

Can Japan Compete?

New Findings from the Global Competitiveness Report 2002

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

HBS Japan Research Office
Tokyo, Japan.
December 4 , 2002

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 2002/03](#), (World Economic Forum, 2002), "Clusters and the New Competitive Agenda for Companies and Governments" in [On Competition](#) (Harvard Business School Press, 1998), and the *Clusters of Innovation Initiative* (www.compete.org), a joint effort of the Council on Competitiveness, Monitor Group, and Professor Porter and ongoing research at the Institute for Strategy and Competitiveness. Additional information may be found at the website of the Institute for Strategy and Competitiveness, 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.

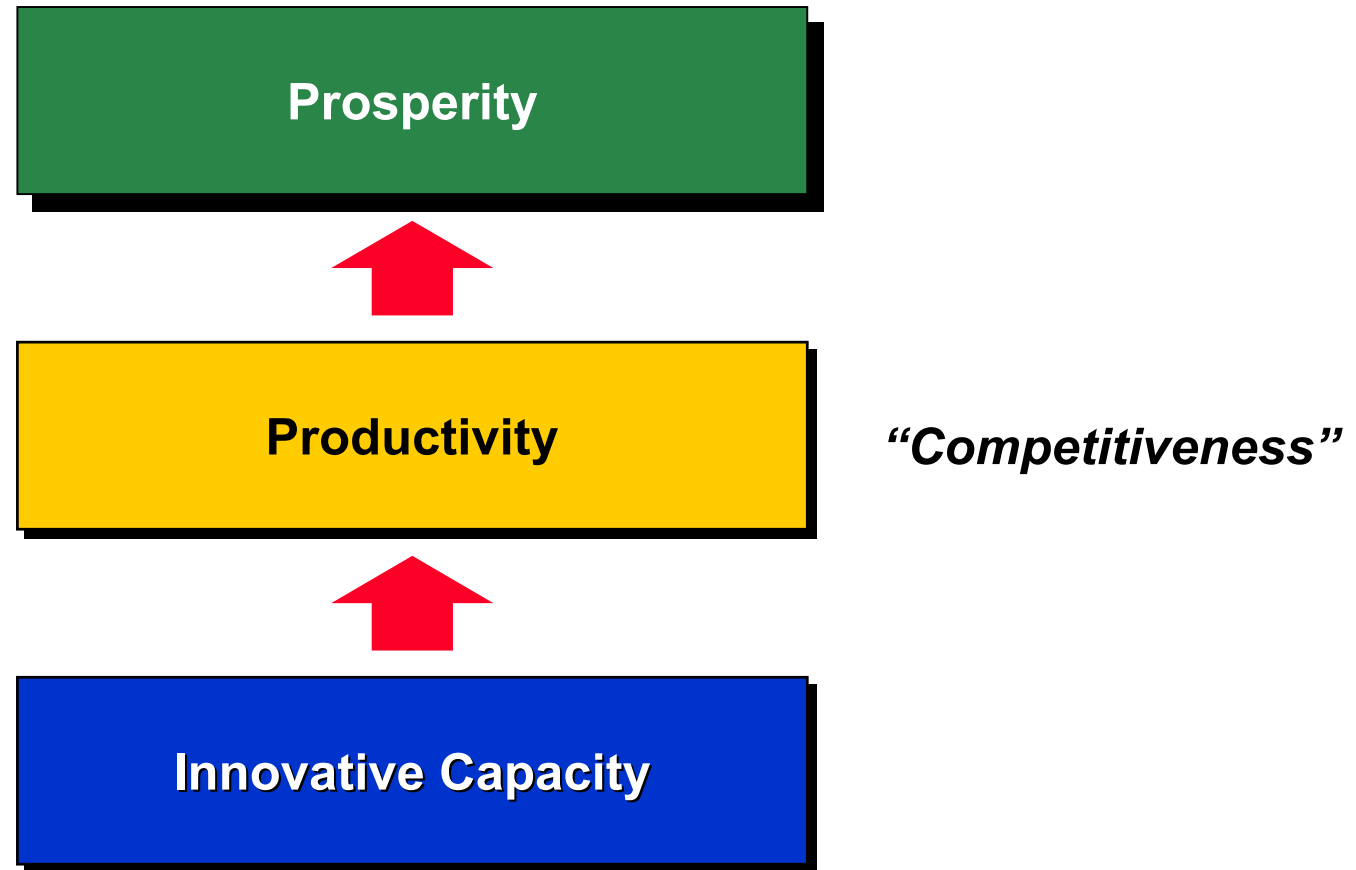
What is Competitiveness?

- Competitiveness is determined by the **productivity** with which a nation uses its human, capital, and natural resources. Productivity sets a nation's 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 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”



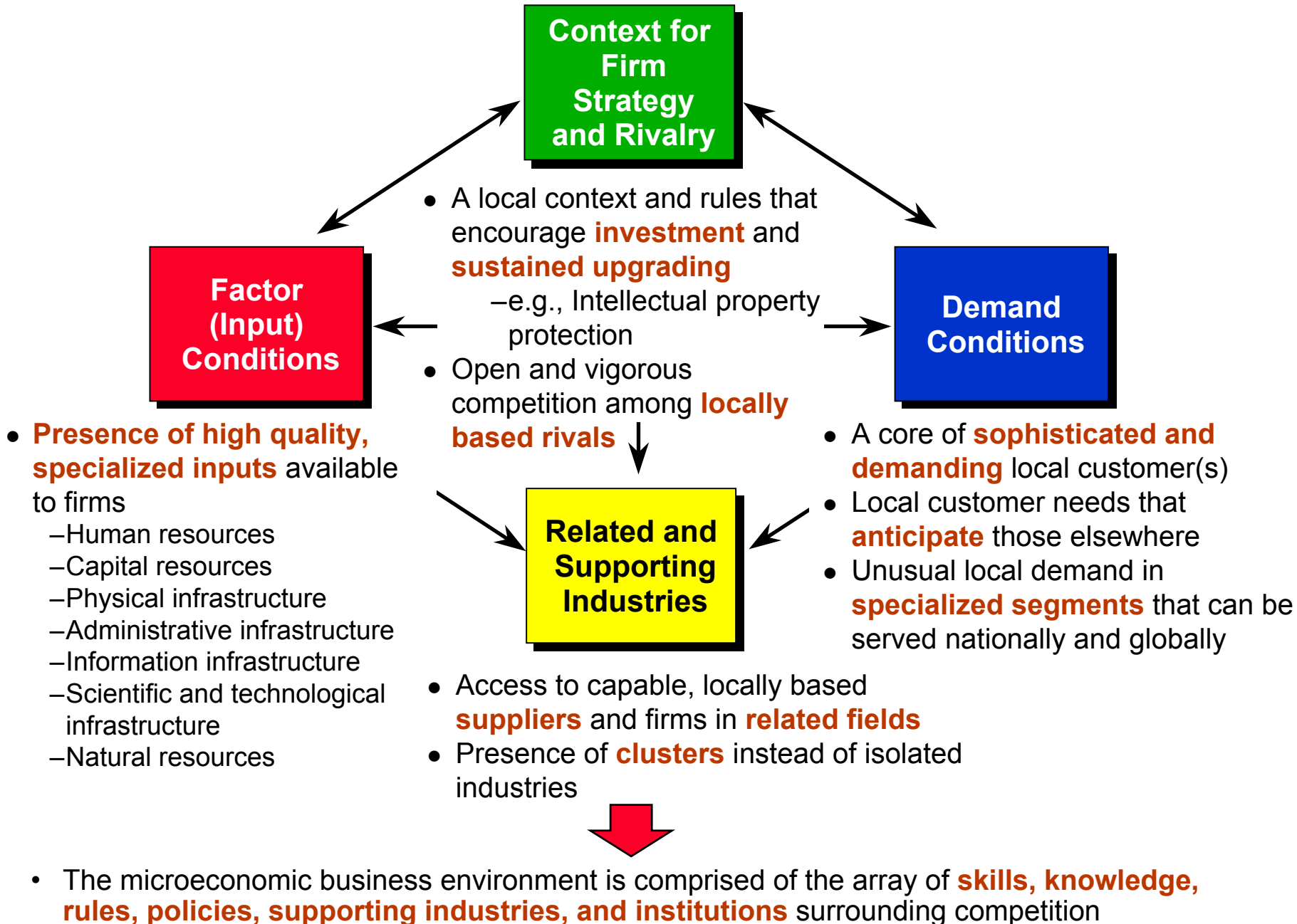
- Nations compete in offering the **most productive environment** for business
- The public and private sectors play **different but interrelated roles** in creating a productive economy

Innovation and Prosperity

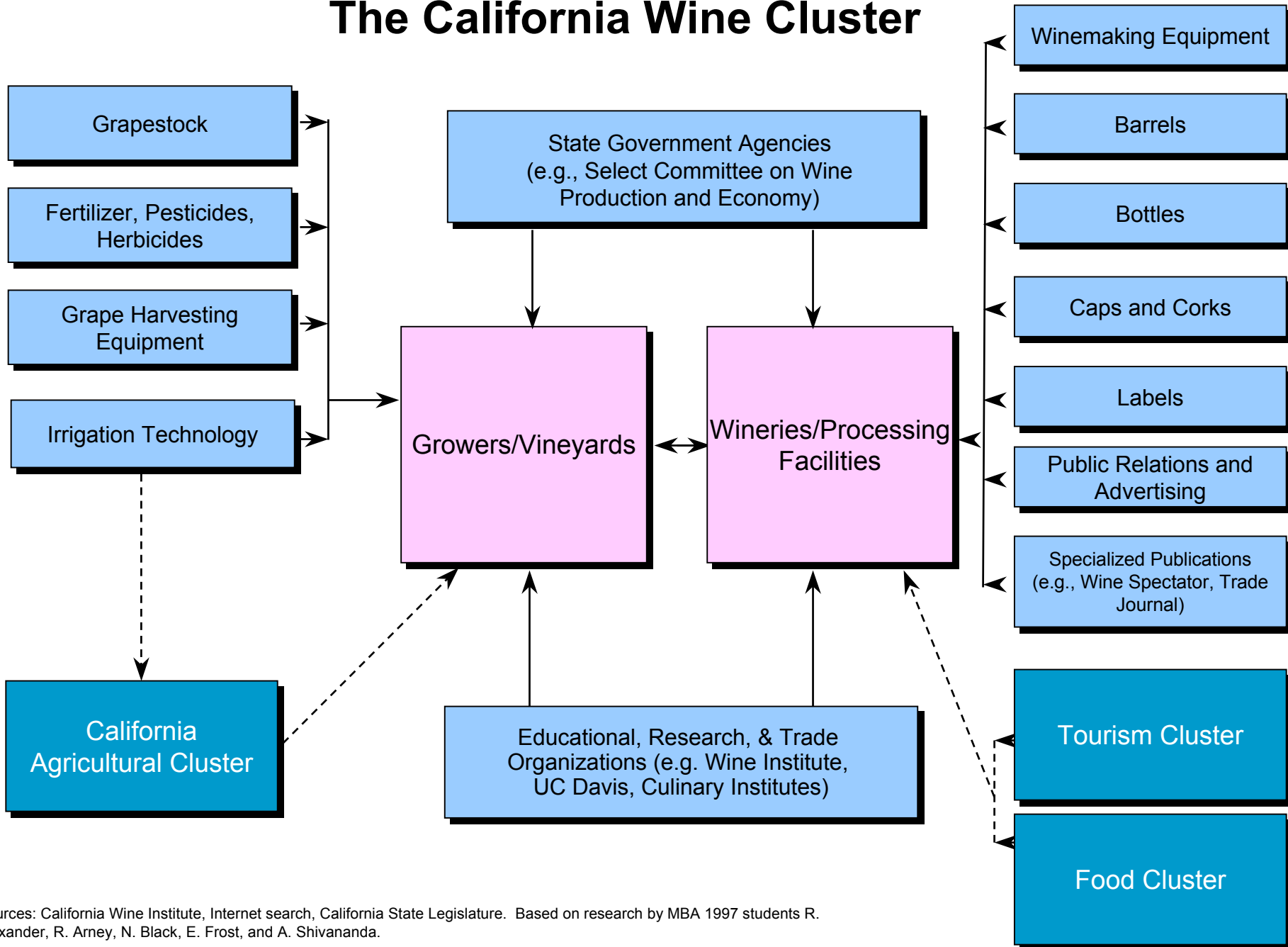


- Innovation is **more than just scientific discovery**
- There are **no low-tech industries**, only low-tech firms

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.

Institutions for Collaboration

Selected Institutions for Collaboration, San Diego

General

- San Diego Chamber of Commerce
- San Diego MIT Enterprise Forum
- Corporate Director's Forum
- San Diego Dialogue
- Service Corps of Retired Executives, San Diego
- San Diego Regional Economic Development Corporation
- Center for Applied Competitive Technologies
- San Diego World Trade Center
- UCSD Alumni
- San Diego Regional Technology Alliance
- San Diego Science and Technology Council
- Office of Trade and Business Development

Cluster-Specific

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

Patents by Organization

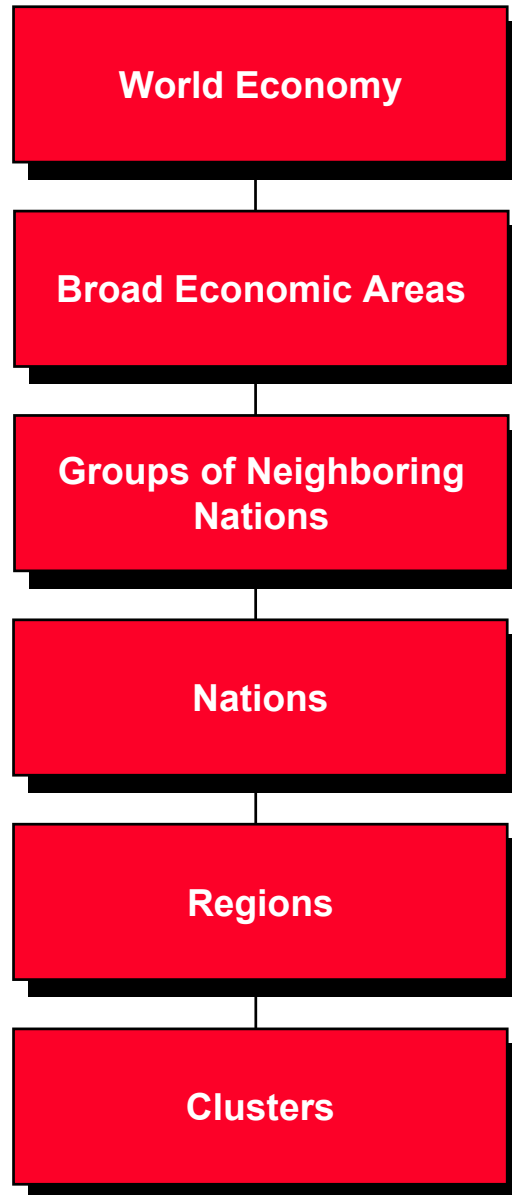
Commonwealth of Massachusetts

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

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

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

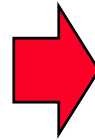
Geographic Influences on Competitiveness



Shifting Responsibilities for Economic Development

Old Model

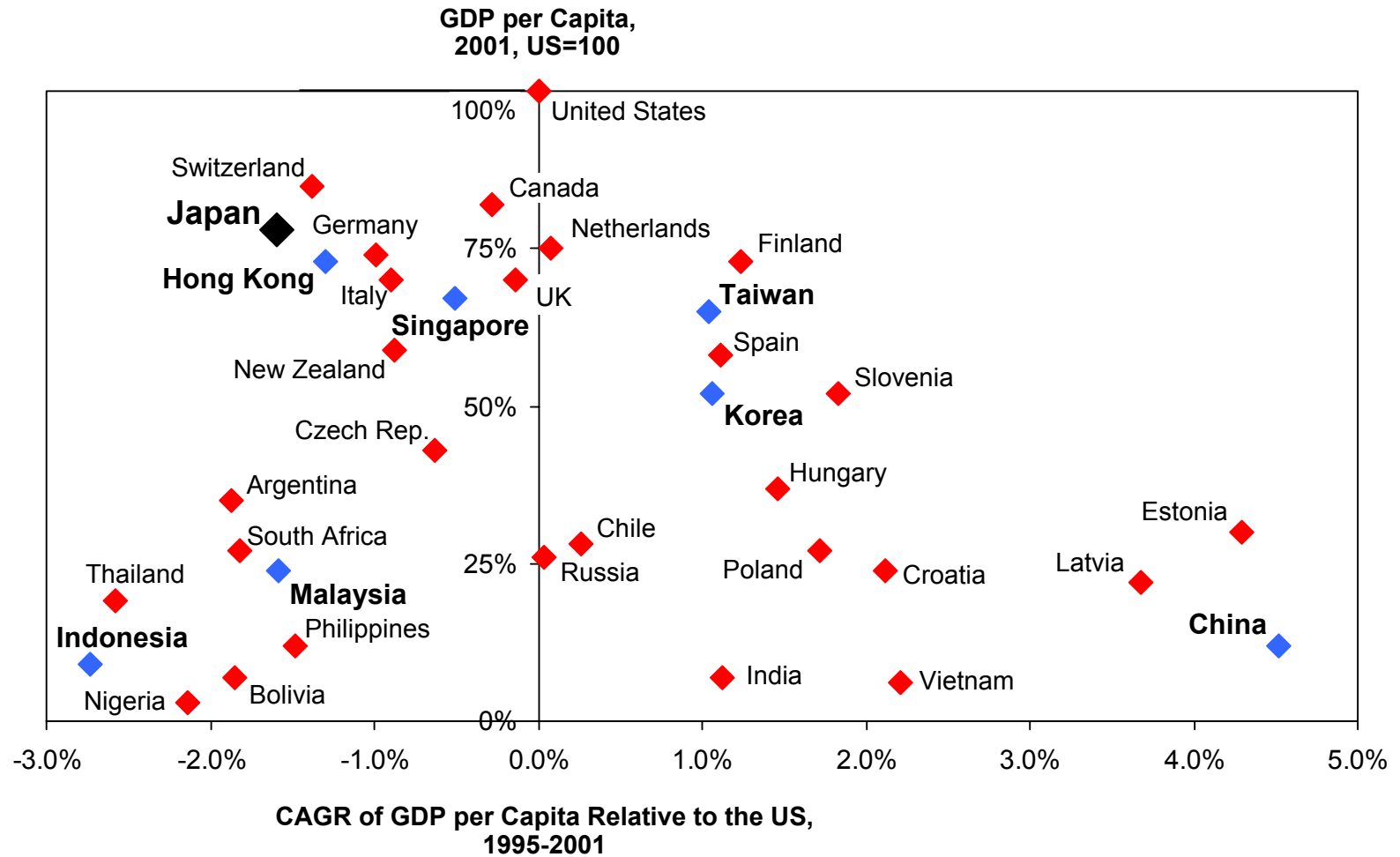
- **Government** drives economic development through policy decisions and incentives



New Model

- Economic development is a **collaborative process** involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration

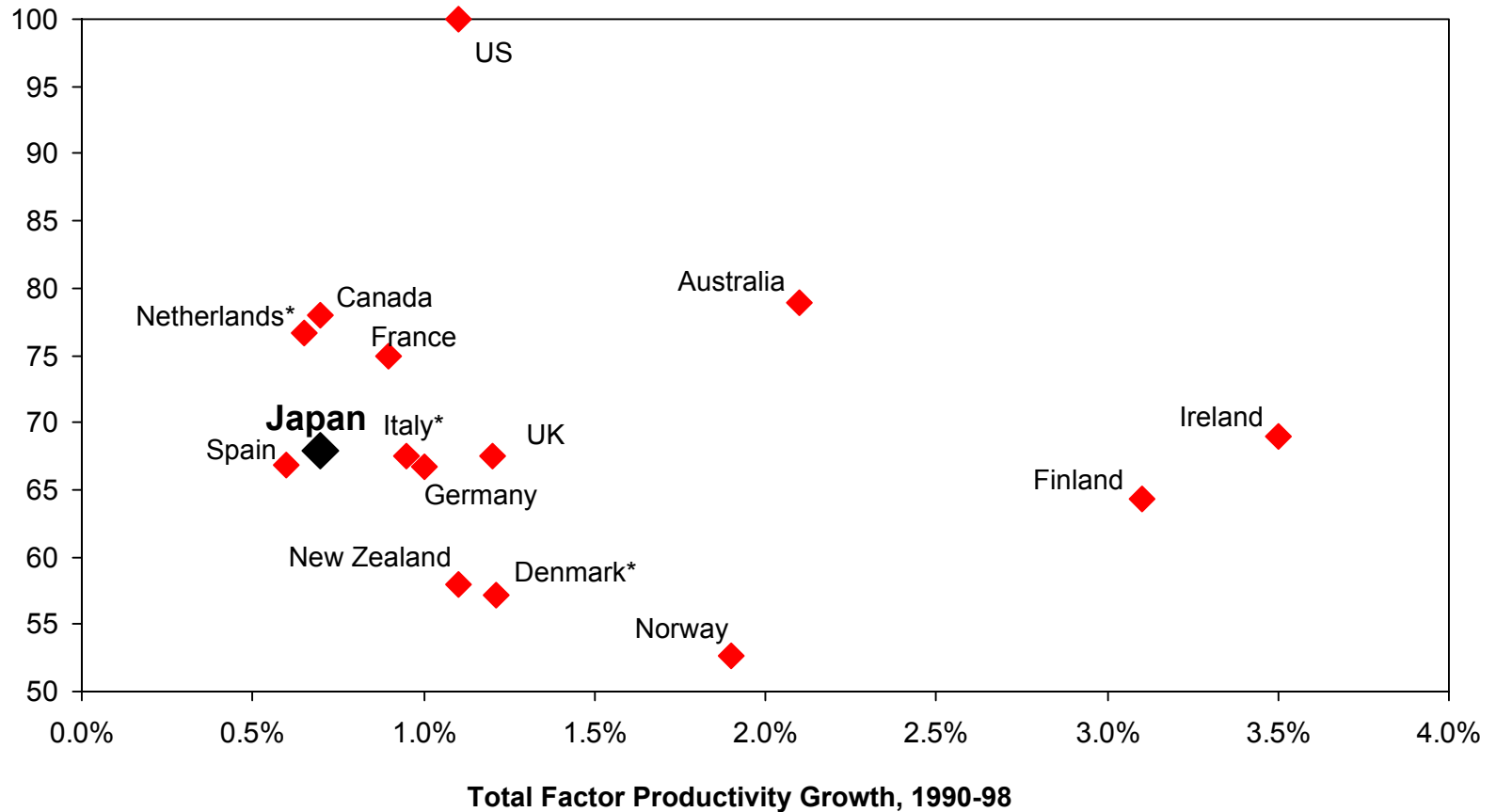
Comparative Economic Performance, Selected Countries



Total Factor Productivity Performance

Selected OECD Countries

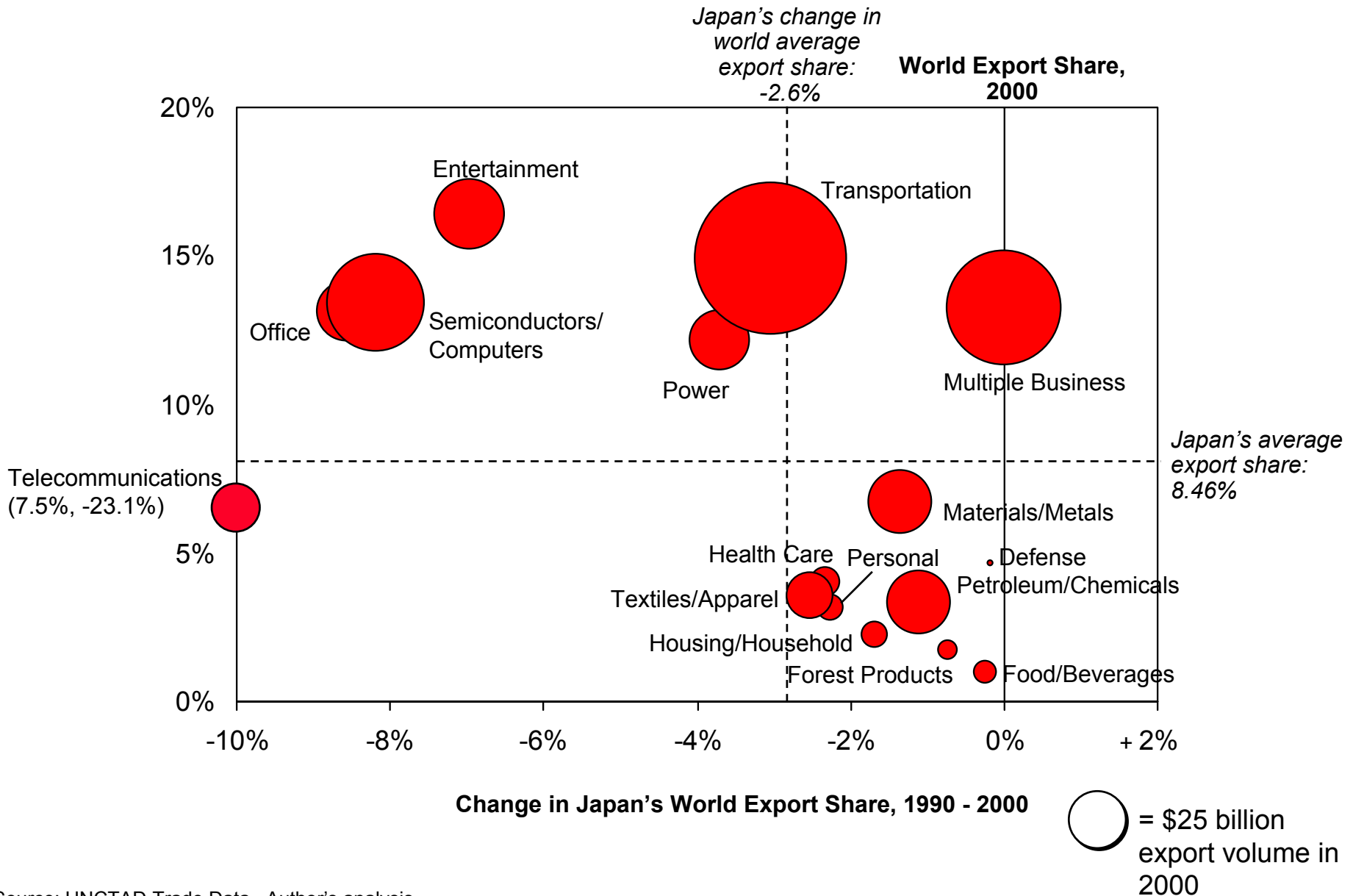
Level of Total Factor Productivity, 1995-97,
US = 100



* Data for 1995 - 1998

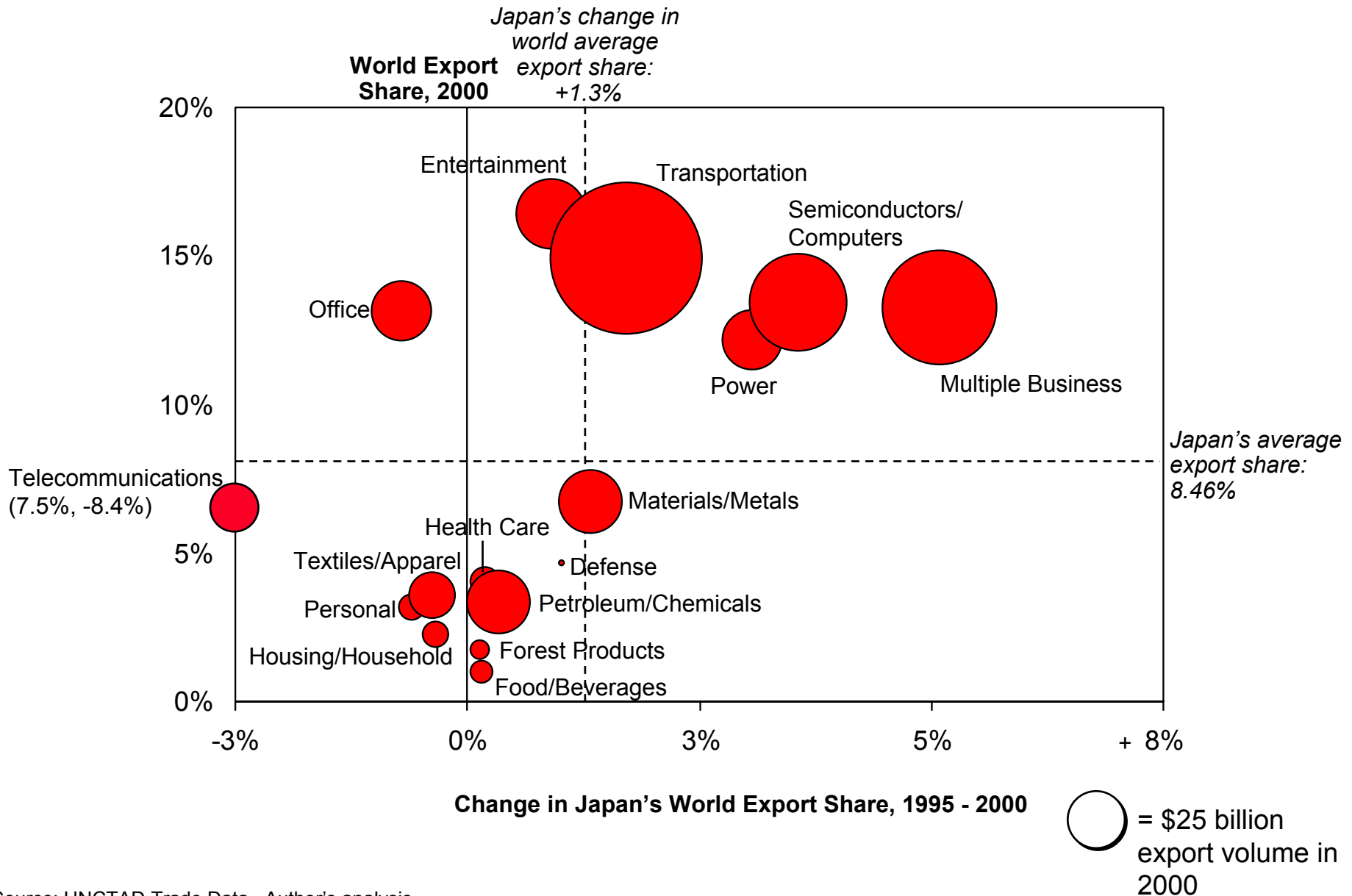
Source: IMF, 2001

Japan's Export Performance By Broad Sector, 1990-2000



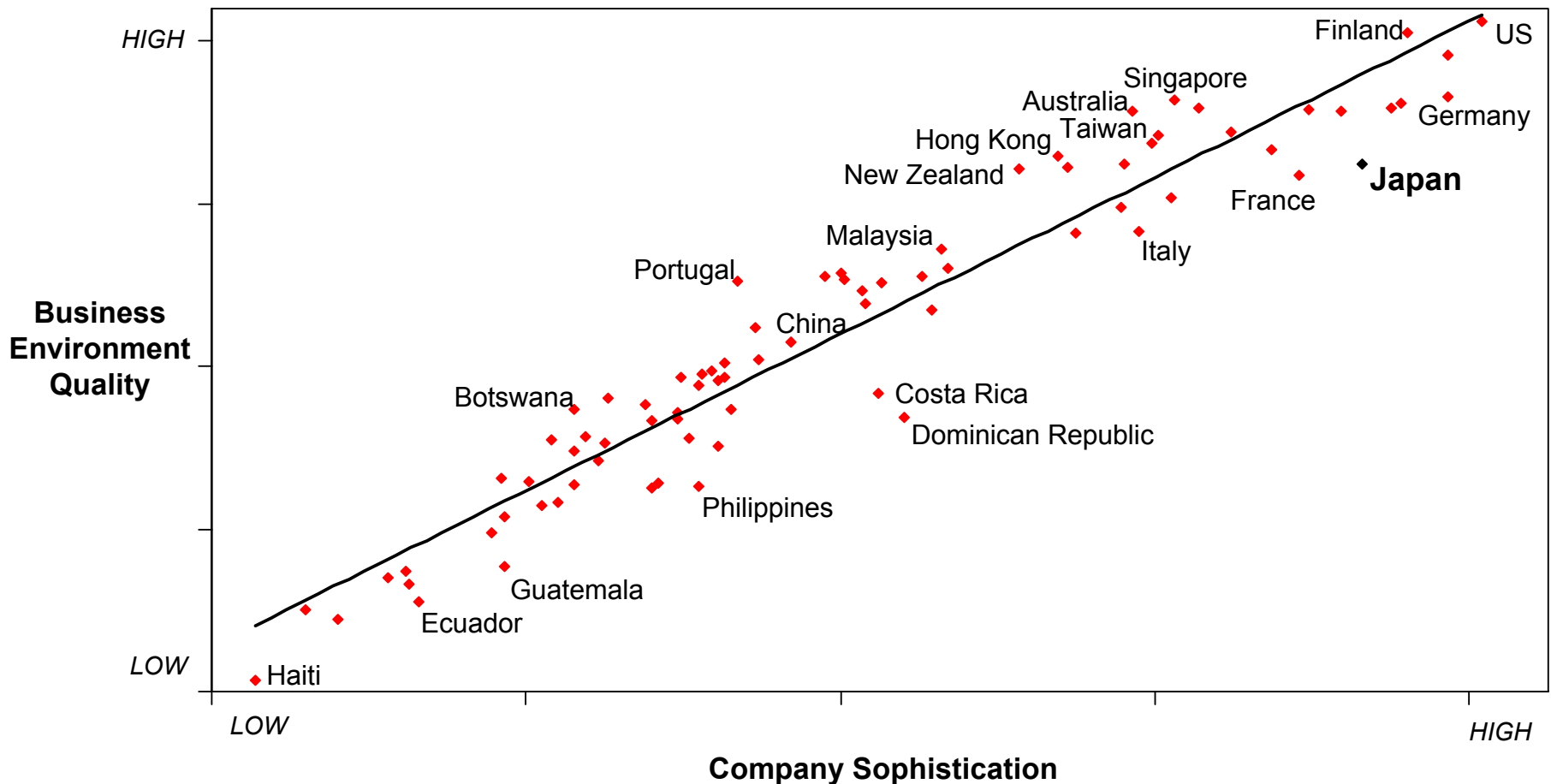
Source: UNCTAD Trade Data. Author's analysis.

Japan's Export Performance By Broad Sector, 1995-2000



Business Environment Quality Relative to Company Sophistication

Global Competitiveness Report 2002



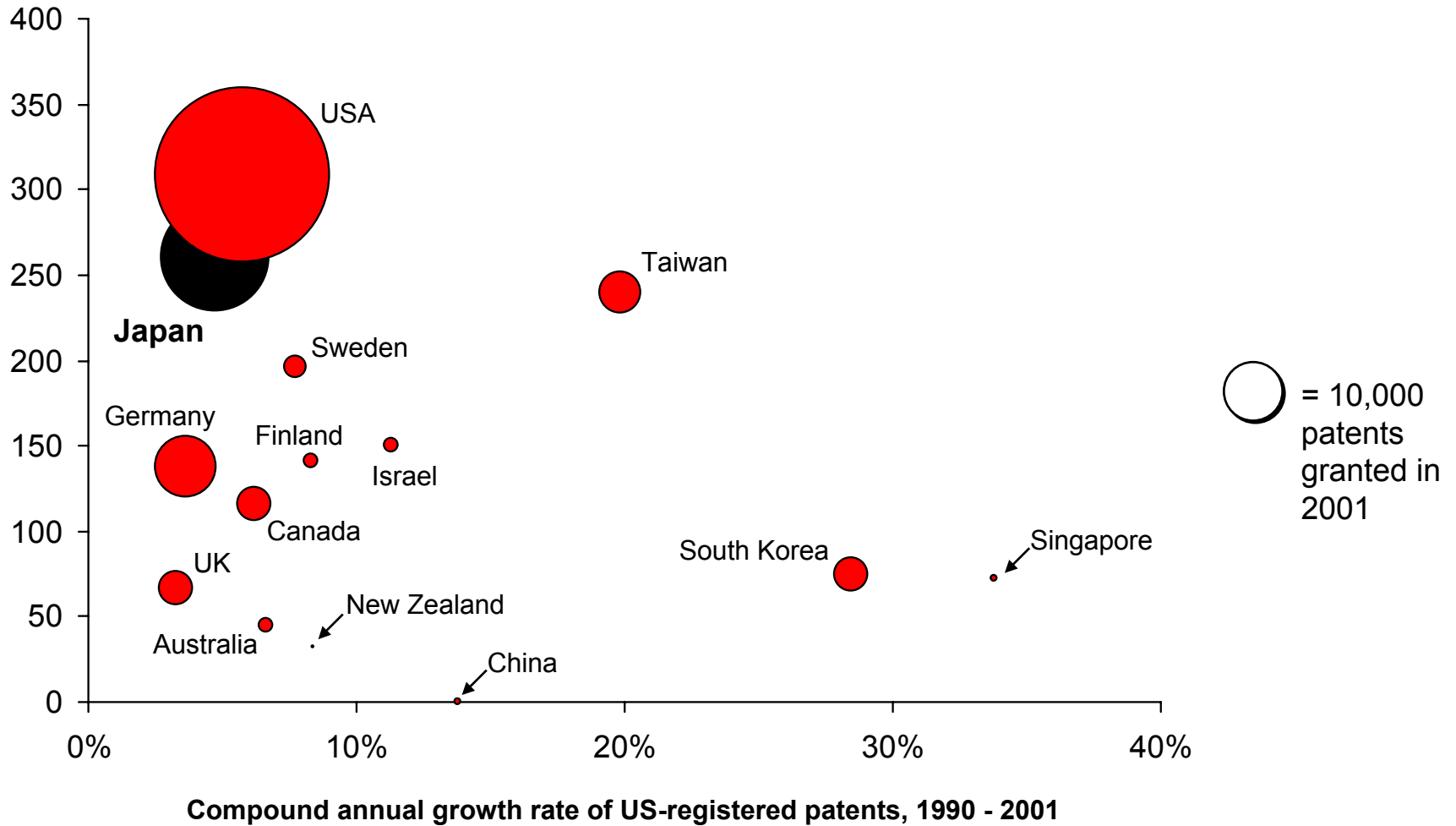
Absolute Patenting Output by Asian Countries and the U.S.

Patents Filed in the U.S.

	Number of Patents, 2001	Patents per 1 Million Population	Annual Growth Rate of Patents, 1990-2001
United States	87,610	308.07	5.7%
Japan	32,924	259.80	4.7%
Taiwan	5,371	240.10	19.9%
South Korea	3,538	74.20	28.5%
Singapore	296	72.20	33.8%
China	195	0.15	13.8%

International Patenting Output

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



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

National Business Environment

Japan Relative Position 2002

Competitive Advantages Relative to GDP per Capita

	Country Ranking
Local Availability of Process Machinery	1
Local Supplier Quantity	1
Railroad Infrastructure Quality	1
Extent of Locally Based Competitors	1
Extent of Product and Process Collaboration	2
Decentralization of Corporate Activity	3
Extent of Bureaucratic Red Tape	3
Local Supplier Quality	3
Local Availability of Specialized Research and Training Services	4
Cooperation in Labor-Employer Relations	5

Competitive Disadvantages Relative to GDP per Capita

	Country Ranking
Efficacy of Corporate Boards	80
Extent of Distortive Government Subsidies	68
Ease of Access to Loans	64
Hidden Trade Barrier Liberalization	56
Quality of Management Schools	51
Administrative Burden for Start-Ups	45
Venture Capital Availability	44
Adequacy of Public Sector Legal Recourse	38
Air Transport Infrastructure Quality	36
Financial Market Sophistication	33
Intellectual Property Protection	32

Note: Rank by countries; overall Japan ranks 11 out of 80 countries (17 on National Business Environment, 10 on GDP pc 2001)

Source: Global Competitiveness Report 2002

National Business Environment

Japan Relative Position 2002 (continued)

Competitive Advantages Relative to GDP per Capita

	Country Ranking
Consumer Adoption of Latest Products	5
Availability of Scientists and Engineers	7
Buyer Sophistication	7
Intensity of Local Competition	9

Competitive Disadvantages Relative to GDP per Capita

	Country Ranking
Laws Relating to Information Technology	30
Judicial Independence	27
Favoritism in Decisions of Government Officials	27
Effectiveness of Anti-Trust Policy	27
Quality of Public Schools	27
Quality of Math and Science Education	27
University/Industry Research Collaboration	24
Costs of Other Firms' Illegal/Unfair Activities	23
Police Protection of Businesses	22
Tariff Liberalization	22

Note: Rank by countries; overall Japan ranks 11 out of 80 countries (17 on National Business Environment, 10 on GDP pc 2001)

Source: Global Competitiveness Report 2002

GCR Innovative Capacity Index

2002 Rankings

Rank	Innovative Capacity Index	Scientists & Engineers Index	Innovation Policy Index	Cluster Environment Index	Linkages Index	Company Innovation Index
1	United States	Iceland	Singapore	United States	United States	United States
2	United Kingdom	Japan	Israel	UK	UK	UK
3	Finland	Sweden	Canada	Italy	Finland	Switzerland
4	Germany	United States	Finland	Taiwan	Israel	Germany
5	Japan	Norway	Taiwan	Finland	Belgium	Hong Kong
6	Switzerland	Denmark	Germany	Japan	Sweden	Denmark
7	Sweden	Finland	United States	Germany	Germany	Japan
8	Taiwan	Australia	Australia	Hong Kong	Canada	Austria
9	Canada	Germany	UK	Netherlands	Netherlands	Finland
10	Singapore	Switzerland	Austria	Korea	France	Singapore
11	Netherlands	Canada	Netherlands	Sweden	Denmark	France
12	Denmark	Belgium	Japan	Singapore	Switzerland	Israel
13	France	France	Ireland	Canada	Ireland	Sweden
14	Austria	UK	France	Switzerland	Austria	Taiwan
15	Israel	Taiwan	Portugal	Australia	Taiwan	Belgium
16	Belgium	Singapore	Switzerland	Norway	Norway	Italy
17	Australia	Netherlands	Belgium	Austria	Japan	Netherlands
18	Iceland	Austria	Korea	France	Australia	Canada
19	Norway	New Zealand	Denmark	Ireland	Hong Kong	Iceland
20	Ireland	Korea	Norway	Portugal	Italy	Ireland

U.S. Patenting by Top 25 Japanese Universities, Institutes, and Government Agencies

Rank	Organization	Patents Issued from 1997 to 2001
65	AGENCY OF INDUSTRIAL SCIENCE & TECHNOLOGY	334
257	INSTITUTE OF PHYSICAL AND CHEMICAL RESEARCH	62
335	JAPAN ATOMIC ENERGY RESEARCH INSTITUTE	43
473	NATIONAL RESEARCH INSTITUTE FOR METALS	24
532	NATIONAL FOOD RESEARCH INSTITUTE	20
550	SUPER SILICON CRYSTAL RESEARCH INSTITUTE	19
569	JAPAN NUCLEAR CYCLE DEVELOPMENT INSTITUTE	18
892	CANCER INSTITUTE	8
892	HIROSHIMA UNIVERSITY	8
892	RAILWAY TECHNICAL RESEARCH INSTITUTE	8
892	TOHOKU UNIVERSITY	8
892	TOKYO UNIVERSITY	8
965	BIOMOLECULAR ENGINEERING RESEARCH INS.	7
965	INSTITUTE FOR ADVANCED SKIN RESEARCH, INC.	7
1054	FORESTRY AND FOREST PRODUCTS RESEARCH INS.	6
1054	KYUSHU UNIVERSITY	6
1054	NATIONAL AEROSPACE LABORATORY	6
1054	INSTITUTE OF AGROBIOLOGICAL RESOURCES	6
1054	INS. OF SERICULTURAL AND ENTOMOLOGICAL SCIE.	6
1054	INSTITUTE OF ADV. MATERIAL GAS-GENERATOR CO.	6
1161	NATIONAL INSTITUTE OF HEALTH	5
1161	KANSAI RESEARCH INSTITUTE (KRI)	5
1161	INSTITUTE OF SPACE AND ASTRONAUTICAL SCIENCE	5
1161	THE KITASATO INSTITUTE	5
1161	TOKYO INSTITUTE OF TECHNOLOGY	5
1161	INSTITUTE OF TECHNOLOGY PRECISION ELECTRICAL	5

Note: Shading indicates universities, research institutions, and other government agencies; rank among Japanese institutions
 Source: US Patent and Trademark Office (www.uspto.gov). Author's analysis.

U.S. Patenting by Top 25 U.S. Universities, Institutes, and Government Agencies

Rank	Organization	Patents Issued from 1997 to 2001
14	UNIVERSITY OF CALIFORNIA, THE REGENTS OF	1904
16	UNITED STATES OF AMERICA, NAVY	1640
37	UNITED STATES OF AMERICA, ARMY	772
50	UNITED STATES OF AMERICA, HEALTH & HUMAN S.	636
55	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	595
76	UNITED STATES OF AMERICA, NASA	469
79	CALIFORNIA INSTITUTE OF TECHNOLOGY	454
82	UNIVERSITY OF TEXAS	442
87	UNITED STATES OF AMERICA, AIR FORCE	427
94	STANFORD UNIVERSITY	401
108	JOHNS HOPKINS UNIVERSITY	363
130	UNITED STATES OF AMERICA, DEP. OF AGRICULTURE	309
133	MASSACHUSETTS GENERAL HOSPITAL CORP.	306
138	UNITED STATES OF AMERICA, DEP. OF ENERGY	300
150	UNIVERSITY OF MICHIGAN	272
152	UNIVERSITY OF PENNSYLVANIA	263
158	COLUMBIA UNIVERSITY	252
166	STATE UNIVERSITY OF NEW YORK	239
173	MICHIGAN STATE UNIVERSITY	228
173	UNIVERSITY OF WASHINGTON	228
186	GAS RESEARCH INSTITUTE	216
188	THE SCRIPPS RESEARCH INSTITUTE	213
196	UNIVERSITY OF MINNESOTA, THE REGENTS OF	201
198	IOWA STATE UNIVERSITY	195
212	WASHINGTON UNIVERSITY	183

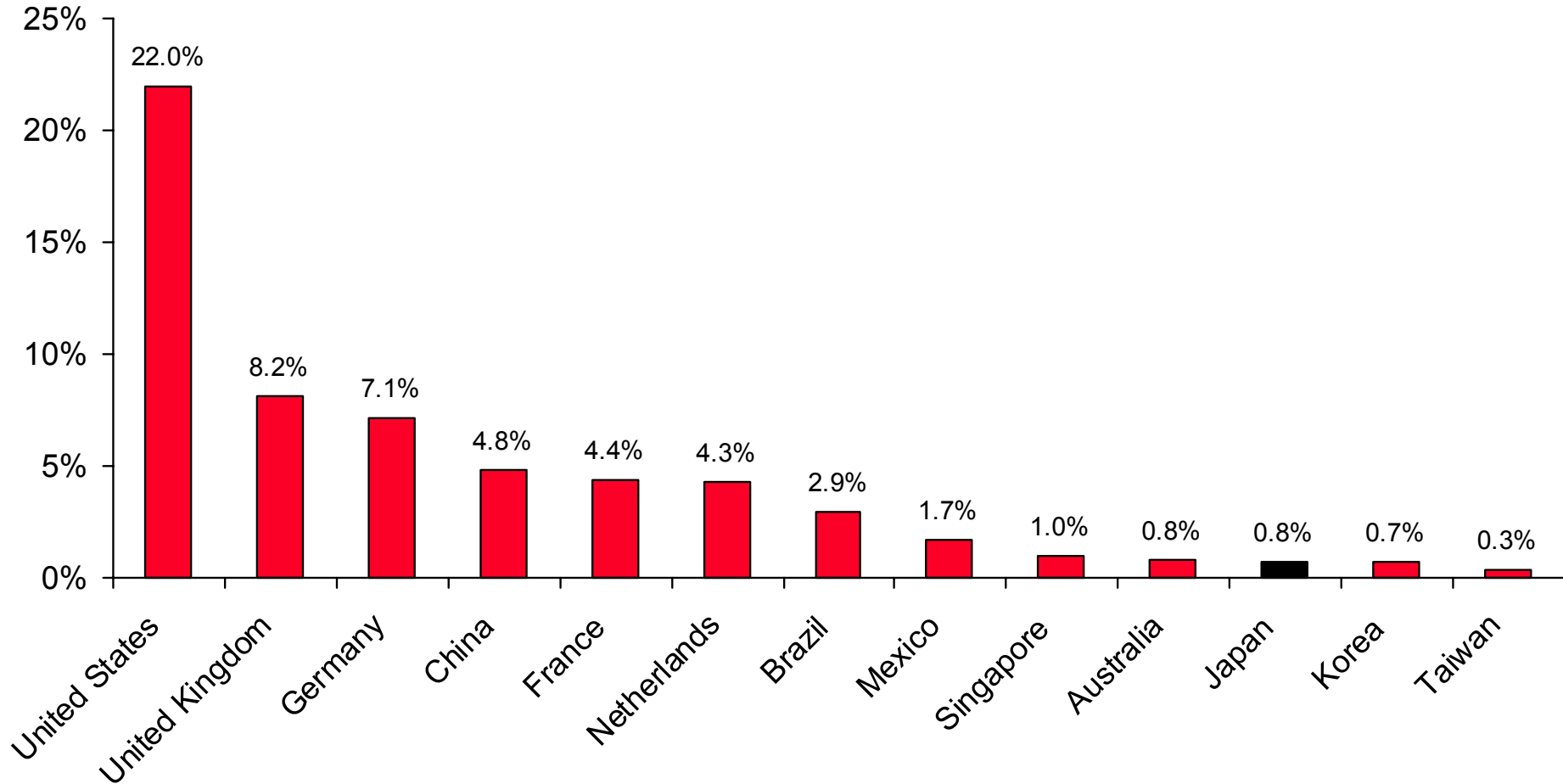
Note: Shading indicates universities, research institutions, and other government agencies; rank among U.S. institutions

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

Share of Global Inward FDI Flows

Selected Countries

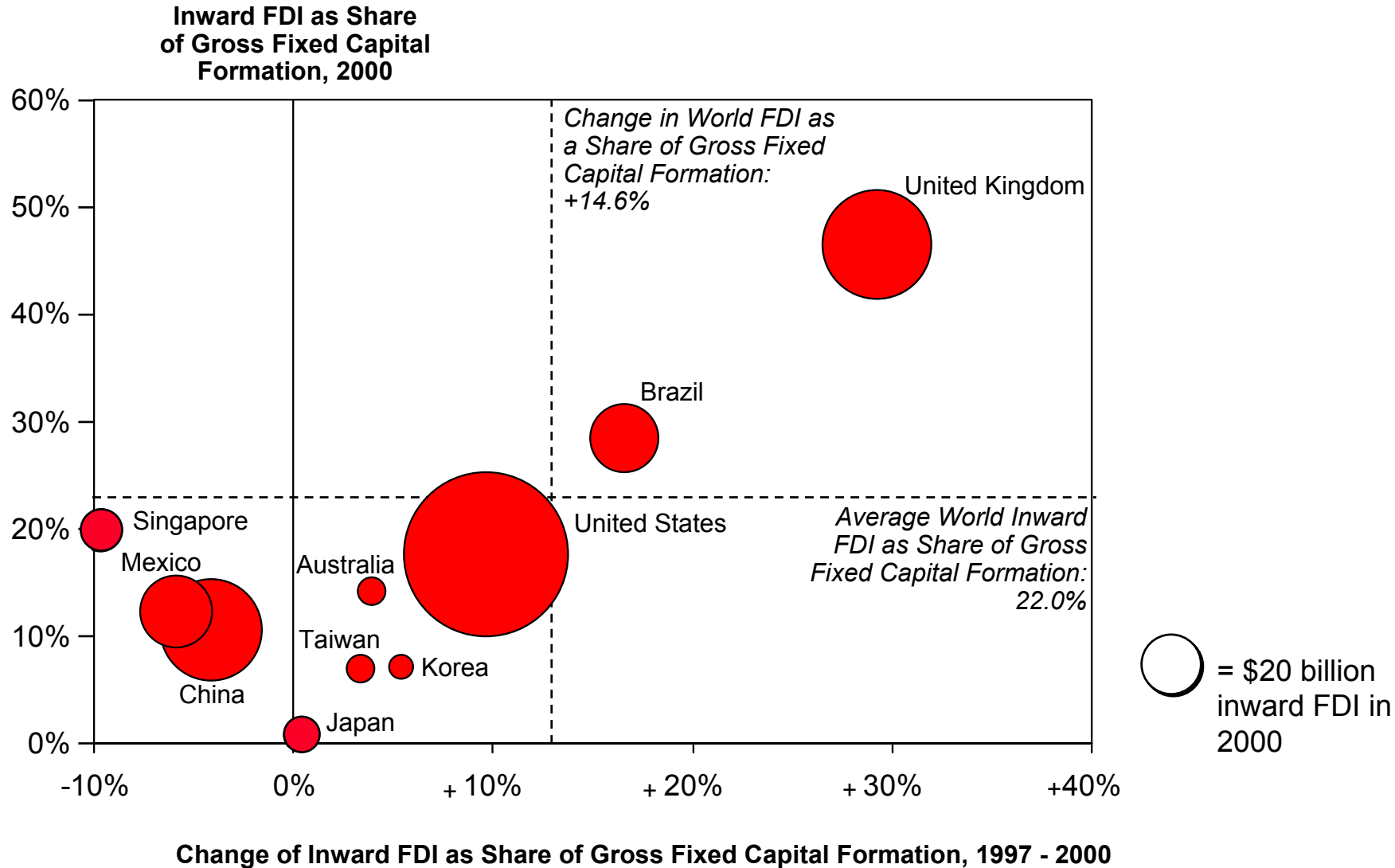
Country Inward FDI as
Share of World
Inward FDI, 1997-2001



Source: UNCTAD World Investment Report 2002. Author's analysis.

Inward FDI Flows

1997 - 2000



New 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



- 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**
- Provide government with **information** and substantive input on regulatory issues and constraints to cluster development



- An important role for **trade associations**
 - Influence and cost sharing