

Irish Competitiveness: Entering a New Economic Era

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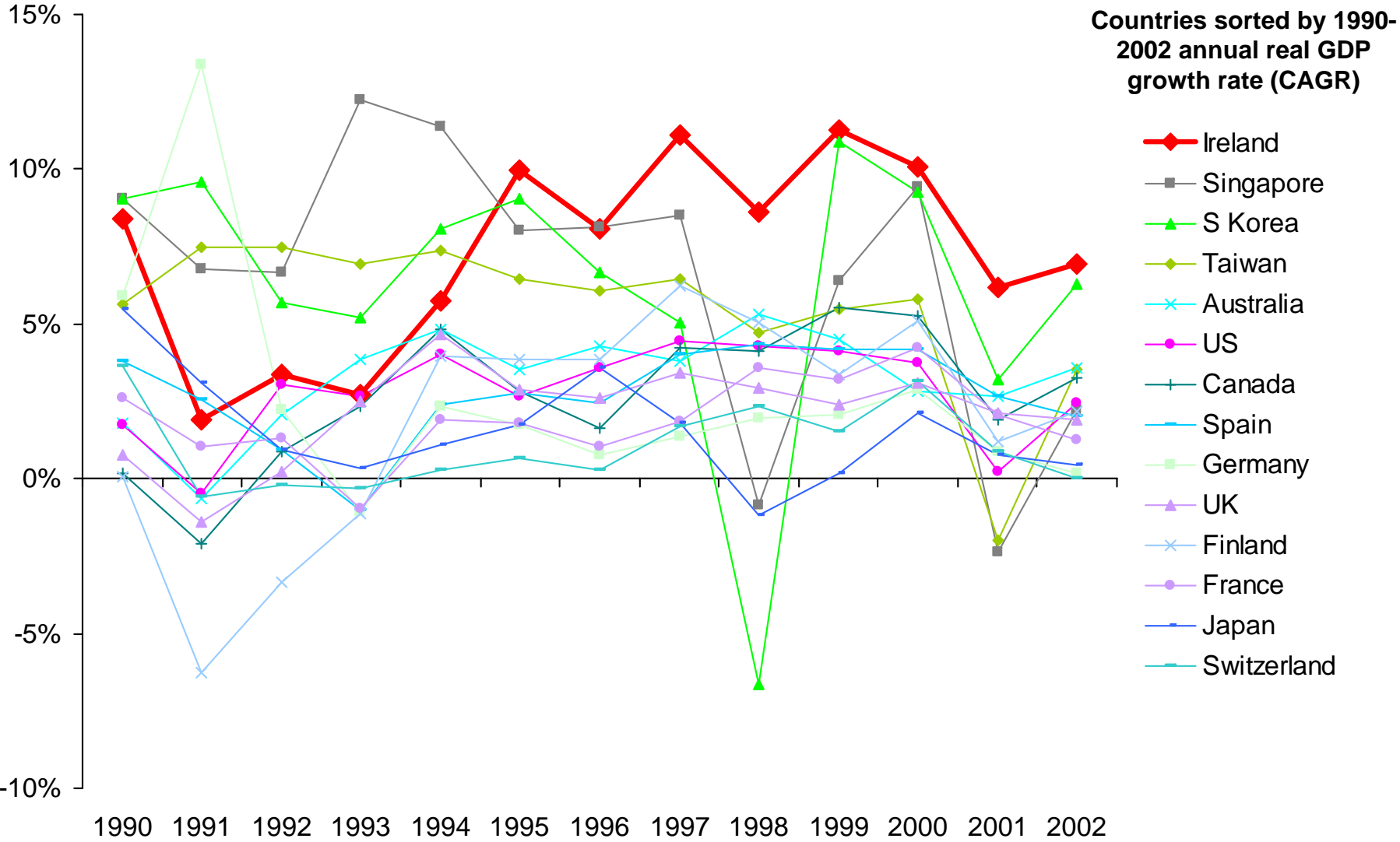
This presentation draws on ideas from Professor Porter's articles and books, in particular, The Competitive Advantage of Nations (The Free Press, 1990), "Building the Microeconomic Foundations of Competitiveness," in The Global Competitiveness Report 2003, (World Economic Forum, forthcoming 2003), "Clusters and the New Competitive Agenda for Companies and Governments" in On Competition (Harvard Business School Press, 1998), and ongoing research on clusters and competitiveness. 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.

Further information on Professor Porter's work and the Institute for Strategy and Competitiveness is available at www.isc.hbs.edu

Comparative Economic Performance

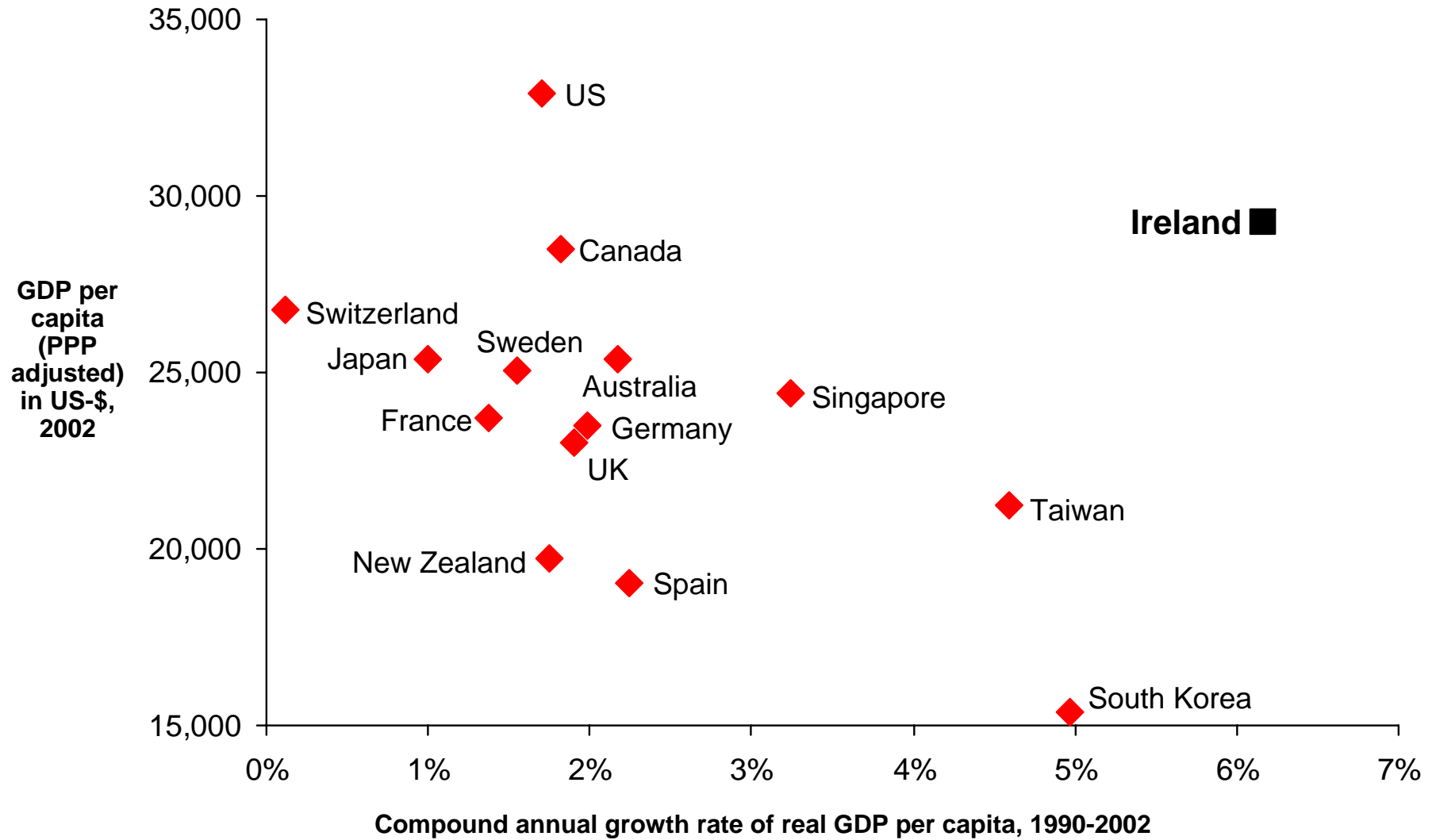
Real GDP Growth Rates

Annual growth rate of real GDP



Source: EIU (2003)

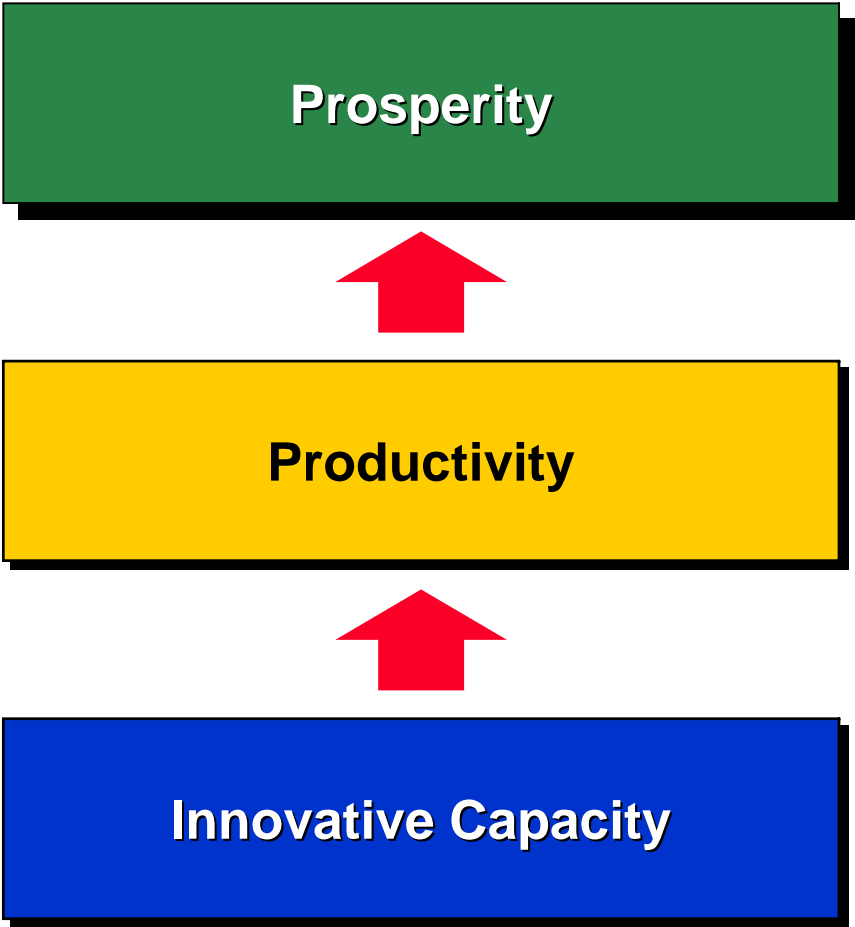
Comparative Economic Performance



Ireland's Economic Situation 2003

- Ireland has been one of the **most dynamic and successful countries** in the global economy over the last decade
 - Ireland's open economy provided an attractive platform to serve European markets
 - Large inflows of foreign direct investment fuelled growth
 - A flexible labor supply from returning unemployed workers and Irish emigrants kept wage growth at bay
 - Ireland is now confronted with new and **more challenging** circumstances
 - Labor supply is constrained; wage costs are rising
 - Global demand is subdued, especially in sectors heavily represented in the Irish economy
 - The European economic landscape is changing with Central and Eastern European countries entering the European Union
- 
- A **new economic strategy** will be needed to maintain and grow Irish prosperity

Foundations of Prosperity



Competitiveness

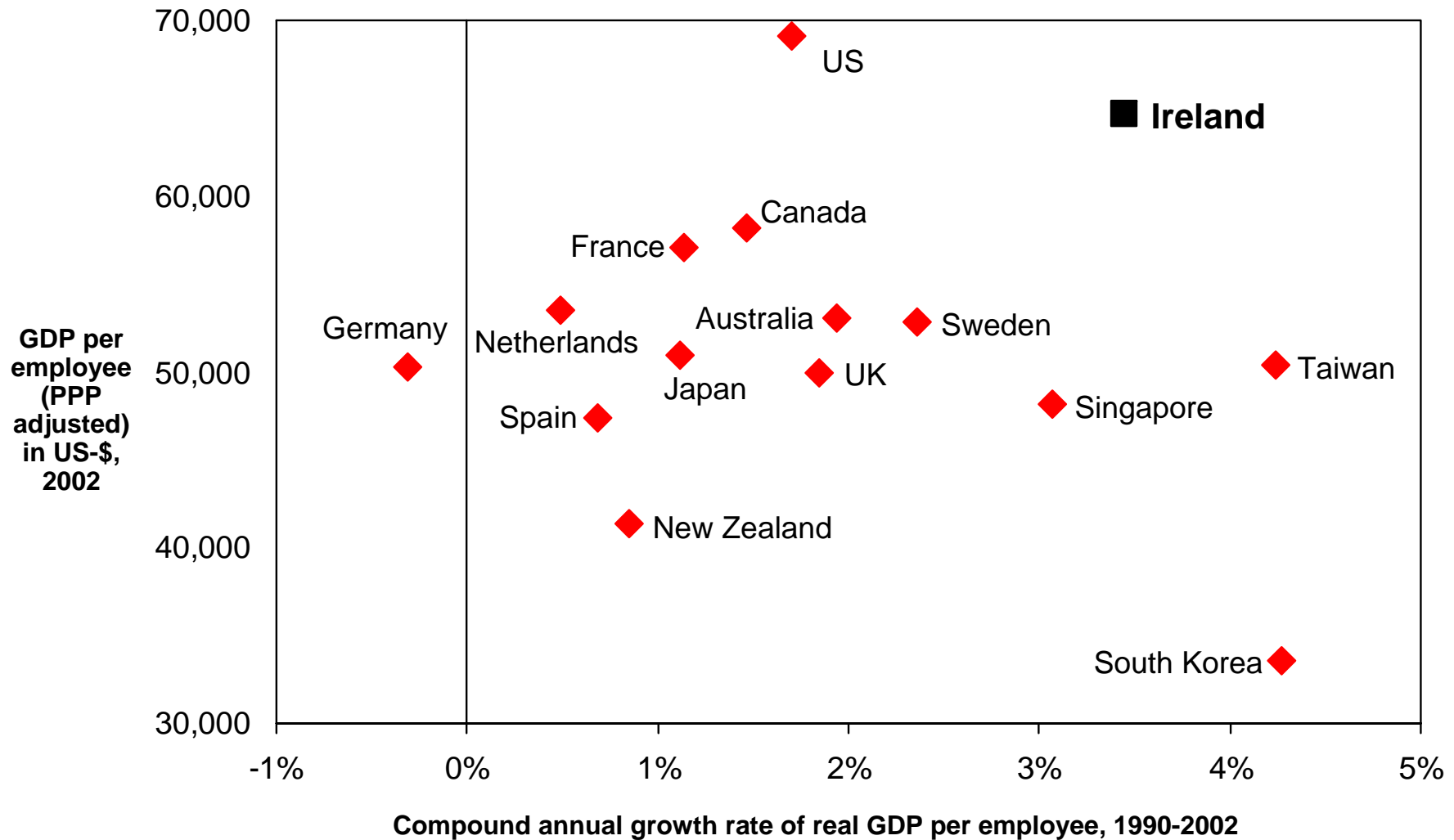
What is Competitiveness?

- Competitiveness is determined by the **productivity** with which a nation uses its human, capital, and natural resources. Productivity sets a nation's or region's standard of living (wages, returns to capital, returns to natural resource endowments)
 - 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 competes in that matters for prosperity, but **how** firms compete in those industries
 - Productivity in a 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
 - Devaluation **does** not make a country more competitive



- 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

Comparative Labor Productivity Performance

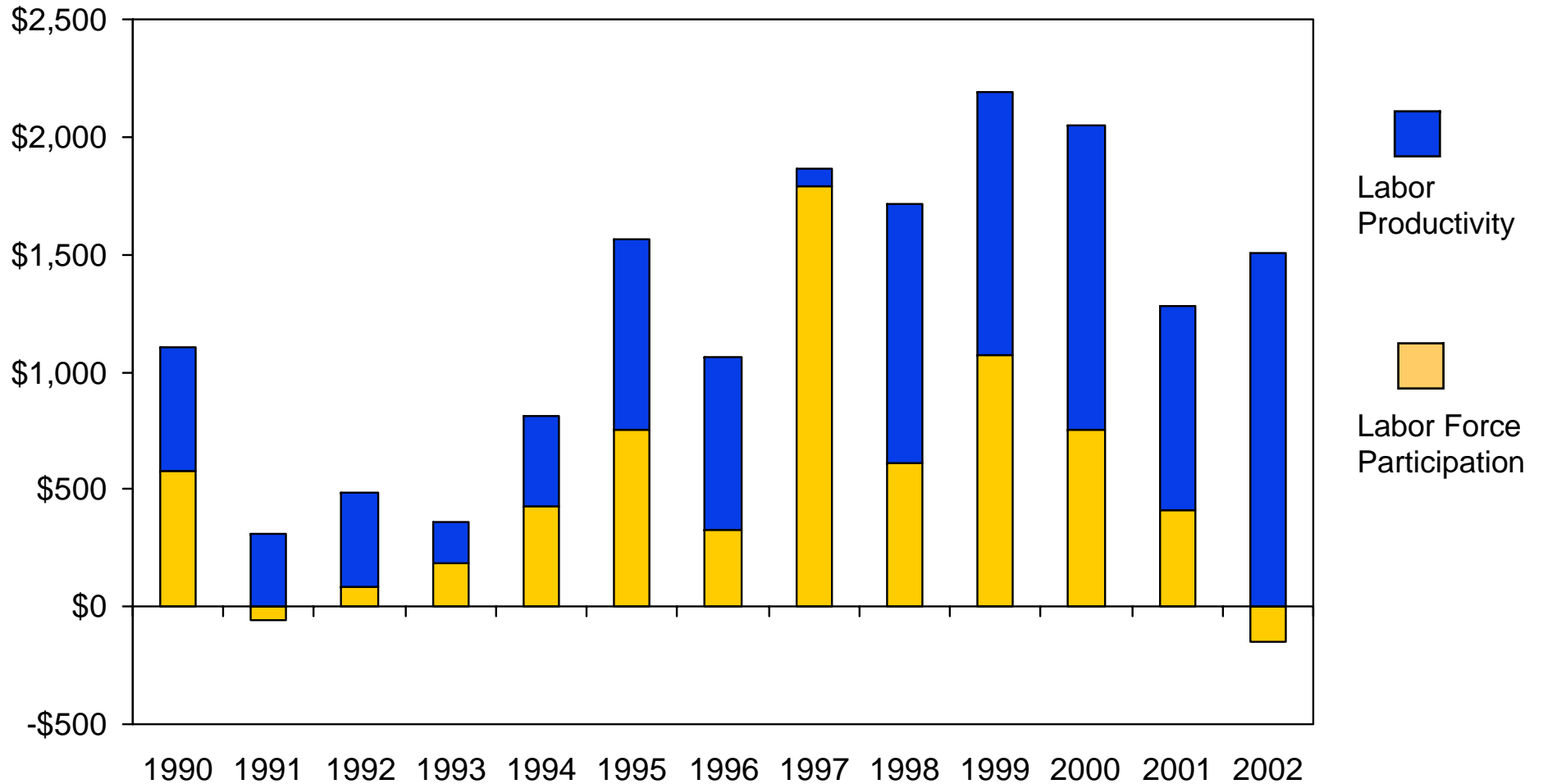


Note: Irish GNP per capita is about 20% lower than the reported GDP per capita figure due to large dividend outflows to foreign investors. We use GNP per capita for Ireland because it is more representative. For other countries GDP and GNP are very similar.

Source: WEO

Decomposing Irish GDP per Capita Growth

Contribution to change in
GDP per Capita



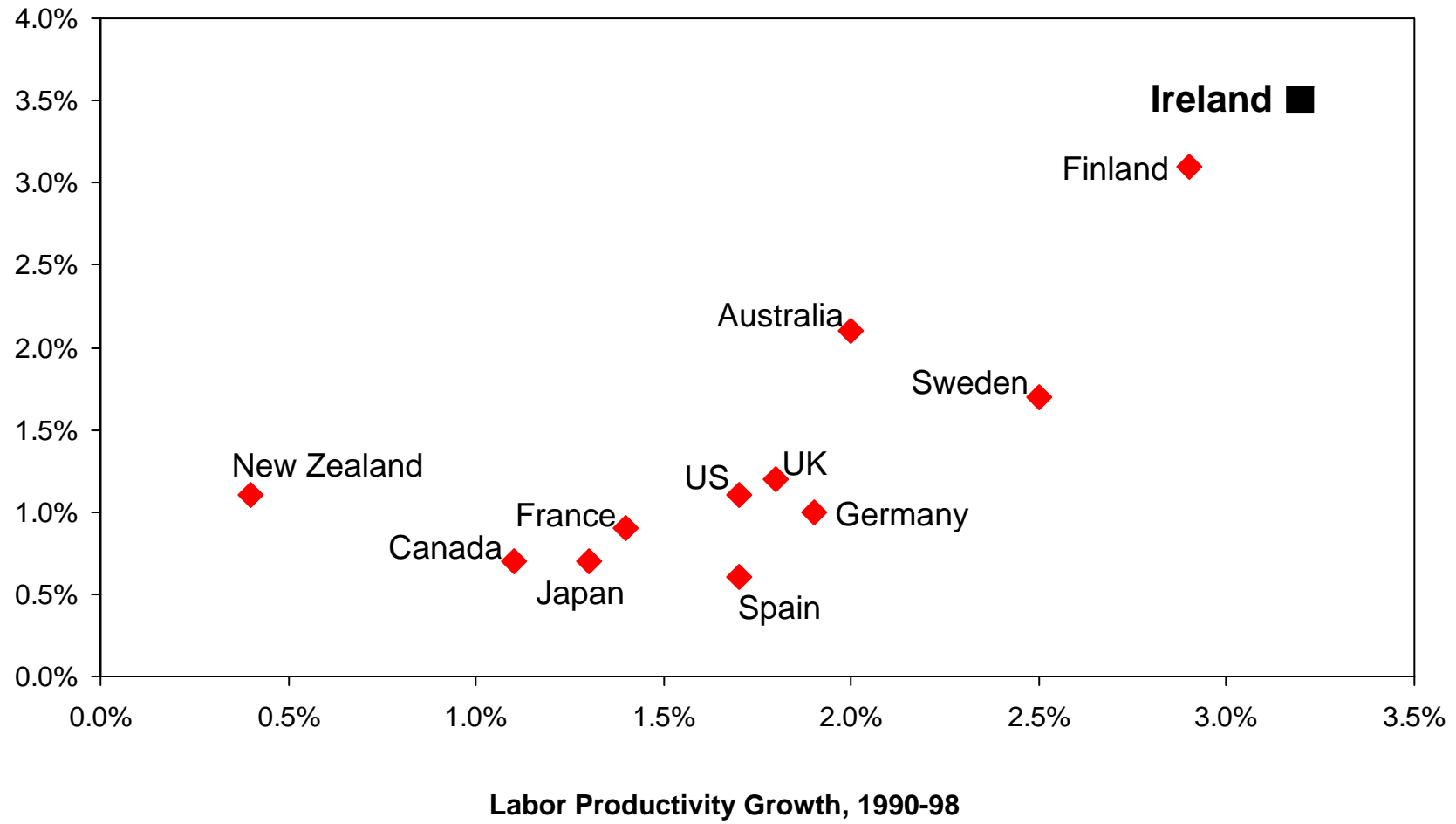
Source: EIU (2003)

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Total Factor Productivity Performance

Selected OECD Countries

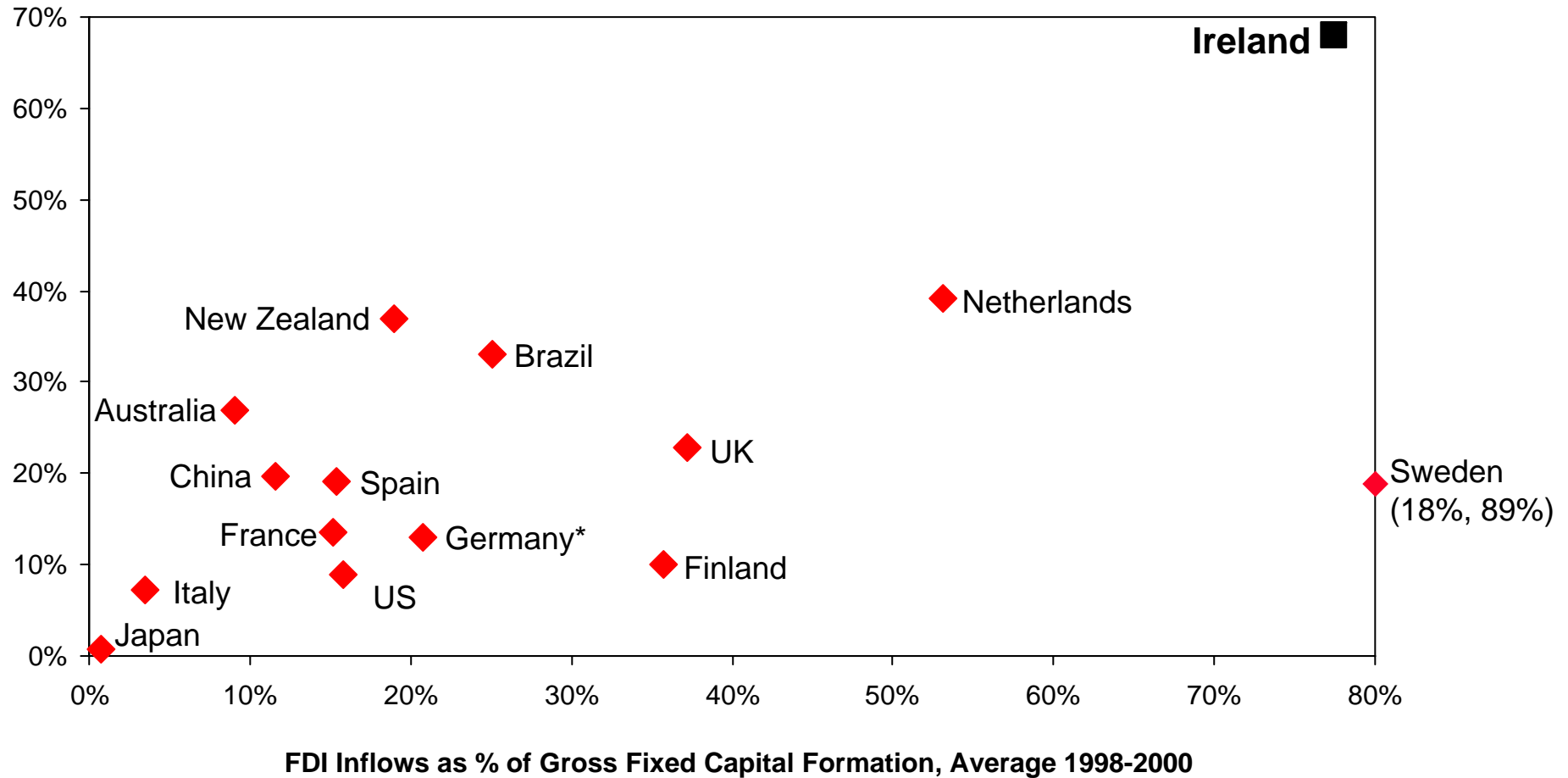
Total Factor
Productivity
Growth, 1990-98



Comparative Inward Foreign Investment

Selected Advanced Economies

FDI Stocks as % of GDP,
Average 1998-2000

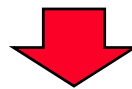
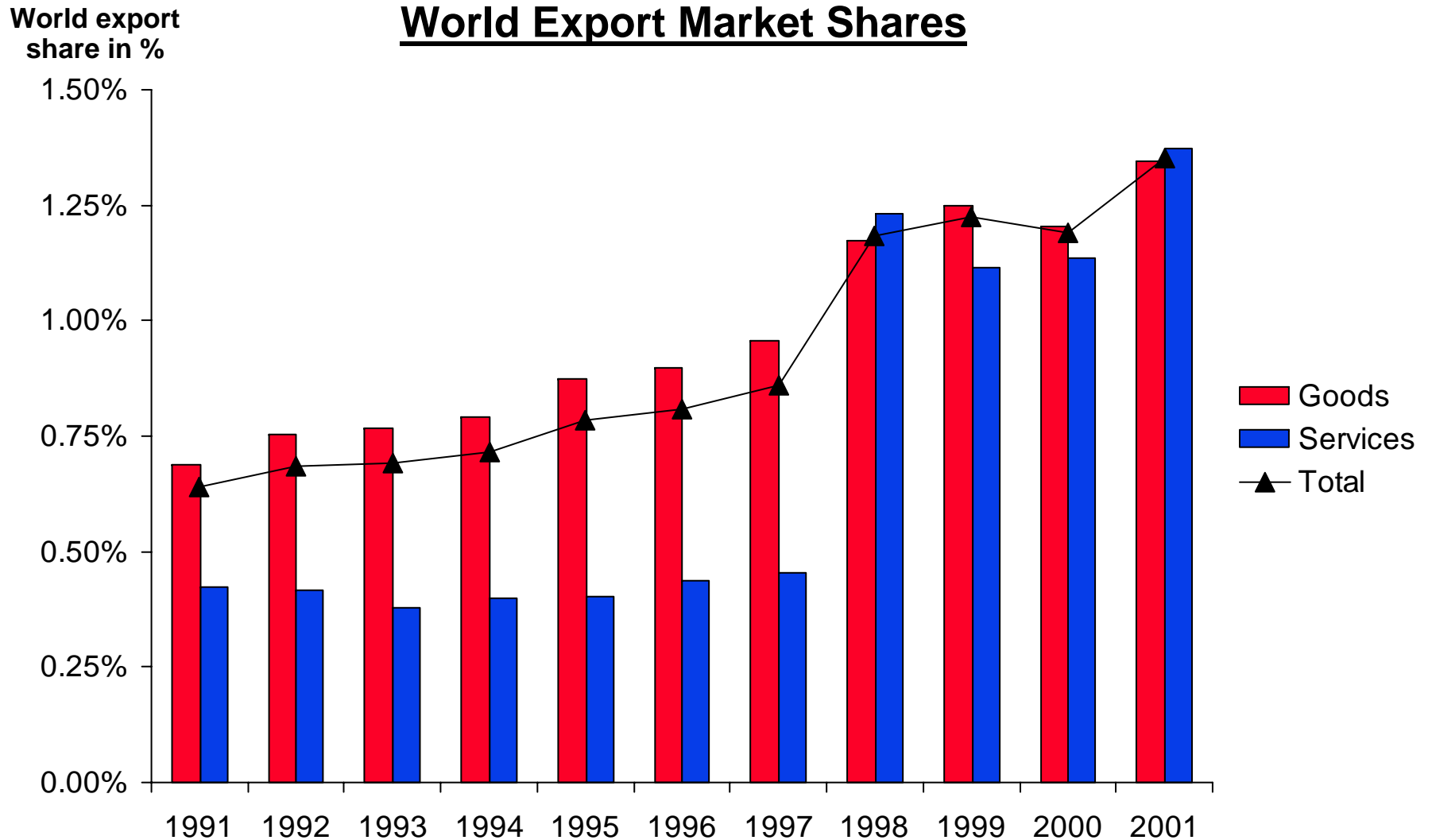


Note: Germany's FDI inflows in this period were exceptionally high due to the Vodafone-Mannesmann takeover in 2000

Source: World Investment Report 2002

Ireland's Export Performance

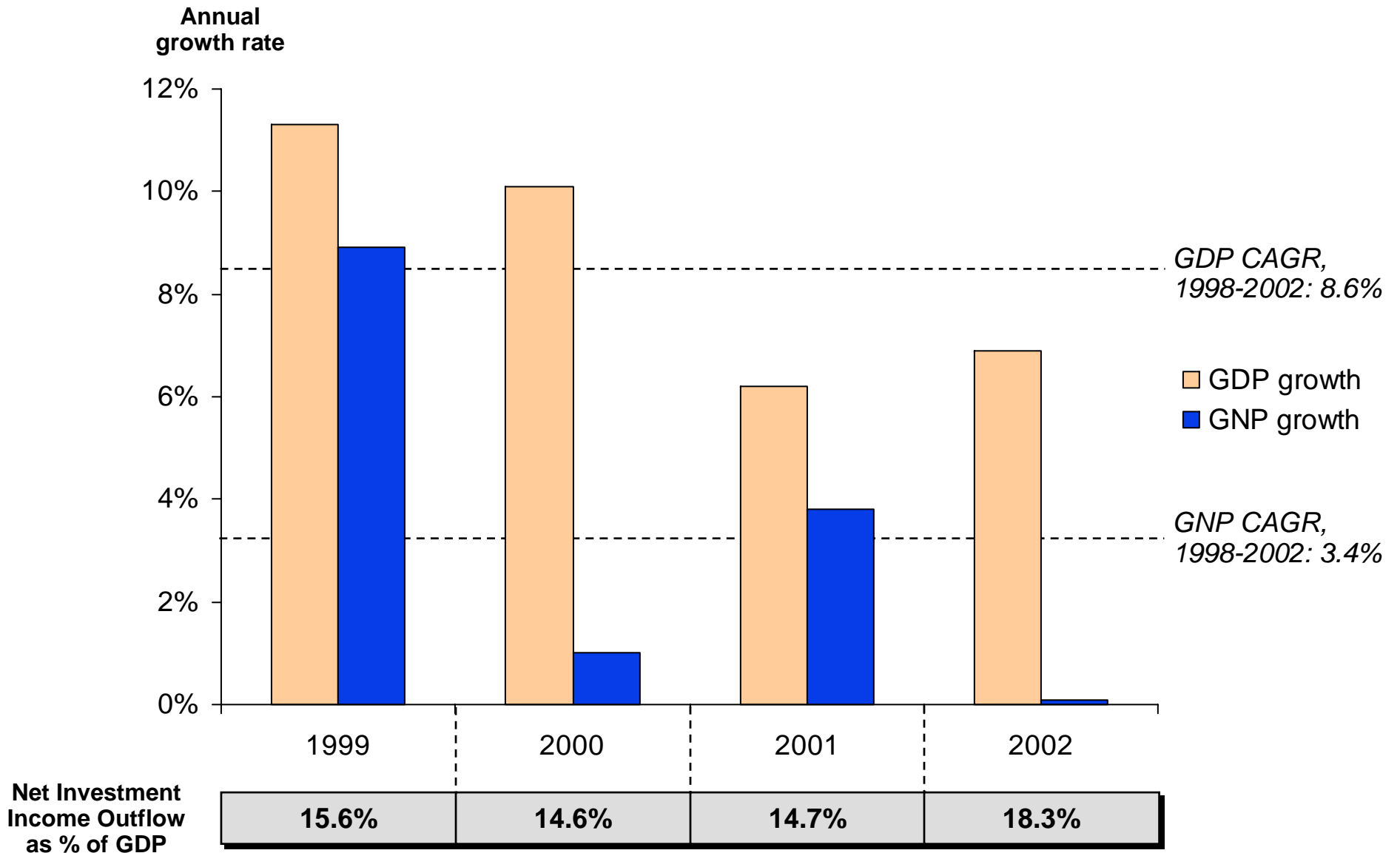
World Export Market Shares



- Ireland's world export share has increased strongly over the last decade

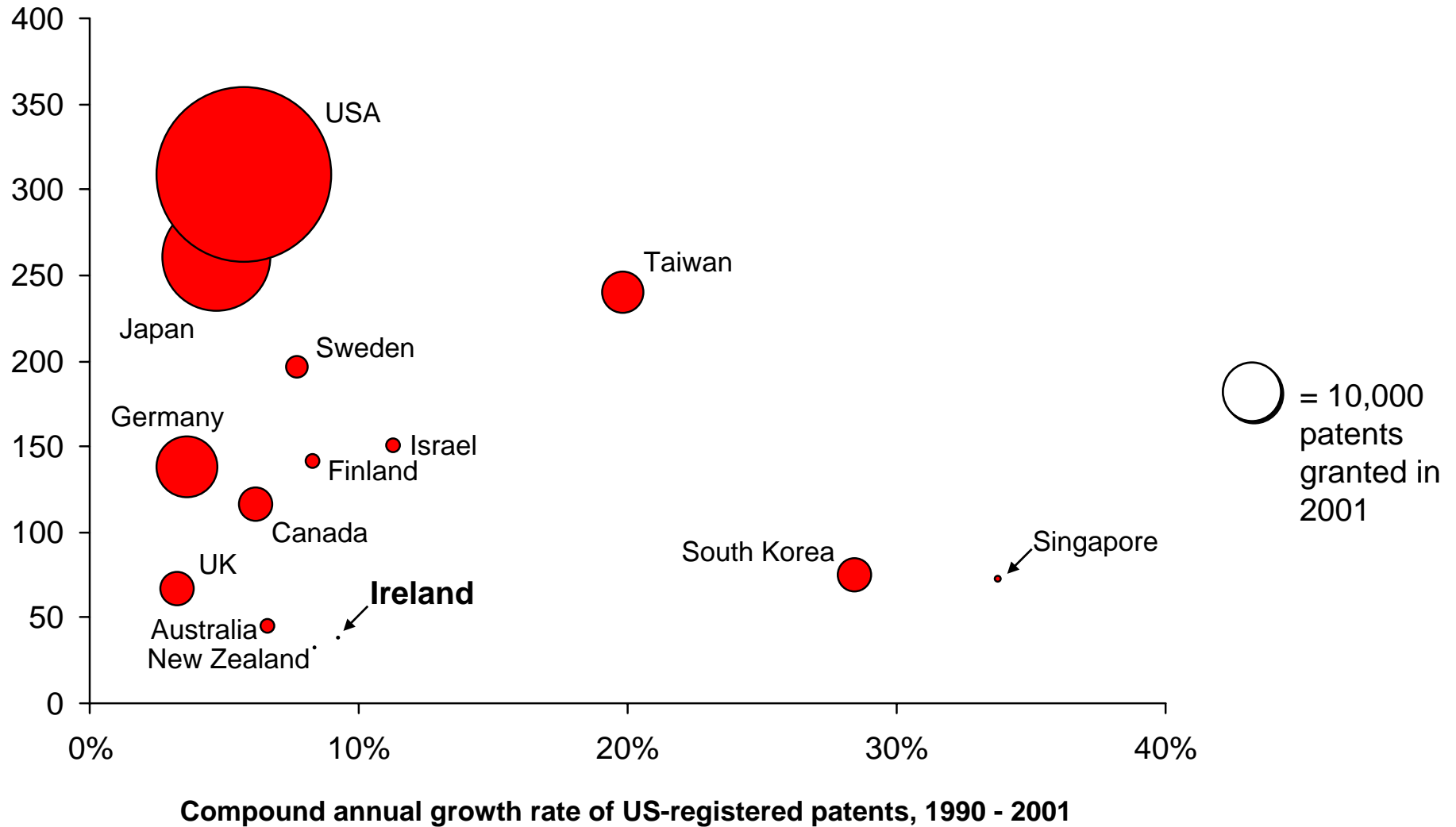
Ireland's Economic Performance

GDP versus GNP



International Patenting Output

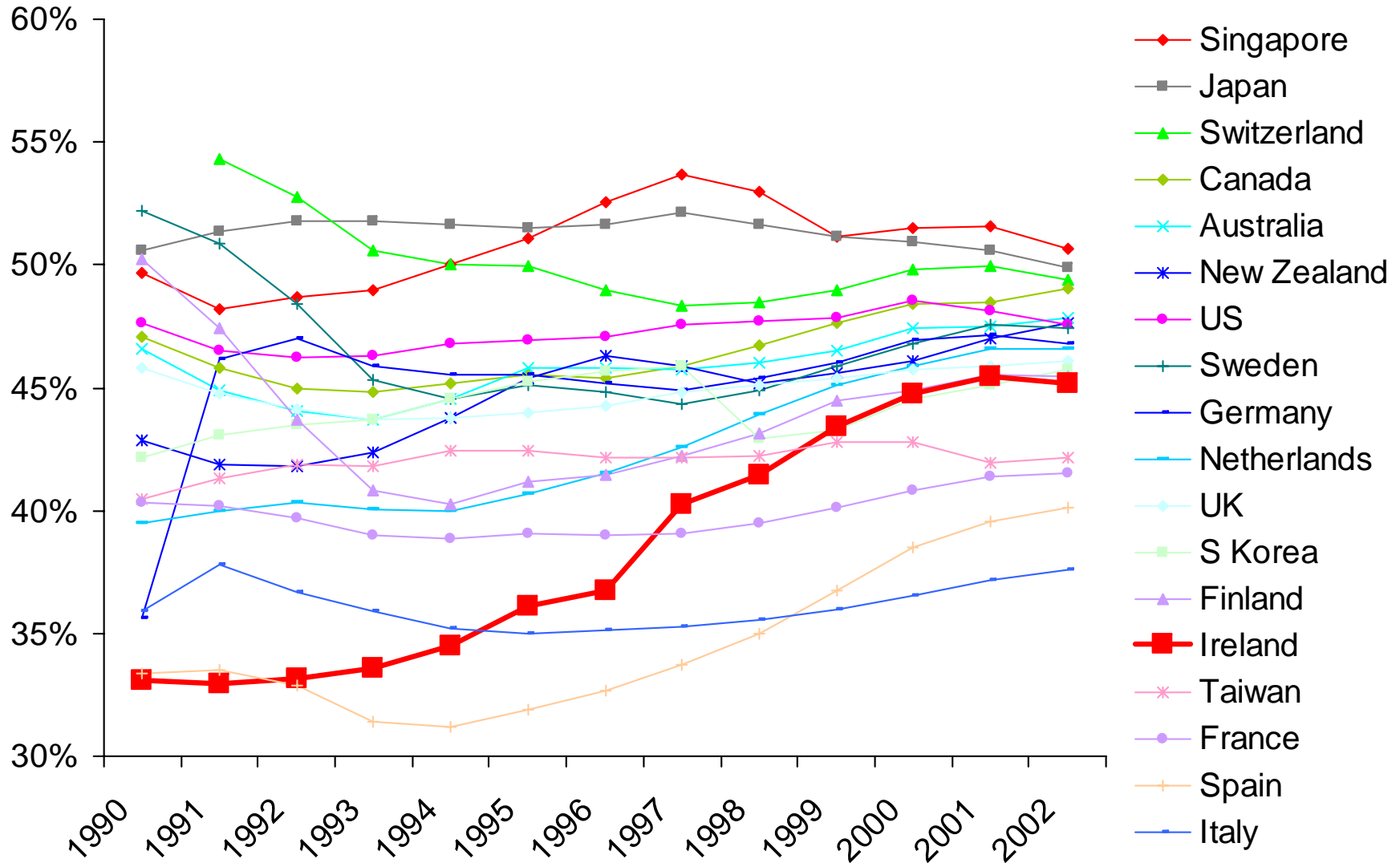
Annual U.S. patents
per 1 million
population, 2001



Source: US Patent and Trademark Office (www.uspto.gov). Author's analysis.

Labor Force Participation

Employees as Share of Population



Ireland Entering a New Era

- Recent Economic Performance
- **Foundations of Microeconomic Competitiveness**
- Challenges to Irish Competitiveness

Determinants of Productivity and Productivity Growth

Macroeconomic, Political, Legal, and Social Context for Development

Microeconomic Foundations of Development

Sophistication of Company Operations and Strategy

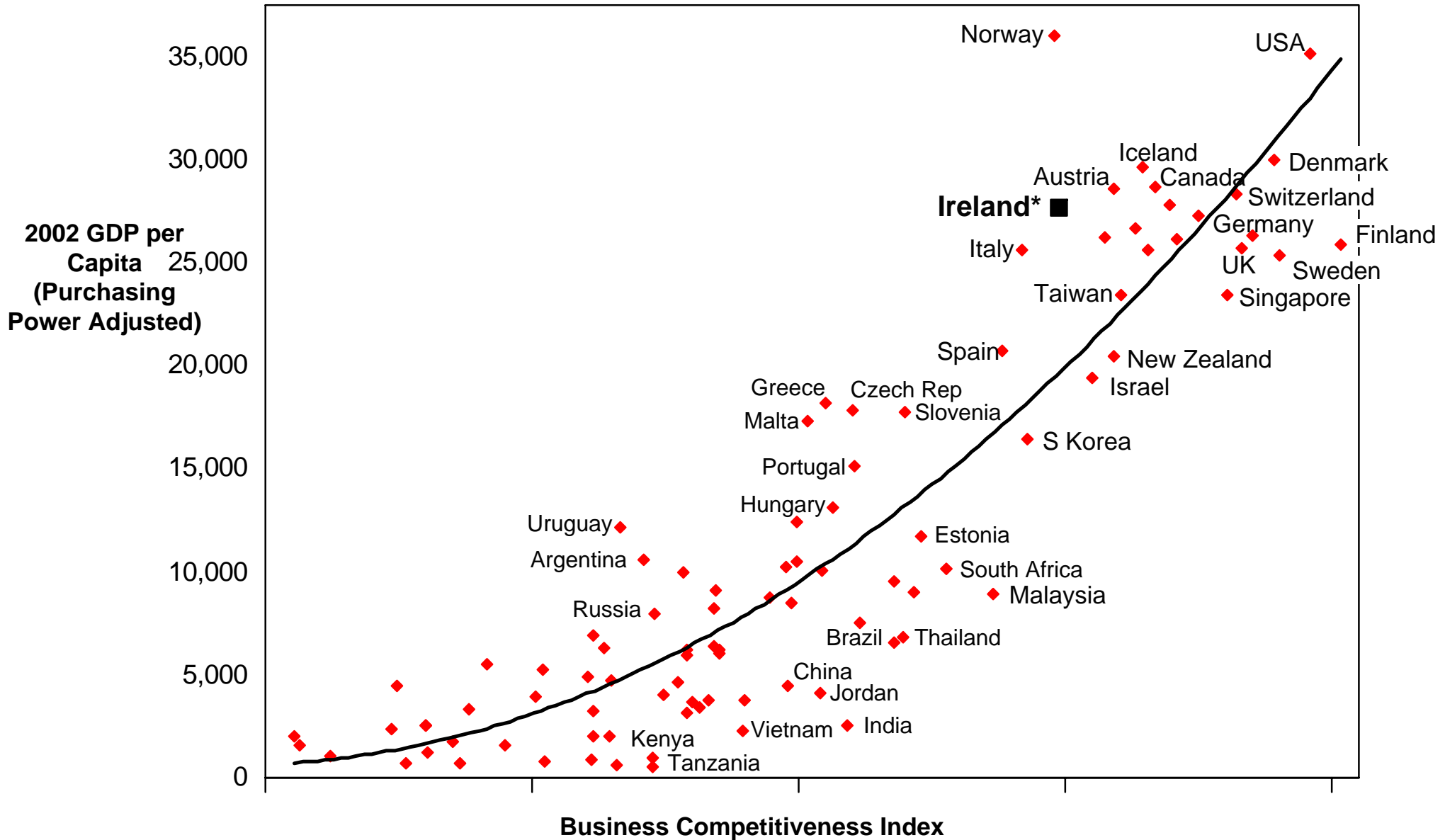


Quality of the Microeconomic Business Environment

- A sound macroeconomic, political, legal, and social 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 companies and local competition**

Global Competitiveness Report 2003

The Relationship Between Business Competitiveness and GDP Per Capita

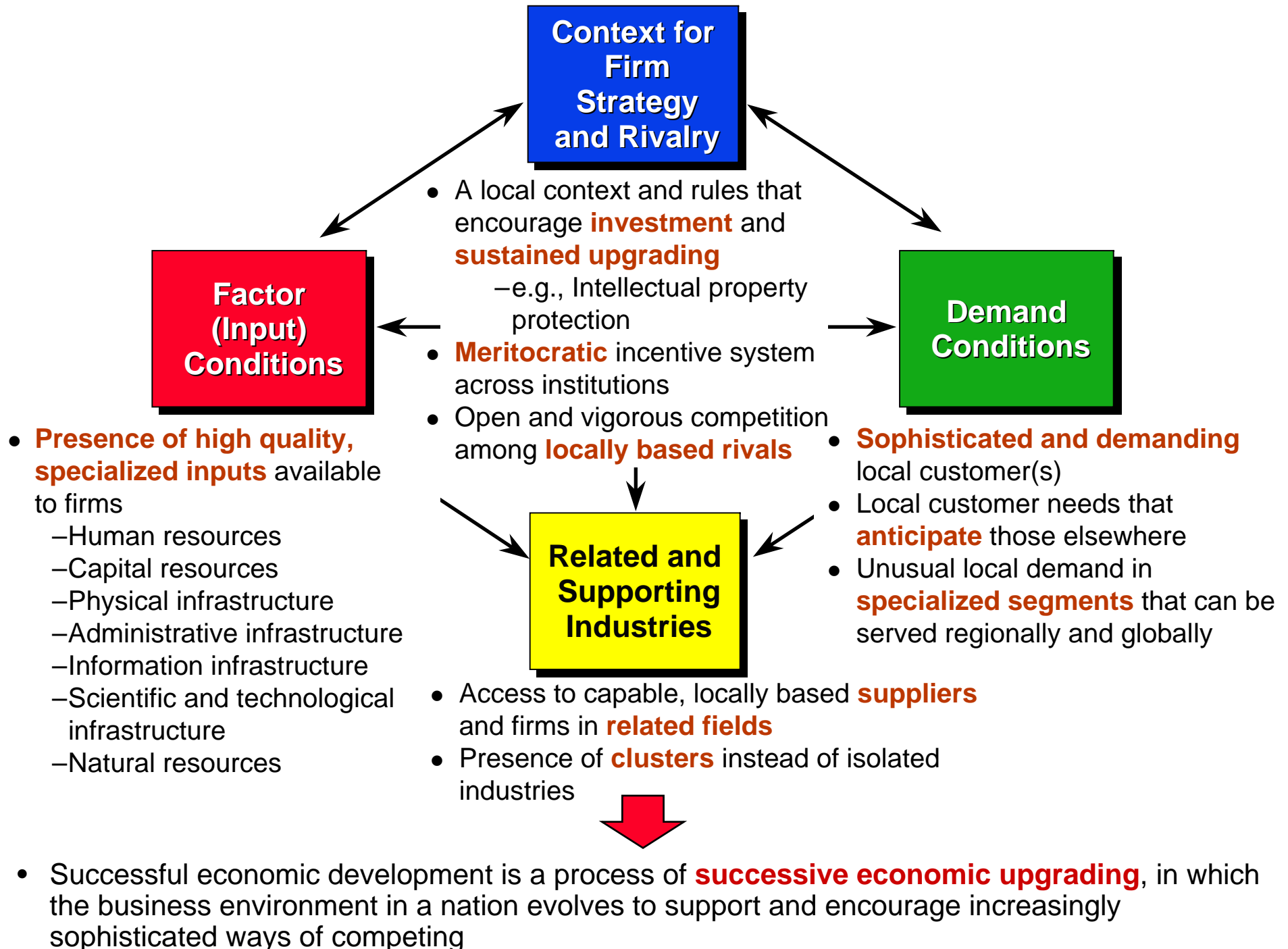


Note: For Ireland we use GNP per capita which excludes payments of foreign company subsidiaries to parent companies

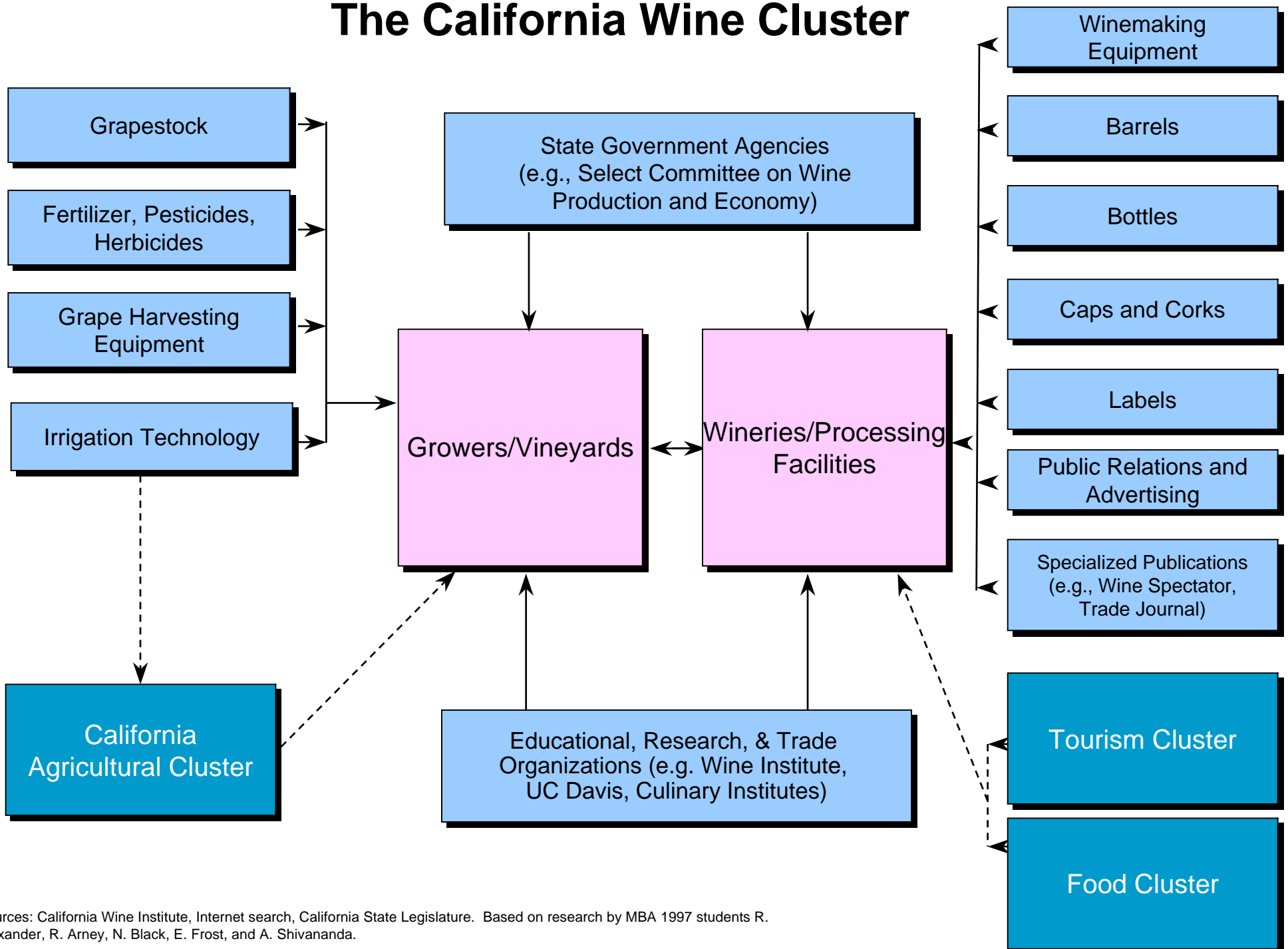
Source: Global Competitiveness Report 2003

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Productivity and the Business Environment

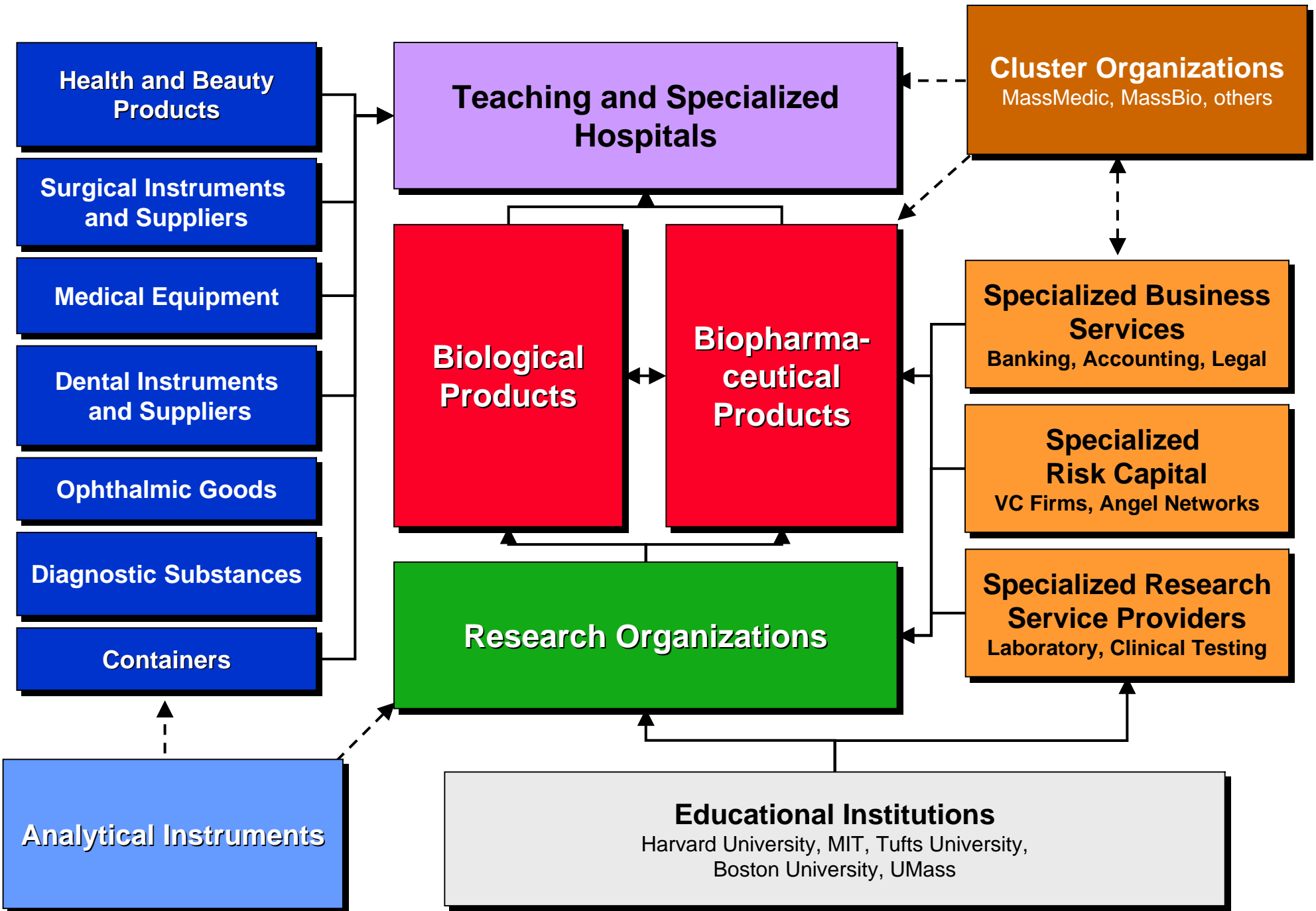


The California Wine Cluster



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.

Boston Life Sciences Cluster



Leading Footwear Clusters

Portugal

- Production
- Focus on short-production runs in the medium price range

Romania

- Production subsidiaries of Italian companies
- Focus on lower to medium price range

Italy

- Design, marketing, and production of premium shoes
- Export widely to the world market

United States

- Design and marketing
- Focus on specific market segments like sport and recreational shoes and boots
- Manufacturing only in selected lines such as hand-sewn casual shoes and boots

China

- OEM Production
- Focus on low cost segment mainly for the US market

Vietnam/Indonesia

- OEM Production
- Focus on the low cost segment mainly for the European market

Levels of Clusters

- There is often an **array of clusters** in a given field in different locations, each with different levels of specialization and sophistication
- Global **innovation centers**, such as Silicon Valley in semiconductors, are few in number. If there are multiple innovation centers, they normally **specialize** in different market segments
- Other clusters focus on **manufacturing**, outsourced **service functions**, or play the role of **regional** assembly or service centers
- Firms based in the most advanced clusters often **seed or enhance clusters** in other locations in order to reduce the risk of a single site, access lower cost inputs, or better serve particular regional markets
- The challenge for an economy is to move from **isolated firms** to an array of **clusters**, and then to **upgrade the breadth and sophistication** of clusters to more advanced activities

Institutions for Collaboration

Selected Massachusetts Organizations, Life Sciences

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

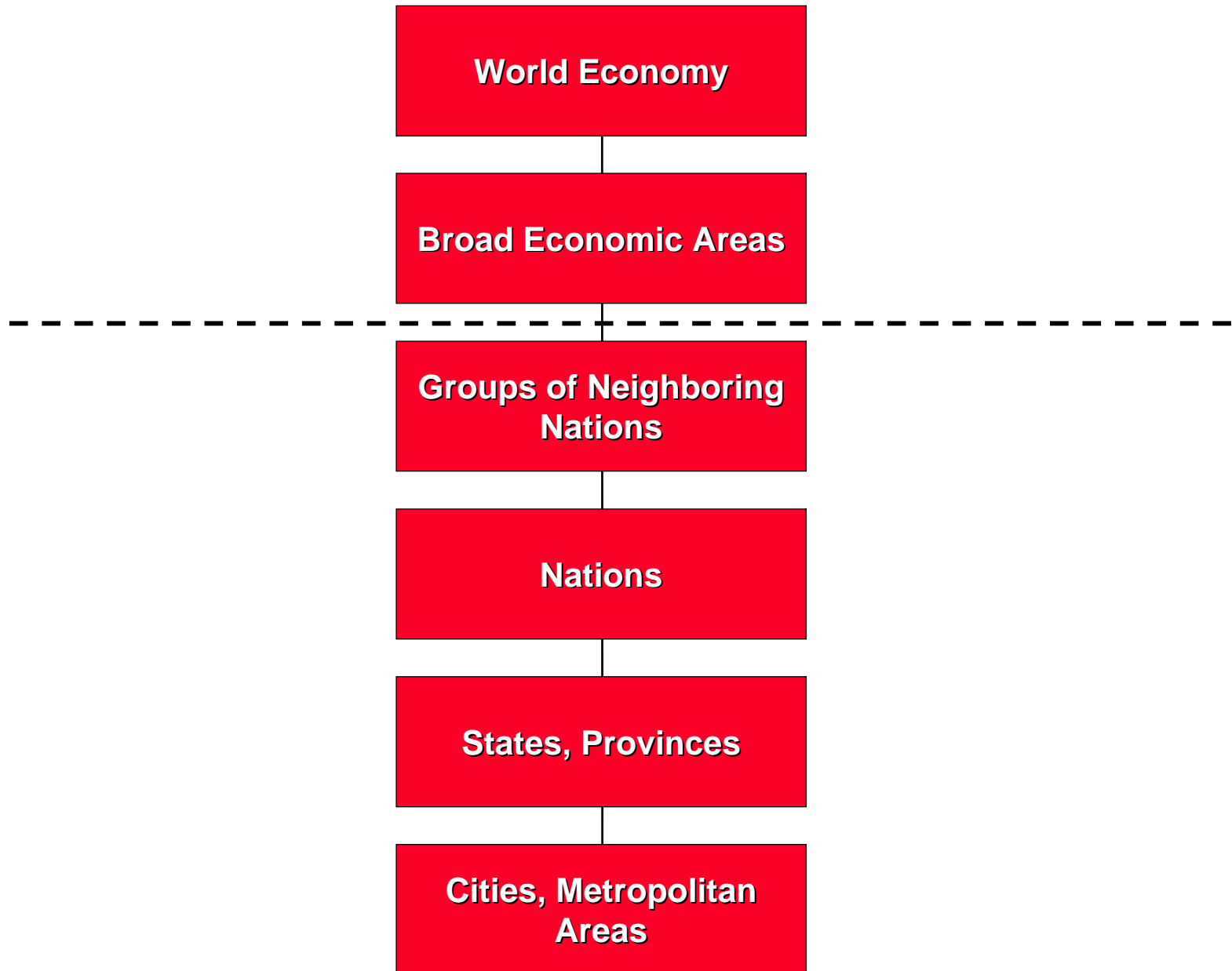
- Company alumni groups
- Venture capital community
- University alumni groups

Joint Research Initiatives

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

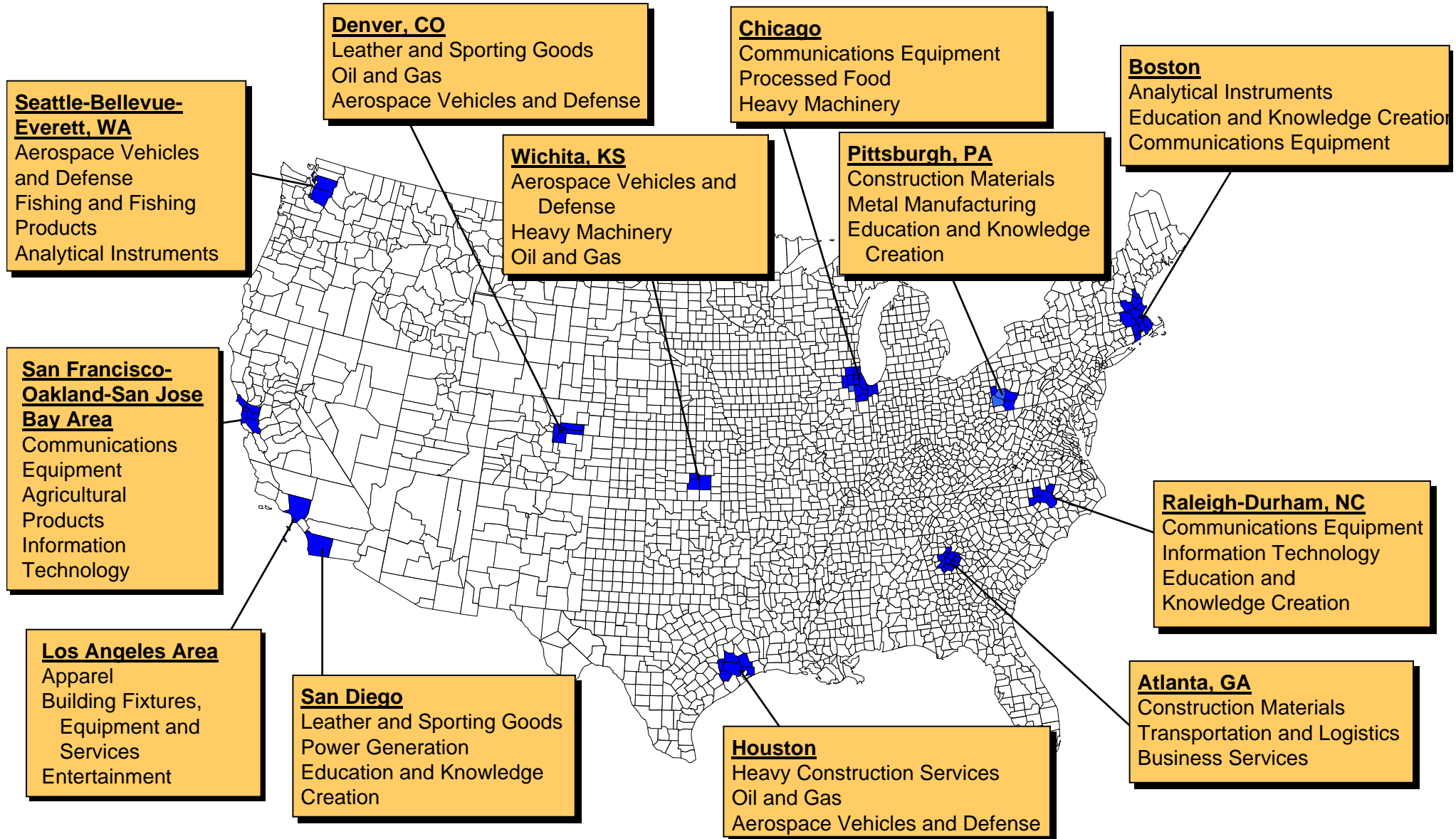
Influences on Competitiveness

Multiple Geographic Levels



Specialization of Regional Economies

Select U.S. Geographic Areas



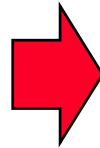
Note: Clusters listed are the three highest ranking clusters in terms of share of national employment

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

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

Transition to a New Economic Strategy

Ireland: A New Era

- Recent Economic Performance
- Foundations of Microeconomic Competitiveness
- **Challenges to Irish Competitiveness**

Ireland's Competitive Situation 2003

- Many of Ireland's traditional competitive advantages are **eroding**
 - Competing locations have caught up on in terms of market opening and business friendly regulations and tax structure
 - With rising cost levels, Ireland's traditional position as a low-cost location to serve European markets becomes **untenable**
- Ireland faces **weaknesses** in supporting higher value competition and needs to develop **new strengths** to emerge as an **innovation economy**

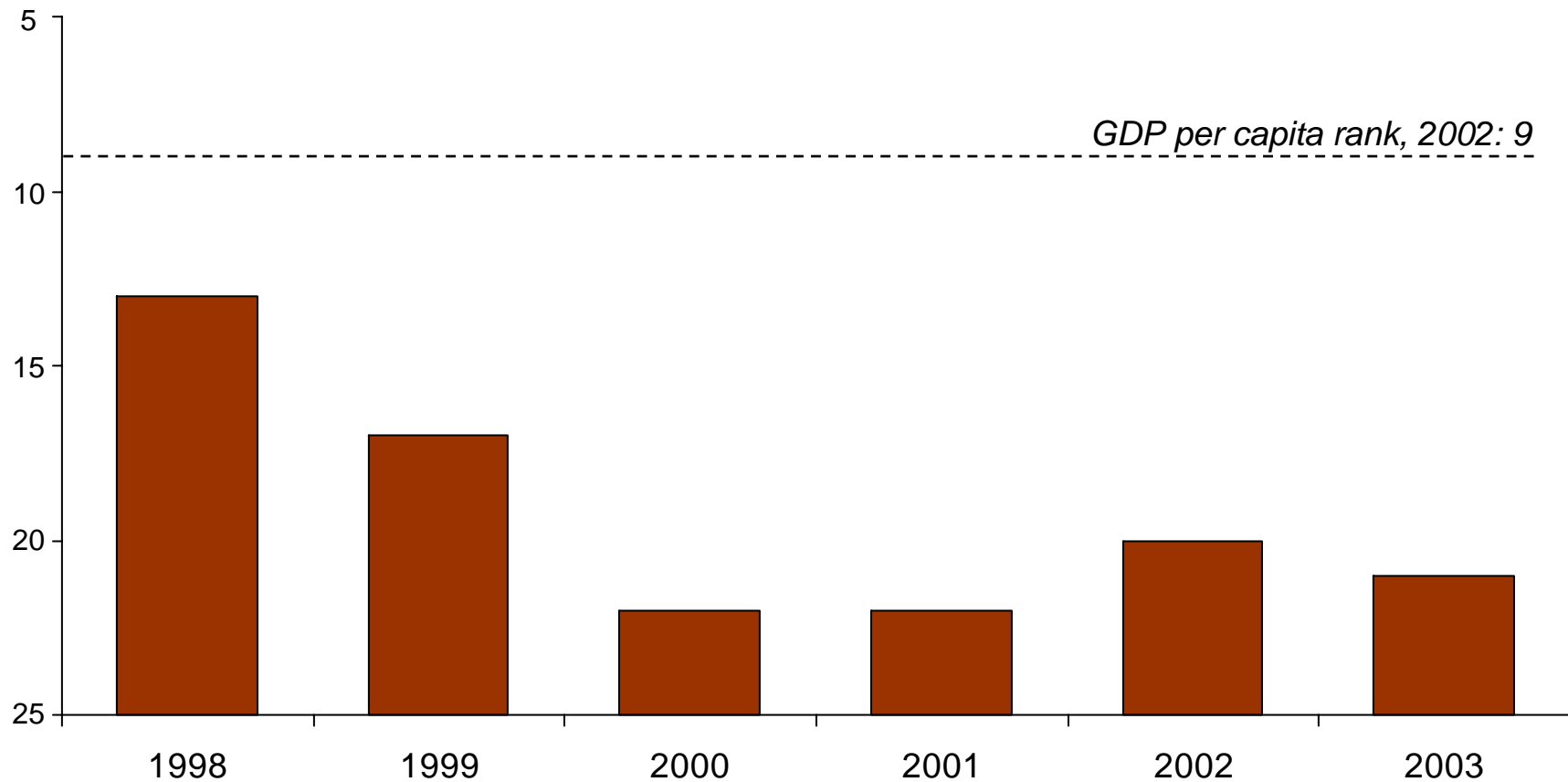


- Ireland's current economic policy is beginning to address some of these challenges, but progress on **implementation** is less clear
- There is not yet a **consensus** in Irish society about the problem or the solutions. Too many take Irish prosperity **for granted**

Business Competitiveness Index

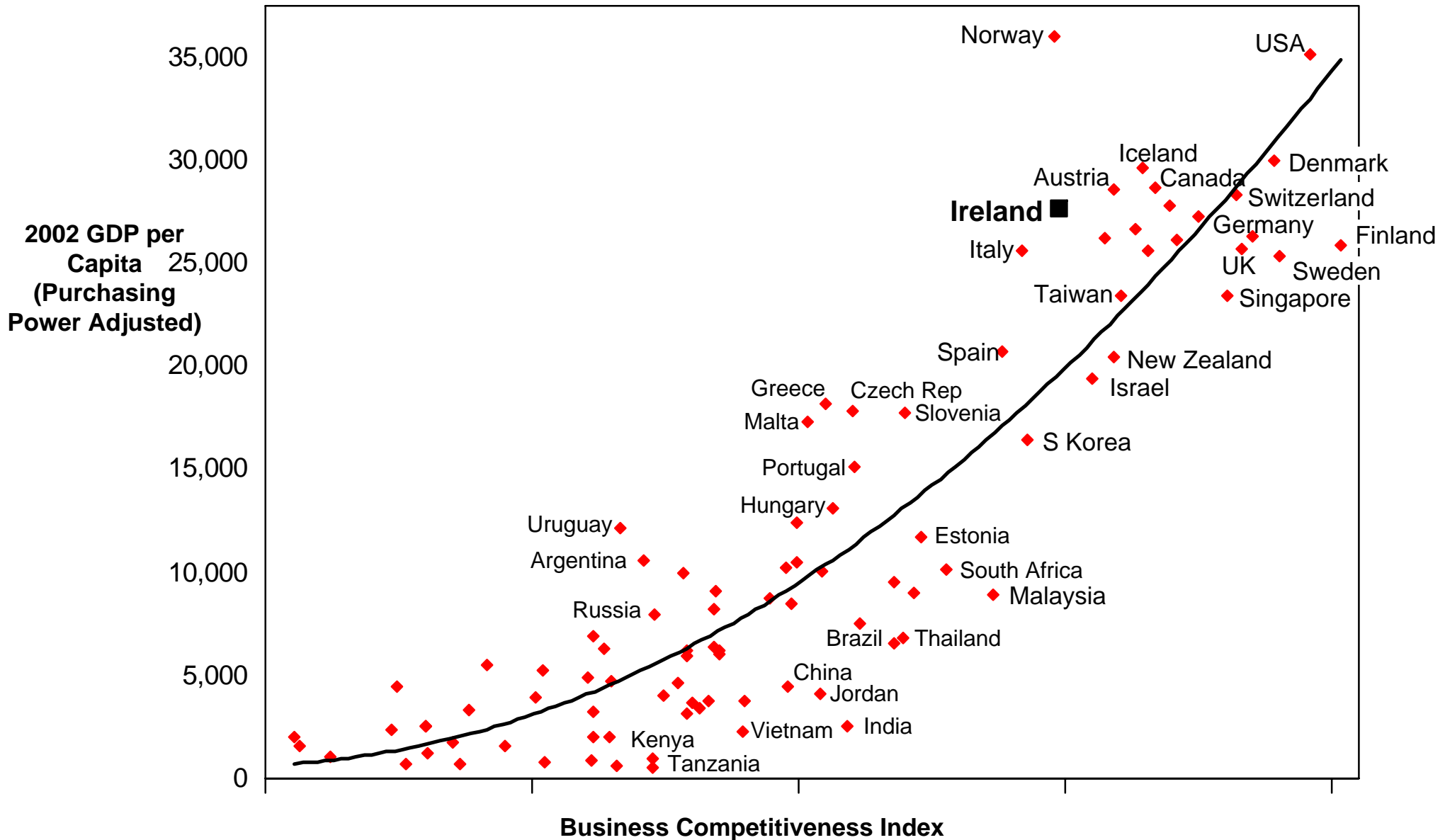
Ireland's Position over Time

Business
Competitiveness
Index Rank



Global Competitiveness Report 2003

The Relationship Between Business Competitiveness and GDP Per Capita



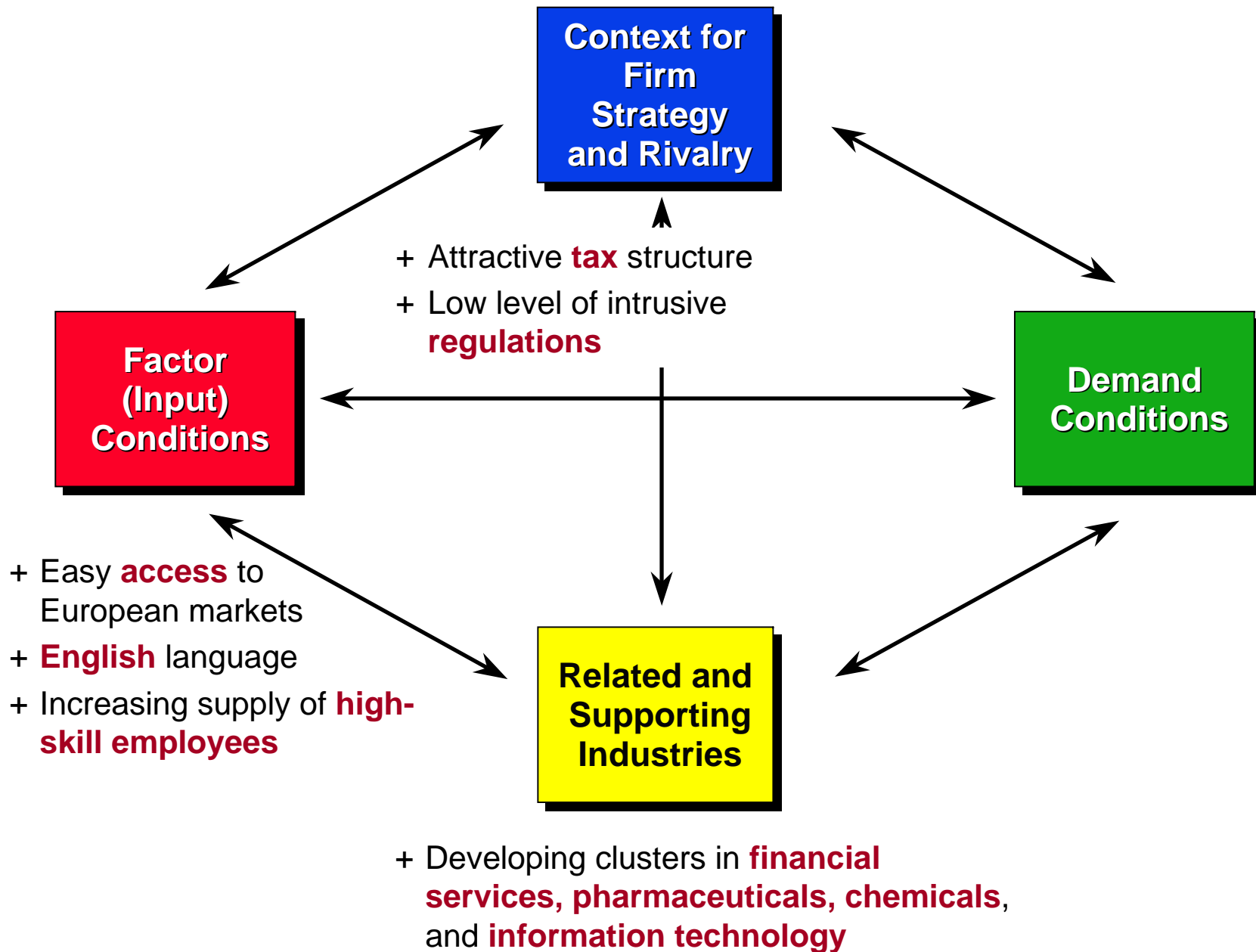
Note: For Ireland we use GNP per capita which excludes payments of foreign company subsidiaries to parent companies

Source: Global Competitiveness Report 2003

Competitiveness Agenda for Ireland

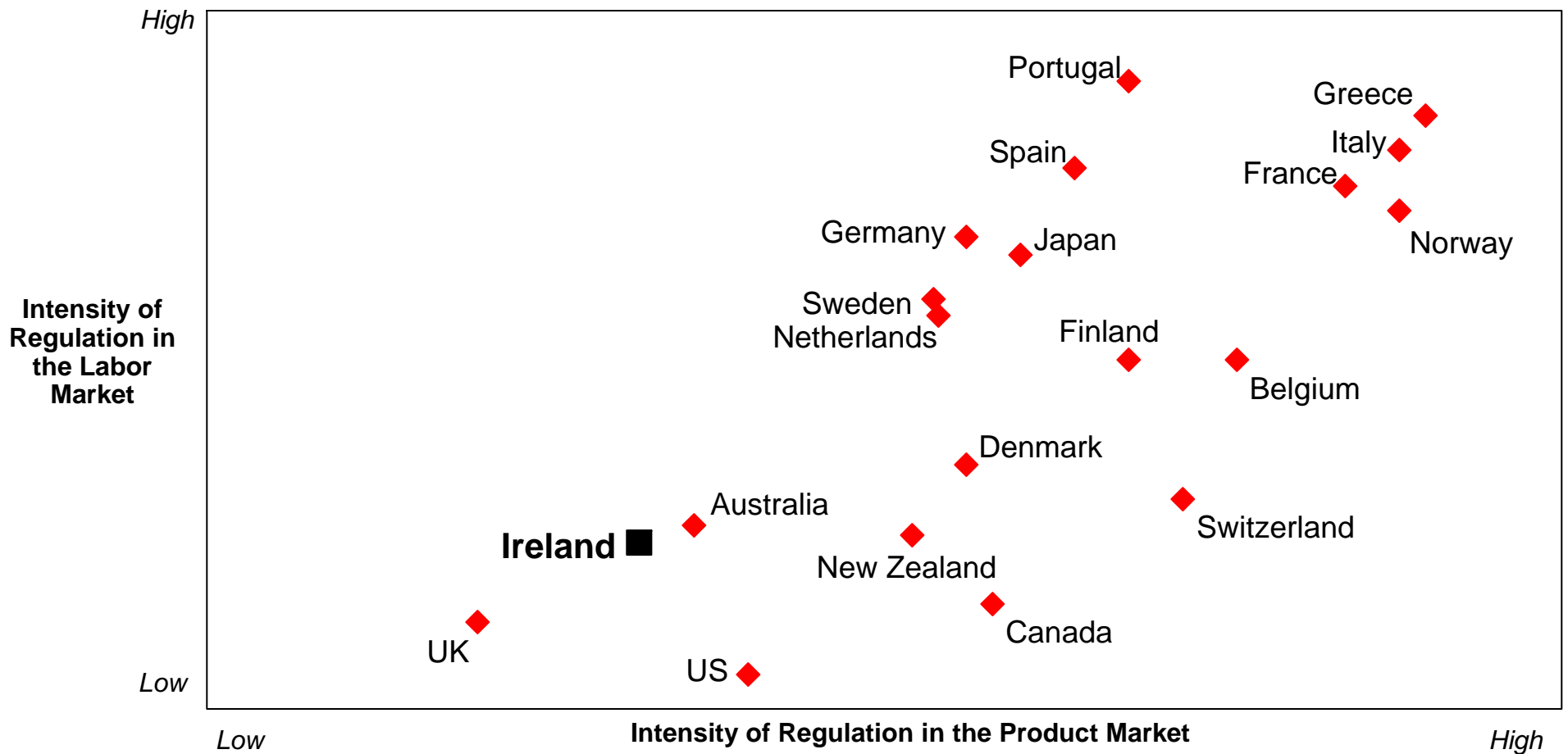
- **Move from low cost to superior productivity**
 - **Address weaknesses in the business environment**
 - Strengthen innovative capacity
- Develop robust clusters
- Redefine the institutional structure for economic development
- Decentralize economic policy-making

Assessing the Irish Business Environment



Regulation of Product and Labor Markets

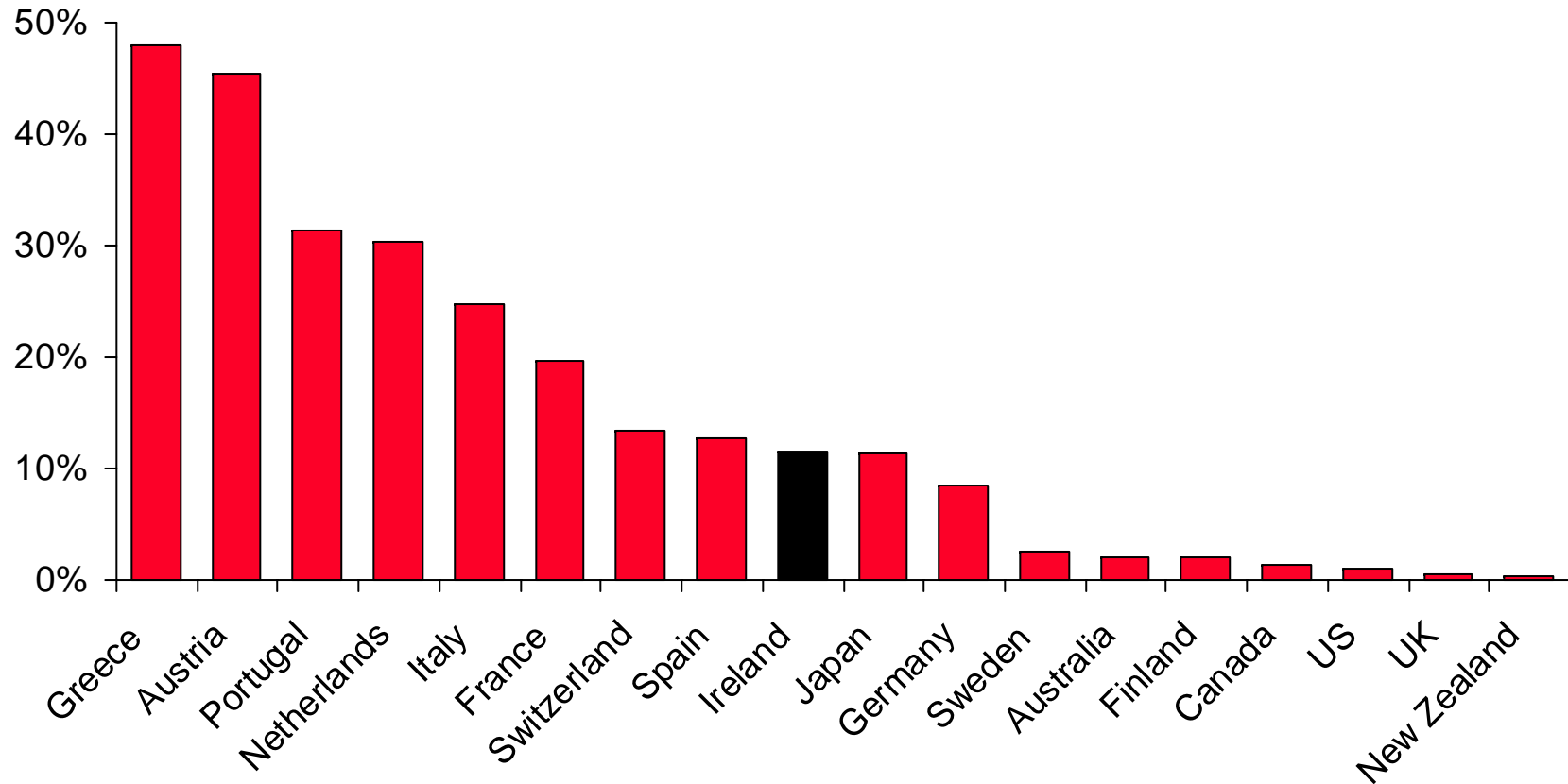
Selected OECD Countries



Ease of Business Formation

Selected OECD Countries

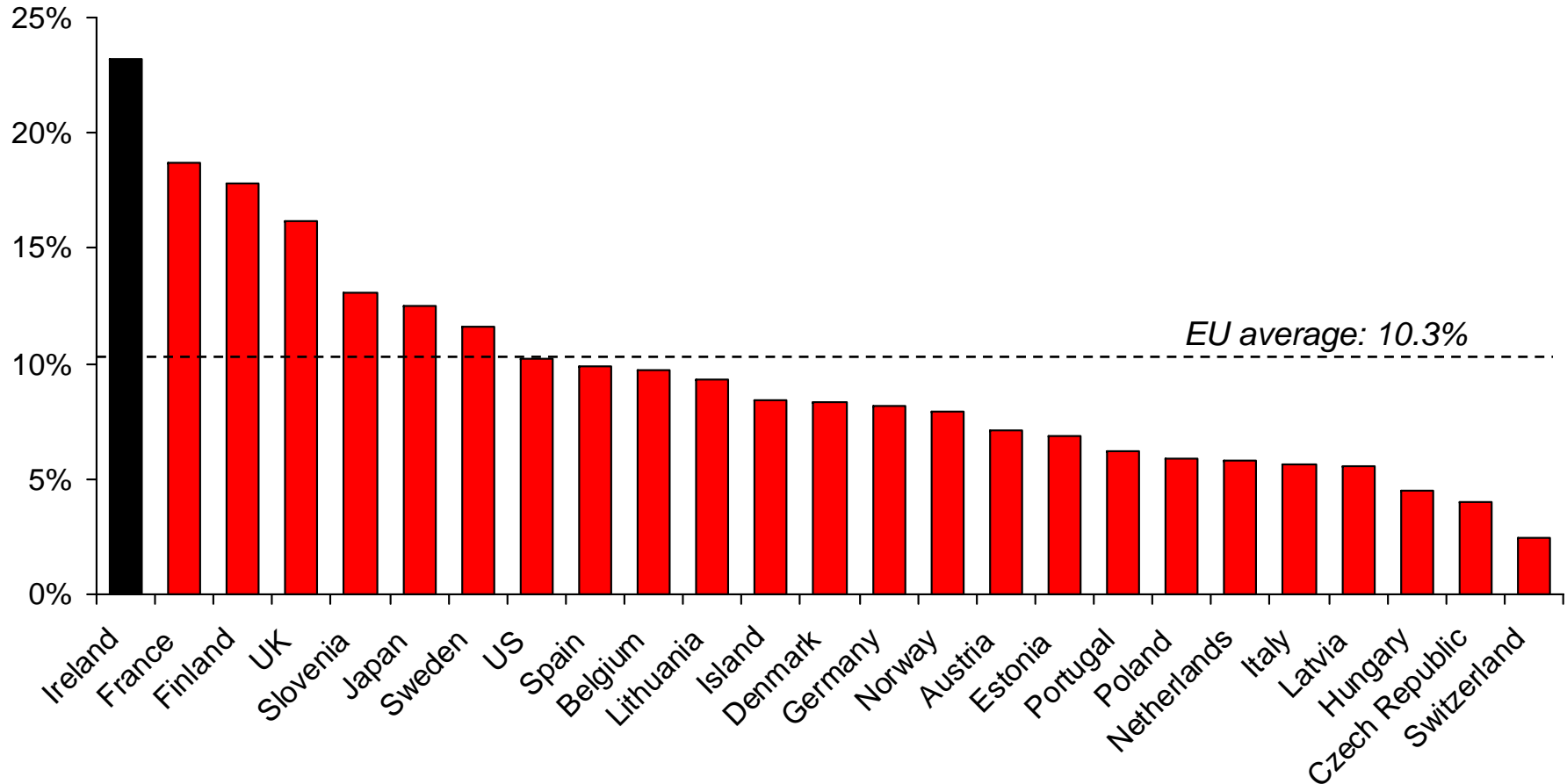
Cost of Business Formation
relative to GDP per capita



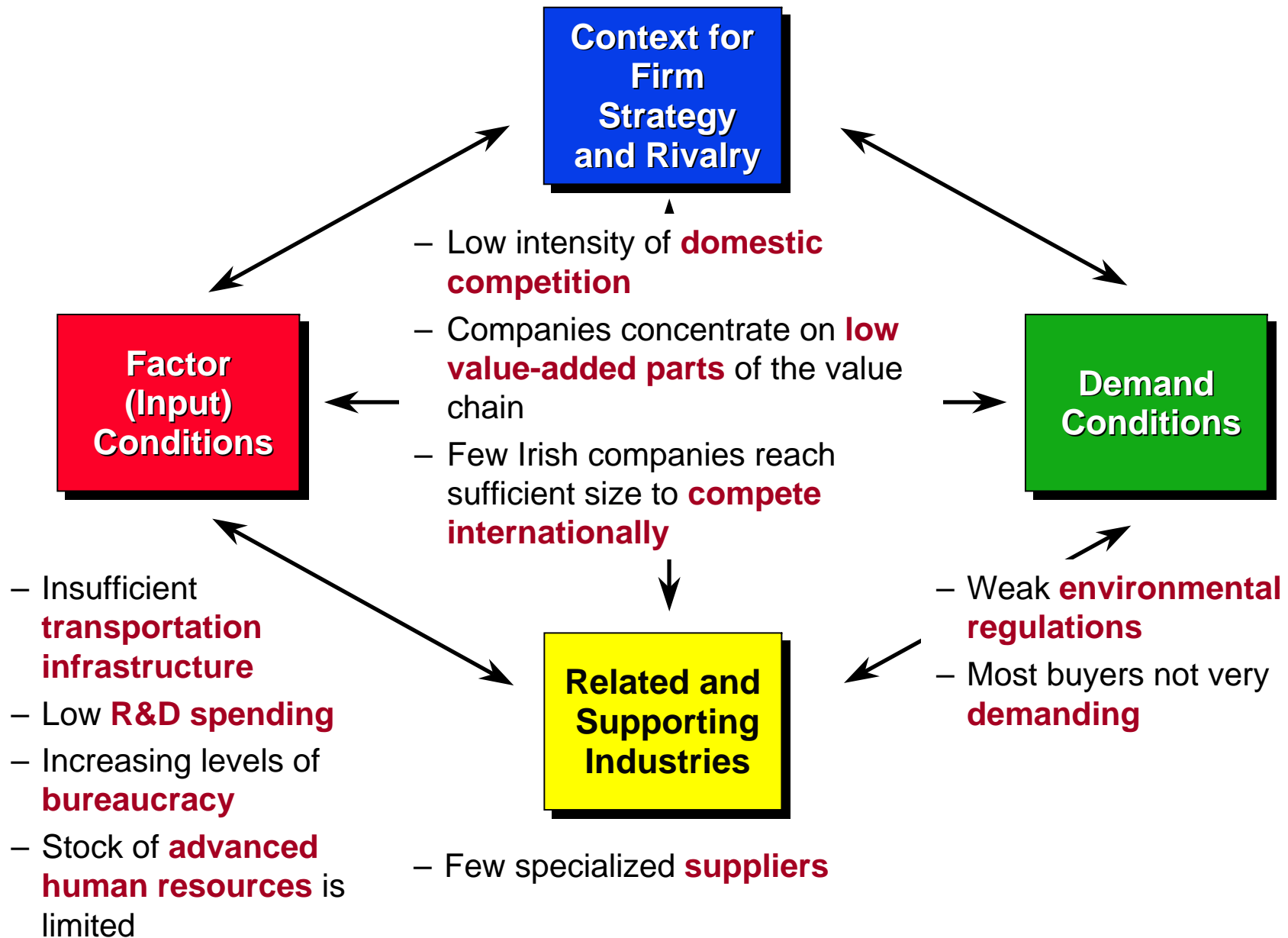
Education in Science & Technology

Selected Countries

Share of Science & Technology
graduates in the age 20 – 29
population, 2000 or latest



Assessing the Irish Business Environment



Factor (Input) Conditions Ireland's Relative Position

Competitive Advantages Relative to GDP per Capita

Country Ranking, Arrows
indicate a change of 5 or more
ranks since 2000

Ease of Access to Loans	4	
Venture Capital Availability	8	
Quality of Educational System	10	
University/Industry Research Collaboration	11	↑
Quality of Public Schools	12	↓
Quality of Scientific Research Institutions	14	
Quality of Management Schools	16	↓

Competitive Disadvantages Relative to GDP per Capita

Country Ranking, Arrows
indicate a change of 5 or more
ranks since 2000

Overall Infrastructure Quality	59	↓
Railroad Infrastructure Quality	59	↓
Port Infrastructure Quality	58	↓
Air Transport Infrastructure Quality	47	↓
Telephone/Fax Infrastructure Quality	41	↓
Extent of Bureaucratic Red Tape	30	
Internet users per 100 people (2002)	28	
Local Equity Market Access	27	
Police Protection of Businesses	26	↓
Judicial Independence	24	↓
Patents per million Population (2002)	23	
Adequacy of Public Sector Legal Recourse	23	↓
Administrative Burden for Start-Ups	23	↓

Note: Rank by countries; overall Ireland ranks 9 on GDP per Capita 2002

Source: Global Competitiveness Report 2003

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Context for Firm Strategy and Rivalry

Ireland's Relative Position

Competitive Advantages Relative to GDP per Capita

Country Ranking, Arrows
indicate a change of 5 or more
ranks since 2000

Foreign Ownership of Companies	2
Prevalence of Mergers and Acquisitions	6
Regulation of Securities Exchanges	9
Business Costs of Corruption	16
Effectiveness of Anti-Trust Policy	17
Tariff Liberalization	17
Efficacy of Corporate Boards	17
Hidden Trade Barrier Liberalization	18 ↓
Existence of Bankruptcy Law	19
Protection of Minority Shareholders	19

Competitive Disadvantages Relative to GDP per Capita

Country Ranking, Arrows
indicate a change of 5 or more
ranks since 2000

Centralization of Economic Policy-making	75
Extent of Locally Based Competitors	36
Favoritism in Decisions of Government Officials	35 ↓
Intensity of Local Competition	31
Extent of Distortive Government Subsidies	28 ↓
Intellectual Property Protection	25
Decentralization of Corporate Activity	25

Note: Rank by countries; overall Ireland ranks 9 on GDP per Capita 2002

Source: Global Competitiveness Report 2003

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Recent Policy Initiatives

- Transportation infrastructure projects (Euro 5.5bn) included in the National Development Plan, 2000 – 2006
- Strengthening of the antitrust authority
- Single regulatory authority for financial markets

Issues

- Limited acceptance of the relationship between local competition and competitiveness, even in a small open economy

Company Operations and Strategy

Ireland's Relative Position 2002

Competitive Advantages Relative to GDP per Capita

Country Ranking, Arrows
indicate a change of 5 or more
ranks since 2000

Extent of Regional Sales	5
Reliance on Professional Management	12
Extent of Incentive Compensation	14
Extent of Branding	15
Willingness to Delegate Authority	15

Competitive Disadvantages Relative to GDP per Capita

Country Ranking, Arrows
indicate a change of 5 or more
ranks since 2000

Degree of Customer Orientation	29	↓
Extent of Marketing	23	↓
Control of International Distribution	23	
Breadth of International Markets	23	
Extent of Staff Training	22	

Note: Rank by countries; overall Ireland ranks 9 on GDP per Capita 2002

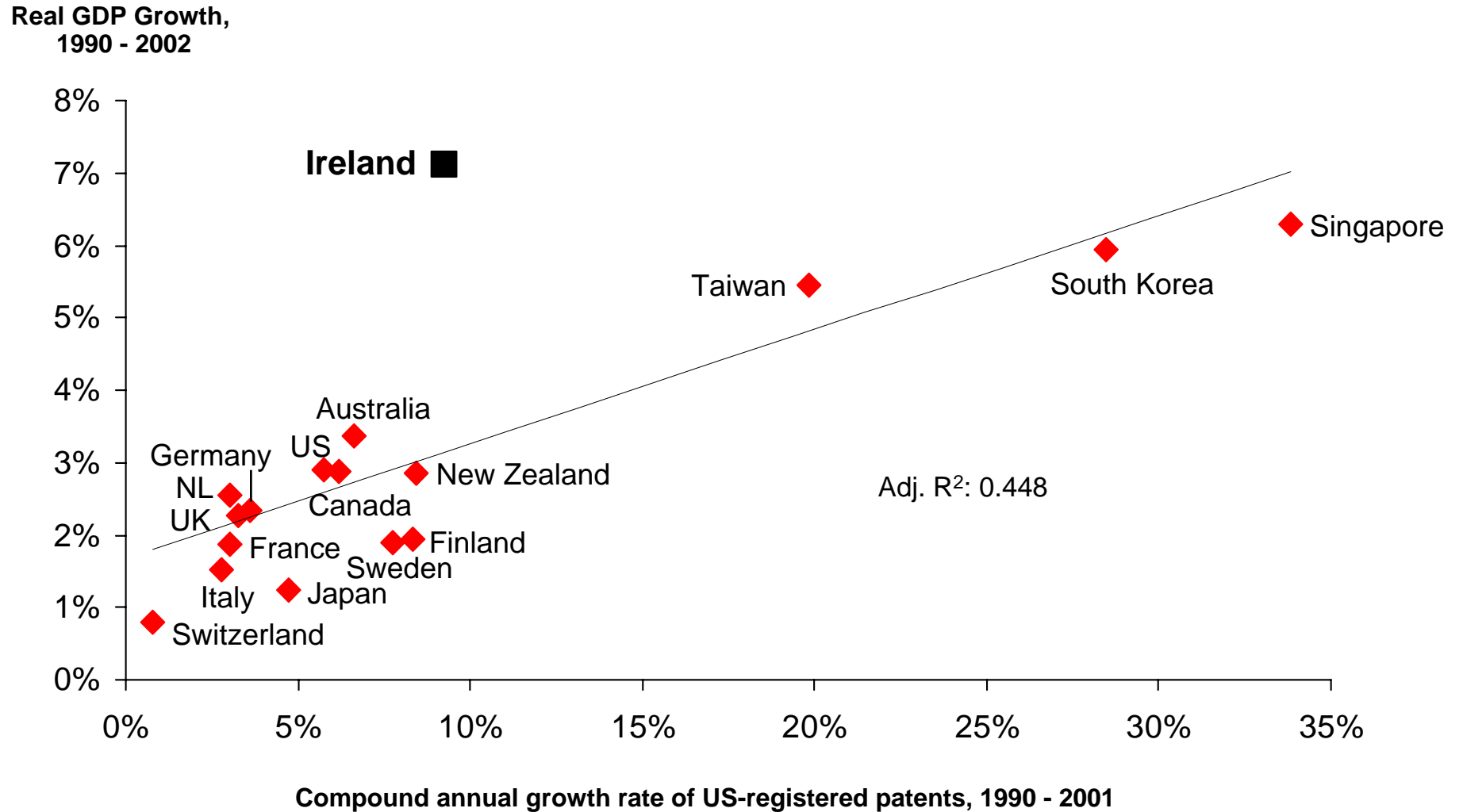
Source: Global Competitiveness Report 2003

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Competitiveness Agenda for Ireland

- Move from low cost to superior productivity
 - Address weaknesses in the business environment
 - **Strengthen innovative capacity**
- Develop robust clusters
- Redefine the institutional structure for economic development
- Decentralize economic policy-making

Growth Rate of GDP and Patents Selected Countries



Note: * The share of a country's patents filed between 1994 and 1998 that were highly cited in 1999.

Source: CHI Patent, National Science Foundation and Council on Competitiveness data. Author's analysis.

Innovative Capacity Index

2003 Rankings

Rank	Scientists & Engineers Index	Innovation Policy Index	Cluster Environment Index	Linkages Index	Operations and Strategy Index
1	Iceland	Singapore	Japan	USA	USA
2	Japan	Luxembourg	USA	Finland	Switzerland
3	Finland	Taiwan	Finland	United Kingdom	United Kingdom
4	USA	Finland	Germany	Israel	Denmark
5	Sweden	USA	Italy	Netherlands	Japan
6	Singapore	Australia	Taiwan	Sweden	Singapore
7	Norway	Canada	Denmark	Canada	Finland
8	Switzerland	Israel	France	Denmark	Germany
9	Russian Fed.	France	Canada	France	Sweden
10	Denmark	United Kingdom	Switzerland	Australia	Hong Kong
11	Australia	Germany	Singapore	Germany	France
12	Germany	Netherlands	United Kingdom	Switzerland	Israel
13	Canada	Belgium	Austria	Japan	Taiwan
14	Belgium	Austria	Hong Kong	Singapore	Luxembourg
15	France	Ireland	Sweden	Belgium	Netherlands
16	Taiwan	Japan	Korea	Ireland	Austria
17	United Kingdom	Malaysia	Netherlands	New Zealand	Belgium
18	Netherlands	Denmark	Malaysia	Korea	Iceland
19	Austria	Sweden	Australia	Italy	Canada
20	Korea	Tunisia	New Zealand	Norway	Ireland
21	New Zealand	Spain	South Africa	Taiwan	Italy
22	Ireland	Portugal	Luxembourg	Austria	Korea
23	Slovenia	Iceland	Ireland	Iceland	Australia

Source: Global Competitiveness Report 2003, forthcoming

U.S. Patenting by Organizations

Ireland

	Organization	Patents Issued from 1996 to 2001
1	ANALOG DEVICES, INC.	60
2	ELAN CORPORATION P.L.C.	14
3	LOCTITE (IRELAND) LIMITED	13
4	MOLEX INCORPORATED	12
5	AVE CONNAUGHT	11
6	3COM TECHNOLOGIES	10
7	IBM CORPORATION	8
7	ELAN MEDICAL TECHNOLOGIES LIMITED	8
9	TELEFONAKTIEBOLAGET LM ERICSSON	7
9	ABBOTT LABORATORIES	7
9	PURITAN-BENNETT CORPORATION	7
12	HITACHI, LTD	6
13	BOURNS, INC	5
13	DONNELLY CORPORATION	5
13	DONNELLY MIRRORS LIMITED	5
13	BAUSCH & LOMB, INC.	5
13	DIGITAL EQUIPMENT CORPORATION	5
18	ARTESYN TECHNOLOGIES, INC.	4
18	COLLEGE OF THE HOLY AND UNDIVIDED TRINITY	4
18	CARROLL PRODUCTS AND DESIGNS LIMITED	4

Note: Shading indicates universities, research institutions, and other government agencies

Source: US Patent and Trademark Office (www.uspto.gov). Author's analysis.

U.S. Patenting by Organizations

Massachusetts

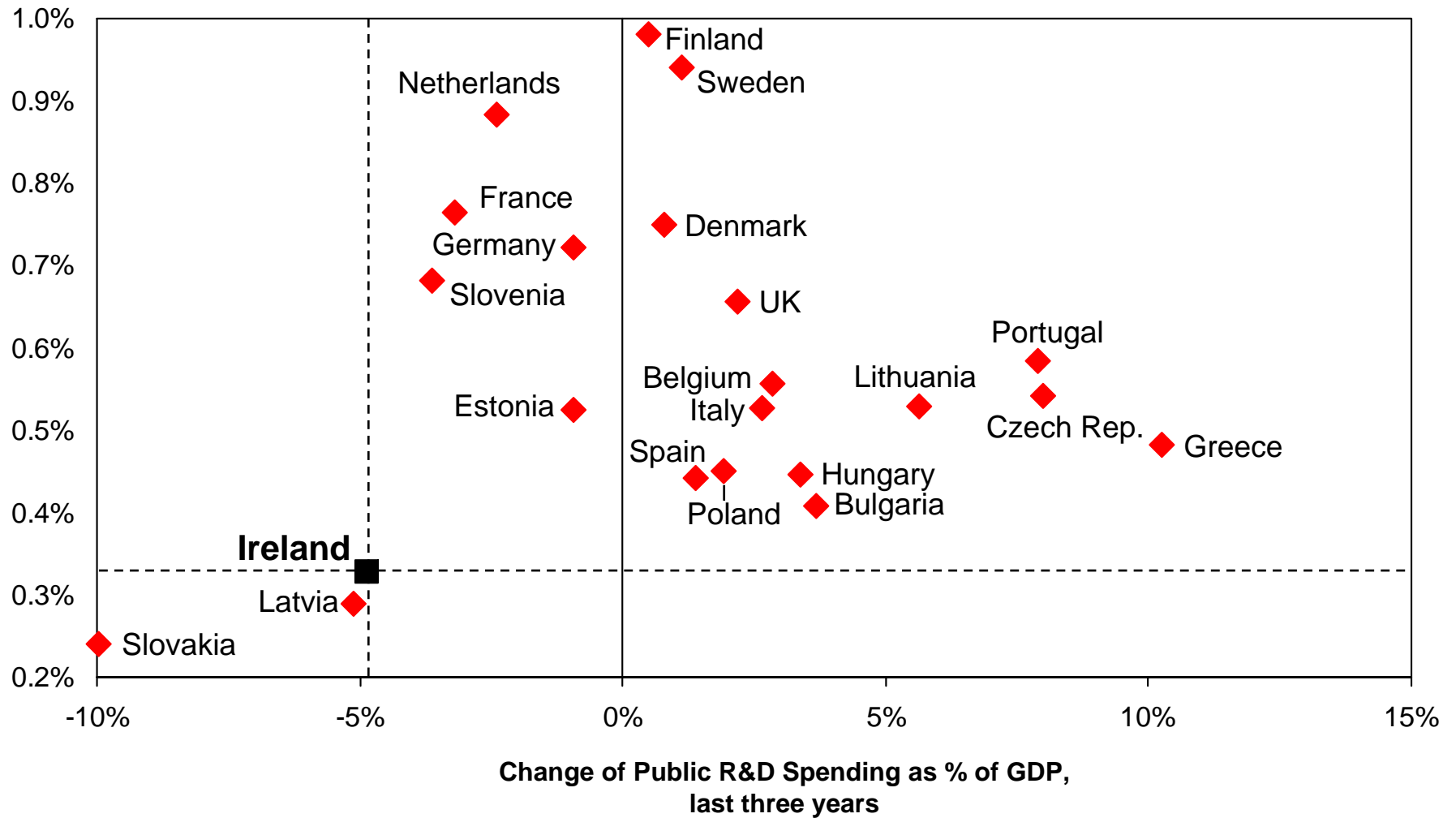
	Organization	Patents Issued from 1997 to 2001
1	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	518
2	GENERAL HOSPITAL CORPORATION	296
3	EMC CORPORATION	269
4	DIGITAL EQUIPMENT CORPORATION	261
5	POLAROID CORPORATION	213
6	ANALOG DEVICES, INC.	167
7	MILLENNIUM PHARMACEUTICALS, INC.	165
8	HARVARD UNIVERSITY	150
9	COMPAQ COMPUTER CORPORATION, INC.	147
10	SUN MICROSYSTEMS, INC.	143
11	BOSTON SCIENTIFIC CORPORATION	135
12	ACUSHNET COMPANY	130
13	GENETICS INSTITUTE, INC.	127
14	GILLETTE COMPANY	112
15	BRIGHAM AND WOMEN'S HOSPITAL	107
16	RAYTHEON COMPANY	101
17	GENERAL ELECTRIC COMPANY	99
18	HEWLETT-PACKARD COMPANY	96
19	CHILDREN'S MEDICAL CENTER CORPORATION	93
20	QUANTUM CORP. (CA)	93
21	COGNEX CORPORATION	90
22	DANA-FARBER CANCER INSTITUTE	90
23	JOHNSON & JOHNSON PROFESSIONAL INC.	90
24	BOSTON UNIVERSITY	84
25	SEPRACOR INC.	84

Note: Shading indicates universities, research institutions, and other government agencies

Source: US Patent and Trademark Office (www.uspto.gov). Author's analysis.

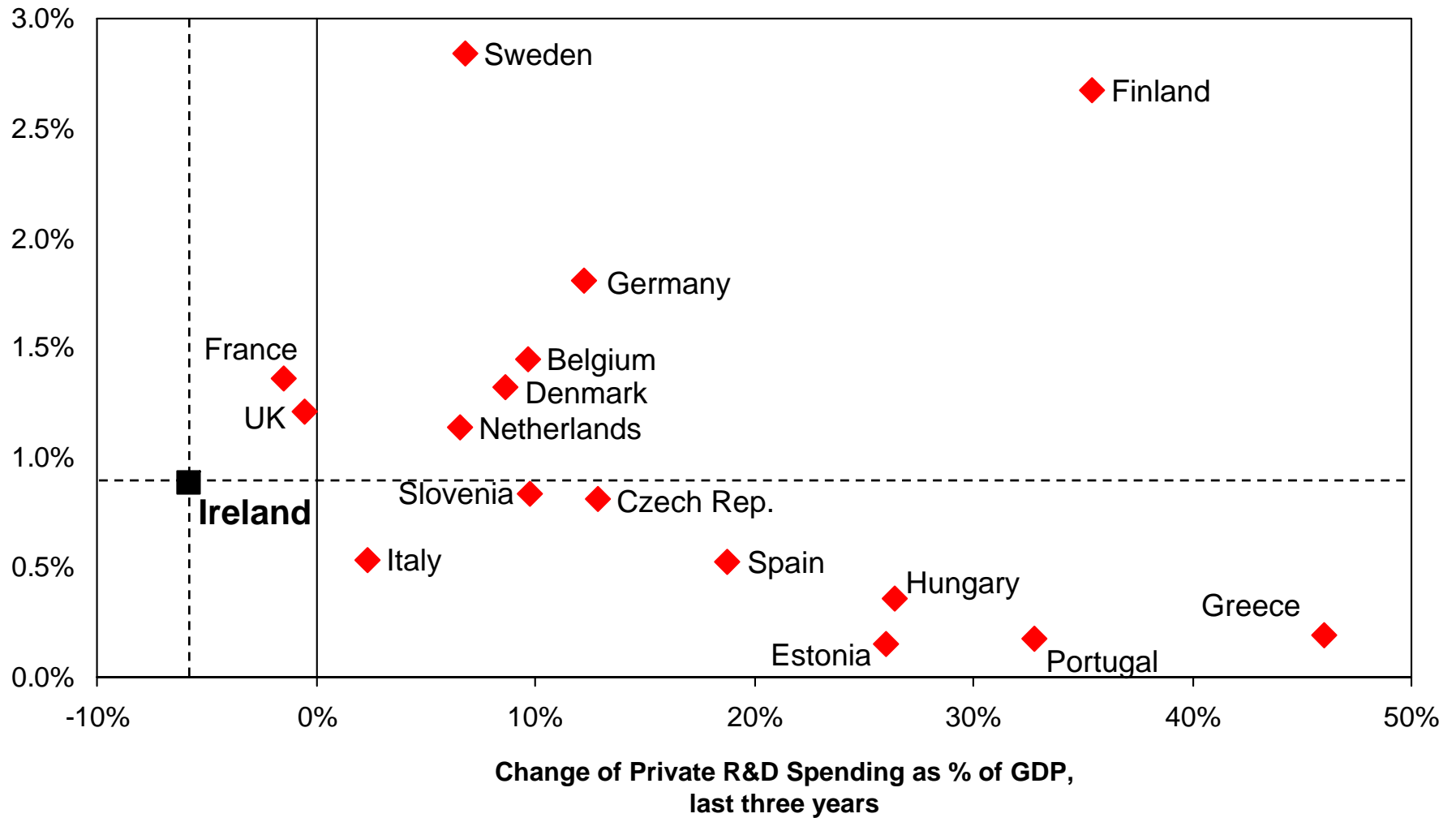
Government R&D Spending Selected European Countries

Public R&D Spending as % of GDP, 2001 (or last available)



Private R&D Spending Selected European Countries

Private R&D Spending as % of GDP, 2001 (or last available)



Demand Conditions Ireland's Relative Position

Competitive Advantages Relative to GDP per Capita

Country Ranking, Arrows
indicate a change of 5 or more
ranks since 2000

Government Procurement of Advanced Technology Products	16
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Competitive Disadvantages Relative to GDP per Capita

Country Ranking, Arrows
indicate a change of 5 or more
ranks since 2000

Stringency of Environmental Regulations	36
Buyer Sophistication	25 ↓
Consumer Adoption of Latest Products	25

Note: Rank by countries; overall Ireland ranks 9 on GDP per Capita 2002

Source: Global Competitiveness Report 2003

GCR Ireland 2003 09-30-03 CK.ppt

Recent Policy Initiatives

- Five-fold increase of industry-related R&D spending by the government included in the National Development Plan, 2000 – 2006
- Reorganization of science-related policy institutions
 - Science Foundation Ireland

Issues

- Lack of public understanding for the need to upgrade innovative capacity
- Focus and coherence of ramp-up in R&D spending

Competitiveness Agenda for Ireland

- Move from low cost to superior productivity
 - Address weaknesses in the business environment
 - Strengthen innovative capacity
- **Develop robust clusters**
- Redefine the institutional structure for economic development
- Decentralize economic policy-making

Related and Supporting Industries

Ireland's Relative Position

Competitive Advantages Relative to GDP per Capita

Country Ranking, Arrows indicate a change of 5 or more ranks since 2000

State of Cluster Development	7
Extent of Product and Process Collaboration	12

Competitive Disadvantages Relative to GDP per Capita

Country Ranking, Arrows indicate a change of 5 or more ranks since 2000

Local Supplier Quantity	36	↓
Local Availability of Components and Parts	34	
Local Availability of Process Machinery	31	

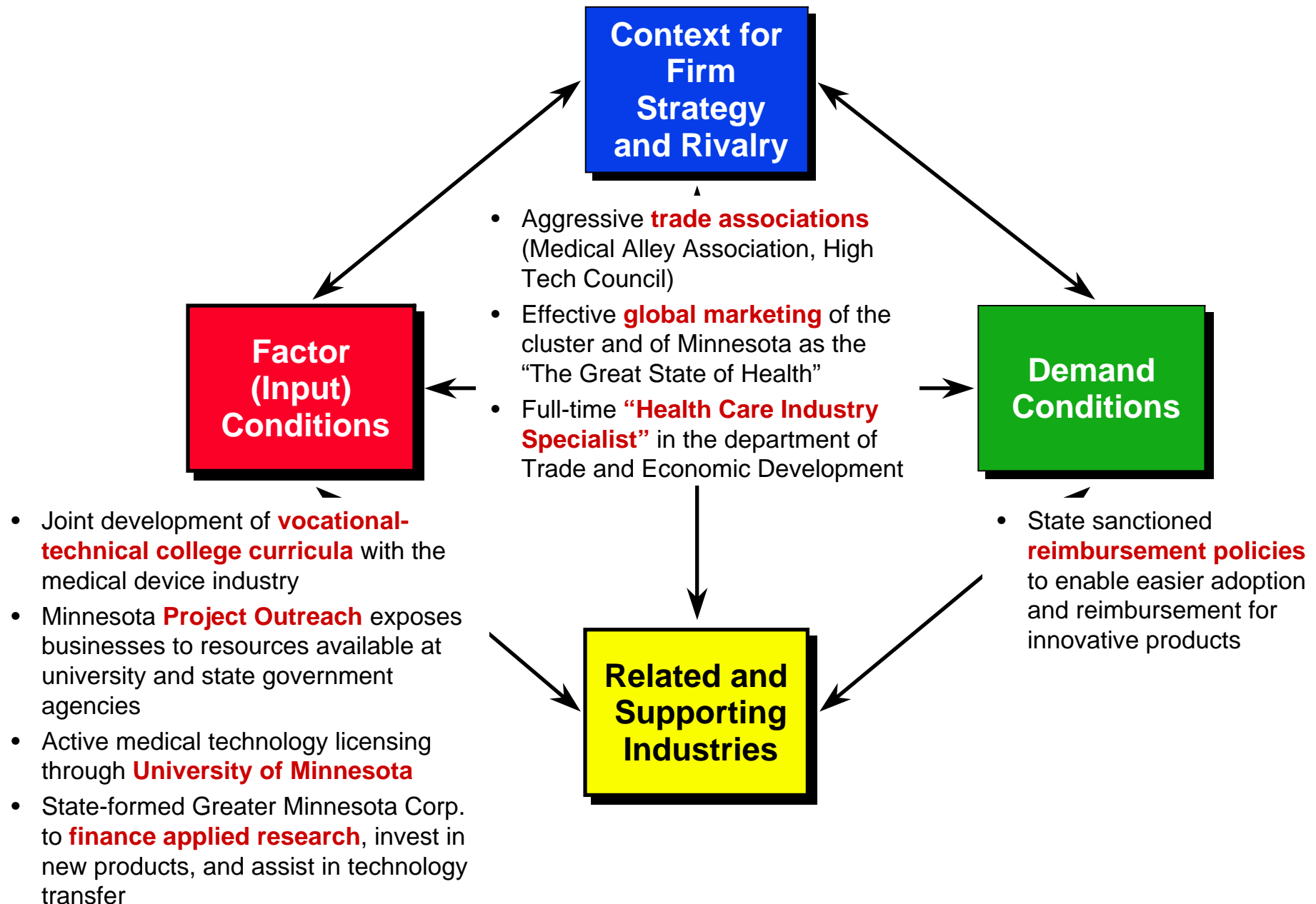
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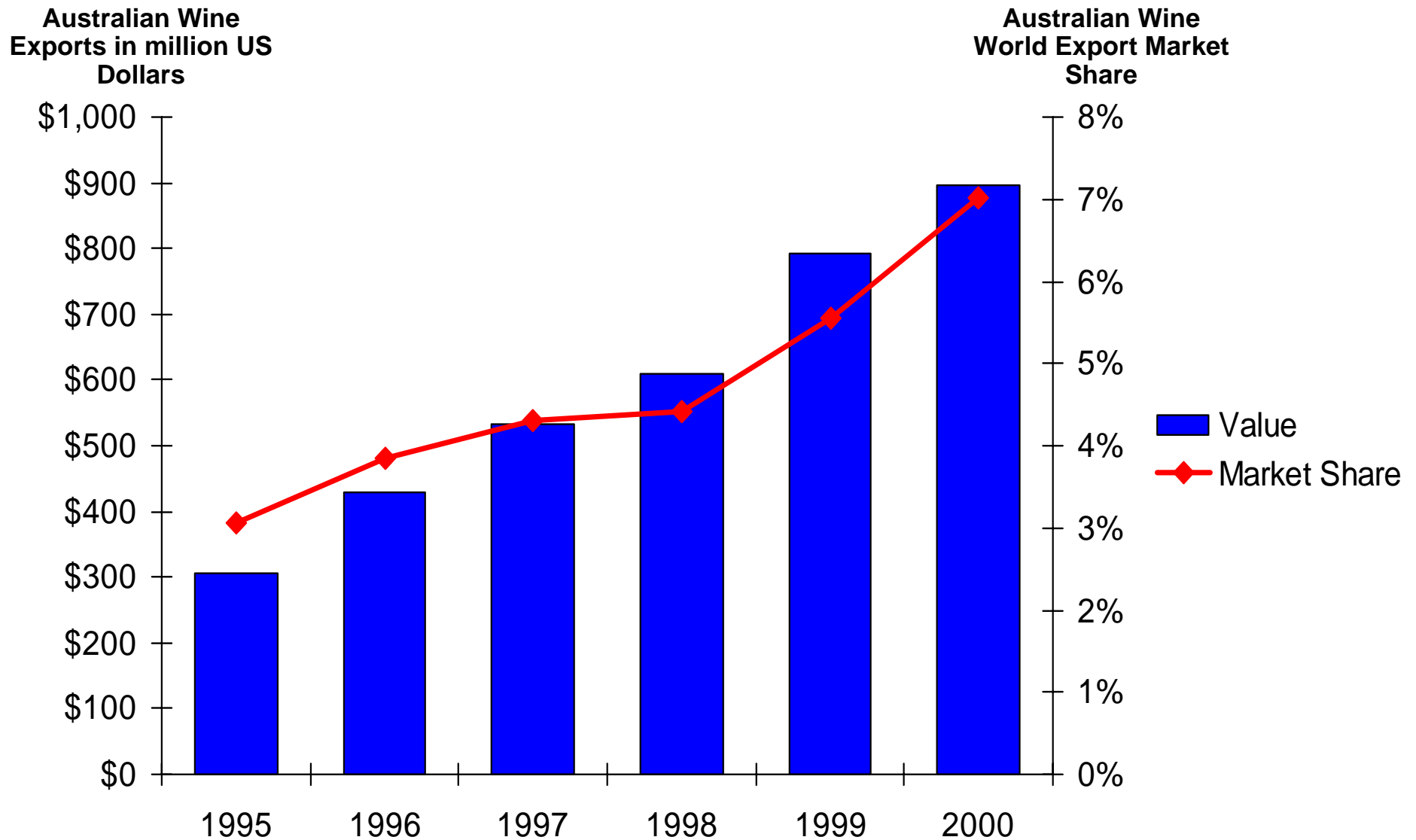
Public / Private Cooperation in Cluster Upgrading

Minnesota's Medical Device Cluster



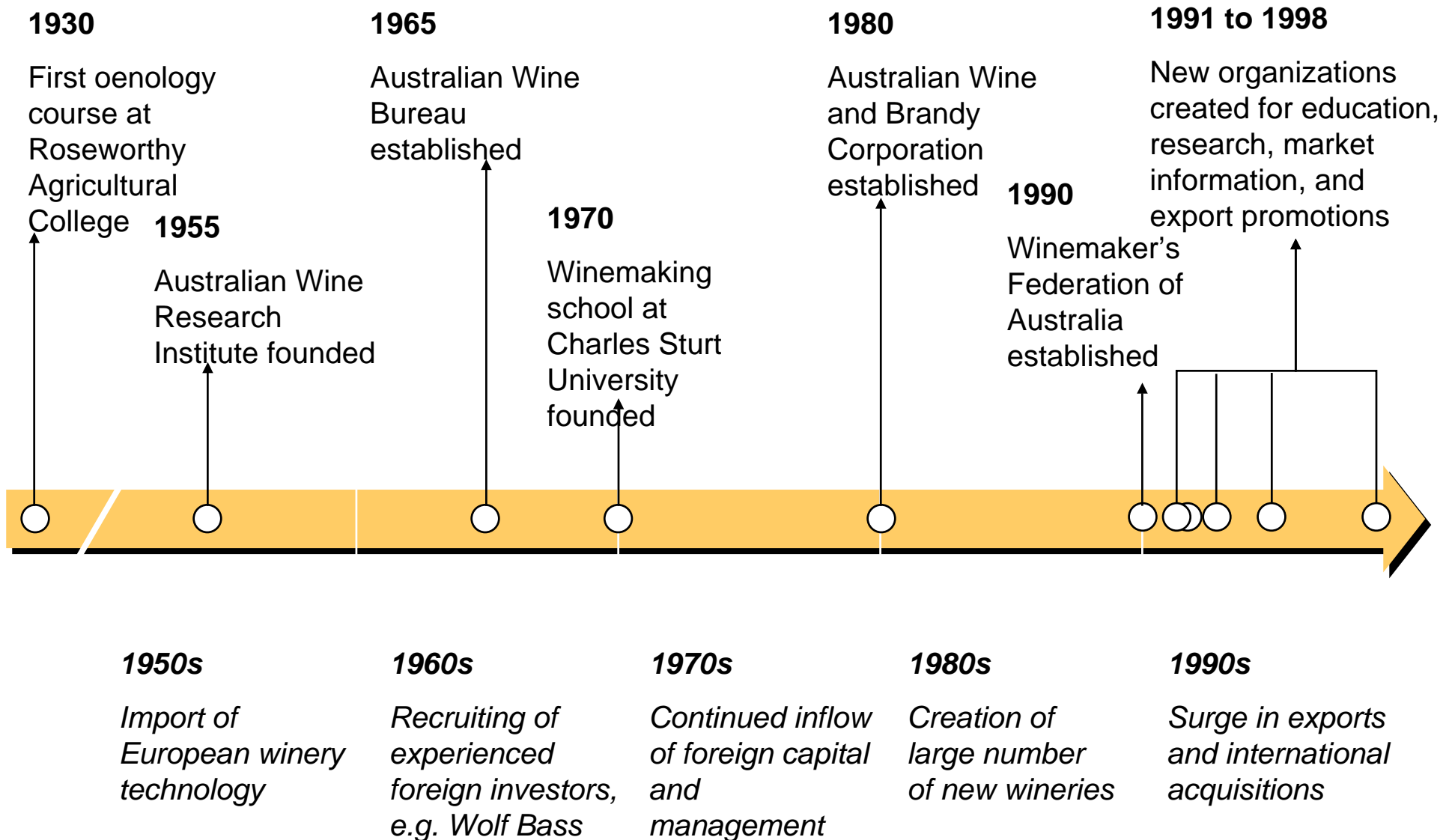
The Australian Wine Cluster

Trade Performance



Source: UN Trade Statistics

The Australian Wine Cluster History



Source: Michael E. Porter and Örjan Sölvell, The Australian Wine Cluster – Supplement, Harvard Business School Case Study, 2002

The Australian Wine Cluster

Recently founded Institutions for Collaboration

Winemakers' Federation of Australia

- Established in 1990
- Focus: Public policy representation of companies in the wine cluster
- Funding: Member companies

Cooperative Centre for Viticulture

- Established in 1991
- Focus: Coordination of research and education policy in viticulture
- Funding: other cluster organizations

Australian Wine Export Council

- Established in 1992
- Focus: Wine export promotion through international offices in London and San Francisco
- Funding: Government; cluster organizations

Grape and Wine R&D Corporation

- Established in 1991 as statutory body
- Focus: Funding of research and development activities
- Funding: Government; statutory levy

Wine Industry Information Service

- Established in 1998
- Focus: Information collection, organization, and dissemination
- Funding: Cluster organizations

Wine Industry National Education and Training Council

- Established in 1995
- Focus: Coordination, integration, and standard maintenance for vocational training and education
- Funding: Government; other cluster organizations

Issues in the Irish Policy Debate

Cluster Development

- Clusters have so far played a **limited role** in Irish economic development efforts
 - The national economy perceived as too small to support fully-developed clusters
 - Clusters seen as focusing resources on some parts of the economy while neglecting others
- Clusters are an **important tool** to address key competitiveness challenges that Ireland cannot afford to neglect
 - All clusters are good. Ireland must develop **all** its existing and emerging clusters, not choose among them
 - Clusters enable higher levels of **innovation** based on spill-overs and increased interaction
 - Clusters provide a fertile ground for **Irish-based companies** to evolve and grow
 - Clusters provide a vehicle for redefining the **roles** of the public and the private sector in economic development

Competitiveness Agenda for Ireland

- Move from low cost to superior productivity
 - Address weaknesses in the business environment
 - Strengthen innovative capacity
- Develop robust clusters
- **Redefine the institutional structure for economic development**
- Decentralize economic policy-making

Roles in Economic Development

Government

- Improve the macroeconomic, political, legal, and social context
- Upgrade the general business environment
- Facilitate cluster formation and upgrading
- Lead a collaborative process of economic change

Firms

- Take an active role in upgrading the local infrastructure
- Nurture local suppliers and attract new supplier investments
- Work with government and universities in efforts to upgrade the business environment
- Focus corporate philanthropy on enhancing the local business environment

Trade Associations

- Negotiate with government
- Provide services such as information collection and dissemination, and training
- Market the region and the cluster
- Develop platforms for joint research and procurement

Universities

- Joint generation and transfer of knowledge
- Engage in workforce development
- Facilitate competitiveness initiatives

Issues in Ireland

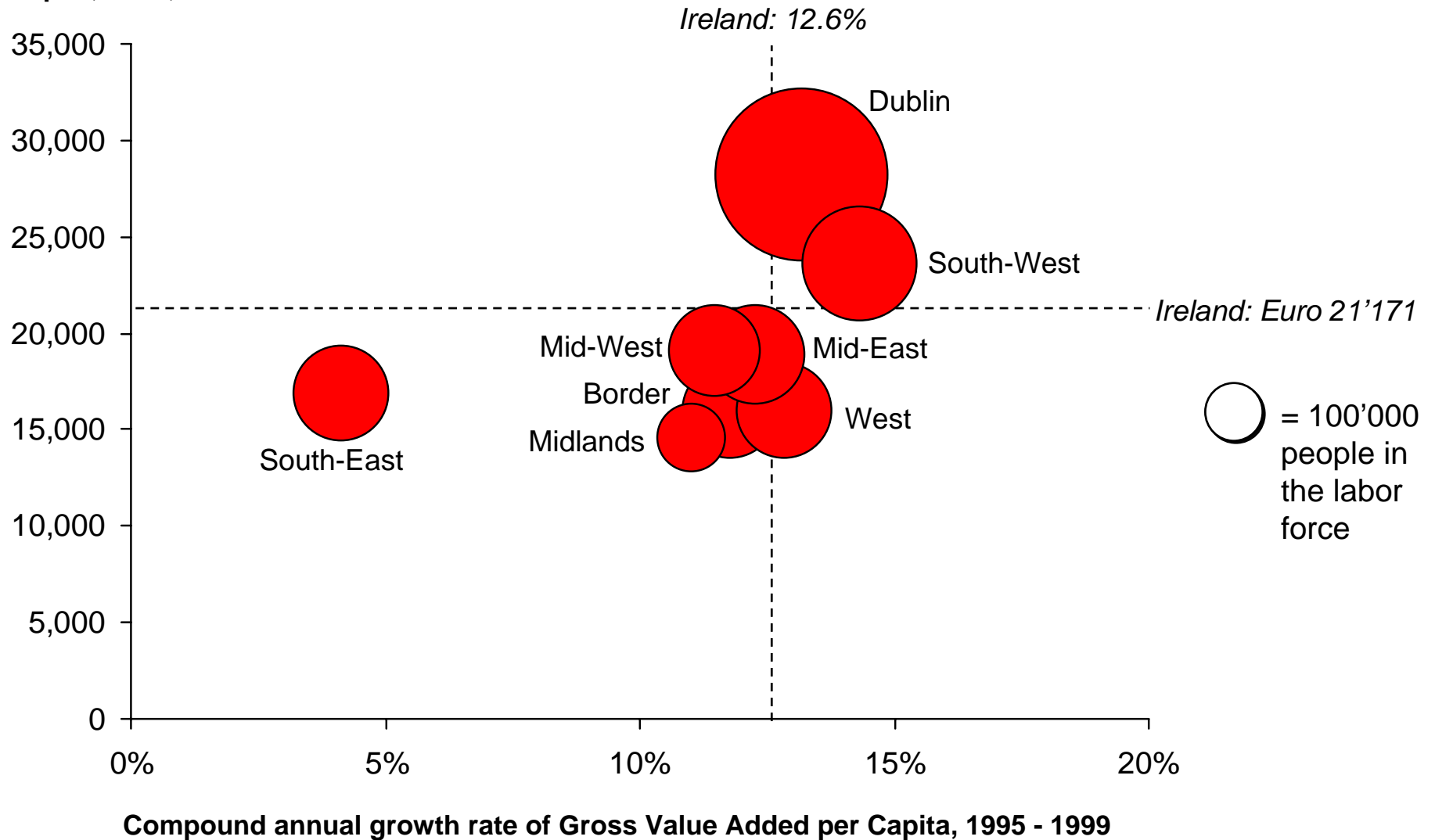
- Economic development is strongly government-led
- Limited private sector engagement
- Weak Institutions for Collaboration
- Weak relationship between universities and private sector only gradually improving

Competitiveness Agenda for Ireland

- Move from low cost to superior productivity
 - Address weaknesses in the business environment
 - Strengthen innovative capacity
- Develop robust clusters
- Redefine the institutional structure for economic development
- **Decentralize economic policy-making**

Regional Economic Performance

Gross Value Added per Capita, Euro, 1999



Issues in the Irish Policy Debate

Decentralization of Economic Development Efforts

- Significant variation in the economic performance of Irish regions suggests large regional differences in competitiveness
- Yet Ireland ranks **75th out of 80 countries** in the Global Competitiveness Report on the decentralization of economic policy making
 - Recent efforts to develop regional institutions have been a requirement to receive EU funding, not a sign that Irish thinking is changing



- Shifting decision powers to the regional and local level are of increasing importance for the Irish economy
 - Address the unique challenges and opportunities of different regions
 - Foster cluster development
 - Encourage the **acceptance of responsibility** at the local level

Ireland is Entering a New Economic Era

- The transition to an innovation economy is **complex** but well within reach for Ireland
- Ireland success in the past bodes well for the country's **ability** to meet the new challenges
- The country has identified many of the key steps that need to be taken; now it is a matter of **persistence** and **implementation**
- Competitiveness is a **marathon**, not a sprint!



- It is very difficult to achieve economic change without a **crisis**
- A **consensus** about the need for a new strategy is not yet in place