The Economic Future of Taiwan: A View from Outside

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Preview

- The Economy of Taiwan Today
- The Sources of Economic Growth
- The Role of Economic Policies
- The Transition from Tangible to Intangible Capital-Based Growth
- New Global and Local Trends
- Paradigms for the Future
- Implications for Public Policies

The Economy of Taiwan Today (1)

- East Asia is the fastest-growing region in the world over the past two decades, the East Asian currency crisis of 1997-1998 notwithstanding
- Taiwan is one of the first “Newly Industrialized Economies” (NIEs) in East Asia
- Over the last half century, real GNP and real GNP per capita have grown at 8.4% and 6.2% respectively
- Taiwan began its industrialization drive after Hong Kong and before South Korea
- Taiwan has done exceptionally well despite relatively unfavorable resource endowment and population density.
- Taiwan survived the East Asian currency crisis relatively unscathed
- How has it been able to achieve this economic performance?

The Economy of Taiwan Today (2)

	1951	1999
	US$ (1999 prices)	
Real GDP	6 bill.	290 bill.
Real GDP per capita	725	12,750

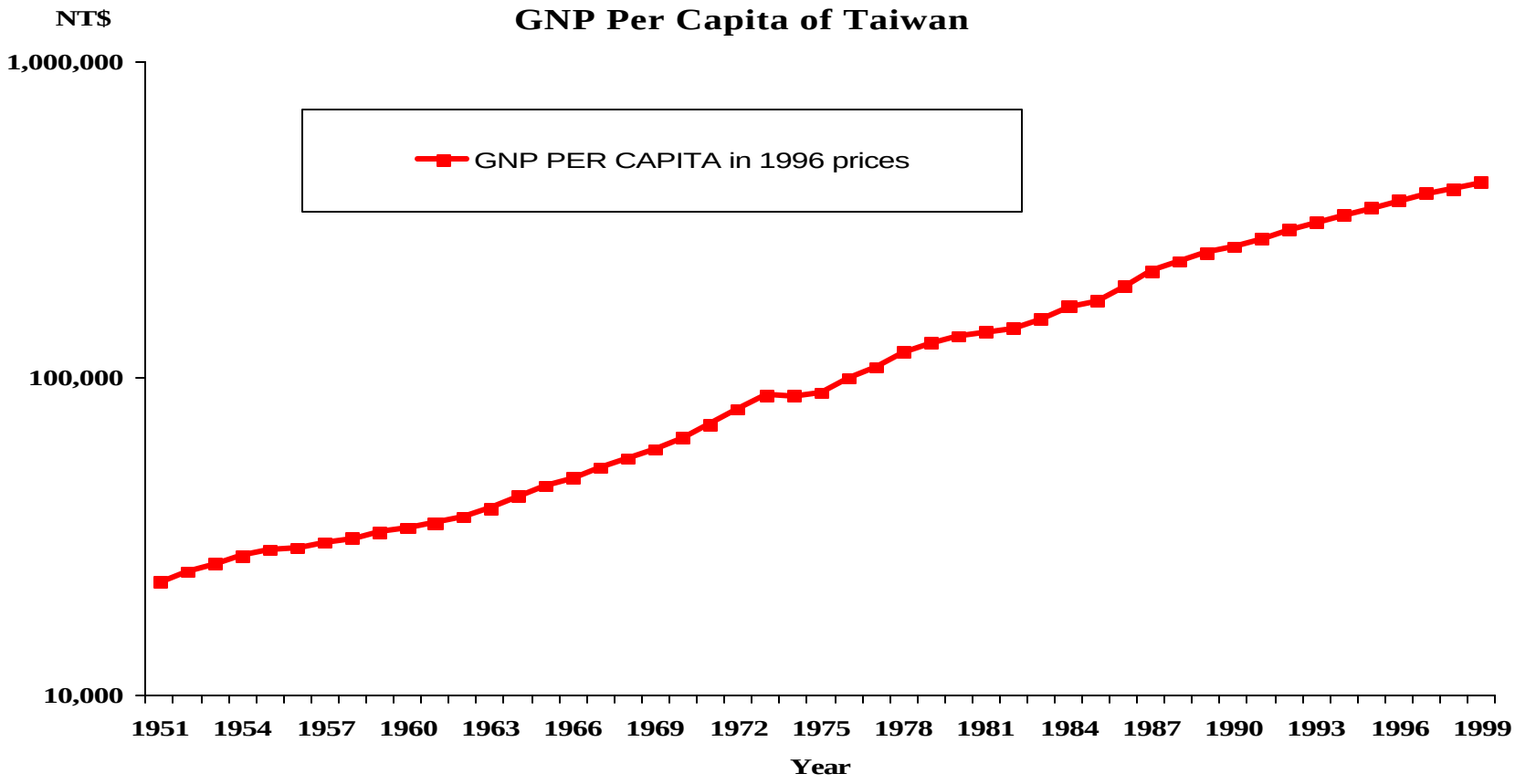
The Economy of Taiwan Today (3)

	U.S.	Taiwan
	US$ (current prices)	
1999 GDP	9.248 trill.	0.290 trill.
1999 GDP per capita	33,857	12,750

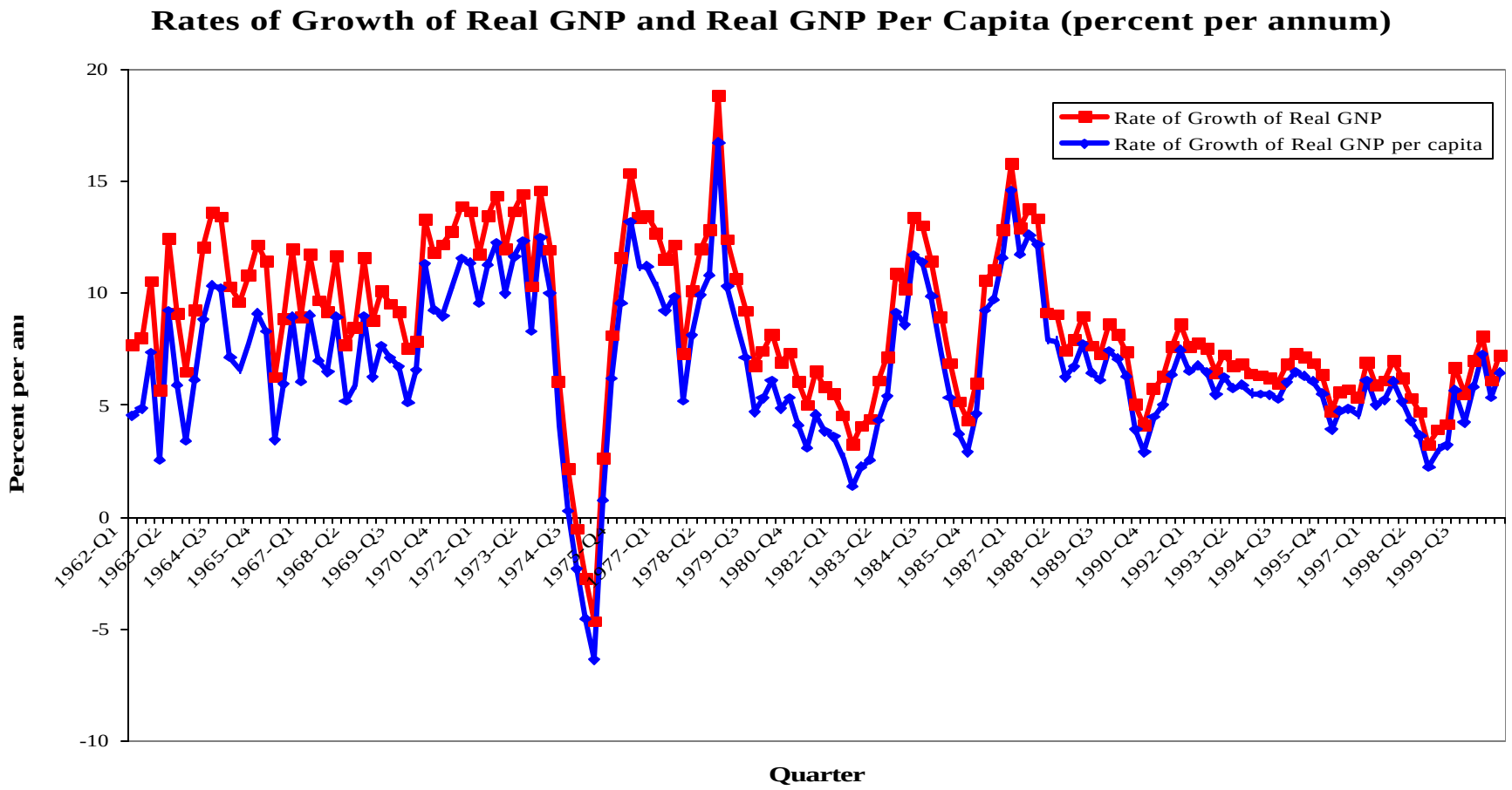
The Goal of Economic Development

- To achieve the highest rate of growth of real output (GNP) per capita, subject to the following considerations:
  - Non-pecuniary benefits--e.g., the effects on life expectancy, health, literacy and other non-monetary indicators of welfare
  - Non-pecuniary costs--e.g., degradation of the environment, pollution
  - Depletion of natural resources
  - An equitable distribution of income

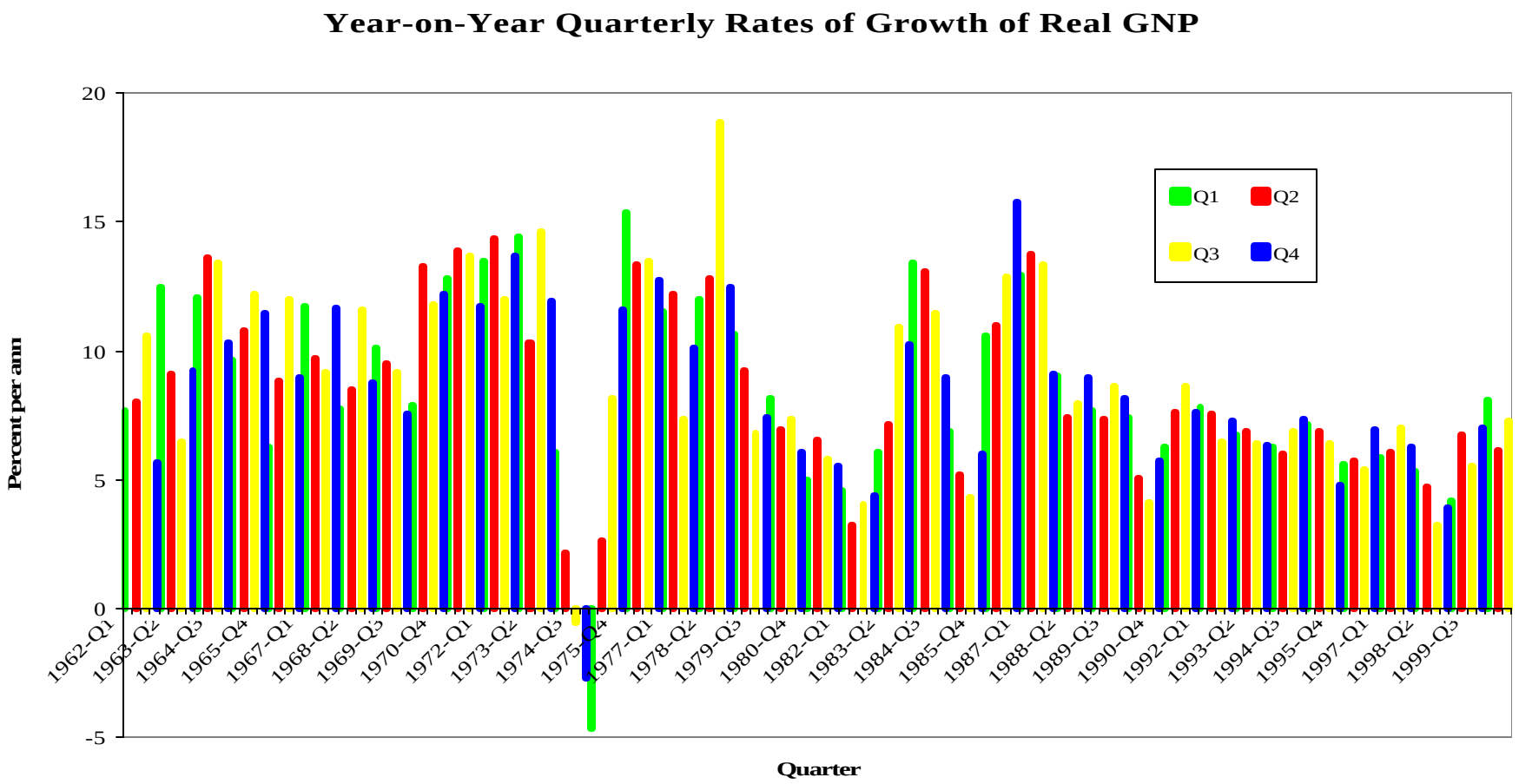
Taiwan's Economic History
Real GNP per Capita



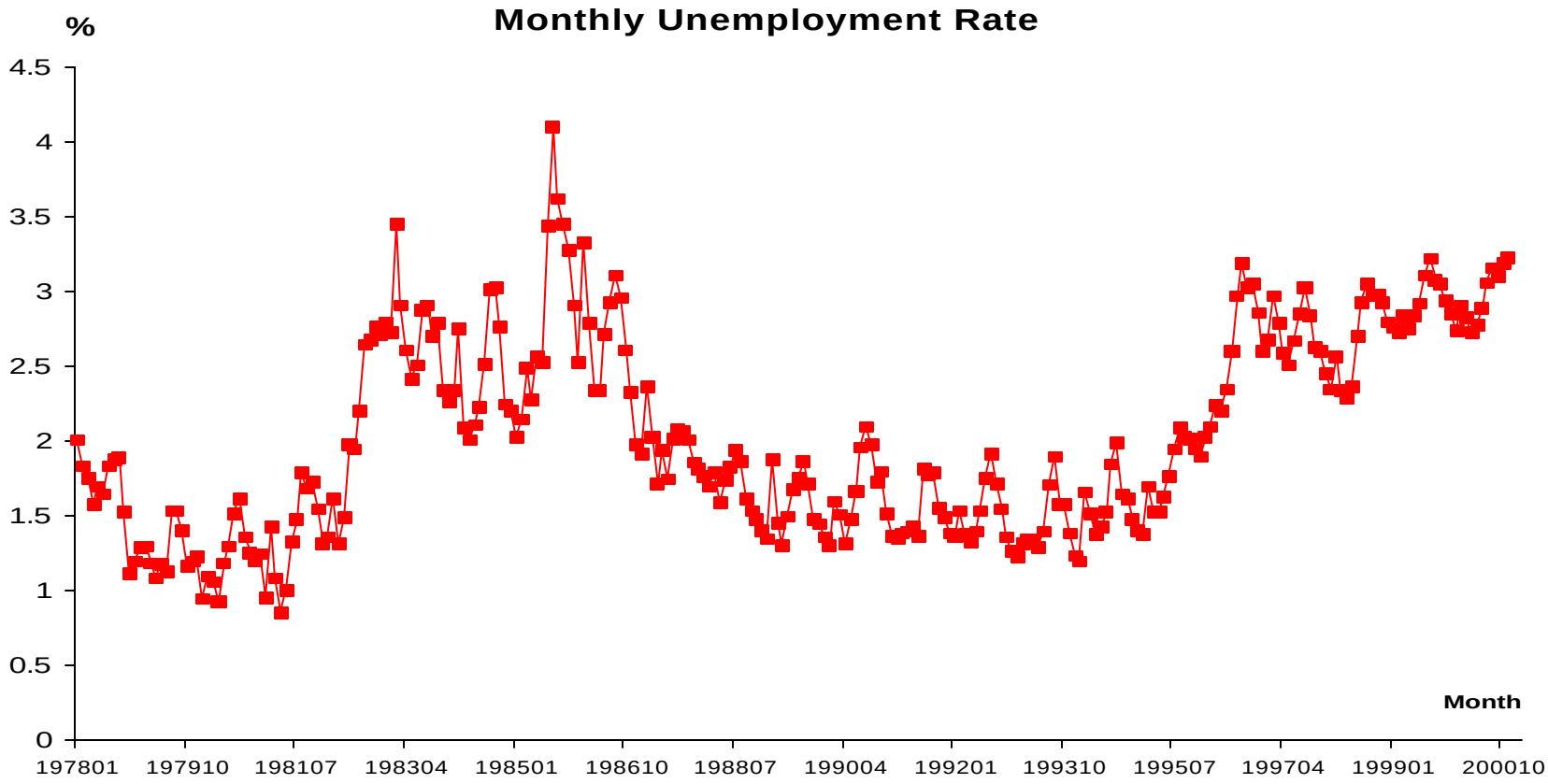
Year-on-Year Quarterly Rates of Growth of Real GNP and Real GNP Per Capita



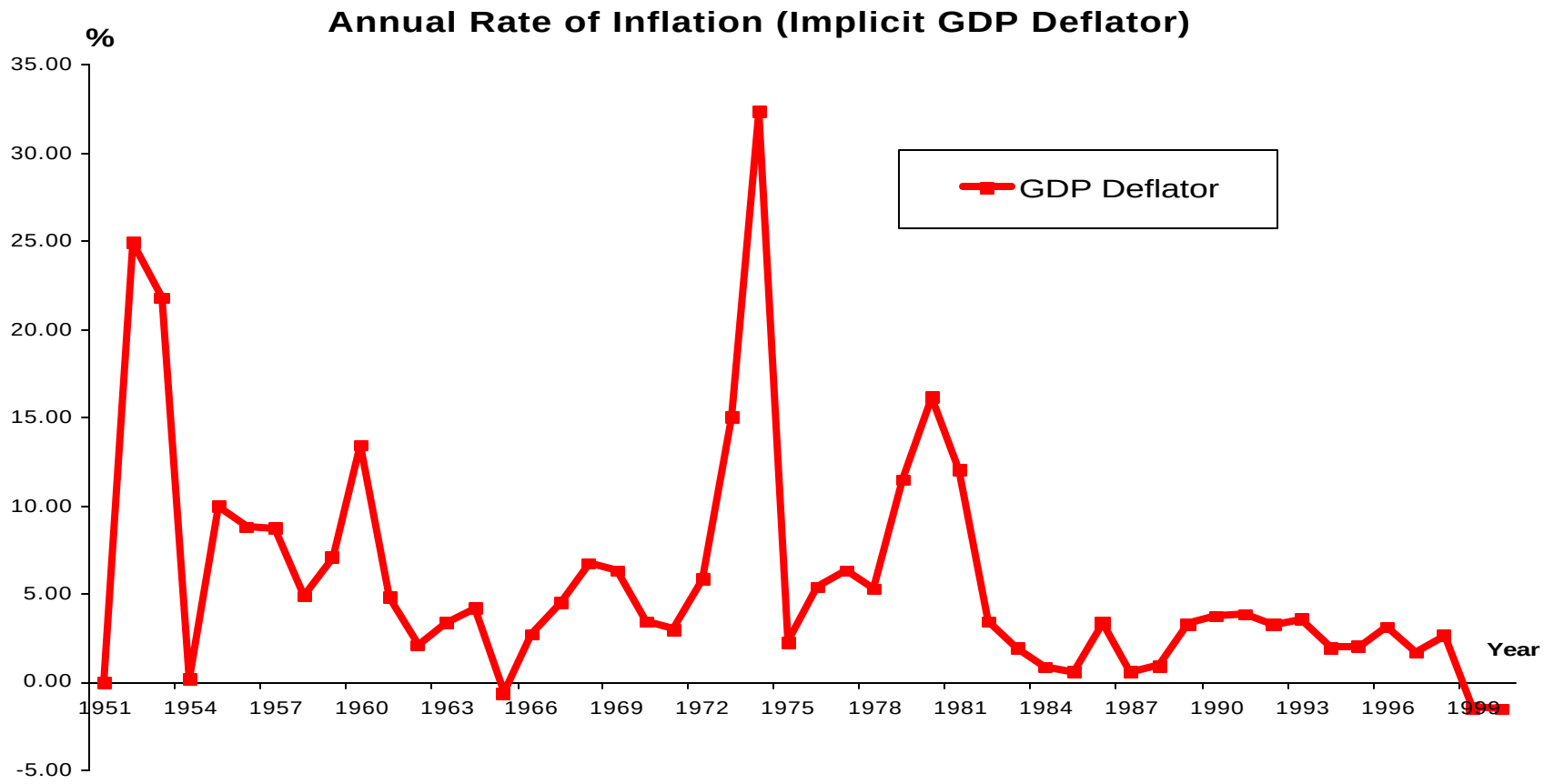
Year-on-Year
Quarterly Rates of Growth of Real GNP



Unemployment Rate



The Rate of Inflation



The Stylized Facts

- The rate of growth of real GNP per capita has declined
- The rate of growth of population has declined significantly
- The rate of unemployment has risen in recent years
- The rate of inflation has remained low

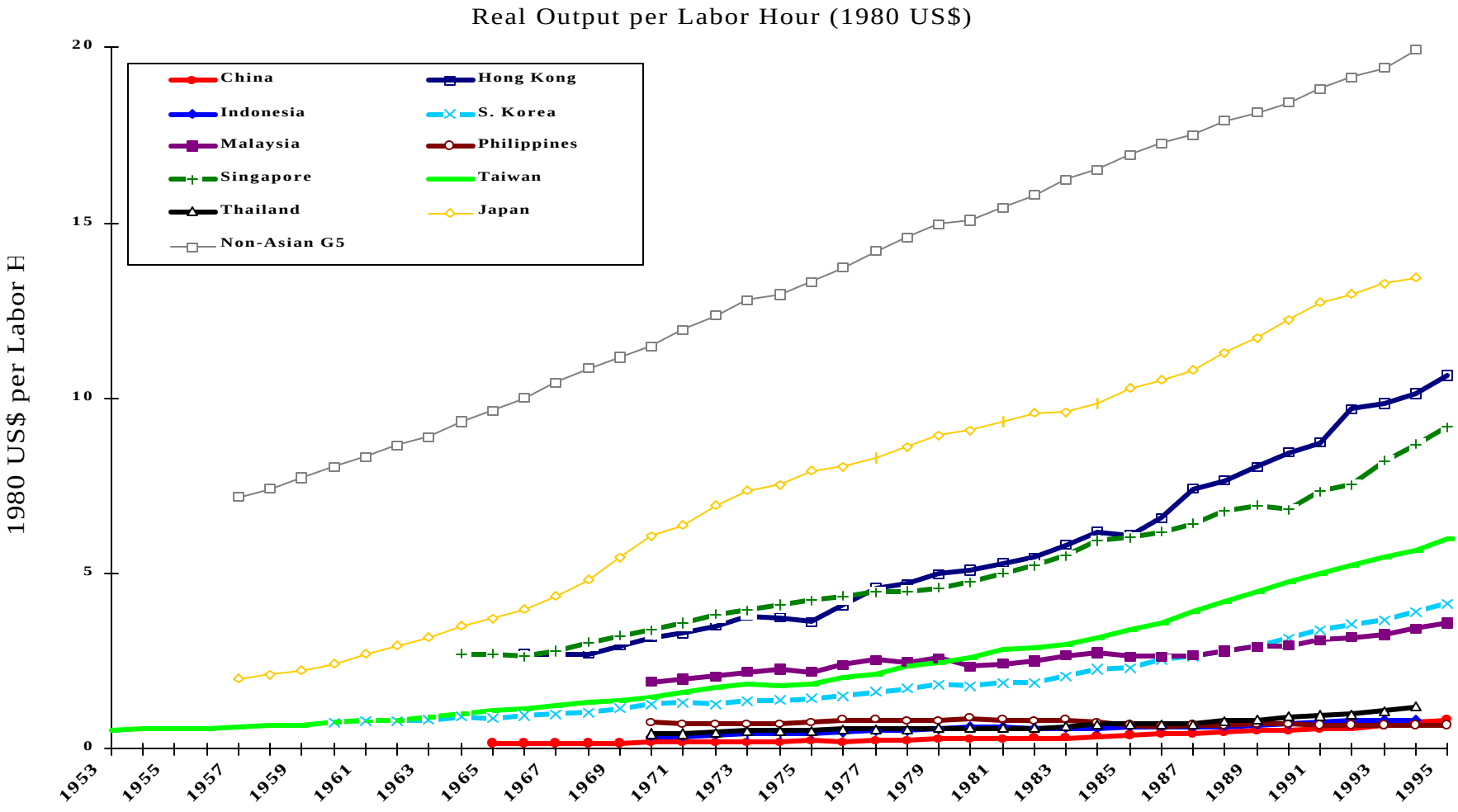
Rates of Growth of Inputs & Outputs of the East Asian Developing & the G-7 Countries

Table 3.1: Average Annual Rates of Growth of Real GDP, Capital, Labor and Human Capital (percent)

(Extended sample period)

Country	Period	GDP	Capital Stock	Utilized Capital	Employment	Labor Hours	Human Capital	Average Human Capital
Hong Kong	66-95	7.4	8.8	8.6	2.6	2.4	4.8	2.1
S. Korea	60-95	8.5	12.3	12.3	3.1	3.3	6.2	4.0
Singapore	64-95	8.8	10.3	10.3	4.3	4.7	5.9	3.5
Taiwan	53-95	8.4	11.8	11.8	2.7	2.3	5.3	2.8
Indonesia	70-94	6.7	8.9	9.8	3.1	3.1	9.6	7.7
Malaysia	70-95	7.3	11.8	11.8	3.7	3.7	7.7	4.9
Philippines	66-95	4.0	5.8	5.9	3.2	3.2	10.8	8.5
Thailand	66-94	7.6	9.1	9.4	2.8	2.8	8.5	5.8
China	65-95	8.4	10.3	10.3	3.0	3.0	5.9	3.3
Japan	57-94	5.9	8.1	8.0	1.1	0.6	2.1	0.9
Canada	57-94	3.8	4.8	4.7	2.3	1.9	3.0	1.1
France	57-94	3.3	3.9	3.9	0.4	-0.2	2.0	1.1
W. Germany	57-94	3.2	3.3	3.1	0.1	-0.3	1.5	1.0
Italy	59-94	3.5	5.2	5.3	0.0	-0.3	1.8	1.3
UK	57-94	2.4	3.9	3.8	0.2	-0.1	1.2	0.8
US	49-94	3.1	3.0	3.3	1.7	1.3	2.1	0.8

Real Output per Labor Hour



Accounting for Economic Growth

- Decomposing the growth of output by its proximate sources:
  - How much of the growth of output can be attributed to the growth of measured inputs, tangible capital and labor? and
  - How much of the growth of output can be attributed to technical progress (aka growth in total factor productivity), i.e. improvements in productive efficiency over time?
- **TECHNICAL PROGRESS (GROWTH IN TOTAL FACTOR PRODUCTIVITY)**
  = GROWTH IN OUTPUT HOLDING ALL MEASURED INPUTS CONSTANT

Accounting for Economic Growth

- S. Kuznets (1966) observed that "the direct contribution of man-hours and capital accumulation would hardly account for more than a tenth of the rate of growth in per capita product--and probably less." (p. 81)
- M. Abramovitz (1956) and R. Solow (1957) similarly found that the growth of output cannot be adequately explained by the growth of inputs
- Denison (1962), under the assumption that the degree of returns to scale is 1.1, found less technical progress
- Griliches and Jorgenson (1966), Jorgenson, Gollop and Fraumeni (1987) and Jorgenson and his associates found even less technical progress by adjusting capital and labor inputs for quality improvements

Accounting for Economic Growth

- Boskin and Lau (1990), using labor-hours and constant-dollar capital stocks, found that technical progress has been the most important source of growth for the developed countries in the postwar period

The Concept of a Production Function

- Definition:
  - A production function is a rule which gives the quantity of output, Y , for a given quantity of input, X , denoted:

$$Y = F(X)$$

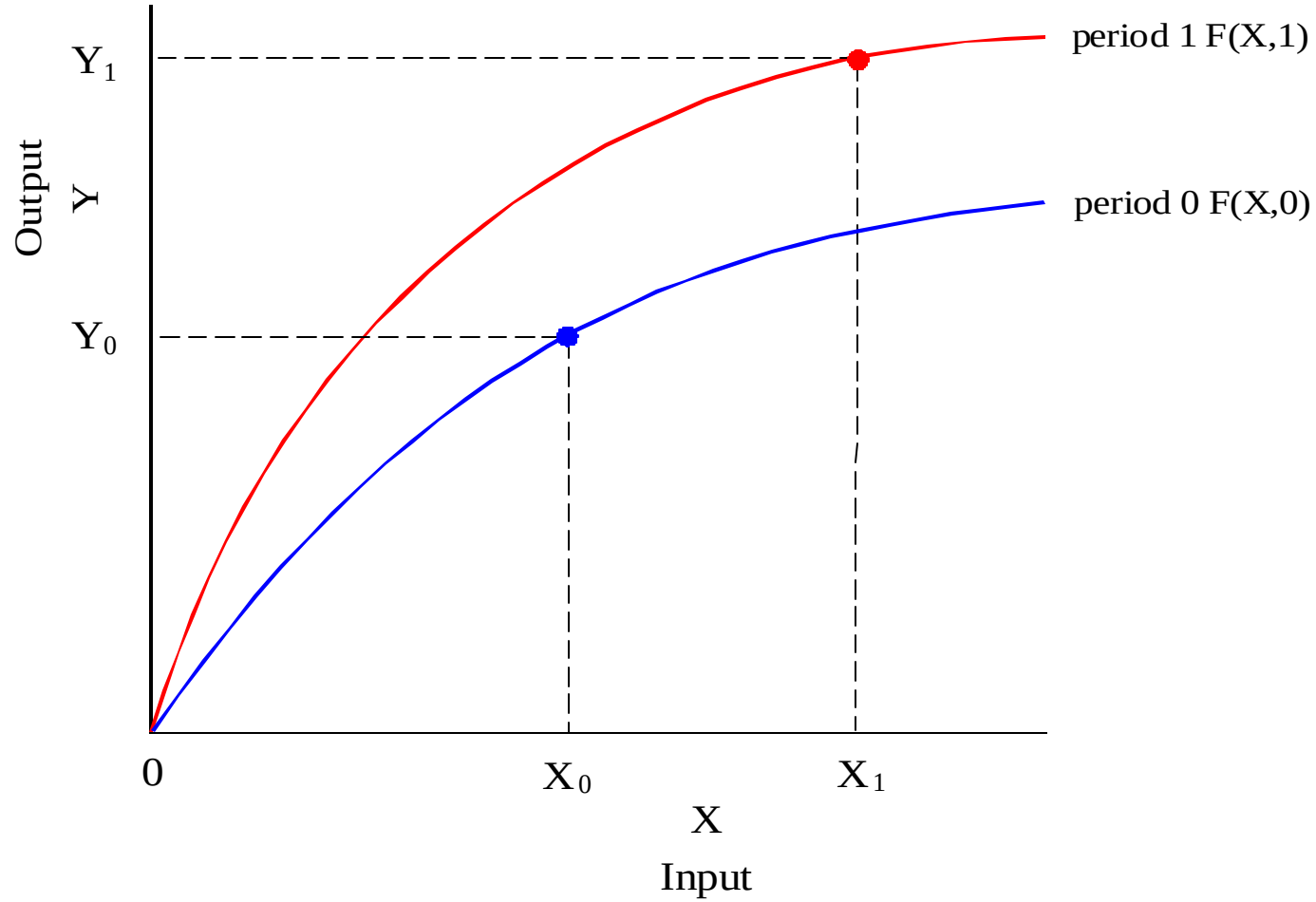
The Economist's Concept of Technical Progress

- A production function may change over time. Thus:
  - $Y = F(X, t)$
- Definition:
  - There is technical progress between period 0 and period 1 if given the same quantity of input, X_0, the quantity of output in period 1, Y_1, is greater than the quantity of output in period 0, Y_0, i.e.,

$$F(X_0, 1) \geq F(X_0, 0)$$

- TECHNICAL PROGRESS = THE GROWTH OF OUTPUT HOLDING MEASURED INPUTS CONSTANT

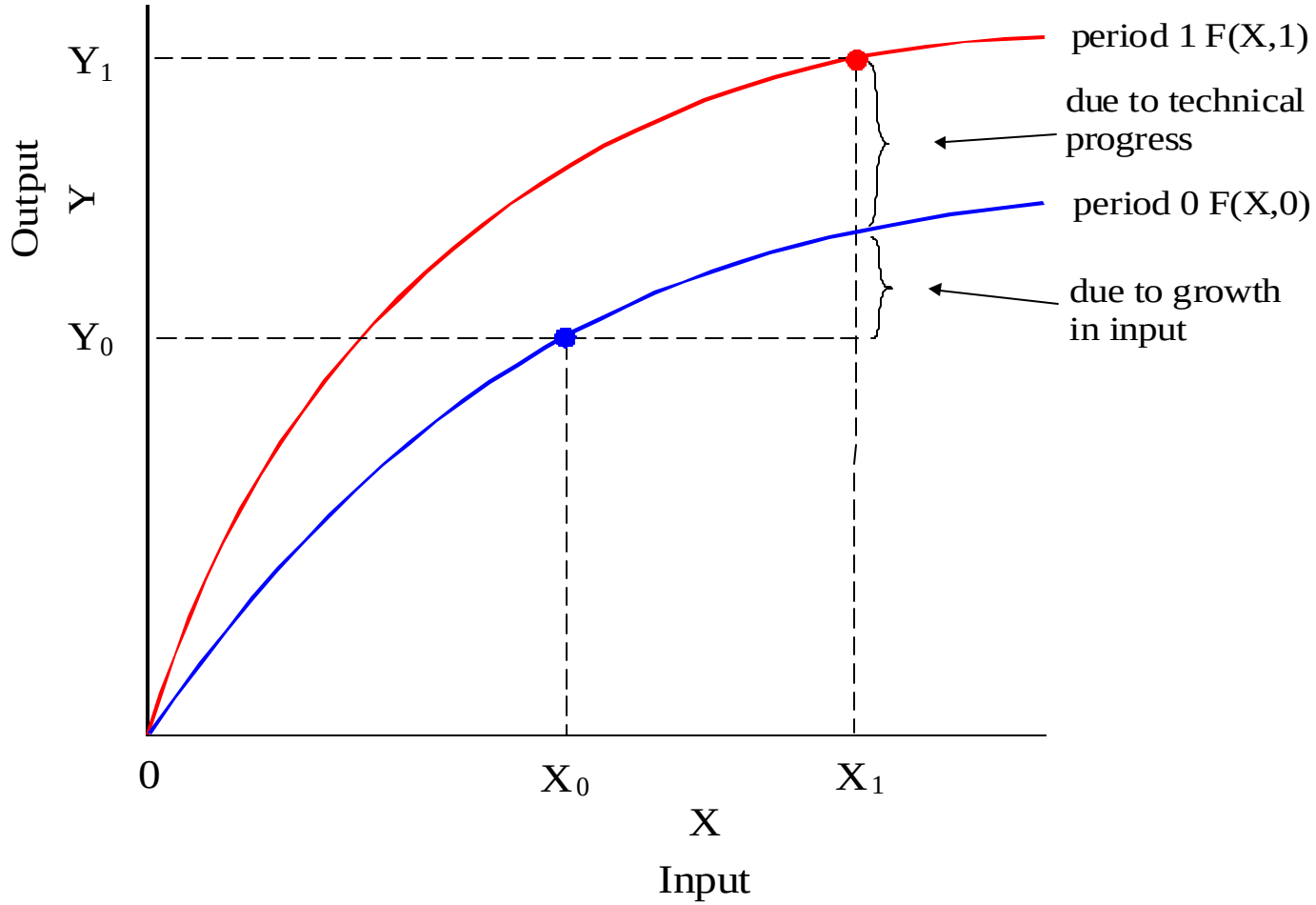
Technical Progress:
The Single-Output, Single-Input Case



Decomposition of the Growth of Output

- If the production function is known, the growth of output can be decomposed into:
  - (1) The growth of output due to the growth of measured inputs (movement along a production function) and
  - (2) Technical progress (shift in the production function)
- The growth of output due to the growth of inputs can be further decomposed into the growth of output due to tangible capital, labor (and any other measured inputs)

Decomposition of the Growth of Output



Interpretation of Technical Progress (Growth of Total Factor Productivity)

- Not “Manna from Heaven”
- The effects of growth in unmeasured “Intangible Capital” (Human Capital, R&D Capital, Goodwill (Advertising and Market Development), Information System, Software, etc.)
- The effects of growth in other omitted and unmeasured inputs (Land, Natural Resources, Water Resources, Environment, etc.)
- The effects of improvements in technical and allocative efficiency over time, e.g., learning-by-doing
- “Residual” or “Measure of Our Ignorance”

The Findings of Kim & Lau (1992, 1994a, 1994b); Reported by Krugman (1994)

- Using data from the early 1950s to the late 1980s, Kim and Lau 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, 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

Capital-Augmenting Technical Progress

$$Y = A_0(t)\, F(A_K(t)K,\, A_L(t)L)$$

$$= A_0 F(A_K(t)K,\, A_L L)$$

$$= A_0 F(A_K e^{Ck.t}K,\, A_L L)$$

Accounts of Growth (Early 1950s-Late 1980s): Kim & Lau (1992, 1994a, 1994b)

Table 2.2: Relative Contributions of the Sources of				
	Economic Growth (percent)			
Economy	Tangible Capital	Labor	Technical Progress	
Hong Kong	74	26	0	
Singapore	68	32	0	
S. Korea	80	20	0	
Taiwan	85	15	0	
Japan	56	5	39	
Non-Asian G-5	36	6	59	

The Sources of Economic Growth: Selected East Asian and Western Economies

The Contributions of the Sources of Growth (percent)

	Capital	Labor	Technical Progress
East Asian Economies			
China	92.2	9.2	-1.4
Hong Kong	55.8	16.0	28.2
Indonesia	115.7	11.5	-27.2
Japan	62.9	4.7	32.4
Malaysia	70.9	18.7	10.4
Philippines	99.5	18.0	-17.5
Singapore	60.0	20.9	19.1
South Korea	86.3	12.7	1.0
Taiwan	88.9	8.6	2.5
Thailand	71.9	12.7	15.4
Western Industrialized Economies			
France	37.8	-1.3	63.5
West Germany	43.7	-6.3	62.6
United Kingdom	46.0	3.7	50.3
United States	32.9	26.2	40.9

Why is There No Measured Technical Progress in East Asian NIEs? (1)

- (1) Low level of investment in intangible capital (human capital, R&D capital, knowledge capital and other forms of intangible capital)
  - Utilization of other countries' intangible capital is not costless
  - Complementary indigenous investment is required, e.g., the Green Revolution
- (2) The distribution of "Innovation Rents" favors the innovators and investors
  - Fully priced capital goods and technology
  - Monopolistic pricing of capital equipment, technology licenses and critical components
  - Transfer pricing by foreign direct investors
  - Limited value added, e.g., notebook computers
  - Monopsonistic pricing for OEM manufacturers

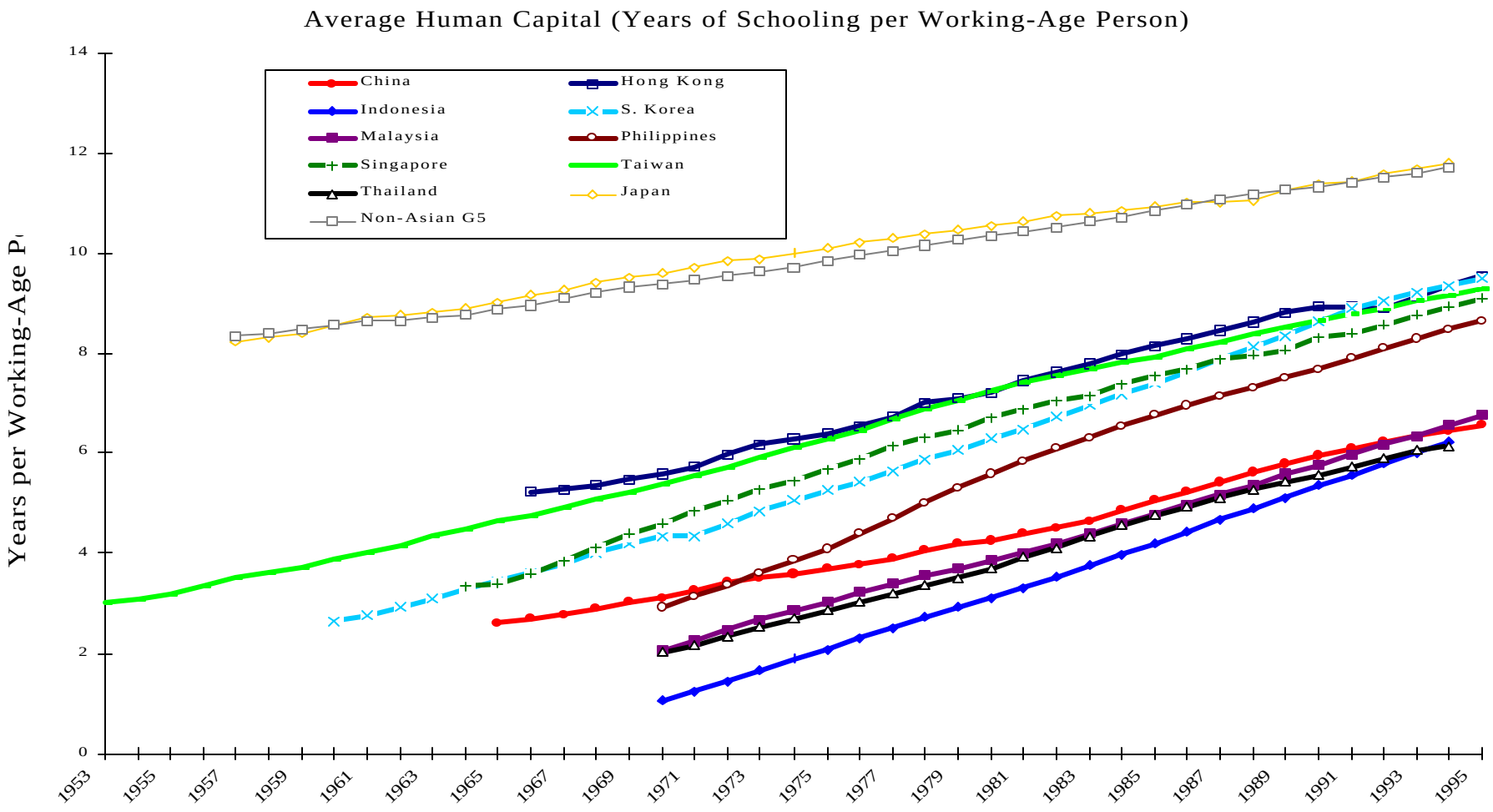
Why is There No Measured Technical Progress in East Asian NIEs? (2)

- (3) Problems of Measurement of Capital
- (4) Aggregation
- (5) Omission of the value of the quality of life

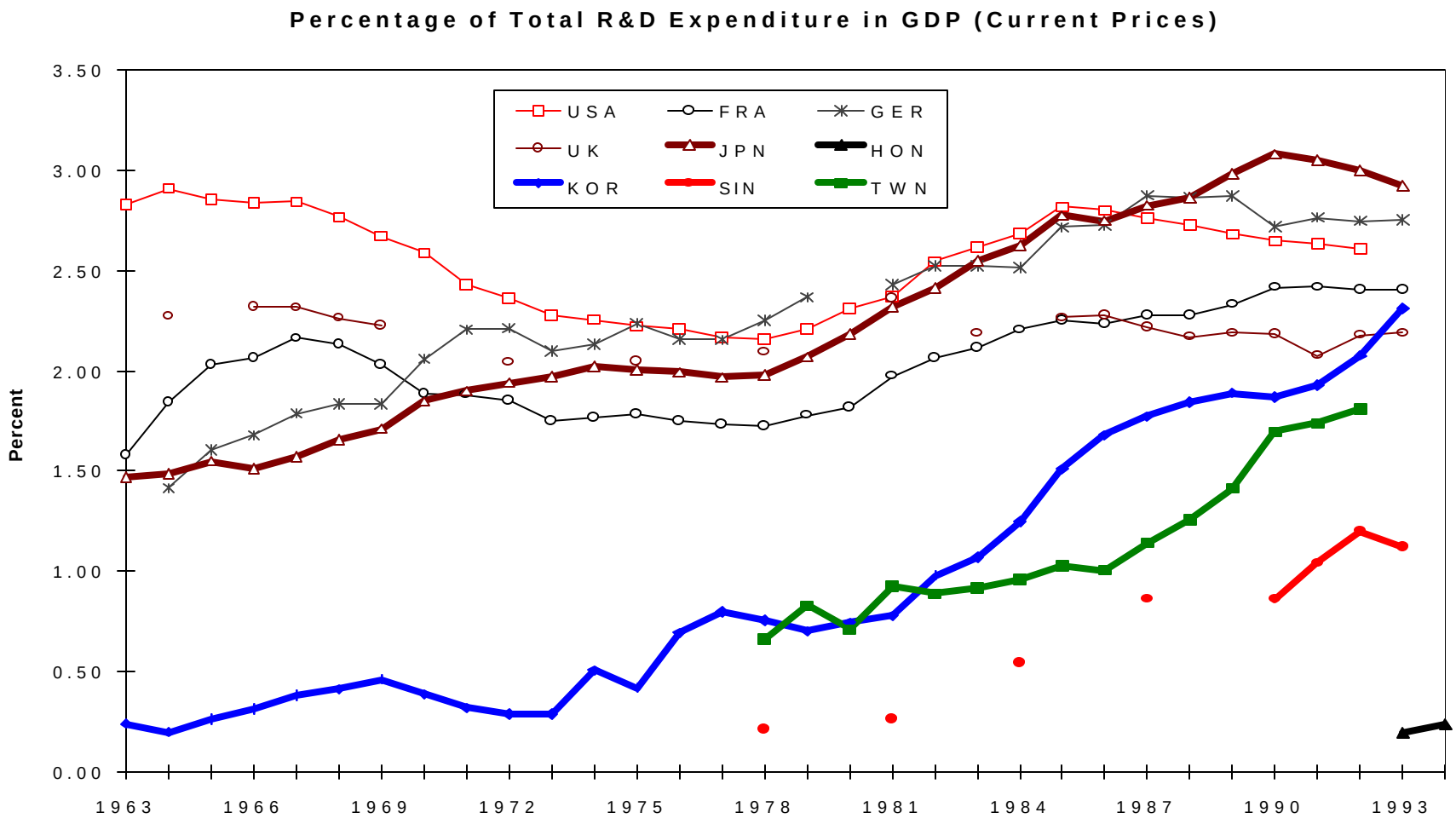
The Sources of Growth: Further Results with Extended Sample--Lau and Park (2000)

Sample (G-5 + 4 NIEs)			
	Tangible Capital	Labor	Technical Progress
Hong Kong	74.46	25.54	0
South Korea	78.2	21.8	0
Singapore	64.8	35.2	0
Taiwan	84.04	15.96	0
Japan	49.9	4.84	45.26
Non-Asian G-5	38.71	2.77	58.52
Sample (G-5 + 9 Asian)			
	Tangible Capital	Labor	Technical Progress
Hong Kong	74.61	25.39	0
South Korea	82.95	17.05	0
Singapore	63.41	36.59	0
Taiwan	86.6	13.4	0
Indonesia	88.79	11.21	0
Malaysia	66.68	33.32	0
Philippines	66.1	33.9	0
Thailand	83.73	16.27	0
China	94.84	5.16	0
Japan	55.01	3.7	41.29
Non-Asian G-5	41.51	1.97	56.53

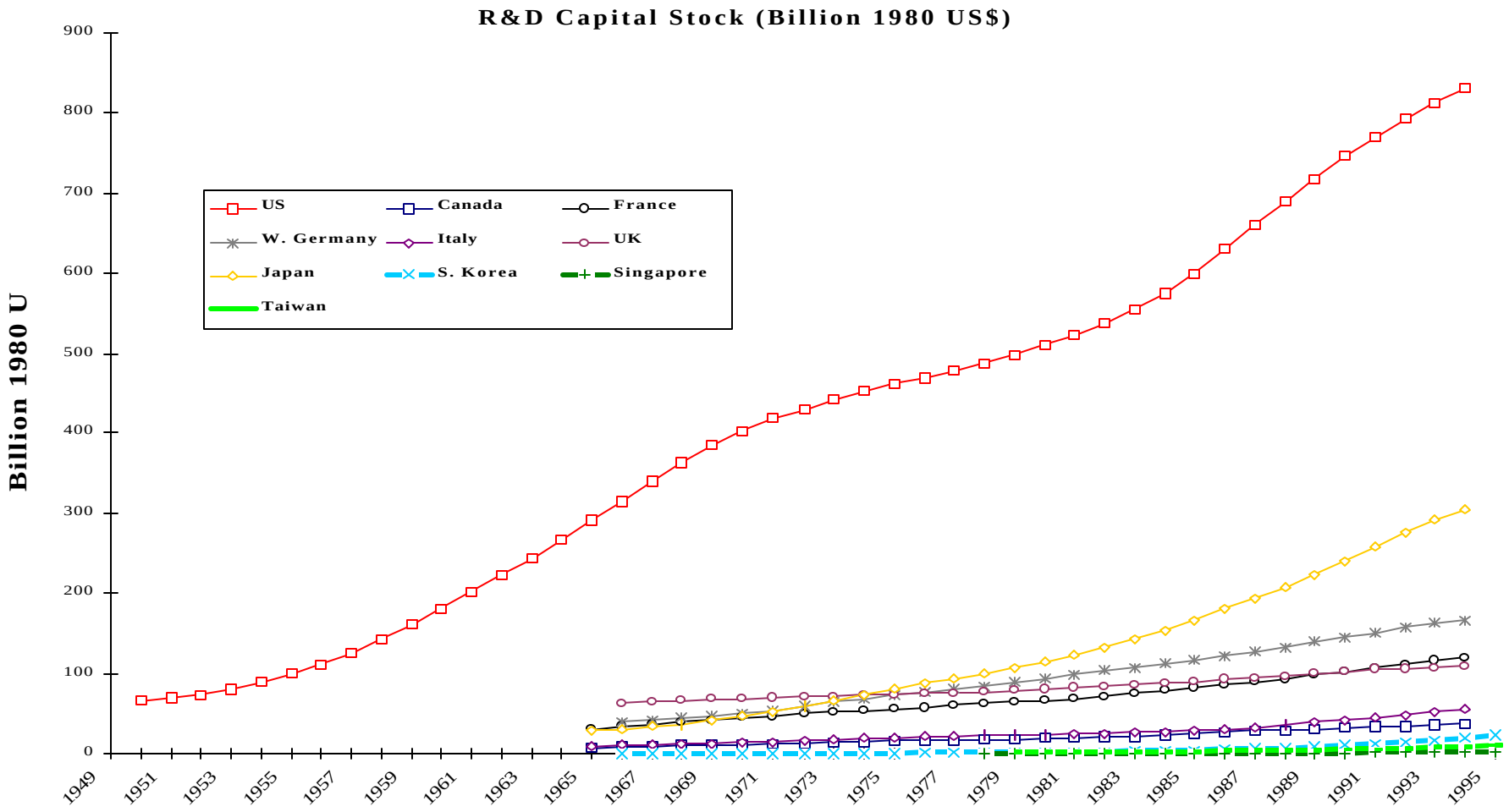
Human Capital



R&D Expenditure as a Percentage of GDP



R&D Capital


R&D Capital Stock (Billion 1980 US$)
Billion 1980 U
900
800
700
600
500
400
300
200
100
0
1949
1951
1953
1955
1957
1959
1961
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
US
Canada
France
W. Germany
Italy
UK
Japan
S. Korea
Singapore
Taiwan

Sources of Economic Growth with Explicit Inclusion of Human and R&D Capital

Table 2.4: Relative Contributions of the Sources of Economic Growth (percent)						
			Intangible Capital			
	Tangible	Labor	Human	R&D	Technical	Total
	Capital		Capital	Capital	Progress	
Korea	62	18	5	15	0	20
Singapore	56	22	5	16	0	21
Taiwan	65	15	4	16	0	20
Japan	37	5	1	8	49	58
Non-Asian G-7	40	4	4	10	43	56

The Sources of Growth: Further Results with Extended Sample--Lau and Park (2000)

	Tangible Capital	Labor	Human Capital	R&D Capital	Technical Progress
South Korea	63.35	13.61	2.1	20.94	0
Singapore	47.33	21.55	1.37	29.75	0
Taiwan	58.73	11.42	1.32	28.54	0
Japan	44.83	5.2	0.82	14.63	34.52
Non-Asian G-7	33.71	3.71	1.32	12.53	48.72

Sources of Economic Growth with Breaks in the Rates of Capital Augmentation (1985)

Sample (G-5 + 4 NIEs)				
	Tangible Capital	Labor	Human Capital	Technical Progress
Hong Kong	48.41	27.57	8.16	15.86
South Korea	51.23	24.78	11.59	12.4
Singapore	46.73	32.43	10.86	9.99
Taiwan	58.26	21.61	9.87	10.27
Japan	38.89	9.17	3.24	48.7
Non-Asian G-5	30.13	7.09	5.21	57.57
Sample (G-5 + 9 Asian)				
	Tangible Capital	Labor	Human Capital	Technical Progress
Hong Kong	56.89	23.65	2.51	16.94
South Korea	65.45	18.62	3.84	12.08
Singapore	53.1	33.94	3.23	9.73
Taiwan	71.26	15.61	3.15	9.99
Indonesia	71.2	14.59	9.38	4.83
Malaysia	54.22	32.47	5.12	8.19
Philippines	54.05	37.81	8.15	-0.01
Thailand	60.84	18.06	5.65	15.44
China	83.87	11.92	4.21	0
Japan	49.04	5.23	1.08	44.65
Non-Asian G-5	37.44	3.36	1.7	57.49

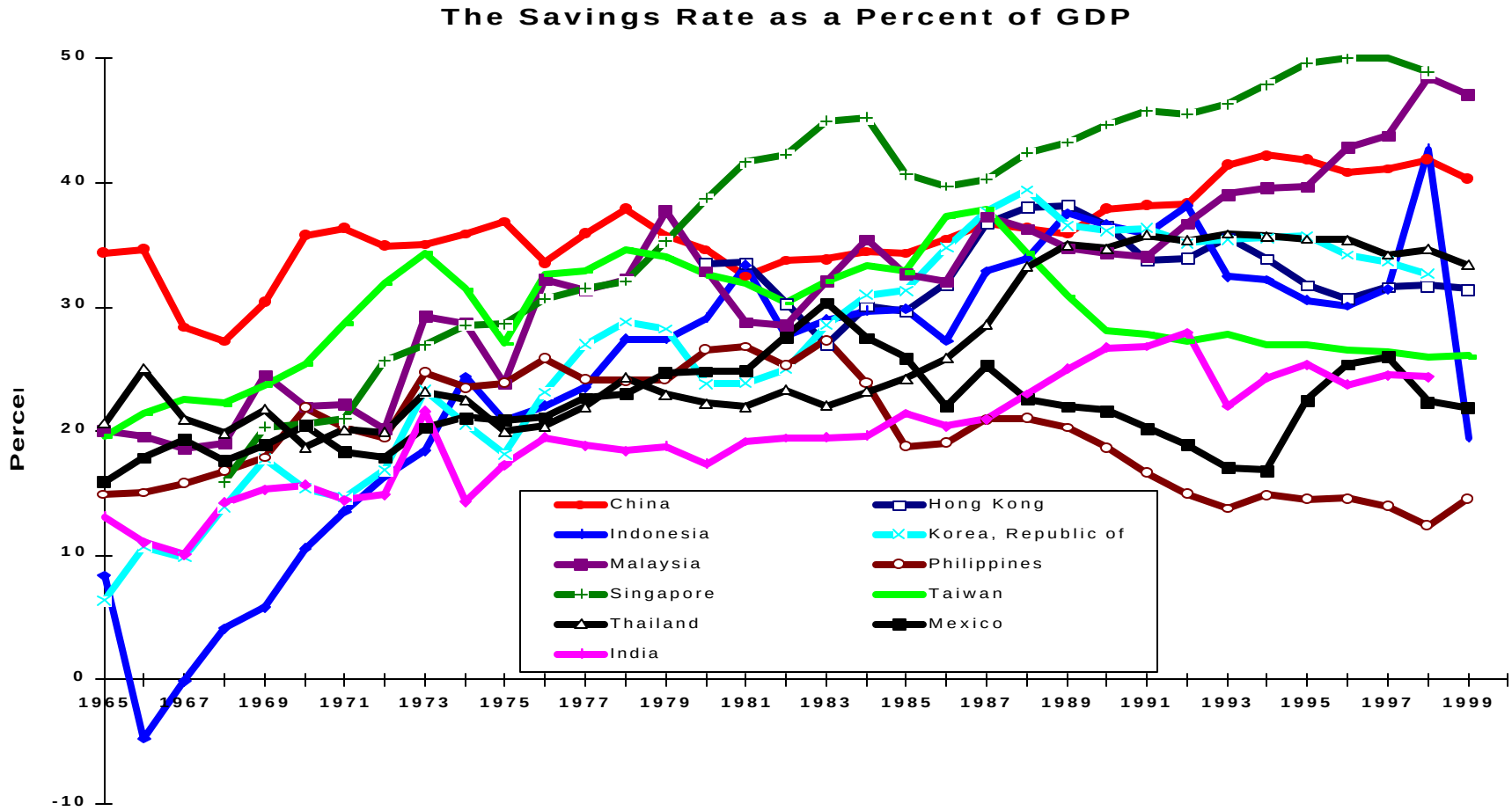
Sources of Economic Growth with Breaks: Sub-periods

Sample (G-5 + 9 Asian)				
1960s-1985				
	Tangible Capital	Labor	Human Capital	Technical Progress
Hong Kong	65.34	31.65	3	0
South Korea	74.66	20.58	4.76	0
Singapore	60.09	35.97	3.94	0
Taiwan	79.92	16.43	3.64	0
Indonesia	76.44	12.41	11.15	0
Malaysia	61.14	32.69	6.17	0
Philippines	55.78	35.36	8.86	0
Thailand	70.77	20.92	8.31	0
China	83.05	12.36	4.59	0
Japan	50.84	5.48	1.06	42.62
Non-Asian G-5	39.69	0.88	1.71	57.72
1986-1995				
Hong Kong	40.81	8.61	1.58	49
South Korea	44.96	14.19	1.8	39.06
Singapore	37.35	29.19	1.6	31.86
Taiwan	41.45	12.61	1.4	44.53
Indonesia	60.25	19.09	5.63	15.03
Malaysia	43.3	32.04	3.44	21.22
Philippines	49.71	44.03	6.29	-0.03
Thailand	49.01	14.61	2.51	33.86
China	85.75	10.9	3.35	0
Japan	34.99	3.17	1.19	60.64
Non-Asian G-5	27	14.66	1.63	56.72

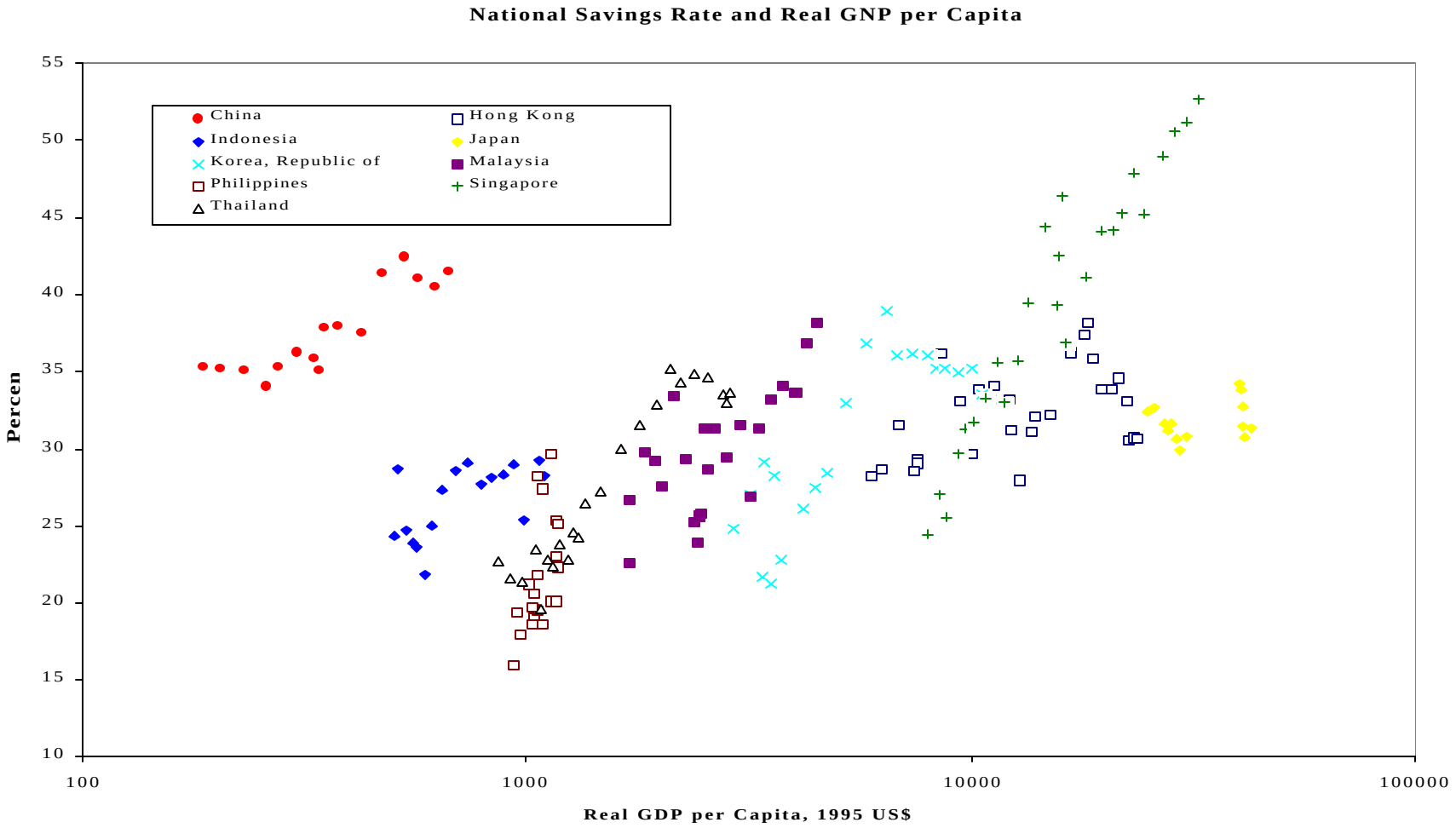
The Sources of Economic Growth--Developing Economies in East Asia

- 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 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 Taiwan

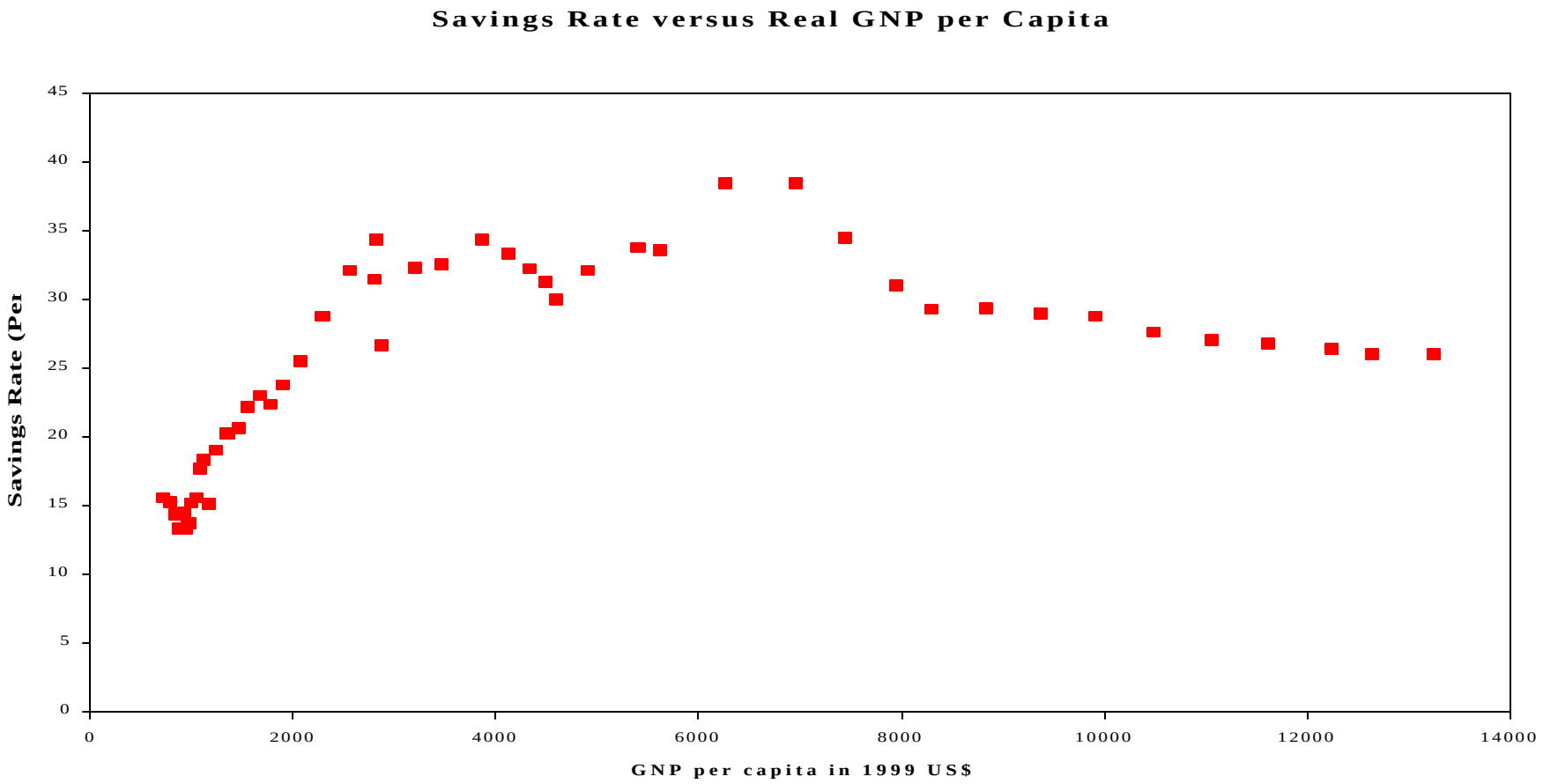
Savings Rates as a Percent of GDP of Selected East Asian Countries



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



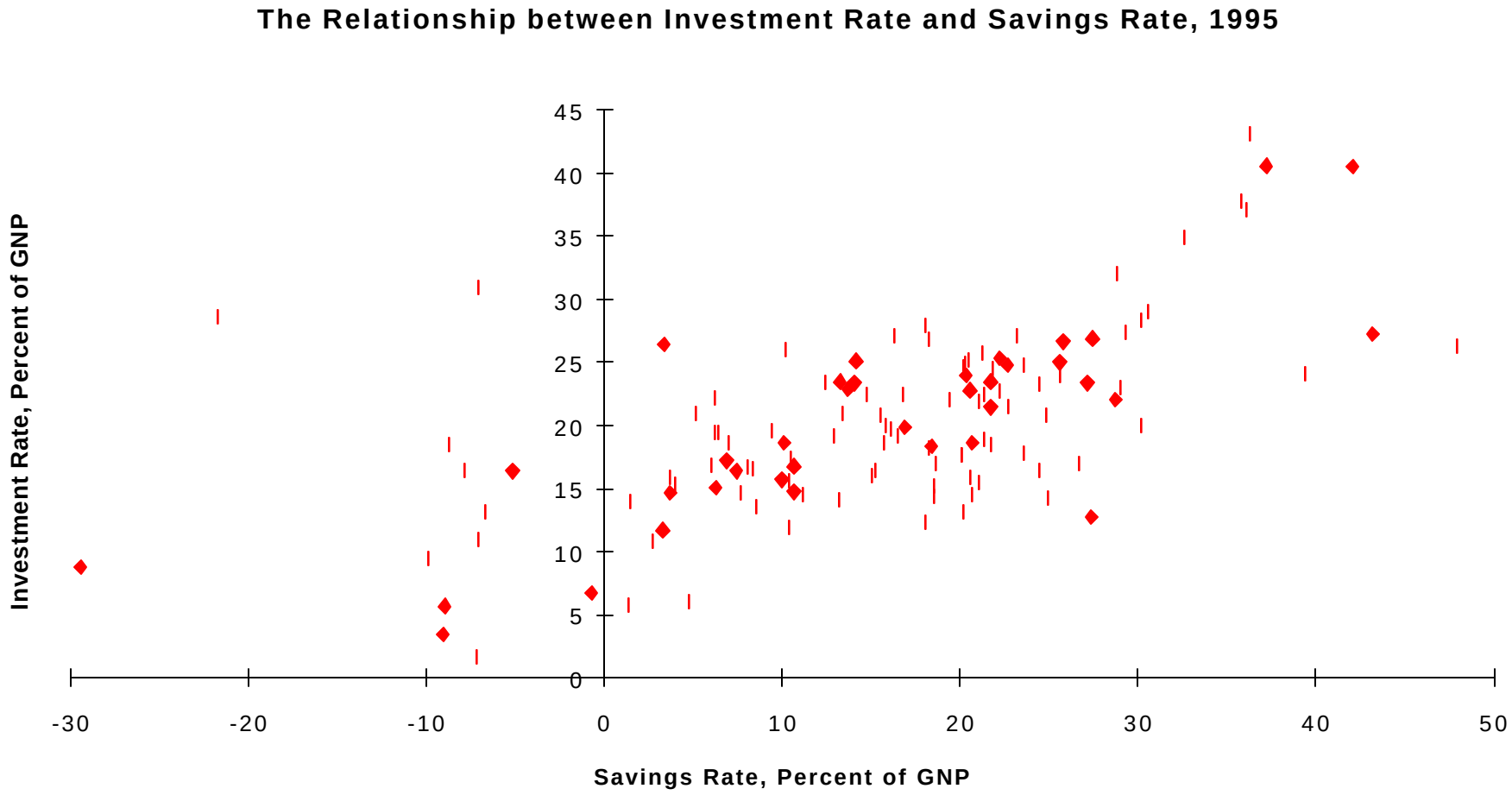
The Savings Rate and Real Output per Capita: Taiwan



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

The Relationship between Investment Rates and Savings Rates



The Sources of Economic Growth--Industrialized Countries

- The most important source of economic growth for industrialized countries is technical progress, accounting for more than half of the growth of output
- Tangible capital is the next important source of economic growth, accounting for almost a third
- Technical progress reflects the effects of intangible capital--R&D capital, knowledge capital, goodwill, etc.
- The United States is a leader in human capital and R&D capital

The Non-Uniqueness of the Postwar East Asian Experience

- Abramovitz and David (1973): U. S. economic growth in the 19th Century can be largely attributed to the growth of inputs
- Tostlebee (1956): The growth in U.S. agriculture in the 19th Century can be attributed to the growth of inputs, with a negative rate of growth of total factor productivity
- Hayami and Ogasawara (1999): Japanese economic growth between the Meiji Restoration and the World War I can be largely attributed to the growth of inputs, principally capital
- Godo and Hayami (1999): Confirms the lack of technical progress in prewar Japan (with human capital included)

Where Is the “Miracle”?

- Achievement of a high savings rate
- Translating domestic savings into investments--the role of self-fulfilling expectations
- Creating and maintaining an environment in which investments are productive
- Philippines as a counter-example

The Role of Economic Policies

- Land reform helped raise agricultural productivity and release savings
- U. S. aid helped bridge the initial savings gap and the foreign exchange gap
- Demographic transition
- Maintenance of a competitive but stable exchange rate
- Maintenance of a low but positive real rate of interest (to promote savings and investment)
- Emphasis on private enterprise
- Maintenance of a stable and predictable economic environment
- Provision of expeditious ad effective social decision-making
- Export-led (as opposed to import-substituting) economic growth
- A focus on economic development--self-fulfilling expectations

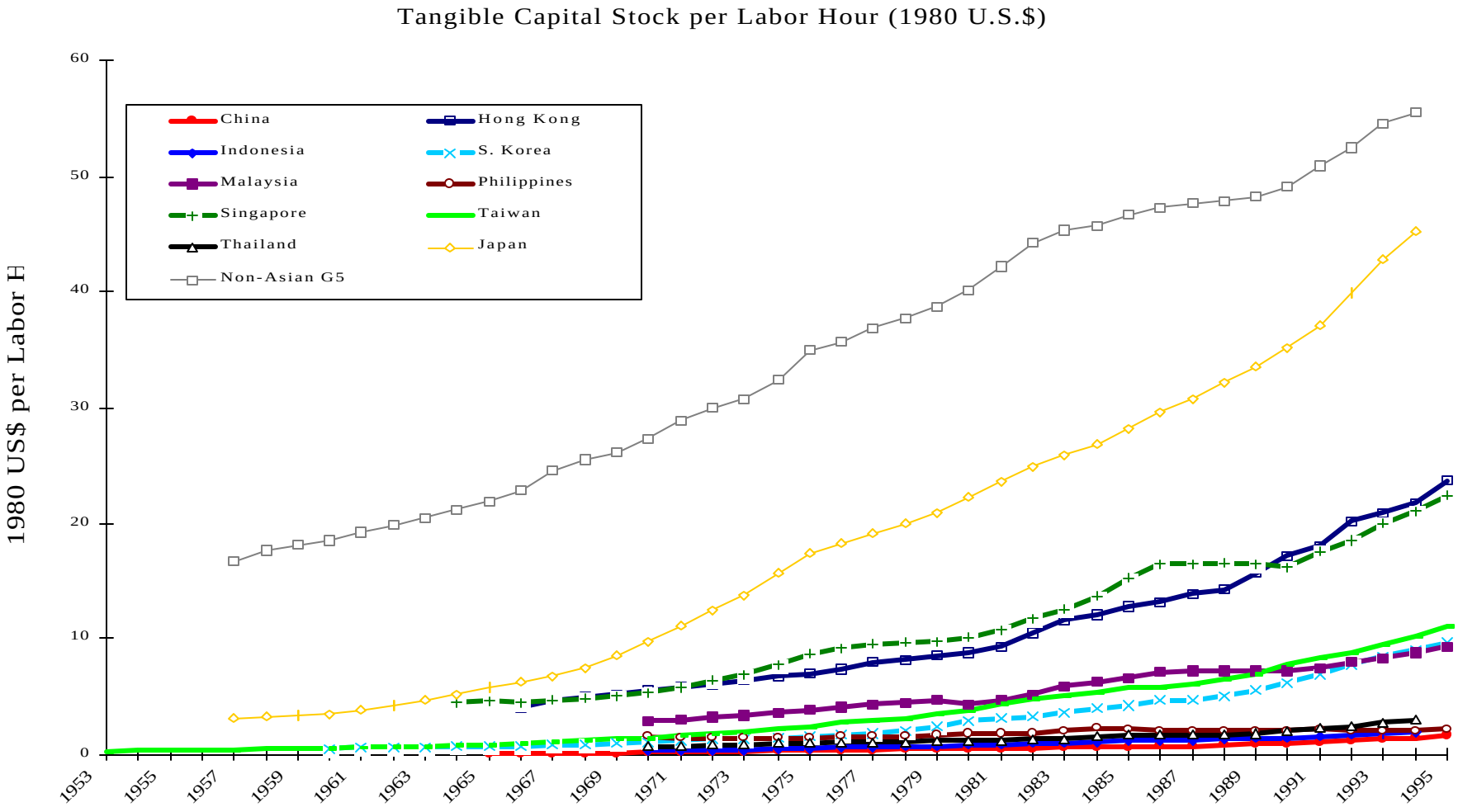
Is Economic Growth Sustainable? Krugman's Worry about East Asia

- If the major source of economic growth is the growth of tangible capital, then given the diminishing marginal productivity of tangible capital, as more and more tangible capital is accumulated, each additional unit of tangible capital will be less productive than the unit before it. Eventually economic growth must slow down and then stop altogether.
- The former Soviet Union was used as an example where a great deal of tangible capital was accumulated but failed to be productive
- However, Taiwan and other East Asian economies lag far behind in both tangible and intangible capital
- Investment in intangible capital can enhance the productivity of tangible capital and counteract the diminishing marginal returns to tangible capital

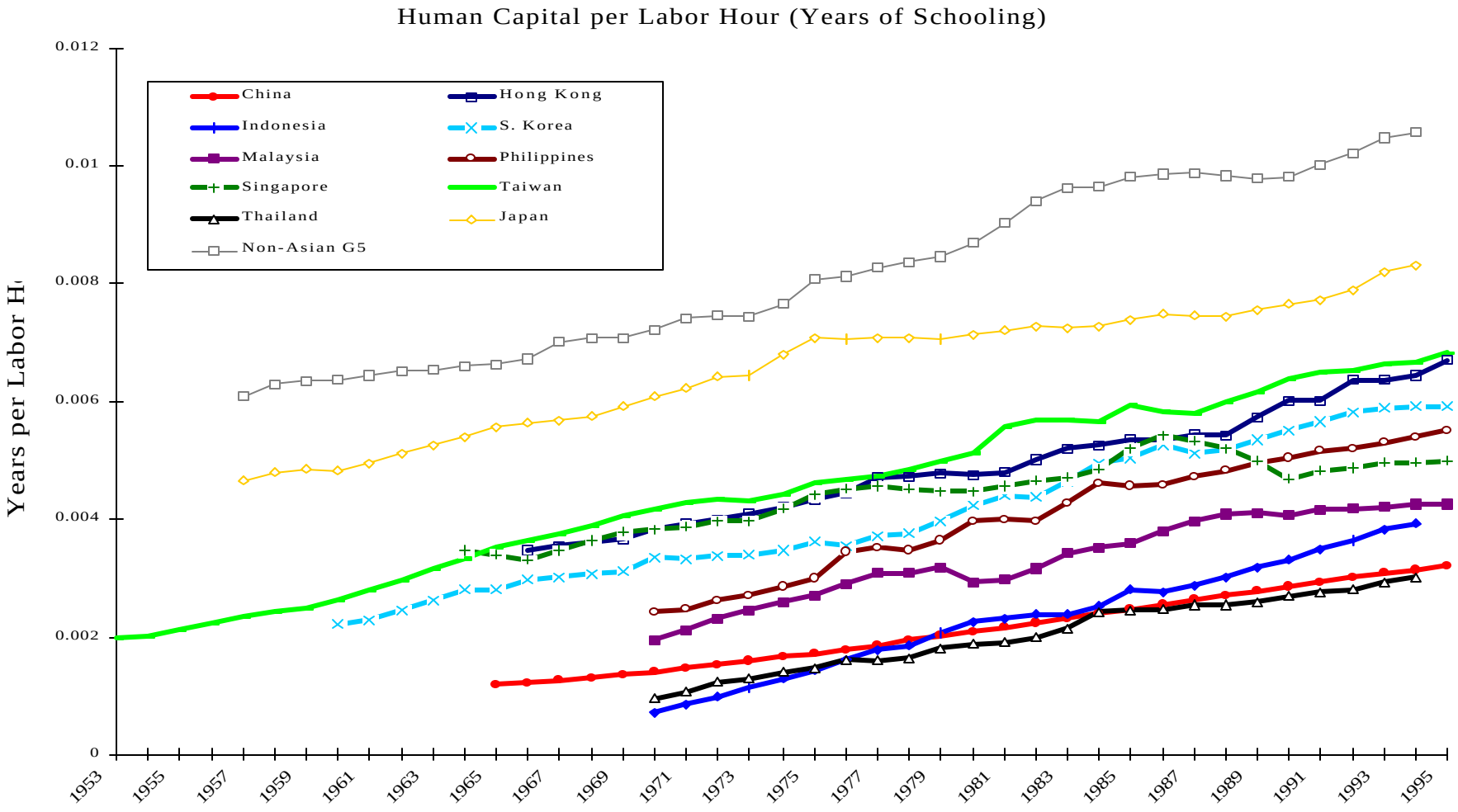
Is Economic Growth Sustainable?
Was East Asian Economic Growth a Bubble?

- Past economic growth neither a miracle nor a mere bubble
  - Economic growth experience replicated in different East Asian economies
  - Sustained economic growth over decades
  - Recent crisis due to many factors, of which “irrational exuberan
  - Economic fundamentals remain sound--high savings rates, investment in human capital, and more recently in R&D capital, entrepreneurship, market orientation
- Past economic growth input-driven rather than technical progress-driven--it is attributable to growth in inputs, particularly the efficient and rapid accumulation of tangible capital
- Considerable room for continuation of rapid tangible inputs-driven economic growth--tangible capital per unit labor still lags significantly behind the developed economies
- Intangible capital per unit labor, e.g., R&D capital, lags even further behind, offering additional opportunities for investment

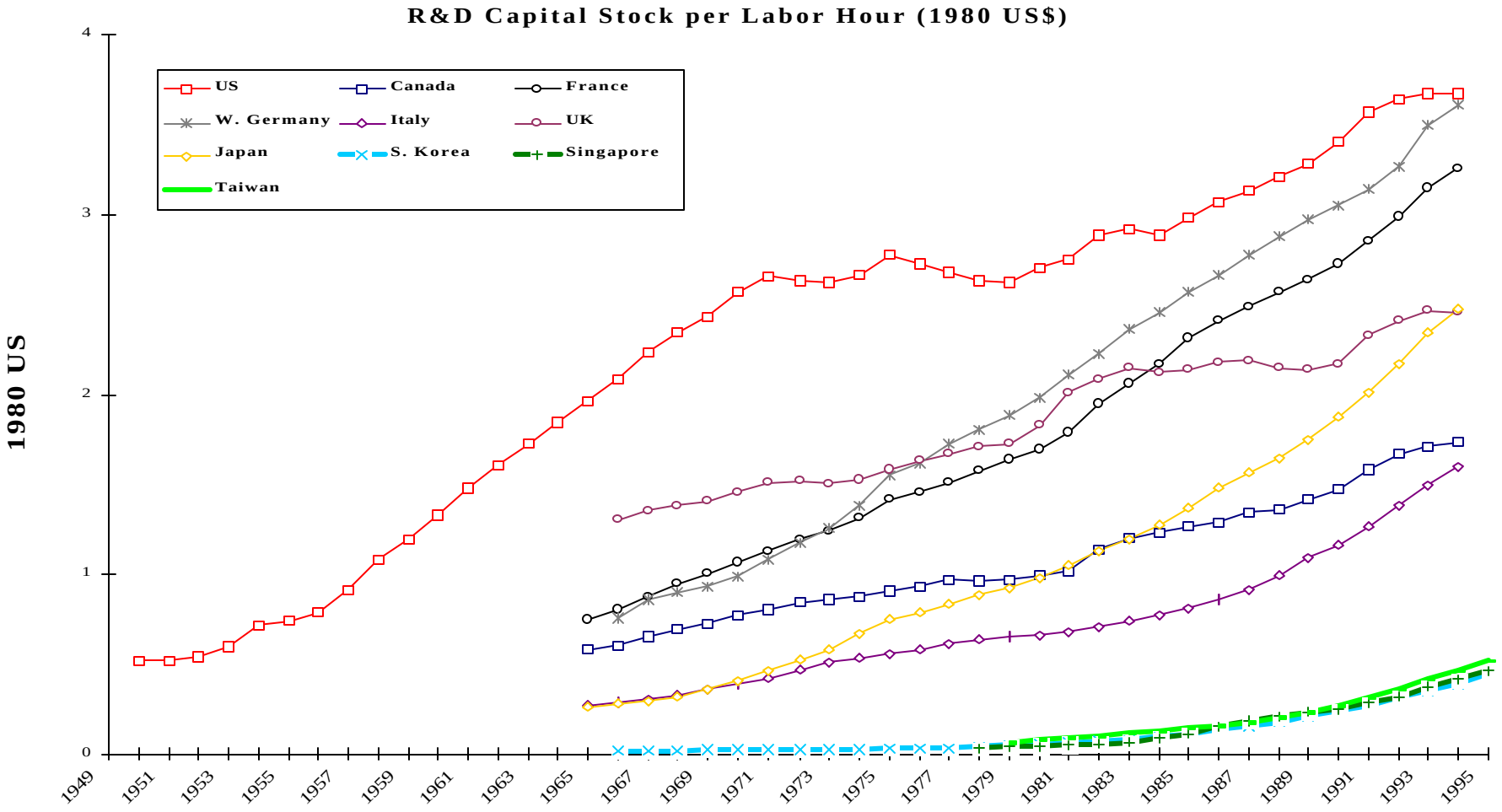
Capital Intensity



Human Capital per Unit Labor



R&D Capital Stock per Unit Labor



Is East Asian Economic Growth Sustainable?

- 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--Taiwan is ahead of other East Asian countries 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

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

- 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 institutes such as Industrial Technology Research Institute (ITRI)
- The importance of private enterprise
- The role of venture capital (CDIB, formerly CDC)
- The role of returnees
- Networks of human capital

New Global Trends

- The information and communication technology (ICT) revolution
- Acceleration of globalization
- De-verticalization and fragmentation of production--focus on core competence coupled with out-sourcing--global supply chains
- Shortening of the product cycle--no firm or industry will last forever
- The World Trade Organization (WTO)--lowering of trade barriers; U.S. focus on services and investment, not goods
- Mobility of capital at the speed of light--how to insulate oneself?
- Increasing leisure time
- The emergence of Mainland China and India

Impacts of the ICT Revolution on the Economy: Reductions in Transactions Costs

- Significant reductions in the transactions costs (due to more, faster, better and cheaper information), including the costs of intra-firm and inter-firm coordination
  - The costs of internal management, monitoring and control--This can facilitate both greater centralization and paradoxically greater autonomy and devolution of decision-making downward and outward
  - The costs of inter-firm coordination
    - The IT revolution enhances predictability and reliability of division of labor across firms and thus shifts the advantage to “De-verticalization”, “Out-sourcing”, and “Globalization” of supply chains
    - Reduction in transactions costs enables the exploitation of efficiencies in specific segments of the design, manufacturing, marketing and distribution process
  - Many services have become highly tradable or potentially highly tradable and can be “outsourced” globally
    - e.g., software, back-office paper work, design, quality assurance, entertainment

Increases in Timeliness of Information; Reductions in Costs of Market Creation

- Significant increases in the timeliness of economically relevant information (sales, inventory, competitor's prices and new products, etc.) and decreases in the response time
- Significant reductions in the costs of market creation, expansion, differentiation, and segmentation--markets not bounded by physical space and time limitations
  - Aggregation of users/consumers to create new and diverse markets consisting of consumers who may be geographically dispersed or socioeconomically stratified
    - e.g. vegemite; vegetarians; exceptionally large and small sizes of clothing; left-handed individuals
  - Vast expansion of consumer choice
    - The ease of customization through the internet (e.g. many different choices are possible (Dell))
    - Products are built to order rather than on speculation

Implications of the New Economy

- Both the reductions in transactions costs and the timeliness of information flow expands the span of control of managers and results in the flattening of organizations
- They also encourage “de-verticalization”, “globalization” and “out-sourcing”
- The “Product Cycle” has been greatly shortened--reduction in “time to market”--the average product cycle has shortened from 5 years to 12-18 months
- The rise of new markets, products, services, and business models
- Transformation of the “Old Economy” through application of the new information and communication technology--meeting the “old” needs in new ways
- The “New Economy” further facilitates globalization through the international diffusion of the information/communication technology

Economic Globalization

- Globalization is also facilitated by the decline in transportation and communication costs
- Specialization of firms in “Tasks” rather than “Products”
  - Global vertical division of labor--global supply chains
- Trade in “Intermediate Inputs” and “Services” rather than finished “Products”
  - A substantial proportion of world trade is intra-company trade
- The concept of national origin of a product or a service becomes fuzzy

De-Verticalization or Fragmentation of Production

- De-Verticalization or “Fragmentation”--vertical division of labor--separation of design, manufacturing, marketing, inventory, transportation and distribution functions (generalized out-sourcing) both within and across national boundaries
- Logistics and supply chain management--managing a production process not all of which lies within a single firm
- De-verticalization depends on the possibility of standardization (uniform grading), existence of common platforms (precision, communication protocol, compatibility, etc.).
- It also depends on quality assurance (possibly by impartial third parties) and timely performance--reputational capital is key here
- However, a long-term collaborative relationship is still indispensable in sectors with rapid innovation (repeated game)

The Benefits of De-Verticalization or Fragmentation of Production

- De-verticalization and out-sourcing encourage specialization (in tasks rather the products
  - Emphasis on “core competence” and focus on adding value
  - Blurring the boundary between manufacturing and service
- De-verticalization and out-sourcing permit efficient sharing of resources and thus
  - Reduces the fixed costs of and hence lowers the barriers to entry--promotes competition
    - Example: the rise of “fabless” semiconductor design firms
  - Enables the realization of economies of scale and learning-by-doing effects through specialization in particular tasks (rather than products)
    - e.g., firms do not typically generate their own electricity; the semiconductor foundry business; delivery services such as United Parcel Service (UPS) and Federal Express
  - Allows the realization of the benefits (efficiency gains) of targeted incentives in specific tasks or segments of the traditional business
  - Much duplication of efforts--”rediscovering the wheel”--can be avoided

Implications of a Shortened Product Cycle

- The shortened product cycle in turn also mandates a reduction in fixed costs, and hence de-verticalization and out-sourcing
- De-verticalization and out-sourcing are also strategies for achieving rapid responsiveness and risk sharing, especially in an uncertain environment
- The “first-move advantage” is magnified by the shortened product cycle as well as the expanded possibilities for the realization of both technological and market economies of scale
- Traditional life-time employment in the same industry and product segment is no longer possible

Transformation of the Old Economy

- It makes no sense to try to save low-paying jobs; even if one were successful, the workers thus saved would be doomed to a permanent level of low income
- The Government is much better off providing education and re-training allowances to affected workers, and to provide life-long subsistence support where it is not possible to re-educate or to retrain them (this way the problem will be solved in at most one generation)
- If the United States still has a sizable percentage of its population in agriculture today, its per capita income would have been much lower
- The new economy will bring about creative destruction of the old economy
- Many old economy functions can be rationalized and made more efficient through the use of information and communication technology

The Risk of "Hollowing Out"-- De-Industrialization

- The Silicon Valley is the prime example of successful fragmentation--it has indeed been hollowed out, but real wage and income per capita has kept rising and unemployment is at an all-time low
- Production has been out-sourced to elsewhere in the United States (Colorado, New Mexico, Oregon) and to the rest of the World, including East Asia (and Taiwan in particular)
- Diversification away from sole-sourcing is inevitable--should Taiwan leverage up its expertise, or should Taiwan let someone else do it?
- The distinction between "made by Taiwan" and "made in Taiwan" (the value is in the branding and the reputation of the firm, not in the place)
- The distinction between GNP and GDP

The Risk of "Hollowing Out"

- There will be "hollowing out" if there is no substitution of the old industries by new ones
- Silicon Valley has shown how it is possible to continue to be prosperous with out-sourcing on a massive scale by controlling the most profitable (the highest value-added) links of the global supply chain
- Japanese firms have also used a "critical components" technology and tried to upgrade their technological levels to stay ahead of their potential rivals in the developing economies
- Maintaining an environment that facilitates the constant creation of new firms and industries is the key
- Taiwan has always been able to move upwards in the value-added chain--it has always been successful in introducing new industries and now new services

Exports and Imports by Commodities--Evolution over Time

- Bananas, pineapples, sugar
- Grey goods (textiles), garments
- Plastics
- Ceramics
- Shoes
- Television sets
- The world's largest producer of computer monitors, mice, motherboards, keyboards and scanners
- Fax machines
- 25% of the world's desktop computers
- 50 % of the world's notebook computers
- Semiconductors--DRAMs, LCDs

The World Trade Organization (WTO)

- Promotion of “openness” works in Taiwan’s interests, given Taiwan’s size and political isolation
- Taiwan should sign as many free trade agreements and join as many free trade areas as possible

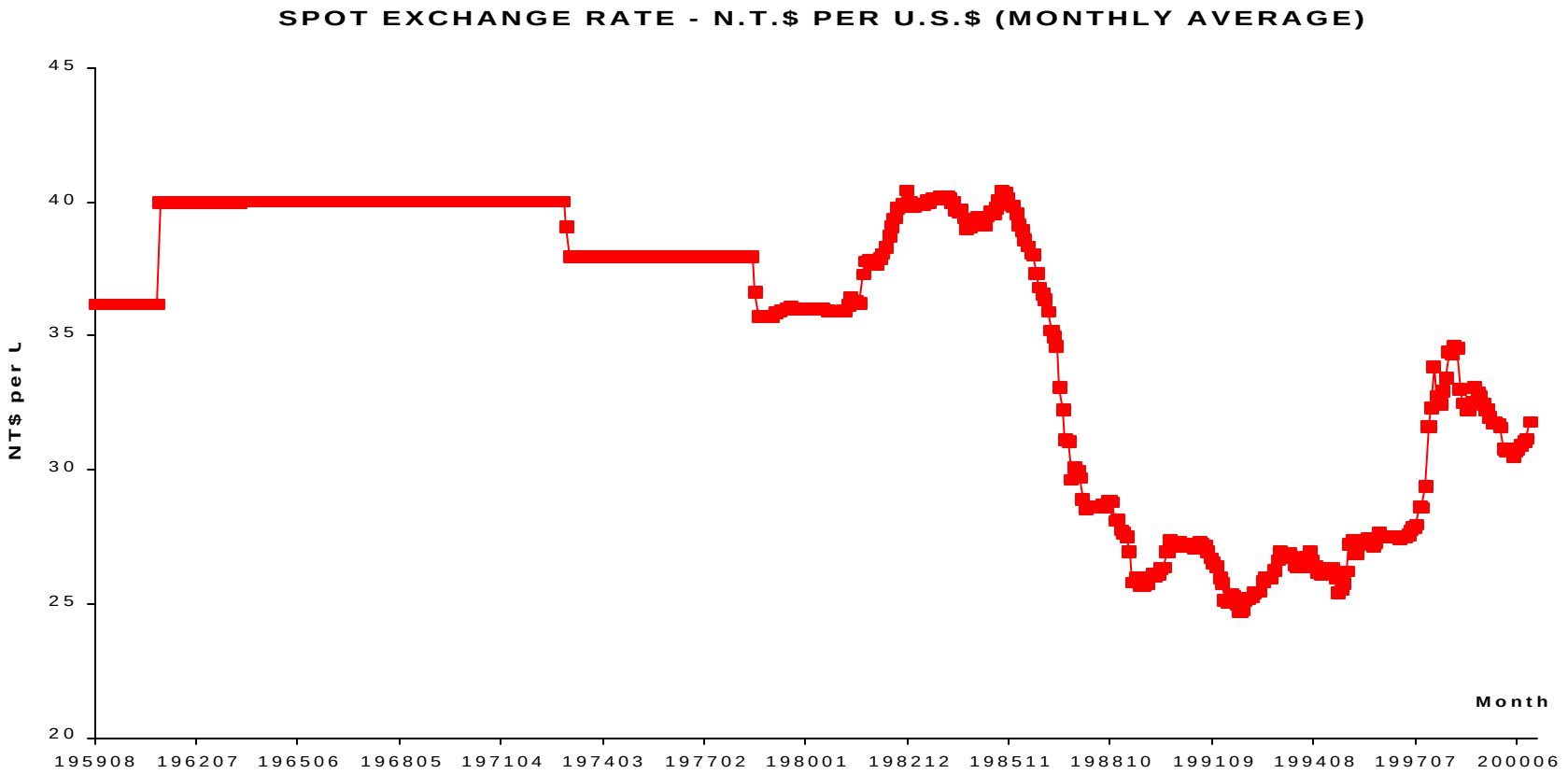
Does Taiwan Really Need a Floating Exchange Rate? The Possibility of Dollarization

- Hot money flows as well as political developments can easily disrupt the foreign exchange market in Taiwan
- Advantages of Dollarization or a currency board for Taiwan
  - Uncertainty in the exchange rate discourages trade, reduces real output and real fixed investment; removal of the uncertainty encourages trade, increases real output and real fixed investment
  - Uncertainty in the exchange rate also raises the rate of interest through the risk premium
  - A stable exchange rate encourages long-term foreign portfolio and direct investment by United States and other investors with currencies pegged to the U.S.$ and promotes economic integration
  - Dollarization or a currency-board arrangement takes the monetary policy out of the realm of politics
  - Under true Dollarization, or a credible currency board system, if there is capital flight, it is not due to fear of devaluation
  - Taiwan has ample foreign exchange reserves to make Dollarization or a currency board work

Does Taiwan Really Need a Floating Exchange Rate? The Possibility of Dollarization

- Through Dollarization, or having a fixed parity to the US$, Taiwan firms and its major suppliers of inputs (technology, capital equipment, human capital, oil, natural gas, raw materials) and major customers of outputs will all have the same currency and hence no more exchange rate risks on all sides
- It is true that Taiwan will lose the ability to have an independent rate of interest policy, although this ability is rather tenuous in any case, given the almost complete absence of capital controls on outward remittances by citizens of Taiwan. Fiscal policy can still be used for domestic stimulus purposes.

The Exchange Rate



The Benefits/Costs of a Devaluation

- The prices of all tradable goods, including skilled labor, are determined in the world market and cannot be affected by Taiwan no matter what it does
- The import content of Taiwan exports (equipment, intermediate inputs) is very high
- Devaluation increases the risk premium on the domestic rate of interest and imposes a cost on capital-intensive industries such as semi-conductor manufacturing
- Thus, a devaluation only makes the non-tradable goods, principally land, and unskilled labor, appear cheaper in US$ terms, the prices of all tradable goods remain the same in U.S.$ terms
- Wage rates are in general flexible in Taiwan, except for government employees and those workers in the world labor market and thus, ultimately, depends on the price of tradable goods and land

The Benefits/Costs of a Devaluation

- A devaluation immediately leads to an increase in prices, including that of land, in NT$ terms, which reduces the real wage of the workers; moreover, it will lead to a second round of inflation as the nominal wage rate rises

Devaluation versus a Decline in the Price of Land

- The same degree of external competitiveness as a devaluation can be achieved by keeping the exchange rate constant but increasing the supply of land so as to lower its price
- Allowing bona fide farmers to change the use of their land on a more liberal basis actually benefits them much more than any system of subsidy designed to keep them on their land
- If land use can be changed more easily, the price of land will decline, benefiting all businesses
- A rising price of land will threaten Taiwan's competitiveness in the long run

The Risk of a Continuous Devaluation Strategy

- South Korea has used such a strategy for a long time until recently
- However, the real income per capita of an economy cannot grow without a continuous upgrading of industries
- There will be economic stagnation if the traditional industries are kept viable through a strategy of continuous devaluation--real income per capita will stop growing

New Demand for Services

- Demand for education, training, and life-time learning
- Demand for recreational activities, including tourism

The Emergence of Mainland China and India

- Mainland China as a sub-contractor/production and export base
- Mainland China as a market in which scale and credible market power (critical to standard setting and branding) can be achieved
- Mainland China as a supplier
- Mainland China as a competitor
- Taiwan firms have a special advantage over the firms of other countries investing in Mainland China
- Investments will be made in Mainland China whether Taiwan firms invest or not

Managing Economic Relationship between Mainland China and Taiwan

- Economically viable and mutually beneficial transactions
- Overseas Private Investment Corporation insurance for foreign direct investments made by Taiwan firms in Mainland China and elsewhere against nationalization and confiscation risks can protect investors from political pressure--so they do not need to pressure their own Government
- Global taxation and tax treaties/agreements to cover overseas investments
- Access to public capital market in Taiwan and ability to deduct operating losses from abroad against consolidated taxes
- Profits made in Mainland China and elsewhere to benefit the shareholders of Taiwan firms and to subject to Taiwan taxation
- Opening of Taiwan to Mainland Chinese direct investment (and tourism)

How Much Economic Dependence on Mainland China is Risky for Taiwan?

- China is now the second largest market for Taiwan, after the United States, with much of the trade consisting of intermediate goods
- As long as Taiwan firms are upstream, and Mainland Chinese firms (including Taiwan-invested firms) are downstream, there is little risk because the downstream firms typically depend on their upstream firms for their intermediate inputs (the Japanese example)
- However, no advantage is permanent--continual upgrading is necessarily to maintain competitive edge
- In fact, the greater risk is posed by selling only finished goods to Mainland China as opposed to investing in a downstream firm--unless there is absolutely no other supplier in the world. It is much better to have these goods finished in a factory over there so that there is an incentive on the other side not to interfere with the trade flow in intermediate inputs

Democratization in Taiwan

- Environmental concerns
- Social welfare policies
  - Learn from the mistakes of other countries
  - Incentive effects are important

Implications

- Specialization in tasks rather than products
- Higher labor quality requirements
- Smaller and more nimble firms and a larger proportion of self-employed workers
- Opening of the economy is essential and irreversible
- Uncertainty and volatility of demand
- Social safety net is even more necessary than before

Priorities for Taiwan

- Active participation in the global economy
- Identifying core competence and special niches--where can Taiwan add the most value? Which link(s) of the supply chain should Taiwan try to fight for, to keep or to let go?
  - e.g., choosing to be a manufacturer or a marketer (Nike)
  - e.g., choosing to be a contract manufacturer or a designer (TSMC)
  - Sharing a supply chain--TSMC, ASE, VIA
  - The rise of flexible manufacturing--Solectron, Flextronics
- The critical determinant is the value-added--what kind of economic activities can support and sustain a high, real wage rate?
- How to maintain long-term competitiveness?
  - Education and training of the labor force
  - An efficient social safety net
  - Keeping the price of land affordable
- The problem of transition

What Does the Future Hold? Paradigms

- Silicon Valley
  - Innovation through open competition
  - Globalization, fragmentation and out-sourcing enhances rather than diminishes the economic success of the Silicon Valley
  - Unemployment is at an all-time low
  - Inter-firm networking among professionals
- Northern California
  - Same population; similar climate; knowledge-based economic activities
- Japan
  - Continuous upgrading of industry
  - Continued dominance in the production of critical components
- Netherlands and Switzerland
  - Large global firms--Phillips, Shell, Unilever, Asea-Brown-Bovary, Nestle
  - Brand-name products, special niches (the watch industry in Switzerland has come and gone)

Models Not to Follow

- Silicon Valley
  - High cost of housing
- Japan
  - Ten years of stagnation
  - Heavy hand of government
  - Lack of a vision and a strategy
  - Inhospitable to 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

Models Not to Follow

- South Korea
  - It is too late for Taiwan to develop some of the traditional heavy industries, such as automobile.
  - The chaebols are not a good model for the promotion of innovation
- France
  - It is impossible to fire anyone in France. As a result, no one gets hired. There is an attempt to get around the law through using employment agencies like Manpower

Implications for Taiwan (1)

- Maintaining the growth in tangible capital
  - Encouraging savings and investment
  - Preserving a low-tax environment
  - Affirming property rights
  - Keeping inflation under control
  - Maintaining free flows of capital, labor and goods
  - Maintaining an orderly and stable foreign exchange market
  - Providing needed infrastructure
  - Avoiding open-ended social welfare programs
  - Strengthening capital markets

Implications for Taiwan (2)

- Assuring the efficiency of tangible capital
  - Commitment to an open economy
  - Continued liberalization and deregulation
  - Preserving open competition in all markets
  - Maintaining the rule of law
  - Providing needed infrastructure
    - Traditional economy requires physical infrastructure--railroads, roads, ports, airports, power, etc.
    - New economy requires, in addition, virtual infrastructure--Telecommunication (Telephone and internet access from every village; Fiber optic links); Wireless; National and international delivery services--United Parcel Service (UPS), Federal Express; Generic trading platforms; Enabling technologies and services (Internet service providers; portals)
  - Eschewing market intervention
  - Maintaining land prices at affordable, competitive levels

Implications for Taiwan (3)

- Closing the gap on intangible capital
  - Investment in human capital (formal, technical, on-the-job training, and re-training); universal secondary and tertiary education; a PC and Internet access device in every classroom
  - Tax incentives and subsidies for education and re-training and R&D
  - Support for basic science
  - Upgrading the universities to be the among the best in the world
  - Investment in R&D capital
  - Investment in other forms of intangible capital (design, goodwill, brand name, market development, information systems and software, etc.)
  - Protection of intellectual property rights
  - New modes of education and information dissemination

Public Investment in Human Capital

- Investment in Human Capital (formal, technical, on-the-job training, and re-training); re-orientation from firm-specificity to worker-specificity (flexibility, adaptability and re-employability); mobility (institutional and legal); network externalities and benefits from networking; accreditation, standardization, quality assurance and examinations and tests
- Human capital is critical for a number of reasons:
  - Complementarity between human capital and tangible capital
  - Complementarity between human capital and R&D and knowledge capital
  - Network externalities (e.g., the benefits of Ph. D.'s depend on having a critical mass and on externalities generated by their interactions—the whole is more than the sum of its parts)
  - The network of entrepreneurs, engineers, scientists and venture capitalists themselves is a form of human capital itself, especially valuable under conditions of de-verticalization

Investment in Other Intangible Capital

- Investment in R&D Capital--necessary for both learning and diffusion
  - Essentiality of indigenous R&D for the successful exploitation of imported technology, e.g., new rice variety
  - The distribution of gains from technology trade and transfer is biased in favor of the innovators and the owners of intangible capital (e.g. brand names) and not the imitators
  - Licensing frequently takes the form of cross-licensing
  - R&D projects as an instrument of industrial policy (Strategic R&D)
  - Focus on development rather than basic or applied research
  - Consortium approach
- Investment in other forms of Intangible Capital (Design, Market Development, Information System and Software, Etc.)
- Networking with Silicon Valley and elsewhere

Implications for Taiwan (4)

- Investment in social and institutional infrastructure
  - New boards/stock exchanges for high-tech and non-state-owned enterprises (Domestic versions of NASDAQ) so that "Initial public offerings listings on domestic stock exchanges can be an exit strategy for investors--high-risk ventures should be financed with equity rather than debt
  - Uncertainty created by globalization of supply chains and hence global competition and shortening of "Product Cycles" necessitates
    - The establishment of a social safety net that encourages individual incentives but provides security for the truly indigent
    - Promotion of competitive, flexible, and mobile labor markets with wage rates and other compensation freely determined by market forces
    - Improving the educational and training systems--flexible skills, retrainable labor force, higher quality
    - Design of equipment that are labor-friendly
  - Standardization and grading; quality assurance

Implications for Taiwan (4)

- Creation and maintenance of an hospitable environment/habitat for entrepreneurs and start-up firms
  - Simplification of tax and competition laws and regulations to facilitate the establishment and operation of start-up and small and medium-sized firms which can be expected to be more nimble than large firms
  - Adoption of tax and competition laws and regulations that encourage entrepreneurship and new businesses so that new jobs may be created faster than old jobs are destroyed
  - Promotion of a culture of open communication and mobility; of acceptance of risk and failures; that enables the realization of network externalities and the benefits of networking
- Promotion of university-industry-government cooperation and collaboration

Prospects for Future Economic Growth Remain Good

- Prospects for continued economic growth in Taiwan remain good
- The experience of developed economies, especially that of Japan, suggests that investment in R&D capital and other forms of intangible capital has high returns
- Because of its complementarity with tangible capital, investment in intangible capital can retard the decline in the marginal productivity of tangible capital
- There is also evidence of positive technical progress in the more recent period
- A shift towards the service sector (education and recreation) and self-employment
- The people of Taiwan are entrepreneurial and hard-working--all they need is a good, stable environment
- A vision of the future and a realistic strategy for getting there