

# Taiwan As a Model for Economic Development

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Lawrence J. Lau, Ph. D., D. Soc. Sc. (hon.)

Kwoh-Ting Li Professor of Economic Development

Department of Economics

Stanford University

Stanford, CA 94305-6072, U.S.A.

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Phone: 1-650-723-3708; Fax: 1-650-723-7145

Email: [LJLAU@STANFORD.EDU](mailto:LJLAU@STANFORD.EDU); WebPages: [WWW.STANFORD.EDU/~LJLAU](http://WWW.STANFORD.EDU/~LJLAU)

# Reminiscences

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- ◆ Professors Ta-Chung Liu and Sho-Chieh Tsiang
- ◆ Professor Mo-Huan Hsing
- ◆ Professor Tzong-Shian Yu
- ◆ Professor Paul K. C. Liu
- ◆ Prof. Yung-San Lee, Prof. Jia-Dong Shea, Prof. Sheng-Cheng Hu,  
Prof. Chung-Ming Kuan

# An Overview

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- ◆ Taiwan's Economic Record
- ◆ Taiwan as a Pioneer of and “Laboratory” for Economic Policies
- ◆ Lessons from the Taiwan Experience for Developing Economies
- ◆ Lessons for Taiwan from the Rest of the World

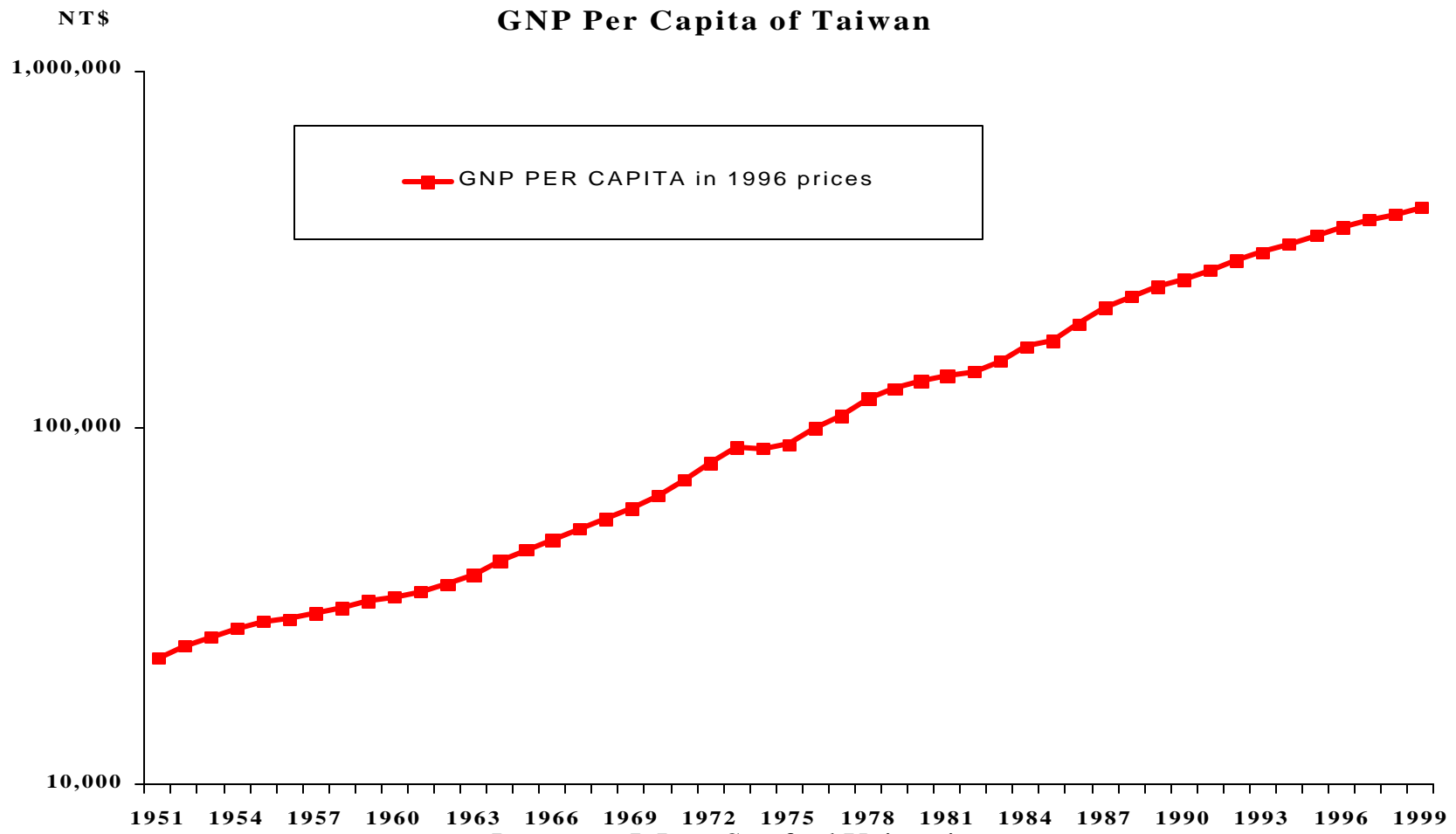
# The Economic Record

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- ◆ Taiwan is one of the first “Newly Industrialized Economies” (NIEs) in East Asia.
- ◆ Taiwan began its industrialization drive after Hong Kong and before South Korea as a result of rising wage rates in Japan, and subsequently Hong Kong, and quota restrictions imposed by the U.S. and subsequently Europe on textile exports.
- ◆ Taiwan has done exceptionally well despite relatively unfavorable resource endowment and population density.
- ◆ Over the last half century, real GNP and real GNP per capita have grown from approximately US\$6 billion to over US\$300 billion and from slightly more than US\$700 to almost US\$13,000 (2000 prices), achieving rates of growth of more than 8% and 6% per annum respectively.
- ◆ Taiwan survived the East Asian currency crisis relatively unscathed, thanks to its large foreign exchange reserves and low external debt.
- ◆ How has it been able to achieve this remarkable economic performance?

# Taiwan's Economic Record: Real GNP per Capita

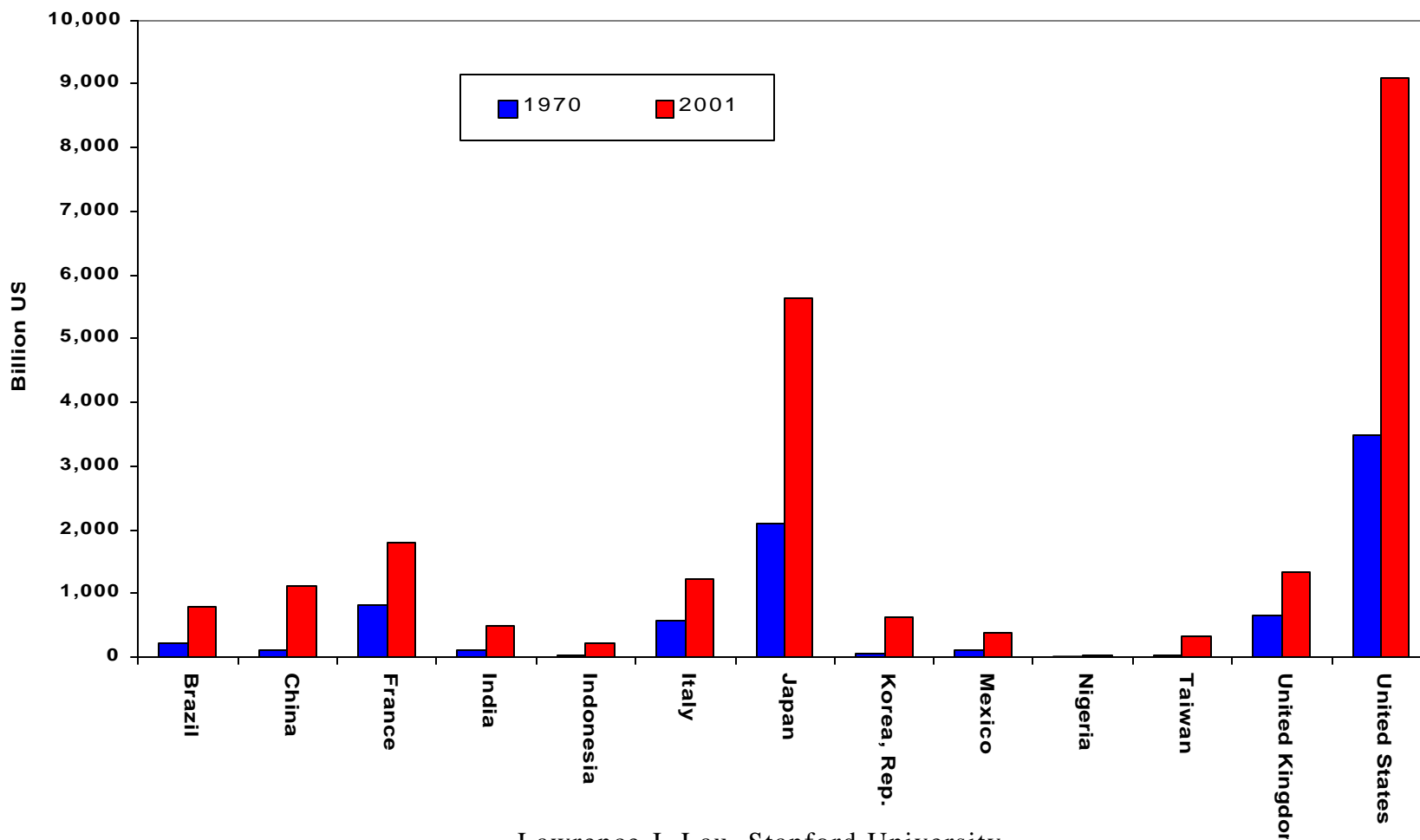
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# Real GDP of Selected Countries and Regions, 1970 and 2001

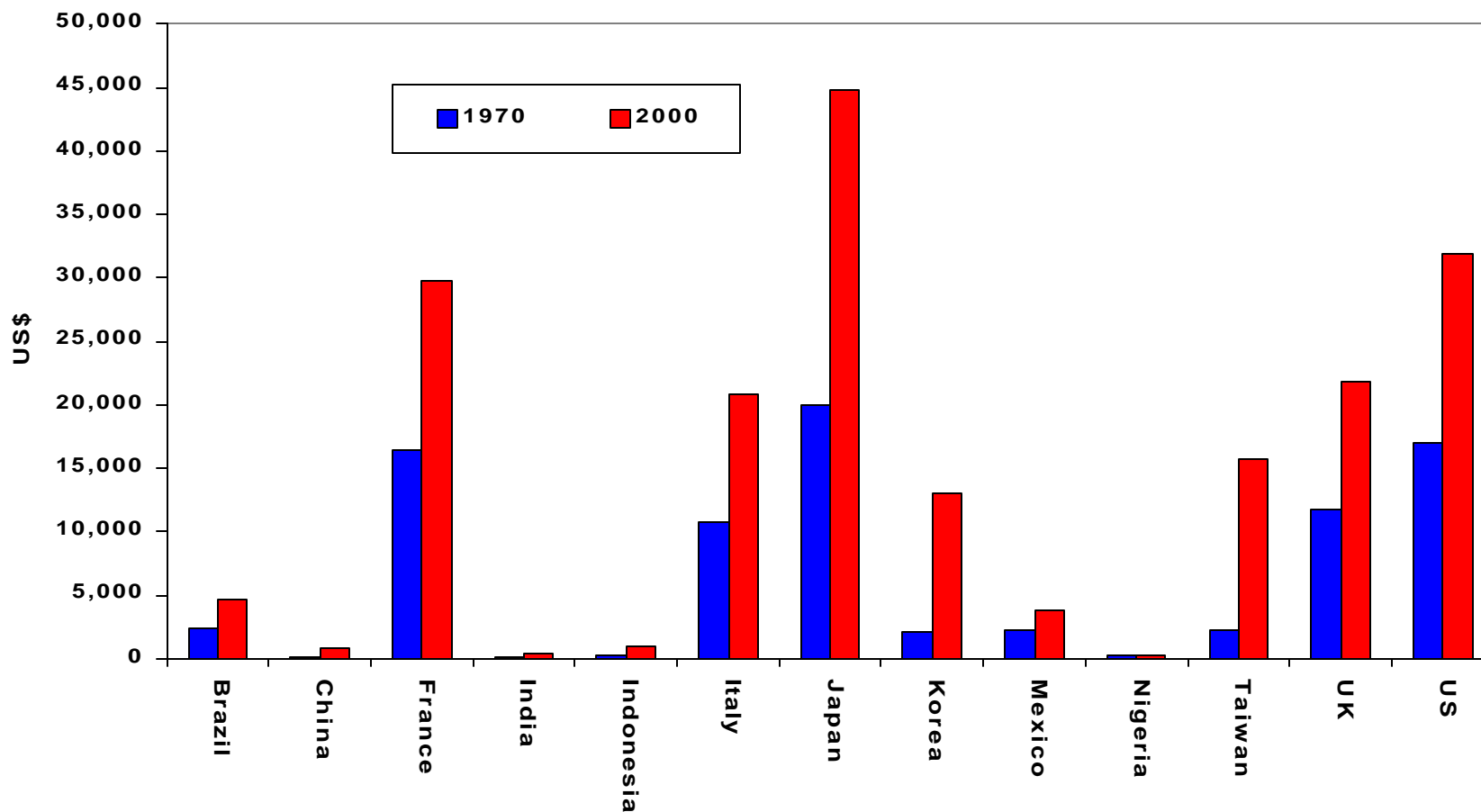
Real GDP of Selected Countries and Regions, 1970 and 2001  
(1995 US\$)



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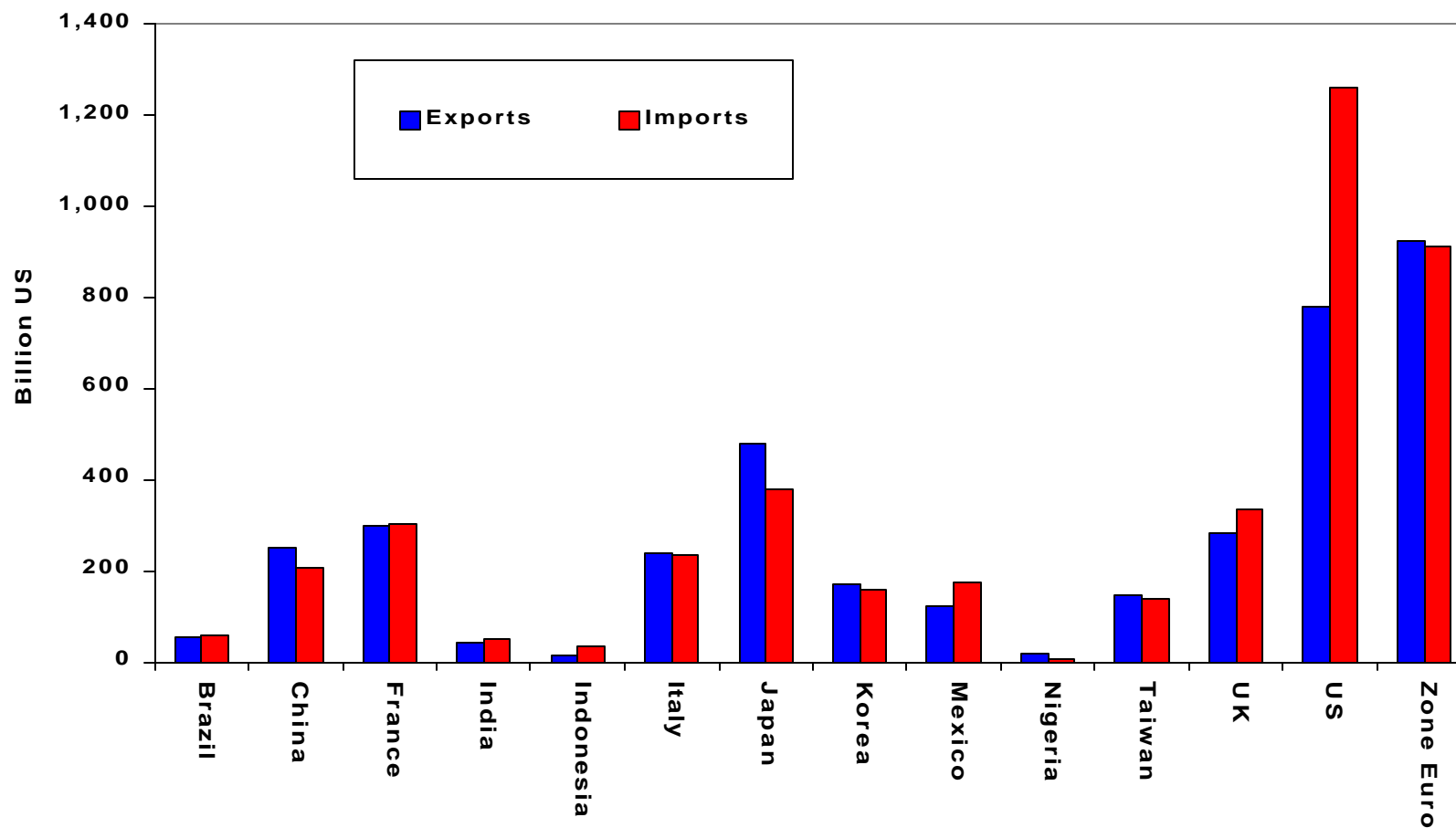
# Real GDP per Capita of Selected Countries and Regions, 1970 and 2001

Real GDP per Capita of Selected Countries and Regions, 1970 and 2000  
(1995 US\$)



# Exports and Imports (US\$): Selected Countries and Regions, 2000

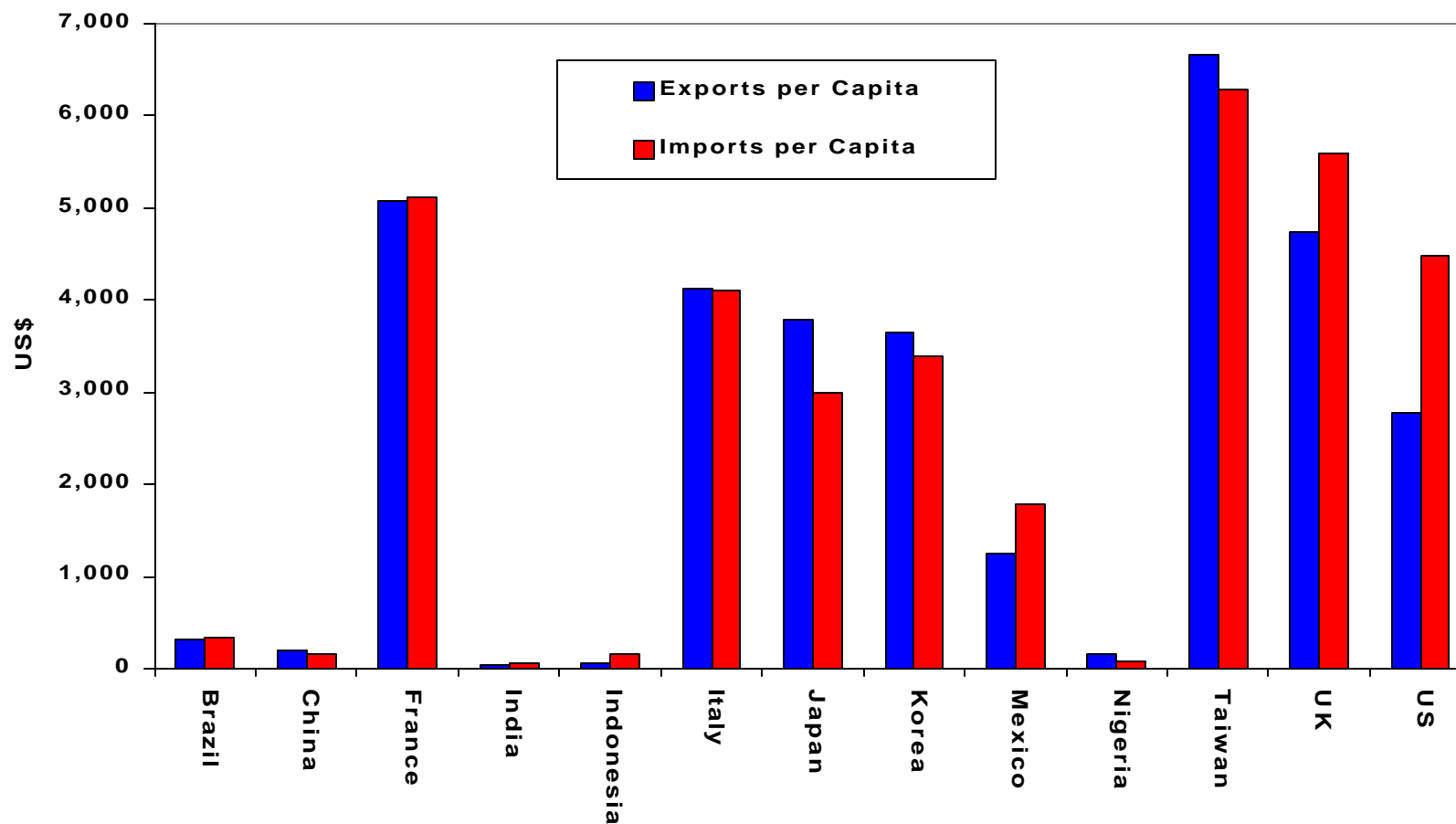
Exports and Imports of Selected Countries and Regions, 2000  
(US\$)





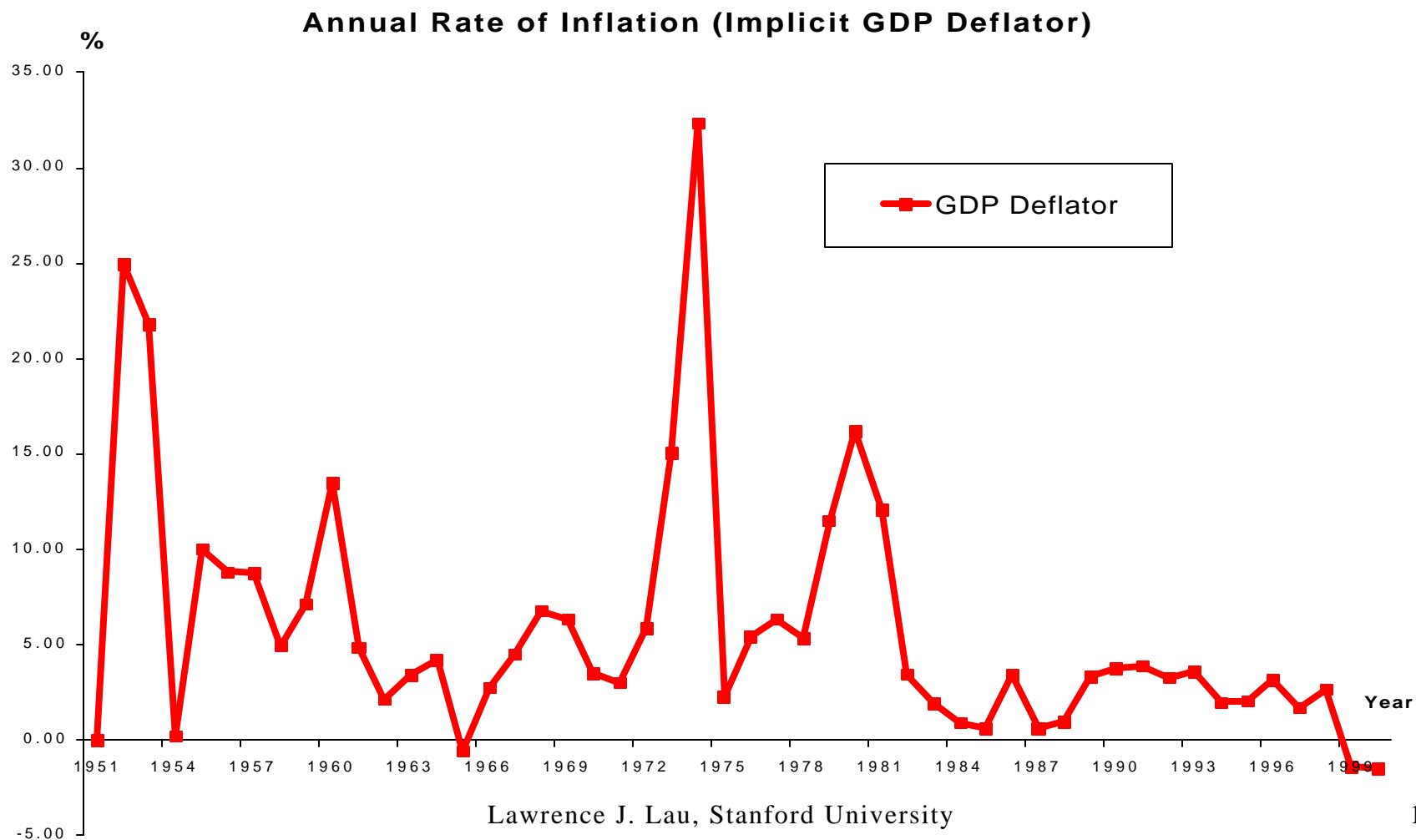
# Exports and Imports per Capita (US\$): Selected Countries and Regions, 2000

Exports and Imports per Capita of Selected Countries and Regions  
(Year 2000)



# The Rate of Inflation

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# Pioneering Economic Policies

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- ◆ Land Reform—the successful (and peaceful) land reform, one of the very few in the world, helped raise agricultural productivity, improve the income distribution, and release savings for investment in the industrial sector.
- ◆ Promotion of Family Planning.
- ◆ Reliance on Private Rather Than Public Enterprise.
- ◆ Export-Oriented Industrialization (as opposed to import-substituting industrialization).
- ◆ Maintenance of Macroeconomic Stability.
- ◆ Maintaining Equity with Growth.
- ◆ Promoting the Transition from Tangible Capital-Based to Intangible Capital-Based Industrialization.

# Land Reform

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- ◆ Raises agricultural productivity through the incentive effect
- ◆ Releases both tangible capital and human capital from agriculture
- ◆ Improves the distribution of income, providing the basis for an increase in aggregate demand (both consumption and savings)
- ◆ Enhances investment in human capital
- ◆ It was successfully implemented because the reformers themselves did not own any land and did not want any for themselves
- ◆ The Joint Commission for Rural Reconstruction (JCRR) played an important role in the land reform.

# Reliance on Private Enterprise

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- ◆ There were extensive debates in Taiwan in the mid-1950s as to whether private or public enterprise should lead the drive for industrialization. It was finally decided at the highest level of government that private enterprise was consistent and compatible with the Three People's Principle and should be allowed to grow.
- ◆ Similarly, in South Korea, President Park Chung-Hee, having observed the degree of incompetence and corruption within the government (army), also decided in the early 1960s that private enterprise would be allowed to lead the drive for industrialization in South Korea.

# Reliance on Private Enterprise

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- ◆ A private-enterprise economy can also be inefficient if the markets are not competitive or if there are artificial barriers to entry and to movement of goods and factors. The resulting allocations can be very much worse. Simply changing the system of ownership of the means of production from public to private does not necessarily guarantee economic efficiency. In the cases of Hong Kong, Singapore, and Taiwan, the economy is forced to be efficient because of its participation in the competitive world markets. In other words, the world markets provide the discipline and replace the antitrust laws that are sometimes necessary in developed economies to keep the markets competitive. The world markets also make sure that special privileges are not sufficient, in the absence of efficiency, for profits or even survival. In the final analysis, it is competition, with free entry and exit and not just profit maximization, that guarantees efficiency.
- ◆ Private entrepreneurs are not necessarily smarter than public officials. Their advantage is that they do not have deep pockets and so have to cut their losses very quickly when a project turns out to be a mistake. Public enterprises, supported financially by the government, tend to hang on long after they can be commercially justified.

# Export-Oriented Industrialization

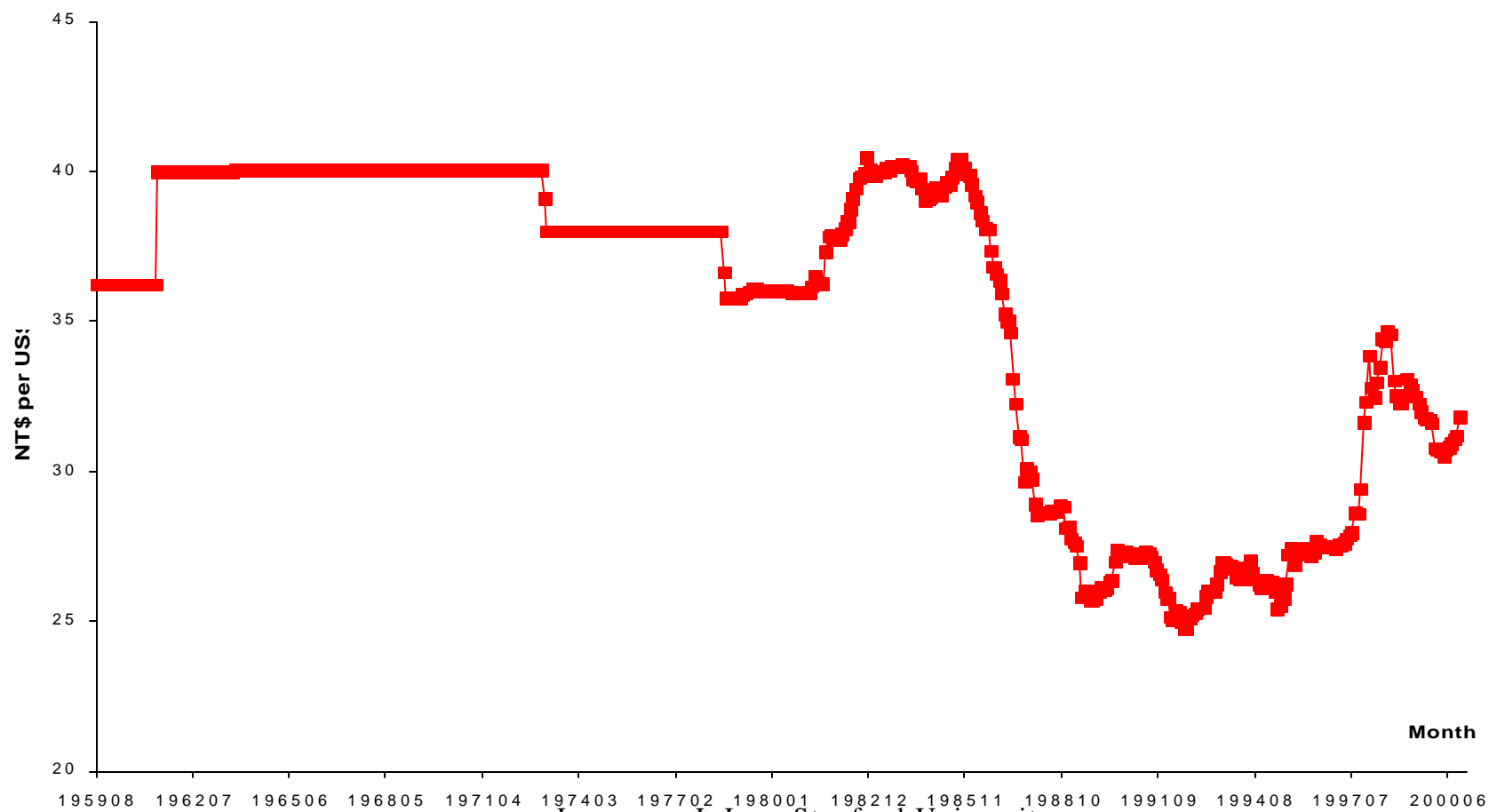
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- ◆ Export-oriented industrialization was in the mid-1950s a bold and unconventional economic policy, outside the mainstream of economic development at the time, but proved to be extremely successful.
- ◆ It was advocated by Prof. Ta-Chung Liu and Sho-Chieh Tsiang, among others.
- ◆ Maintenance of a single, competitive but stable, equilibrium exchange rate that facilitates exports and imports.
  - ◆ Exchange rate was unified and pegged to NT\$40/US\$ in 1960 and was held stable for almost two decades.
  - ◆ Stability is just as important, perhaps even more important, than a low level from the point of view of economic development—producers, exporters, importers and investors can make long-term plans.
  - ◆ A stable exchange rate also promotes domestic savings as it encourages the reliance on the domestic currency as a store of value.
- ◆ Reduction or rebate of tariffs in support of exports.
- ◆ Establishment of the first export-processing zone in the world in Kaohsiung.

# The Exchange Rate

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SPOT EXCHANGE RATE - N.T.\$ PER U.S.\$ (MONTHLY AVERAGE)



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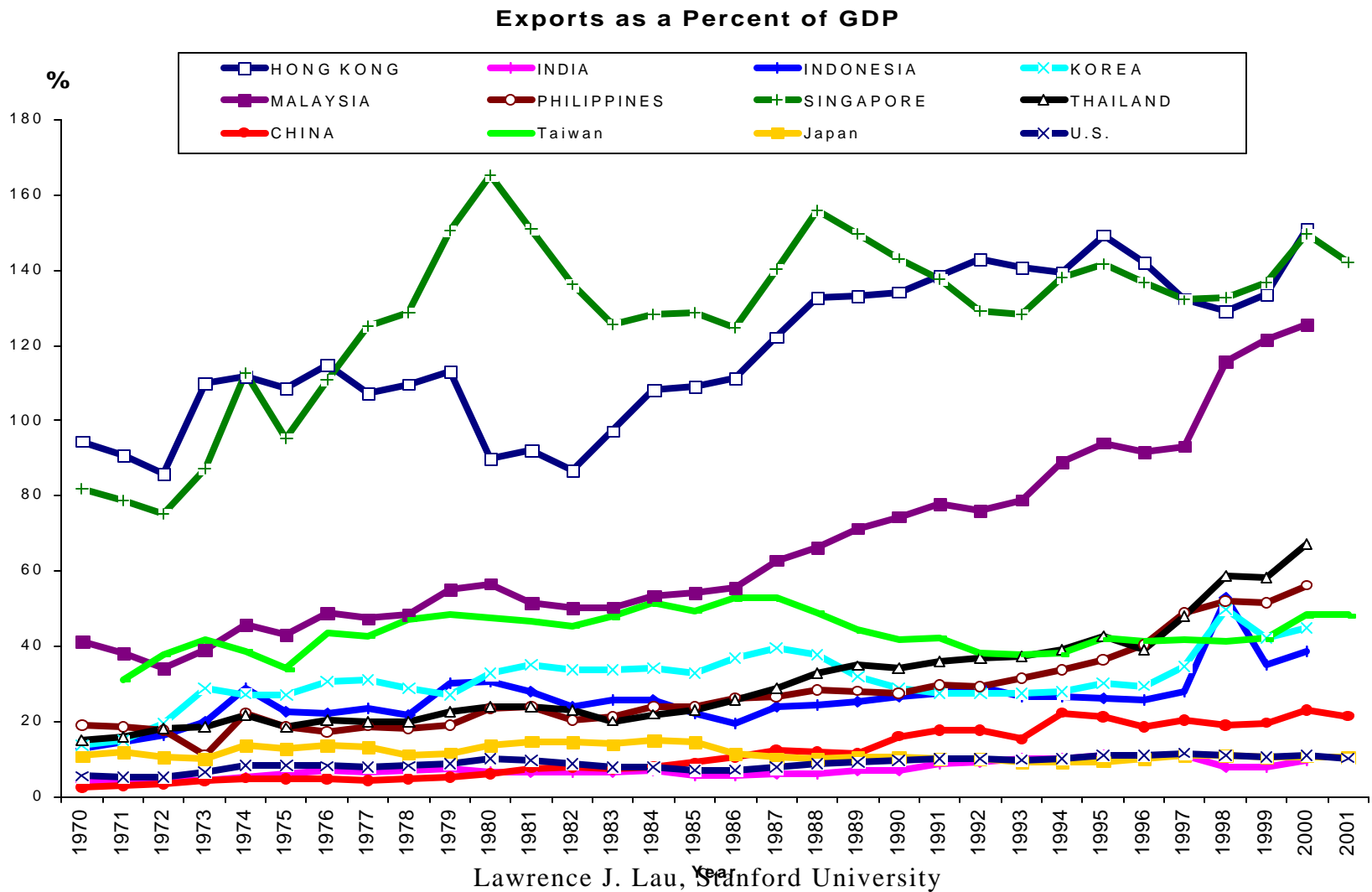


# Transformation from a Closed to an Open Economy

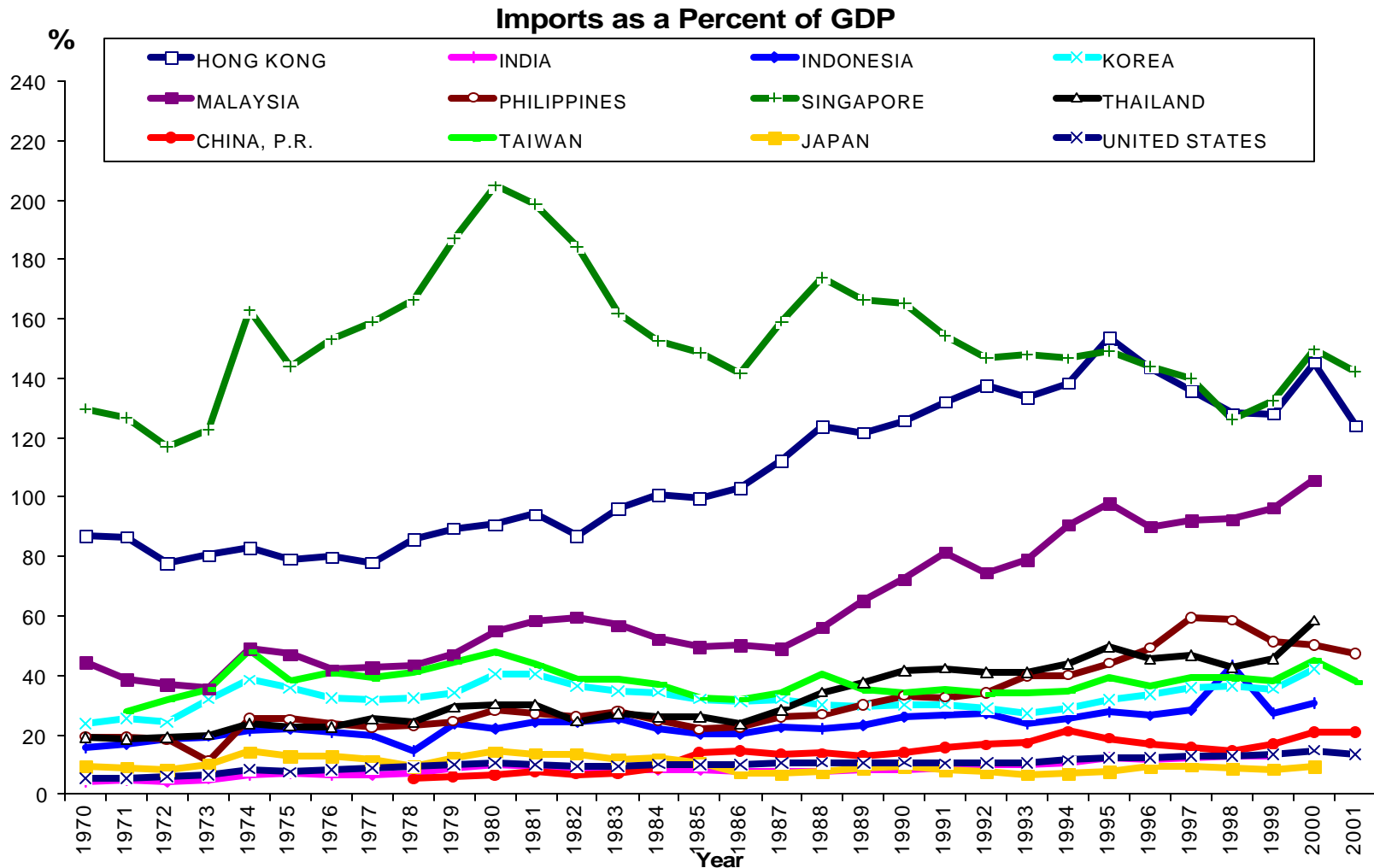
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- ◆ A small economy must be open in order to grow.
  - ◆ Enterprises are free to export and import, exploiting their international comparative advantage and access to a much larger market. (There was protection in Taiwan, although over the years the degree of protection gradually declined.)
  - ◆ The openness keeps the enterprises efficient by keeping the markets competitive. Inefficiencies cannot exist long in the face of international competition. This in turn puts pressure on the domestic factor markets, principally labor and land, to remain competitive.
  - ◆ An open economy facilitates the transfer of technology in both production and management.
  - ◆ An open economy solves the transfer problem for foreign capital in the forms of either loans or direct or portfolio investment.

# Exports as a Percent of GDP: Selected East Asian Economies and U.S.



# Imports as a Percent of GDP: Selected East Asian Economies and U.S.



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# Maintenance of Macroeconomic Stability

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- ◆ A low rate of inflation and a positive real rate of interest were also considered unconventional economic policies in the 1950s.
- ◆ Prof. Sho-Chieh Tsiang was the major proponent of low inflation and a positive real rate of interest; in particular, he emphasized that only the former could only be achieved with the latter.
- ◆ Maintenance of a low rate of inflation (an imperative because of past experience with inflation on both Mainland and Taiwan, and also necessary if the exchange rate is to remain stable).
- ◆ Maintenance of a low but positive real rate of interest (to control inflation and to promote savings and investment).
- ◆ Conservative fiscal policy, in part also necessitated by the inability to raise revenue through printing money or issuing bonds.
- ◆ Institution of a new system of taxation (since inflation tax through the issuance of money and borrowing at negative real rates of interest are no longer available).

# Macroeconomic Stability: Coordination of the Three Rates

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- ◆ A positive real rate of interest--maintenance of a positive real rate of interest is one of the most effective way of preventing inflation from getting out of control.
- ◆ A low rate of inflation—a low relative rate of inflation is essential for a stable exchange rate to remain a long-term equilibrium exchange rate.
- ◆ A stable exchange rate is in turn consistent with long-term price stability—however, it must also be consistent with long-term equilibrium in the balance of payment accounts.
- ◆ Capital control was maintained in Taiwan until the 1980s, which permitted a degree of independence in the monetary policy prior to that time; however, from the early 1960s to the lifting of capital control, the gap between the official exchange rate and the black market exchange rate was never large, indicating that the official exchange rate was probably close to being an equilibrium exchange rate most of the time.

# Transformation of the National Savings Rate

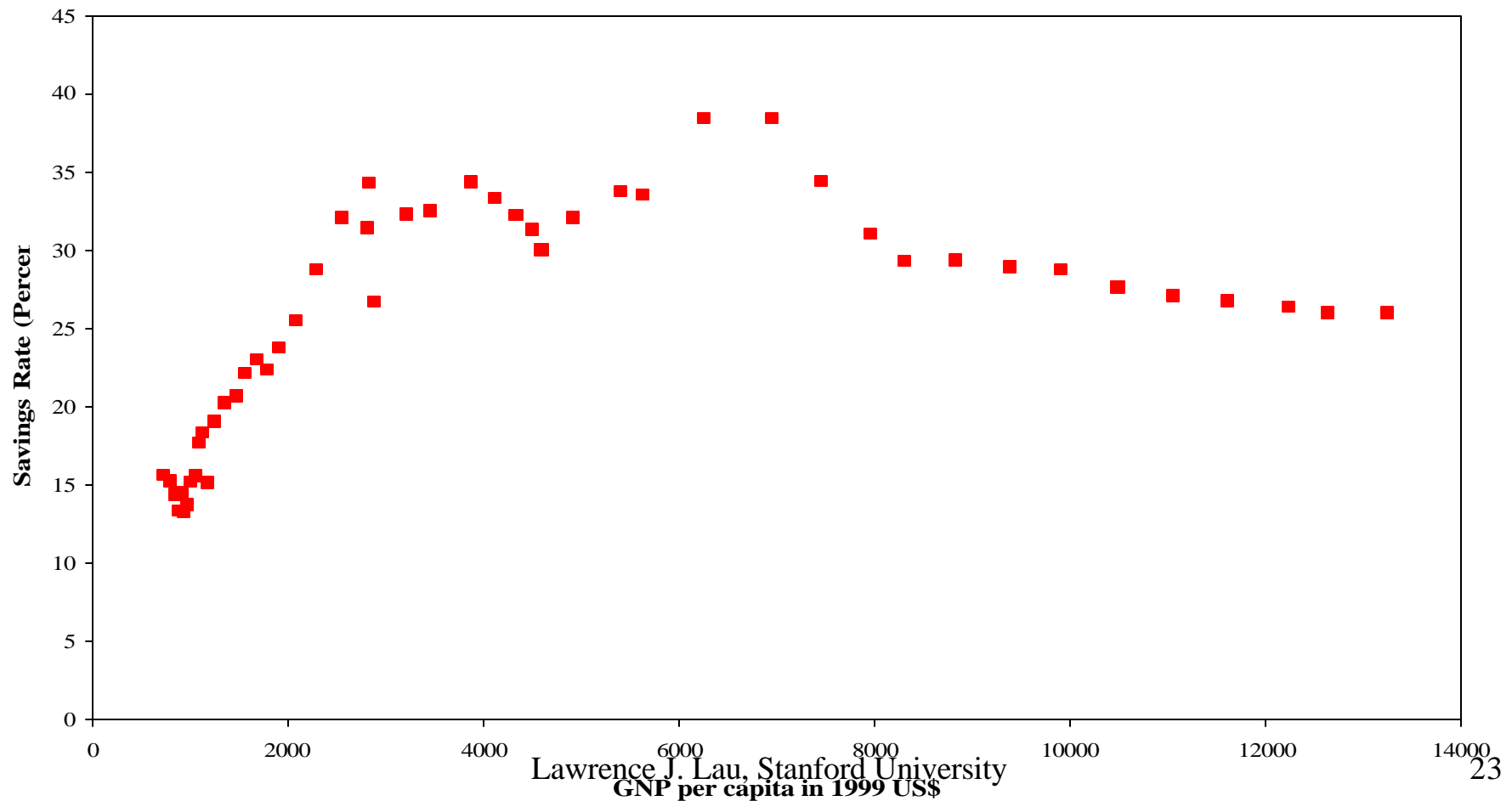
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- ◆ Ultimately, an economy has to rely on its own savings to finance its investment—foreign resources can only help in a transition.
- ◆ U. S. aid in the early years helped bridge the initial savings gap and the foreign exchange gap.
- ◆ A low rate of inflation and a positive real rate of interest promote savings.
- ◆ The true savings rate of Taiwan is higher than the measured savings rate
  - ◆ R&D expenditures are typically expensed rather than capitalized but they are in fact investments--yielding a stream of benefits beyond the current period
  - ◆ If R&D expenditures and other investments in intangible capital, such as software, are included, the savings rate of Taiwan should be higher by at least 5 percentage points
- ◆ Translating domestic savings into investments—financial intermediation and capital markets--the role of self-fulfilling expectations.
- ◆ Creating and maintaining an environment in which investments are productive
- ◆ In more recent years, however, the government has become a net dis-saver because of its deficits, both on and off-budget.

# The Savings Rate and Real Output per Capita: Taiwan

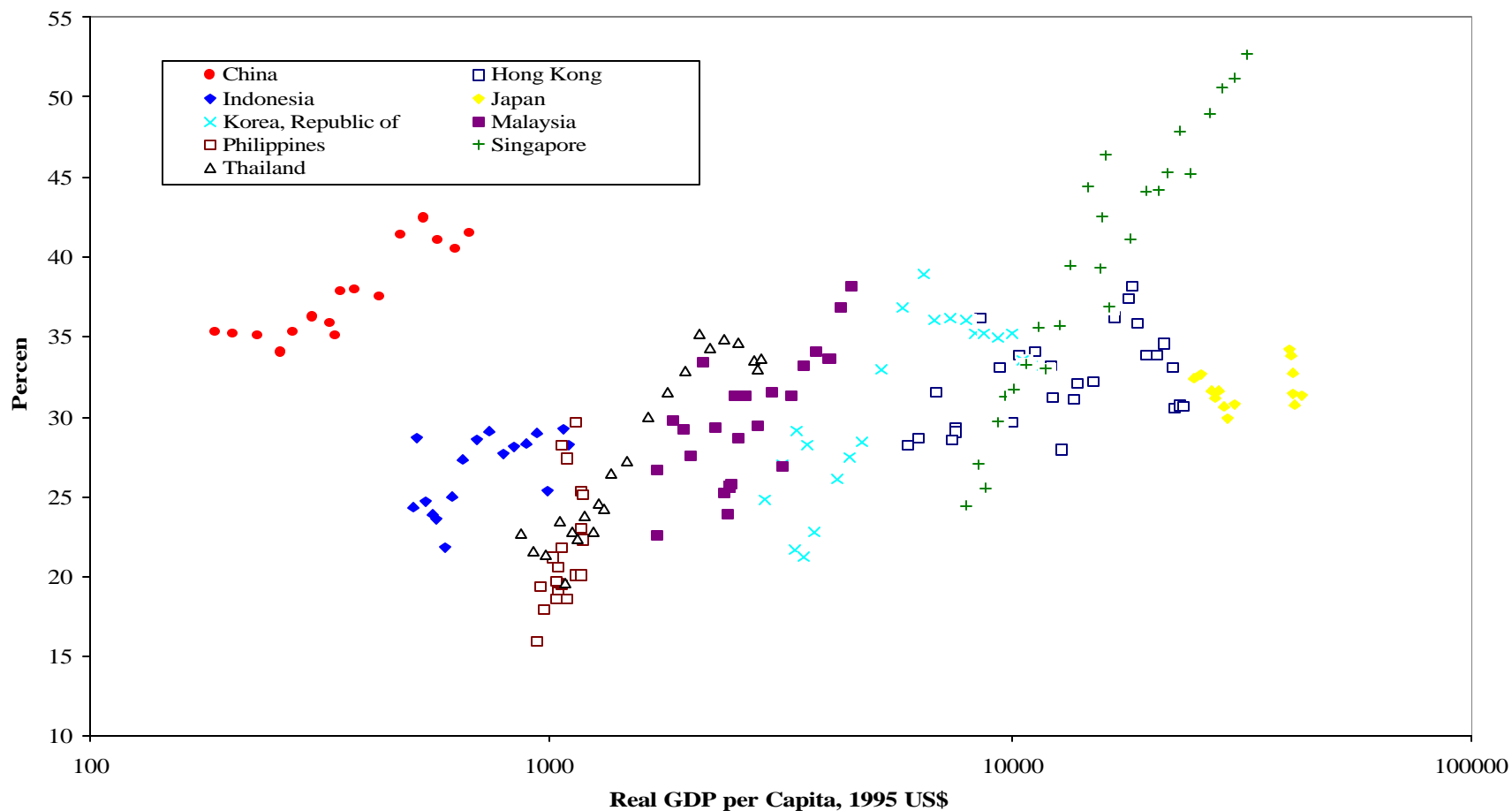
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Savings Rate versus Real GNP per Capita



# The Savings Rate and Real Output per Capita: East Asian Economies

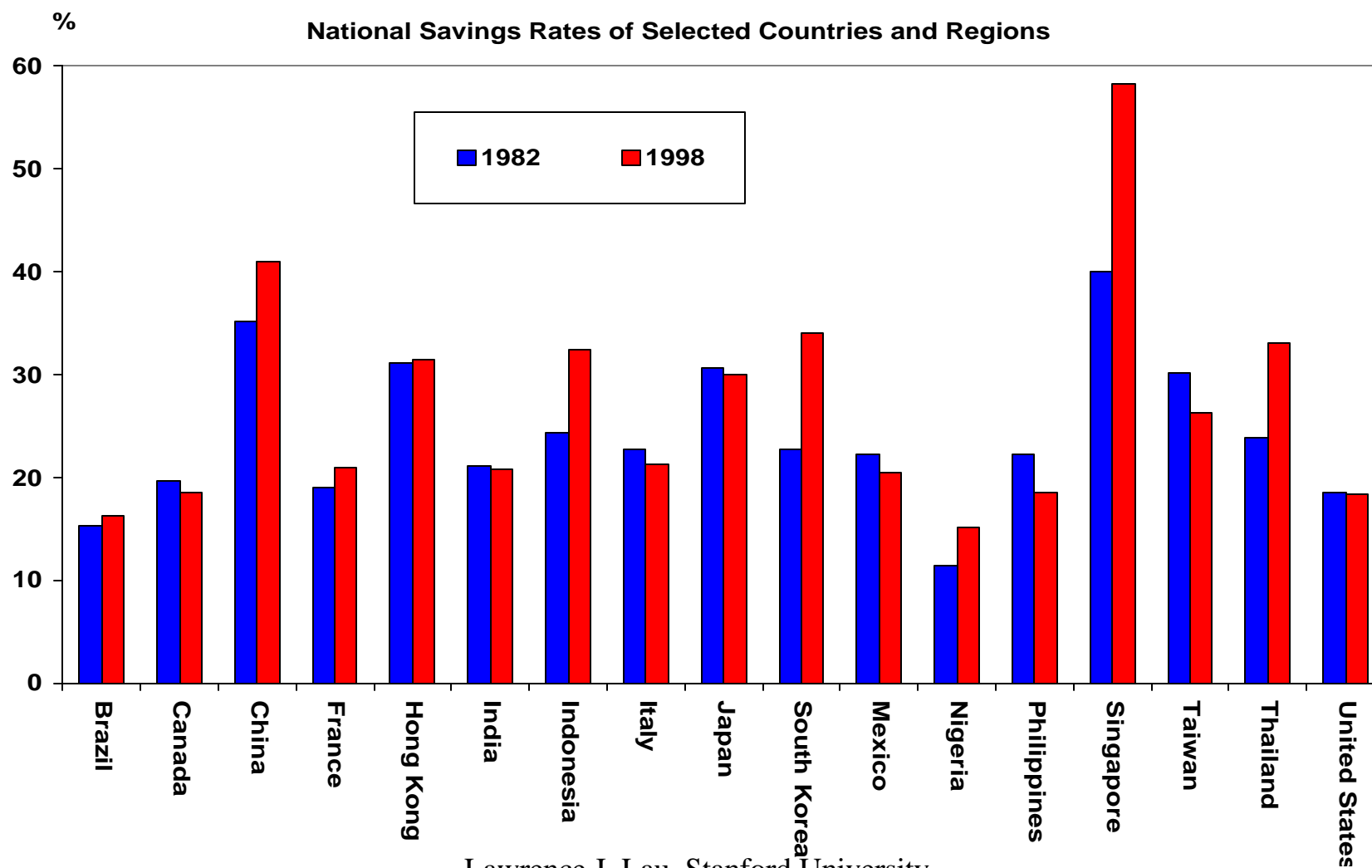
National Savings Rate and Real GNP per Capita



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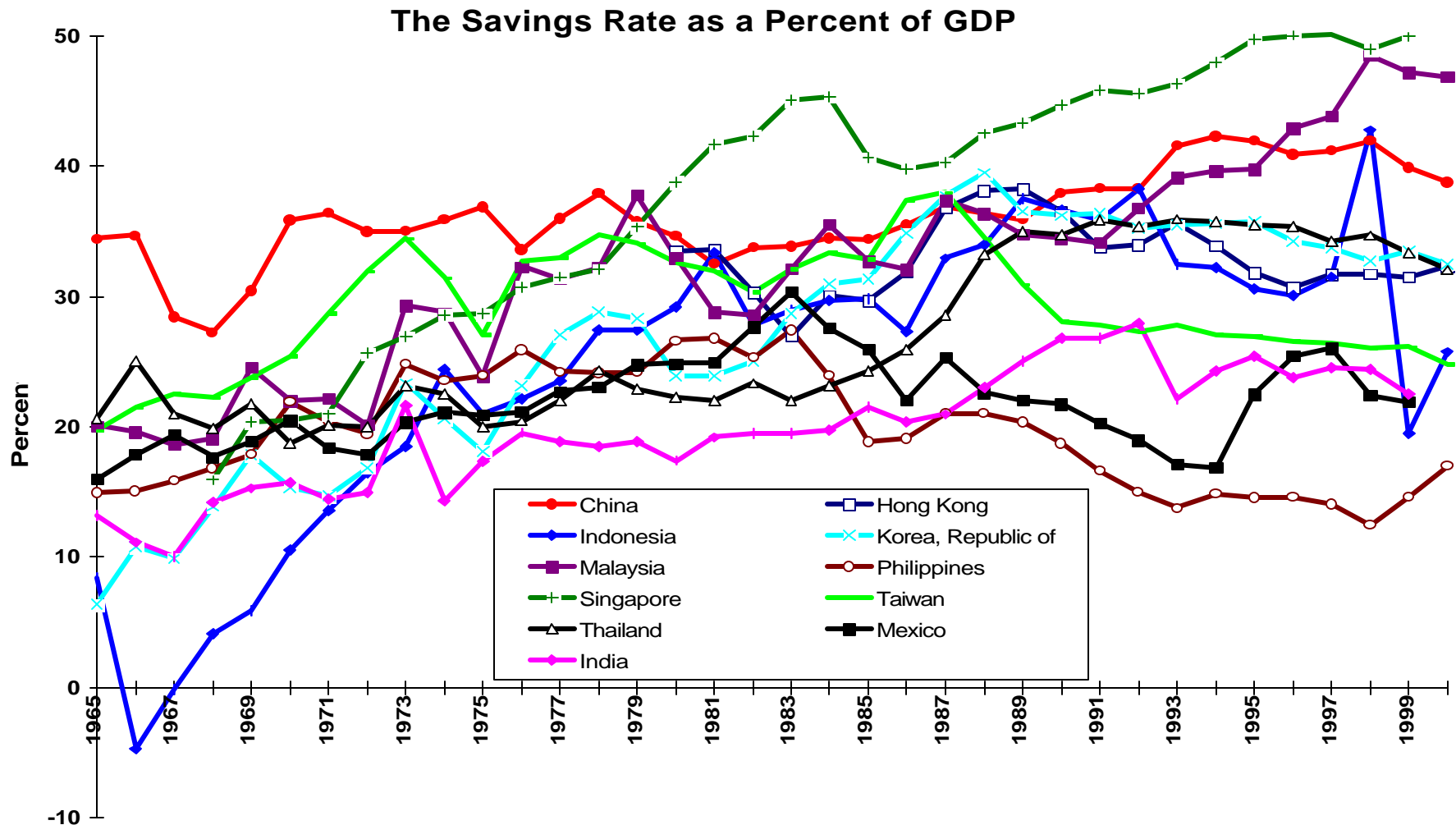


# National Savings Rate as a Percent of GDP: Selected Countries and Regions

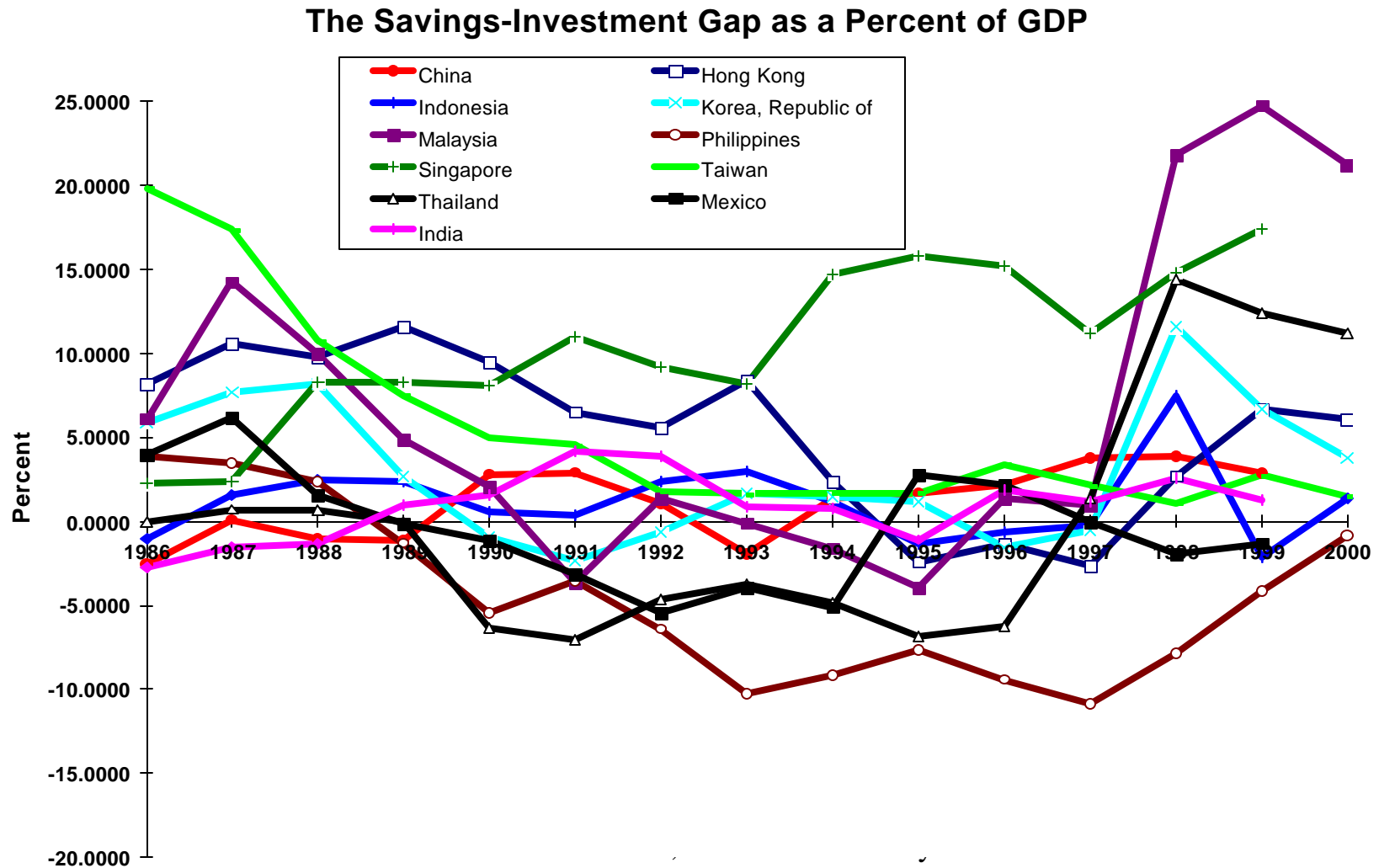


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# The Savings Rate as a Percent of GDP: Selected East Asian Countries and Regions



# The Savings-Investment Gap Selected East Asian Economies



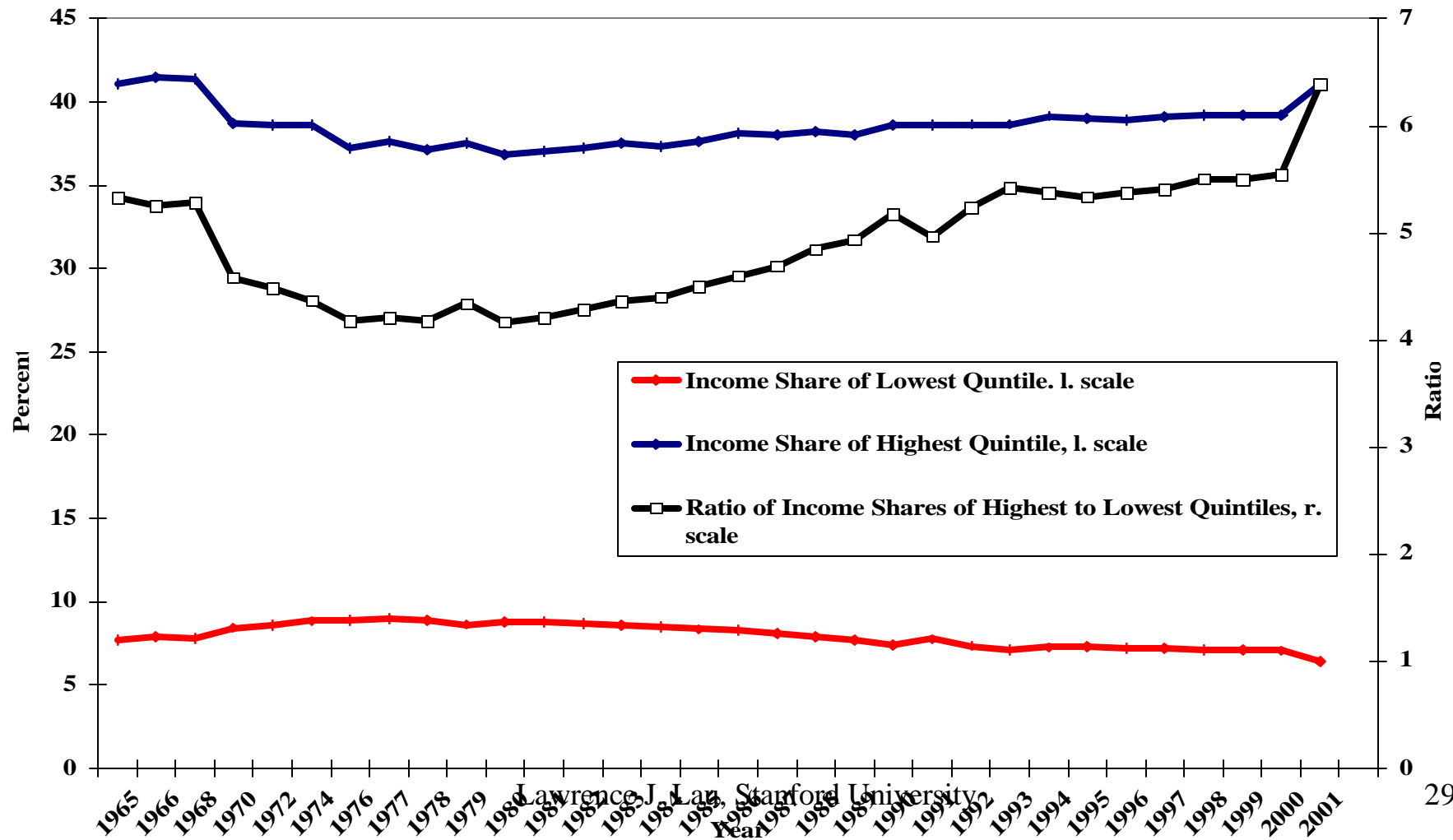
# Growth with Equity

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- ◆ During the period of the most rapid economic growth, approximately from 1965 to 1985, the distribution of disposable income has become more equitable, contrary to the prediction and expectation of most development economists at the time.
- ◆ The principal instruments used are the creation of employment in the non-agricultural sector and the investment in education.
  - ◆ The creation of employment was mostly through the private sector.
  - ◆ Universalization of education, first nine years and then twelve years.
- ◆ The distribution in income in Taiwan is improved by improving the distribution of tangible wealth, through land reform, and intangible wealth (human capital), through massive government investment in education. It was not done through the direct redistribution of income.
- ◆ Giving people human capital rather than income, so that they can seek employment rather than welfare, helps to encourage self-reliance and preserve individual dignity and reduces moral hazard.
- ◆ Complementarity between tangible capital and human capital--investment in one type of capital enhances the rate of return of the other type of capital, and vice versa.

# The Distribution of Income

The Distribution of Disposable Income in the Republic of China on Taiwan



# Taiwan's Transition from Tangible Capital to Intangible Capital-Based Economic Growth

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- ◆ From shoe-maker to global contractor
- ◆ Backward integration from assembly operation
- ◆ From OEM (original equipment manufacture) to ODM (original design and manufacture)
- ◆ From intellectual “pirate” to innovator
- ◆ The role of the public education system
- ◆ The role of public research and development (R&D) institutions such as Industrial Technology Research Institute (ITRI)
- ◆ Establishment of the Hsin-Chu Science-Based Industrial Park by the government, the world's first, and one of the very few successful ones.
- ◆ The importance of private enterprise and free entry
- ◆ The role of venture capital (CDIB, formerly CDC)
- ◆ The role of returnees from the U.S. and elsewhere
- ◆ Networks of human capital

# The Sources of Economic Growth: Findings of Kim & Lau As Reported by Krugman (1994)

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- ◆ Using data from the early 1950s to the late 1980s, Kim and Lau (1992, 1994a, 1994b) find that:
- ◆ (1) No technical progress in the East Asian NIEs but significant technical progress in the industrialized economies (IEs)
- ◆ (2) East Asian economic growth has been input-driven, with tangible capital accumulation as the most important source of economic growth (the latter applying also to Japan)
  - ◆ Working harder as opposed to working smarter
- ◆ (3) Technical progress is the most important source of economic growth for the IEs, followed by tangible capital, accounting for over 50% and 30% respectively, with the exception of Japan
  - ◆ NOTE THE UNIQUE POSITION OF JAPAN!
- ◆ (4) Technical progress is purely tangible capital-augmenting and hence complementary to tangible capital

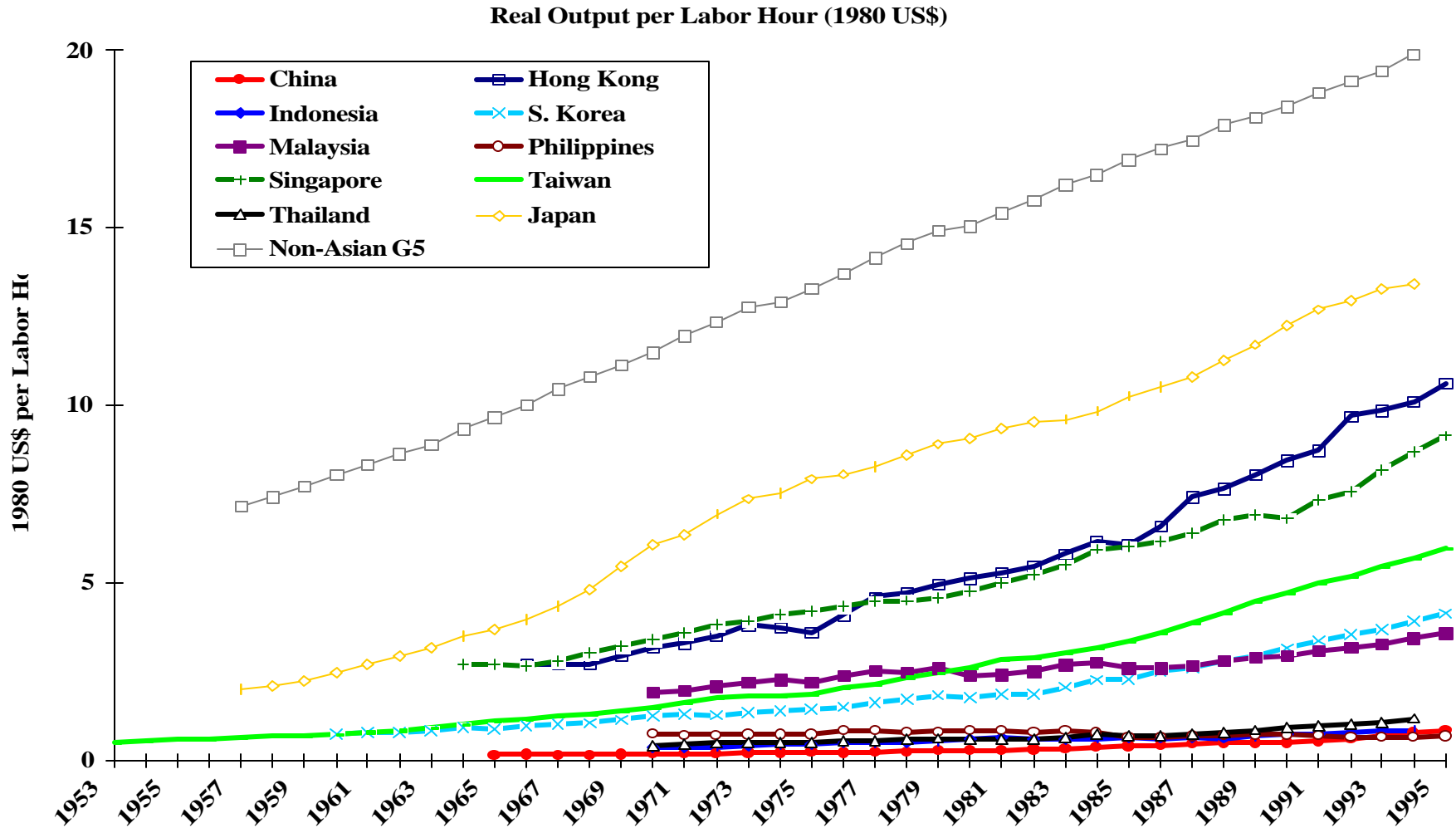
# The Sources of Economic Growth-- Developing Economies in East Asia

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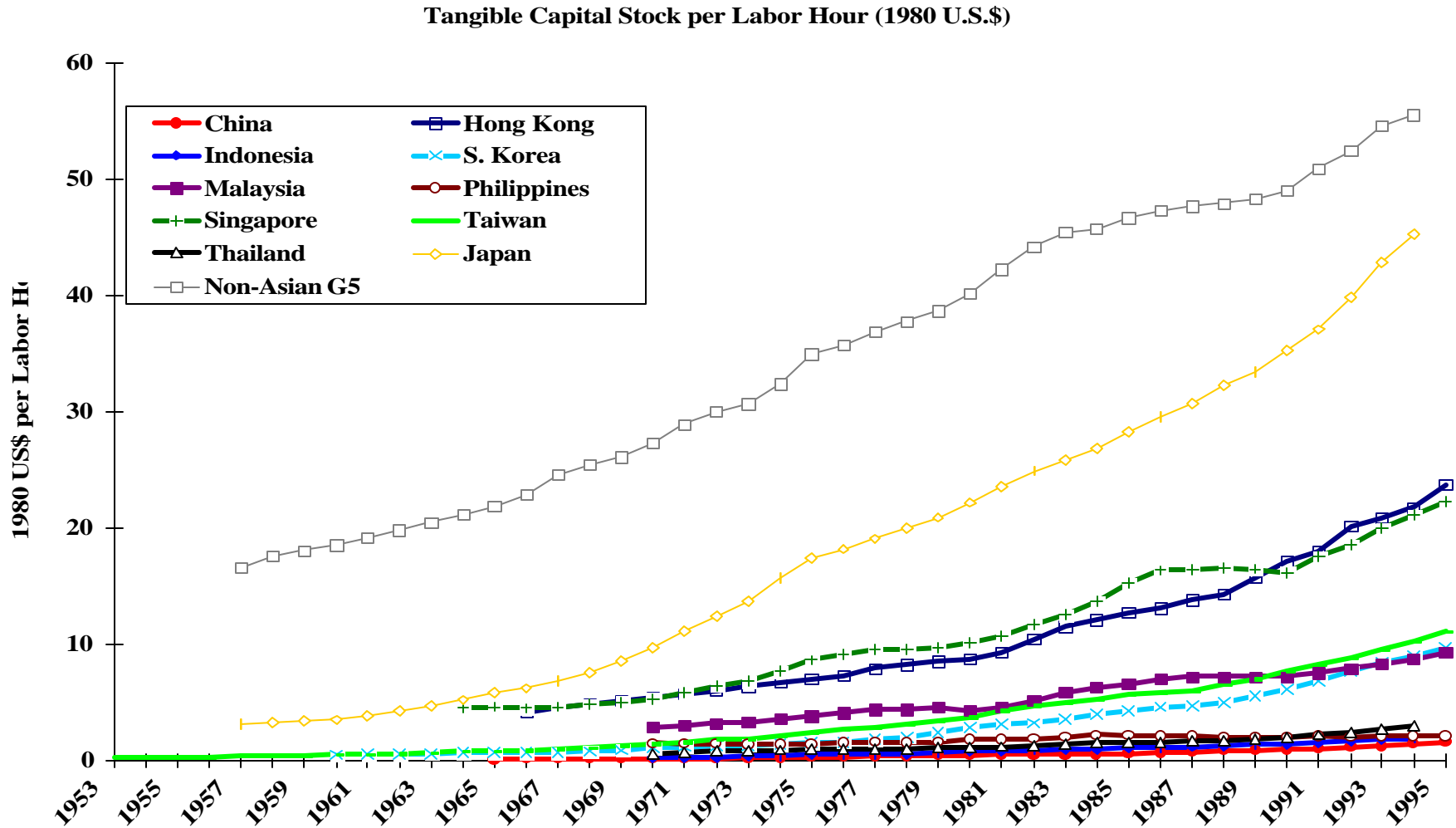
- ◆ Different types of measured inputs play different roles at different stages of economic growth
- ◆ Tangible capital accumulation is the most important source of growth in the early stage of economic development
- ◆ But simply accumulating tangible capital is not enough--it must also be efficiently allocated
- ◆ Efficient tangible capital accumulation is the major accomplishment of the East Asian NIEs, including Taiwan, in the postwar period
  - ◆ Market-directed allocation of new investment, aided by export orientation, promotes efficiency
  - ◆ Private enterprises have the incentives for prompt self-correction
- ◆ Intangible capital accumulation becomes important only after a certain level of tangible capital per worker is achieved but has begun to be important for some East Asian NIEs such as South Korea and Taiwan



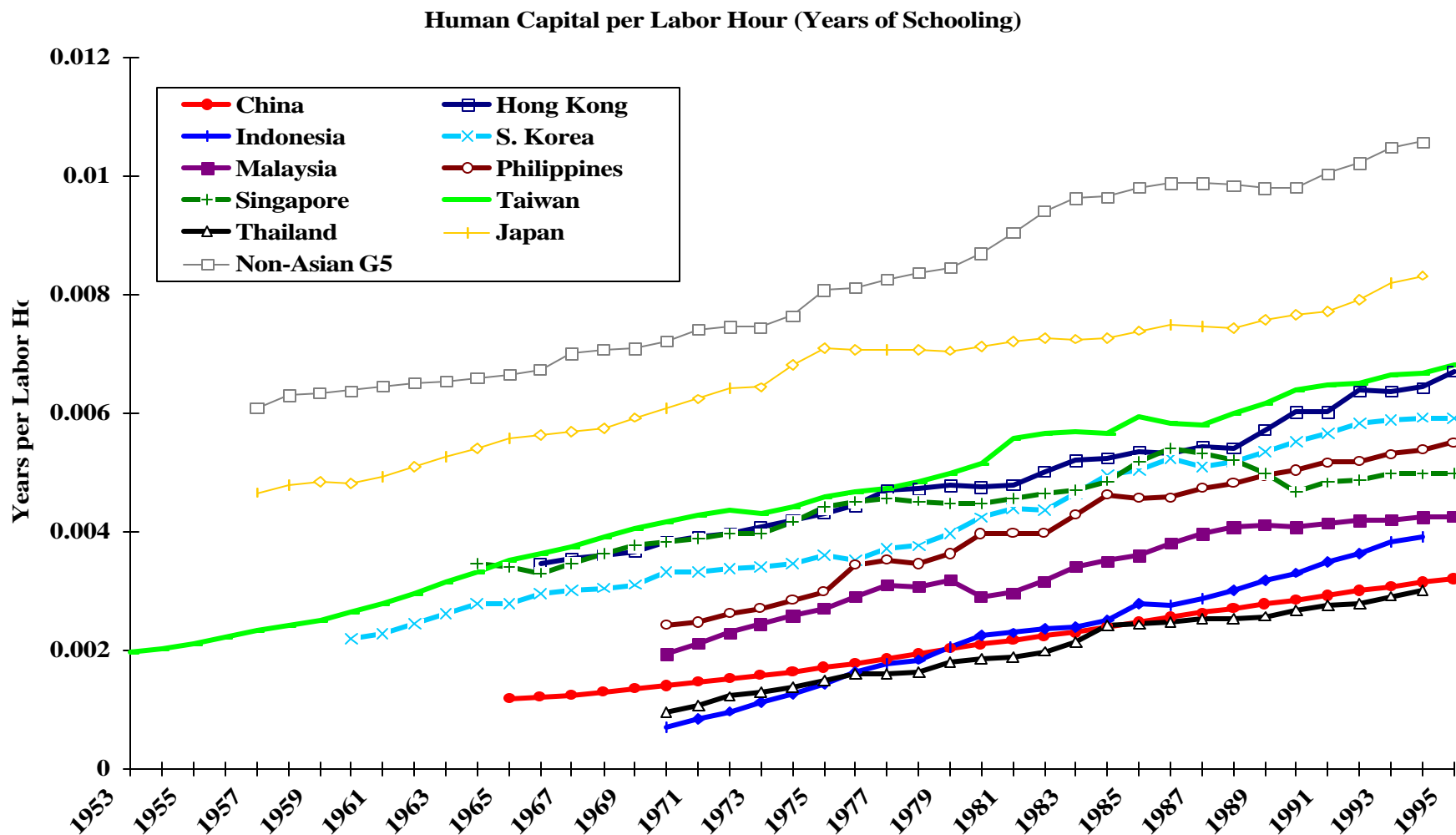
# Real Output per Labor Hour (1980 US\$)



# Tangible Capital Stock per Labor Hour (1980 US\$): Selected Economies



# Human Capital per Labor Hour (Years of Schooling): Selected Economies



# Sources of East Asian Economic Growth with 3 Inputs and Technical Progress—No Breaks

	Tangible Capital	Labor	Human Capital	Technical Progress
Hong Kong	69.37	29.08	1.55	0.00
South Korea	75.44	22.33	2.23	0.00
Singapore	59.36	38.82	1.82	0.00
Taiwan	80.83	17.37	1.80	0.00
Indonesia	77.49	17.36	5.15	0.00
Malaysia	59.48	37.68	2.83	0.00
Philippines	54.60	41.24	4.16	0.00
Thailand	73.91	22.66	3.44	0.00
China	83.75	14.12	2.13	0.00
Japan	50.44	5.70	0.56	43.30
Non-Asian G-5 Countries	37.79	3.54	0.86	57.81

## Sources of East Asian Economic Growth with 3 Inputs and Technical Progress—With Breaks in 1985

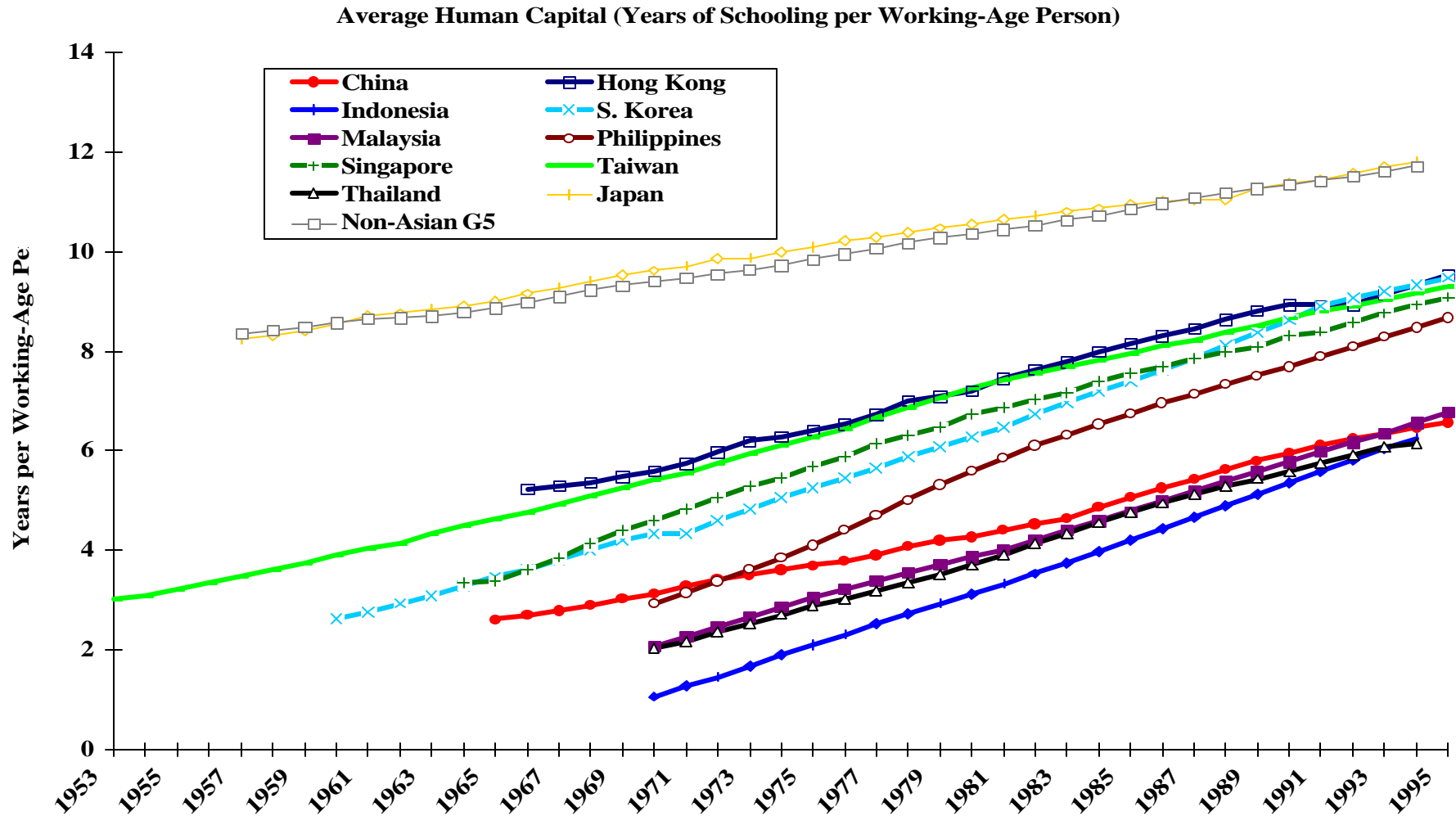
		Tangible Capital	Labor	Human Capital	Technical Progress
Hong Kong	66-95	56.89 (8.79)	23.65 (2.44)	2.51 (4.80)	16.94
South Korea	60-95	65.45 (12.28)	18.62 (3.35)	3.84 (6.31)	12.08
Singapore	64-95	53.10 (10.23)	33.94 (4.70)	3.23 (5.92)	9.73
Taiwan	53-95	71.26 (11.76)	15.61 (2.33)	3.15 (5.40)	9.99
Indonesia	70-94	71.20 (10.88)	14.59 (2.72)	9.38 (10.34)	4.83
Malaysia	70-95	54.22 (9.65)	32.47 (4.68)	5.12 (8.02)	8.19
Philippines	70-95	54.05 (5.40)	37.81 (3.94)	8.15 (7.41)	-0.01
Thailand	70-94	60.84 (9.68)	18.06 (2.93)	5.65 (8.00)	15.44
China	65-95	83.87 (11.63)	11.92 (2.55)	4.21 (5.99)	0.00
Japan	57-94	49.04 (7.98)	5.23 (0.56)	1.08 (2.15)	44.65
Non-Asian G-5 Countries	57-94	37.44 (3.52)	3.36 (0.17)	1.70 (1.68)	57.49

## Sources of East Asian Economic Growth with 4 Inputs and Technical Progress—With Breaks in 1985

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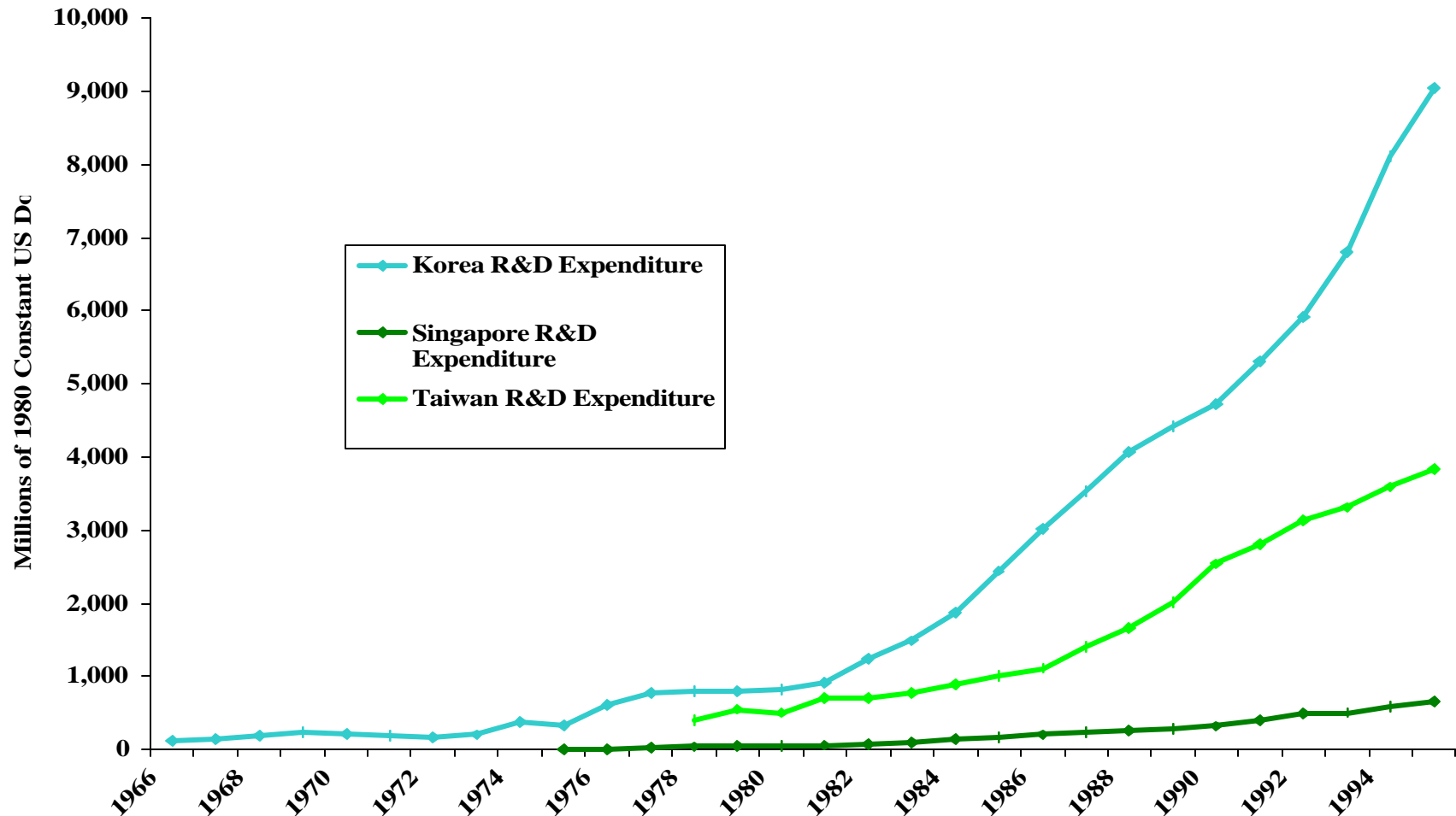
	Sample Period	Tangible Capital	Labor	Human Capital	R&D Capital	Technical Progress
South Korea	65-95	63.35	13.61	2.10	20.94	0.00
Singapore	77-95	47.33	21.55	1.37	29.75	0.00
Taiwan	78-95	58.73	11.42	1.32	28.54	0.00
Japan	64-94	44.83	5.20	0.82	14.63	34.52
Non-Asian G-7 Countries	65-94	33.71	3.71	1.32	12.53	48.72

# Average Human Capital: Selected Economies



# R&D Expenditures: 3 East Asian Newly Industrialized Economies

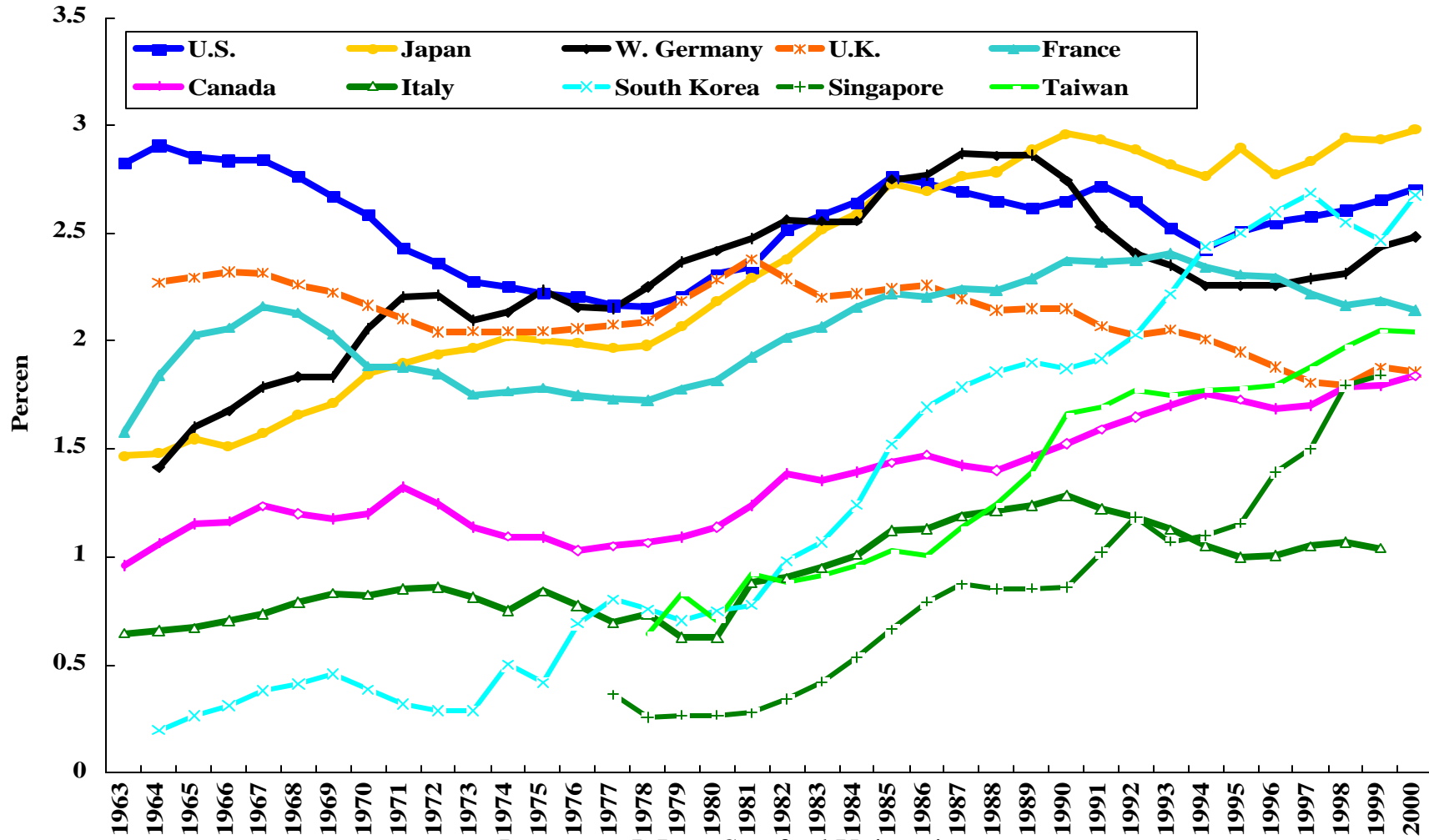
Real R&D Expenditures (3 NIEs)





# R&D Expenditures as a Ratio of GDP: G-7 Countries and 3 East Asian NIEs

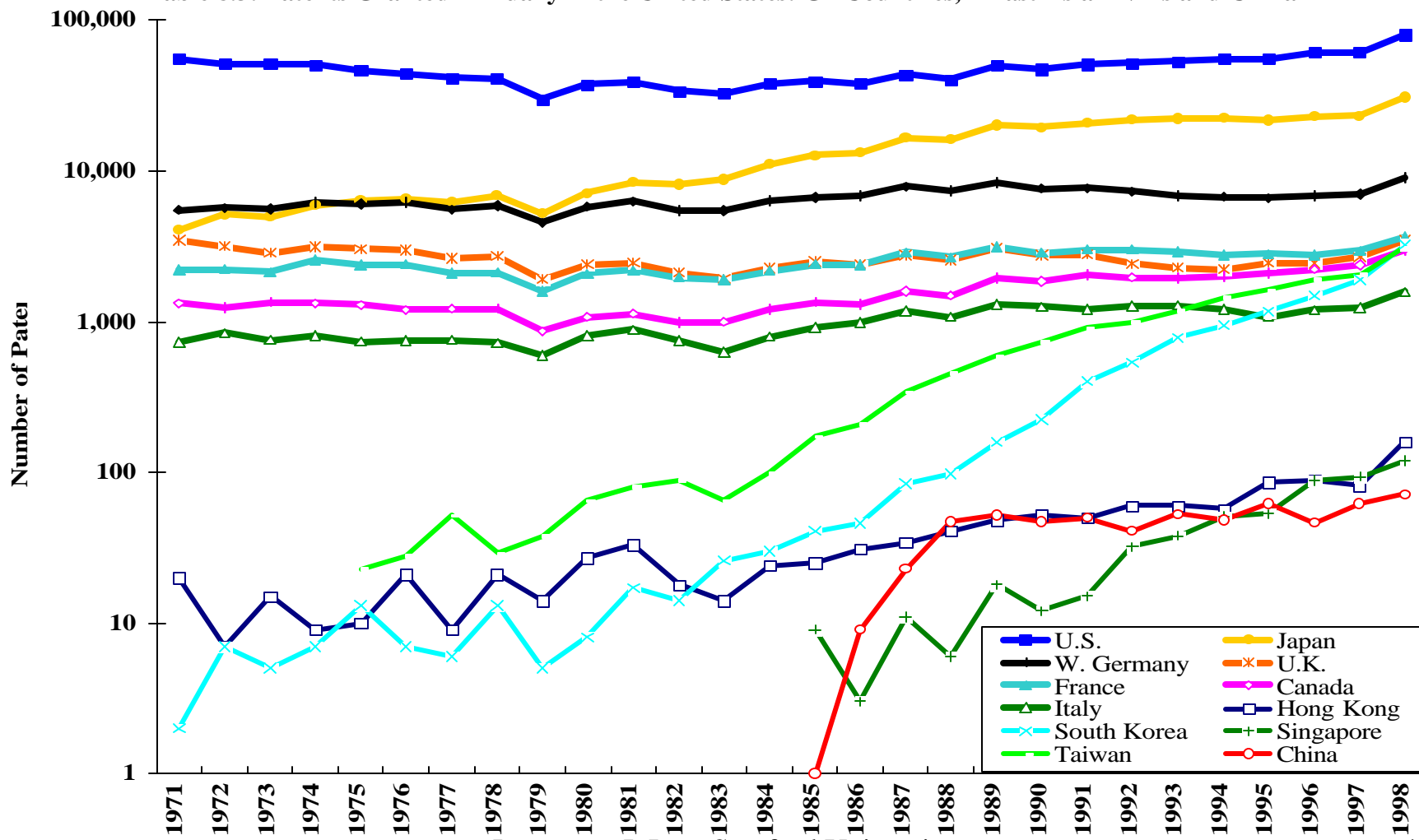
Figure 8.1: R&D Expenditures as a Percentage of GDP: G-7 Countries and 3 East Asian NIEs



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# Patents Granted in the United States: G-7 Countries and East Asian Developing Countries

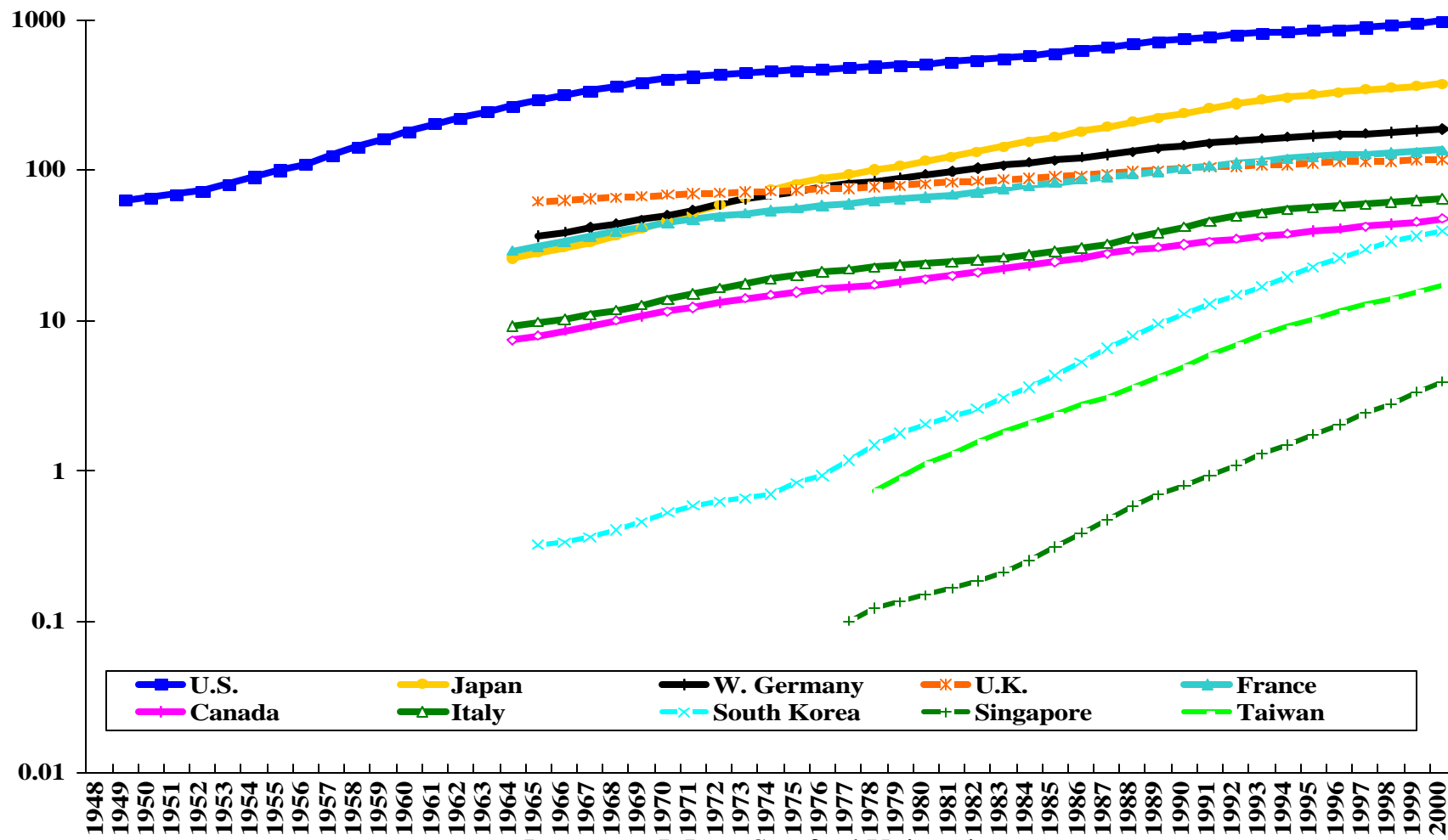
Table 8.3: Patents Granted Annually in the United States: G-7 Countries, 4 East Asian NIEs and China



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# R&D Capital Stocks: G-7 Countries and 3 East Asian NIEs

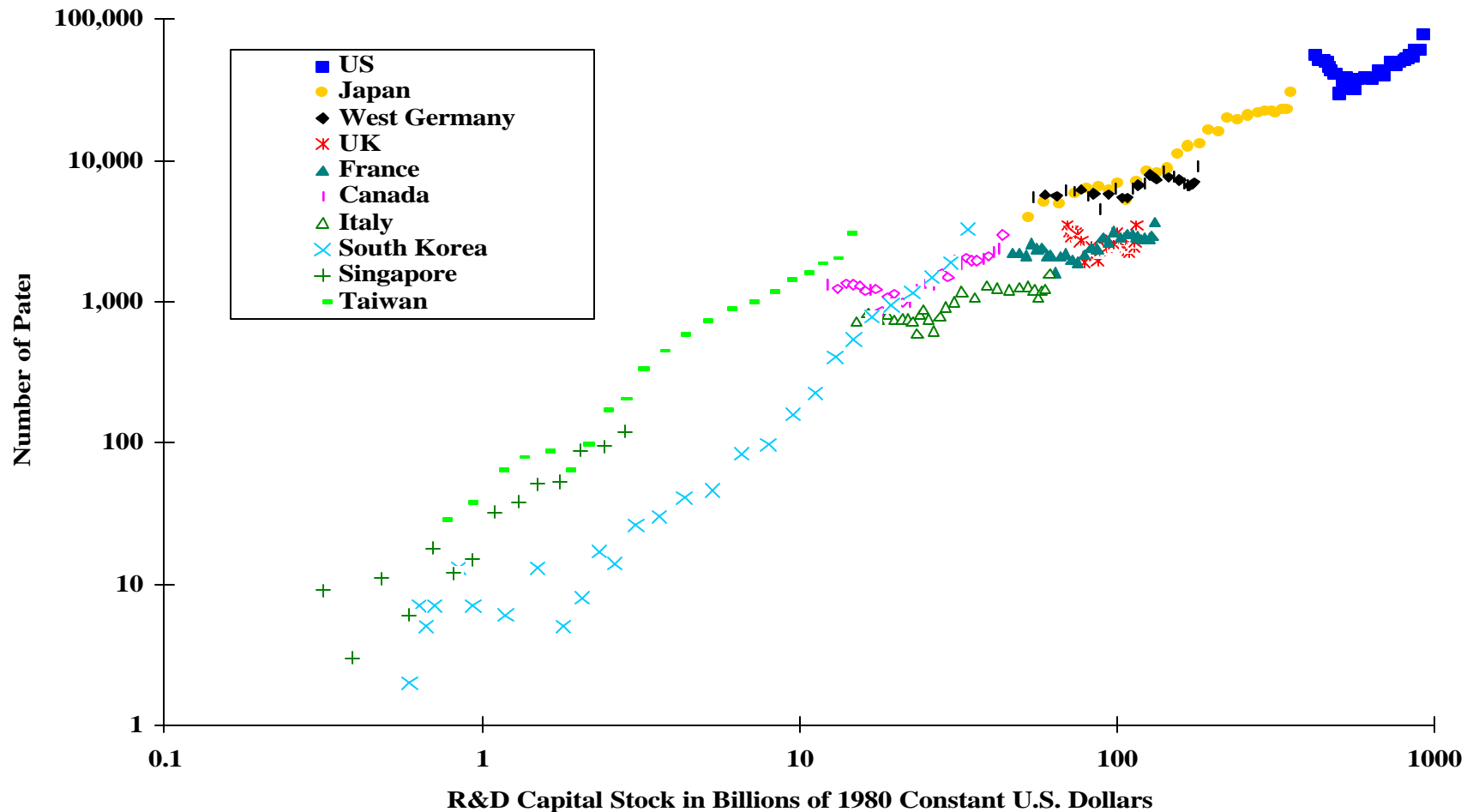
Figure 8.2: R&D Capital Stocks in Billions of 1980 U.S. Dollars



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# Patents Granted in the United States and R&D Capital Stock

Figure 8.4: The Number of U.S. Patents Granted Annually vs. R&D Capital Stocks



# Is East Asian Economic Growth Sustainable?

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- ◆ The attractiveness of investment in intangible capital depends on the protection of intellectual property rights, which in turn depends on whether a country is a producer of intellectual property--some of the East Asian economies, e.g., Hong Kong, South Korea, Singapore and Taiwan are ahead of other East Asian economies with the possible exception of Japan on this score
- ◆ Intangible capital is different from tangible capital in three important aspects:
  - ◆ Intangible capital is freely mobile across countries
  - ◆ Intangible capital is simultaneously deployable in different locations without diminution of its effectiveness (increasing returns in the utilization of intangible capital)
  - ◆ Intangible capital enhances the productivity of existing tangible capital whereas additional tangible capital diminishes the productivity of existing tangible capital
- ◆ Because of its complementarity with tangible capital, investment in intangible capital can retard the decline in the marginal productivity of tangible capital and counteract the “Krugman effect”
- ◆ There is also evidence of positive technical progress in the more recent period in South Korea, Singapore and Taiwan, reflecting their increased investment in intangible capital
- ◆ The people of Taiwan (and East Asia in general) are entrepreneurial, hard-working, and thrifty--all they need is a good, market-friendly, predictable and stable environment

# Lessons from the Taiwan Experience for Developing Economies

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- ◆ The rate of growth of population must be brought down to manageable levels before sustained economic growth is possible.
- ◆ The transformation from agriculture to industry is inevitable.
- ◆ Private enterprise can play a major and critical role.
- ◆ A small economy with little or no natural resources must be open in order to develop—the exchange rate must therefore be set to equilibrate the supply and demand for foreign exchange in the long term.
- ◆ The transformation of the domestic savings rate is essential for sustained economic growth.
- ◆ Maintenance of macroeconomic stability is essential for achieving balance of payments equilibrium and promoting domestic savings.
- ◆ Investment in human capital can not only increase productivity but also improve the income distribution.
- ◆ Investment in intangible capital (human capital and R&D capital) can help to maintain economic growth after sufficient tangible capital per worker has been accumulated.

# The Economic Future of Taiwan: Transition to a Service Economy

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- ◆ The transition to a service economy, with a focus on high value-added activities, is inevitable.
- ◆ Just as it was discovered that Taiwan could not become rich by remaining in agriculture half a century ago, Taiwan cannot become richer by remaining in manufacturing alone.
- ◆ The Group-of-Seven (G-7) countries have shown the way, with significantly more than half of their GDPs originating from the service sector.
- ◆ The Silicon Valley is the prime example of a successful transition—very little manufacturing is done in Silicon Valley today--it has indeed been “hollowed out”, but real wage and income per capita has continued to remain high.
- ◆ What made the success of Silicon Valley possible is the successful out-sourcing of production to elsewhere in the United States (Colorado, New Mexico, Oregon) and the rest of the World, including East Asia (and Taiwan in particular).
- ◆ As Taiwan moves up the supply chain, it too must out-source the lower-value-added activities in order to survive the global competition and to enhance the value that Taiwan is able to capture.
- ◆ Nike and Dell are the prime examples of a successful transition at the microeconomic level—neither of them do any manufacturing, but both have continued to prosper. They control intangible capital—brand name, management organization and methods, logistics, marketing, quality assurance, etc.

# The Risk of “Hollowing Out”-- De-Industrialization

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- ◆ If a good cannot be “made in Taiwan”, better that it is “made by Taiwan” than by elsewhere (the value-added resides with the branding and the reputation of the firm, not in the physical place of manufacture).
- ◆ The distinction between GNP and GDP—it is much more important to increase GNP rather than GDP.



# Models Not to Follow

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- ◆ Silicon Valley
  - ◆ High cost of housing
- ◆ Japan (the Japanese disease)
  - ◆ More than a decade of stagnation
  - ◆ Heavy hand of government
  - ◆ Lack of a vision and a strategy
  - ◆ Inhospitable to start-up entrepreneurs
  - ◆ Asset price bubble
  - ◆ High leverage
  - ◆ Inefficient non-tradable sector
- ◆ Hong Kong
  - ◆ Asset price bubble
- ◆ United States
  - ◆ The science base in Taiwan is too small to support a full emulation of the United States—Taiwan must be much more selective.
  - ◆ Permanent agricultural price support is not a good idea—transitional aid should be provided to individual farmers, not farms; with appropriate land use policy, farmers can benefit from land price appreciation without creating a land price bubble.

# Models Not to Follow

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## ◆ South Korea

- ◆ It is too late for Taiwan to develop some of the traditional heavy industries, such as the automobile.
- ◆ The chaebols are not, in general, a good model for the promotion of innovation (there is the same problem with Japanese zaibatsus).

## ◆ European Union (the Dutch disease)

- ◆ The welfare state reduces the incentive to work and to save and imposes a huge fiscal burden on the government. That is not to say there should be no social arrangements for unemployment, retirement and health care, but the arrangements should embody incentives for responsibility-sharing by individuals who are able to do so and preventing moral hazard. After all, the majority of the population has to bear the financial burden and responsibilities themselves one way or the other.
- ◆ Legislation supposedly designed to protect labor has made it almost impossible to dismiss any worker in France and Germany. As a result, no employer wants to hire anyone. Unemployment rates have therefore remained at the double-digit level. There is an attempt to circumvent the law through using temporary employment agencies like Manpower.

## ◆ Does Taiwan need a floating exchange rate?