

The Competitive Advantage of Singapore: Transition to the Innovation Stage

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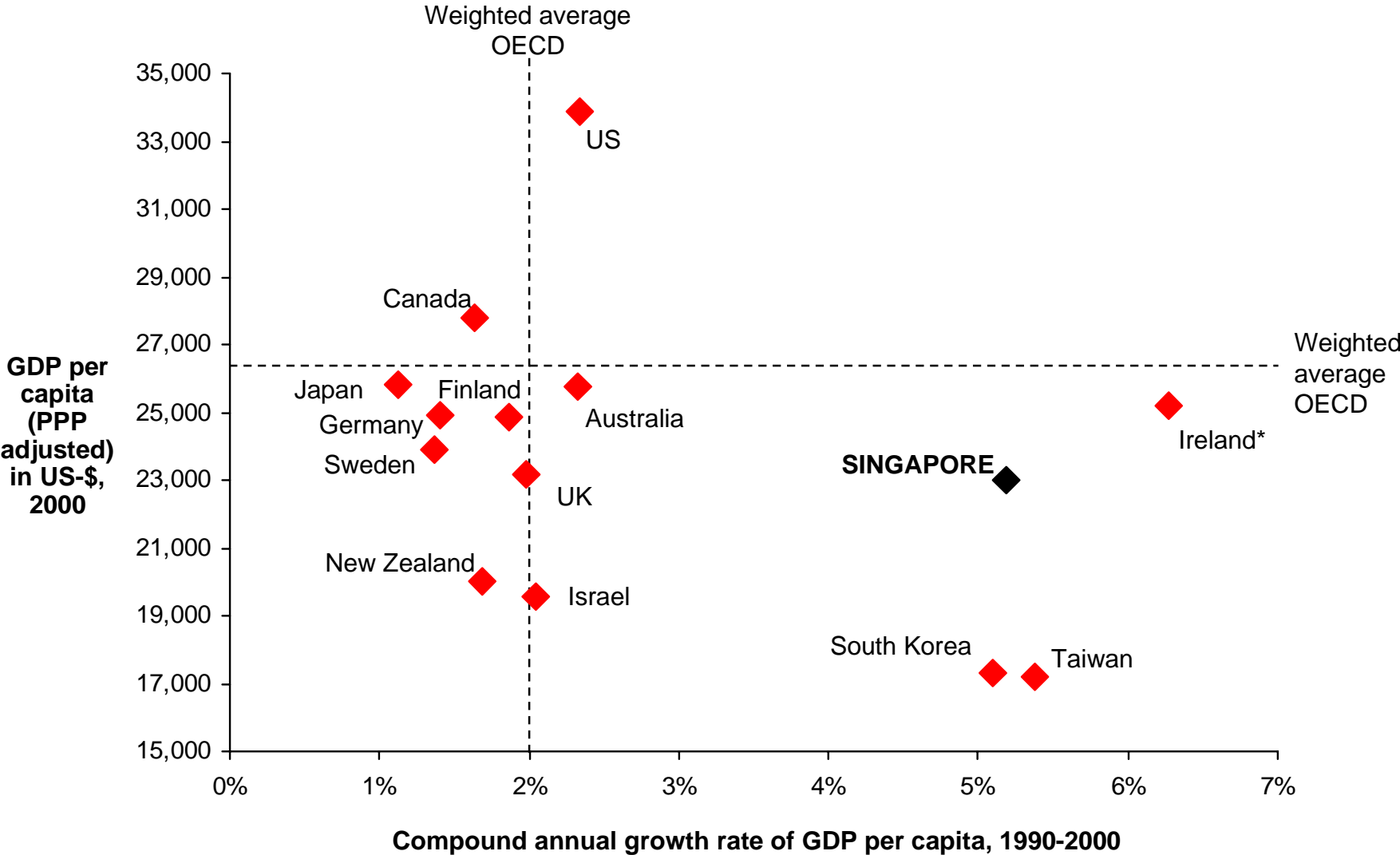
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This presentation draws on ideas from Professor Porter's articles and books, in particular, The Competitive Advantage of Nations (The Free Press, 1990), "The Microeconomic Foundations of Economic Development," in The Global Competitiveness Report 1998, (World Economic Forum, 1998), "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.

Singapore 2001

- Singapore has achieved an extraordinary level of prosperity
- The current economic downturn is largely driven by the IT investment
- However, there are structural changes in the competitive environment that require that Singapore revisit its economic strategy

Singapore's Economic 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

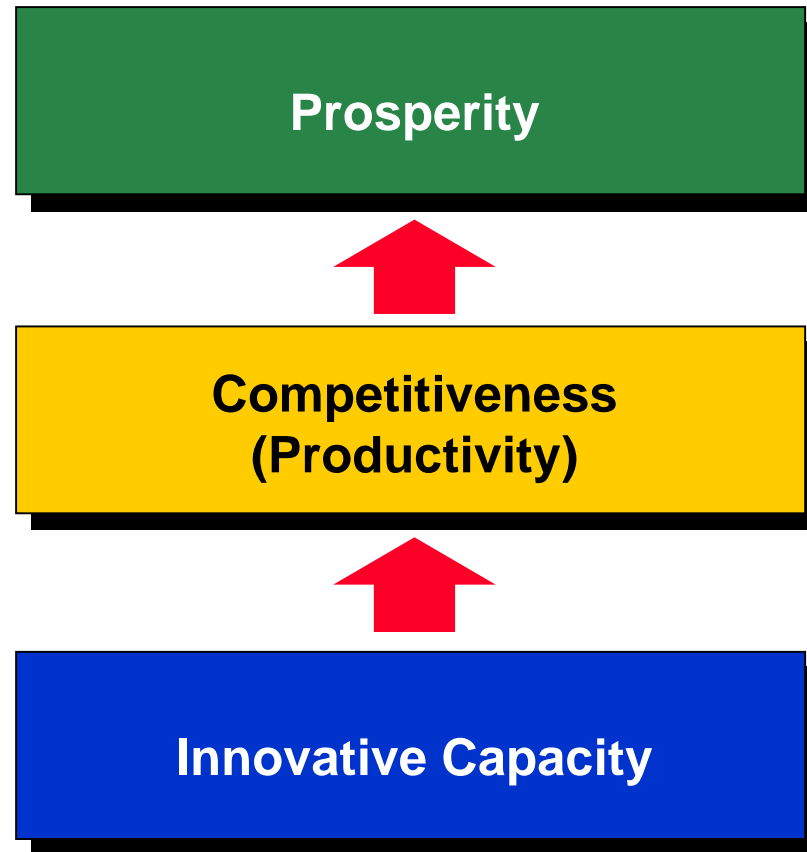
Sources of Rising Prosperity

- A 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, 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 combination of domestic and foreign firms in a particular field creates the most fertile environment for 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”, rather it reveals a **lack of fundamental competitiveness**



- 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



- In advanced economies, innovation is needed to support high levels of prosperity

Determinants of Productivity and Productivity Growth

Macroeconomic, Political, and Legal Context for Development

Microeconomic Foundations of Development

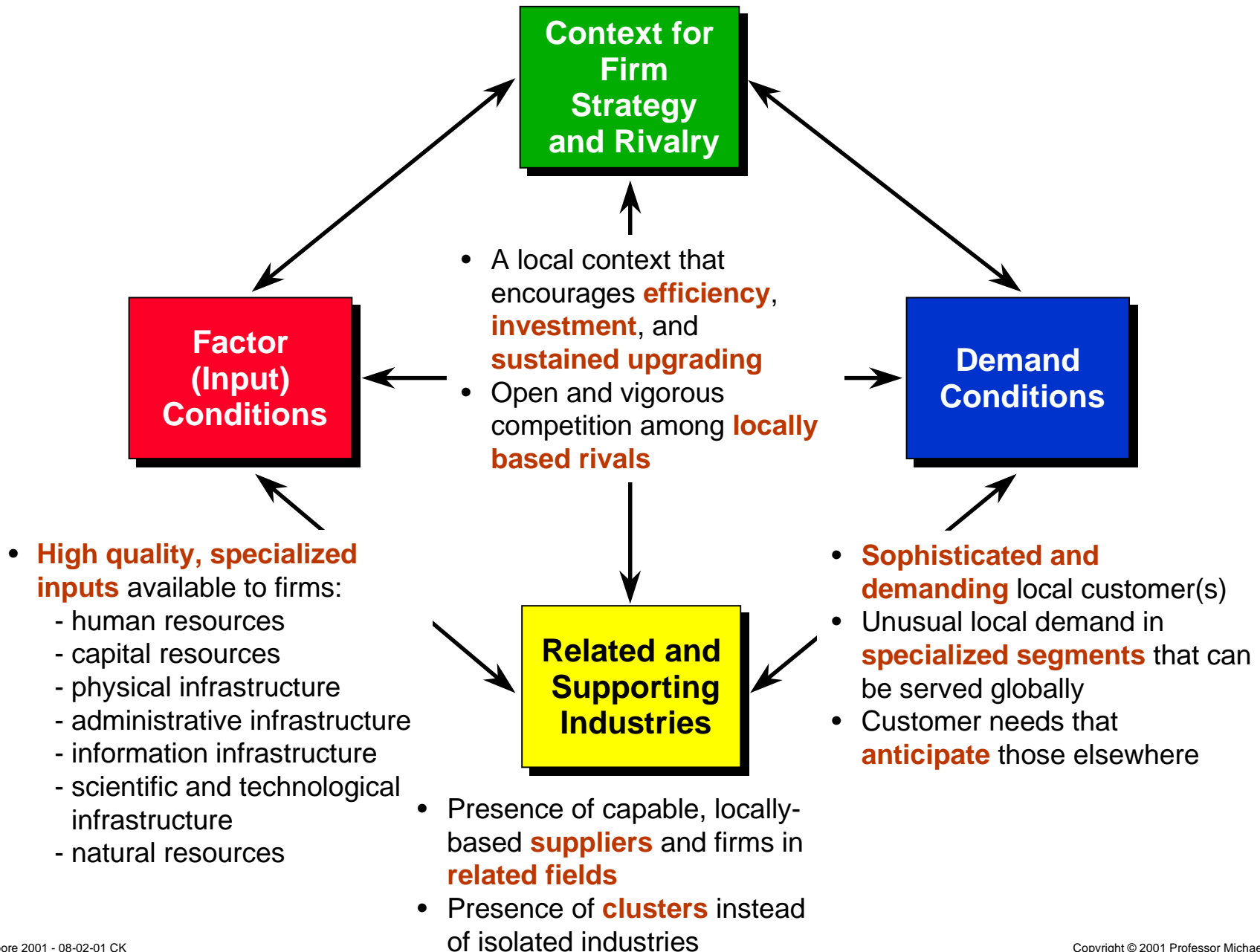
Sophistication
of Company
Operations and
Strategy



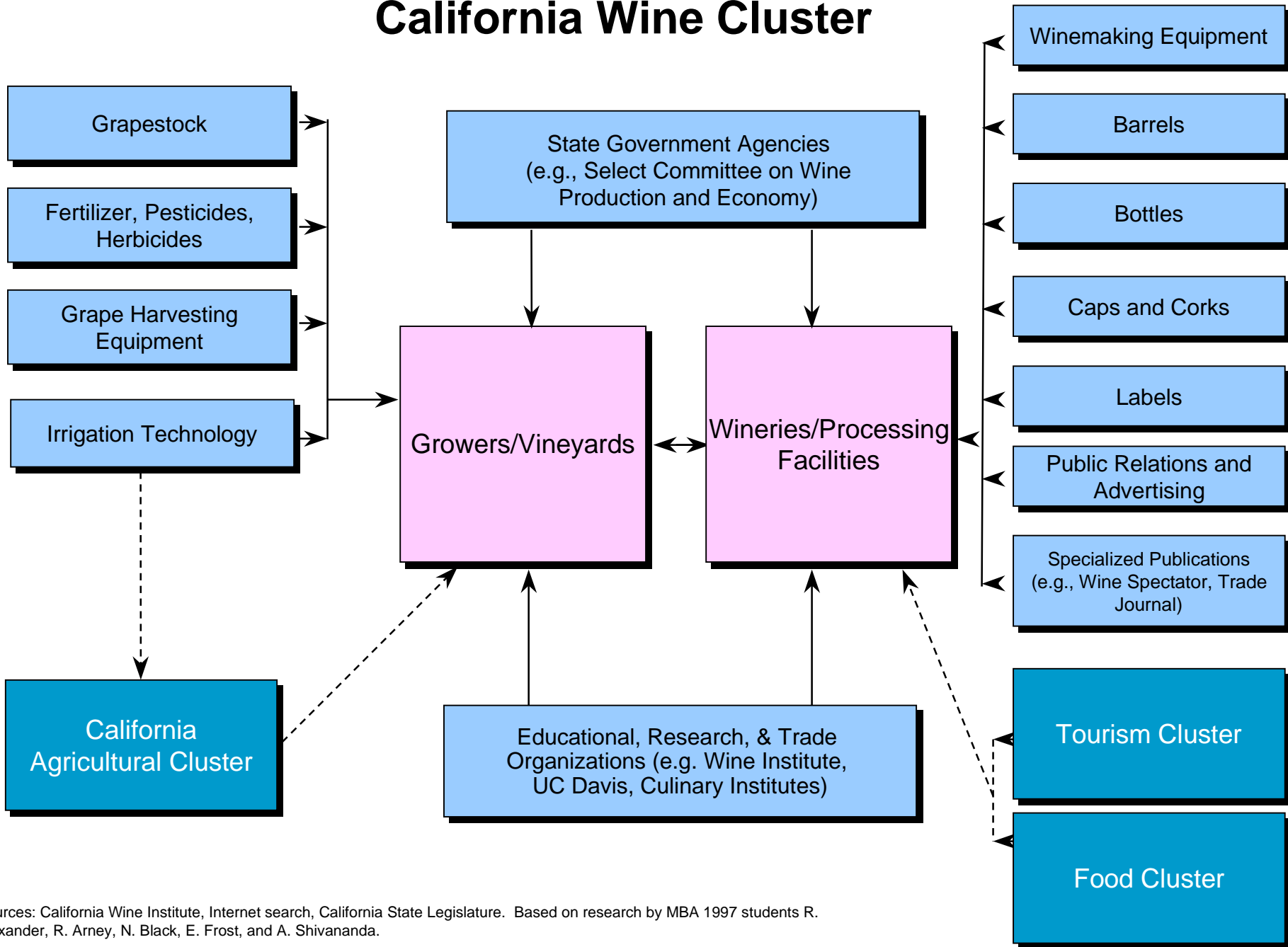
Quality of the
Microeconomic
Business
Environment

- Sound macroeconomic policies and a stable political / legal context are **necessary** to ensure a prosperous economy, **but not sufficient**
- Competitiveness ultimately depends on improving the **microeconomic foundations** of competition

Productivity and the Microeconomic Business Environment



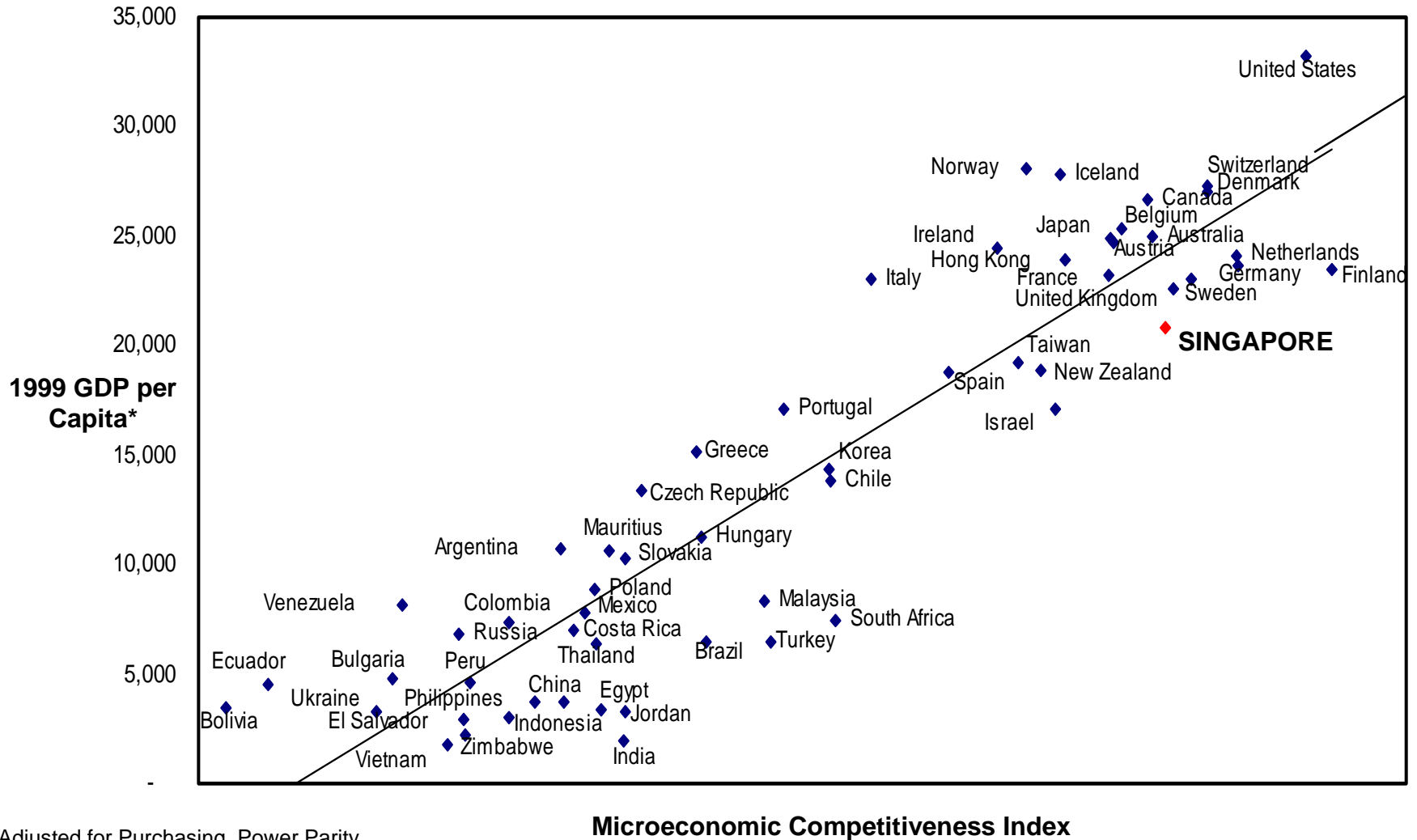
California Wine Cluster



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.

Global Competitiveness Report 2000

The Relationship Between Microeconomic Competitiveness and GDP Per Capita



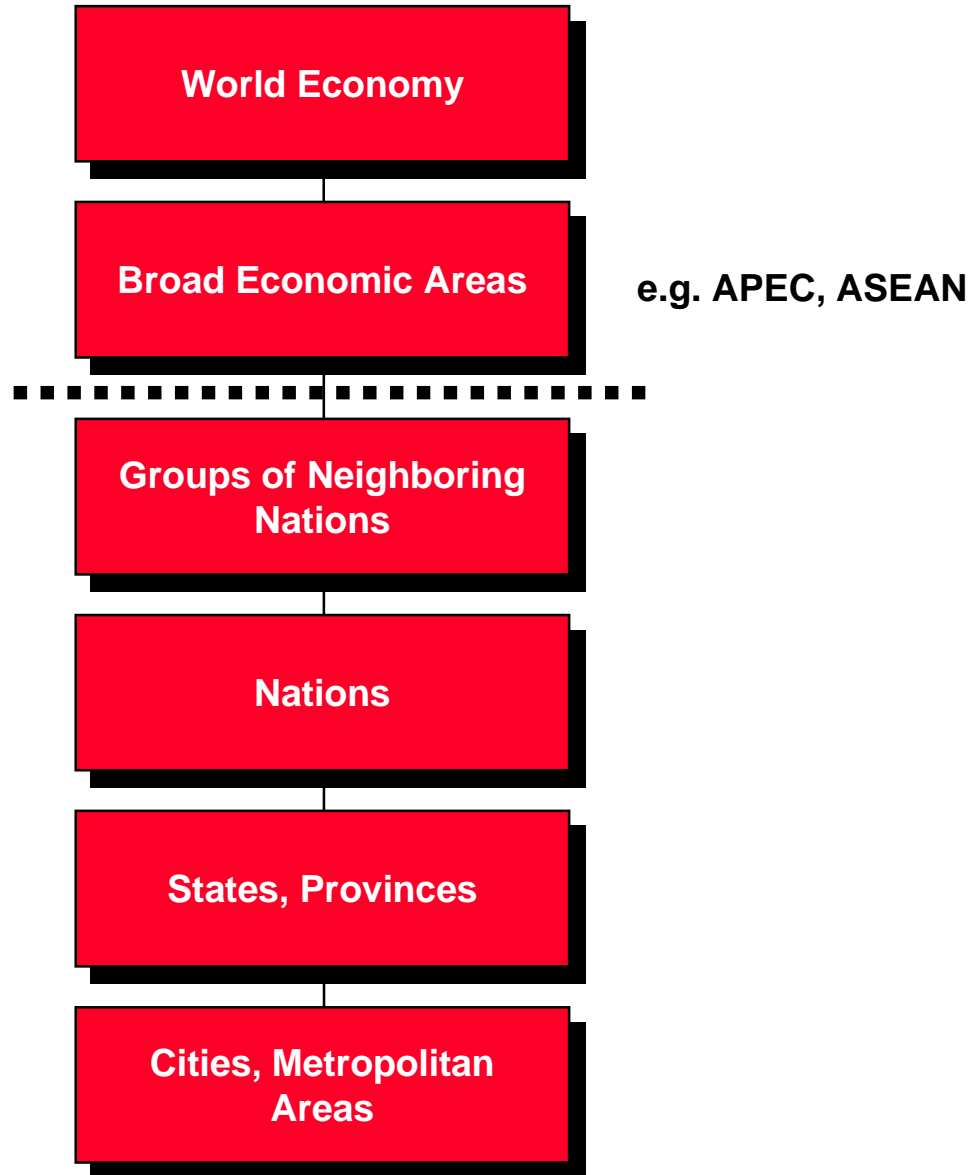
* Adjusted for Purchasing Power Parity

Source: Porter, Michael E. "The Current Competitiveness Index: Measuring the Microeconomic Foundations of Prosperity." *The Global Competitiveness Report 2000*, New York: Oxford University Press, 2000

Stages Of Competitive Development



Geographic Levels and Competitiveness



Singapore's Current Position

- Singapore has taken the Investment-Driven strategy of economic development to an extraordinary level of prosperity
- But the limits of the Investment-Driven strategy are becoming apparent
 - Singaporean **wages** are already higher than other locations competing for investment-driven activities
 - Labor force participation is near its upper limit
 - Capital/labor ratios are at or near U.S. levels
 - China is fundamentally altering patterns of FDI and the competitive landscape
 - Progress in growing and globalizing indigenous companies is slow
- Regional cooperation initiatives have yet to yield major benefits

Singapore's Economic Agenda in 2001

I. Address some enduring and emerging weaknesses

II. Make the transition to an Innovation-Driven economy with a **unique role** in the region

III. Transform company strategies

IV. Reorient and broaden the approach to regional cooperation

Singapore's Economic Agenda in 2001

- I. Address some enduring and emerging weaknesses
 - **Improve the efficiency of domestic industries**

Competition and Local Prices

Relative Prices for Local Goods and Services, 2000

Rank	GDP per capita (current exchange rate) Index rank	GDP per capita (PPP) Index rank
1	Luxembourg	Luxembourg
2	Japan	United States
3	United States	Norway
4	Norway	Iceland
5	Switzerland	Switzerland
6	Denmark	Canada
7	Iceland	Denmark
8	SINGAPORE	Belgium
9	Sweden	Austria
10	United Kingdom	Japan
11	Finland	Ireland
12	Hong Kong	Australia
13	Netherlands	Netherlands
14	Austria	Germany
15	Germany	Finland
16	Belgium	Hong Kong
17	Canada	France
18	France	Sweden
19	Ireland	Italy
20	Australia	United Kingdom
21	Italy	SINGAPORE
22	Israel	New Zealand
23	Spain	Israel
24	Taiwan	Spain
25	New Zealand	Korea

Singapore's Economic Agenda in 2001

- I. Address some enduring and emerging weaknesses
 - Improve the efficiency of domestic industries
 - **Strengthen domestic competition and antitrust policy**

Competition and Competition Policy

Singapore's Relative Position

Competitive Advantages Relative to GDP per Capita

	Country Ranking
Absence of Distortive Government Subsidies	1
Tariff Liberalization	1
Hidden Trade Barrier Liberalization	6
Absence of Legal Barriers to Entry	8

Competitive Disadvantages Relative to GDP per Capita

	Country Ranking
Extent of Locally Based Competitors	40
Intensity of Local Competition	27
Effectiveness of Anti-trust Policy	14

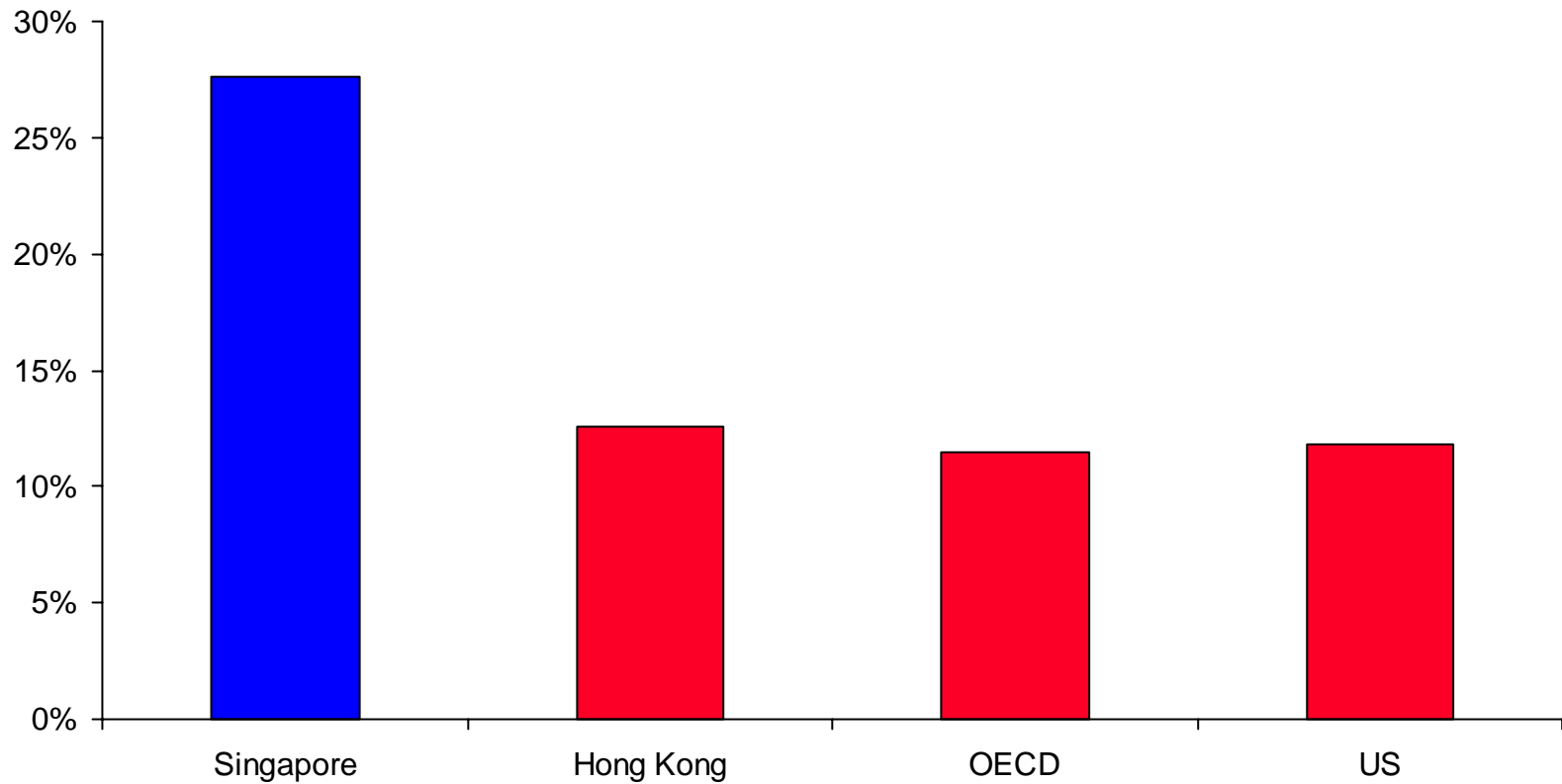
Note: Rank by countries; overall Singapore ranks 9 (5 on Quality of Business Environment)

Source: Global Competitiveness Report 2000

Competitive Pressure in Singapore

Comparative Price-Cost Margins in Manufacturing

Price - Average
Cost Margin,
Average, 1990 - 98

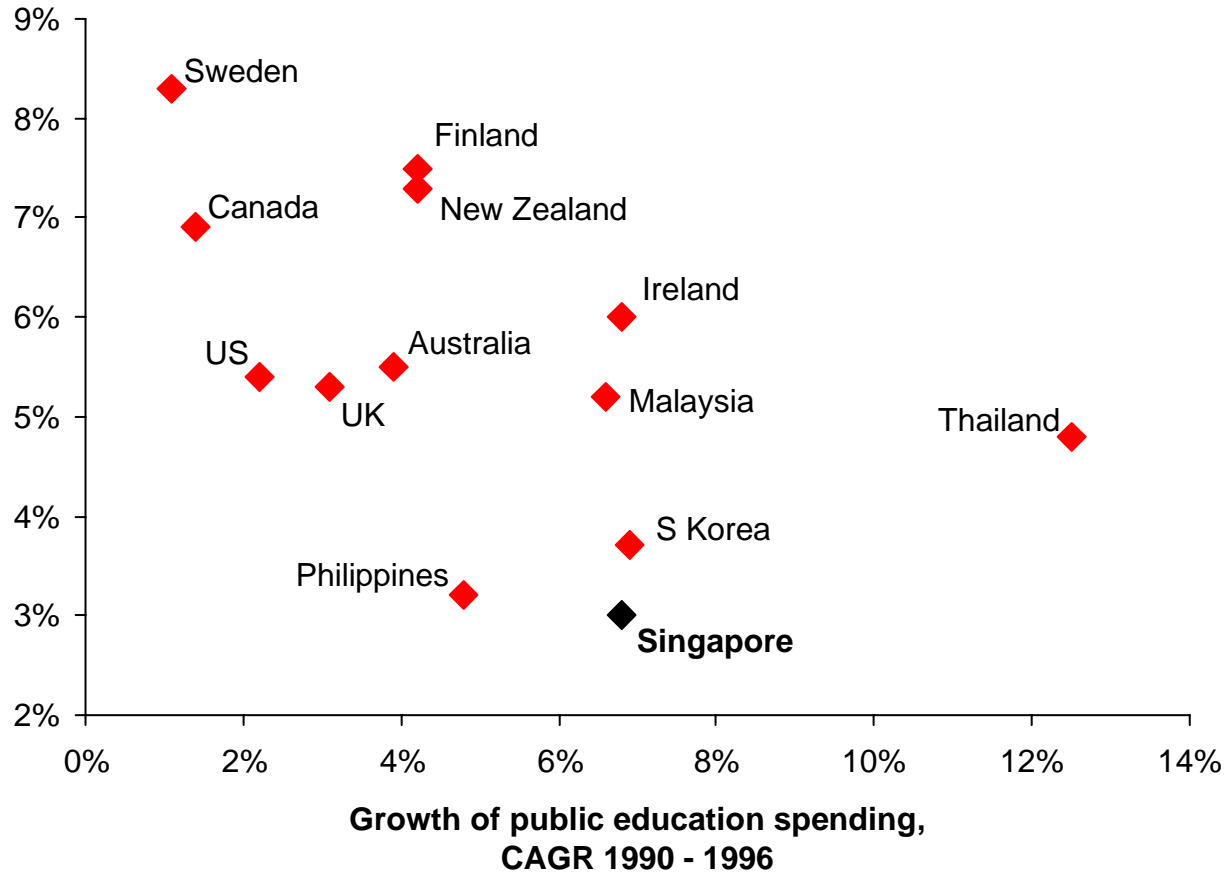


Singapore's Economic Agenda in 2001

- I. Address some enduring and emerging weaknesses
 - Improve the efficiency of domestic industries
 - Strengthen domestic competition and anti-trust policy
 - **Improve the capabilities of the education system**

Comparative Educational Spending, Selected Countries

Public expenditure on
education, Share of
GDP 1996



Singapore's Economic Agenda in 2001

- I. Address some enduring and emerging weaknesses
 - Improve the efficiency of domestic industries
 - Strengthen domestic competition and anti-trust policy
 - Improve the capabilities of the education system
 - **Create an explicit strategy to mobilize older and underemployed citizens**

Singapore's Economic Agenda in 2001

- I. Address some enduring and emerging weaknesses
 - Improve the efficiency of domestic industries
 - Strengthen domestic competition and anti-trust policy
 - Improve the capabilities of the education system
 - Create an explicit strategy to mobilize older and underemployed citizens
 - **Reduce government involvement in the economy**

Government-Ownership In Singaporean Companies

Comparison with other Asian Countries

	Share of top 20 companies with state share > 20%*	Share of companies with state share**		
		> 10%	> 20%	> 30%
Singapore	45%	23.6%	23.5%	11.3%
Hong Kong	5%	3.7%	1.4%	0.9%
Japan	5%	1.1%	0.8%	0.4%
Korea	15%	5.1%	1.6%	1.2%
Malaysia	NA	17.8%	13.4%	8.2%
Taiwan	NA	3.0%	2.8%	2.8%
Philippines	NA	3.6%	2.1%	2.1%

Evolving the Role of Government

- A strong and effective government role proved beneficial in the investment phase when efficiency and reliability were the principal competitive advantages
- Substantial government involvement will have diminishing returns
 - Government ownership is still high despite recent partial privatizations. Government ownership places constraints on company strategy, and limits competition in the affected sectors
 - Outward investments by government-linked companies are viewed with suspicion in many countries, and are likely to be politicized
 - Government “guidance” in the form of financial incentives and approval requirements draws management to focus more on the government than on the market
- A more open, pluralistic and heterogeneous society and economy are needed to spur innovation and attract mobile knowledge workers
- Government’s role must shift to improving the business environment and less involvement in the competitive process

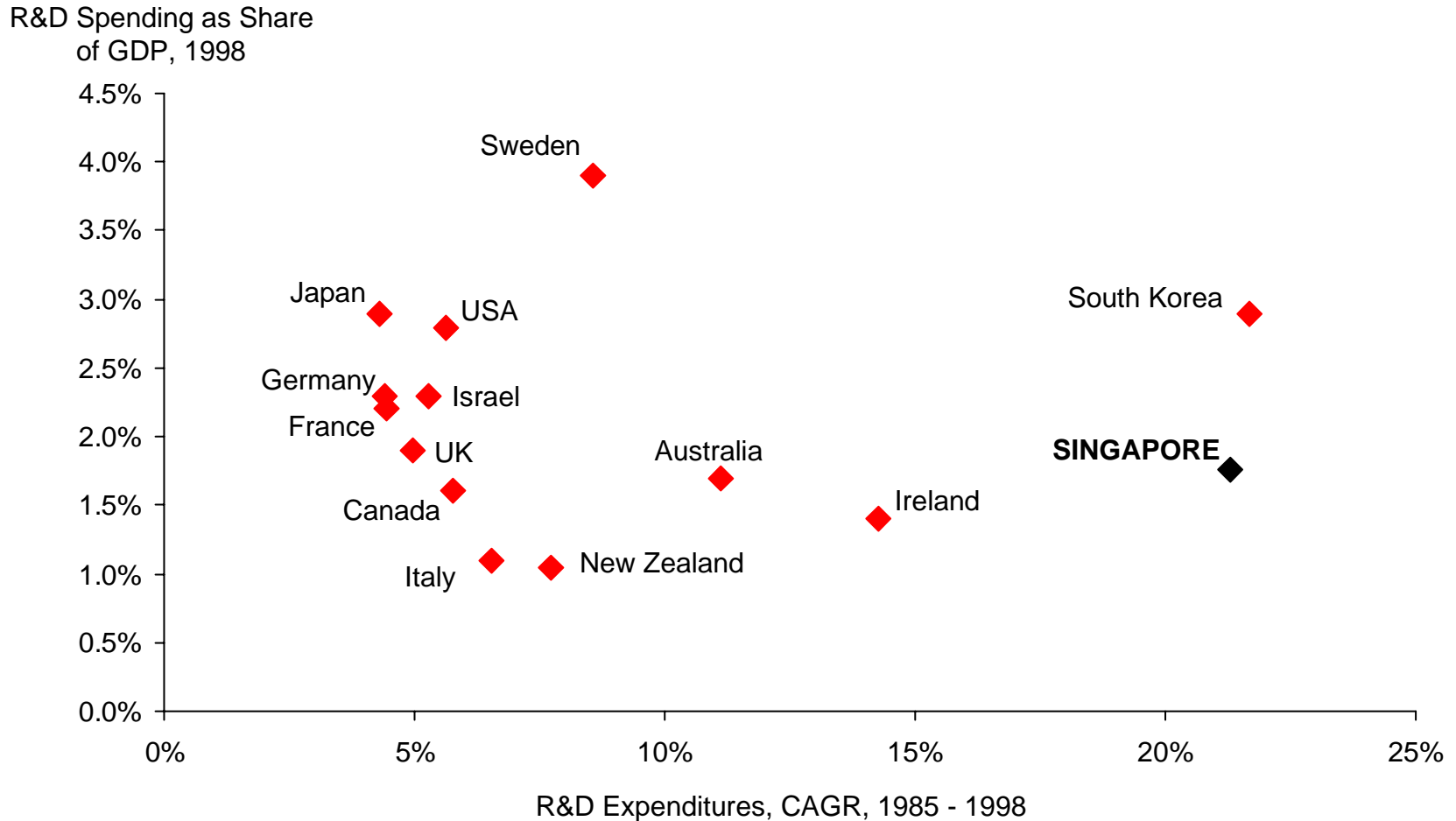
Singapore's Economic Agenda in 2001

- I. Address some enduring and emerging weaknesses
 - Improve the efficiency of domestic industries
 - Strengthen domestic competition and anti-trust policy
 - Improve the capabilities of the education system
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 - Reduce government involvement in the economy

- II. Make the transition to an Innovation-Driven economy
 - **Signs of Progress**

Change in R&D Investments

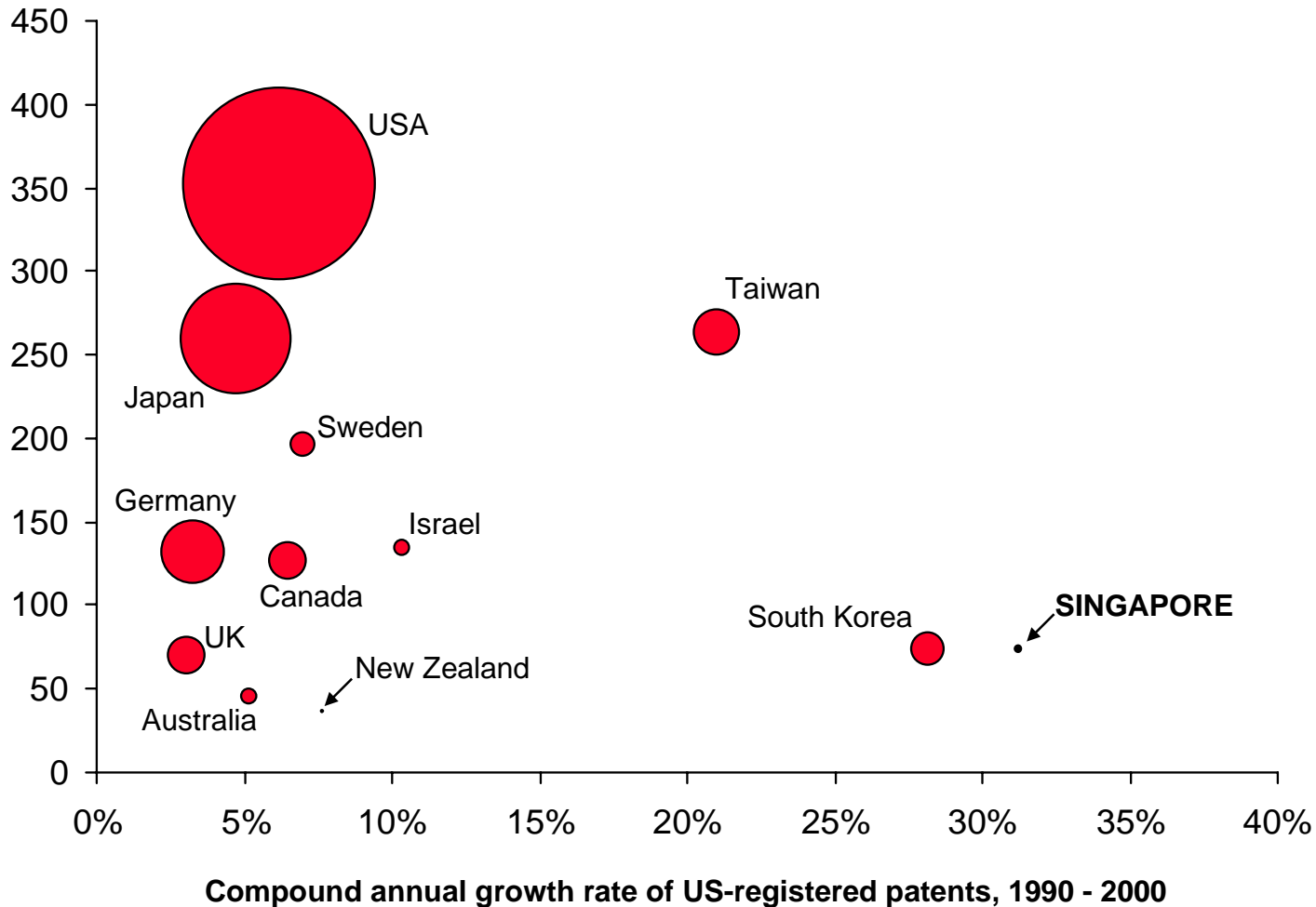
Compound Annual Growth Rate in R&D Expenditures, 1985-1998



Source: US Competitiveness 2001: Strengths, Vulnerabilities, and Innovation Priorities Report; Global Competitiveness Report 2000

International Patenting Output

Annual U.S. patents
per 1 million
population, 2000



○ = 10,000
patents
granted in
2000

Singapore's Economic Agenda in 2001

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 - Improve the efficiency of domestic industries
 - Strengthen domestic competition and anti-trust policy
 - Improve the capabilities of the education system
 - Mount an explicit strategy to mobilize older and underemployed citizens
 - Reduce government involvement in the economy

- II. Make the transition to an Innovation-Driven economy
 - Signs of Progress
 - Challenges
 - **Upgrade Singapore's scientific, technological and knowledge creation capacity**

Science and Technology Infrastructure

Singapore's Relative Position

Competitive Advantages Relative to GDP per Capita

	Country Ranking
Licensing of Foreign Technology	4

Competitive Disadvantages Relative to GDP per Capita

	Country Ranking
University / Industry Research Collaboration	19
Quality of Business Schools	18
Quality of Science Research Institutions	15
Intellectual Property Protection	12
Company Spending on R&D	12

Note: Rank by countries; overall Singapore ranks 9 (5 on Quality of Business Environment)

Source: Global Competitiveness Report 2000

Composition of Singaporean Patenting in the US

Top Patenting Industries and Companies, 1999

- Top 10 Singaporean-based inventors in terms of U.S. patents, 1999
 - CHARTERED SEMICONDUCTOR MANUFACTURING PTE LTD (37 patents)
 - TEXAS INSTRUMENTS, INCORPORATED (10)
 - HEWLETT-PACKARD COMPANY (9)
 - TRITECH MICROELECTRONICS INTERNATIONAL PTE LTD. (8)
 - NATIONAL UNIVERSITY OF SINGAPORE (7)
 - TRITECH MICROELECTRONICS, LTD.
 - SEAGATE TECHNOLOGY, INCORPORATED
 - BERG TECHNOLOGY, INC.
 - BLACK & DECKER INC.
 - MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
- The electronics cluster accounts for more than 2/3 of all U.S. patents filed by Singaporean entities in 1999

Singapore's Economic Agenda in 2001

I. Address some enduring and emerging weaknesses

- Improve the efficiency of domestic industries
- Strengthen domestic competition and anti-trust policy
- Improve the capabilities of the education system
- Mount an explicit strategy to mobilize older and underemployed citizens
- Reduce government involvement in the economy

II. Make the transition to an Innovation-Driven economy

- Signs of Progress
- Challenges
 - Upgrade Singapore's scientific, technological and knowledge creation capacity
 - **Create advanced demand conditions**

Demand Conditions

Singapore's Relative Position

Competitive Advantages Relative to GDP per Capita

	Country Ranking
Extent of Regulatory Distortion of Competition	1
Openness of Public Sector Contracts	4

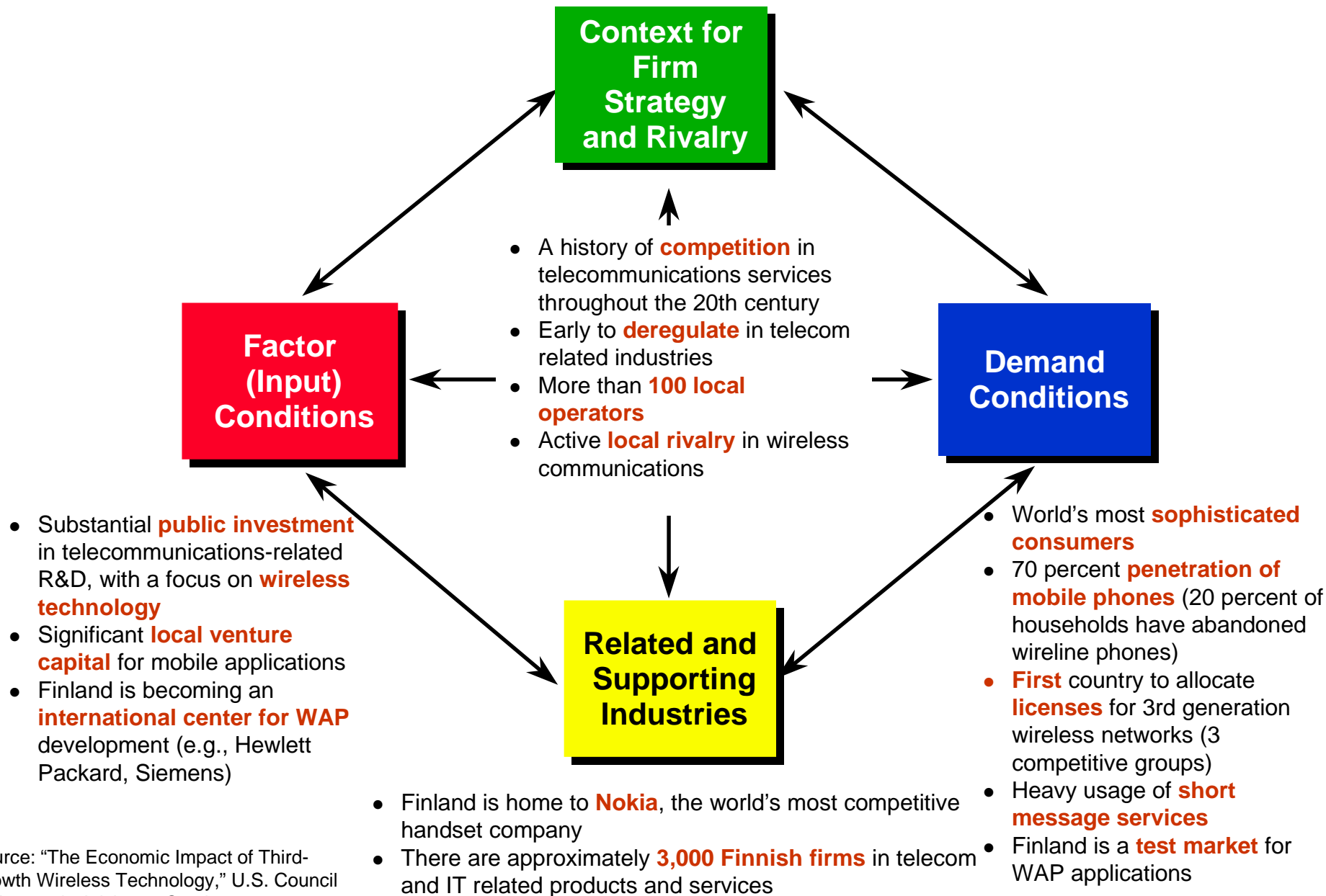
Competitive Disadvantages Relative to GDP per Capita

	Country Ranking
Demanding Regulatory Standards	15
Buyer Sophistication	12
Demanding Regulatory Standards	10

Note: Rank by countries; overall Singapore ranks 9 (5 on Quality of Business Environment)

Source: Global Competitiveness Report 2000

Finnish Wireless Cluster



Singapore's Economic Agenda in 2001

- I. Address some enduring and emerging weaknesses
 - Improve the efficiency of domestic industries
 - Strengthen domestic competition and anti-trust policy
 - Improve the capabilities of the education system
 - Mount an explicit strategy to mobilize older and underemployed citizens
 - Reduce government involvement in the economy

- II. Make the transition to an Innovation-Driven economy
 - Signs of Progress
 - Challenges
 - Upgrade Singapore's scientific, technological and knowledge creation capacity
 - Upgrade the science, technology infrastructure
 - Create advanced demand conditions
 - **Encourage private sector-led cluster development**
 - **Widen the base of clusters in the economy around Singapore's unique advantages in the region**

Related and Supporting Industries

Singapore's Relative Position

Competitive Advantages Relative to GDP per Capita

	Country Ranking
Cluster Presence	4

Competitive Disadvantages Relative to GDP per Capita

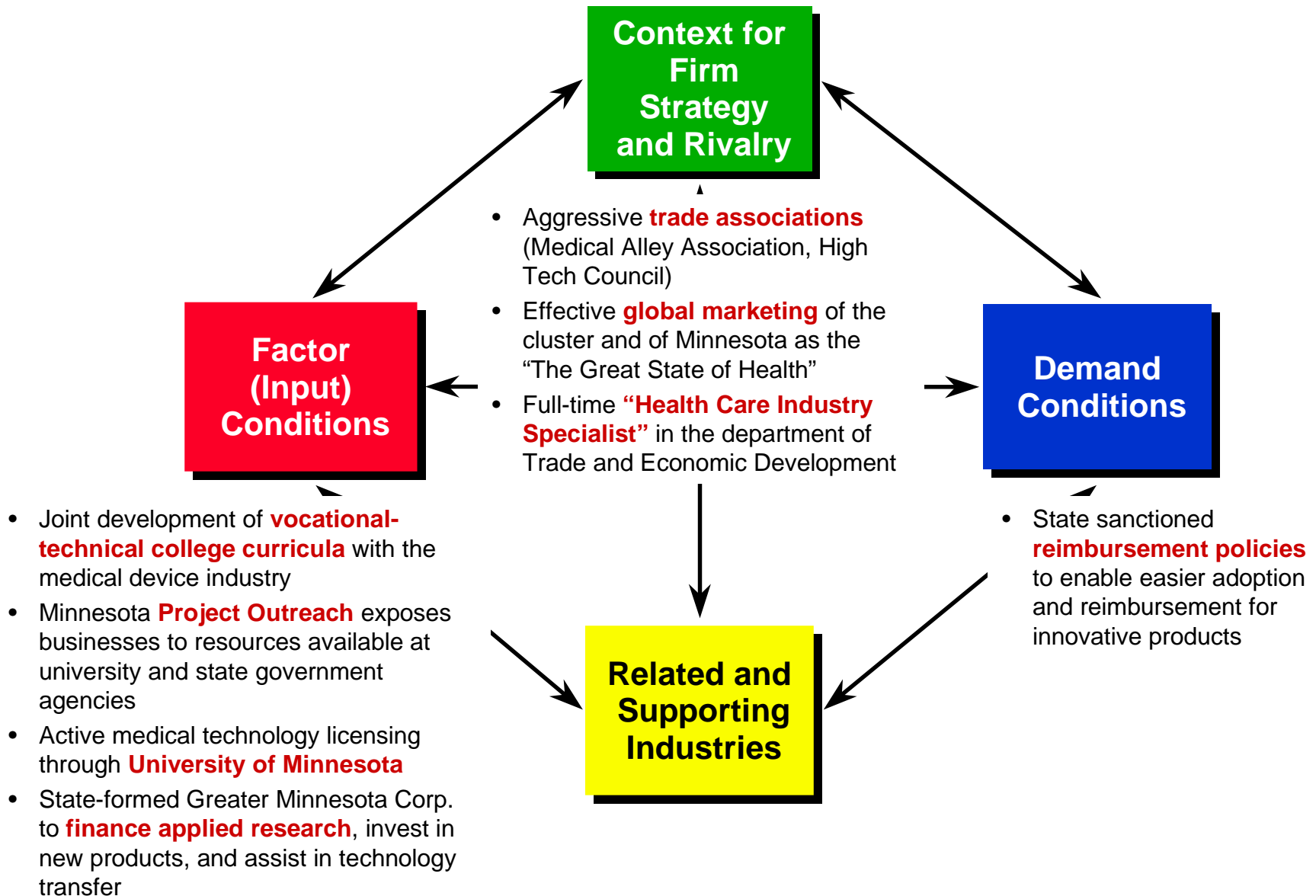
	Country Ranking
Domestic Supplier Quality	22
Domestic Supplier Quantity	19

Note: Rank by countries; overall Singapore ranks 9 (5 on Quality of Business Environment)

Source: Global Competitiveness Report 2000

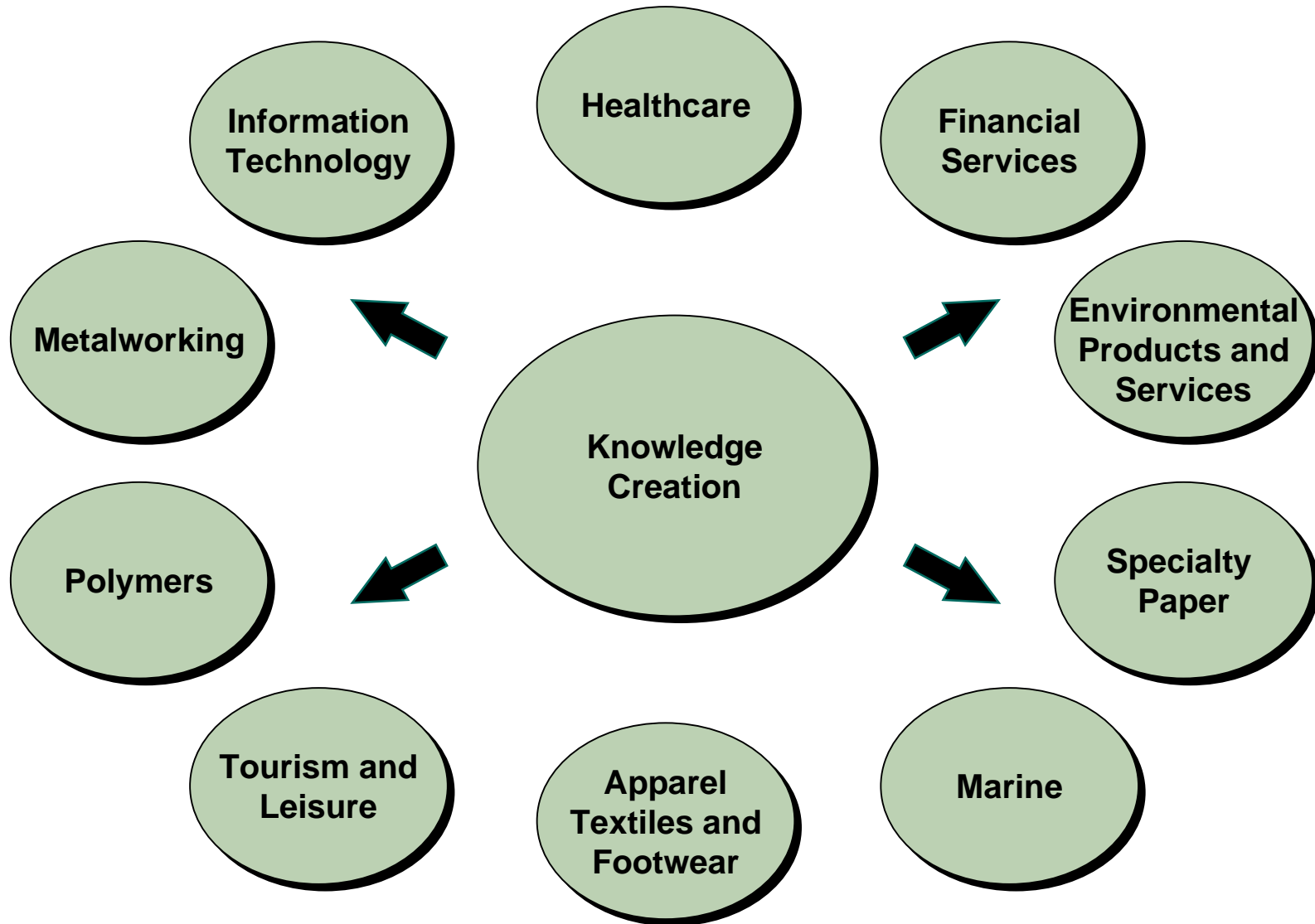
Public / Private Cooperation in Cluster Upgrading

Minnesota's Medical Device Cluster



Massachusetts Clusters

Widening the Cluster Base



Microeconomic Business Environment

Singapore's Relative Position

Competitive Advantages Relative to GDP per Capita

	Country Ranking
Government Infrastructure Investment	1
Port Infrastructure Quality	1
Road Infrastructure Quality	1
Air Transport Infrastructure Quality	1
Overall Infrastructure Quality	1
Quality of Public Schools	4
Telephone / Fax Infrastructure Quality	6

Note: Rank by countries; overall Singapore ranks 9 (5 on Quality of Business Environment)

Source: Global Competitiveness Report 2000

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Singapore's Economic Agenda in 2001

- I. Address some enduring and emerging weaknesses
- II. Make the transition from an Investment-Driven to a true Innovation-Driven economy

III. Transform company strategies

Global Competitiveness Report 2000

Singapore's Ranking

Rank	Current Competitiveness Index	Company Strategy & Operations Index	National Business Environment Index
1	Finland	Germany	Finland
2	United States	United States	United States
3	Germany	Finland	Netherlands
4	Netherlands	Japan	Denmark
5	Switzerland	Switzerland	SINGAPORE
6	Denmark	Sweden	Germany
7	Sweden	Netherlands	Australia
8	United Kingdom	Denmark	Canada
9	SINGAPORE	France	United Kingdom
10	Australia	Belgium	Switzerland
11	Canada	United Kingdom	Sweden
12	Belgium	Austria	Austria
13	Austria	Israel	Belgium
14	Japan	Iceland	Hong Kong
15	France	SINGAPORE	France
16	Hong Kong	Canada	Iceland
17	Iceland	Italy	New Zealand
18	Israel	Taiwan	Norway
19	New Zealand	Ireland	Japan
20	Norway	Australia	Israel

Company Operations and Strategy

Singapore's Relative Position

Competitive Advantages Relative to GDP per Capita

Country Ranking

Licensing of Foreign Technology	4
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Competitive Disadvantages Relative to GDP per Capita

Country Ranking

Product Designs	25
Control of International Distribution	25
Capacity for Innovation	25
Extent of Branding	21
Extent of Regional Sales	21
Marketing Expertise	17
Nature of Competitive Advantage	16
Value Chain Presence	16
Production Processes	13
Senior Management Recruitment	13
Breadth of International Markets	13
Company Spending on R&D	12

Note: Rank by countries; overall Singapore ranks 9 (15 on Company Operations and Strategy)

Source: Global Competitiveness Report 2000

Determinants of Relative Performance

Types of Competitive Advantage



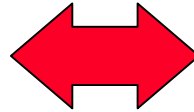
Sources of Competitive Advantage

Operational Effectiveness

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



Do the same thing better



Strategic Positioning

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

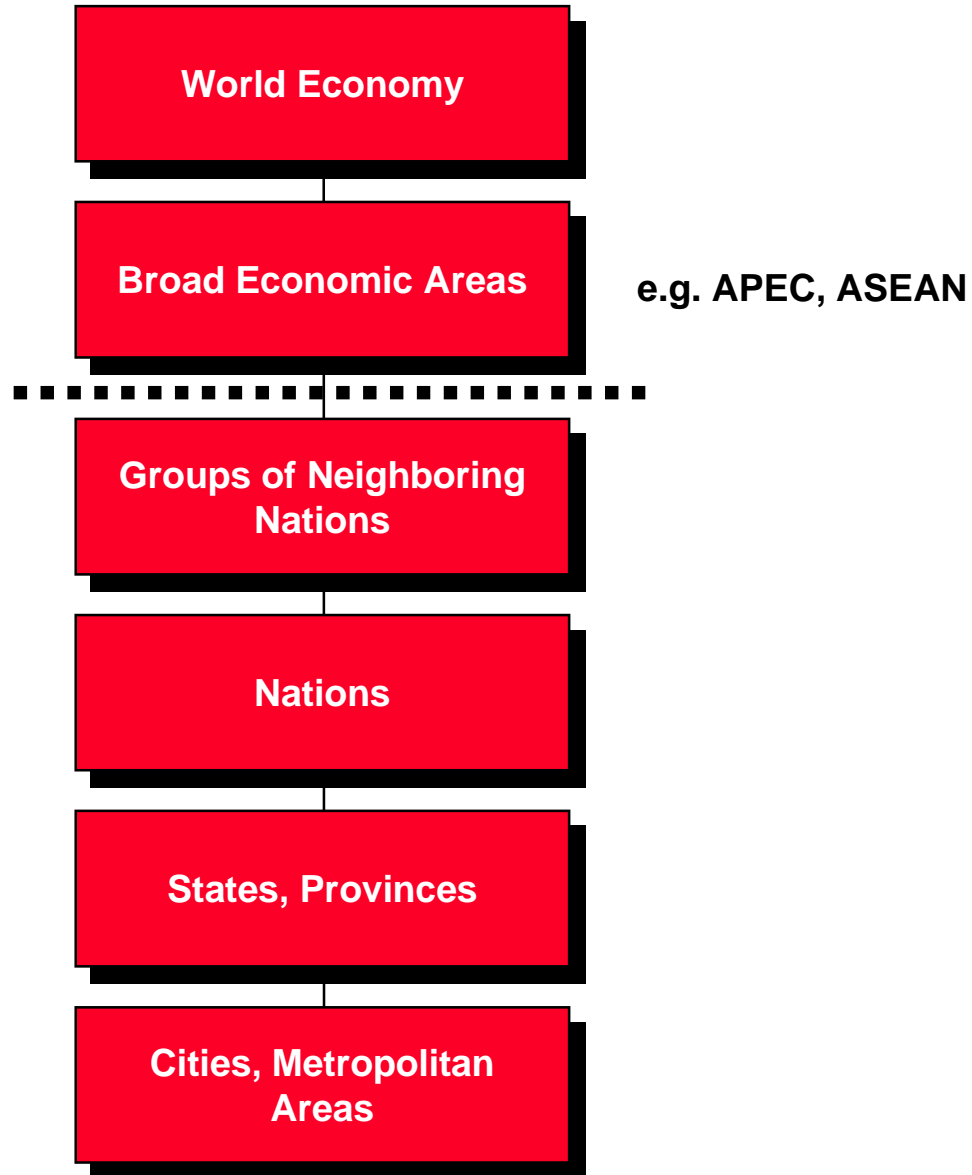


Compete in a different way

Singapore's Economic Agenda in 2001

- I. Address some chronic weaknesses
- II. Make the transition from an Investment-Driven to a true Innovation-Driven economy
- III. Transform company strategies
- IV. Reorient and broaden the approach to regional cooperation**

Geographic Levels and Competitiveness

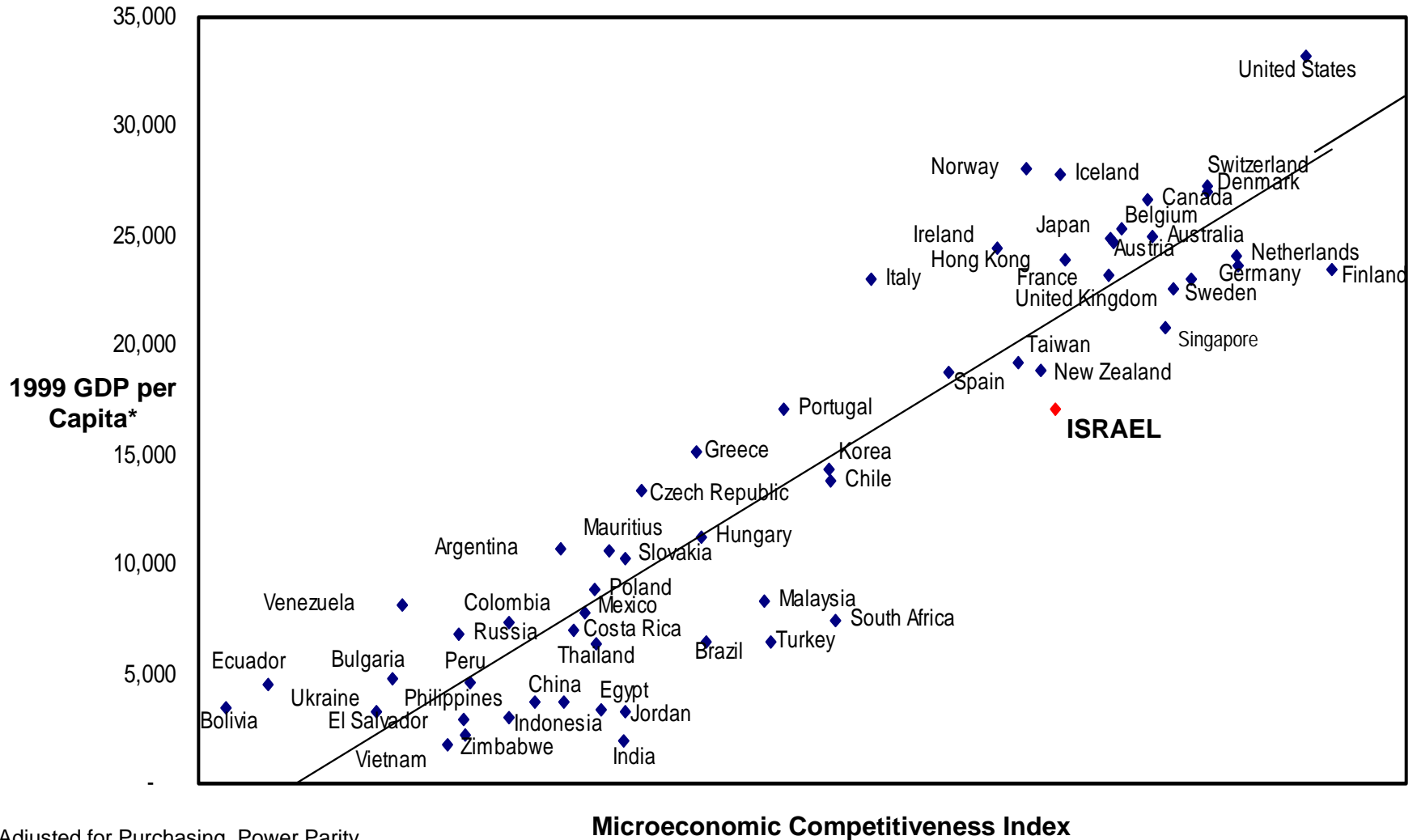


The Mutual Dependence of Nations and Their Regional Neighbors

- A nation's economic growth and prosperity can be **greatly enhanced by healthy neighboring economies**
 - A collectively larger overall market increases specialization, widens export industries, and attracts foreign investments
 - Individual nations can focus on their unique strengths
- A nation will **inevitably suffer** if it is isolated or an island amid countries that are not prospering
 - e.g. Israel
- A nation's productivity can be **greatly enhanced by regional coordination versus unilateral action**

Global Competitiveness Report 2000

The Relationship Between Microeconomic Competitiveness and GDP Per Capita

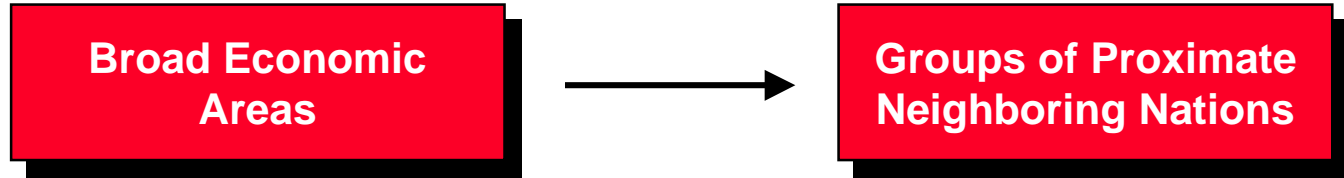


* Adjusted for Purchasing Power Parity

Source: Porter, Michael E. "The Current Competitiveness Index: Measuring the Microeconomic Foundations of Prosperity." *The Global Competitiveness Report 2000*, New York: Oxford University Press, 2000

Regional Strategy and Geographic Scope

Geographic proximity



Benefits of regional cooperation

- Communication and mutual understanding
 - Gains from increased trade and investment
- Communication and mutual understanding
 - **Greater** gains from increased trade and investment
 - Widen the range of traded industries
 - More efficient specialization by industry and stage in the value chain
 - Investments in the **business environment of each nation**

Regional Strategy and Competitiveness

Traditional View

- **Free trade zone**
 - Gains from trade and investment

New View

- A regional strategy to enhance **competitiveness** in each neighboring country
 - Deep gains from trade and investment
- and**
- Policy coordination to capture **mutual benefits to productivity** among countries via specialization and capturing externalities across borders
 - A powerful lever for speeding up the process of economic reform at the **national** level
 - A tool for promoting interest and investment in the region by the **international community**

Regional Economic Coordination

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**
- Coordinate activities to ensure **personal and physical safety**

Context for Strategy and Rivalry

- Coordinate **macroeconomic** policies
- Eliminate **trade and investment barriers** within the region
- Simplify and standardize **cross-border** regulations and paperwork
- Guarantee minimum basic **investor protections**
- Agree on foreign **investment promotion guidelines** to limit forms of investment promotion that do not enhance productivity
- Coordinate **competition policy**

Demand Conditions

- Set minimum **environmental standards**
- Set minimum **safety standards**
- Establish reciprocal **consumer protection laws**

Related and Supporting Industries

- Enhance specialization and upgrading in **clusters that cross national borders**, e.g.
 - Tourism
 - Agribusiness
 - Textiles and Apparel
 - Information Technology

Regional Governance

- Share **best practices** in government operations
- Improve regional **institutions**
 - Regional development banks
 - Dispute resolution mechanisms
 - Policy coordination bodies
- Develop a regional **marketing strategy**

The Role of Regional Coordination

- APEC and ASEAN cover a vast geographic area and encompass countries with widely different political systems and stages of development
 - APEC and ASEAN's role can be useful in trade expansion and establishing general rules and guidelines
 - Cooperation with individual countries within the Asia area can boost trade and strengthen the competitiveness of specific clusters
- Deeper cooperation with **immediate neighbors** like Indonesia and Malaysia can produce significant productivity benefits
 - Meaningful cluster integration
 - Coordination of government economic and infrastructure policies
- At the same time, market integration within ASEAN, and with India, offer compelling strategic advantages to Singapore