

Global Economic Trends

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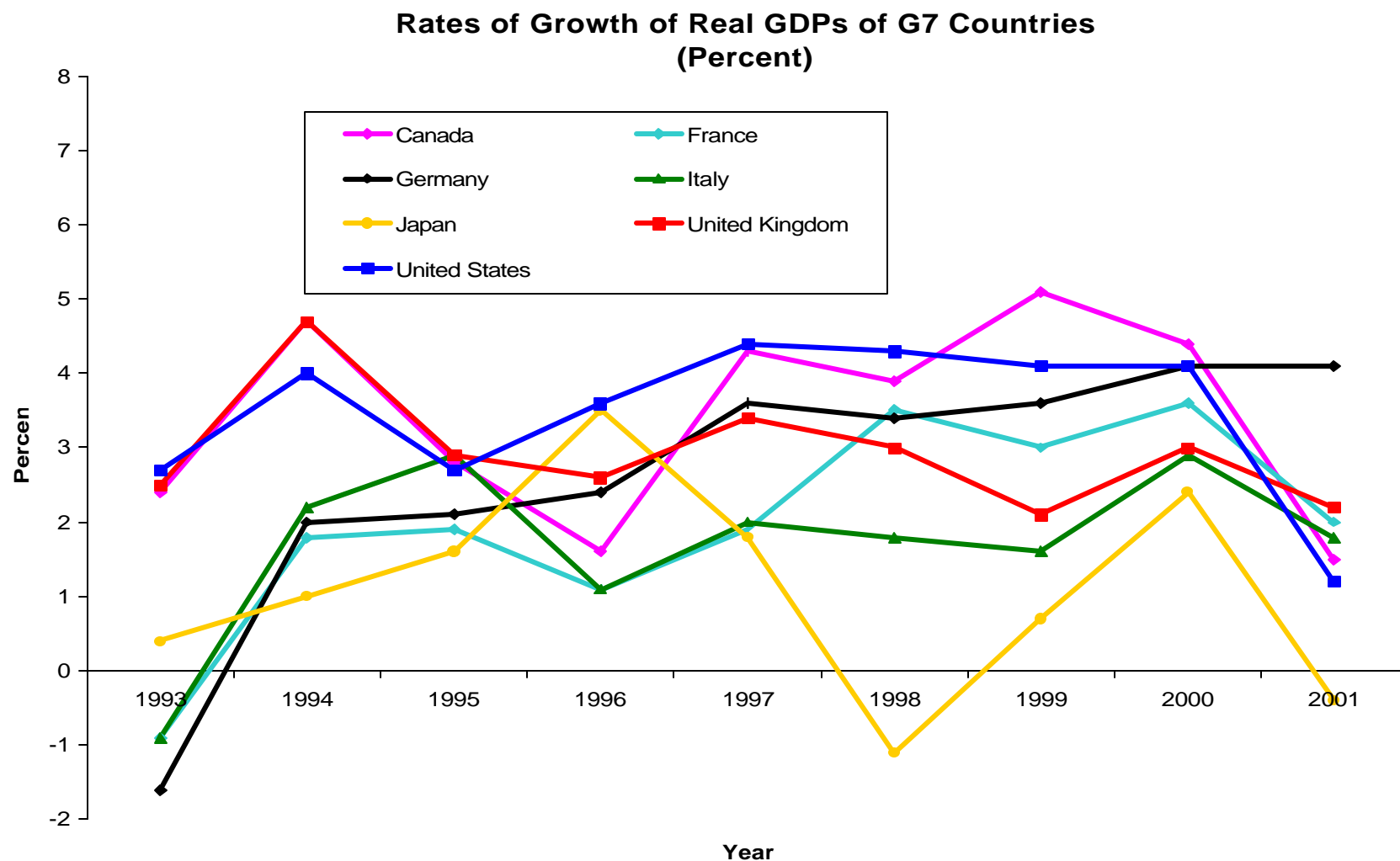
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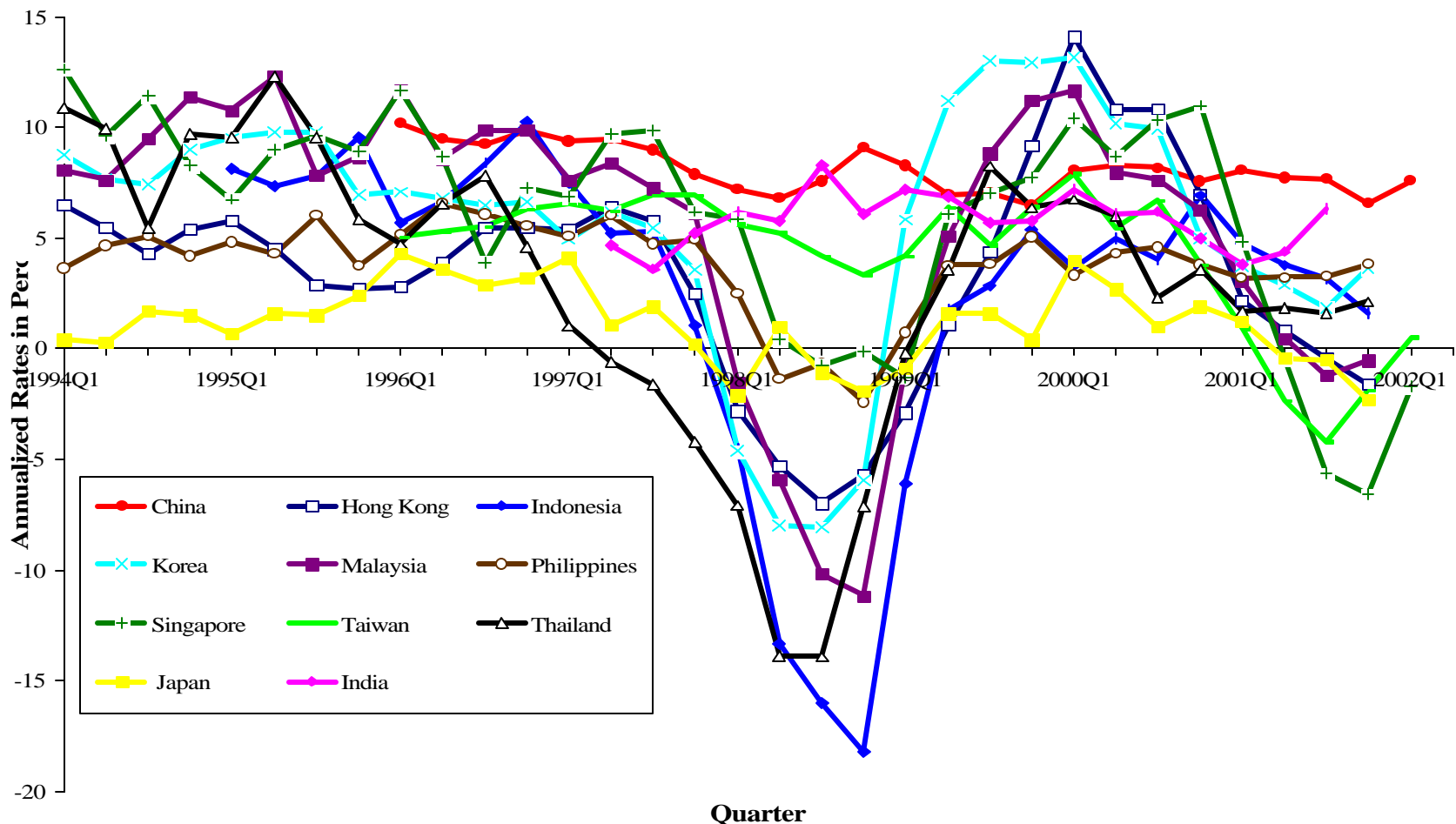
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Rates of Growth of Real GDP of G7 Countries



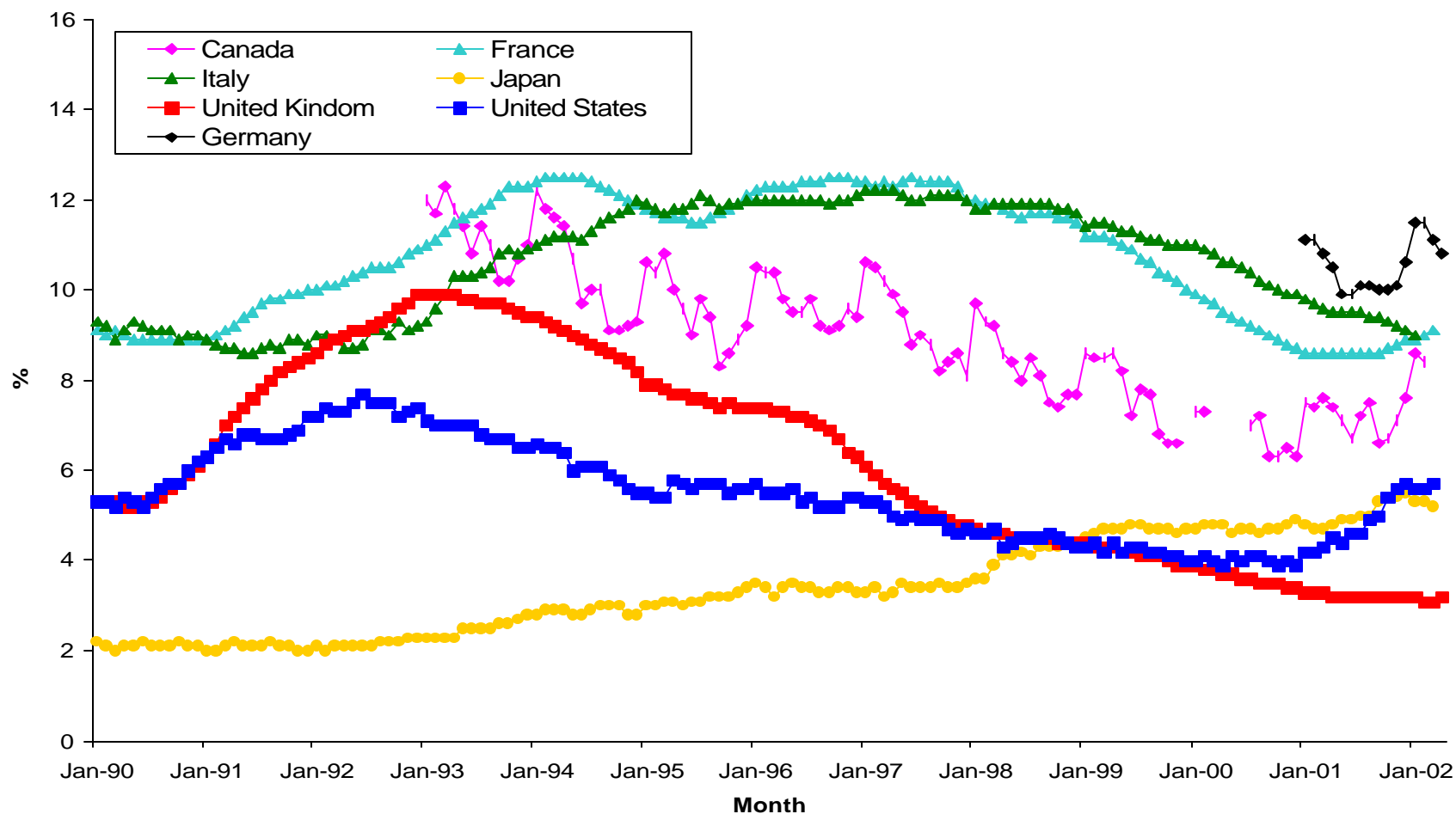
Quarterly Rates of Growth of Real GDP: Selected East Asian Economies

Quarterly Rates of Growth of Real GDP, Year-over-Year, Selected East Asian Economies



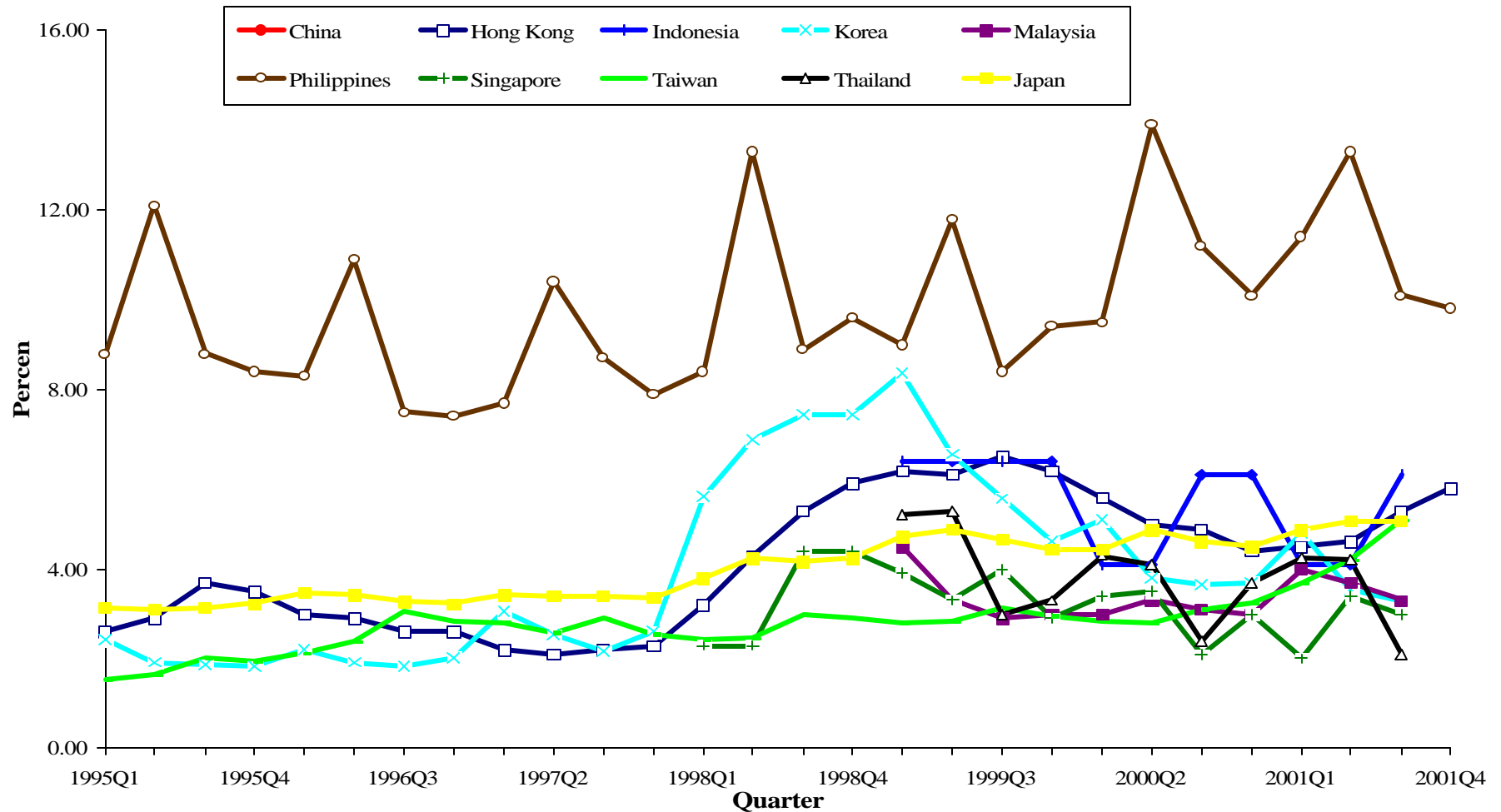
Rates of Unemployment of G-7 Countries

Monthly Unemployment Rates of G7 Countries



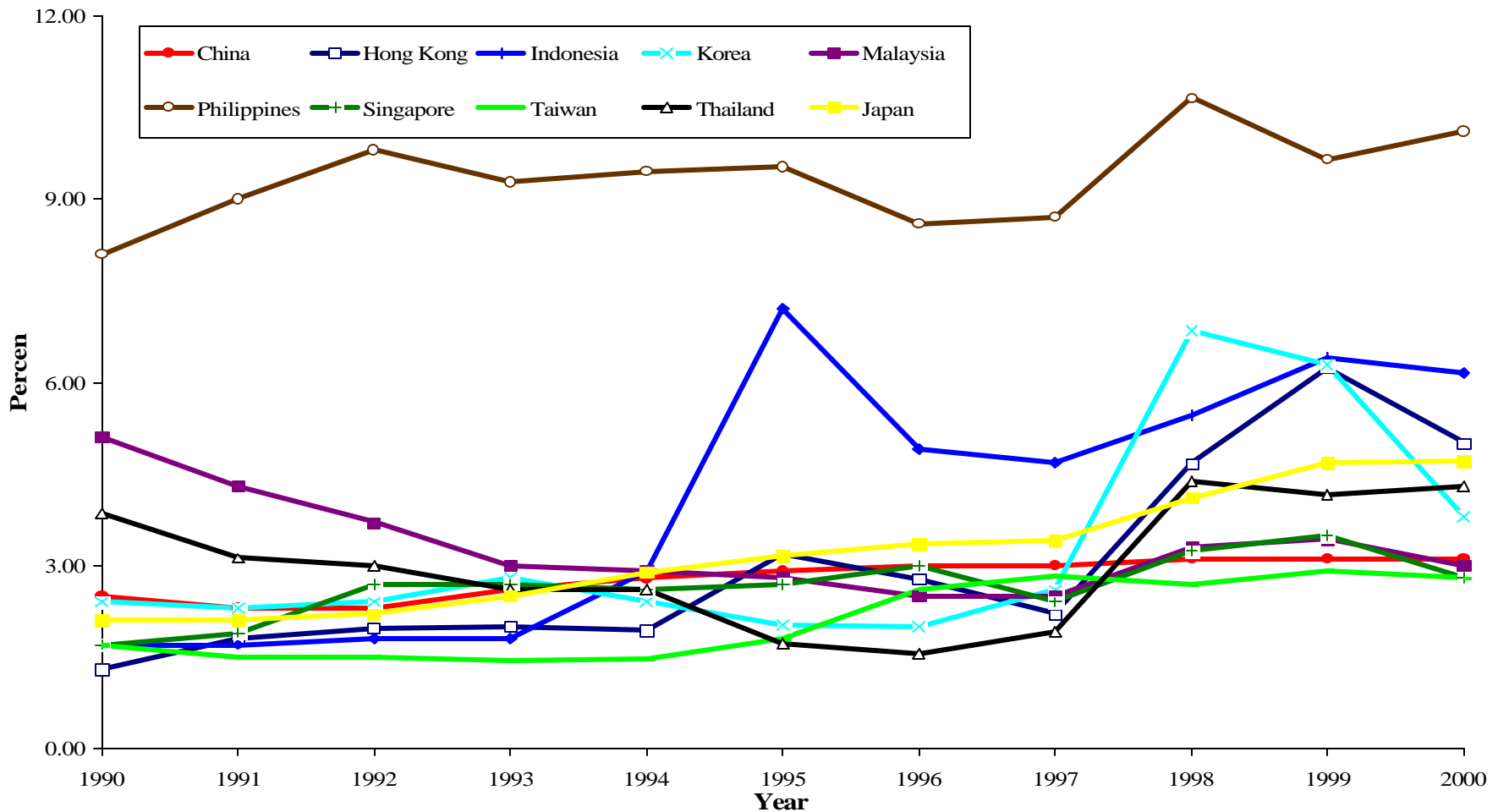
Quarterly Rates of Unemployment: Selected East Asian Economies

Unemployment Rate of Selected East Asian Economies (Quarterly Data)



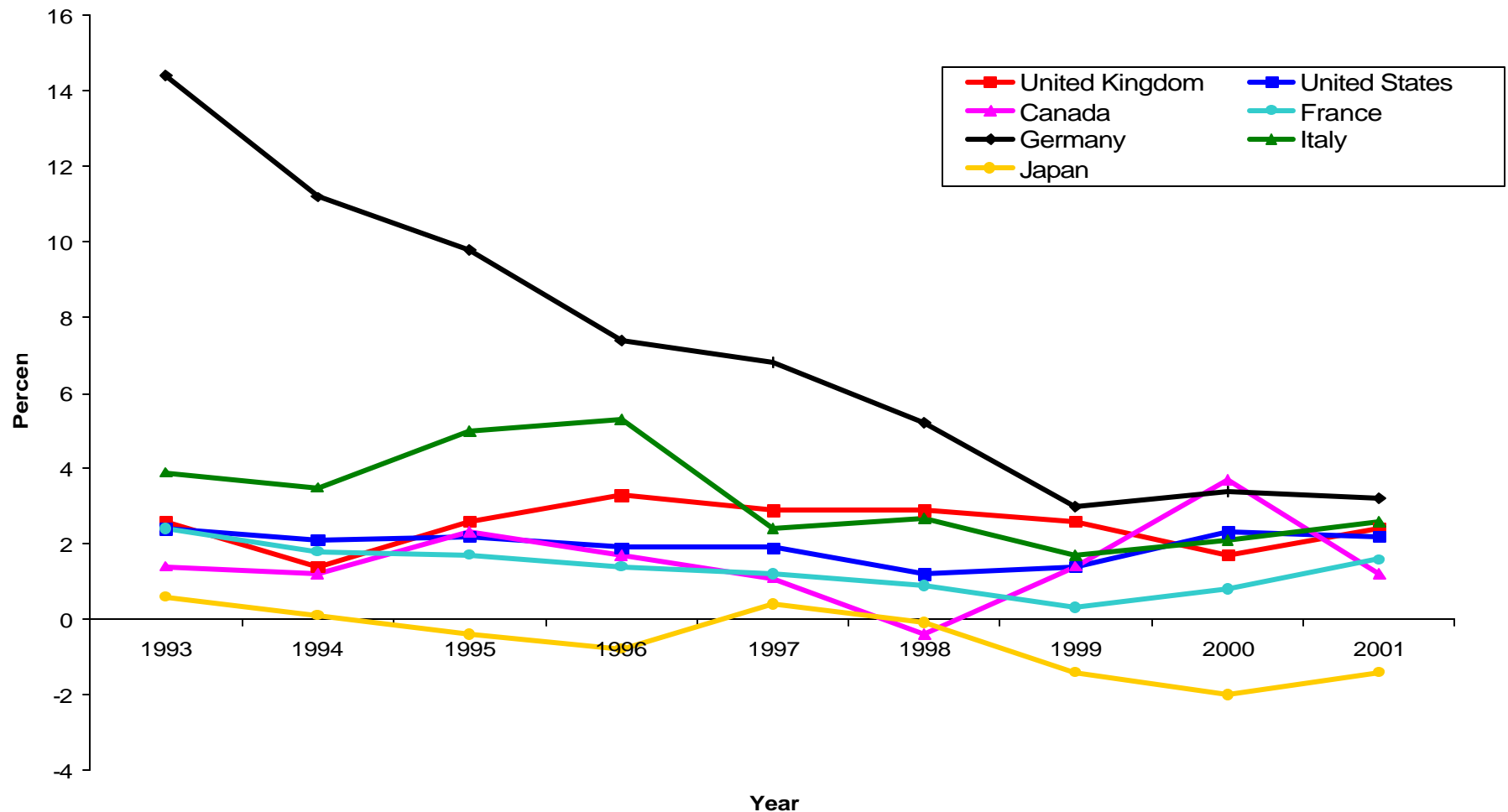
Annual Rates of Unemployment: Selected East Asian Economies

Annual Unemployment Rates of Selected East Asian Economies

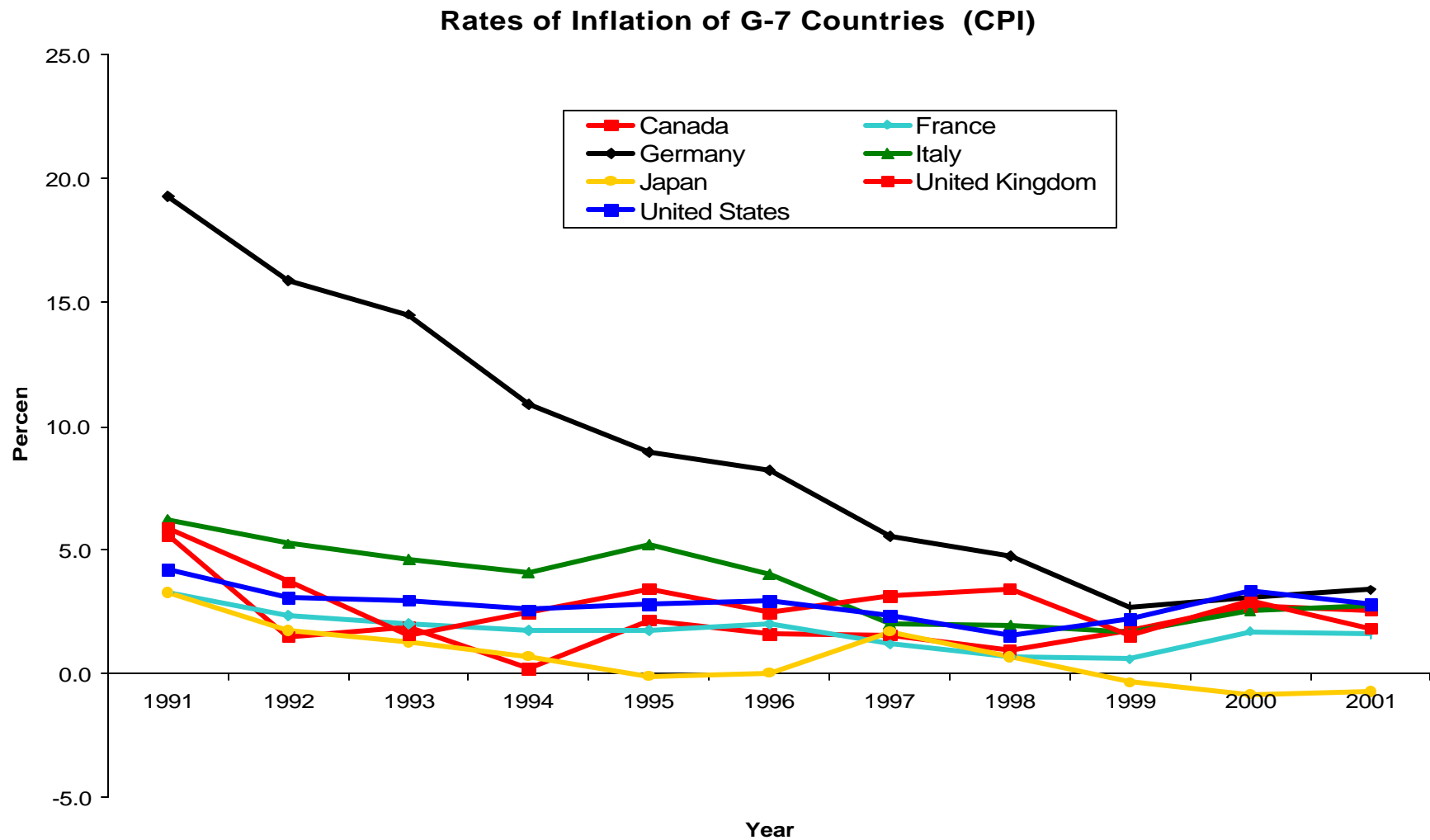


Rates of Inflation of G-7 Countries (GDP Deflator)

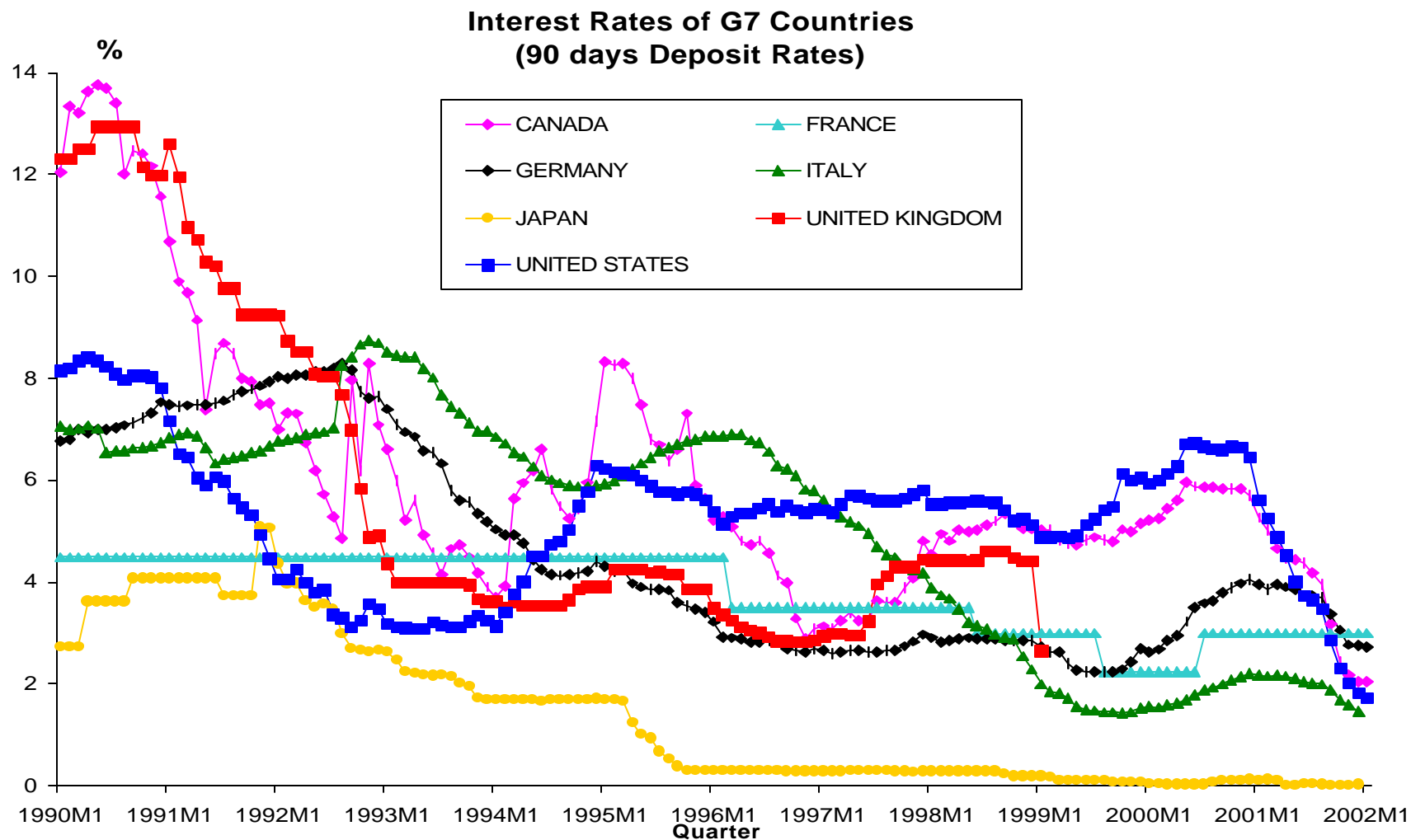
Rates of Inflation of G-7 Countries (GDP Deflator)



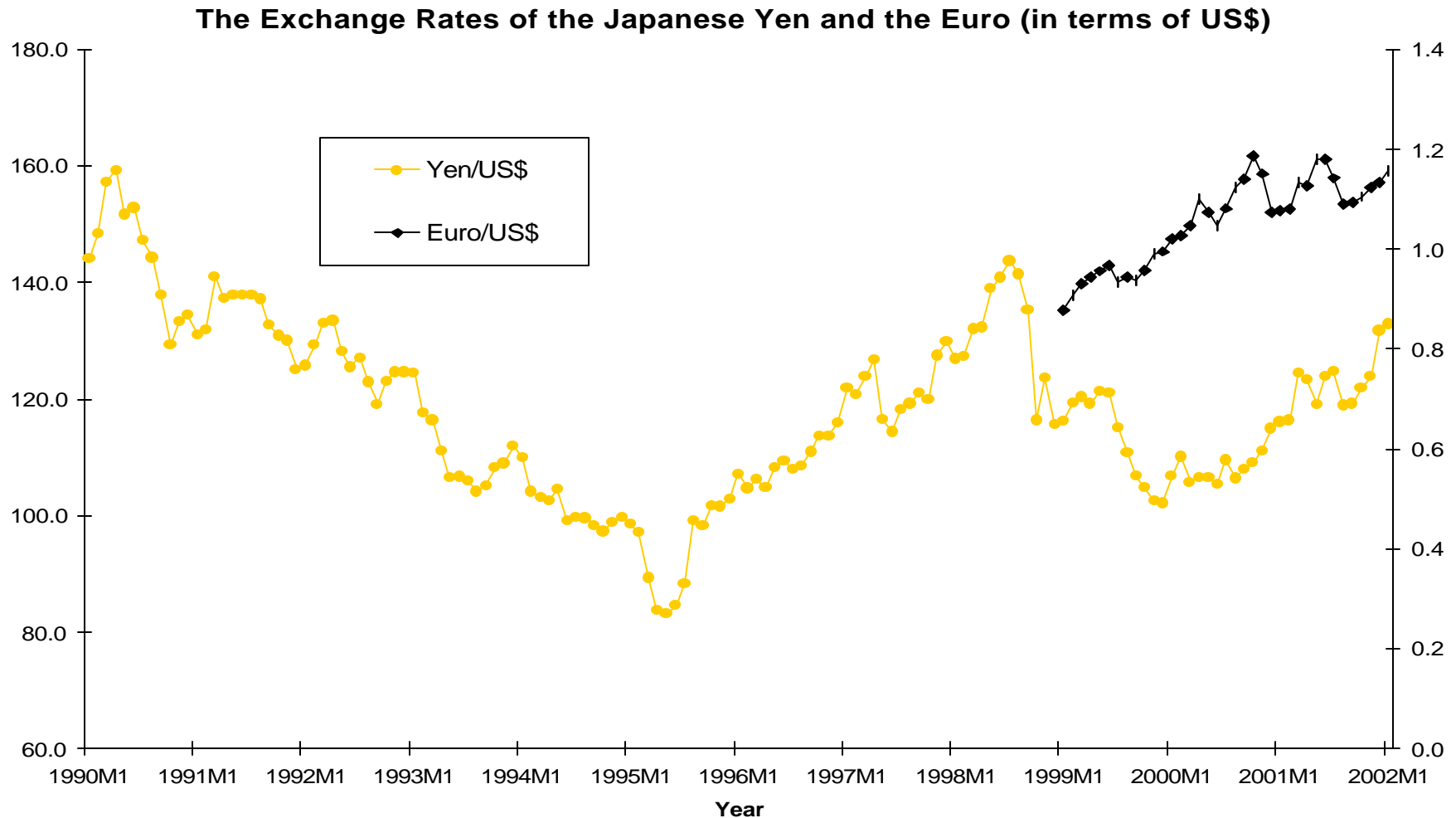
Rates of Inflation of G-7 Countries (CPI)



Rates of Interest of G-7 Countries



The Exchange Rates of the Japanese Yen and the Euro



Long-Term Global Economic Trends

- ◆ Low rates of inflation and hence low rates of interest
- ◆ Rapid economic transformation and adjustment—brought about by the information and communication technology revolution, i.e., the "New" Economy
- ◆ De-verticalization or fragmentation and out-sourcing—also brought about by the information and communication technology revolution
- ◆ Globalization and the growth of world trade—accelerated by the huge declines in communication and transportation costs
- ◆ The increasing importance of intangible capital (human capital and R&D capital)—complementarity with tangible capital
- ◆ Demographic transition—declining fertility rates and aging
- ◆ The potential of the biotechnology revolution

The Information and Communication Technology Revolution

- ◆ The Information and Communication Technology (ICT) revolution and its rapid international diffusion
- ◆ The huge decline in the costs of computation and information storage coupled with the huge increase in the speed of computation
- ◆ The huge decline in the cost of communication coupled with the huge increase in speed and throughput volume
- ◆ Example: The semiconductor manufacturing technology has been improving exponentially in terms of number of components on a chip whereas the cost per component has also been declining exponentially (Moore's Law)
- ◆ Example: The price of a computer, holding the size of memory and speed constant, has been declining at 14% p.a. since the 1960s
- ◆ Example: There is significant broad-band over-capacity

Internet Users in the Asia/Pacific Region

Internet Users in the Asia/Pacific Region (millions)								
	1999	2000	2001	2002	2003	2004	2005	Annual Rate of Growth
China	16.5	27.2	40.4	59.4	84.5	111.6	141.3	43.0
Hong Kong	1.9	2.5	3.0	3.2	3.8	4.6	5.4	19.0
India	3.2	6.2	11.0	18.9	30.3	42.3	62.5	64.1
Indonesia	1.0	1.4	1.9	2.5	3.6	5.2	7.3	39.3
South Korea	5.3	8.1	10.7	14.1	17.7	22.1	26.8	31.0
Malaysia	1.2	1.7	2.4	3.5	4.7	6.2	8.1	37.5
Philippines	0.6	1.1	1.6	2.7	4.1	6.3	8.6	55.9
Singapore	0.8	1.0	1.3	1.5	1.7	1.9	2.4	20.1
Taiwan	4.4	5.5	6.9	8.6	10.8	12.4	15.8	23.7
Thailand	1.0	1.5	2.3	3.5	4.6	6.5	8.7	43.4
Asia/Pacific Region	66.2	94.5	128.0	173.3	231.5	295.7	374.4	33.5

Note: 1999 figures estimated and 2000-2005 figures projected by the Yankee Group.

Penetration Rates in the Asia/Pacific Region

Penetration Rates in the Asia/Pacific Region (percent)							
	1999	2000	2001	2002	2003	2004	2005
China	1.3	2.0	2.9	4.2	5.8	7.4	9.2
Hong Kong	26.9	35.6	40.6	42.5	49.6	57.7	65.3
India	0.3	0.6	1.0	1.7	2.7	3.6	5.2
Indonesia	0.5	0.6	0.9	1.1	1.5	2.1	2.9
South Korea	11.2	17.0	22.3	29.3	36.2	44.8	53.9
Malaysia	5.3	7.4	10.0	13.9	18.1	23.3	29.8
Philippines	0.8	1.4	2.1	3.3	4.8	7.2	9.5
Singapore	24.2	29.0	37.7	42.5	47.9	54.0	66.1
Taiwan	19.9	24.7	30.5	37.8	46.8	53.3	67.4
Thailand	1.6	2.4	3.5	5.1	6.6	9.1	11.7
Asia/Pacific Region	2.4	3.3	4.5	6.0	7.8	9.6	11.9

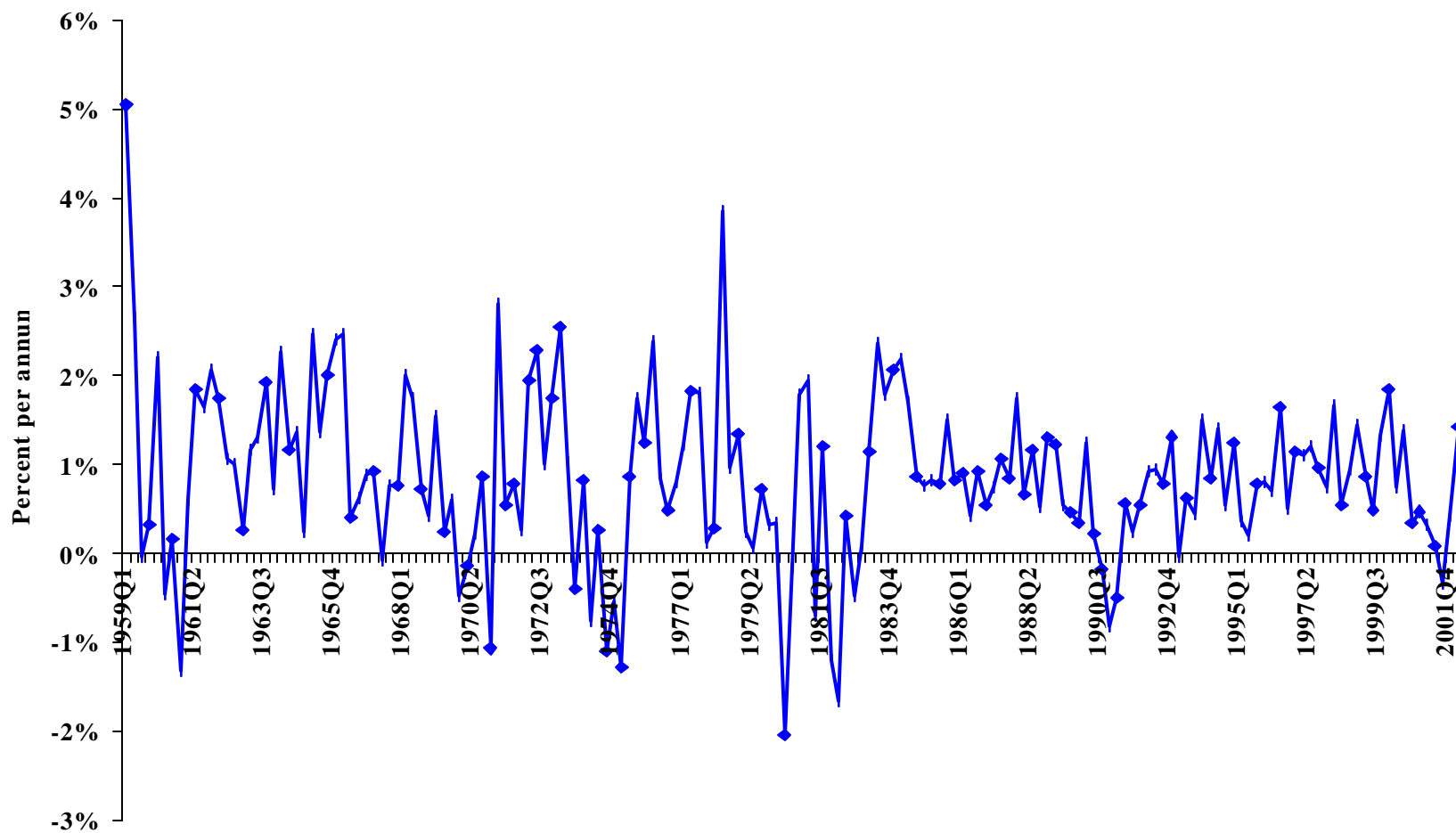
Note: 1999 figures estimated and 2000-2005 figures projected by the Yankee Group

Rapid Economic Transformation and Adjustment— Manifestation in the United States

- ◆ The “New Economy” brings about a one-time permanent increase in potential output, hence, productivity.
- ◆ The increase in the rate of measured technical progress over time, or growth of total factor productivity—that is, the ability of producing output from a given quantity of inputs—over the decade of the 1990s, arose not so much from the rate of innovation given the rate of R&D investments but from the increased rates of diffusion and adoption. However, this acceleration in the rate of measured technical progress is likely to be transient. It will return to a steady-state rate once the new frontier of the set of production possibilities is reached.
- ◆ The “New Economy” helps to reduce the amplitude of the business cycles.
- ◆ A decline in the average level of changes in inventory (stocks) relative to GDP as well as in its volatility. Changes in inventory used to be a major source of business cycle fluctuations in the United States. The improvement may be attributed in part to better inventory management due to more, more timely, better and cheaper information available, resulting in faster responses to changes in demand conditions.
- ◆ The volatility of new housing starts, which used to be a major source of business cycle fluctuations in the United States, has also been significantly reduced in recent years, reflecting better information and faster adjustments, and institutional changes such as the introduction of adjustable-rate mortgages and securitization of mortgages and the resulting sharing of the interest rate risks by the mortgage lenders to other investors. New housing starts are no longer as sensitive to changes in the rates of interest.

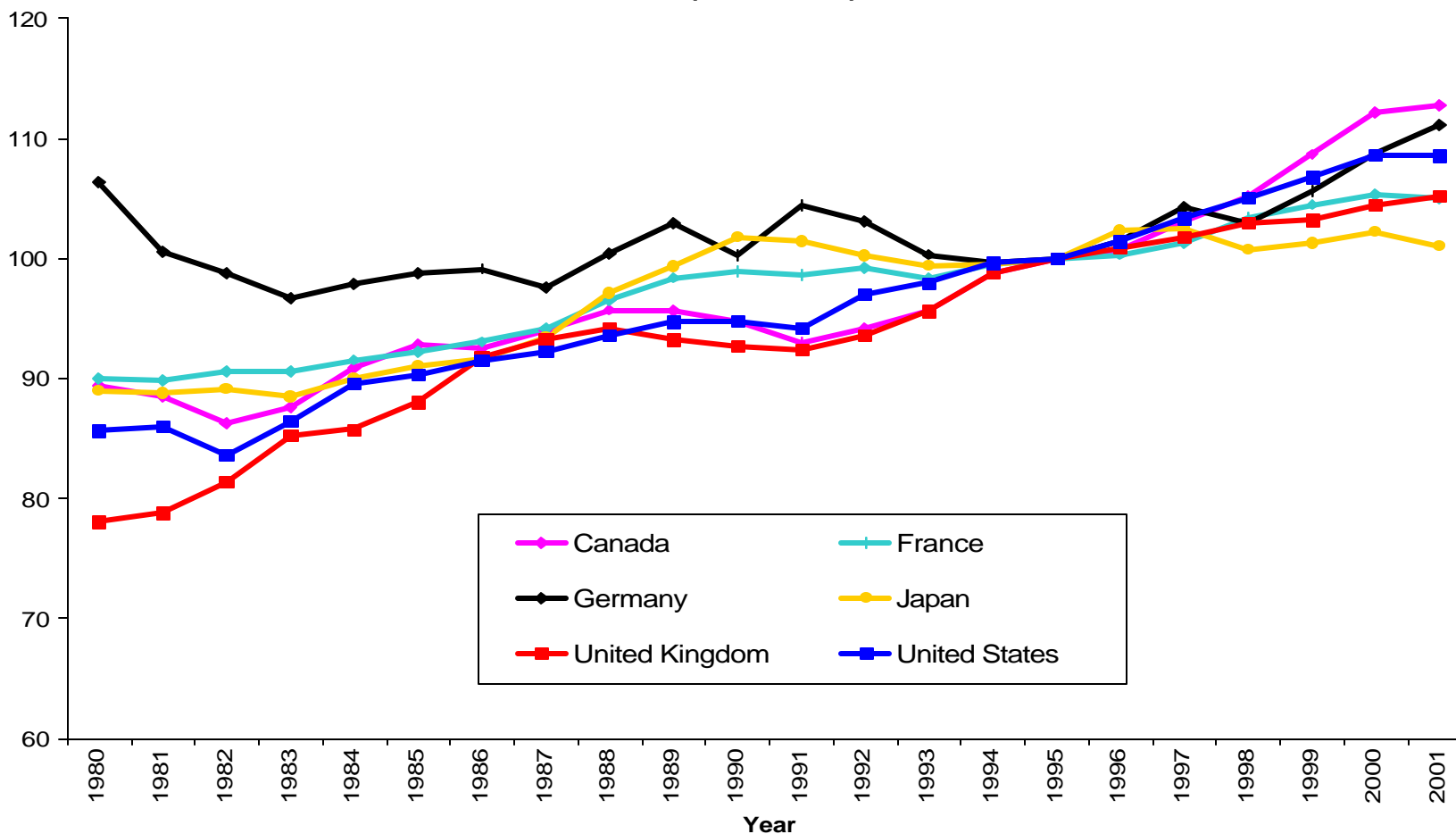
Rates of Growth of Total Factor Productivity in the United States--Quarterly Data

Rates of Growth of Total Factor Productivity of the United States



Total Factor Productivity in the G7 Countries

Total Factor Productivity of G7 Countries
(1995=100)

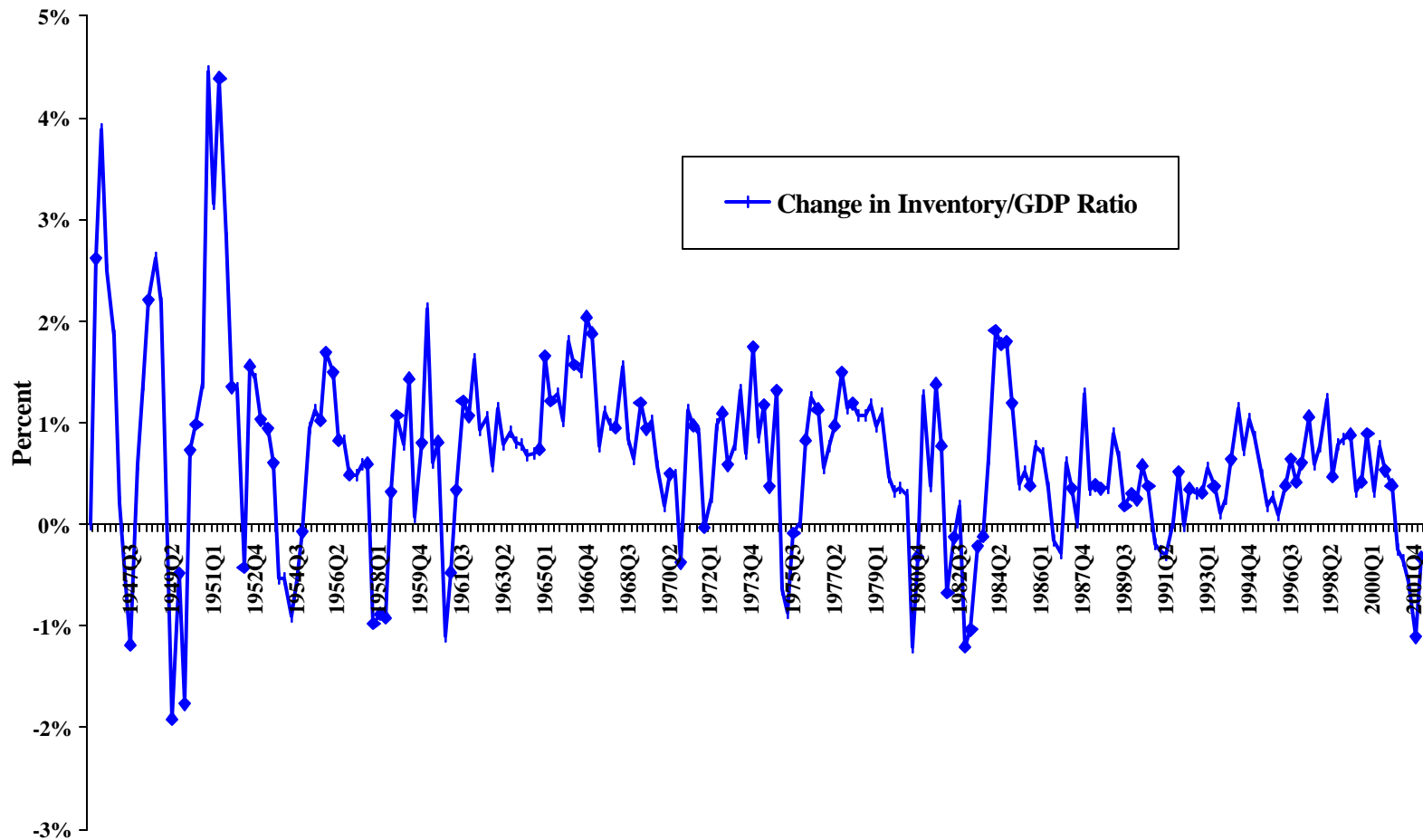


The Evolution of Measured Technical Progress over Time

- ◆ Some problems of the recent measures of total factor productivity
 - ◆ The measurement of labor inputs is based on a standard number of hours, or hours paid, rather than hours worked--the discrepancy between hours paid and hours worked for employees in the high-technology sector is believed to have risen during the high-technology boom of the past five years
 - ◆ The change in the accounting practice on expenditure on software not bundled with hardware from full expensing to capitalizing will in the first few years result in a higher measured real GDP even though nothing has changed
 - ◆ The hedonic price index adjustment may over-state the pecuniary benefits of purely technological innovations
 - ◆ The price indexes may not have taken fully into account the shift in the composition of consumption and investment away from goods to services. The prices of services, however, have risen faster than the prices of goods
 - ◆ Moreover, the deterioration in service sector quality has not been taken into account
 - ◆ The pricing of upgrades of subscription type services--how to distinguish between quality improvement and a pure price increase
 - ◆ The possibility of outright accounting and other forms of fraud, e.g., Enron, that overstates revenue and hence value added and profit

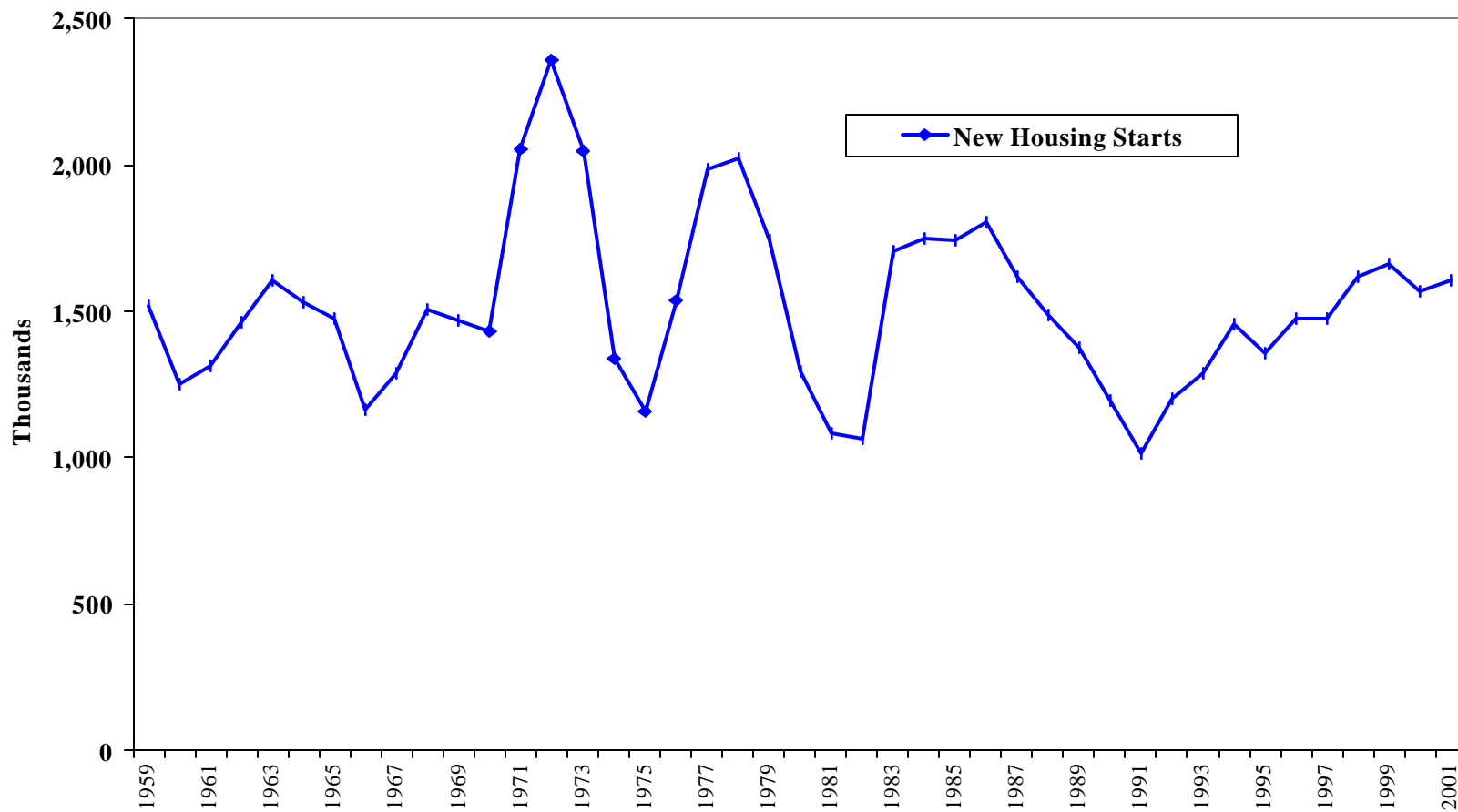
The Change in Inventory/GDP Ratio in the United States--Quarterly Data

Change in Inventory/GDP Ratio



New Housing Starts in the United States

New Housing Starts (thousand units)

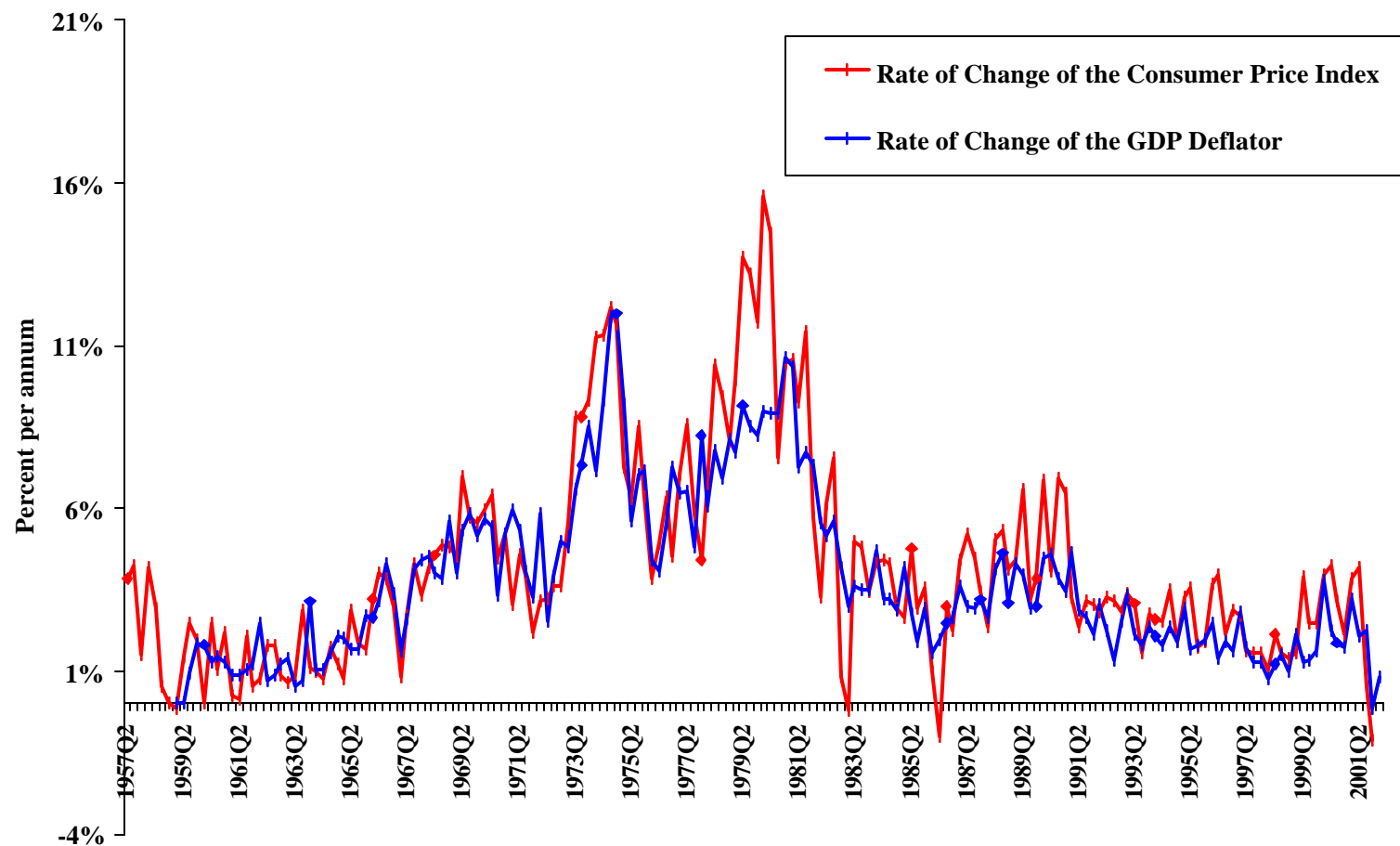


Rapid Economic Transformation and Adjustment— Manifestation in the United States

- ◆ The rate of inflation in the United States has remained low during the past decade.
 - ◆ This has been made possible, in part, through the productivity gains due to the information and communication technology revolution--Increases in productivity lower the unit cost of production and hence reduce the upward pressure on prices and keep the rate of inflation low.
 - ◆ This has also been made possible, in part, because of better management of the monetary policy (by Dr. Alan Greenspan, Chairman of the Federal Reserve Board) based on better and more timely information and better and faster analysis and response (e.g., Taylor's rule).
 - ◆ The U.S. has been the beneficiary of the East Asian currency crisis
 - ◆ The price of imports has remained low, helping to keep inflation down
 - ◆ Its status as a safe haven for capital has allowed the rate of interest in the U.S. to remain low.
 - ◆ The foreign central banks have to re-build their foreign exchange reserves by purchasing and holding U.S. dollars.
 - ◆ Low unemployment has been achieved without kindling high inflation

The Rates of Inflation of the United States

Rates of Inflation in the United States

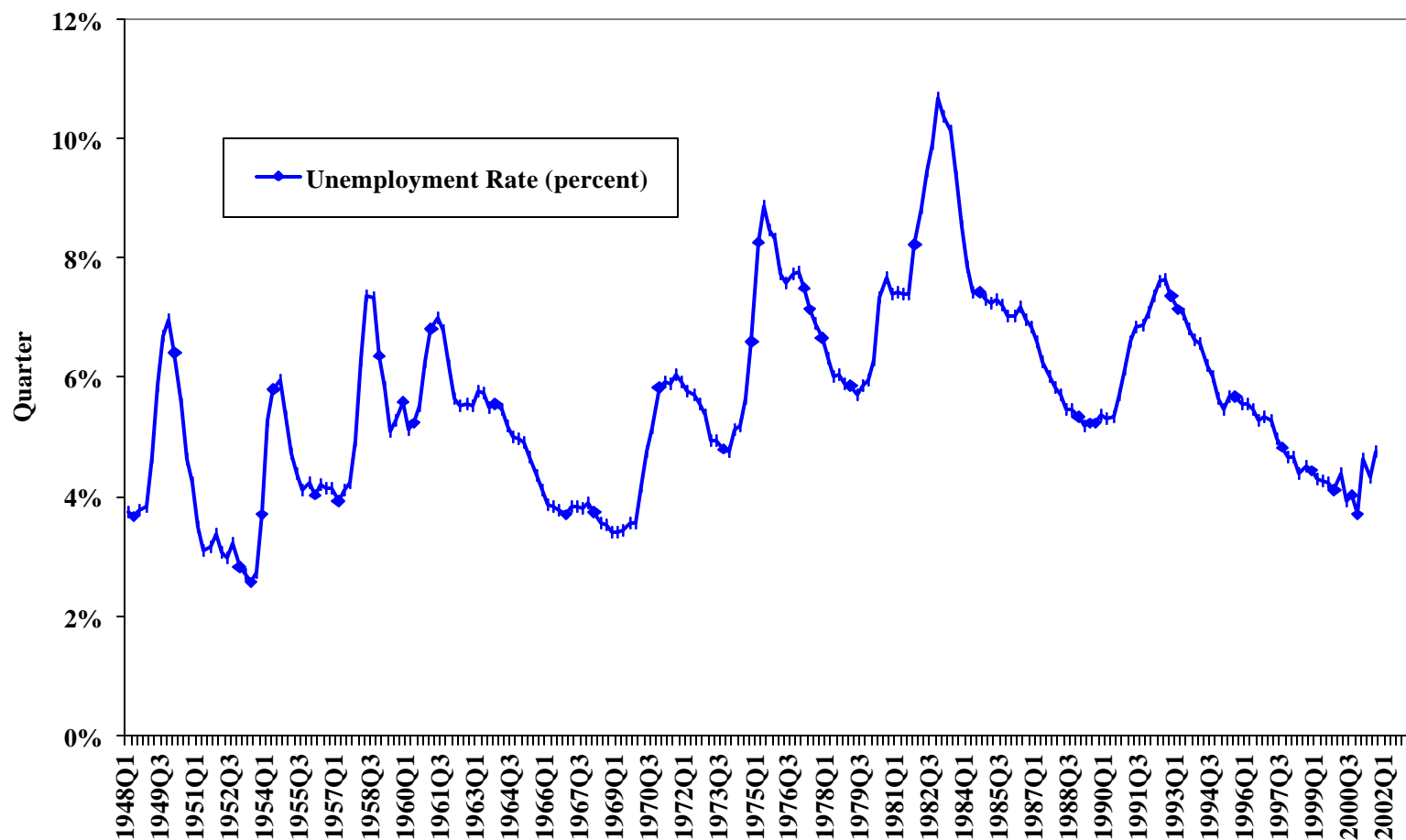


Rapid Economic Transformation and Adjustment— Manifestation in the United States

- ◆ The labor market has also benefited from the rapid economic transformation and adjustment and from the de-verticalization and fragmentation—the rapid adjustment implies that the labor force is kept lean at any one time so massive layoffs become unnecessary; the de-verticalization and fragmentation imply that new and more specialized and hence better jobs are continually created as old ones are destroyed.
- ◆ The rate of unemployment has declined to levels unseen since the late 1960s, even below the so-called “natural” rate of unemployment.
- ◆ There appears to have been a shift of the so-called Phillips Curve inward towards the origin (in the southeast direction).
- ◆ Has there been a permanent lowering of the “natural” rate of unemployment? At any rate of inflation, the lowest feasible unemployment rate appears to be now lower.
- ◆ The severity of the business cycles seems to have been considerably moderated.

The Unemployment Rate of the United States

Unemployment Rate of the United States (percent)



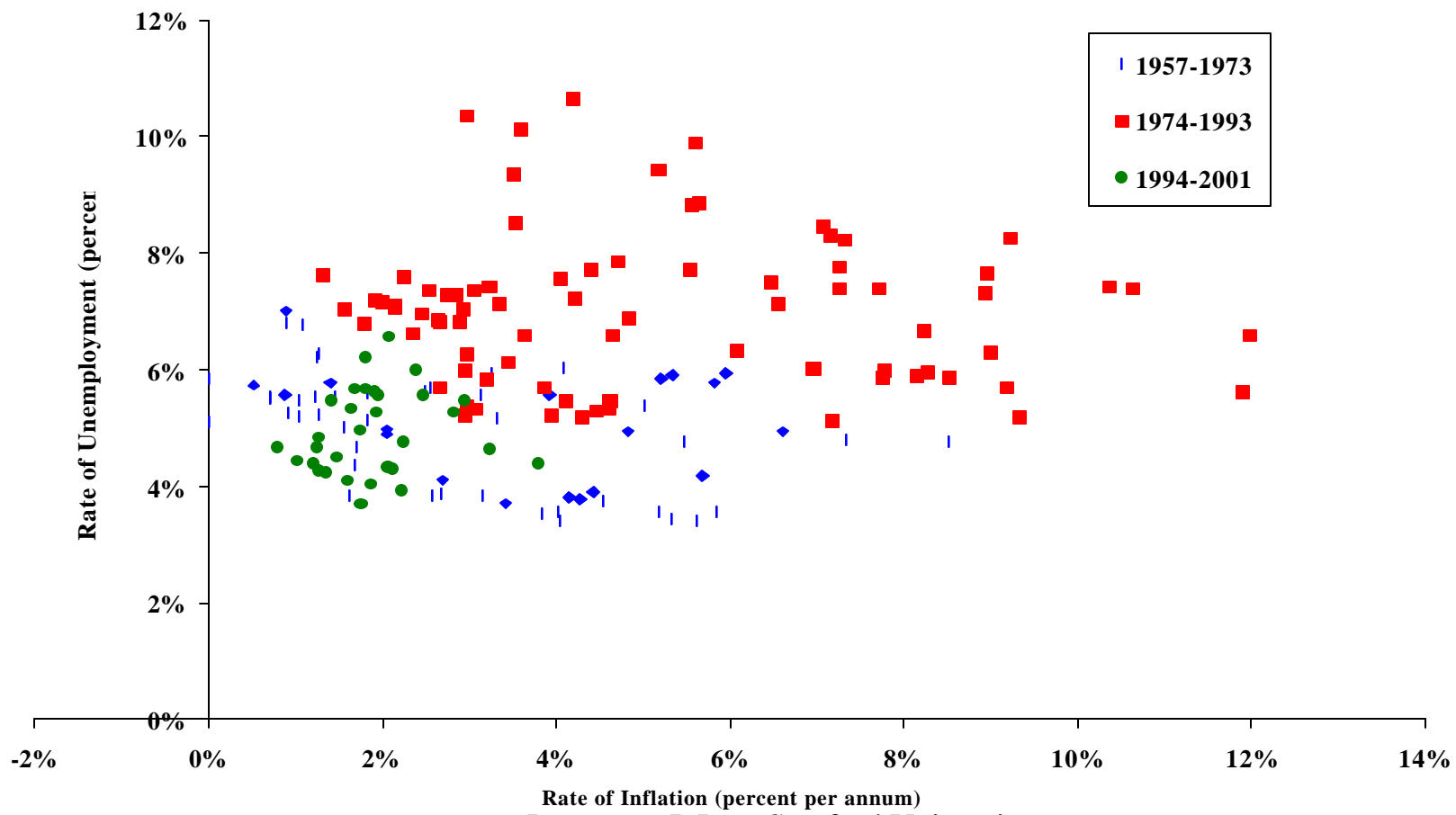
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The Effects of the “New” Economy in the United States

	Average Rate of Growth of TFP	Average Inventory Change-GDP Ratio	Average Absolute Inventory Change-GDP Ratio	Average Unemployment Rate	Average Rate of Growth of GDP Deflator
1951-60		0.69%	1.09%	4.55%	
1961-70	1.05%	0.95%	1.00%	4.72%	2.83%
1971-80	0.82%	0.68%	0.84%	6.44%	7.00%
1981-90	0.76%	0.43%	0.63%	7.12%	3.97%
1991-2001	0.77%	0.40%	0.53%	5.53%	2.29%

The Relationship between the Unemployment Rate and the Rate of Change of PGDP

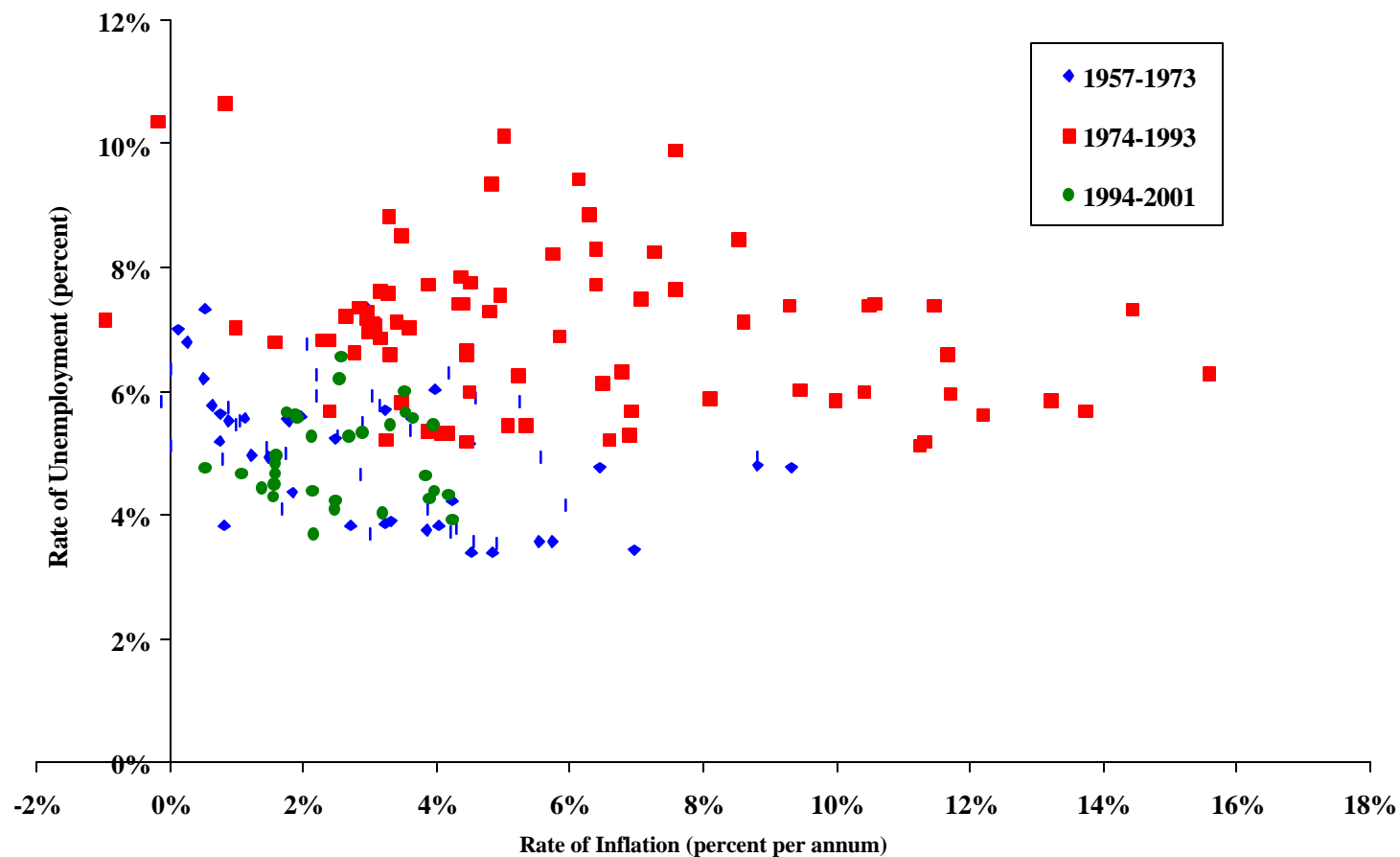
The Relationship between Unemployment and Inflation



Lawrence J. Lau, Stanford University

The Relationship between the Unemployment Rate and the Rate of Change of the CPI

The Relationship between Unemployment and Inflation



De-Verticalization, Fragmentation and Outsourcing—Manifestation in the United States

- ◆ The “New Economy” facilitates and encourages the process of “de-verticalization” or “fragmentation” and outsourcing.
- ◆ The need for every firm to identify, improve and sharpen “core competence” in order to survive; productivity can actually be enhanced by taking advantage of the opportunities for “de-verticalization” and “outsourcing”
 - ◆ e.g., the choice amongst being a designer, manufacturer or a marketer (Nike, Taiwan Semi-conductor Manufacturing Corporation)
- ◆ Specialization of firms in “Tasks” rather than “Products”
 - ◆ Global vertical division of labor--global supply chains
- ◆ Specialization results in lower costs, greater output, and more new varieties of products and services
- ◆ Down-sizing as well as proliferation of firms
 - ◆ Outsourcing
 - ◆ Reduction of middle management
 - ◆ Small and medium-sized firms can have access to high quality services previously unavailable on the market (the Internet levels the playing field)
 - ◆ Small and medium-sized firms can specialize in niche markets
- ◆ The innovations connected with the Internet have been made mostly by small- and medium-sized start-up firms rather than large, established corporations.
- ◆ Small and medium-sized firms are more nimble, and hence can adjust much more quickly.

Rise of New Businesses or New Ways of Doing Business

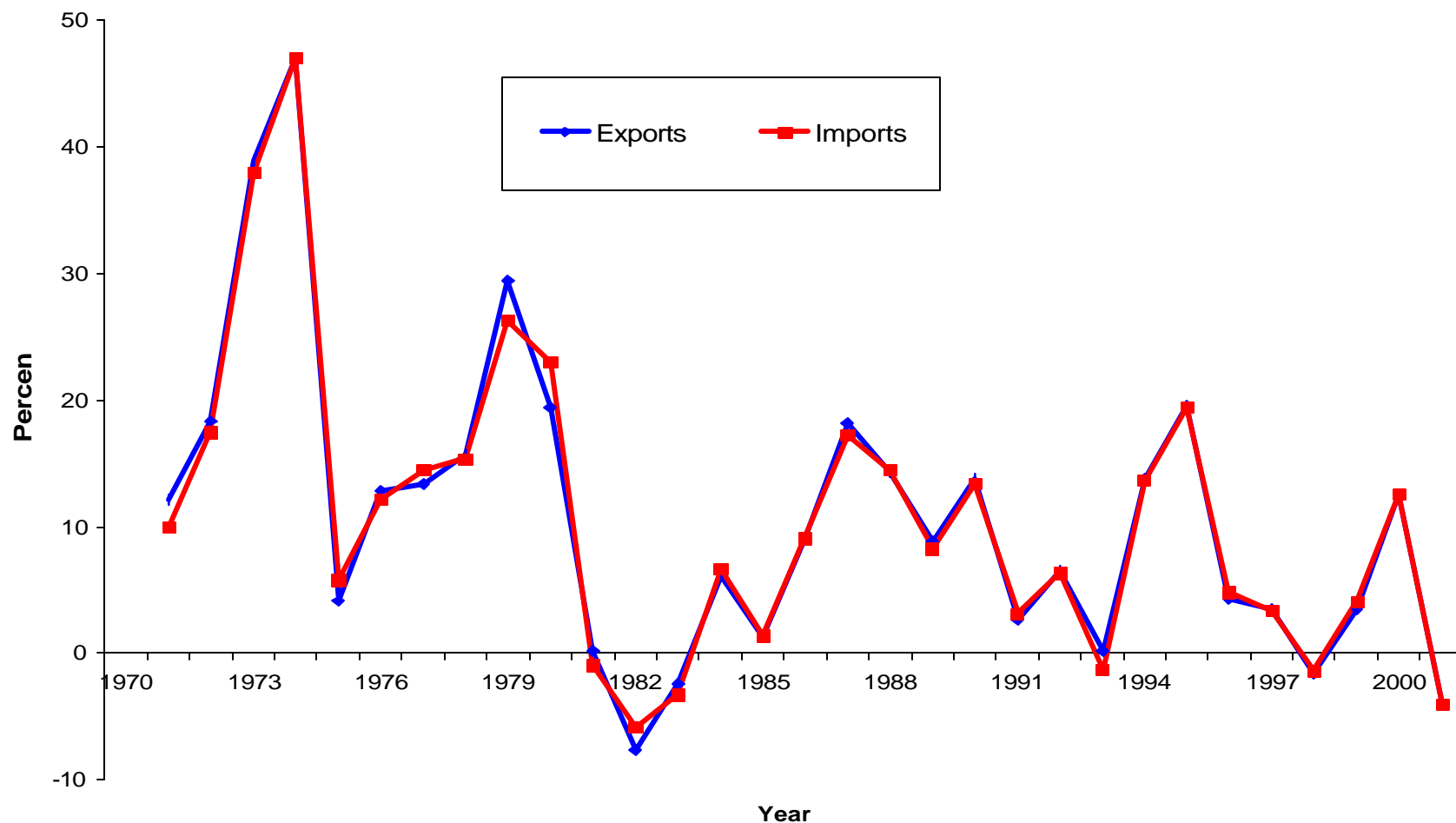
- ◆ Existing demands for goods and services are supplied by new entrants into the businesses, most of them small and medium-sized start-up firms, using new technology—these firms are typically less tangible-capital-intensive but more intangible-capital-intensive.
 - ◆ e.g., internet bookstores wipe out real brick and mortar bookstores; internet securities trading knock out traditional stock brokerages (however, there is still a role to play--assurance of fulfillment, assumption of credit and performance risks--reputation and brand name are still important)
 - ◆ The new firms will take away the business from the old firms--"Creative Destruction"
- ◆ The rise of completely new businesses
 - ◆ "Cuusoo" (Japan)--consumer participation in the design of new products
 - ◆ e.g., special suppliers of tools for left-handed individuals

Globalization

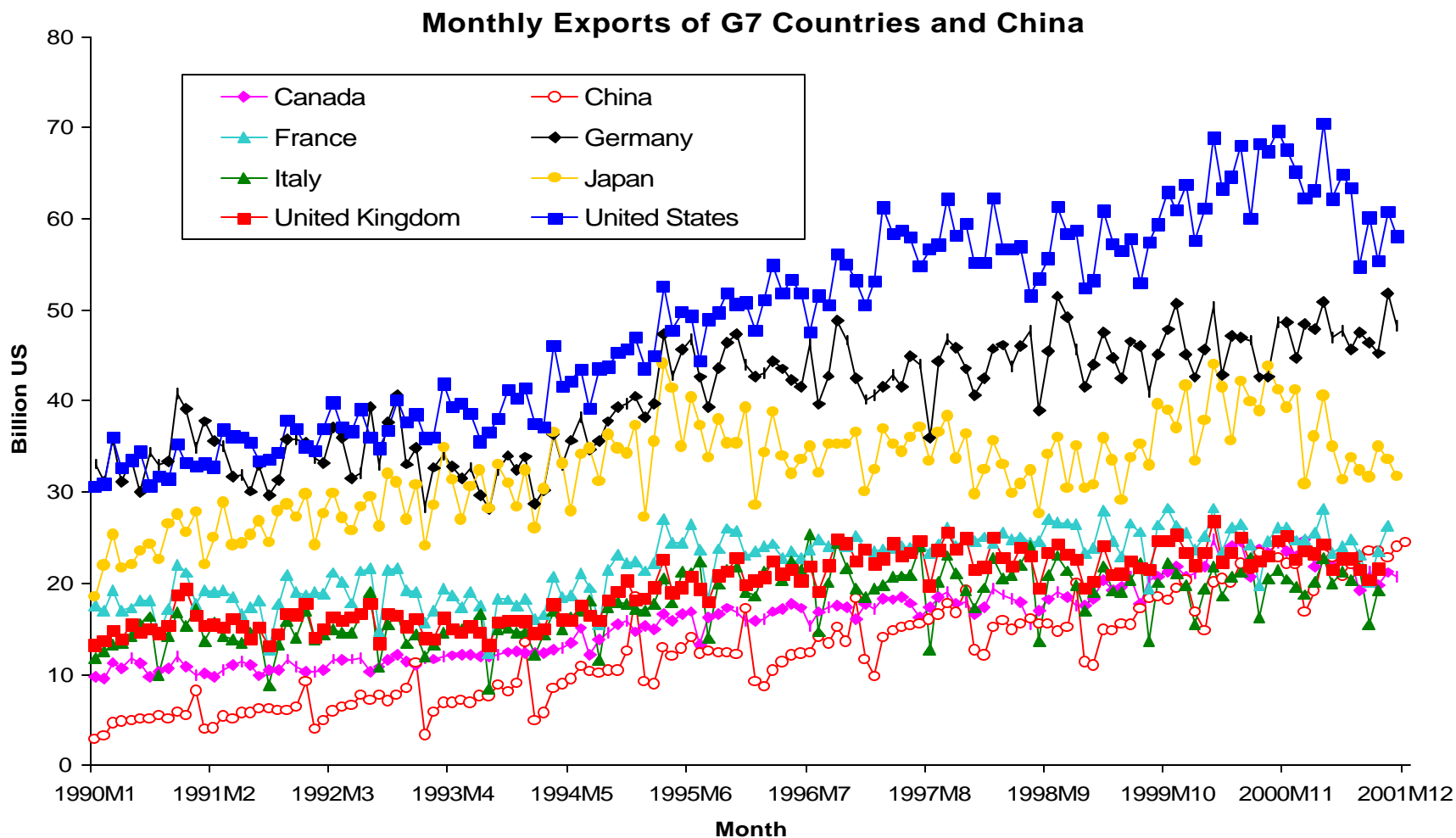
- ◆ Globalization and the growth of world trade are greatly facilitated by the huge declines in communication and transportation costs
- ◆ Local out-sourcing is transformed into global out-sourcing.
- ◆ The finer division of labor increases the gross volume of world trade, even if total value-added grows much more slowly
- ◆ Over time, both exports and imports as percentages of GDP will tend to rise; however, net exports, and value-added from exports as a percent of GDP will tend to rise much more slowly
- ◆ Trade in “Intermediate Inputs” and “Services” rather than finished “Products”
 - ◆ A substantial proportion of world trade is intra-company trade
- ◆ Many services not previously traded have become tradable—e.g., back office work, call centers.
- ◆ Tourism is one of the few non-tradable services left because it is location-specific

Rates of Growth of World Trade (US\$)

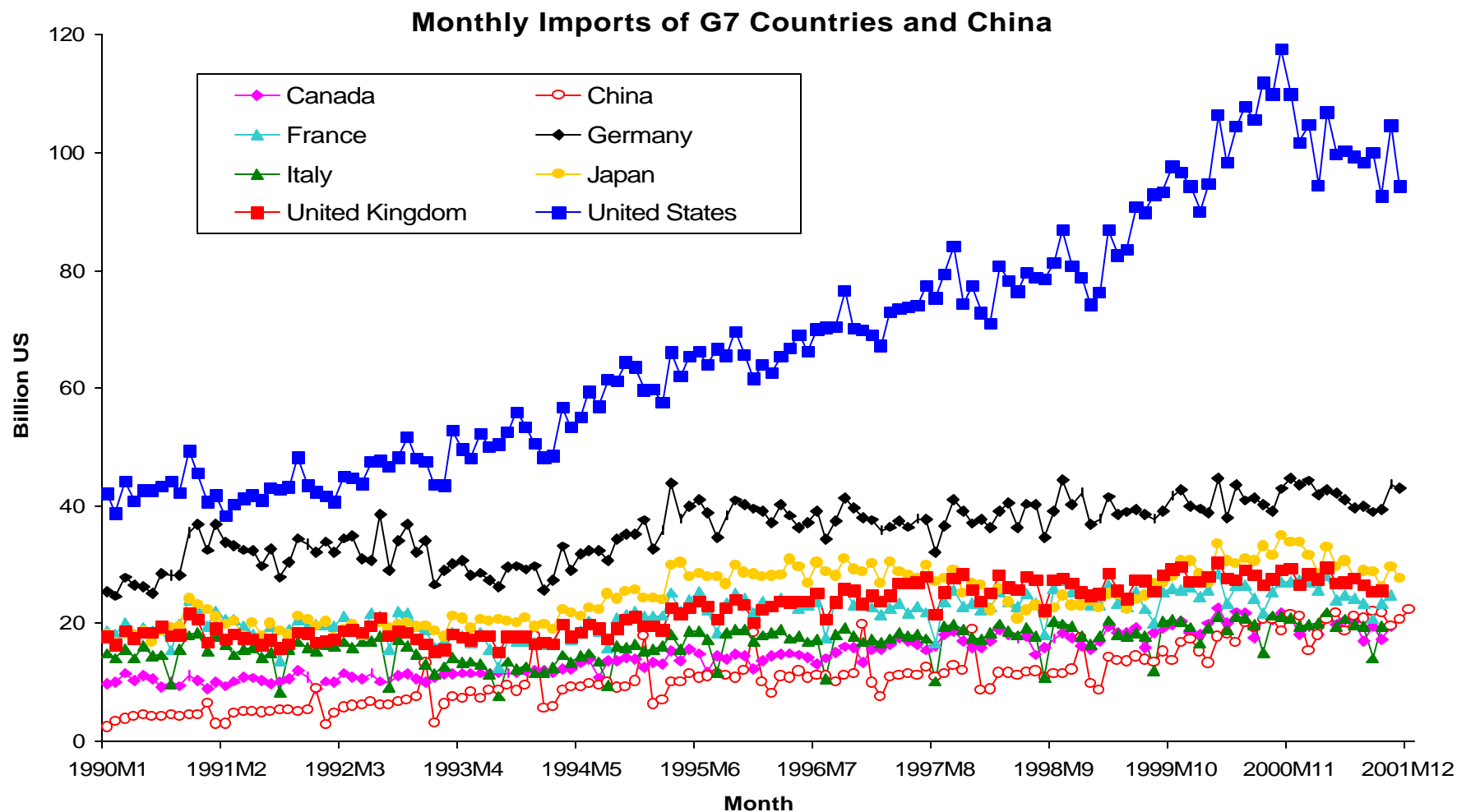
Rates of Growth of World Exports and Imports (Percent p.a.)



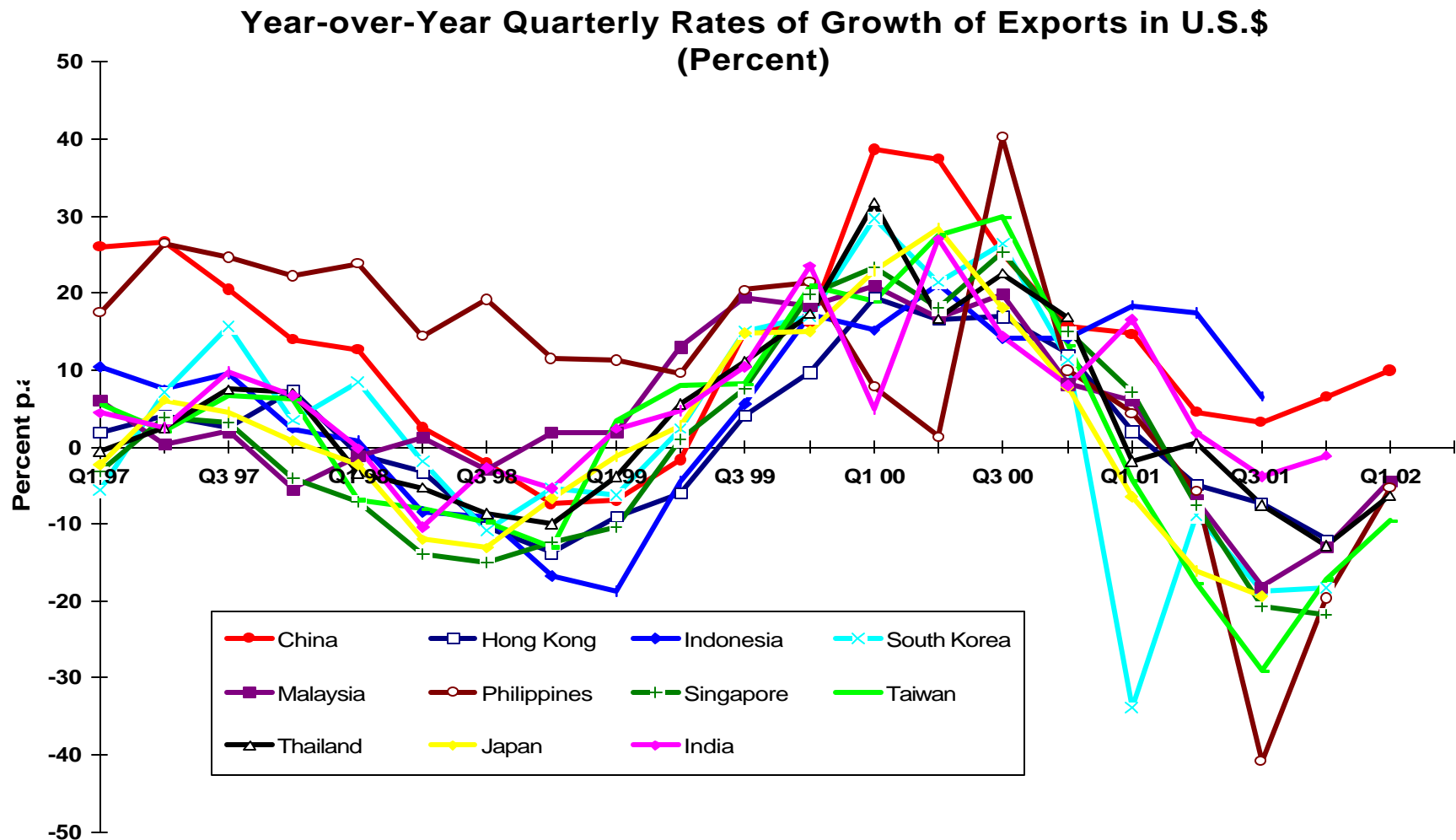
Monthly Exports of G7 Countries and China



Monthly Imports of G7 Countries and China

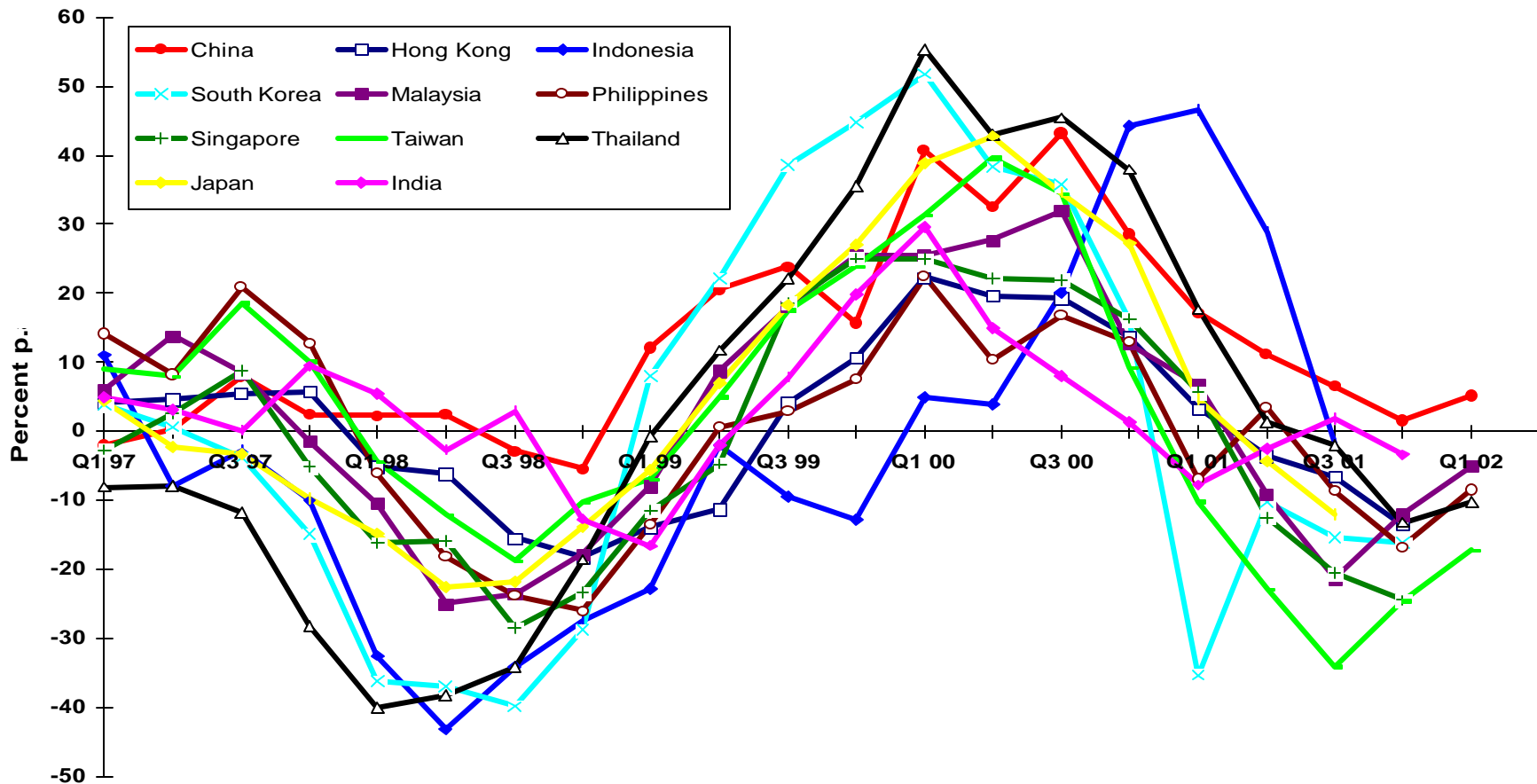


Quarterly Rates of Growth of Exports: Selected East Asian Economies

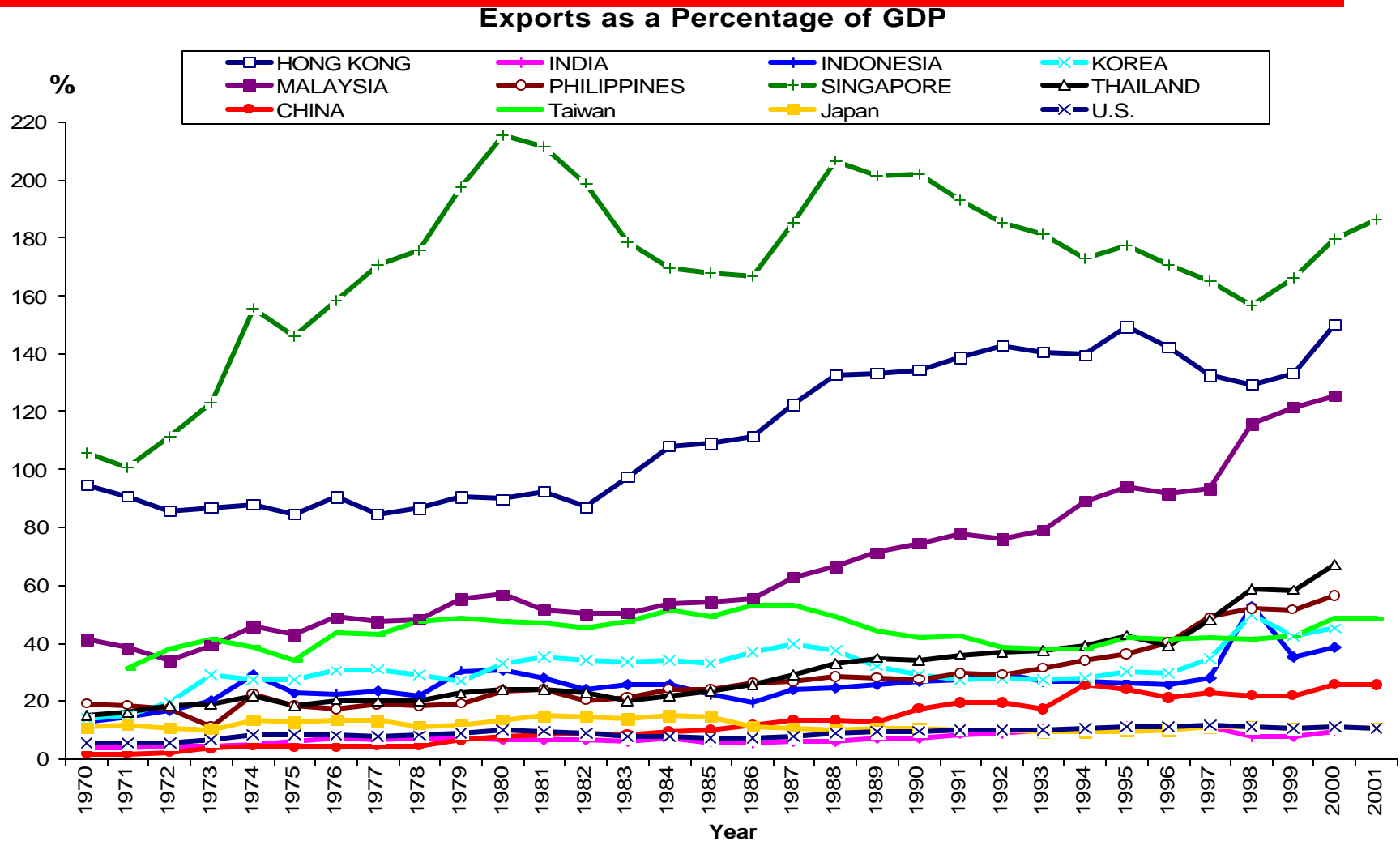


Quarterly Rates of Growth of Imports : Selected East Asian Economies

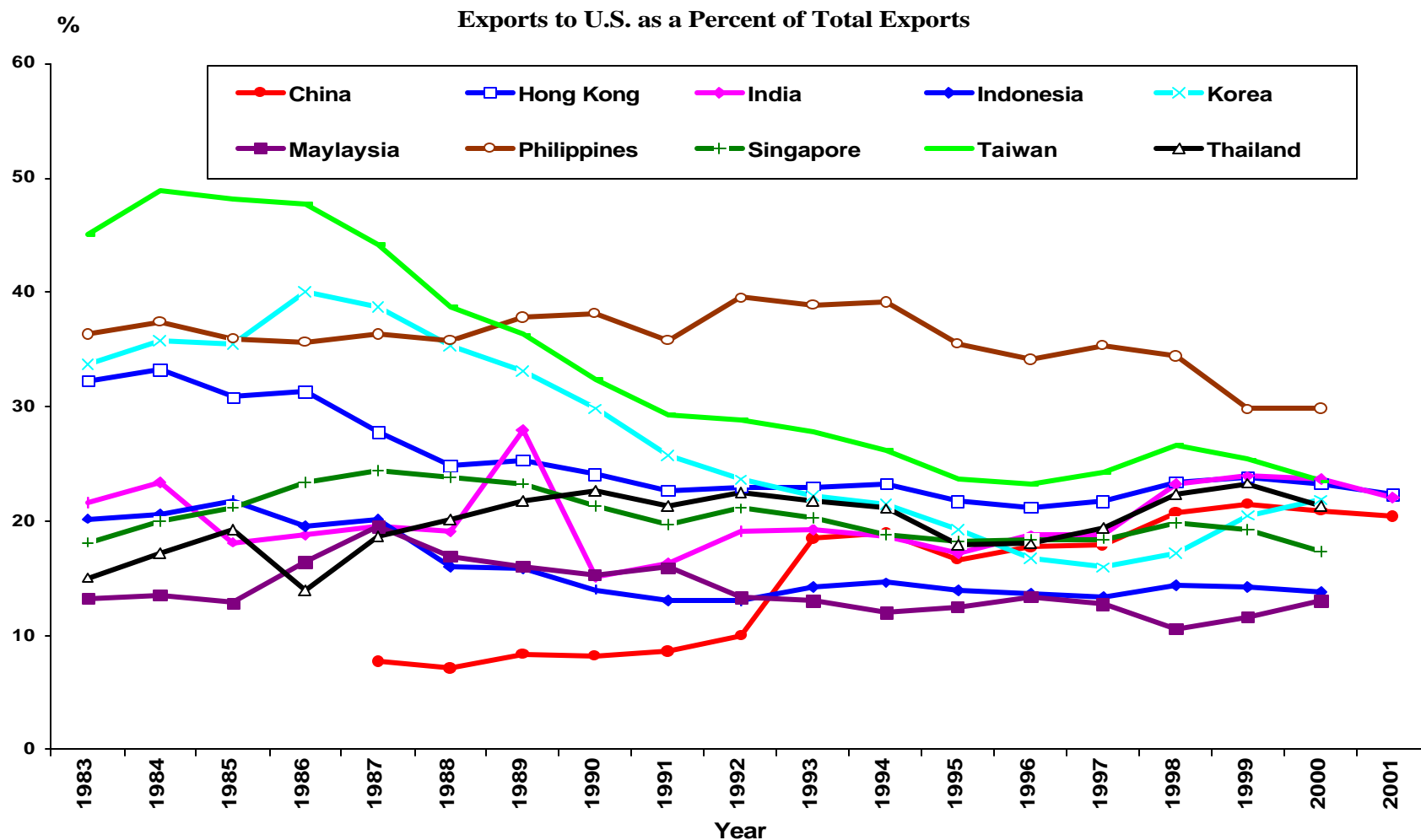
Year-over-Year Quarterly Rates of Growth of Imports in U.S.\$
(Percent)



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

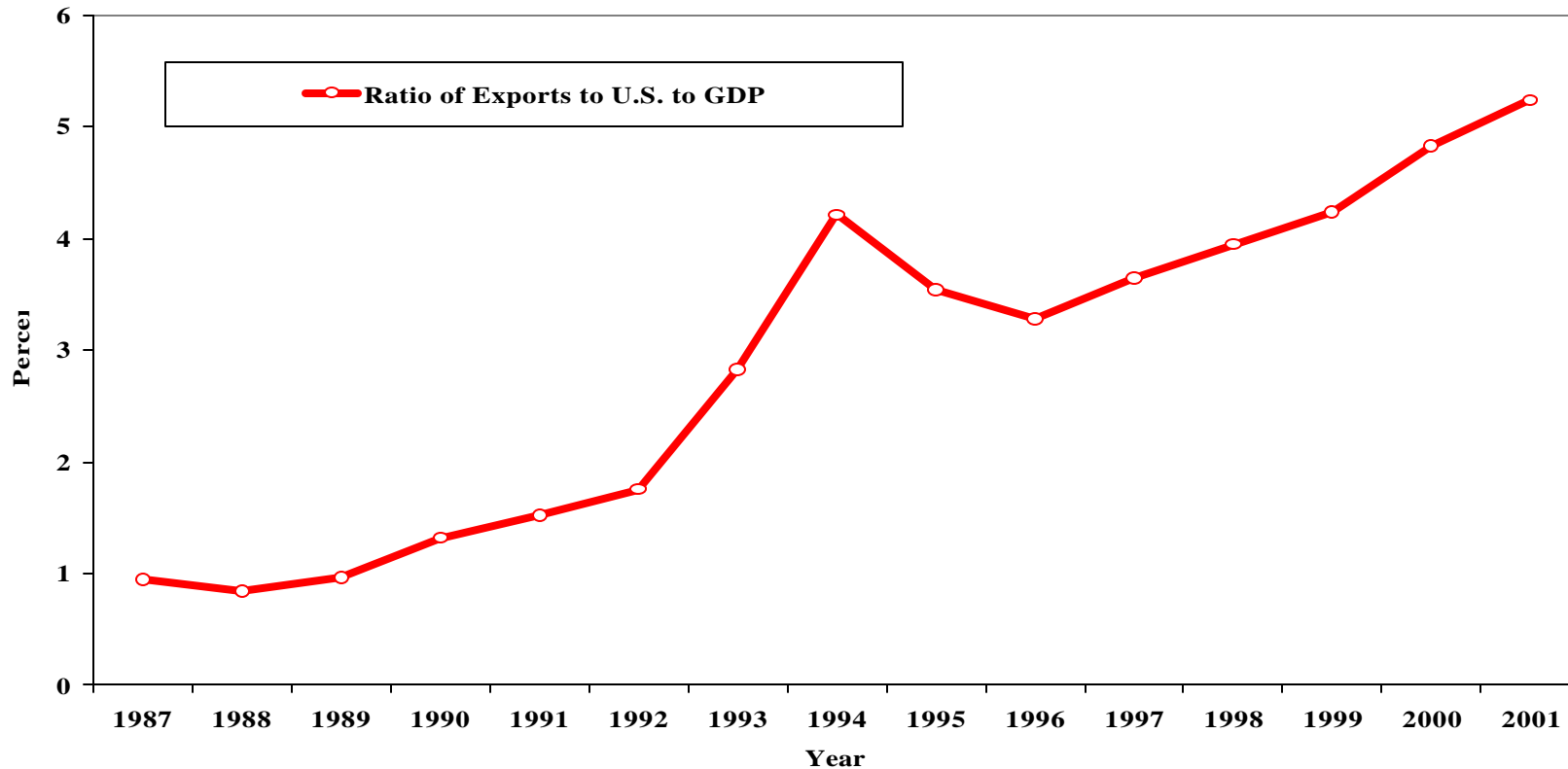


Exports to U.S. as a Percent of Total Exports

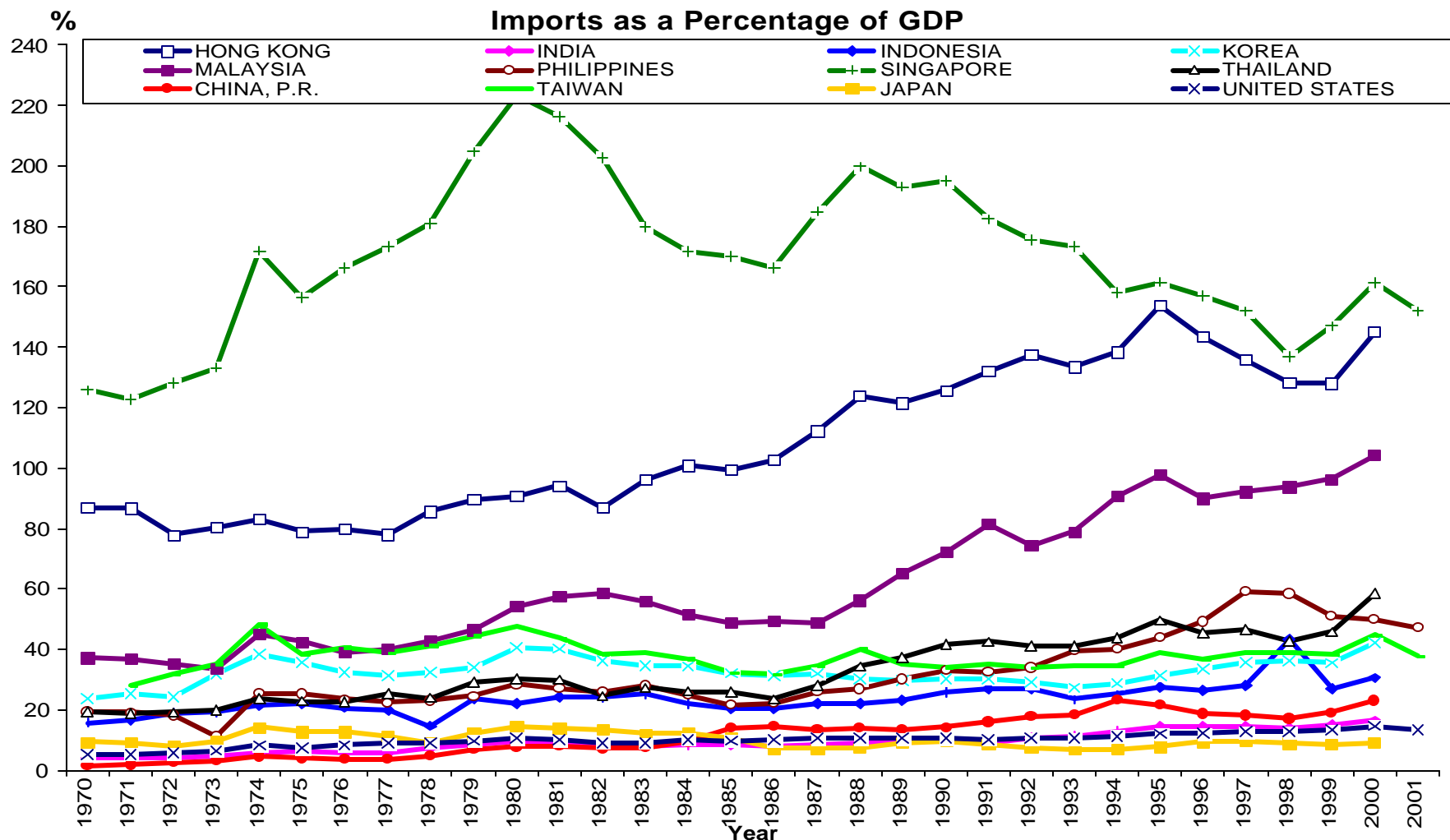


Chinese Exports to the United States as a Percent of Chinese GDP (Chinese Data)

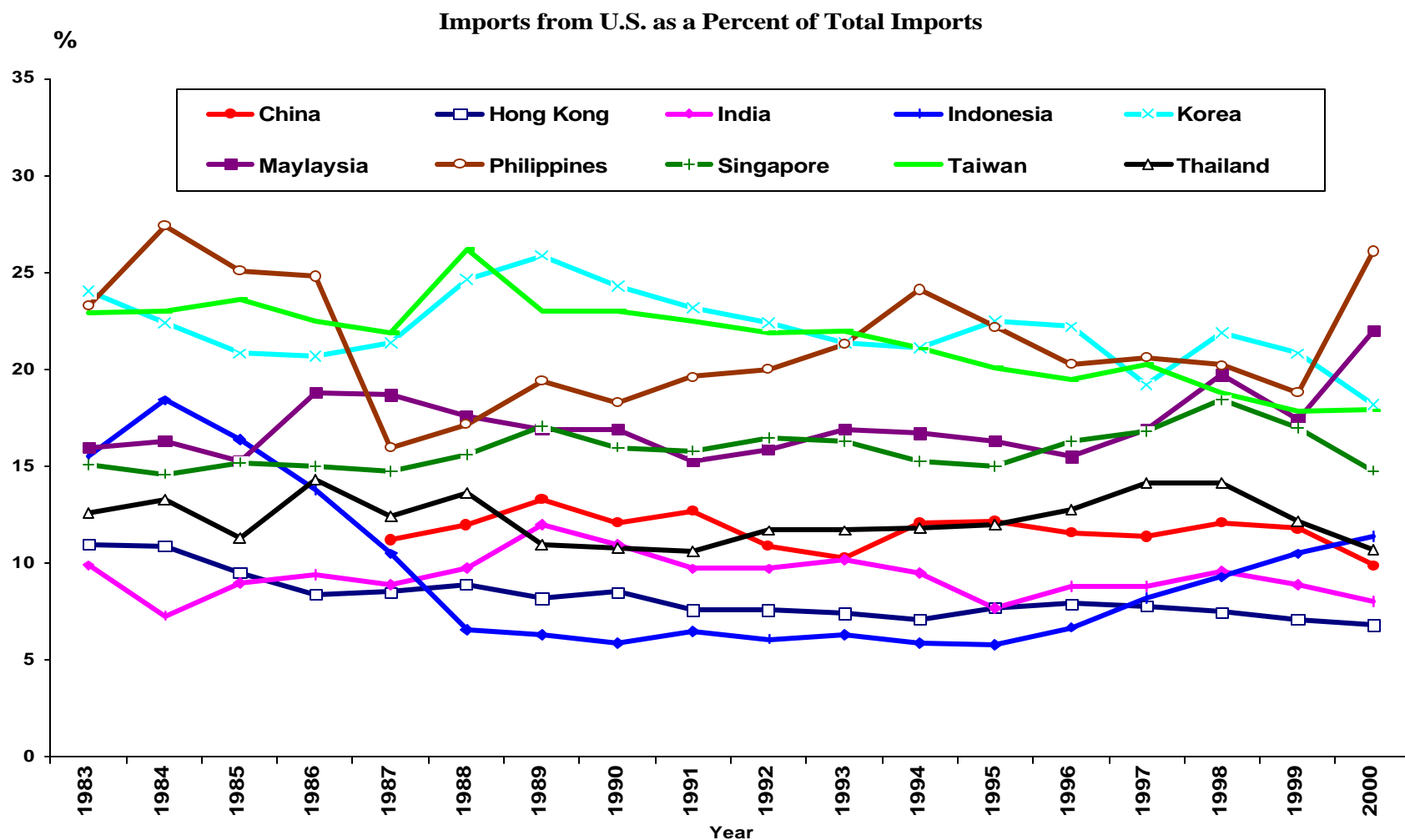
Chinese Exports to U.S. as a Percent of Chinese GDP



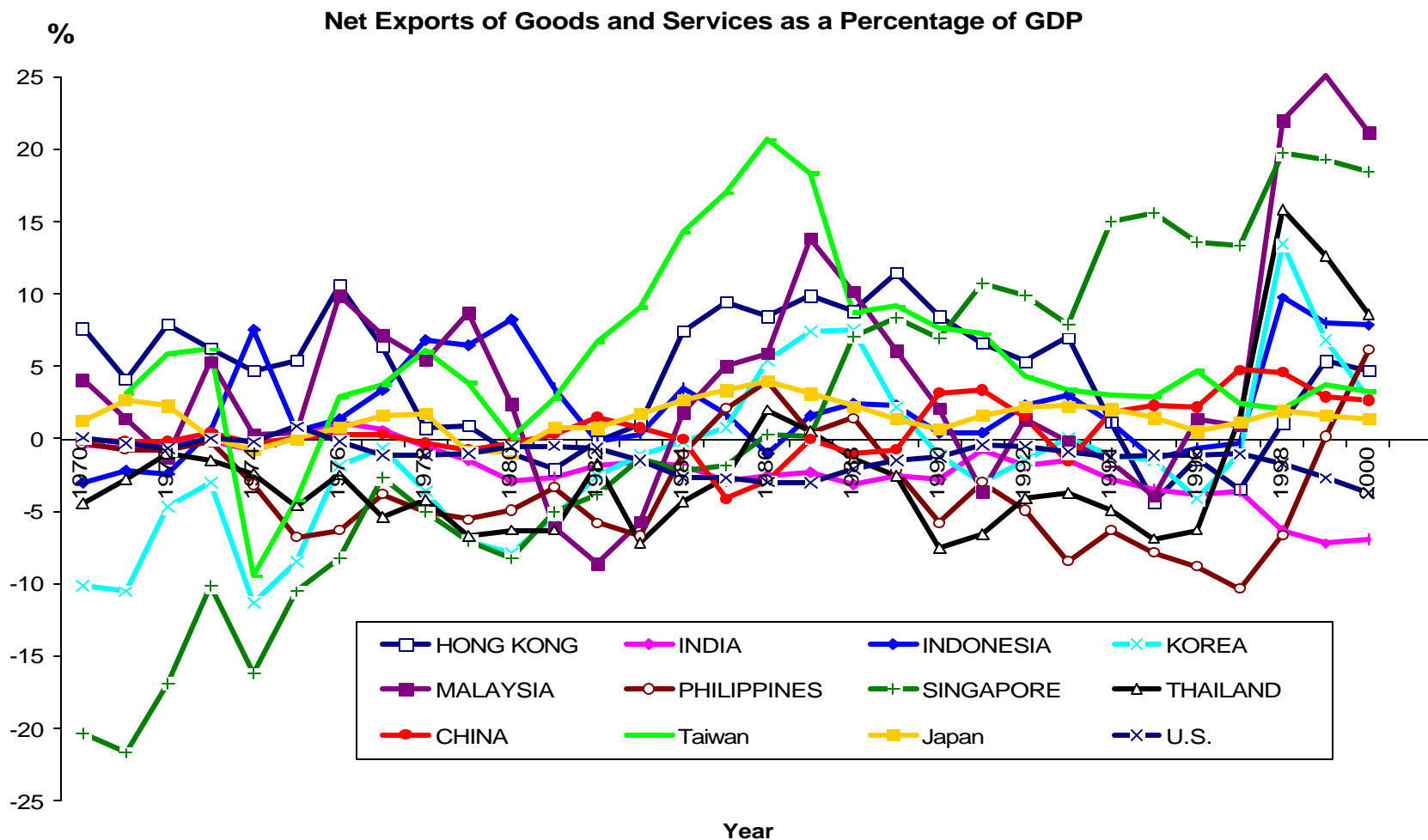
Imports as a Percent of GDP: Selected East Asian Economies and U.S.



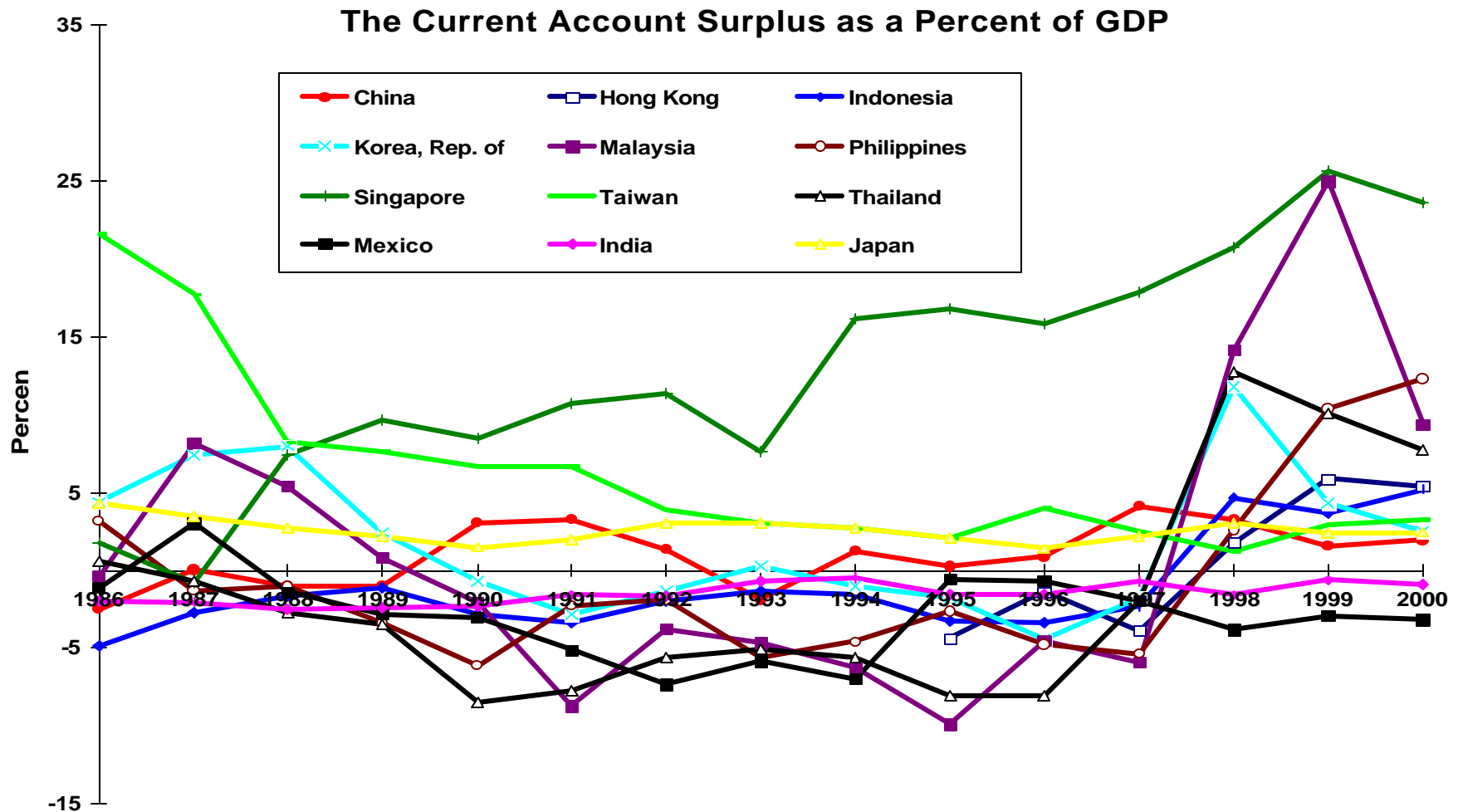
Imports from U.S. as a Percent of Total Imports



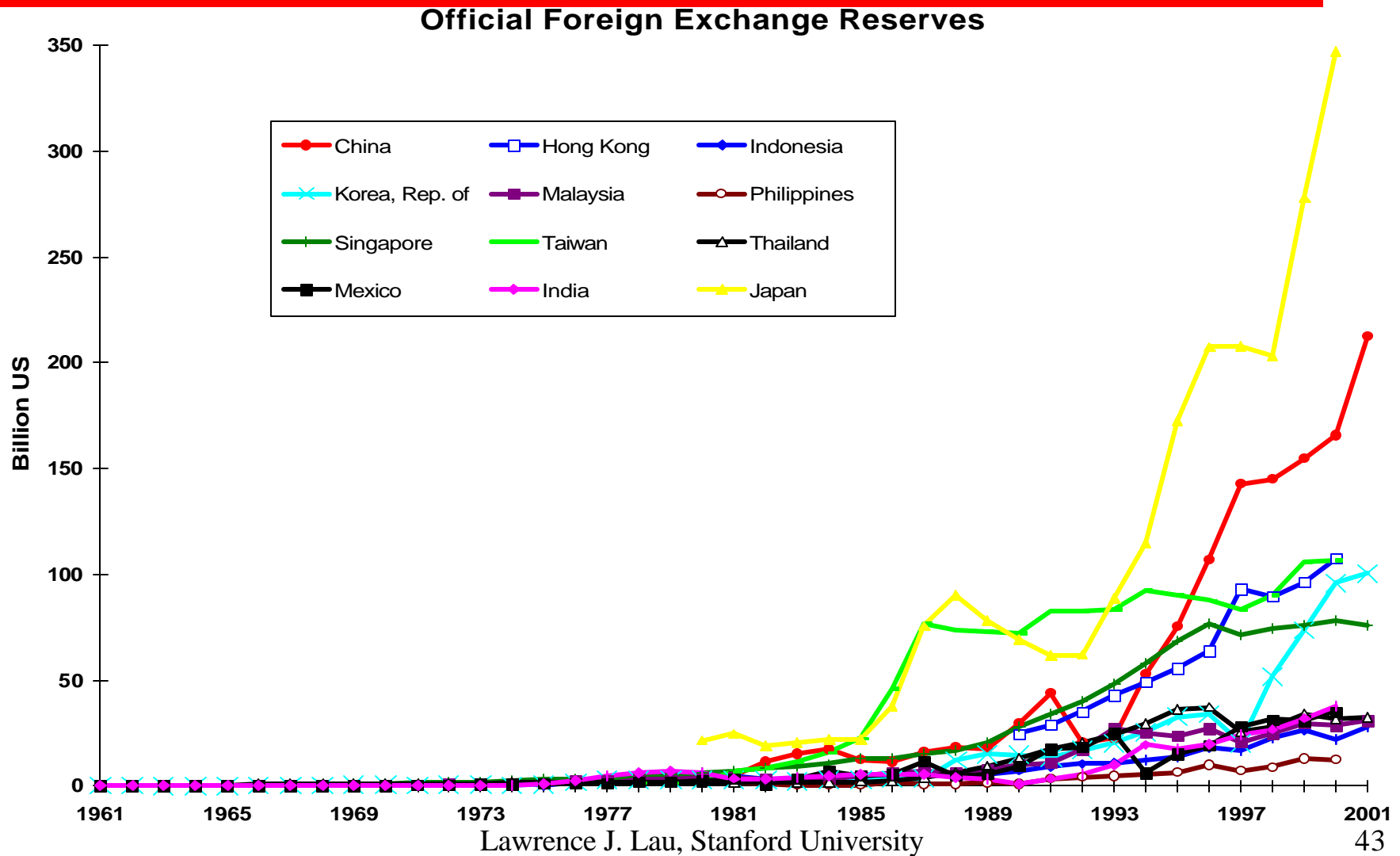
Net Exports of Goods and Services as a Percentage of GDP: Selected Economies



The Current Account Surplus as a Percent of GDP: Selected East Asian Economies

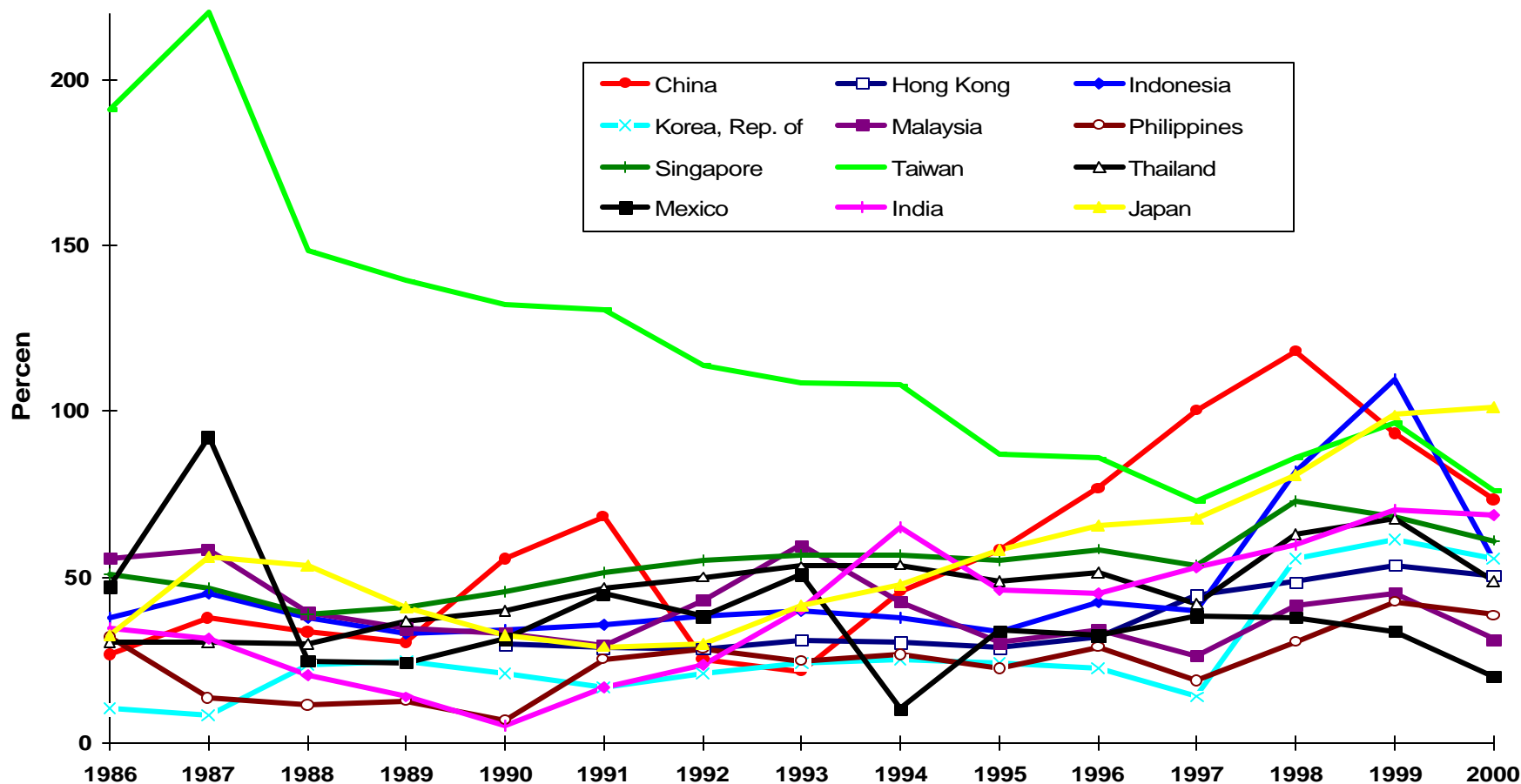


Official Foreign Exchange Reserves: Selected East Asian Economies



Foreign Exchange Reserves as a Percent of Annual Imports: Selected East Asian Economies

Foreign Exchange Reserves as a Percent of Annual Imports



The Opportunities and Challenges of Globalization

- ◆ The globalization of supply chains facilitates and encourages worldwide search for sources of supply--hence new opportunities for many economies
- ◆ However, the globalization of supply chains also implies greater uncertainty because of increased footlooseness of foreign investors and customers and the constant threat of potential competition elsewhere. Products and firms and even industries can no longer be expected to last forever.
 - ◆ Social safety net, nimble businesses and flexible workers
 - ◆ Hospitable legal, tax and competitive environment for start-up firms
- ◆ Developing countries have the ability to leap-frog--there are no vested interests to protect; no existing business to be cannibalized; there can be creation without destruction
 - ◆ e.g., mobile and wireless telephones; debit and credit cards instead of checks

Human Capital Becomes Even More Important in the New Economy

- ◆ The “New Economy” depends on both tangible and intangible capital--the importance of complementarity of different forms of capital (tangible, infrastructural, human, R&D, knowledge)
- ◆ 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 human capital is needed to exploit the potential presented by the “New Economy”—the “New Economy” has much higher skill requirements
- ◆ The impossibility of any employer to honor a life-time employment contract places even greater emphasis on the accumulation of human capital by the workers—on investment in general, flexible human capital rather than firm-specific human capital. Workers must strive to be flexible and adaptable and capable of learning so as to maximize the probability of re-employment.

R&D Capital

- ◆ Improvements in technology (equivalently technical progress or the ability to produce greater output with the same or less inputs) are mostly the results of purposive activities such as investment in R&D
- ◆ R&D capital is complementary to both tangible capital and to human capital
- ◆ The developed economies are way ahead of the developing economies in terms of current investments in R&D as a proportion of GDP as well as aggregate R&D capital stock
- ◆ Domestic R&D capital and human capital are essential for the import and absorption of technology—to facilitate learning and to accelerate diffusion
- ◆ The importance of strategic R&D—licenses for trading and cross-licensing; credible threats of entry.

Demographic Transition

- ◆ Declining fertility worldwide linked to the education of women
- ◆ Aging of population worldwide—the rise of the dependency ratio
- ◆ The importance of the quality rather than quantity of human capital
- ◆ Complementarity of physical capital, human capital, and technical progress implies more resources should be devoted to the provision of education

The Biotechnology Revolution

- ◆ Two major areas of potential payoffs:
 - ◆ Food and agriculture--Drought, disease and pest-resistant crop strains; healthy, disease-resistant livestock breeds; rapid-growth plants
 - ◆ Medical care and public health—Gene therapy; new cures for diseases; preventive therapy; genetically specific vaccines, drugs and treatments

Implications for Public Policy

- ◆ Public support of education and R&D, especially basic education and basic research; tax incentives for education and R&D
- ◆ Promotion of competitive, flexible, and mobile labor markets with wage rates and other compensation freely determined by market forces
- ◆ Creation of a viable social safety net that can be sustained independently of firms
- ◆ Maintenance of a competitive market environment with free entry and exit (use of anti-trust laws to prevent unfair competition and monopolistic practices)
- ◆ Protection of intellectual property rights, including patents, copyrights, brand names and trade secrets
- ◆ Promotion of venture capital, “angels” and other forms of private risk capital; encouragement of entrepreneurship; promotion of a culture of open communication and mobility and acceptance of risk and failures; development of private capital markets
- ◆ Maintenance of a fully integrated national market—with free flows of goods, services and capital—the equivalent of the “Interstate Commerce” clause of the the U.S. constitution
- ◆ Enforcement of contracts and prosecution of fraud; insistence on transparency and good corporate governance; protection of property rights
- ◆ Promotion of university-industry-government cooperation