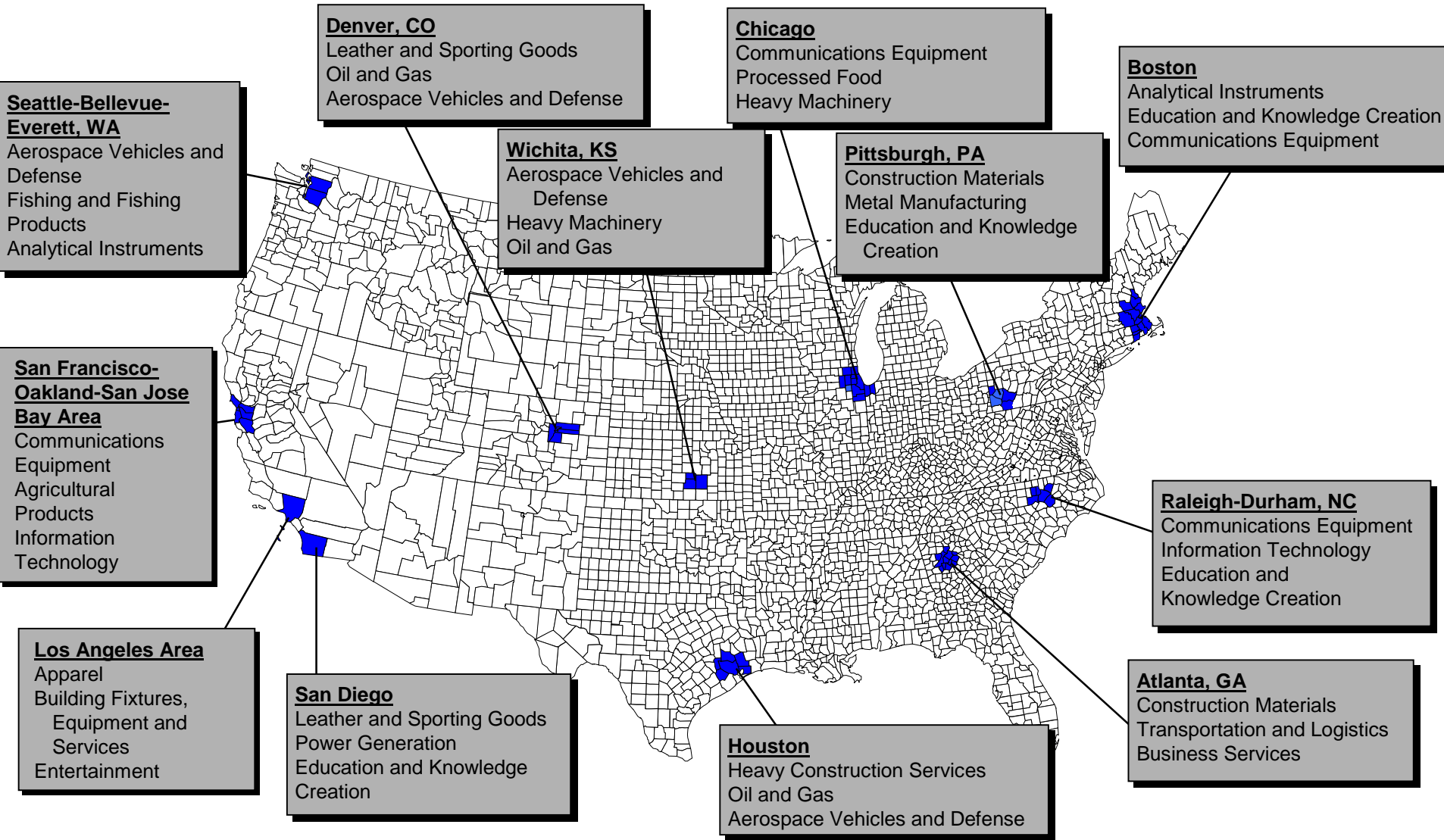
	Traded Clusters	Local Clusters	Natural Resource-Driven Industries
Share of Employment	32.1%	67.1%	0.8%
Employment Growth, 1993 to 1999	2.5%	2.8%	-0.1%
Average Wage	\$41,678	\$26,049	\$31,264
Relative Wage	134.0	83.8	100.5
Wage Growth	5.0%	3.8%	2.5%
Relative Productivity	144.1	79.3	139.5
Patents per 10,000 Employees	20.48	1.38	6.40
Number of SIC Industries	592	241	46

Note: 1999 data, except relative productivity which is 1997 data, and patents data which is 1998 data

Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School, [www.isc.hbs.edu](http://www.isc.hbs.edu)

# Specialization of Regional Economies

## Selected U.S. Geographic Areas

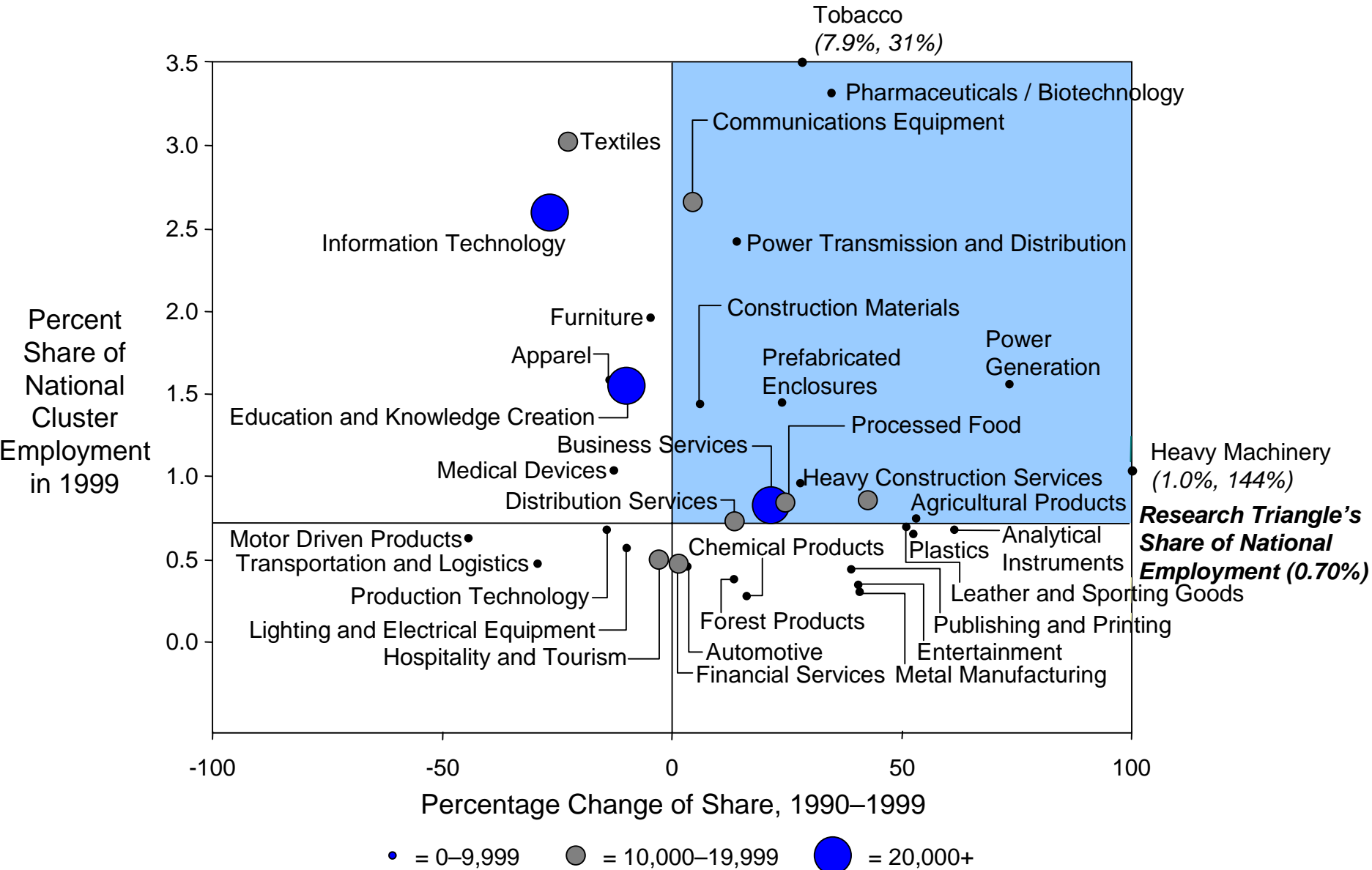


Note: Clusters listed are the three highest ranking clusters in terms of share of national employment

Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School, [www.isc.hbs.edu](http://www.isc.hbs.edu)

# Specialization of Regional Economies

## Research Triangle

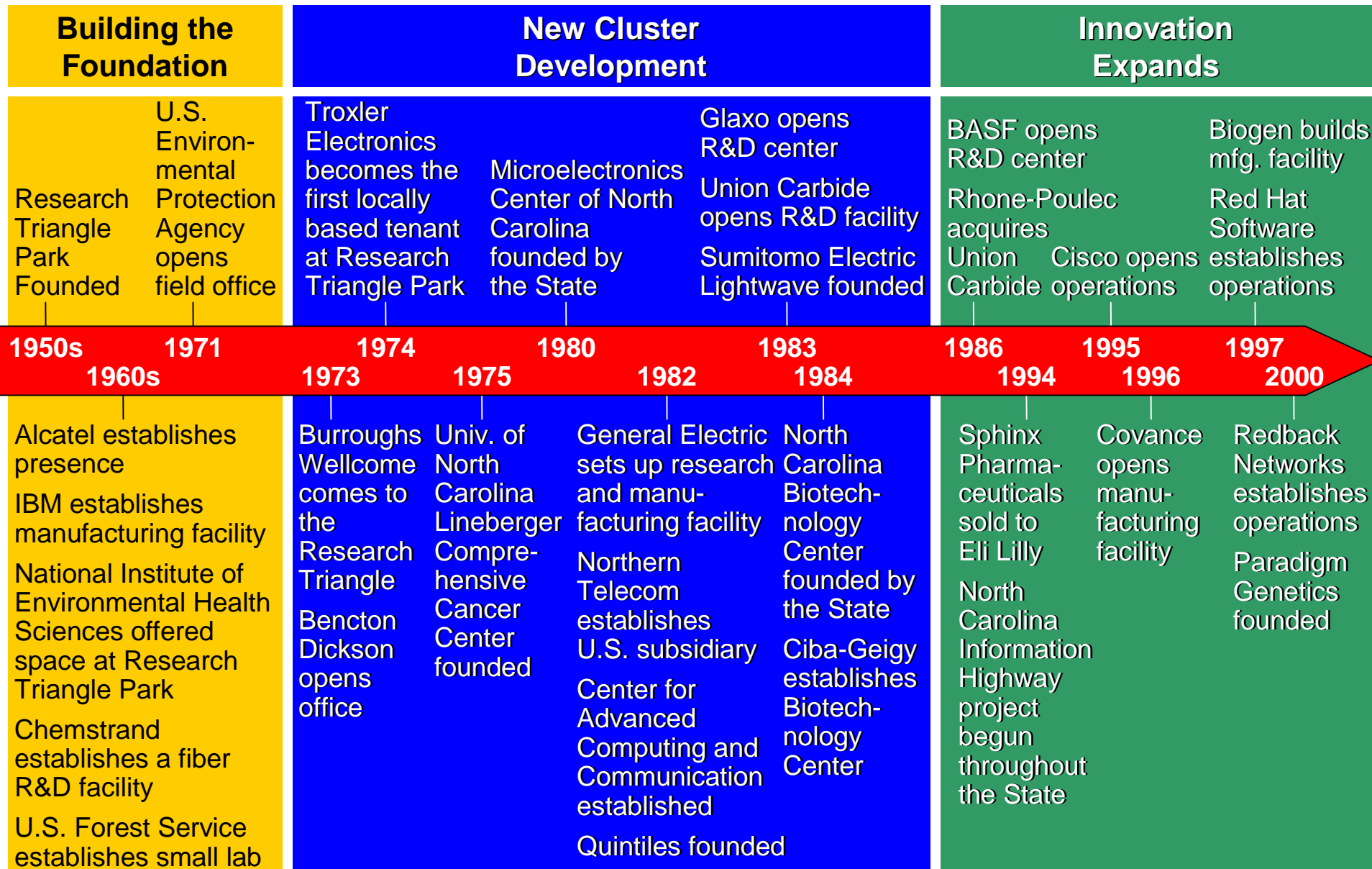


Note: (y-axis, x-axis)

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

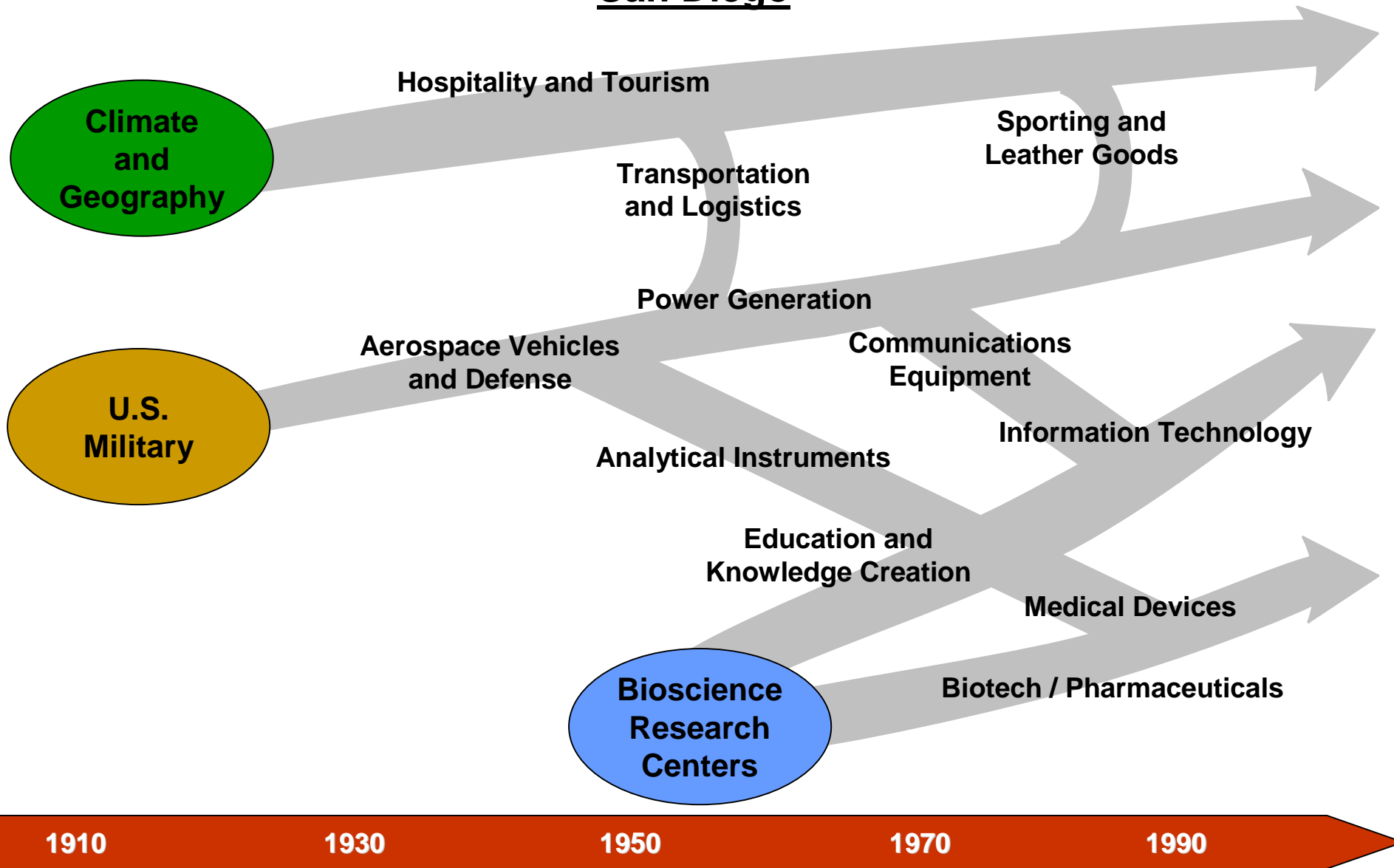
# The Evolution of Regional Economies

## Research Triangle



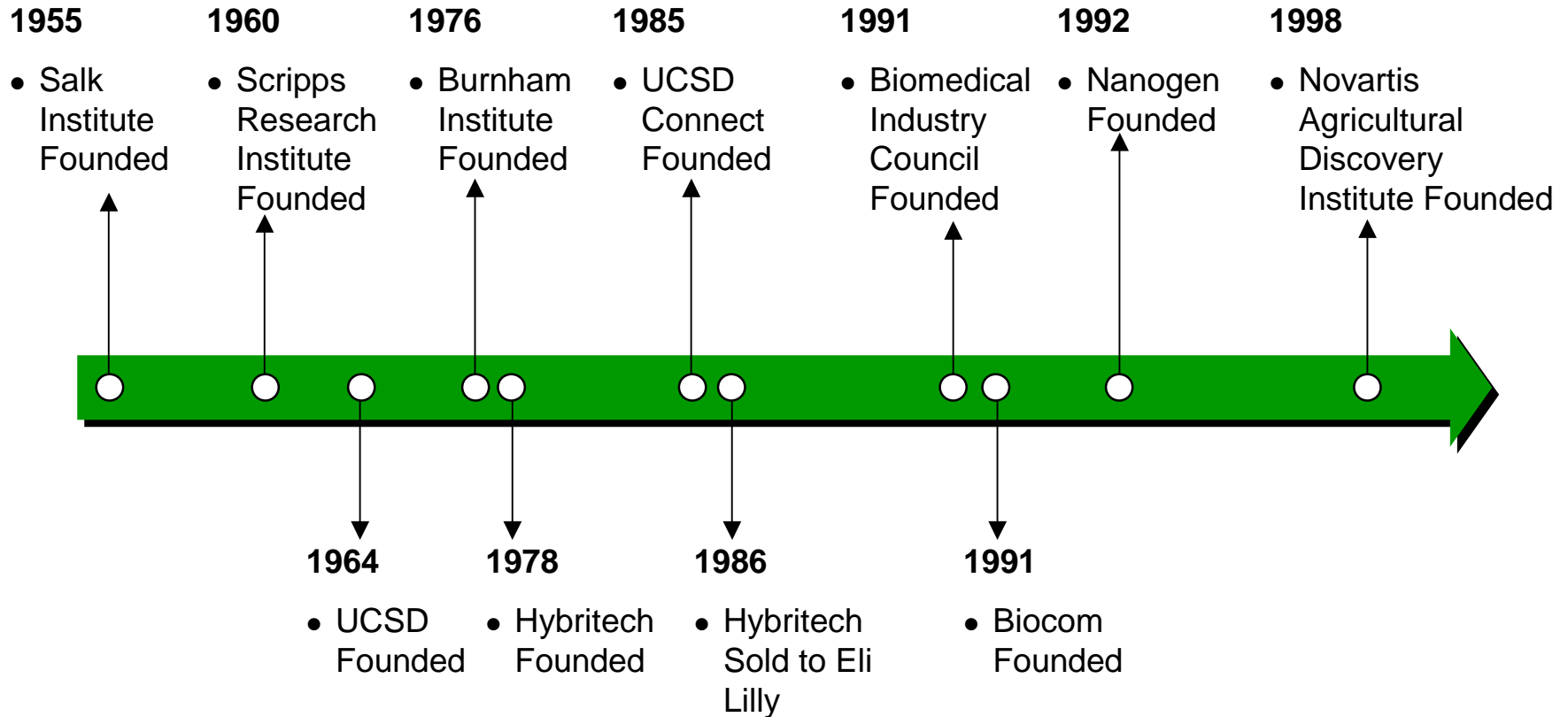
# Evolution of the Regional Economy

## San Diego



# The Development of Clusters

## History of the San Diego Biotech / Pharma Cluster



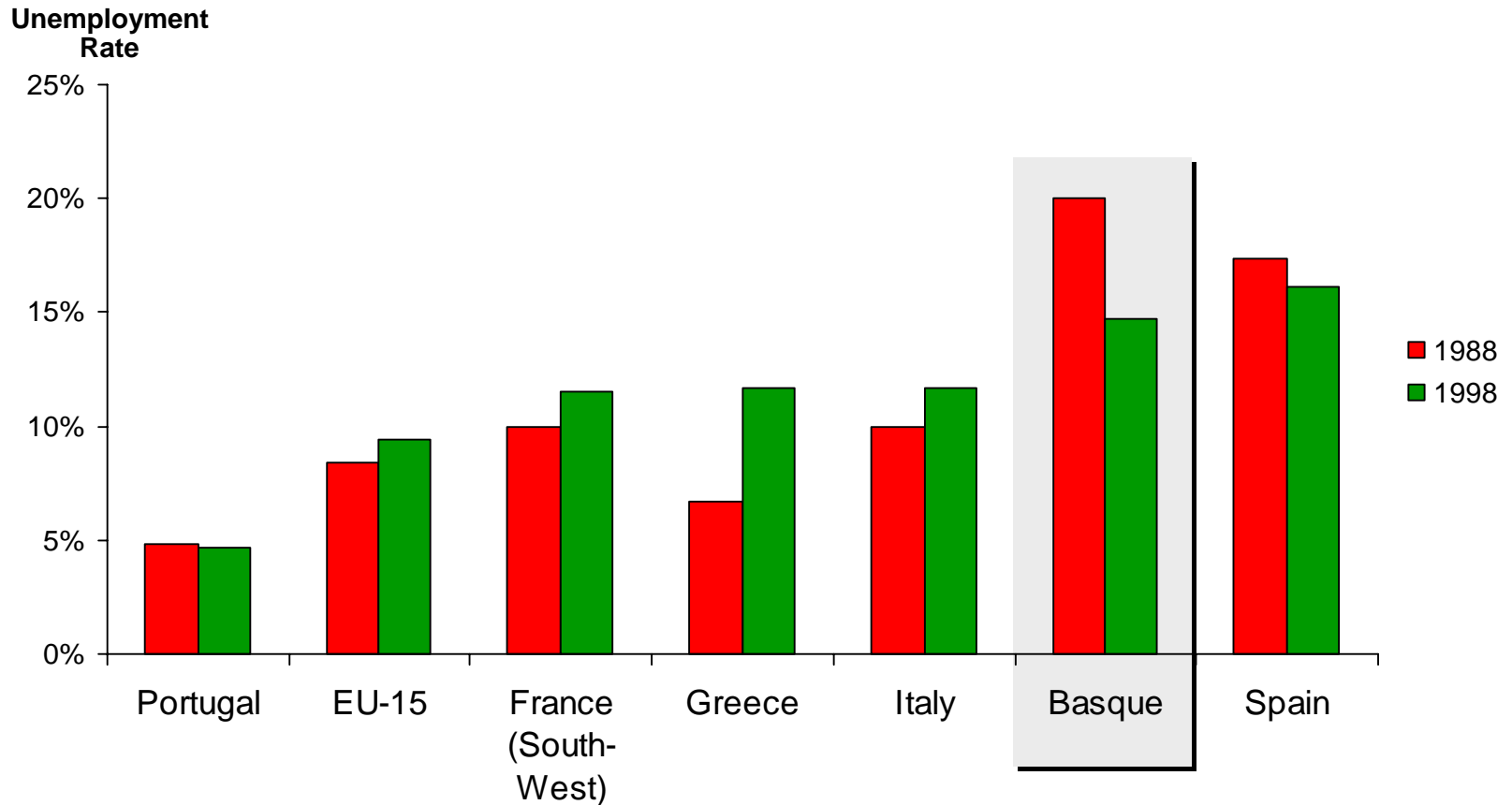
# Agenda

- Foundations of competitiveness and the role of regions
- **Basque competitive performance**
- Basque competitiveness: The next agenda



# Unemployment Rate

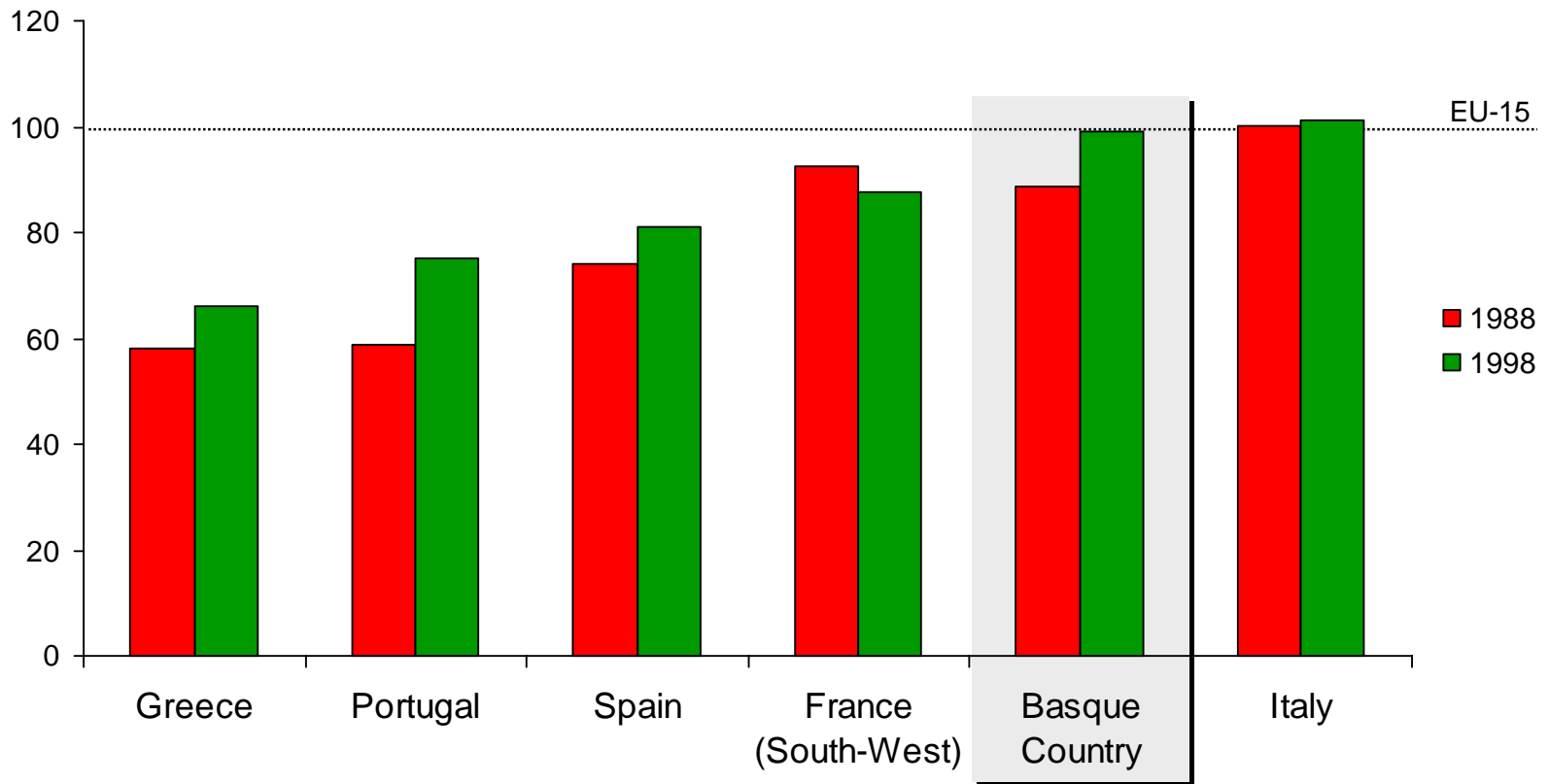
## Southern European Countries and Regions



# GDP per Capita

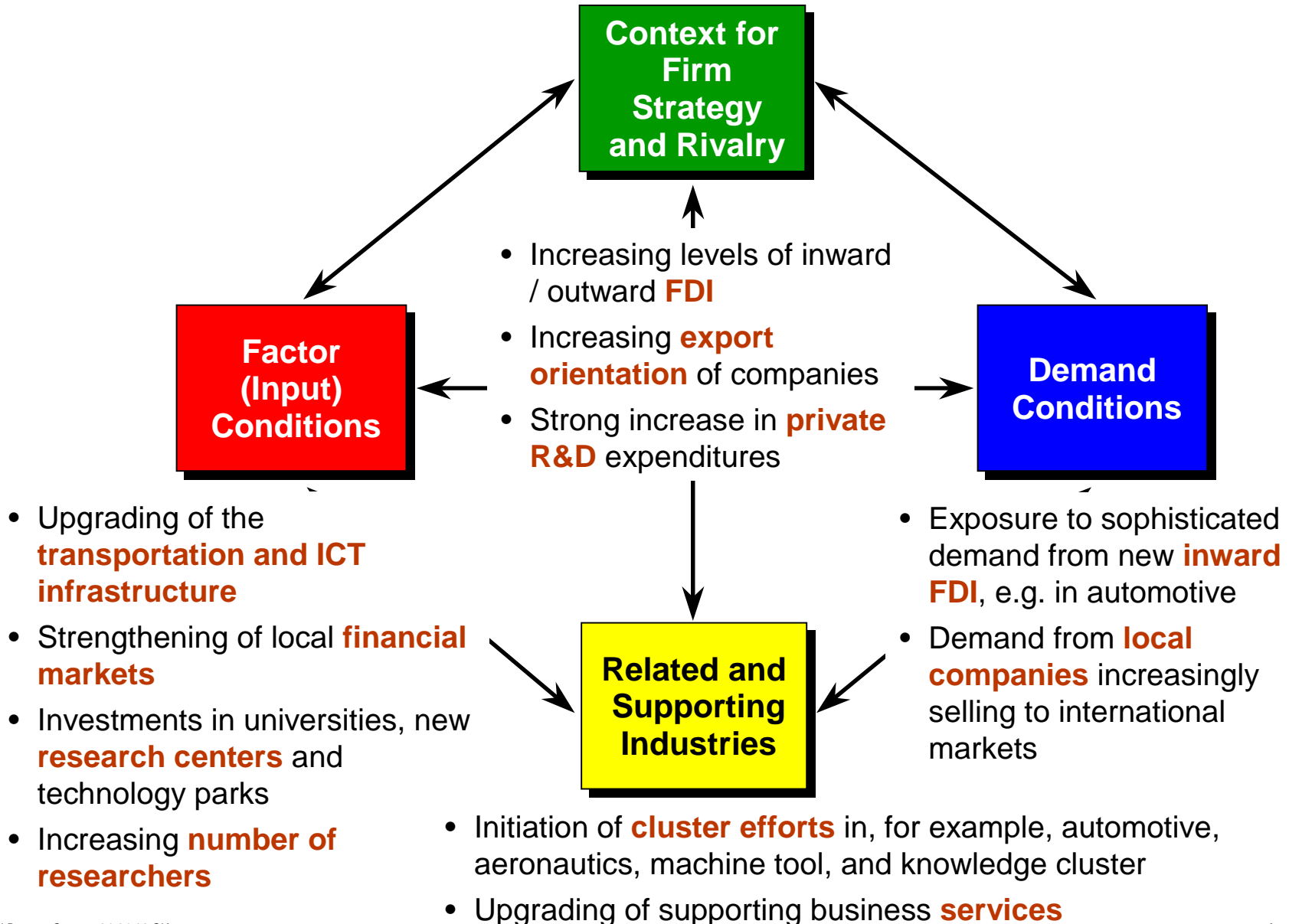
## Southern European Countries and Regions

GDP per capita (PPP),  
EU-15 = 100



# Basque Business Environment

## Recent Changes



# Basque Business Environment

## Recent Changes

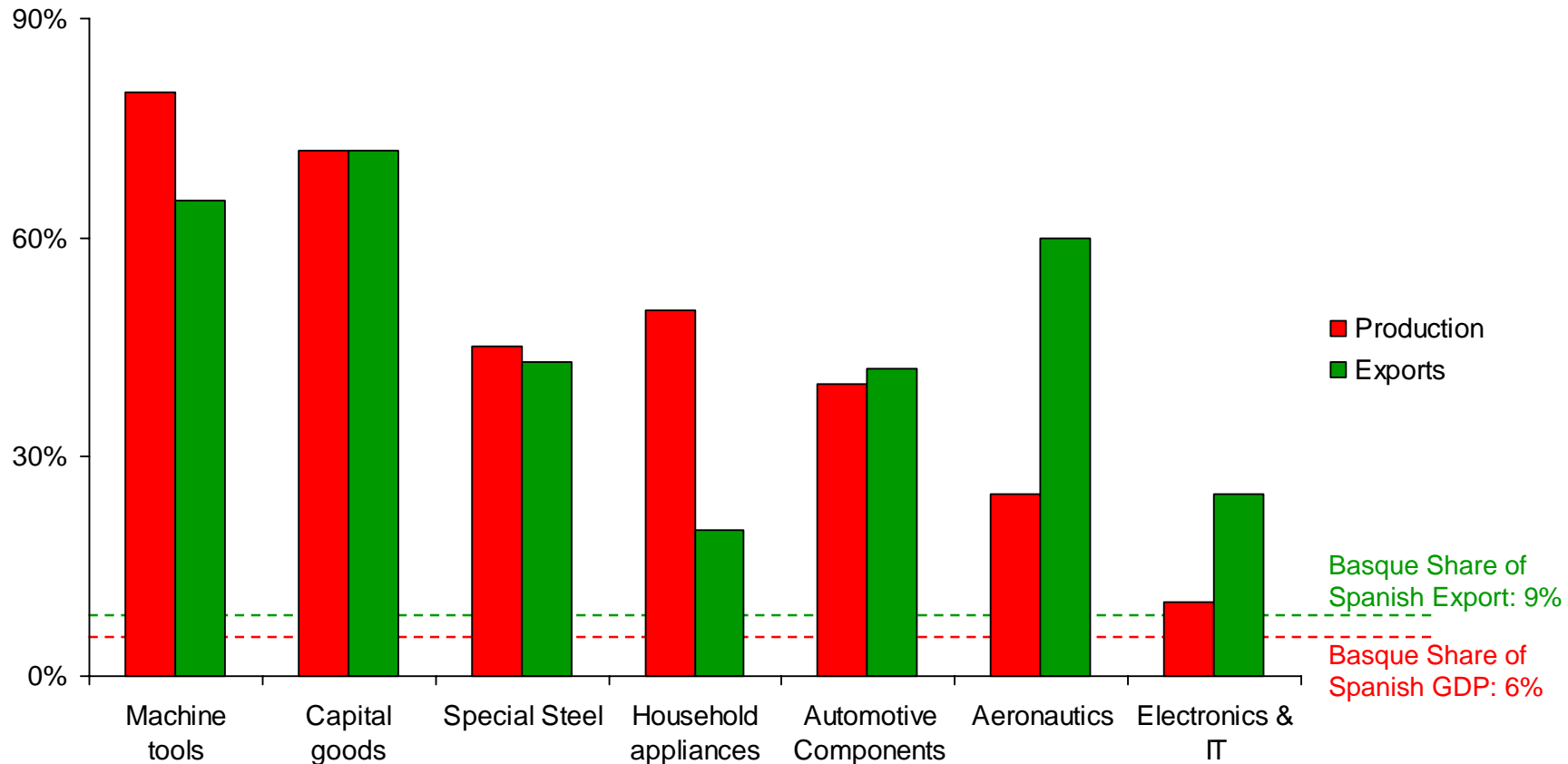
### Government Policy

- Improved **tax incentives** for business investment
- Creation and support of **institutions** to implement the upgrading of the business environment
  - E.g., Euskalit (Basque Quality Foundation)
  - E.g., Basque Council for Science, Technology and Innovation
  - E.g., Basque Technology Network
- Support of **cultural initiatives** (Guggenheim Museum Bilbao)
- Launch and support of **cluster initiatives**
- Creation of **technology parks**
- Aggressive participation in **EU Science & Technology programs**

# Clusters in the Basque Country

## Export and Production Levels

Basque Share of Spanish Economy



# Basque Clusters

## Examples

### Machine Tools

- High percentage of foreign sales (71% of companies are habitual exporters)
- Customers
  - Mainly German companies
  - Top aeronautical and automotive multinationals (Airbus, McDonnell Douglas, General Motors, Mercedes Benz, Peugeot, Renault, Chrysler, Volkswagen).
- 4,570 direct and 4,000 indirect jobs

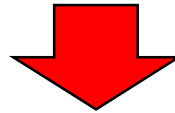
### Aeronautics

- 75% of all manufactured products are exported
- 18% of all income is earmarked for R&D.
- The most important companies in this cluster are
  - Gamesa Group (Embraer, Sikorsky and Sino Swearingen)
  - Turbo Engine Industry (aircraft engines, e.g.: Airbus)

# Basque Economic Performance in the 1990s

## Summary

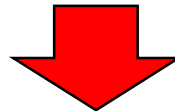
- Strong rebound after the crisis in the late 80s
- Prosperity approaching EU-average level
- Innovation between Spanish and Italian level
- Business environment has been significantly upgraded in a joint effort of public and private sector institutions



- The Basque country is one of the few regions in Europe that has made significant progress in upgrading their traditional industrial base

# Challenges for the Basque Country in 2002

- At higher wage levels, the Basque country has to compete with other increasingly sophisticated business locations
  - E.g., large parts of France, Germany, and the Netherlands have similar levels of prosperity
- Other lower wage locations are catching up
  - Upgrading in other parts of Southern Europe
  - EU entry of countries like Poland and the Czech Republic with a well educated labor force, strong industrial tradition, and a location close to large European markets
- Weak world economy provides a more challenging environment for upgrading



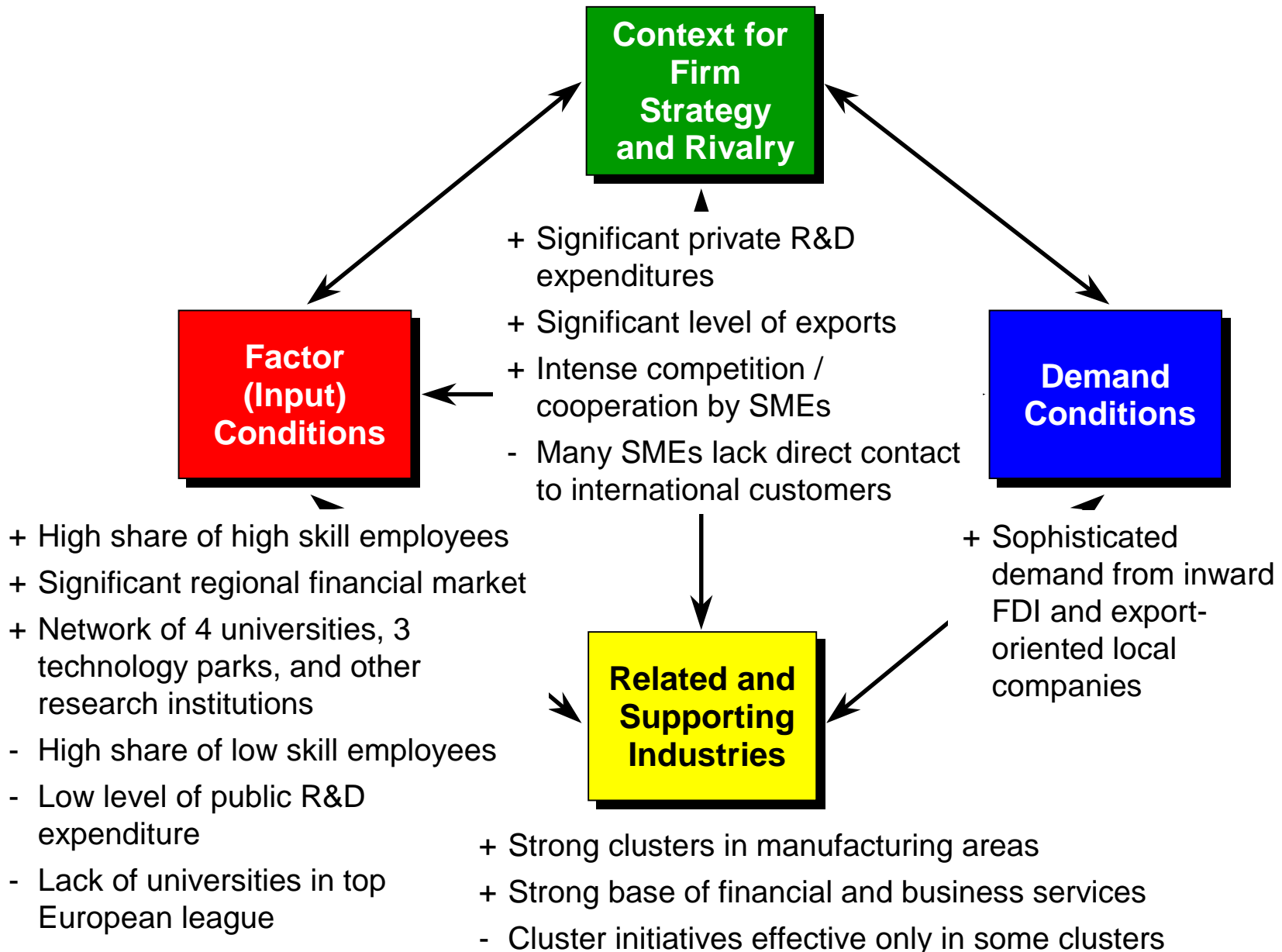
- A new economic strategy for the next decade will be necessary



# Agenda

- Foundations of competitiveness and the role of regions
- Basque competitive performance
- **Basque competitiveness: The next agenda**

# Basque Business Environment



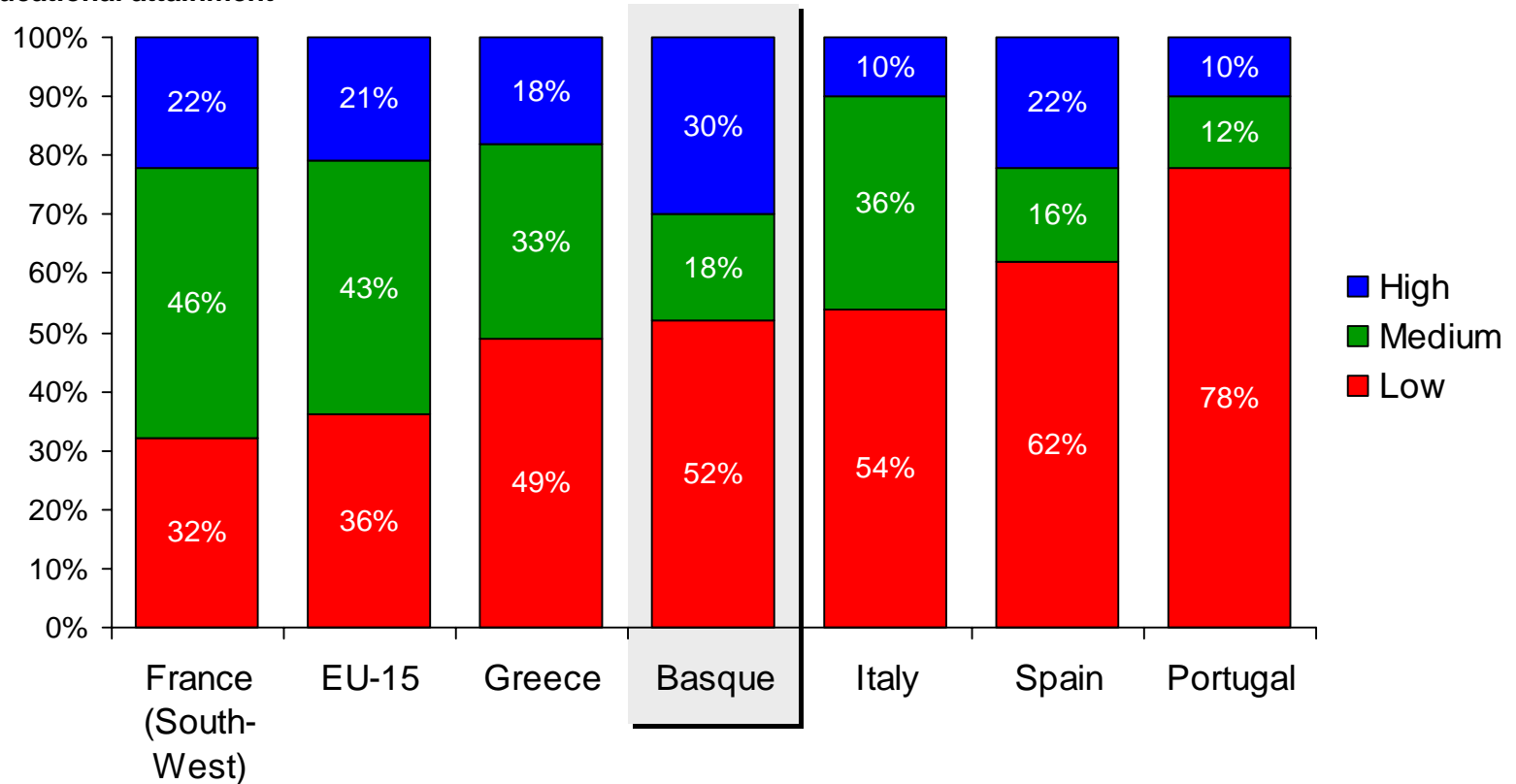
# **Basque Economic Strategy: The Way Ahead**

- **Enhance the skills of the large low-skill workforce**

# Educational Attainment

## Southern European Countries and Regions

Share of 25-59 year old by level of educational attainment

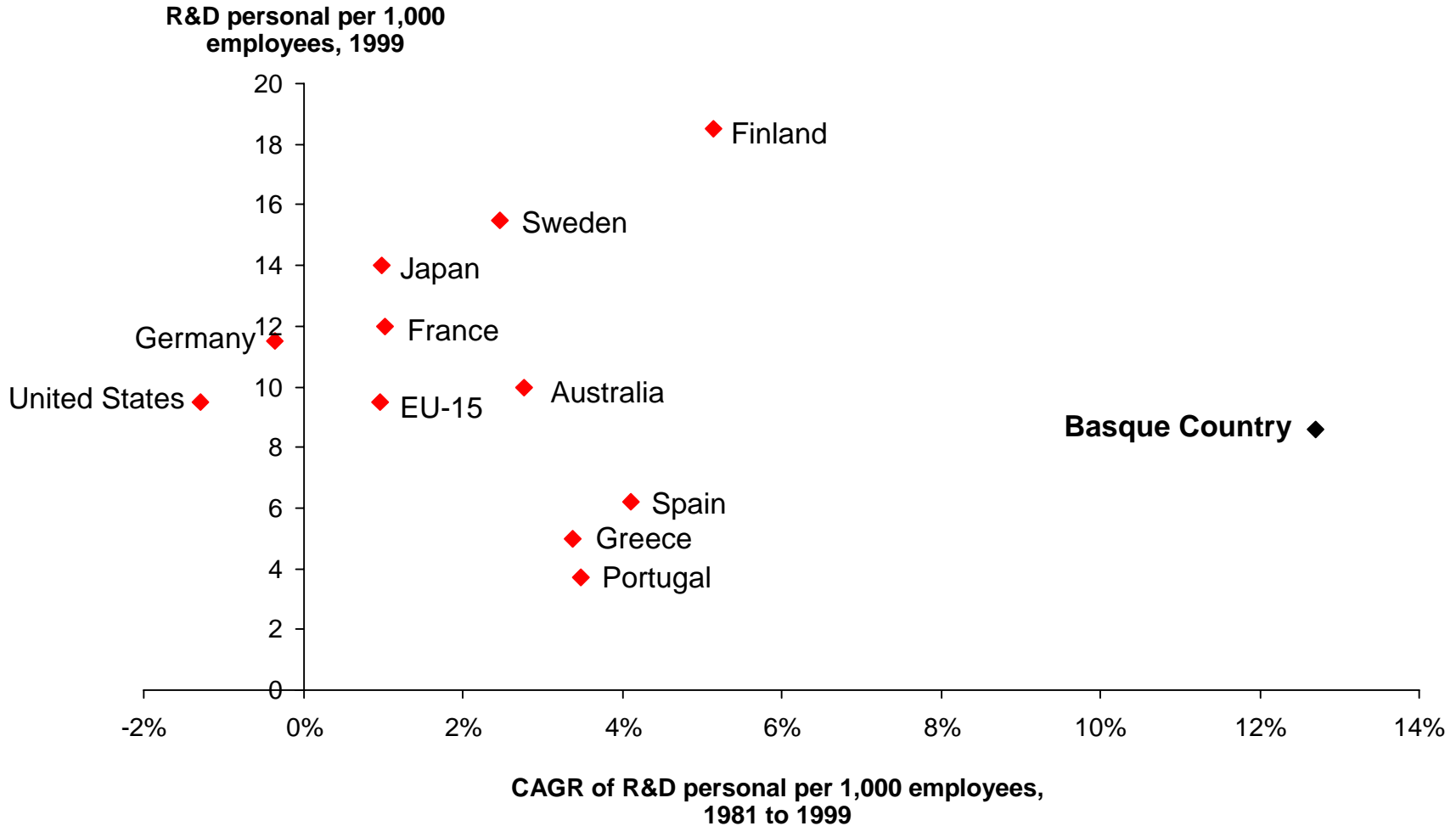


# Basque Economic Strategy: The Way Ahead

- Enhance the skills of the large low-skill workforce
- **Upgrade Innovative Capacity**

# Innovation Environment

## Availability of Researchers




# Basque Innovation Environment

## Institutions for Collaboration

### Basque Technology Network (BTN)

- 10 technology centers
- 4 Universities with 51 reputable departments
- 4 Sectoral Research Centers
- 13 R&D business units
- 4 Research laboratories
- 14 Intermediary innovation organizations
- 2 Public research organizations

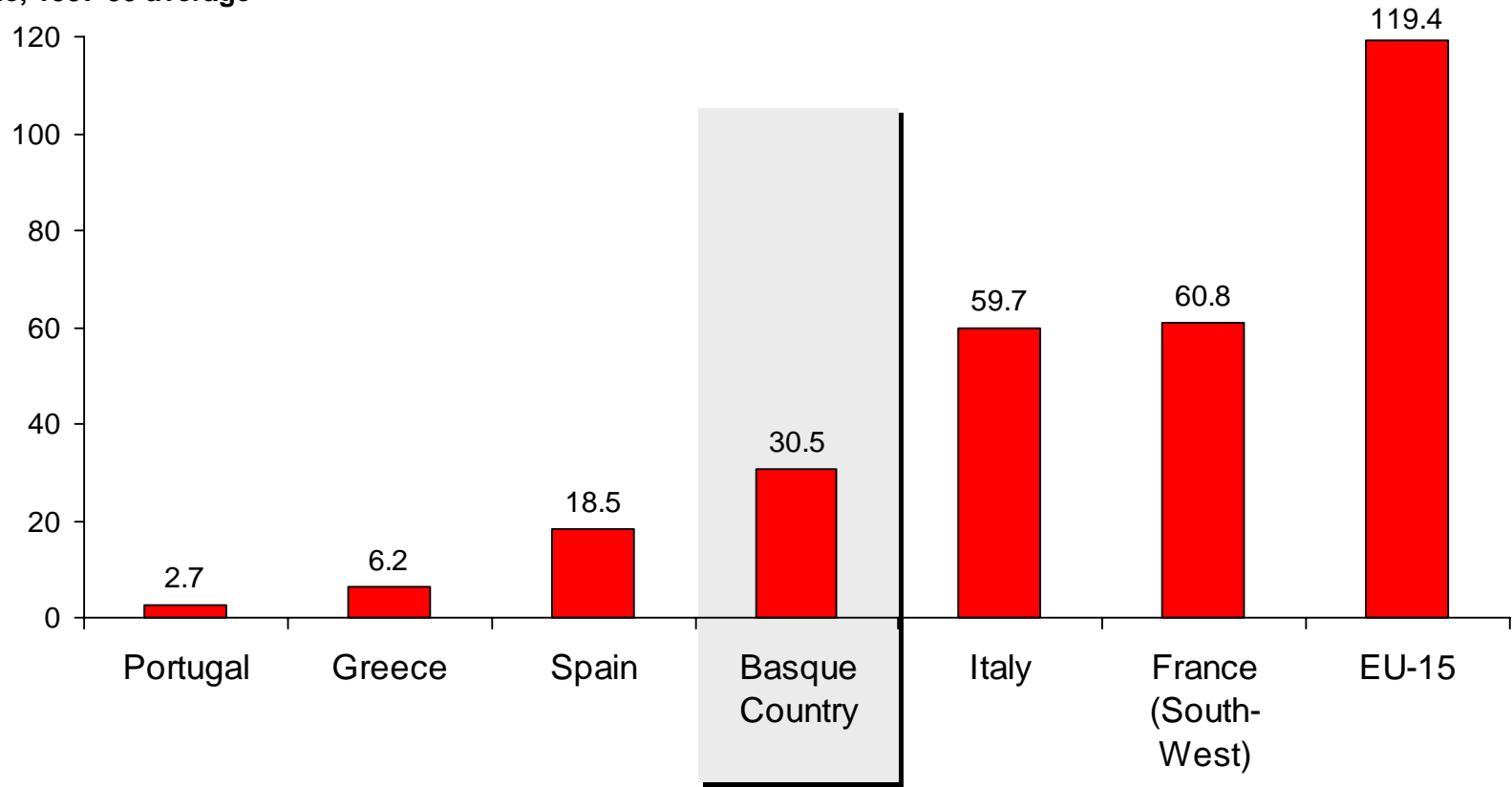
### Technology Parks

- Zamudio (Bizkaia)
  - Miñano (Alava)
  - Miramón-San Sebastián (Gipuzkoa)
- 
- A total of 156 companies and technology centers accounting for 35% of Basque business R&D

# Innovation Performance

## Southern European Countries and Regions

EU Patents per million people, 1997-99 average





# Basque Holders of U.S. Patents

## Total Patents 1996-1999

No. of Patents	Company	Site	Headquarter
2	<b>TELEFONAKTIEBOLAGET LM ERICSSON</b>	Bilbao	Stockholm, Sweden
1	<b>DEGUISA, S.A.</b>	Bilbao	Bilbao
1	<b>COOK COMPOSITES AND POLYMERS CO.</b>	Bilbao	Kansas City, USA
1	<b>TUBOPLAST HISPANIA, S.A.</b>	Vitoria	Vitoria
1	<b>S.A. LORAMENDI</b>	Vitoria	Alava
1	<b>F.M. CONTROL, S.L.</b>	Vitoria	Vitoria-Gasteiz
1	<b>UNION ESPANOLA DE EXPLOSIVOS, S.A.</b>	Bilbao	Madrid

Note: Among all Spanish patent holders in the US Ericsson's Basque subsidiary ranks 54 and all other Basque patent holders rank 94.

Source: USPO, ISC analysis

# Patents by Organization

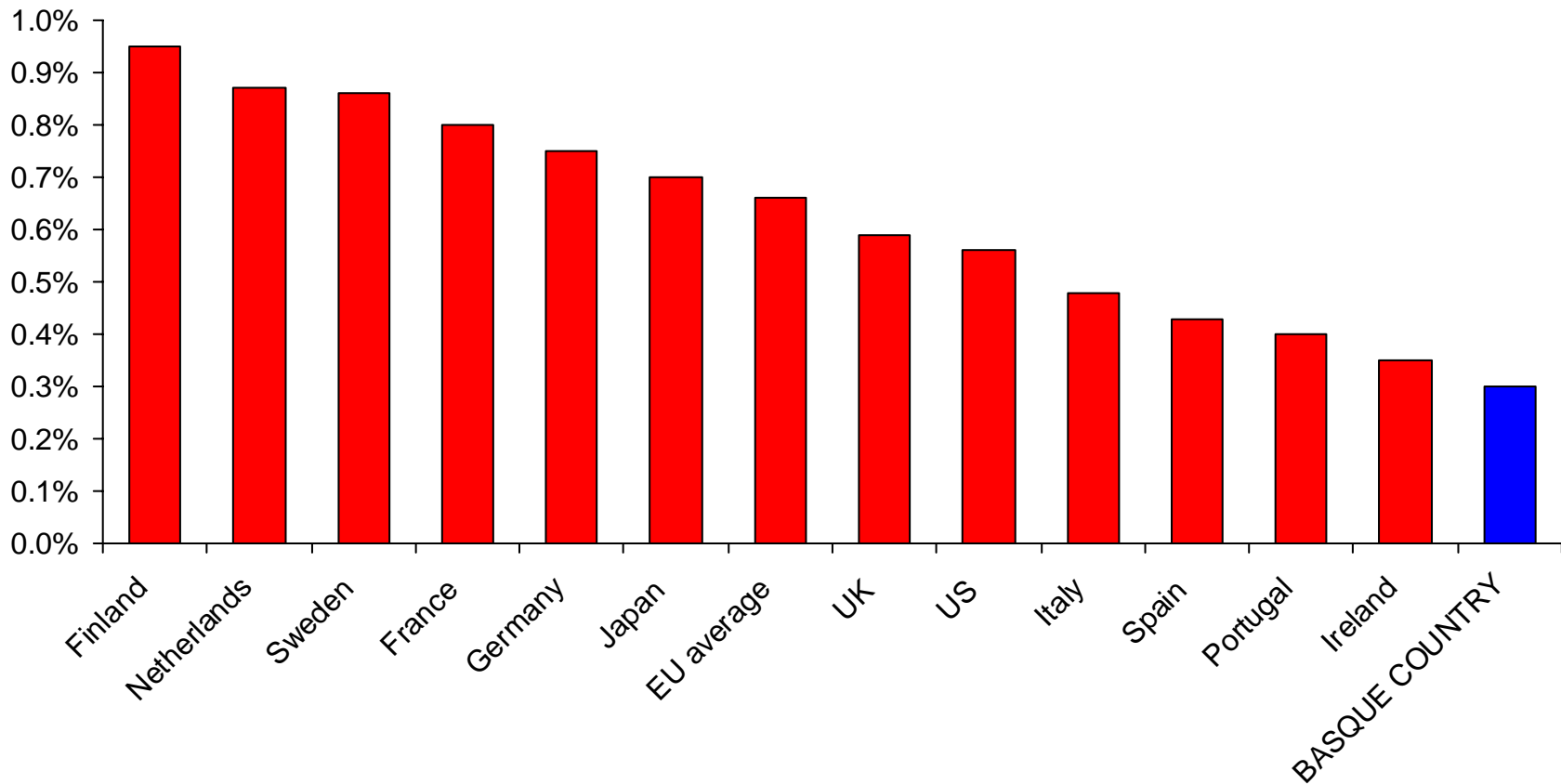
## Research Triangle MSA, 1995–1999

	Organization	Patents Issued from 1995 to 1999
1	International Business Machines Corporation	495
2	Ericsson, Inc.	325
3	Becton, Dickinson and Company	128
<b>4</b>	<b>North Carolina State University</b>	<b>128</b>
<b>5</b>	<b>Duke University</b>	<b>127</b>
<b>6</b>	<b>University of North Carolina — Chapel Hill</b>	<b>124</b>
7	Square D Company	48
8	Novartis	46
9	ABB Power T&D Company, Inc.	44
10	Alcatel Network Systems, Inc.	43
11	Mitsubishi Semiconductor America, Inc.	41
12	Lord Corporation	36
13	Kennametal, Inc.	29
14	Rhone-Poulenc, Inc.	29
15	Telefonaktiebolaget LM Ericsson	28
16	Caterpillar, Inc.	26
17	Cree Research, Inc.	26
18	E.I. DuPont De Nemours and Company	26
<b>19</b>	<b>MCNC</b>	<b>25</b>
20	Raychem Corporation	24
21	Reichhold Chemicals, Inc.	24
22	American Sterilizer Company	21
23	Siemens Energy and Automation, Inc.	21
24	Northern Telecom Limited	20
<b>25</b>	<b>Research Triangle Institute</b>	<b>20</b>

# Government R&D Spending

## Public Expenditure on R&D, Share of GDP

Public R&D Spending as %  
of GDP, 1998



# Basque Economic Strategy: The Way Ahead

- Enhance the skills of the large low-skill workforce
- Upgrade Innovative Capacity
- **Deepen clusters and extend cluster development throughout the economy**
  - **FDI into clusters**
  - **Foreign specialists for clusters**

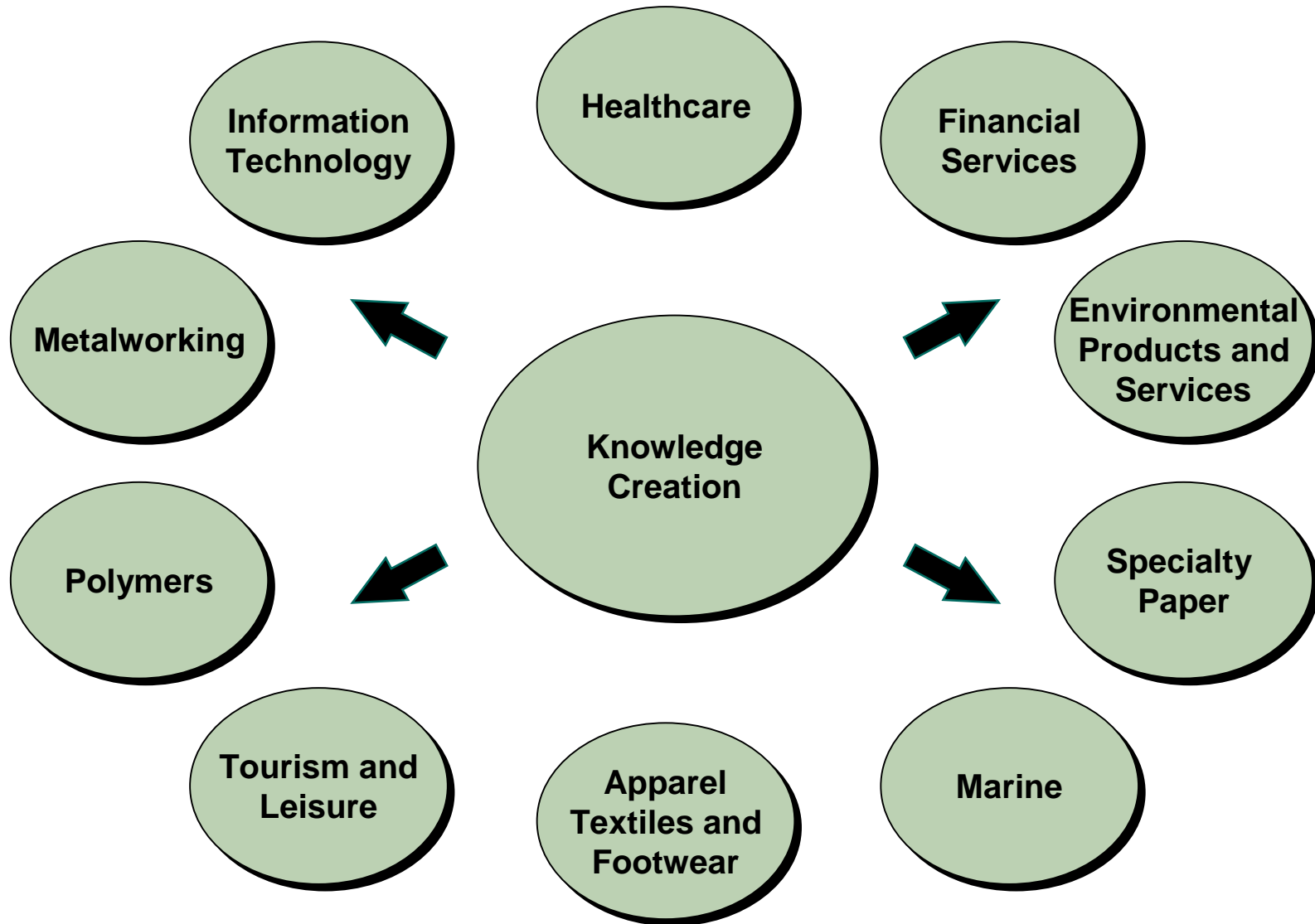
# Clusters in the Basque Country

## *Activated Initiatives*

- **Automotive Suppliers**
- **Aeronautics**
- **Household appliances**
- **Machine-tools**
- **Knowledge**
- **High value added steel**
- **Energy**
- **Pulp&paper**
- **Environment**
- **Telecommunications**
- **Basque Maritime Forum**

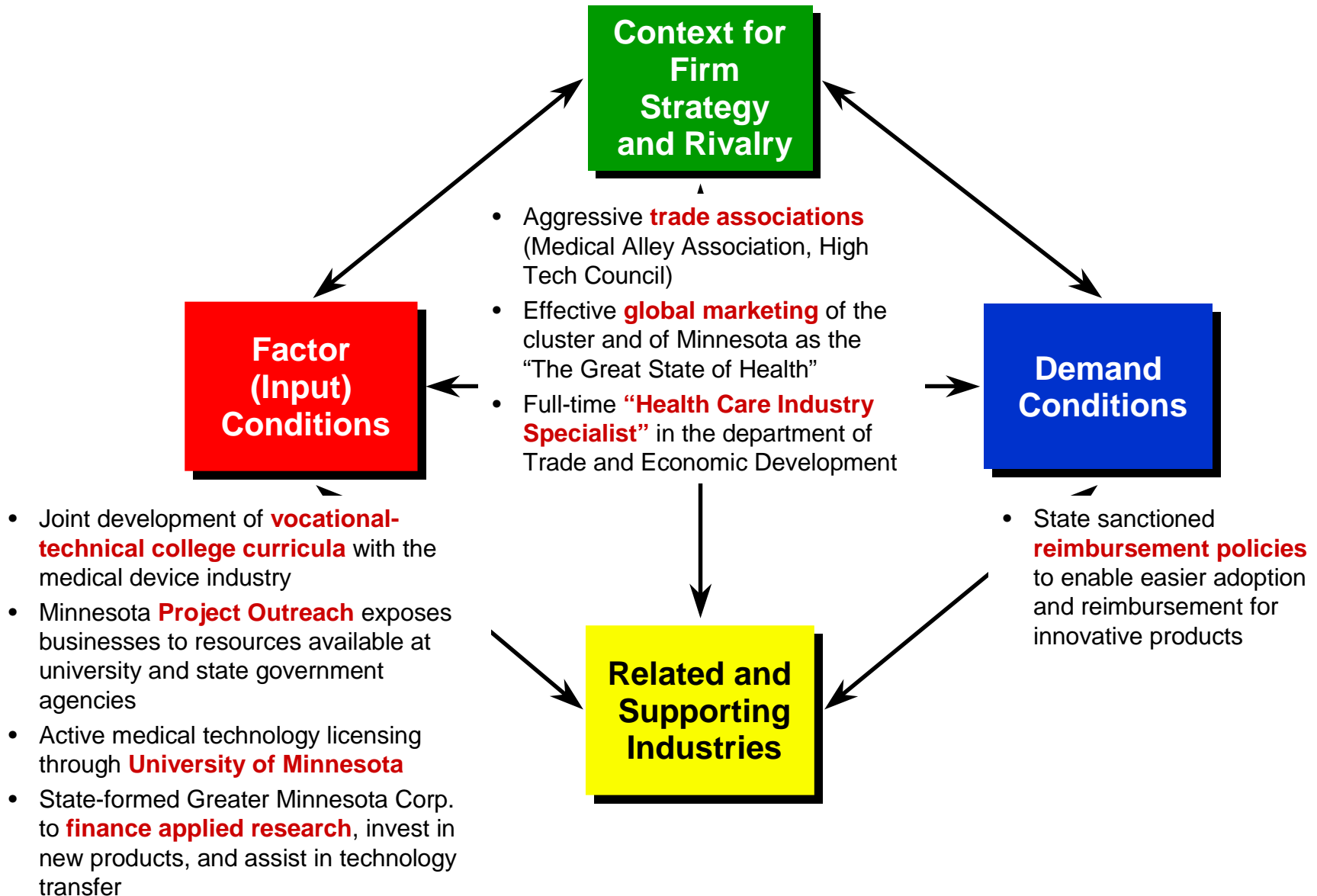
# Massachusetts Clusters

## Widening the Cluster Base



# Public / Private Cooperation in Cluster Upgrading

## Minnesota's Medical Device Cluster



# Basque Economic Strategy: The Way Ahead

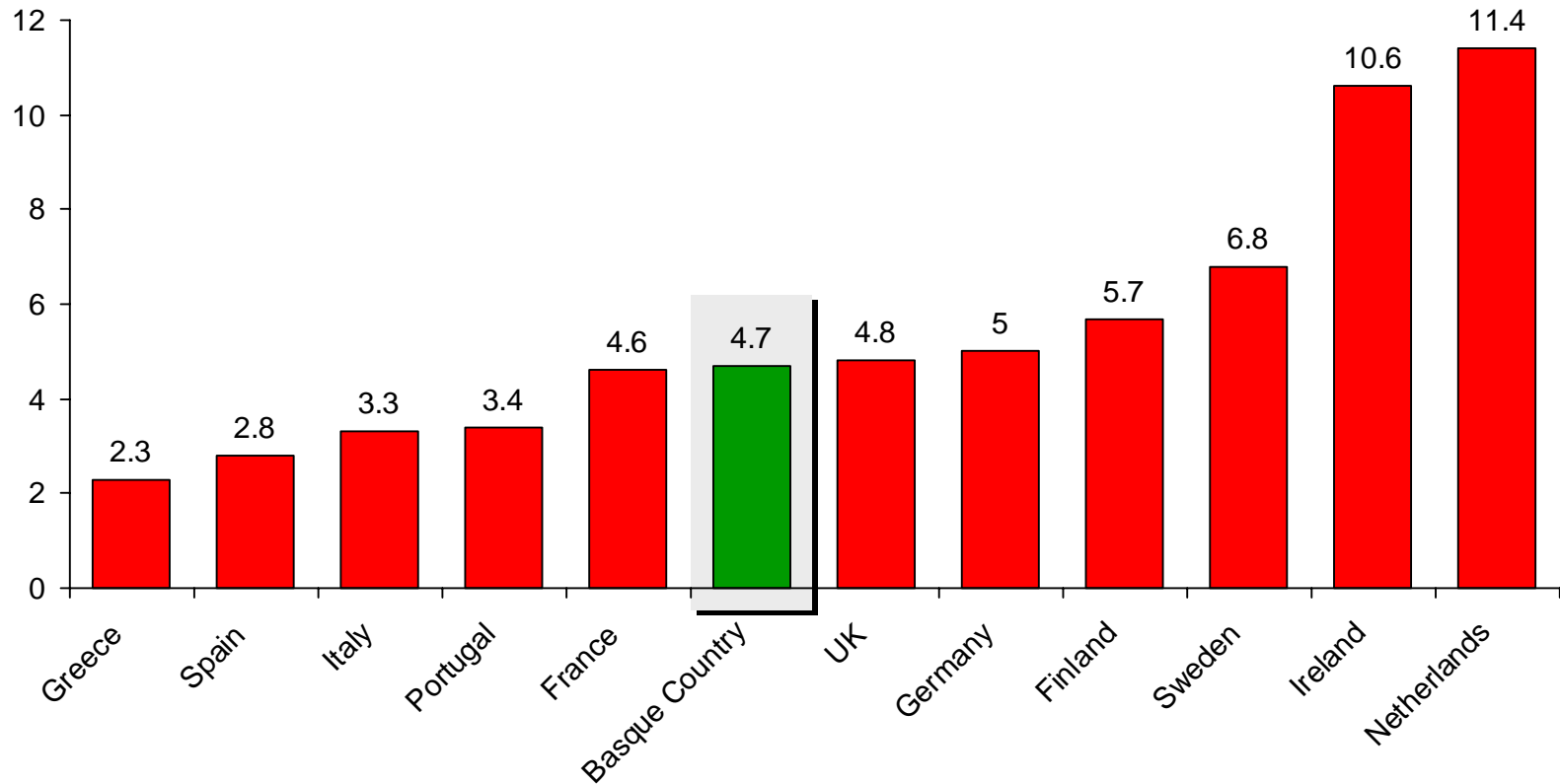
- Enhance the skills of the large low-skill workforce
- Upgrade Innovative Capacity
- Deepen clusters and extend cluster development throughout the economy
- **Upgrade corporate strategies**
  - **Regional and global strategies with a Basque home base**



# Export Performance

## European Countries and Regions

Exports per capita,  
in 1,000 ECU, 1998



Note: Basque exports to destinations outside Spain

Source: Basque Statistical Office

# Basque Companies with Global Strategies

## IRIZAR

- Coach manufacturer with focus on premium segment
- International expansion began in 1995
  - Current operations in Brazil, Mexico, China, India, and Morocco
  - Sales in 65 countries
- Builds on Basque manufacturing supplier base
- Strong employee involvement and flat management structure; involved in upgrading of its social environment
- Leads its sector efficiency and profitability

## CAF

- Railroad equipment manufacturer with focus on innovative technology
- International expansion began in 1992
  - Current operations in the US, Mexico, Brazil, Portugal, Ireland, and the UK
  - 70% of sales are outside Spain
- Builds on Basque manufacturing supplier base
- Strong investment in R&D; launched railroad research center at Basque Technology Centers

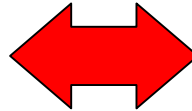
# Determinants of Relative Performance

**Operational Effectiveness**

- Assimilating, attaining, and extending **best practice**



**Do the same thing better**



**Strategic Positioning**

- Creating a **unique** and **sustainable** competitive position

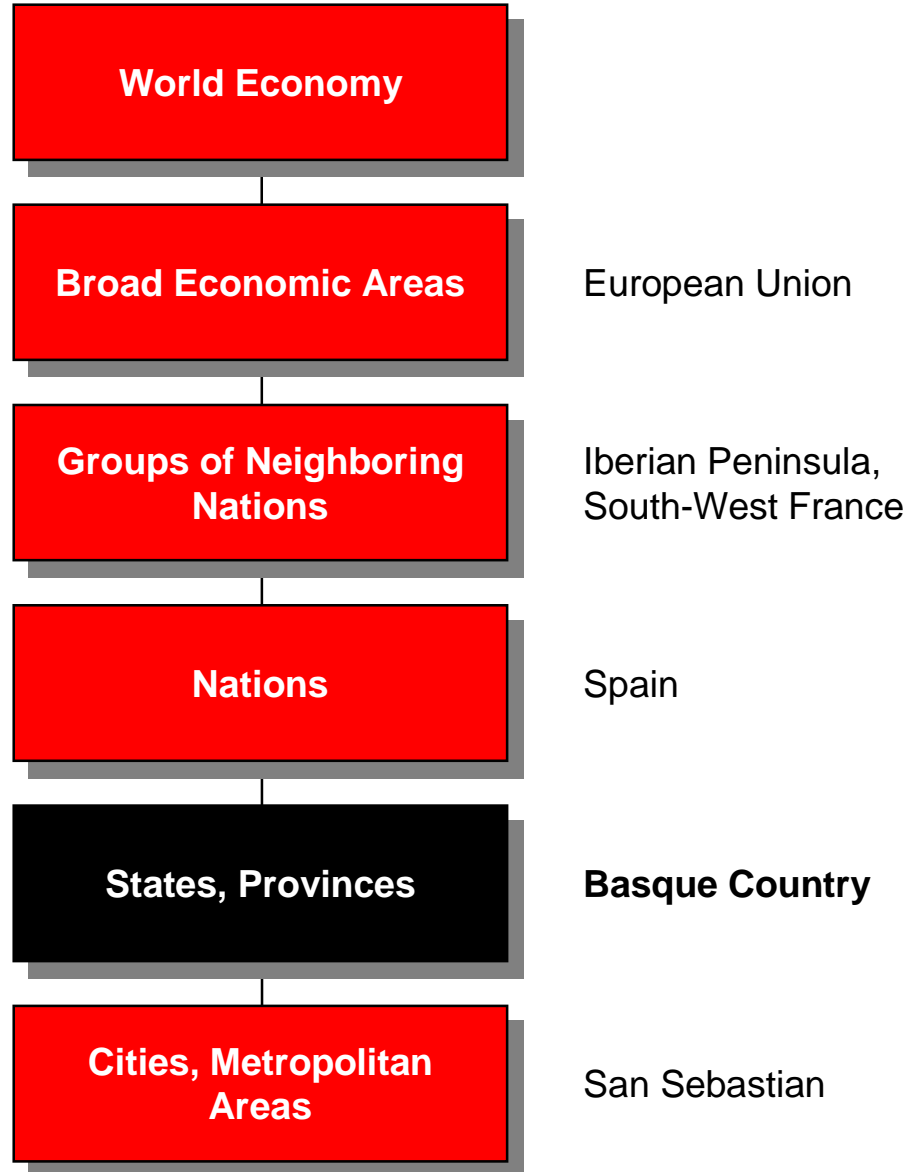


**Compete in a different way**

# Basque Economic Strategy: The Way Ahead

- Enhance the skills of the large low-skill workforce
- Upgrade Innovative Capacity
- Deepen clusters and extend cluster development throughout the economy
- Upgrade corporate strategies
- **Deepen integration with neighboring nations and regions**

# Geographic Levels and Competitiveness



# Economic Coordination With Neighboring Regions and Countries

## Illustrative Policy Levers

### Factor (Input) Conditions

- Improve regional **transportation infrastructure**
- Create an efficient **energy** network
- Upgrade/link regional **communications**
- Upgrade/link **financial markets**
- Upgrade **higher education** through facilitating specialization and student exchanges
- Expand cross-border business and financial **information access and sharing**

### Context for Strategy and Rivalry

- Agree on foreign **investment promotion guidelines** to limit forms of investment promotion that do not enhance productivity
- Simplify **cross-border** regulations and paperwork

### Demand Conditions

- Create joint **public procurement** procedures
- Set common **environmental standards**
- Set common **safety standards**

### Related and Supporting Industries

- Establish ongoing upgrading process in **clusters that cross national borders**

### Regional Governance

- Share **best practices** in government operations
- Improve regional **institutions**
- Develop a regional **marketing** strategy

# Basque Economic Strategy: The Way Ahead

- Enhance the skills of the large low-skill workforce
- Upgrade Innovative Capacity
- Deepen clusters and extend cluster development throughout the economy
- Upgrade corporate strategies
- Deepen integration with neighboring nations and regions



- **Avoid losing momentum**

# Organizing to Compete Massachusetts

## Governor's Council on Economic Growth and Technology

### Industry Cluster Committees

- Advanced Materials
- Biotechnology and Pharmaceuticals
- Defense
- Marine Science and Technology
- Medical Devices
- Software
- Telecommunications
- Textiles
- Information 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 Emerging Companies
- Health Care
- Western Massachusetts
- Business Climate
- Competitive Benchmarking