

Outlook on the Chinese Economy

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October 23, 2002

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A Preview

- ◆ The Chinese Economy Today
- ◆ How Reliable Are Chinese Economic Data?
- ◆ Prospects for Future Economic Growth
 - ◆ Input-Driven versus Innovation-Driven
 - ◆ The Three Paradigms of Economic Growth
 - ◆ The Development of the “Great West”
 - ◆ The New Economy and the Possibility of Leap-Frogging
 - ◆ The Problems and Uncertainties

The Chinese Economy Today

The Chinese Economy Today (1)

- ◆ East Asia is the fastest-growing region in the world over the past two decades, the East Asian currency crisis of 1997-98 notwithstanding
- ◆ China is the fastest growing country in East Asia—nearly 10% p.a. since beginning of economic reform (1979)
- ◆ Between 1979 and 2001, Chinese real GDP grew from \$177 billion to \$1.16 trillion (2001 prices) and real GDP per capita grew from \$183 to \$920. The U.S. GDP (\$10.19 trillion) and GDP per capita (\$36,840) are respectively 9 and 40 times the comparable Chinese figures in 2001.
- ◆ China survived the East Asian currency crisis relatively unscathed.
- ◆ China is one of the very few socialist countries that have made a successful transition from a centrally planned to a market economy—the 10th Five-Year Plan is only indicative and not mandatory; the rate of interest (the price of money) and the exchange rate are the only prices that are still administratively determined on the margin.

The Chinese Economy Today (2)

- ◆ The private (non-state) sector accounts for more than 65% of GDP and an even greater percentage of employment in 2001—non-state-owned firms face hard budget constraints and ordinary citizens can make a good living without being beholden to the state.
- ◆ China is the 6th largest trading country in the world (exports of US\$266.2 billion and imports of US\$245 billion, totaling US\$511.2 billion in 2001)
- ◆ China has been rapidly becoming a major destination for the exports of other East Asian economies
- ◆ China is no longer a “shortage” economy--insufficient aggregate demand is a real possibility

The Chinese Economy Today (3)

	1979	2001
	US\$ (2001 prices)	
Real GDP	177 bill.	1.16 trill.
Real GDP per capita	183	920

The Chinese Economy Today (4)

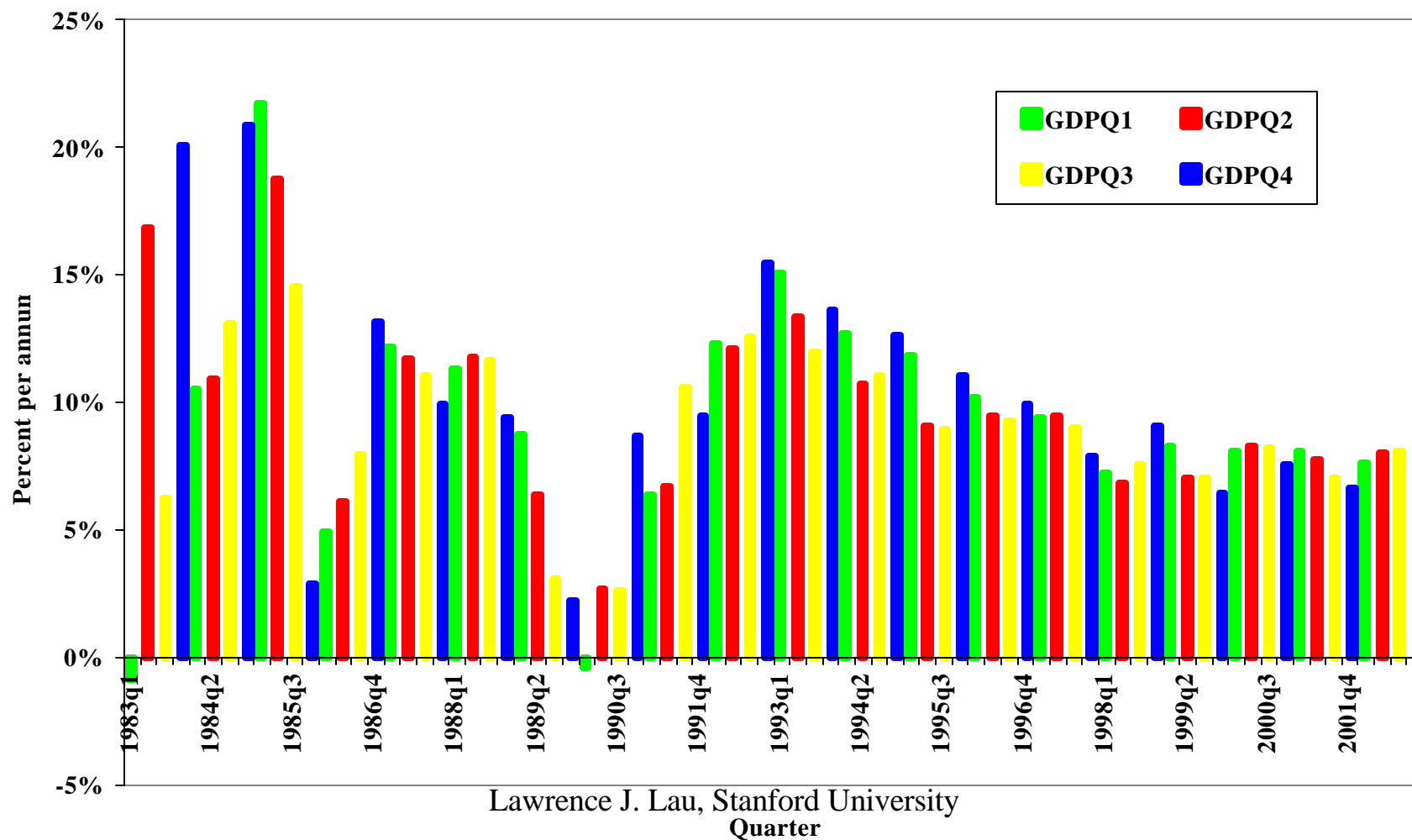
	U.S.	China
	US\$ (current prices)	
2001 GDP	10.19 trill.	1.16 trill.
2001 GDP per capita	36,840	920

Rates of Growth of Real GDP and Inflation (% p.a.)

◆ Actual		Real GDP	RPI	CPI
	1997	8.8	0.8	2.8
	1998	7.8	-2.6	-0.8
	1999	7.1	-2.9	-1.3
	2000	8.0	-1.5	0.4
	2001	7.3	-0.8	0.7
	2002Q1	7.6		-0.6
	2002Q2	8.0		
	2002Q3	8.1		
	2002/Q1-3	7.9		
◆ Projections	2002	>7.0		(NBS)
		>7.5		(PBOC)
		7.0		(ADB)
		7.5		(Lau)
		6.9		(Lehman)
				1.0

Quarterly Rates of Growth of the Real GDP of the Chinese Economy, Y-o-Y

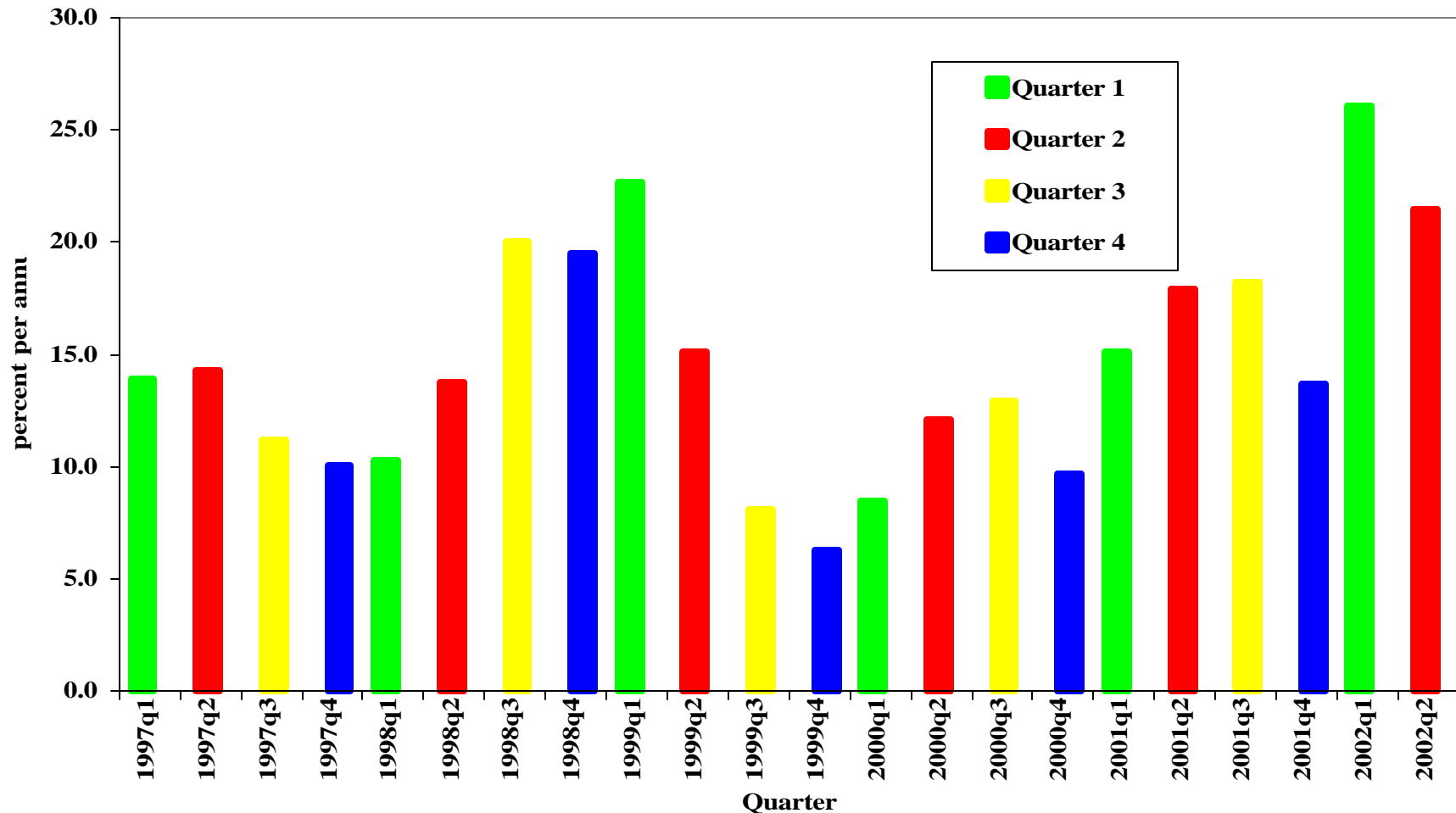
YoY Quarterly Rates of Growth of Real GDP



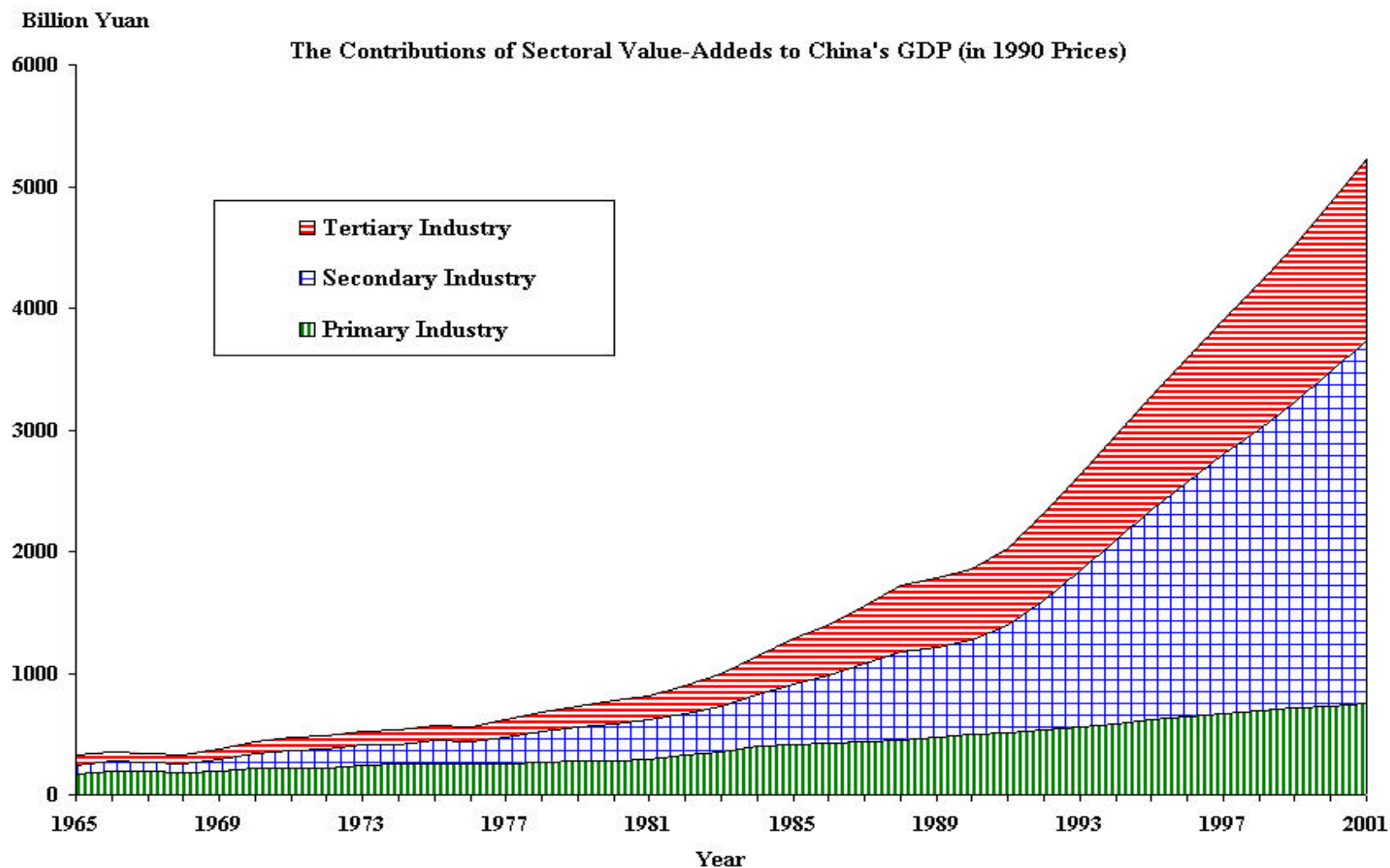
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Quarterly Rates of Growth of the Real Gross Fixed Investment of the Chinese Economy, Y-o-Y

YoY Quarterly Rates of Growth of Real Gross Domestic Fixed Investment

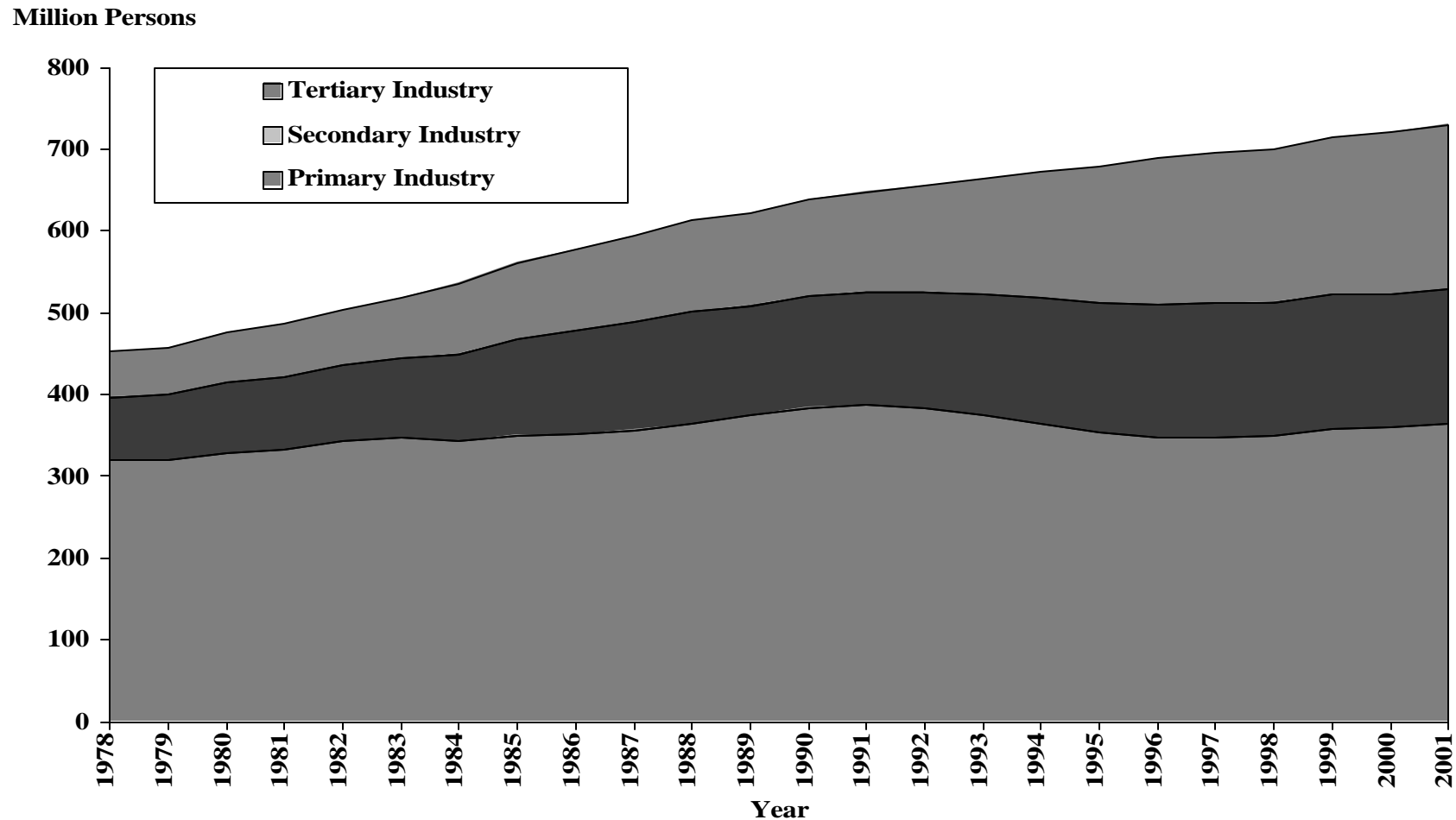


The Contributions of Sectoral Value-Addeds to China's GDP

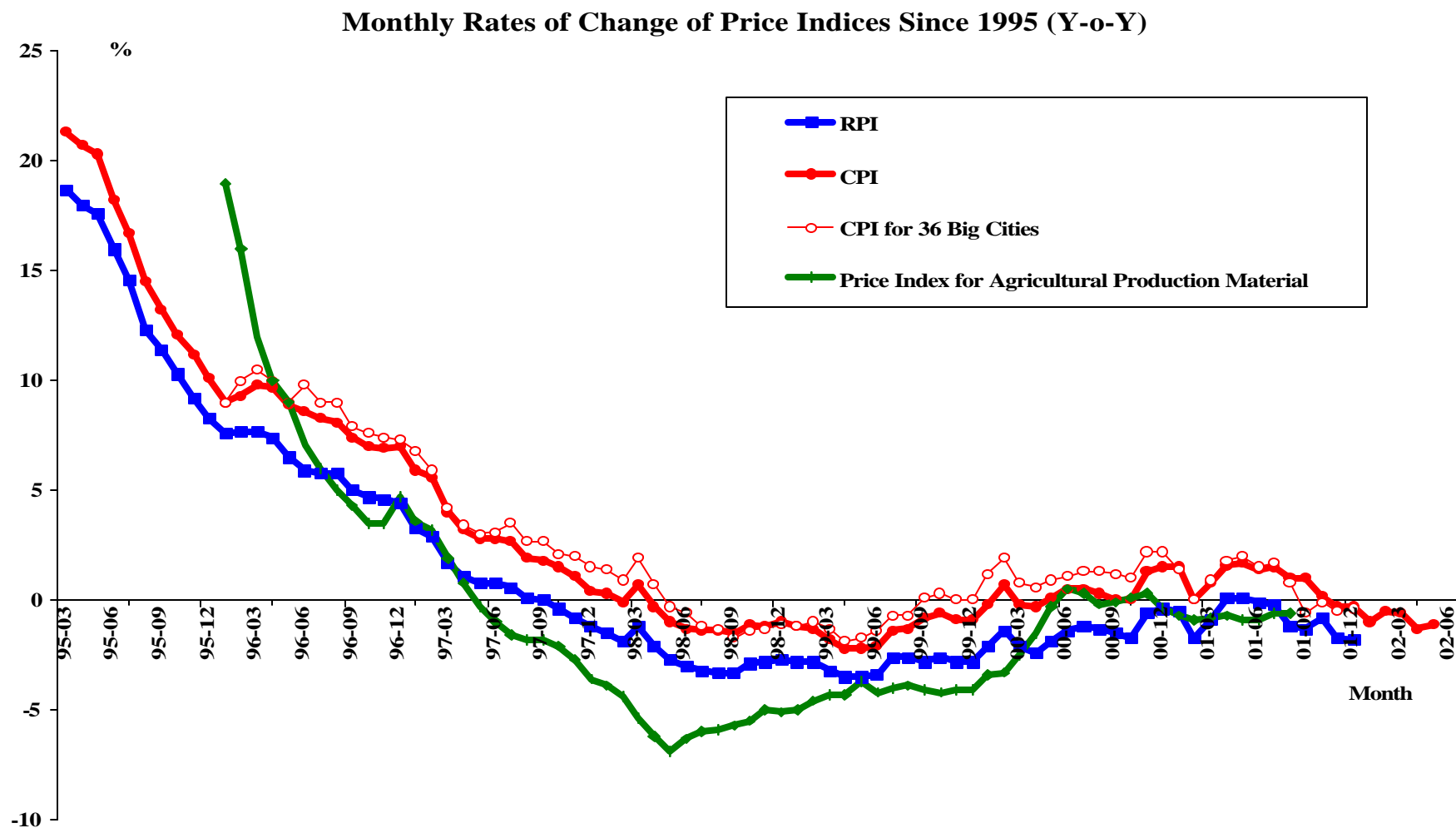


The Sectoral Contributions to China's Employment

The Sectoral Contributions to China's Employment



The Consumer and Retail Price Indices



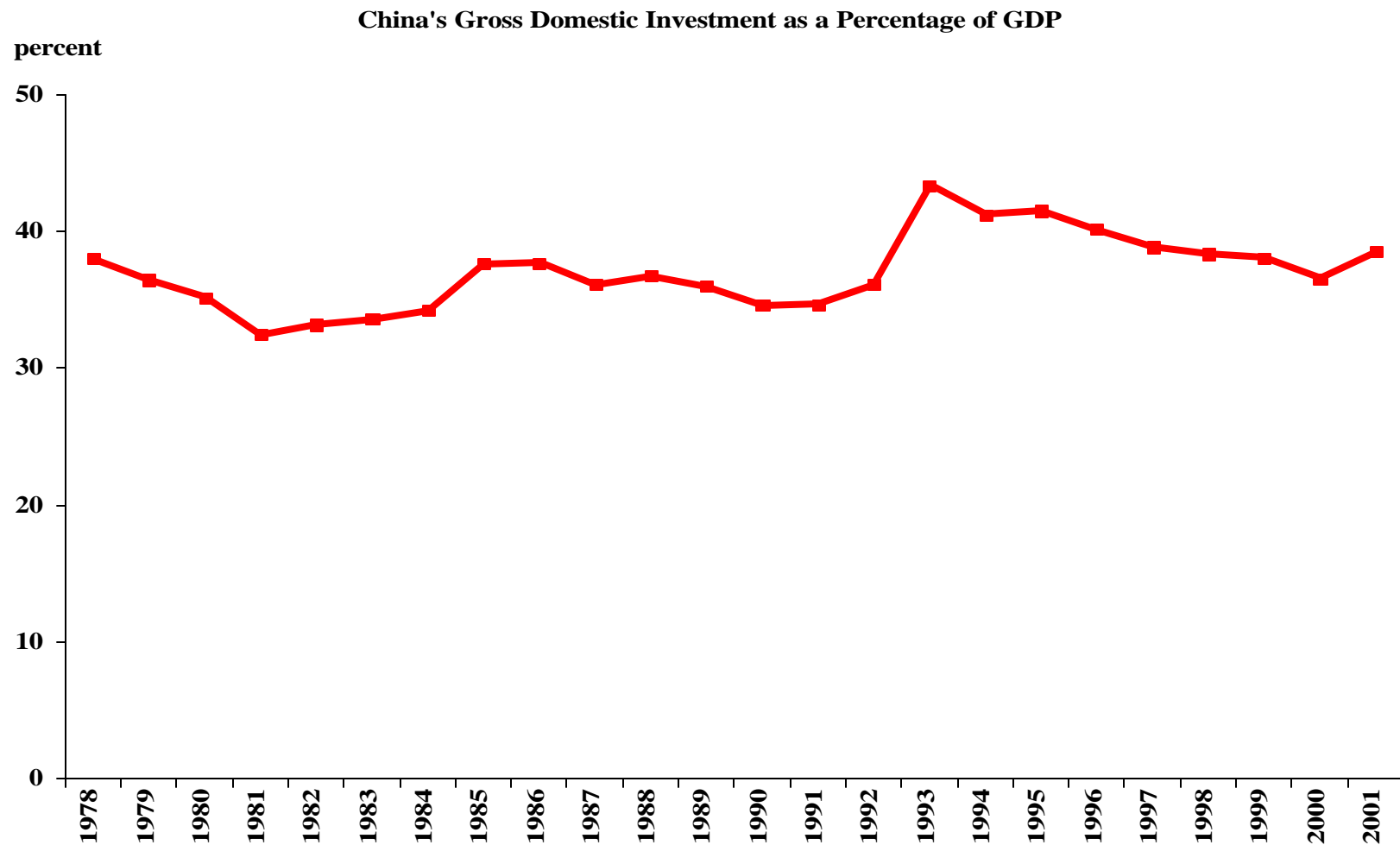
Has “Deflation” Stopped?

- ◆ Deflation has slowed/stopped:
 - ◆ In 1999 the RPI declined 2.9%; in 2000 the RPI declined only 1.5%
 - ◆ In 1999 the CPI declined 1.3%; in 2000 the CPI rose 0.4%
 - ◆ In 2001, the CPI rose 0.7%, the RPI declined 0.8% and the PPI declined 3.7%
 - ◆ In 2002Q1, the CPI declined 0.6%; in 2002/M9, the CPI declined 0.7% YoY.
 - ◆ In April 2002, the PPI declined 3.1% Y-o-Y; in January-April, 2002, the PPI declined 3.8% Y-o-Y
- ◆ The “core” rate of inflation is non-negative
 - ◆ The decline in prices over the past few years was due in part to the fall in the prices of energy, in particular oil, and agricultural products, in particular food.
 - ◆ It was also due in part to the increase in productivity (reduction in cost) and in competition and the decrease in the degree of monopolistic market power (reduction in profit margin)
 - ◆ The long-term core inflation rate--inflation rate net of changes in the prices of energy and food--may be estimated at between 0 and 1 percent--there is no deflation
 - ◆ The key to determining whether there is deflation in the macroeconomic sense is whether the components of aggregate demand, real consumption and investment, are growing (In 2002/M9, retail sales increased 9.1% YoY).

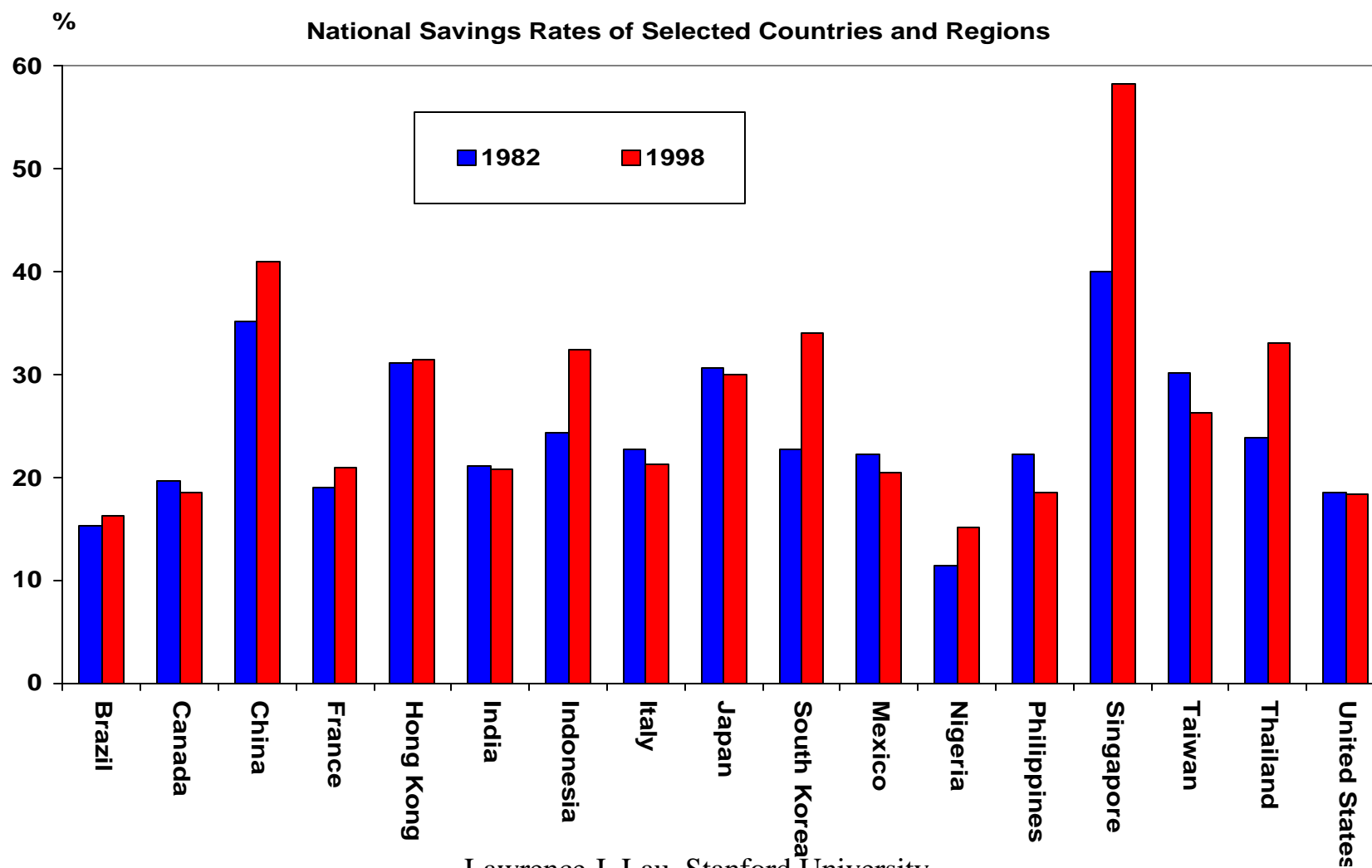
The Relative Stability of the Rate of Growth of Real GDP

- ◆ Gross domestic investment is mostly financed through domestic savings rather than foreign investment or loans.
- ◆ Foreign direct investment (FDI) accounts for approximately 10% of gross domestic investment in China, a relatively small proportion.
- ◆ Despite fluctuations in exports and imports, the rate of growth of real GDP has remained remarkably stable at 7-8%. Exports are approximately 20% of GDP, but the value-added component is only approximately 30%, resulting in an export-generated value-added to GDP ratio of 6%. Chinese exports to the U.S. is approximately 7.3% of Chinese GDP (according to adjusted U.S. data), with a value-added content of 20%, resulting in a value-added to GDP ratio of 1.5%.
- ◆ The volatility of the Chinese annual rates of growth has also declined, indicating an improved capacity for macroeconomic management.
- ◆ The Development Research Center of the State Council has estimated that accession to WTO will increase the rate of growth of the Chinese economy by 0.5% per annum; the U.S. International Trade Commission has estimated that real GDP would be 4% higher in 2010 than otherwise.
- ◆ The National Bureau of Statistics (NBS) projected that the award of the 2008 Summer Olympic Games to Beijing should add 0.3-0.4% to the average annual growth rate

China's Gross Domestic Investment as a Percent of GDP

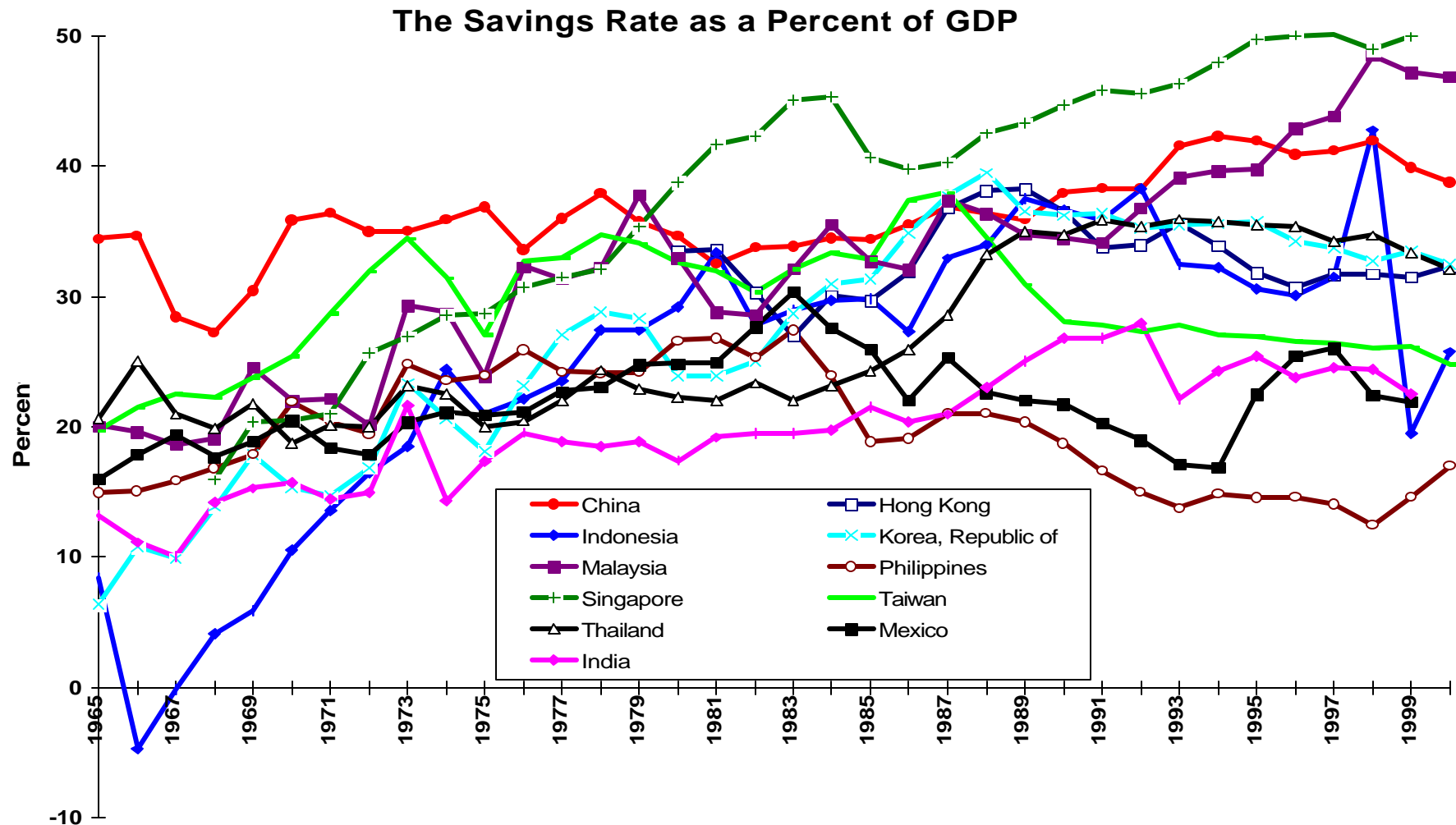


National Savings Rate as a Percent of GDP: Selected Countries and Regions

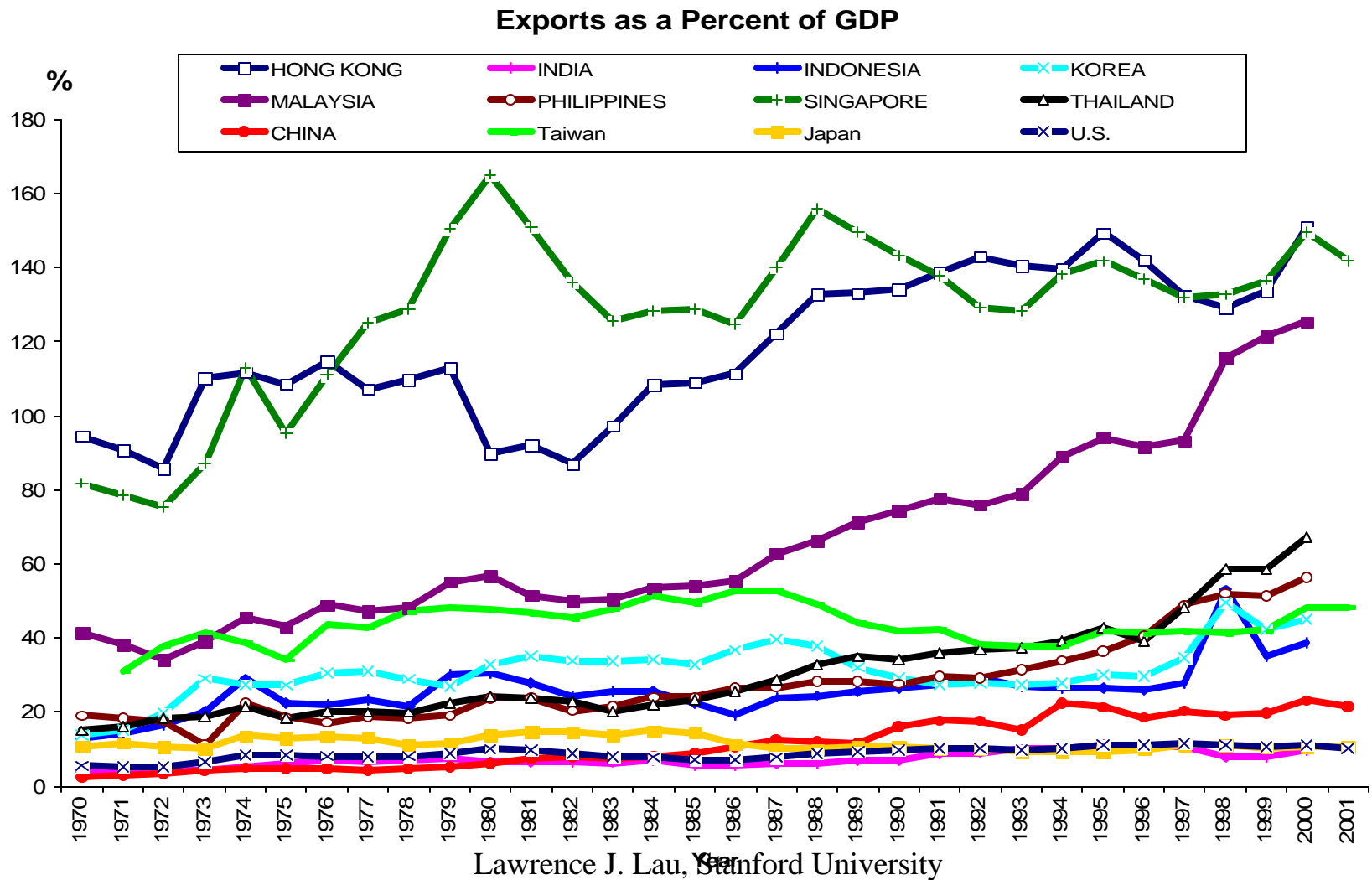


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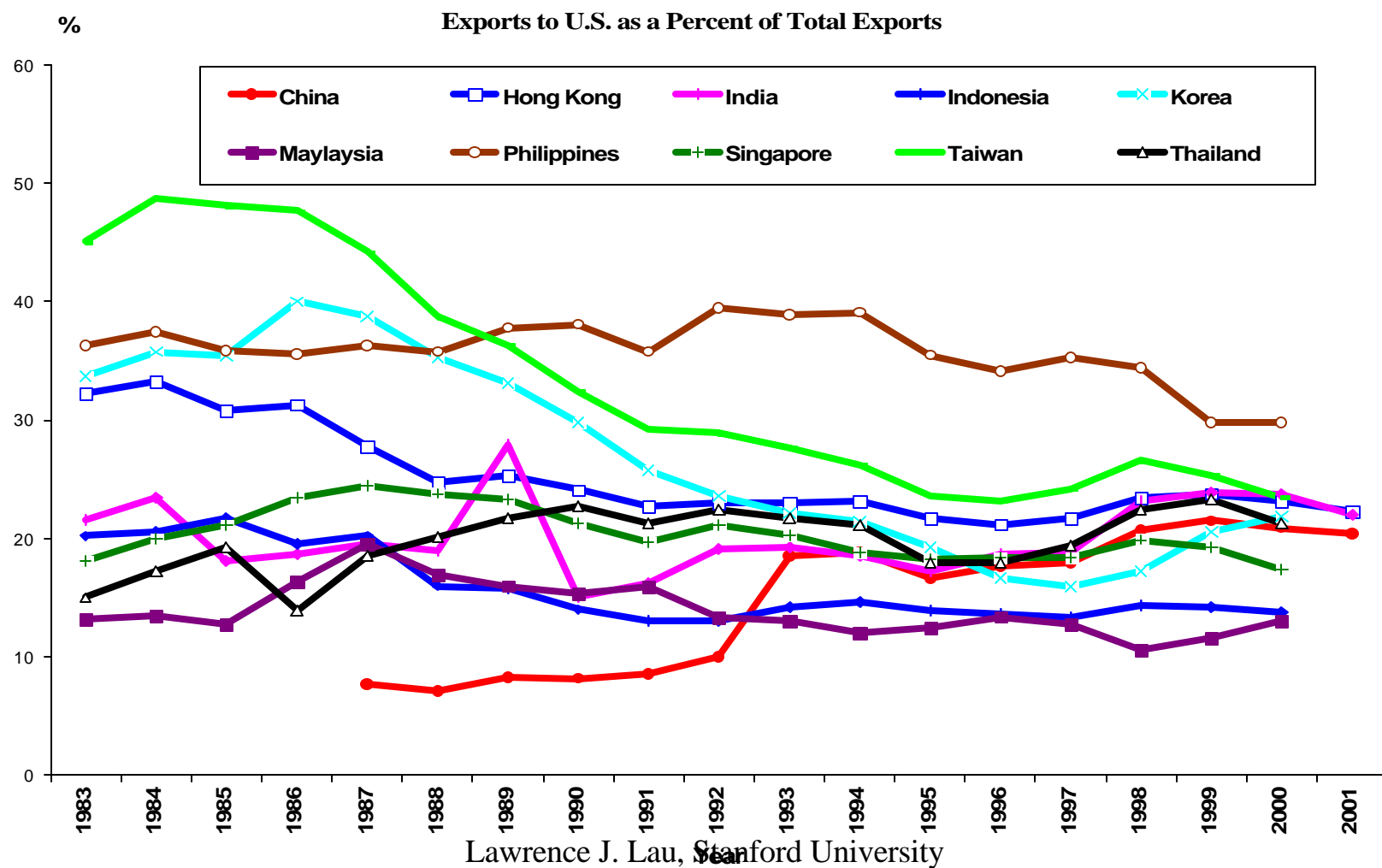
The Savings Rate as a Percent of GDP: Selected East Asian Countries and Regions



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



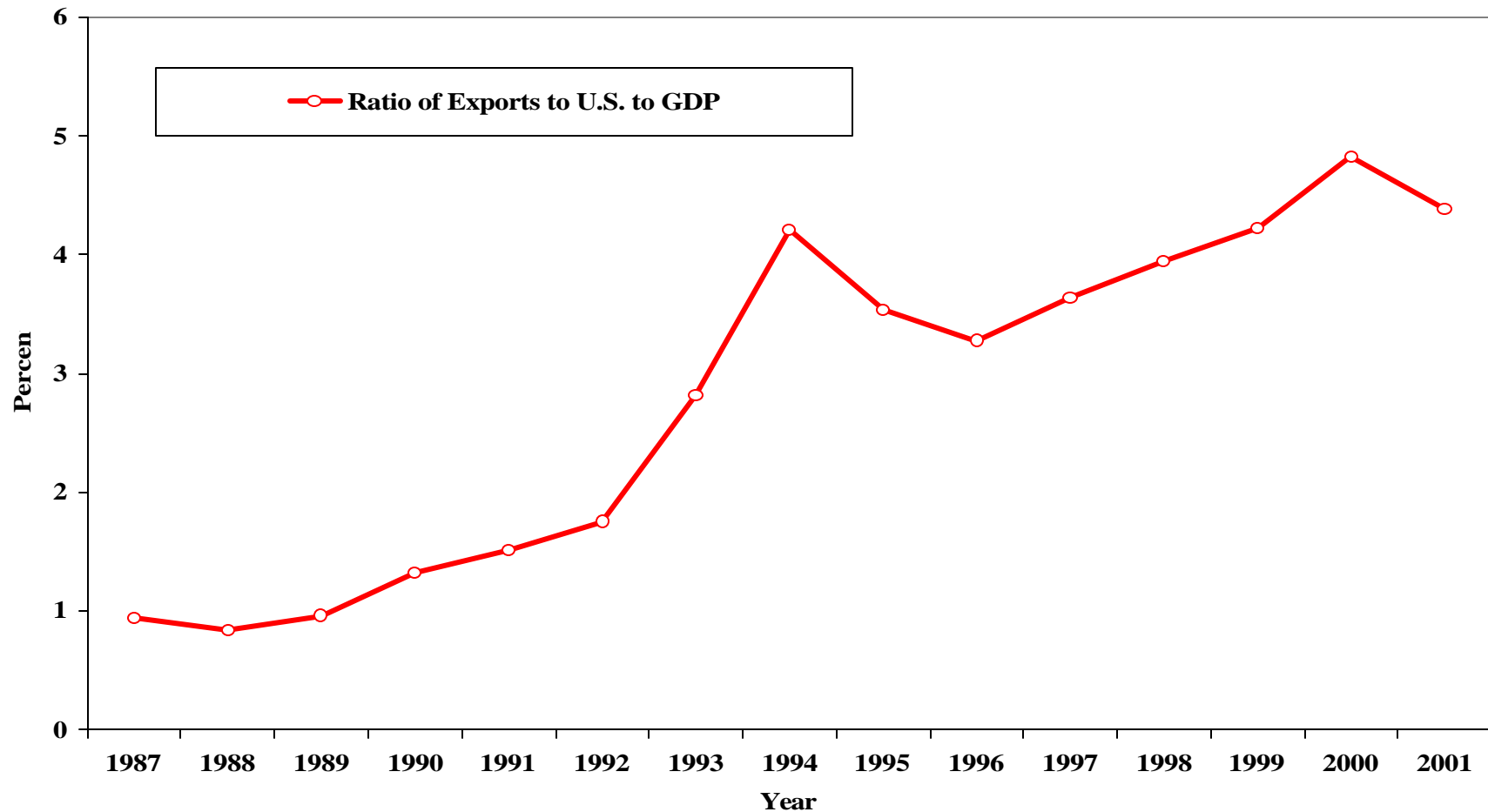
Exports to U.S. as a Percent of Total Exports



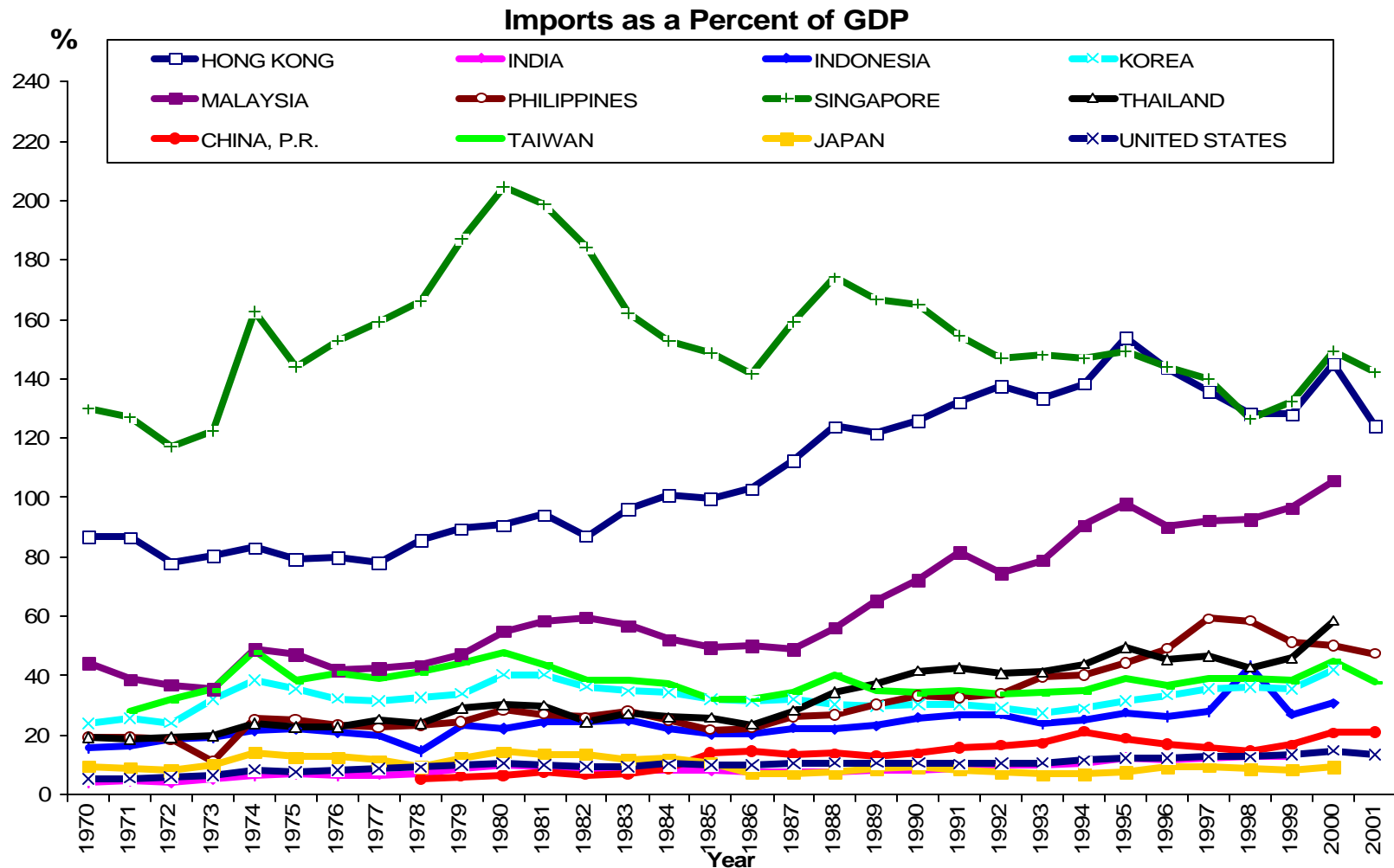
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Chinese Exports to the United States as a Percent of Chinese GDP (Chinese Data)

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

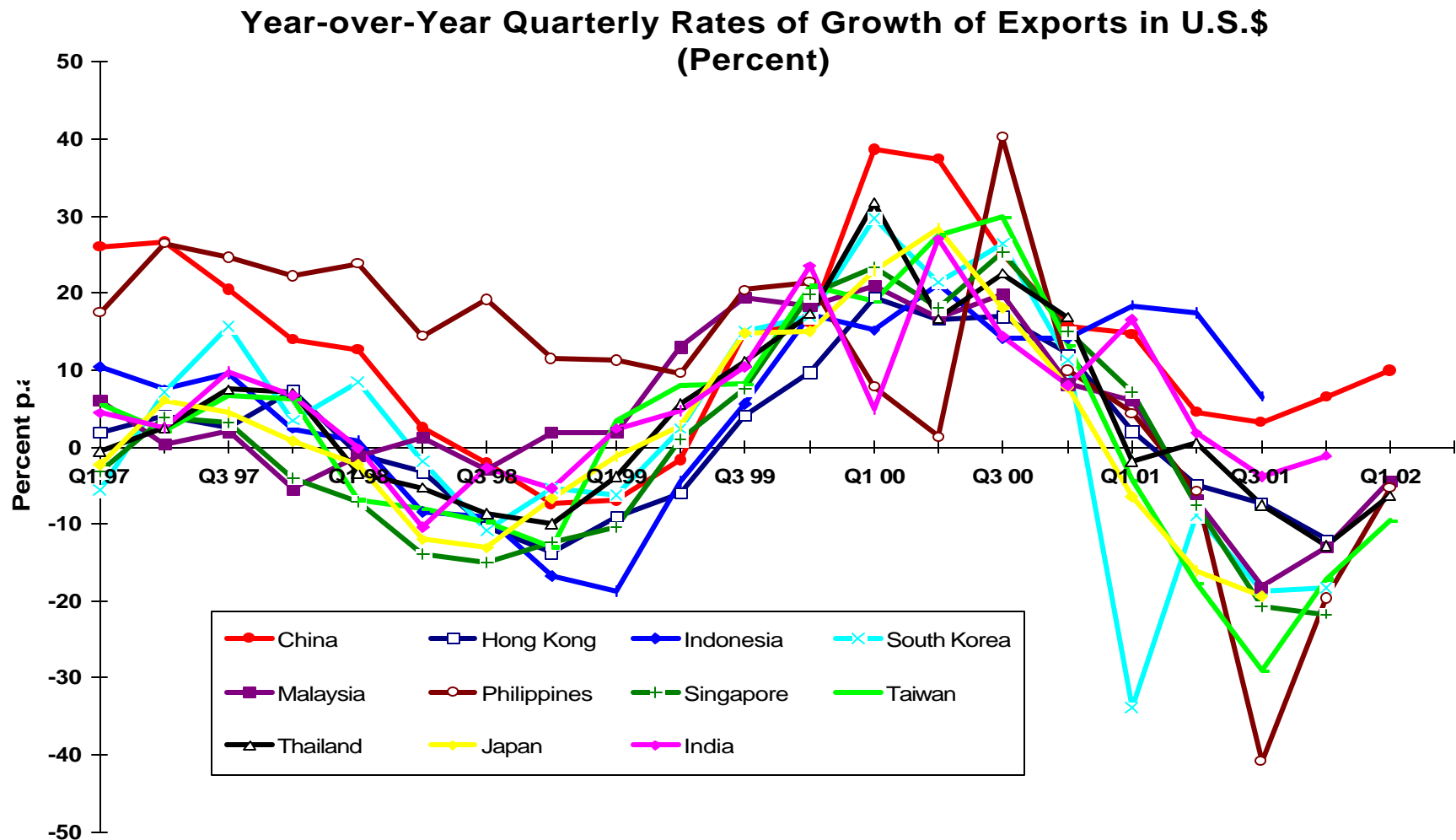


Imports as a Percent of GDP: Selected East Asian Economies and U.S.

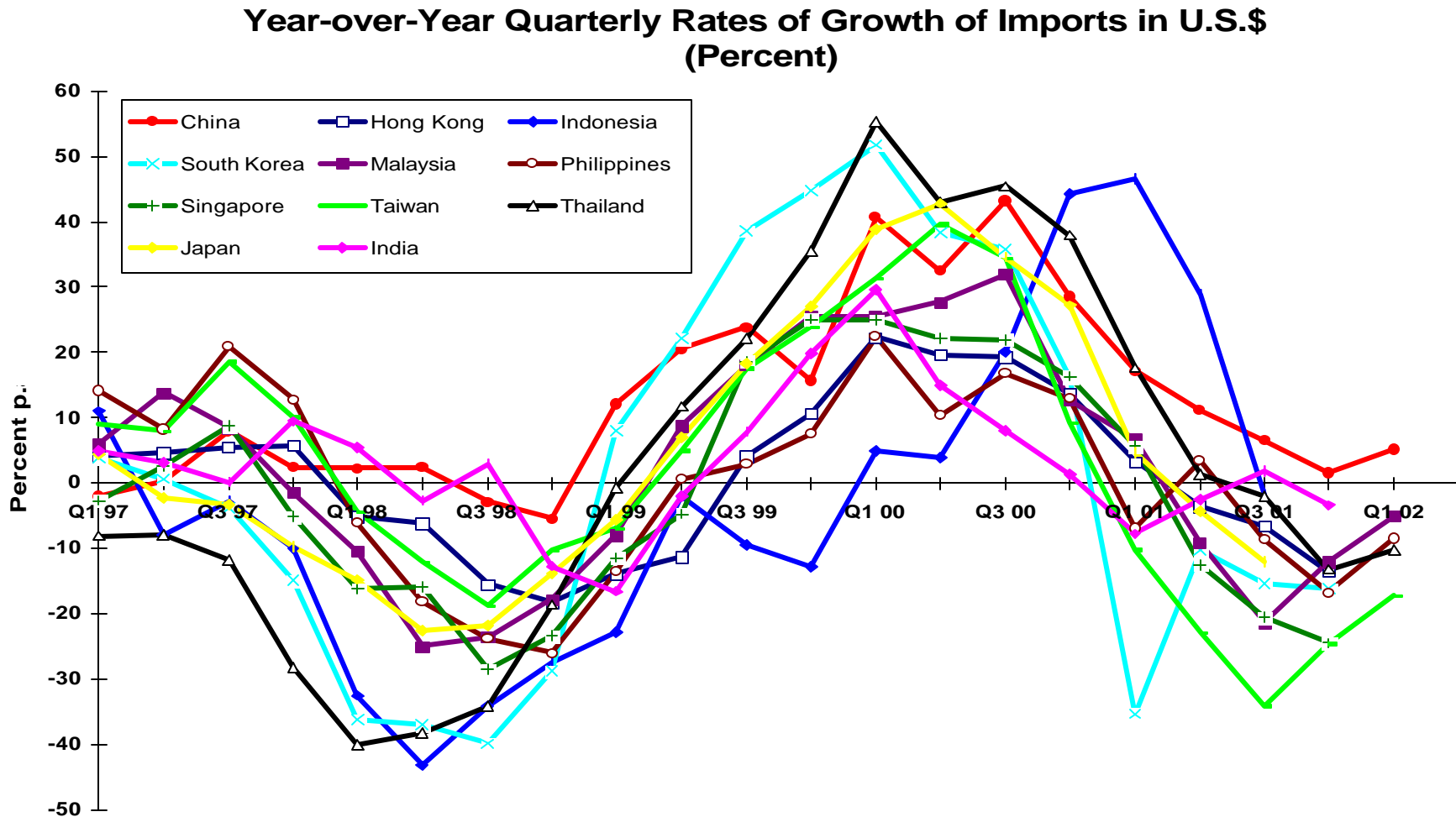


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Quarterly Rates of Growth of Exports: Selected East Asian Economies

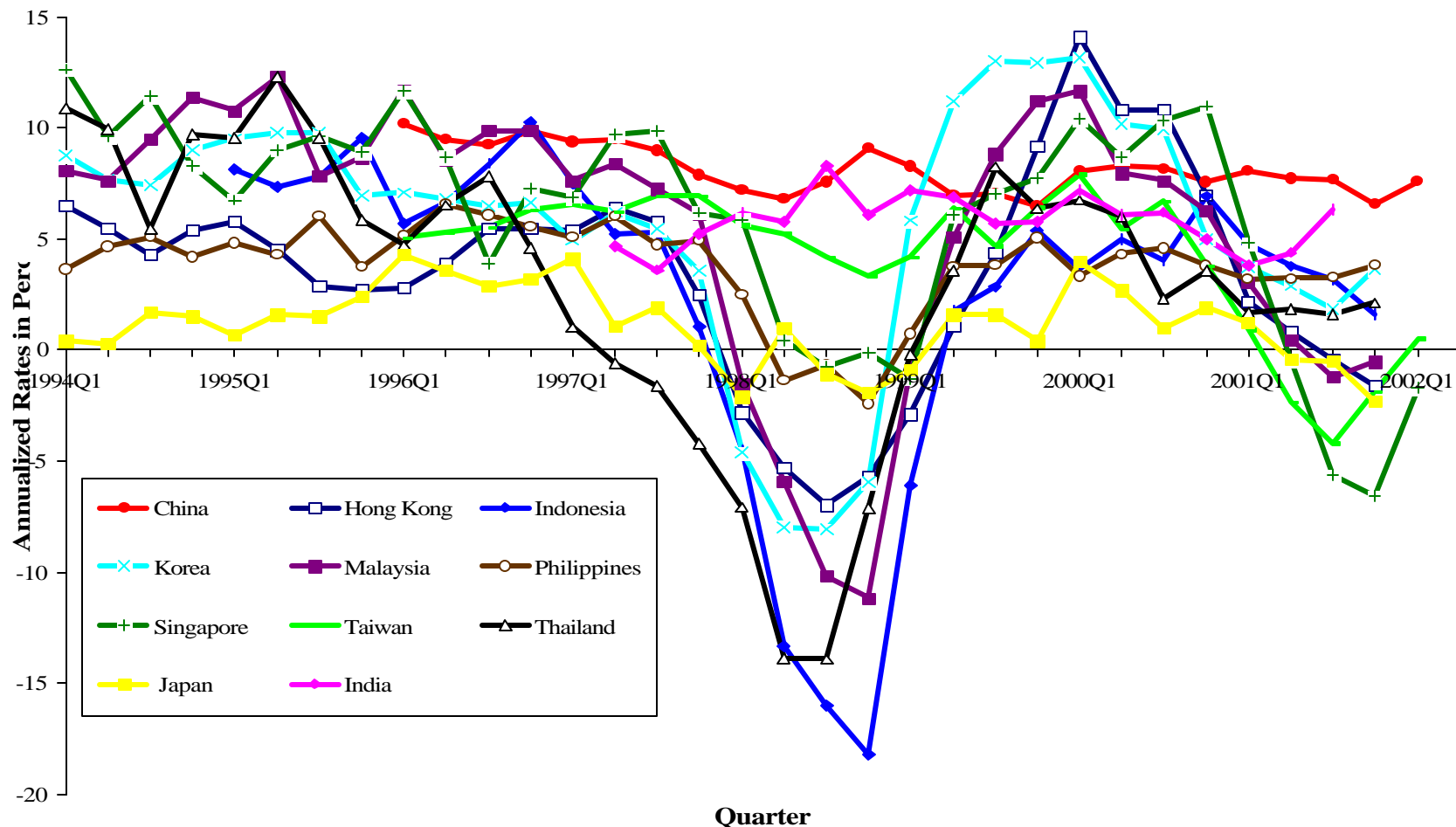


Quarterly Rates of Growth of Imports : Selected East Asian Economies



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

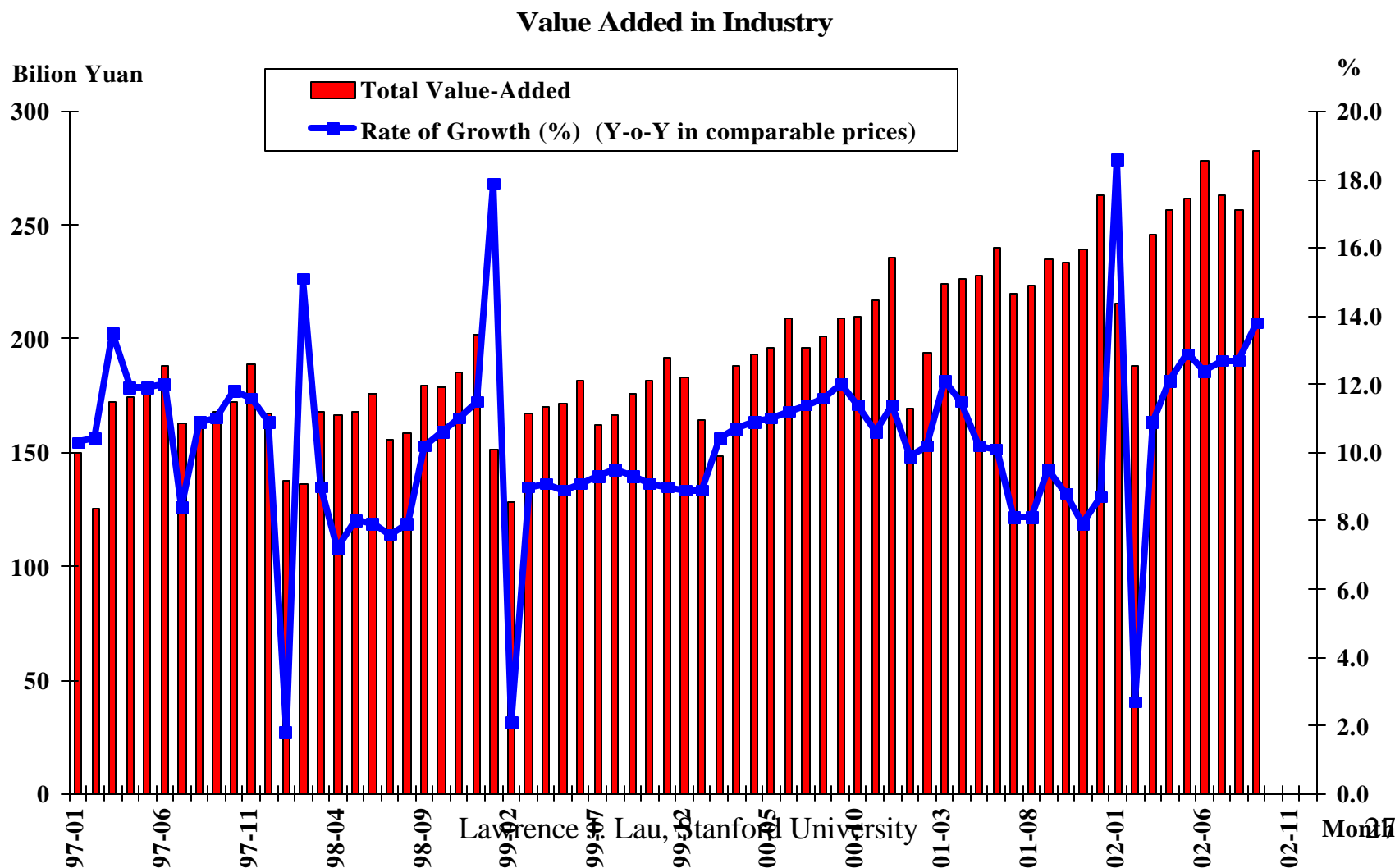
Quarterly Rates of Growth of Real GDP, Year-over-Year, Selected East Asian Economies



Indicators of Current Economic Performance

- ◆ In 2002/Q1-Q3, value-added in industry amounted to 2,248.7 billion Yuan, an increase of 12.2% YoY in real terms
- ◆ Retail sales in 2002/M9 grew 9.1% YoY
- ◆ Savings deposits of households reached 8.4 trillion Yuan, an increase of 18.1% YoY, which itself represents an increase in the rate of increase by 5.4 percentage points

Value-Added in Industry (Monthly Data)



Exports, Imports and Foreign Exchange Reserves

- ◆ In 2000, exports rose 27.8% to US\$249.2 billion; imports rose 35.8% to US\$225.1 billion; with a trade surplus of US\$24.1 billion
- ◆ In 2001, exports rose 6.8% Y-o-Y to US\$266.2 billion and imports rose 8.2% to US\$243.6 billion with a trade surplus of US\$22.5 billion
- ◆ In 2002, after an initial slowdown, exports and imports have resumed their rapid growth—in Q1-Q3, exports grew 19.4% to US\$232.6 billion while imports grew 17.2% to \$212.6 billion; in 2002/M9, exports grew 33.1% YoY to US\$31.9 billion and imports grew 36.4% to US\$29.8 billion, with a total international trade of US\$61.7 billion, a historic monthly high.
- ◆ Trade with Southeast Asian countries, both exports and imports, have been increasing at double-digit rates—in 2002/M1-8, exports from South Korea, Malaysia, Singapore to China increased YoY 42%, 38% and 31% respectively; in 2002.M9, exports from Taiwan to Mainland China increased 171% YoY.

Exports, Imports and Foreign Exchange Reserves

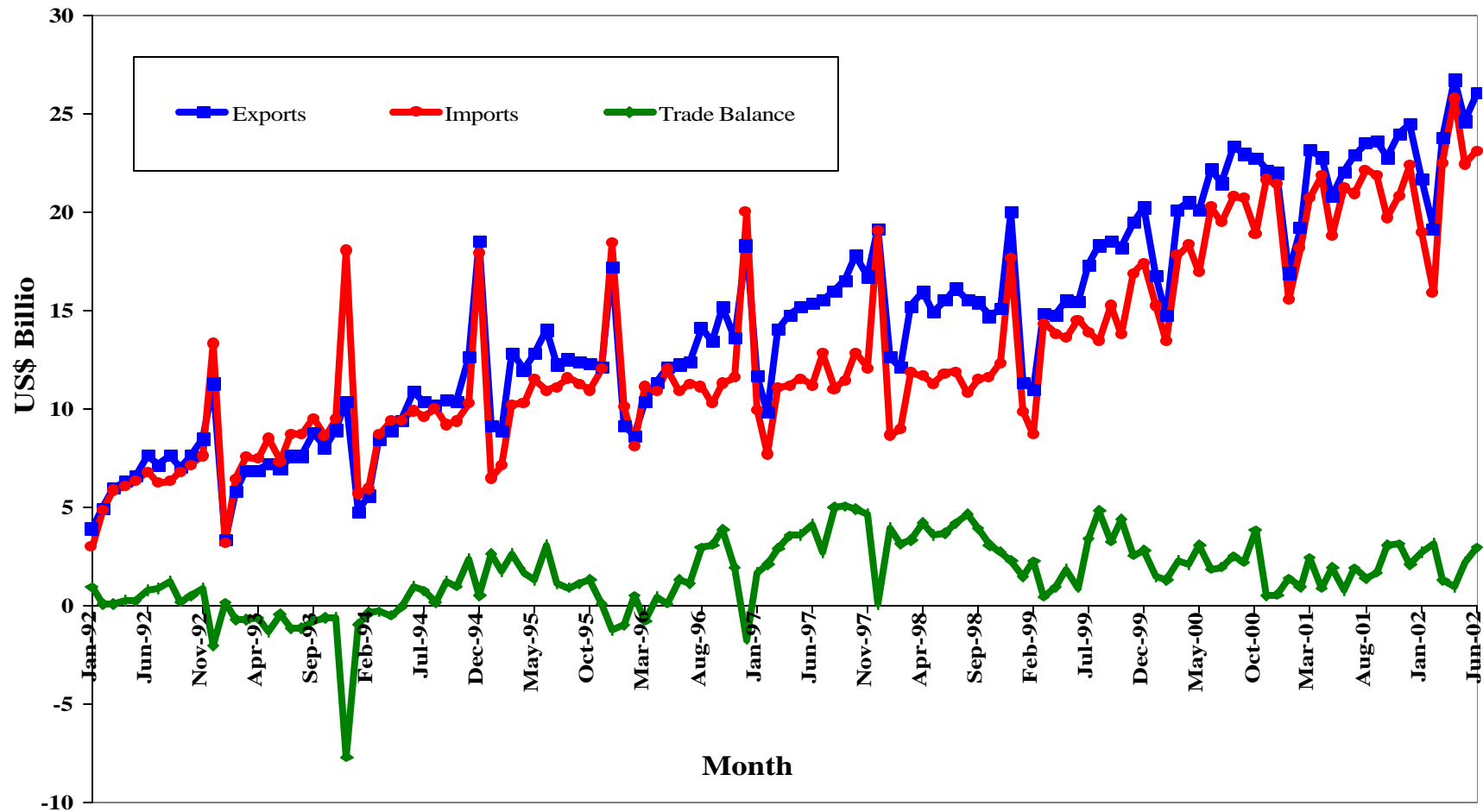
- ◆ Chinese tourists traveling abroad exceeded 10 million in 2000; the tourism component of the balance of payments turned negative in 2000
- ◆ Official foreign reserves continued to rise, reaching US\$212.2 billion at year end 2001, an increase of US\$46.6 billion over year end 2000 (larger than the trade surplus of US\$22.5 billion), and surpassing total outstanding external loans (US\$169.1 billion as of 6/30/2001) by a wide margin; it stood at US\$260 billion as of the end of 2002/M9
- ◆ The exchange rate of the Renminbi vis-à-vis the U.S. Dollar has remained stable since 1994 (in fact, there has been a slight appreciation from 8.7 Yuan/US\$ to 8.3 Yuan/US\$) and is expected to remain so

The Exchange Rate, the Interest Rates and the Stock Market Index



Monthly Exports, Imports and Trade Balance Official Chinese Data

Monthly Exports, Imports, and Trade Balance



The China-ASEAN Free Trade Area

- ◆ Chinese Premier ZHU Rongji proposed in Brunei in November, 2001 a new free trade area, covering China and the ASEAN (Brunei, Indonesia, Khmer Republic, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam), to be created within ten years
- ◆ A 3 trillion US\$ market and 1.7 billion consumers
- ◆ Complementarity (primary raw materials) and competition (light manufactures)
- ◆ Opening the economies for trade—China will become a major export market for the ASEAN and vice versa
- ◆ The free trade area will promote foreign direct investment in the ASEAN region itself through the enlargement of the potential market
- ◆ A mutual support program for the currencies of one another, leading possibly to a currency area
- ◆ Simultaneous, coordinated expansions among the East Asian economies can help accelerate the recovery of the depressed economies of East Asia
- ◆ Significant political implications

Foreign Direct Investment (FDI)

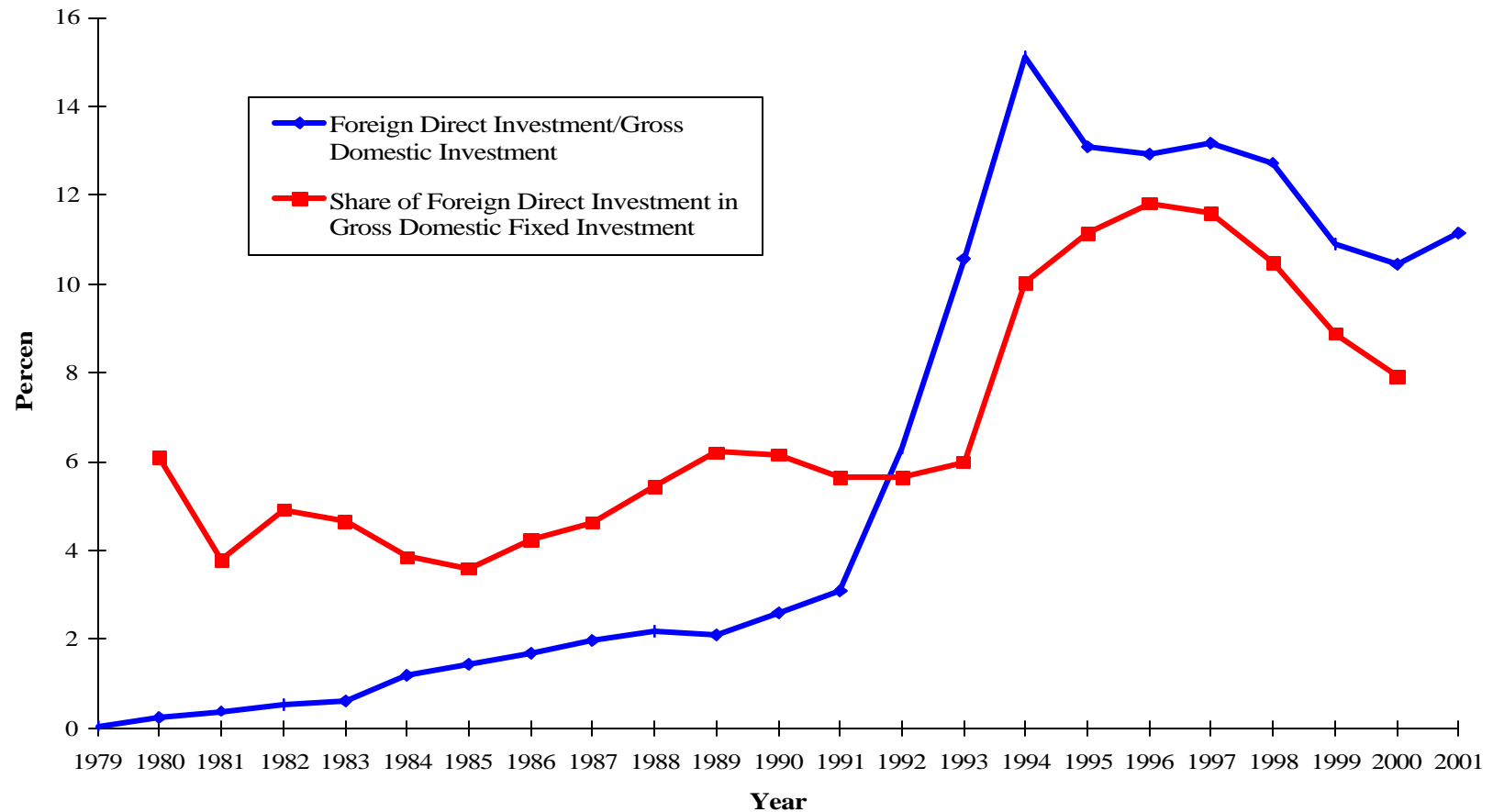
- ◆ FDI, at US\$45 billion a year, amounts to approximately 10% of the annual Chinese aggregate gross domestic investment of approximately US\$450 billion. Moreover, a significant proportion of it is what is known as “recycled” or “round-tripped” investment ultimately originated by Chinese entities and individuals. Quantitatively, FDI is not critical to the Chinese economy.
- ◆ Qualitatively, FDI is probably more important because it brings in technology, know-how, business methods, management techniques and markets that will otherwise be unavailable in China.
- ◆ FDI has been responsible for most of the growth of exports (and imports). However, the nature of FDI has also changed--from export-oriented to domestic-market oriented; from light industry to heavy and high-technology industries; and from small projects to large projects.

Foreign Direct Investment (FDI)

- ◆ In 1999, FDI arrivals totaled US\$40.39 billion, an 11% decline from 1998--however, the sources of the FDI were different--real FDI probably rose if “round-tripped” capital were excluded; FDI commitments amounted to US\$41.24 billion, a decline of 20.9%
- ◆ In 2000, FDI arrivals totaled US\$40.7 billion, a 1% increase over 1999; in 2001, FDI arrivals reached an all-time high of US\$46.85 billion, a 14.9% rise from 2000; FDI commitments amounted to US\$62.4 billion in 2000, a 51.3% increase over 1999, partly in response to expected Chinese accession to WTO; in 2001, FDI commitments amounted to US\$69.19 billion, a 10.43 rise from 2000.
- ◆ Cumulative FDI at year end 2001 amounted to US\$395.47 billion
- ◆ FDI arrivals in 2002/Q1-3 totaled US\$39.6 billion, an increase YoY of 22.6%; FDI commitments amounted to US\$68.4 billion, an increase YoY of 38.4%. FDI arrivals is forecast to be US\$50 billion in 2002.

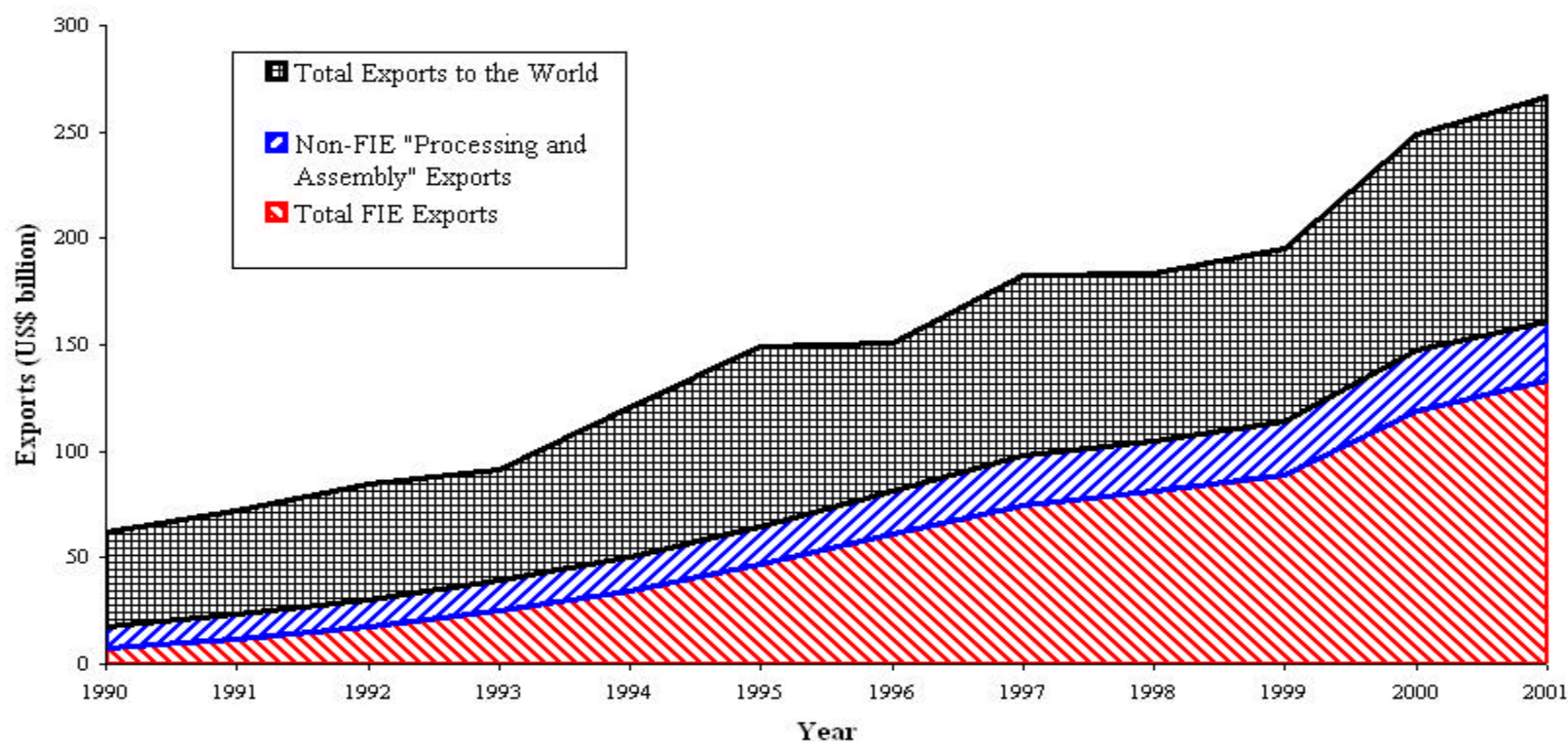
The Shares of FDI in Chinese Gross Domestic and Gross Domestic Fixed Investment

Fig. 1.2. The Share of Foreign Direct Investment in China (Percent)



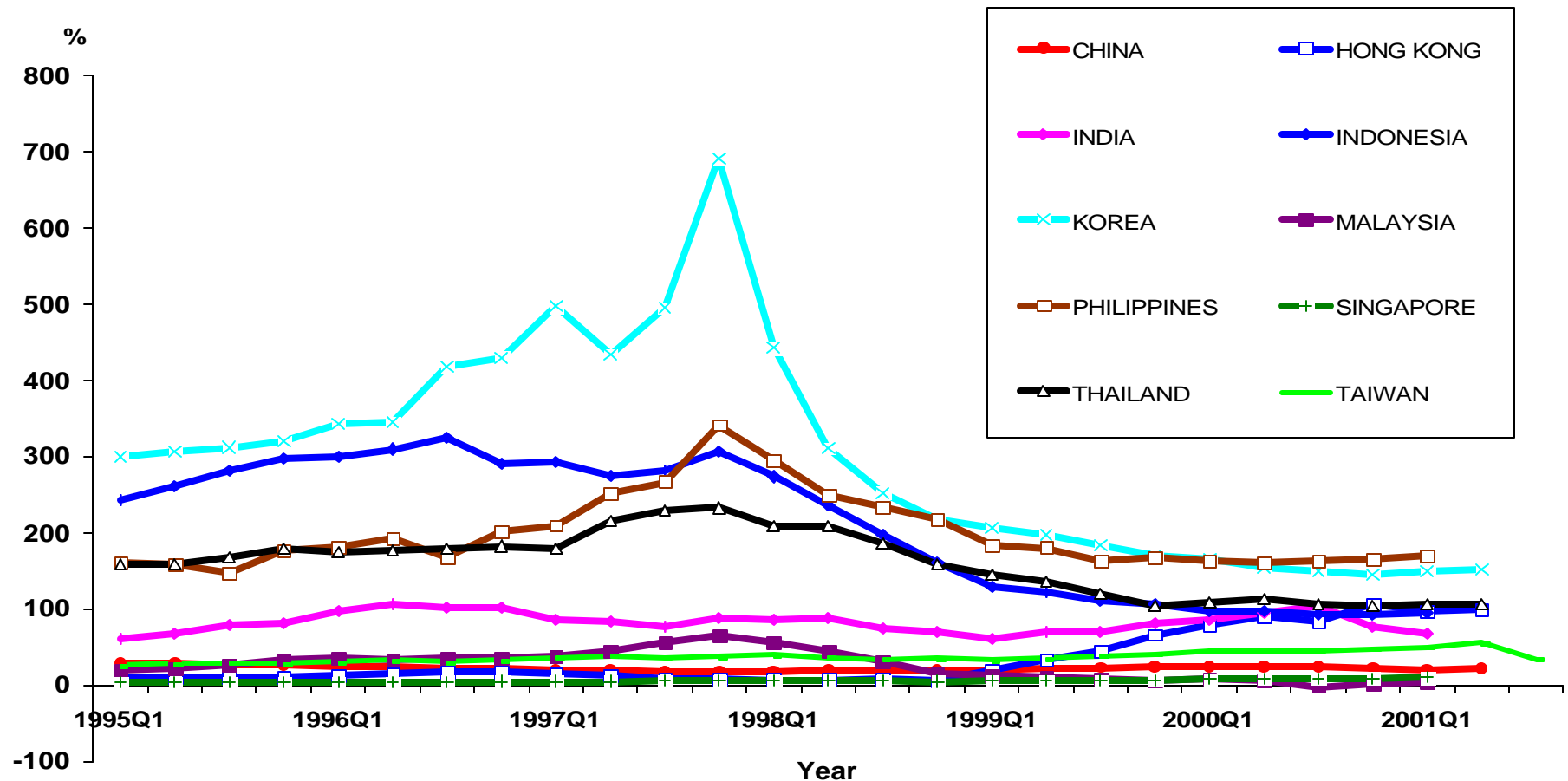
Chinese Total, Foreign-Invested Enterprises (FIEs) and Non-FIE “Processing and Assembly” Exports

Figure 1.1: Total FIE Exports, Non-FIE “Processing and Assembly” Exports, and Total Exports of Goods to the World



Ratio of Liquefiable Foreign Exchange Liabilities, Including Current Account Balance, to Reserves

Ratio of Short-Term Foreign Currency Liabilities, Including Current Account Balance, to Foreign Exchange Reserves



Remaining Problems and New Problems Caused by the Success of the Economic Reform

- ◆ The state-owned enterprises (SOEs) are unable to compete effectively in the open market with the newly formed joint-venture, foreign, and private enterprises, even with the advantage of credit access to the state-owned commercial banks
- ◆ The SOEs are unable to repay the loans they have taken out from the state-owned commercial banks, causing a serious “non-performing loans” problem for the banks as well as the financial system as a whole
- ◆ The SOEs are, on average, overstaffed by one half to two-thirds—many employees have implicit life-time employment guarantees
- ◆ With the loss of their secured markets, many of the SOEs are unable to fulfill their obligations to existing as well as retired employees

Remaining Problems and New Problems Caused by the Success of the Economic Reform

- ◆ The deterioration of social services such as education and public health customarily provided by SOEs
- ◆ Accession to the World Trade Organization (WTO) means even greater competition for many of the SOEs, thus exacerbating the problem; moreover, WTO rules imply that government subsidies to and preferential treatment of the SOEs will no longer be permitted thus making the reform of the SOEs even more urgent
- ◆ Export markets are approaching saturation as the Chinese market shares in the world have risen—continued economic growth can no longer depend on the growth of exports—growth of internal demand has become much more important
- ◆ The rise of inter-regional and intra-regional inequality within China
- ◆ The rise of a new elite outside of the state sector (including the public government sector and state-owned enterprise (SOE) sector)

The Critical Path for Continuing Economic Reform (1)

- ◆ In order to reform the Chinese commercial banking sector, the non-performing loans (NPL) problem of the state-owned commercial banks must be resolved.
- ◆ In order to resolve the NPL problem of the Chinese commercial banks permanently, it is necessary not only to take care of the outstanding stock, but also to stop the continuing flow.
- ◆ In order to stop the flow, it is necessary to restructure the borrower enterprises, so that they are independently viable without relying on new loans afterwards.
- ◆ In order to insure the viability of the restructured SOEs, most of the existing obligations of the SOEs must be assumed by the central and local governments, i.e., “socialized,” or by the individual employees themselves.

The Critical Path for Continuing Economic Reform (2)

- ◆ Socialization of these obligations requires, in turn, the creation of a credible social safety net--a viable social security and pension system (including unemployment “insurance”) to take care of both the inherited historical problems and the future--and the provision of social services by the local governments instead of the SOEs.
- ◆ Provision of social services by the provincial and local governments instead of the enterprises requires an independent source of revenue, through either the sharing of revenue with the central government, the division/sharing of tax bases, and direct and indirect central government subsidies (e.g., through tax preferences).
- ◆ Thus, continued economic reform must start with the creation of a social safety net and the division/sharing of social responsibilities and revenue/tax bases.

The Critical Path for Continuing Economic Reform (3)

- ◆ In parallel, agricultural reform should be undertaken to provide an income floor for households in the rural areas.
- ◆ In parallel, development and deepening of the factor markets to promote efficiency through creation of new markets and enhancement of mobility
 - ◆ Capital markets
 - ◆ Stock market
 - ◆ Bond market (including securitization of loans such as mortgages)
 - ◆ Labor markets
 - ◆ Towards full monetization and mobility
- ◆ Reform of the housing market
 - ◆ Promotion of housing as a major source of aggregate demand
 - ◆ Enhancement of labor mobility through full monetization and marketization
- ◆ Accession to WTO reinforces the urgency of continuing reform.

The Establishment of a Social Safety Net

- ◆ Assumption of current and future unfunded pension liabilities of the SOEs
- ◆ Provision of unemployment “insurance” benefits for the redundant employees of the SOEs; the number of urban residents receiving subsistence benefits increased from more than 4 million at the beginning of 2001 to 11.2 million at the end of 2001
- ◆ Assumption of the responsibility for the provision of social services such as education and health care by the local governments, relieving the enterprises
- ◆ Establishment of a Social Security Fund with state-owned shares of SOEs as an endowment to cover unfunded pension liabilities of SOEs as well as unemployment benefits for employees of the SOEs
- ◆ 10% of new IPOs will consist of state-owned institutional shares with the proceeds dedicated to the Social Security Fund

The Estimated Cost of the Social Safety Net

- ◆ The peak annual flow of unfunded pension obligations may be estimated at 275 billion Yuan, compared to an estimated flow of 220 billion Yuan under the current system for the year 2000
- ◆ The peak annual flow of unemployment benefits for furloughed employees of SOEs may be estimated at 90 billion Yuan in 2004, compared to an estimated flow of 20 billion Yuan under the current system for the year 2000
- ◆ Taking into account the contributions of the central government should make on behalf of its current employees for the future pensions, the peak annual net additional cost of the social safety net may be estimated at approximately 200 billion Yuan in 2004 or less than 2% of projected GDP
- ◆ The stock of unfunded pension obligations may be estimated at 4 trillion Yuan compared to a current GDP of almost 10 trillion Yuan and an estimated value of total state-owned assets of 9 trillion Yuan
- ◆ Total market capitalization of publicly listed Chinese enterprises on domestic Chinese and overseas stock markets may be estimated at US\$700 billion, approximately 70% of which is held by the state directly and indirectly in the form of institutional shares, amounting to slightly more than 4 trillion Yuan; there are additional Chinese state-owned firms remaining to be publicly listed

Non-Performing “Loans” of the State-Owned Banks

- ◆ Borrowers are all state-owned enterprises (SOEs)
- ◆ Non-performance is no surprise to either the lenders or the borrowers
- ◆ In terms of flows, they amount to 2-3% of GDP, comparable to government budget deficits in many countries
- ◆ In terms of stocks, they range from US\$300 billion (People's Bank of China (PBOC)) up to US\$500 billion (25-40% of GDP); more recently (May 2002), Standard and Poor estimated these non-performing loans to be US\$518 billion.
- ◆ Assuming that only 25% of the NPLs are ultimately recoverable, the bad debt provision required ranges between 20 and 30% of GDP. (Auctions for the NPL portfolios have been held successfully recently with a recovery ratio of approximately 25%.)
- ◆ The loans should be regarded as indirect loans to the central government which also owns all of the major banks, i.e. public debt
- ◆ Outstanding Chinese national debt is approximately 18% of GDP (compared to 60-70% for the United States, 140% for Japan, 75% for Zone Euro and 160% for Belgium)
- ◆ Total public debt, assuming the conversion of all non-recoverable non-performing loans into public debt, would amount to 40-50% of Chinese GDP
- ◆ Vice Minister LOU Jiwei estimated that state assumption of the NPLs would have raised the public debt/GDP ratio by approximately 20 percentage points.

How Reliable Are Chinese Economic Data?

How Reliable Are Chinese Economic Data?

- ◆ Since 1979, there has been no intentional falsification of statistical data on the part of the National Bureau of Statistics (NBS), an independent agency of the central government of the People's Republic of China.
- ◆ If in fact, there were intentional falsification of the published statistical data by the Government of the People's Republic of China, that implies the maintenance of two separate sets of books. There is no evidence that there exist two sets of books at the National Bureau of Statistics.
- ◆ One may criticize the methodology, the adequacy of the sampling techniques, the method of data collection, processing and adjustments; and there are undoubtedly biases and errors in the published data, e.g., the omission of the underground economy.
- ◆ There is likely to be under-reporting in wealthy regions and over-reporting in poor regions. The actual degree of inequality is probably greater than that revealed by the officially published statistics.
- ◆ However, the year-to-year rate of growth of real GDP should be reasonably reliable despite the biases because the degree of biases in the estimation of the levels of GDP changes only very gradually over time.

How Reliable Are Chinese Economic Data?

- ◆ Discrepancy between the NBS figures and the published provincial figures--the figure for the rate of growth of Chinese GDP published by the NBS is almost always less than the weighted average of the rates of growth of Chinese provincial GDPs, published by the provincial and regional statistical bureaus, by a significant margin.
- ◆ This has been true for many years, and is a widely known fact, and openly acknowledged by the NBS, and is reflected in the annually published Statistical Yearbook of China.
- ◆ The NBS believes that its national figure is much more accurate and reliable than the sum or weighted average of the provincial and regional figures. While it uses the provincial figures as one of the inputs, the NBS has other, independent, sources of data which it uses for making the final adjustments.

Is GDP Growth Compatible with the Growth of Electricity and Freight Traffic?

- ◆ The rate of growth of electricity production is 6.2% in 1999, 10.7% in 2000, and 8.5% in 2001; The rate of growth of freight traffic is 2.4% in 1999, 3.5% in 2000, and 3.1% in 2001.
- ◆ Common factors:
 - ◆ The rate of growth of the manufacturing sector has slowed down relative to the construction sector and the service sector.
 - ◆ Differences in the rates of growth between heavy and light industry.
 - ◆ Intra-industry changes in the composition of outputs, including upgrading of the qualities (and hence values-added) of products.
 - ◆ Effects of changes in the loci of production and consumption.
- ◆ Factors specific to electricity production:
 - ◆ Effects of changes in prices--the price of electricity has risen 3-4 fold since 1990.
 - ◆ Effects of changes in efficiency.
 - ◆ Other “economic” and technical reasons for changes in the rates of transmission losses.
 - ◆ Effects of co-generation--under-reporting and marginal users.
- ◆ Factors specific to freight traffic:
 - ◆ Effects of environmental regulation and inter-fuel substitution—almost 50% of railroad freight traffic was for coal.

How Reliable Are Chinese Economic Data?

The Rate of Growth of Freight Transported

- ◆ Why was the rate of growth of railroad freight transported, measured in metric ton-kilometers, negative in 1998 at the same time the rate of growth of real GDP was 7.8%?
- ◆ While there is no compelling reason why the rate of growth of freight should be the same as the rate of growth of real GDP, the fact that they were in opposite directions was alarming and greatly puzzling. At the time, the Chinese Government was sufficiently concerned about the apparent discrepancy between the two rates of growth to have commissioned a study to look into the matter. The major cause for the reduction of railroad freight transported, it turned out, was the large reduction in the consumption of coal, caused mostly by the then newly issued environmental regulations covering the major urban areas.
- ◆ Almost half of Chinese freight transported was due to coal; with a sharp reduction in the quantities of coal shipped from the production areas in western China to the population centers on the eastern seaboard, there was a similarly sharp reduction in the total ton-kilometers. The coal that was used in eastern China was largely replaced by oil and gas, and indirectly, by electricity. If one looks at the rate of growth of non-coal freight transported in 1998, it was only slightly negative and not inconsistent with the secular decline in non-coal railroad freight transported relative to the real GDP.

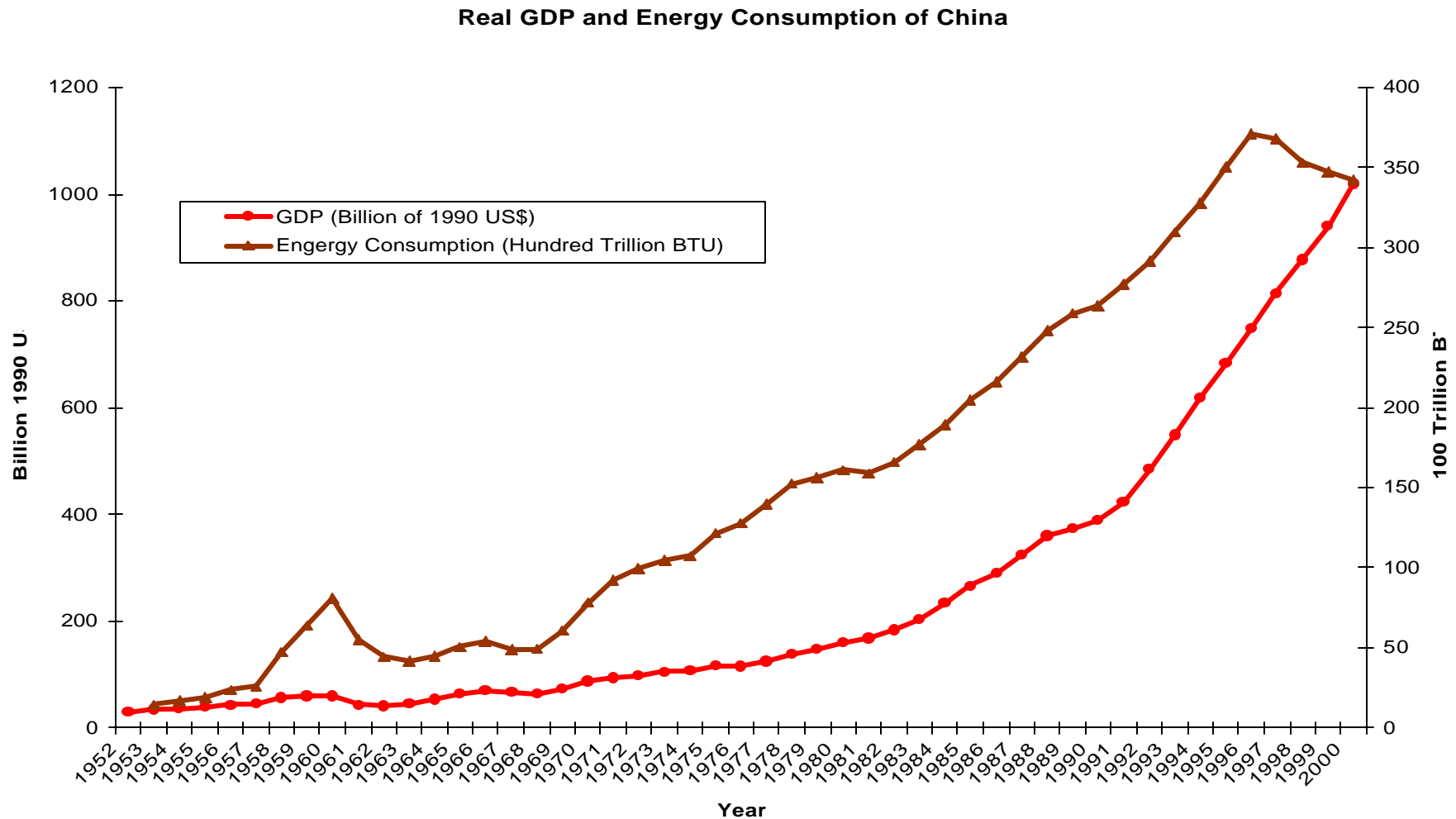
Why Was the Rate of Growth of Energy Consumption So Low During 1997-2000?

- ◆ For a rapidly growing and transforming economy, one expects the energy consumption to real GDP ratio to decline over time. In the case of China, a number of factors that are relevant:
 - ◆ (i) the rise in the relative price of energy in the early 1990s (e.g., the price of electricity has increased 3 to 4-fold) and the resulting conservation efforts;
 - ◆ (ii) the more efficient production and transmission of energy from the new and large-scale power plants and power grids;
 - ◆ (iii) the change in the intersectoral composition of GDP, principally the rapid growth of the service (including construction) sector, which requires little energy, relative to the agricultural and industrial sectors and the more rapid growth of light industry relative to heavy industry; and
 - ◆ (iv) the change in the intra-sectoral composition of output, due especially to the upgrading of quality—for example, the proportion of high-quality steel produced in the steel sector has been rising rapidly, with the value-added rising much faster than energy consumption per ton. Thus, for the steel sector, the energy to value-added ratio will appear to be declining. The rate of growth of GDP can therefore be much faster than the rate of growth of energy consumption.

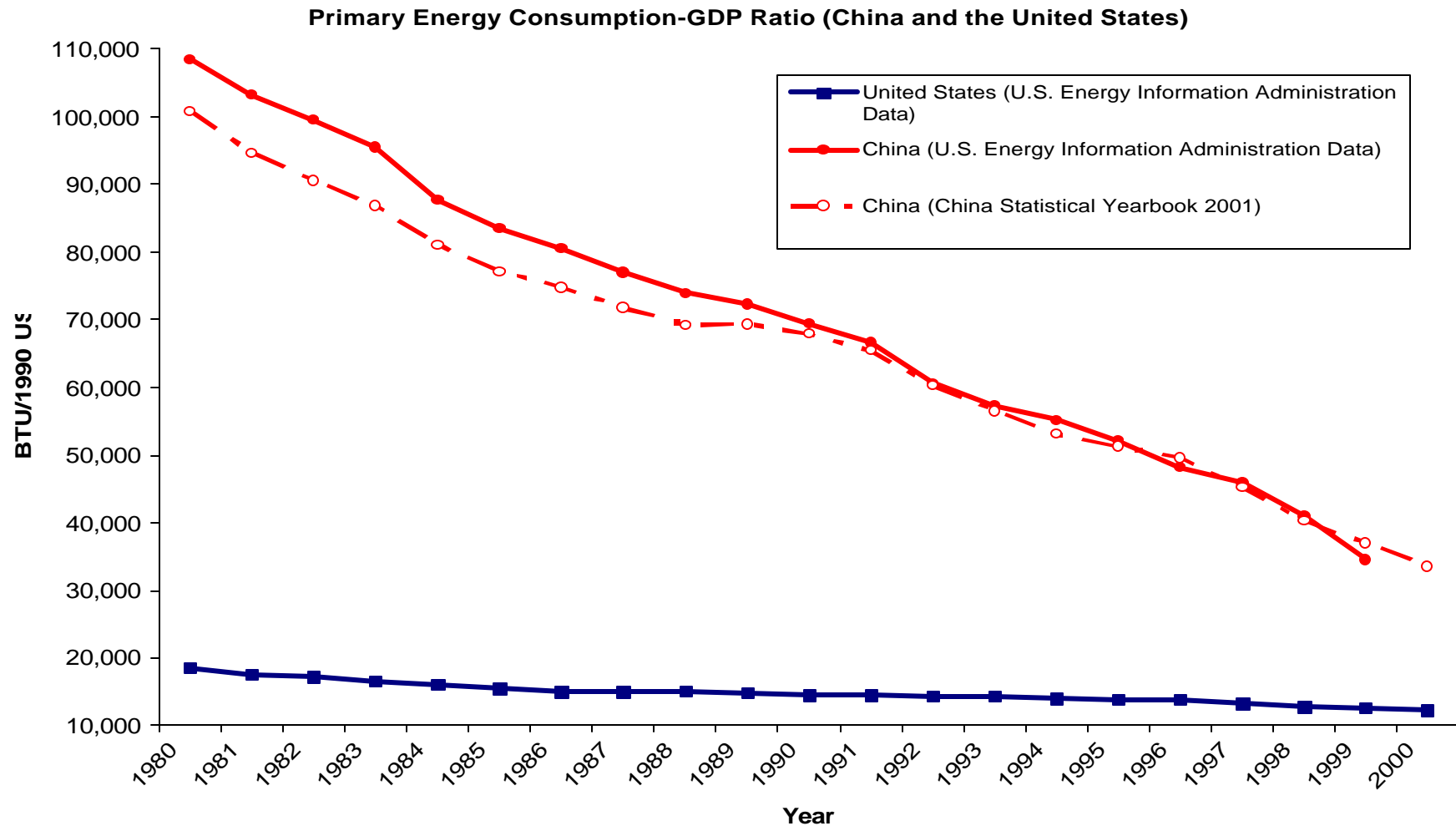
Why Was the Rate of Growth of Energy Consumption So Low During 1997-2000?

- ◆ In the Chinese case, there is actually an additional factor. As part of an environmental and safety campaign, many small and medium coal mines were ordered closed in 1997. However, many localities, for a variety of reasons, secretly kept these mines working, and their production did not find their way into the statistics. No one knows for sure how much unreported production of coal there was during each of these years. It may be estimated to be on the order of 10% of the annual output in 1997, and then declining gradually over time, as these mines became closed. Thus, it is in part the under-reporting of coal production (and consumption), rather than the over-reporting of real GDP, that contributed to the slower reported rate of growth of energy relative to real GDP during some of these years.
- ◆ The Chinese energy consumption/GDP ratio has been declining continuously since 1980 by approximately 2/3 (while the U.S. energy consumption/GDP ratio has declined by approximately 1/3 between 1980 and 2000).

Real GDP and Energy Consumption of China 1952-2000



Primary Energy Consumption-GDP Ratio (China and the United States)



How Reliable Are Chinese Economic Data?

The Rates of Growth of Physical Outputs

- ◆ Why was the rate of growth of value added in industry as a whole so much higher than the weighted average of the rates of growth of the quantities of individual physical industrial commodities and products?
- ◆ The explanation lies once again in the change in the intra-sectoral composition of output—over time, as the quality of the goods produced improved, say, from raw iron to stainless steel, from plain cotton textiles to expensively finished designer fabrics, the value-added per ton of steel or per meter of cloth rose rapidly. For a developed economy nearly at equilibrium, the improvement in quality is marginal and gradual; for a rapidly growing and transforming economy such as China's, these improvements can come about very quickly and abruptly, resulting in real value-added rising significantly faster than the quantities of physical outputs.

How Reliable Are Chinese Economic Data?

Cross-Validation with Other Data

- ◆ It is possible to cross-check these figures on the rates of growth of real GDP, derived mostly from the production side, with those estimates derived independently from other methods. There are at least two other methods: the expenditure approach, consisting of looking at the rates of growth of final demands—consumption, investment, government expenditures, and net exports; and the income approach, consisting of adding up the incomes of households and enterprises (and indirect taxes), derived from survey rather than production or end use data.
- ◆ The results of these calculations do not differ from the published rates of growth of GDP by more than 100 basis points, which should be considered to be well within the margin of error for the statistics of a developing country.
- ◆ It is also possible to cross-check using the quantity theory of money equation (the sum of the rates of growth of the money supply and the velocity of circulation of money must be equal to the sum of the rates of inflation and growth of real GDP): $MV=PT$

How Reliable Are Chinese Economic Data?

Cross-Validation with Other Data

- ◆ It is also possible to cross-check these figures with exports and imports data, obtained from the statistics of trading partner countries (Chinese exports must be the imports of some other countries; Chinese imports must be the exports of some other countries).
- ◆ The number of Chinese tourists traveling around the world has been increasing by leaps and bounds in recent years and they have been spending up a storm—this is inconsistent with the hypothesis that the underlying Chinese economy has been doing poorly

Are the Reported Rates of Growth of Real GDP Reliable? 1999

- ◆ The expenditure approach
 - ◆ Rate of growth of real gross fixed investment=7.3% with a share of GDP of 35.3% (=2.6%)
 - ◆ Rate of growth of changes in stocks estimated at -18.0% with a share of 2.8% (= - 0.5%)
 - ◆ Rate of growth of real retail sales=10%; rate of growth of real per capita disposable income (=9.3% urban; 4% rural); rate of growth of real personal consumption=8.9% with an estimated share of GDP of 46% (=4.1%)
 - ◆ Rate of growth of government consumption=14.1% with a share of GDP of 11.9% (=1.7%)
 - ◆ Rate of growth of net exports estimated at between 20% and 50% (trade surplus was US\$30 billion in 1999 with the crackdown on smuggling; smuggling adjusted trade surplus in 1998 may be estimated at between US\$20-25 billion) with a share of GDP of 3.8% (=0.76%)
- ◆ The sum of the real rates of growth of the components of expenditure = $2.6 - 0.5 + 4.1 + 1.7 + 0.76 = 8.66\%$ (compared to 7.1%); excluding the rate of growth of net exports, the estimated rate of growth of real GDP according to the expenditure approach would be 7.9%.

Prospects for Future Economic Growth

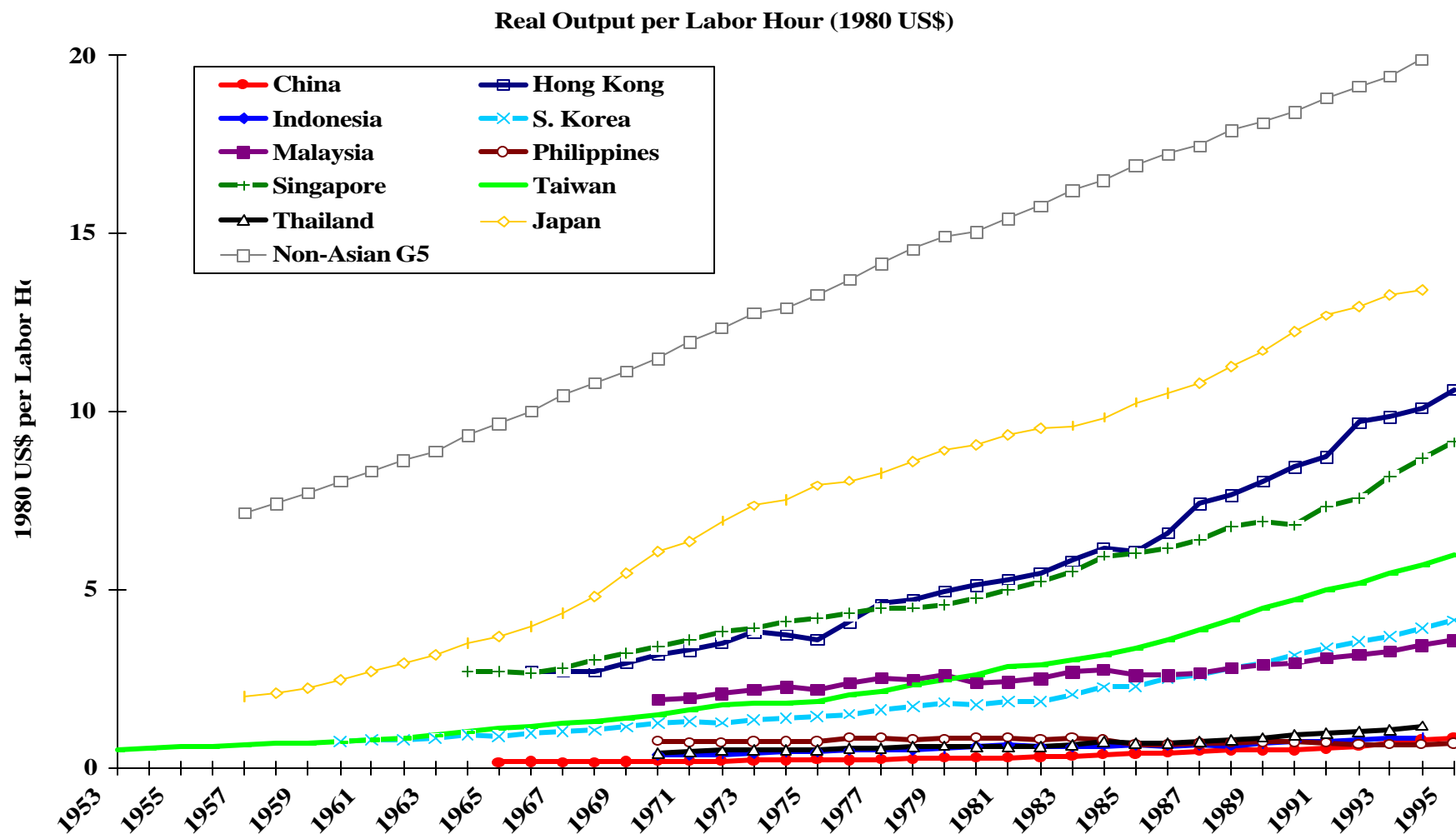
The Sources of Economic Growth: Findings of Kim & Lau As Reported by Krugman (1994)

- ◆ 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

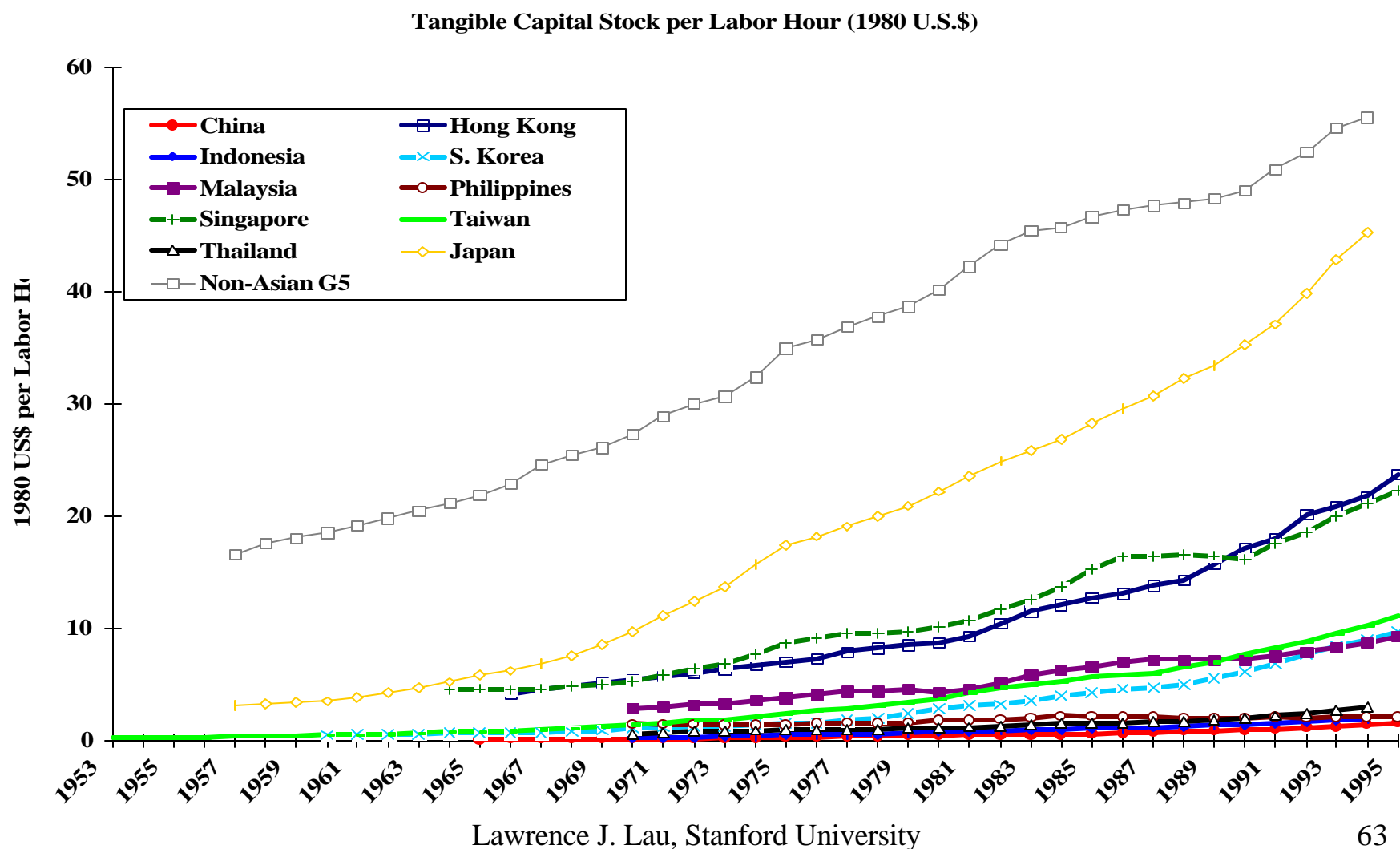
The Sources of Economic Growth--Developing Economies in East Asia

- ◆ 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 South Korea and Taiwan

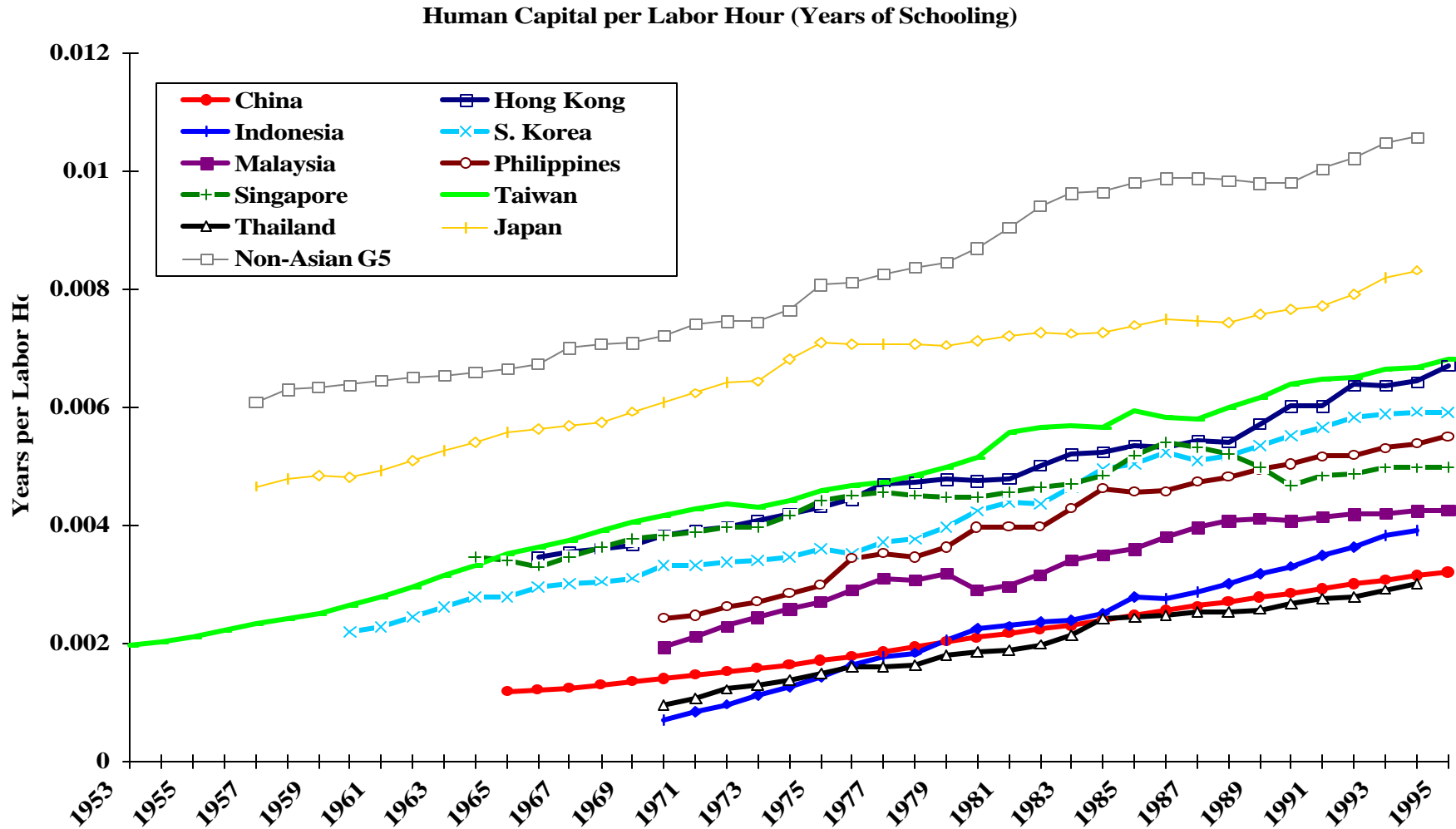
Real Output per Labor Hour (1980 US\$)



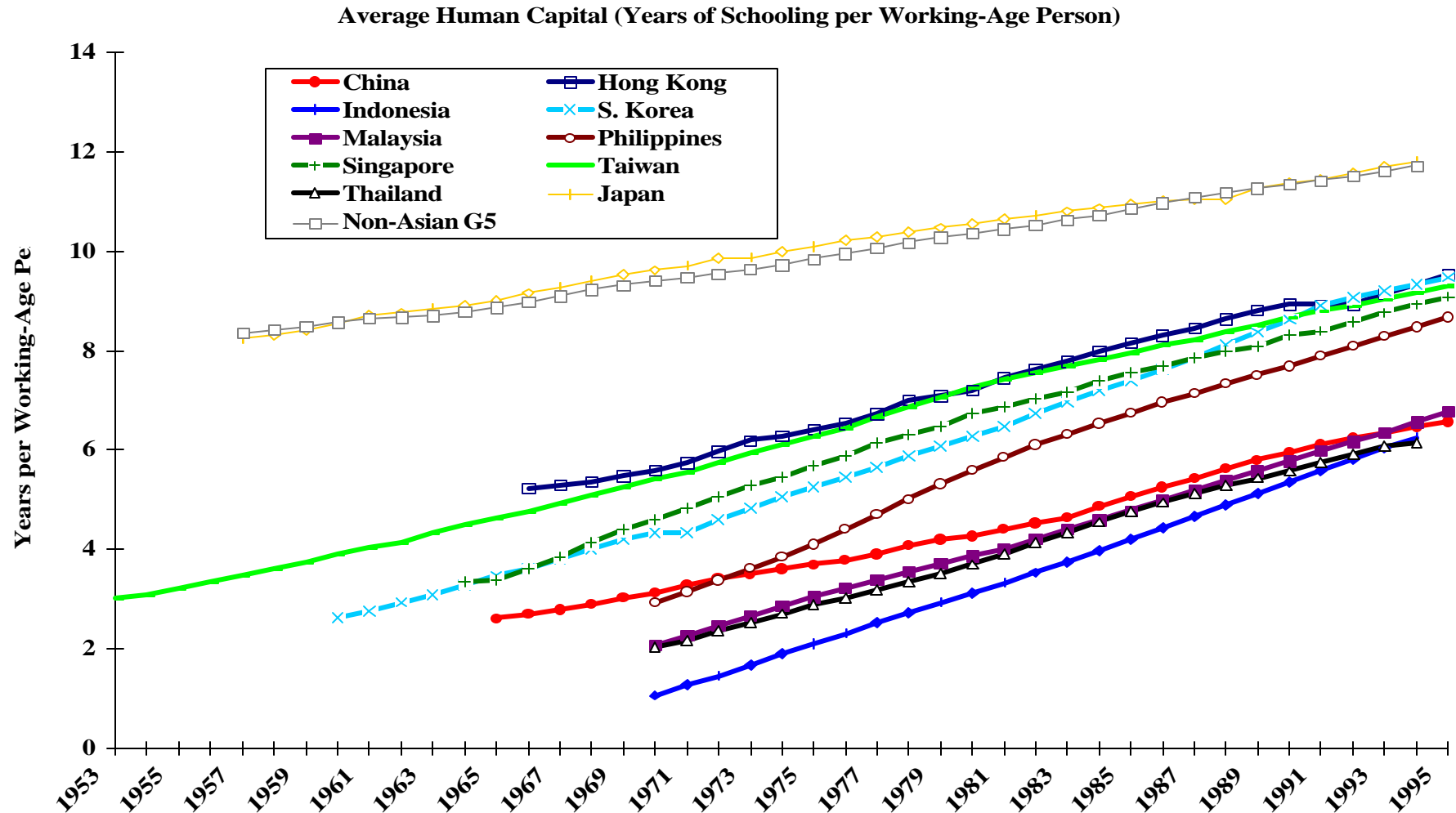
Tangible Capital Stock per Labor Hour (1980 US\$): Selected Economies



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

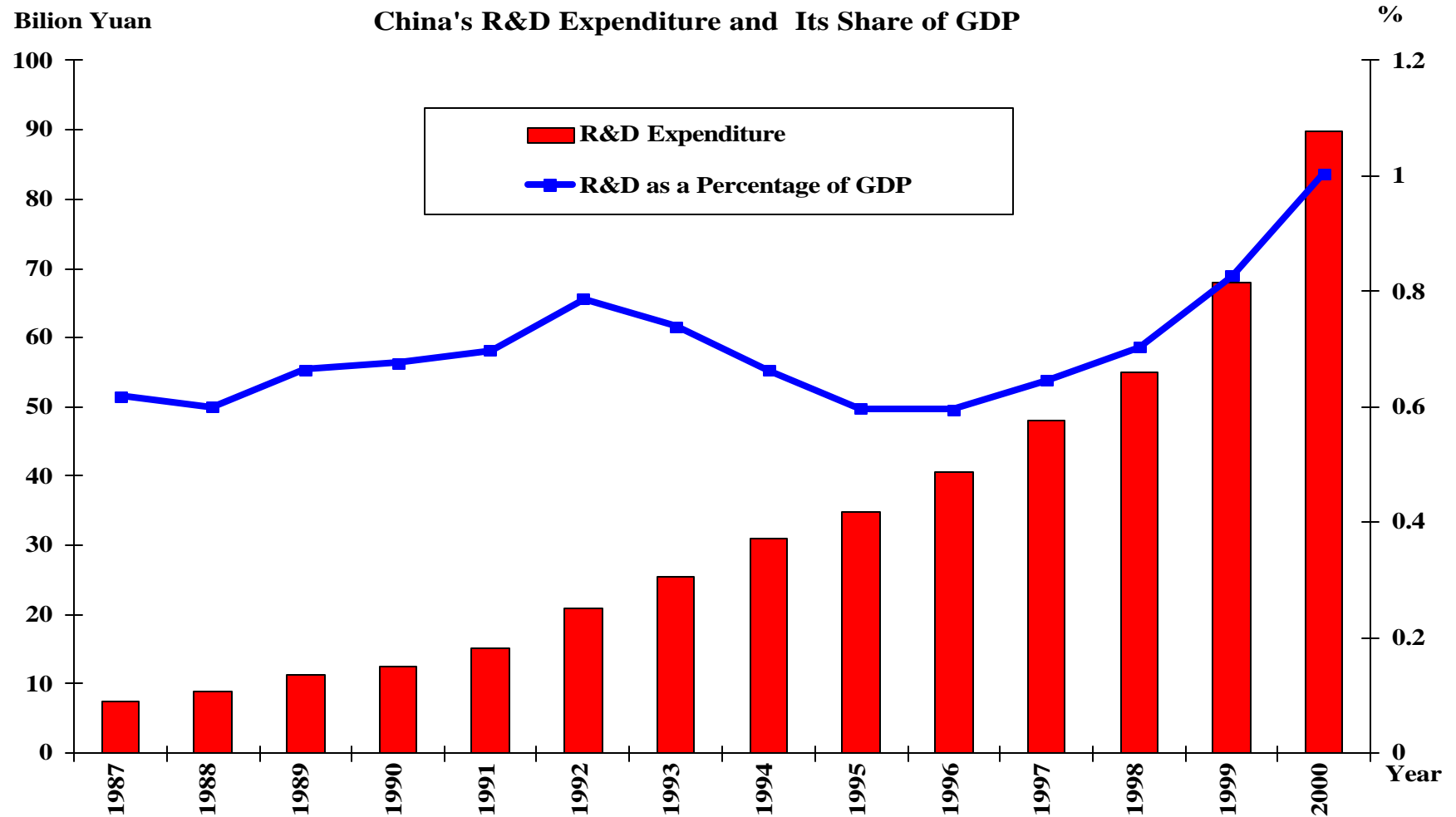


Average Human Capital: Selected Economies



Lawrence J. Lau, Stanford University

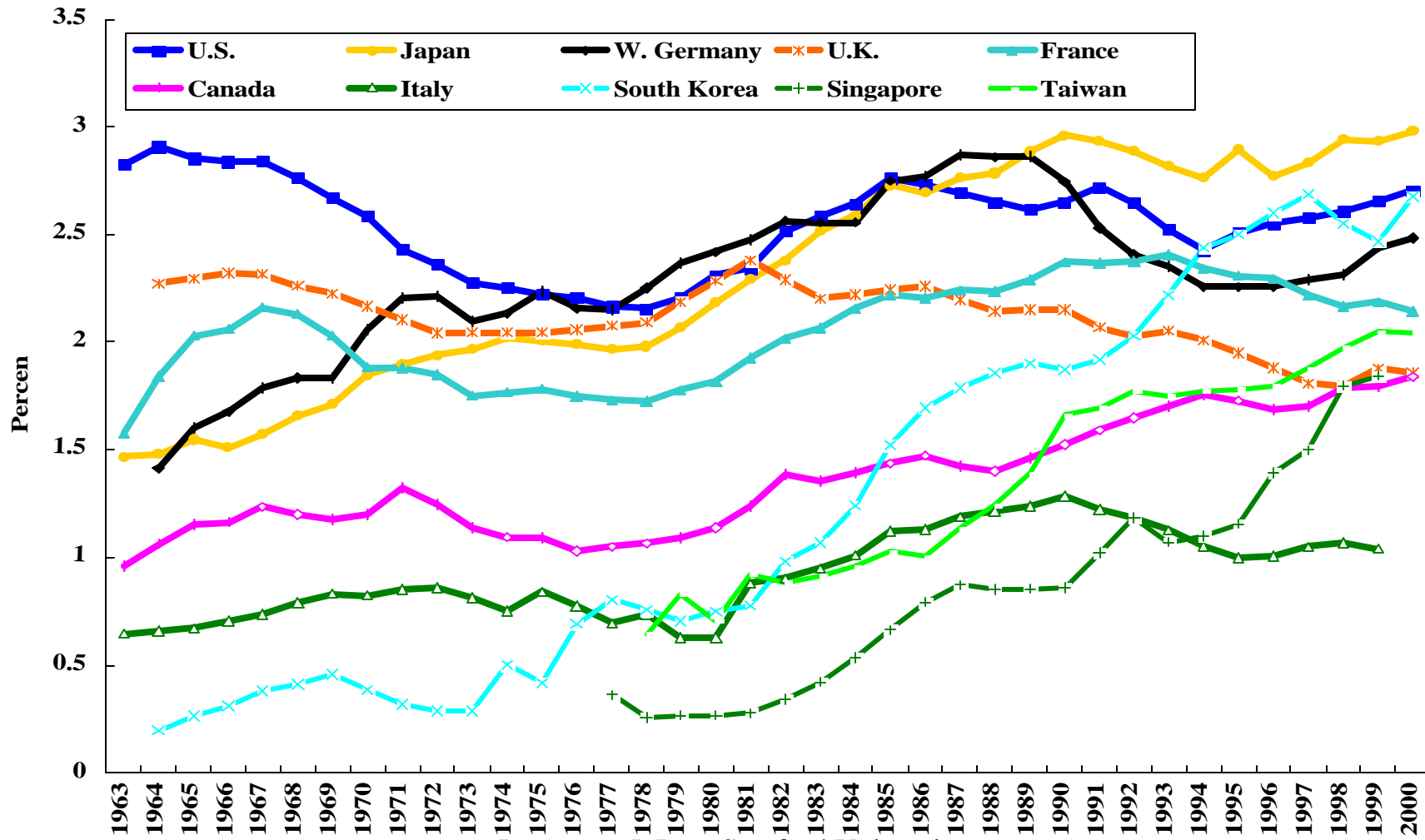
R&D Expenditures: China



Lawrence J. Lau, Stanford University

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

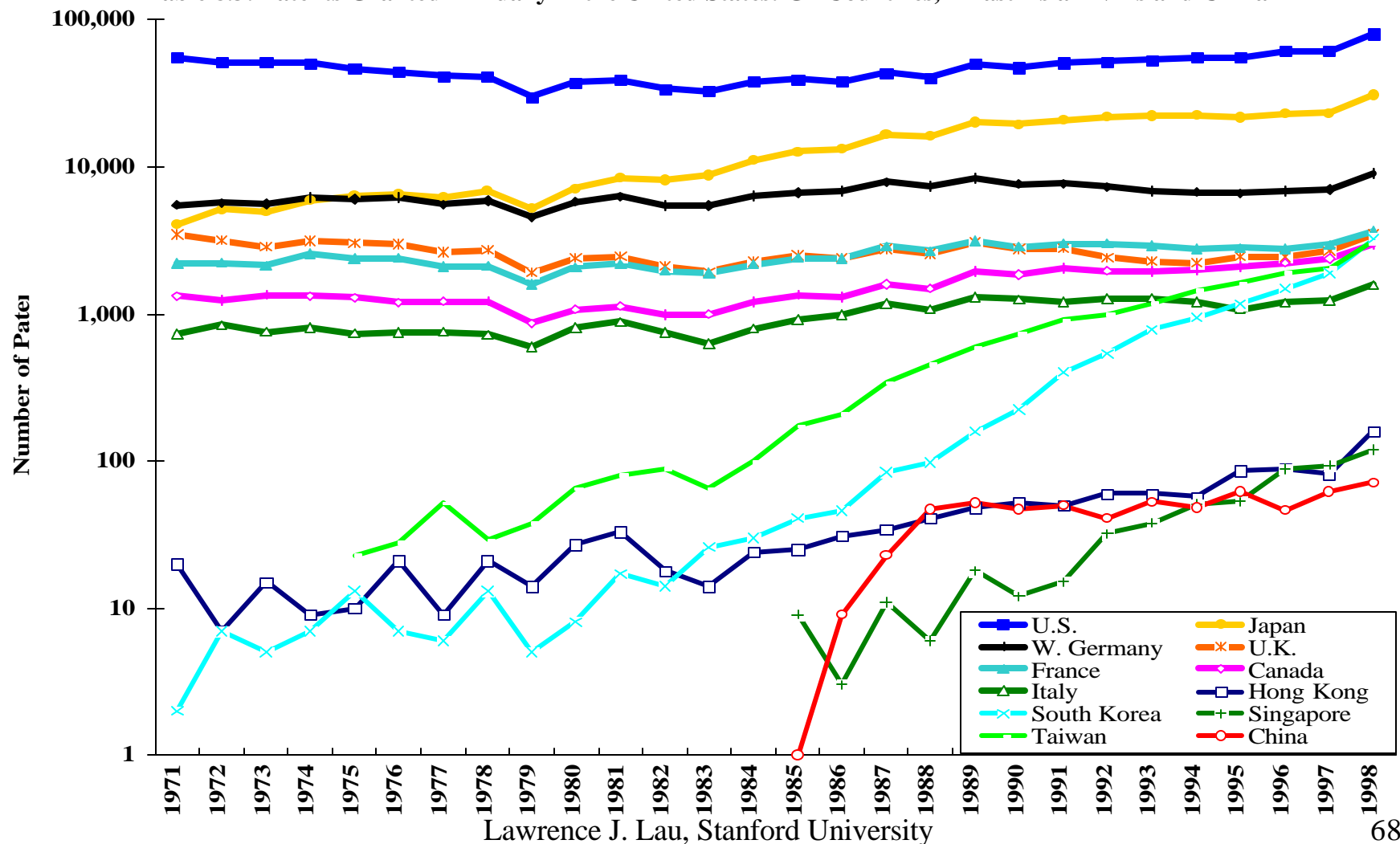
Figure 8.1: R&D Expenditures as a Percentage of GDP: G-7 Countries and 3 East Asian NIES



Lawrence J. Lau, Stanford University

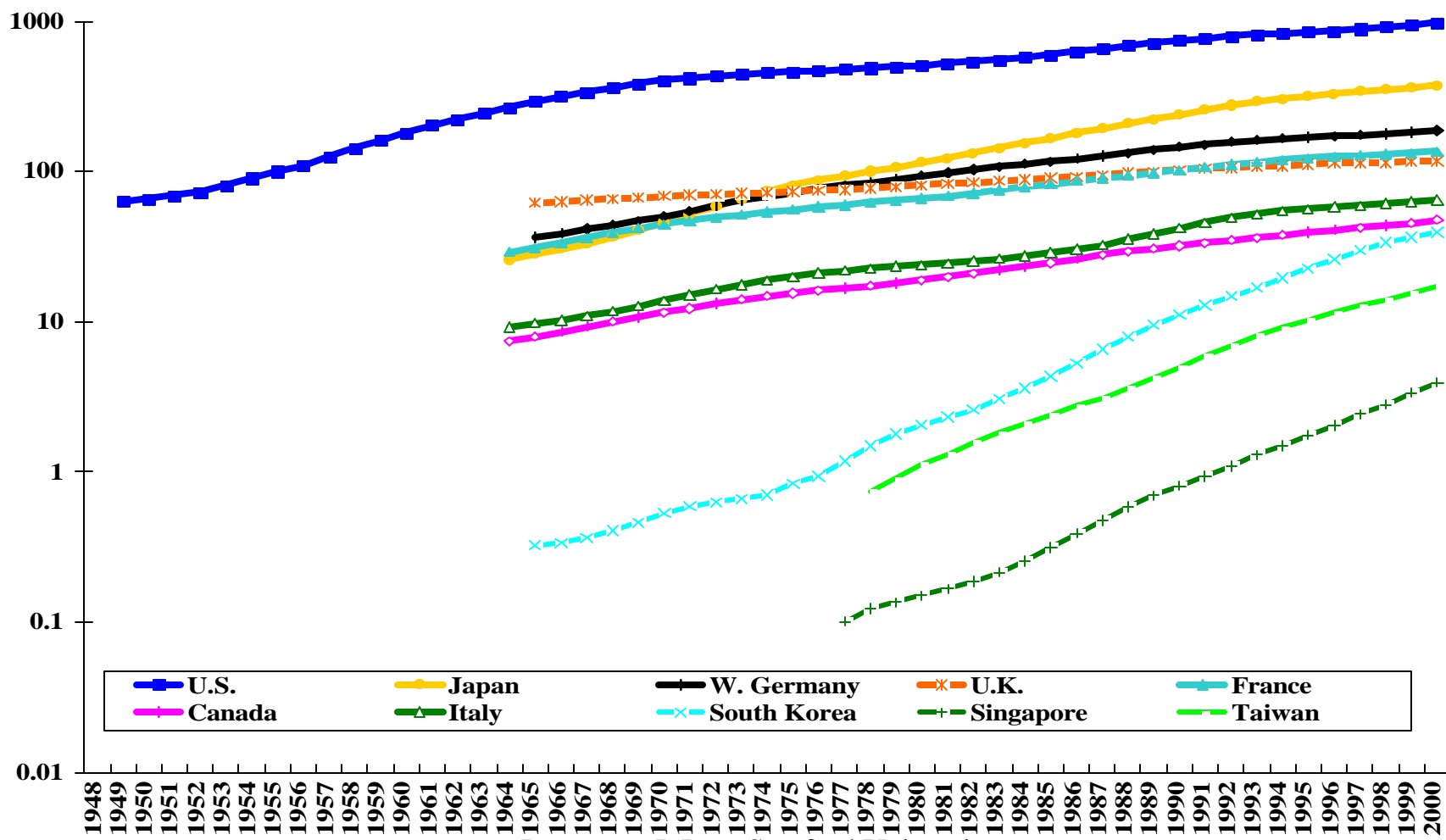
Patents Granted in the United States: G-7 Countries and East Asian Developing Countries

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



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

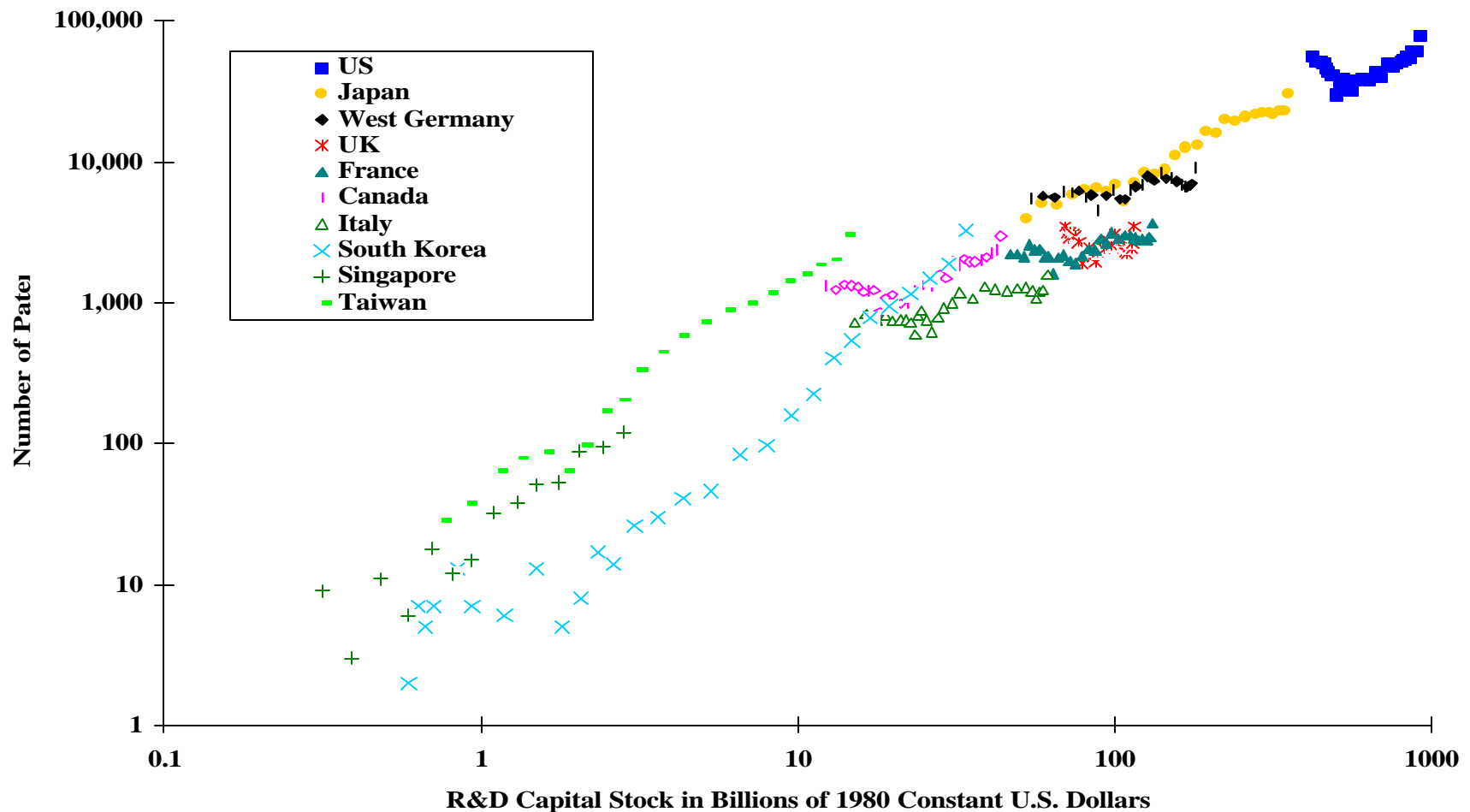
Figure 8.2: R&D Capital Stocks in Billions of 1980 U.S. Dollars



Lawrence J. Lau, Stanford University

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



Prospects for Continued Rapid Economic Growth Remain Good

- ◆ Prospects for continued rapid economic growth in China remain good—huge room for tangible-inputs-driven growth
- ◆ Fundamentals are sound—high savings rates, priority for education, market economy with rapidly expanding non-state ownership
- ◆ 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 and counteract the “Krugman effect”
- ◆ There is also evidence of positive technical progress in the more recent period in some of the East Asian economies, reflecting their investment in intangible capital
- ◆ The people of China (and East Asia in general) are entrepreneurial, hard-working, and thrifty--all they need is a good, market-friendly, predictable and stable environment

Long-Term Economic Growth: Favorable Factors

- ◆ A relative abundance of natural resources
- ◆ A potentially huge domestic market (Economies of Scale, “Coordination Externalities,” and Network effects)
- ◆ An almost unlimited supply of surplus labor
- ◆ A high domestic saving rate of approximately 40%
- ◆ A cultural preference for education
- ◆ A predilection for entrepreneurship
- ◆ The advantage of backwardness—the possibility of leapfrogging
- ◆ The agricultural sector has been performing well
- ◆ Existing and expected fiscal reforms should reduce structural government deficit

Long-Term Economic Growth:

Three Paradigms of Chinese Economic Growth

- ◆ Domestic demand-driven growth--the domestic market paradigm a la the United States in the 19th century. China is a large continental economy--International trade will never be as important as other, smaller countries and China must rely on internal demand for further economic growth. Value-added from exports constitutes only 6 percent of Chinese GDP.
- ◆ The "wild-geese-flying pattern" metaphor of East Asian industrial migration over time can apply to Chinese provinces and regions
- ◆ Privatizing the economy without privatization--shrinking the state sector through the growth of the non-state sector in the absence of explicit privatization--the experience of Taiwan and South Korea
- ◆ What does it take?
 - ◆ Availability of infrastructure (transportation and communication, including the internet)
 - ◆ Continued marketization of the economy
 - ◆ Maintenance of a domestically open economy (the equivalent of the "interstate commerce" clause of the U.S. constitution)
 - ◆ Affirmation of property rights and the rule of law (a national commercial and tax court?)
 - ◆ Maintenance of an internationally open economy--the role of the "open door" (WTO)

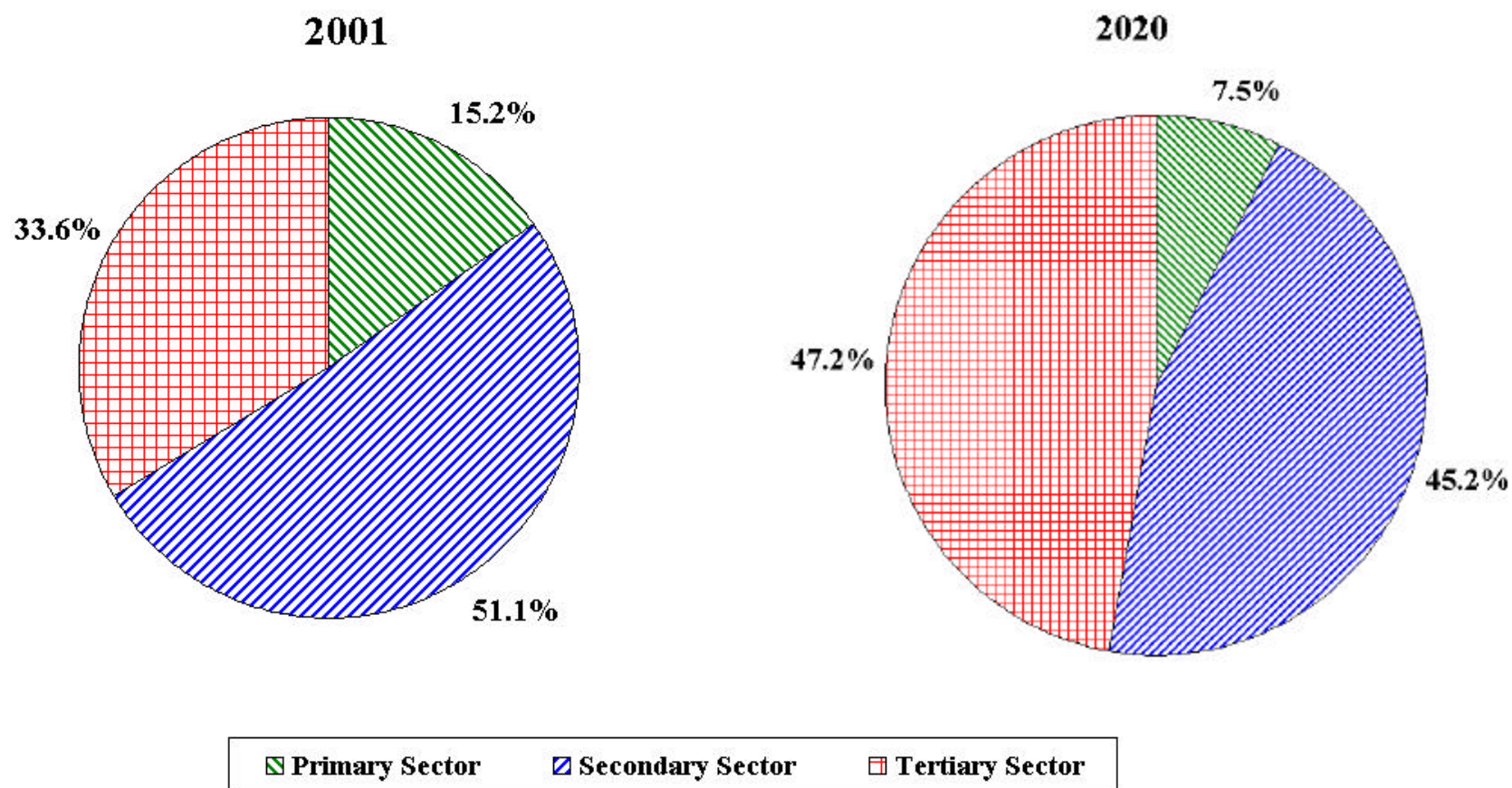
Long-Term Economic Trends

- ◆ Aggregate GDP
 - ◆ The Chinese economy is likely to continue to grow, more or less independently of what happens in the rest of the world, over the next several decades at an average annual rate of approximately 7%
 - ◆ The source of this growth will come primarily from tangible capital accumulation, supported by a national savings rate of 40%, human capital accumulation, and economies of scale, and to a lesser extent on the growth of intangible capital (for example, R&D capital) and improvements in efficiency
 - ◆ By 2020, aggregate Chinese GDP will exceed the aggregate GDP of Japan (and approximately half of aggregate U.S. GDP)
 - ◆ By 2035, aggregate Chinese GDP will reach the same level as aggregate U.S. GDP
- ◆ Per capita GDP
 - ◆ However, Chinese GDP per capita will only reach US\$10,000, or approximately 20% of U.S. GDP per capita, in 2035
 - ◆ Chinese GDP per capita will approach the level of U.S. GDP per capita only beyond 2050
- ◆ Population
 - ◆ By 2035, India will have overtaken China as the most populous nation in the world
- ◆ The currency
 - ◆ The Renminbi will in time become one of the strongest currency in East Asia and a quasi-reserve currency like the Euro

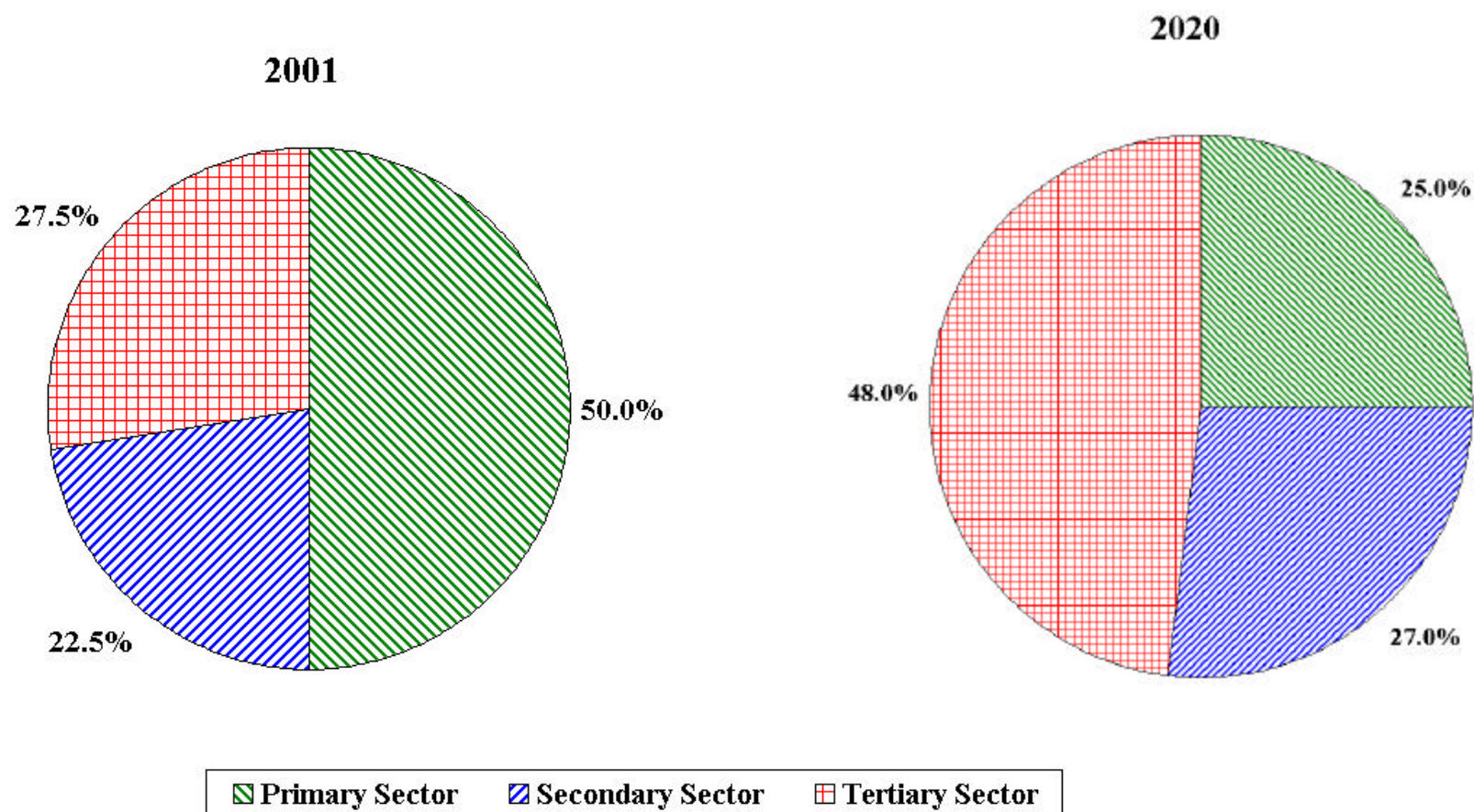
Long-Term Projections

	2001	2010	2020
	US\$ (2001 prices)		
Real GDP	1.16 trill.	2.25 trill.	4.5 trillion
Real GDP per capita	920	1,750	3,400

The Structure of the Economy: GDP



The Structure of the Economy: Employment



Prospects for Economic Growth

- ◆ Chinese economic growth during the next several decades will depend mostly on internal factors and be largely unaffected by the policies of other countries or events outside of China (a disruption of the oil supply may be an exception).
- ◆ There are numerous serious problems confronting the Chinese economy—however, these problems are not intractable.
- ◆ On the margin, foreign involvement in the Chinese economy will make some, but not a critical, difference; but it can be mutually beneficial for both China and the foreign countries.
- ◆ Chinese GDP and GDP per capita will remain low relative to the industrialized economies (G-7) for at least three or more decades.
- ◆ The share of Chinese GDP produced by the non-state-owned sector will rise from 65% to 80% in another decade.
- ◆ There is significant complementarity between the Chinese and G-7 economies--the G-7 economies do not export anything that China exports (and have not done so for decades) and China does not export anything that the G-7 exports. It is this complementarity that maximizes the potential gains from free trade between the two sides.

Sources of Growth of Aggregate Demand: Affordable Owner-Occupied Housing

- ◆ Huge pent-up demand for new affordable owner-occupied residential housing and rebuilt and renovated residential housing—a housing boom that can last for decades
- ◆ Promotion of affordable owner-occupied residential housing investment for and by the domestic population is one of the few alternative new and durable sources of growth of aggregate demand
 - ◆ Simultaneous adjustment of salaries and rents, providing purchasing power for employees not currently provided housing
 - ◆ Establishment of properties (transfer) rights to residential housing similar to those already available in the rural areas
 - ◆ Provision of long-term, preferably fixed rate, mortgages; development of secondary markets for such mortgages to avoid maturity mis-match; adoption of “safe-harbor” rules to overcome “reluctance to lend”
 - ◆ Institution of urban zoning and land use laws; absorption of land costs but maintaining fairness through land leases adjustable upon renewal
 - ◆ Development of mass urban transit
- ◆ Housing reform has taken root in major urban centers except Beijing

Sources of Growth of Aggregate Demand: Affordable Individual and Mass Transportation

- ◆ Huge pent-up demand for new affordable automobiles—in 2002/M9, automobile production increased 35.1% YoY to 325,000 units driven almost entirely by domestic demand
- ◆ Huge need for mass transit in both old and new cities

Sources of Growth of Aggregate Demand: Promotion of Science and Education in China

- ◆ Investments in information technology
 - ◆ Leap-frogging traditional development in telecommunication (the experience of the wireless phone)
 - ◆ E-commerce among enterprises
 - ◆ New models of marketing, distribution and sales
 - ◆ A PC in every classroom (in every urban home)
 - ◆ Set-top boxes on television sets with point and click device and numeric pad can link 400 million households to the internet
 - ◆ New modes of education and information dissemination
 - ◆ The Chinese language is uniquely suited to communication based on a graphic interface (the experience of the fax machine)
- ◆ Extension of compulsory education to 12 years
- ◆ Investments in tertiary education and in R&D

The Development of the Great West: Reducing Regional Inequalities

- ◆ Even though all regions benefited from the economic reform since 1979, the coastal regions benefited much more than the inland regions—there is an estimated 6 to 1 or even 8 to 1 ratio between the per capita GDP of the richest and poorest province/region.
- ◆ Interregional income inequality has risen, resulting in:
 - ◆ Dissatisfaction and restiveness
 - ◆ Deterioration of social services, especially education and health care
 - ◆ Massive illegal migration from the inland regions to the coastal regions, creating huge pressure on social and physical infrastructure
- ◆ Relaxation of rural-urban migration (mostly controlled by the local authorities)
- ◆ Transfer payments from the central government
- ◆ Raising agricultural incomes

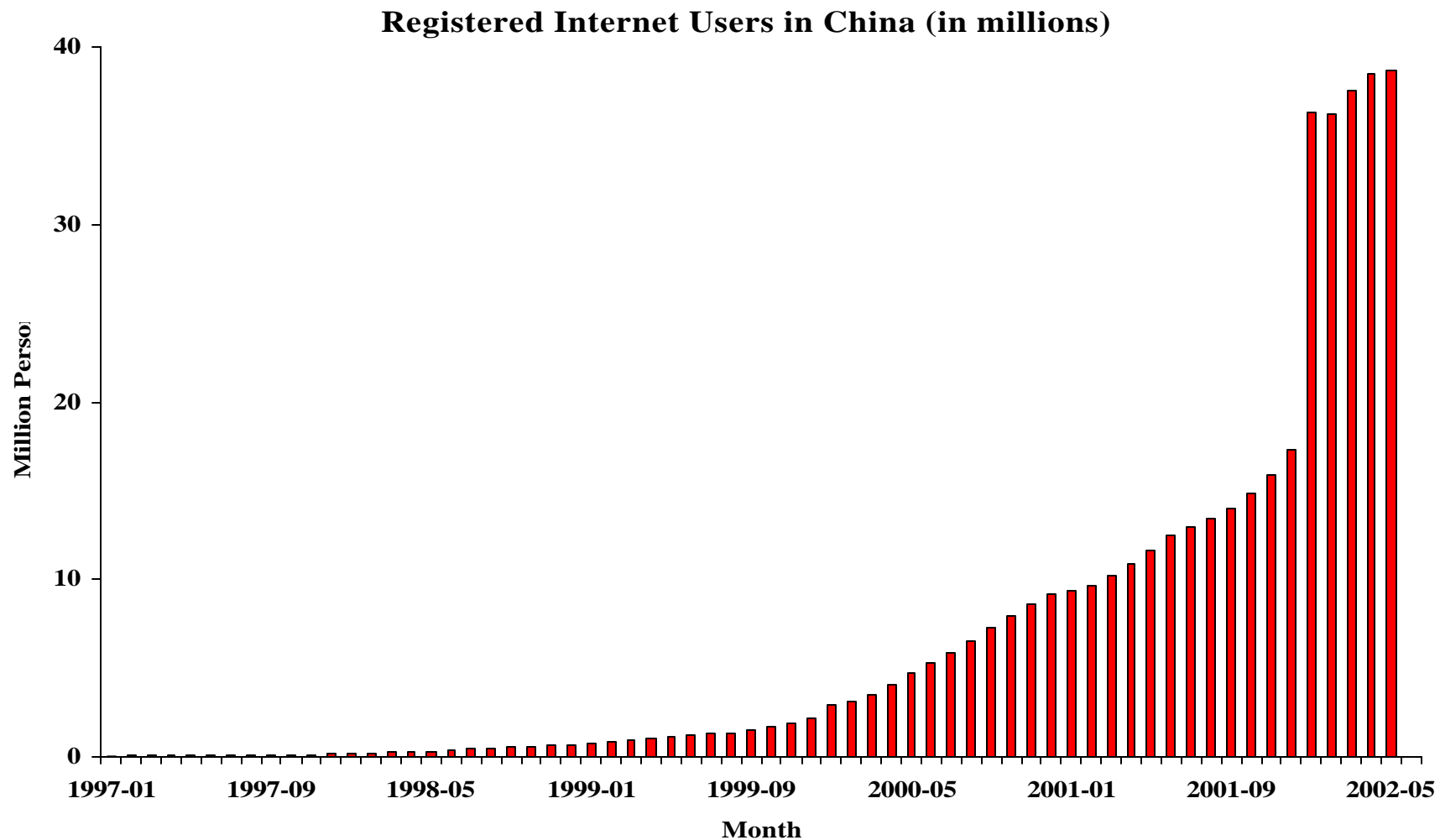
The Development of the Great West: Reducing Regional Inequalities

- ◆ Moving jobs to where people are, not people to where jobs are
- ◆ Urbanization through the creation of new towns and cities, not the growth of existing towns and cities
- ◆ Developing a truly unified national market
- ◆ Education and investment in human capital is the most effective means for reducing income inequality
- ◆ Maintaining long-term competitiveness without devaluation; WTO accession can help by putting pressure on enterprises to move inland to lower their costs and maintain competitiveness
- ◆ Opening a new “Silk Road”—a direct land bridge to Europe and the relocation of the capital from Beijing to a city in the Western region of China can significantly accelerate the development of the Great West

The New Economy and China: The Advantages of Backwardness and Size

- ◆ The possibility of leap-frogging--there are no vested interests to protect; no existing businesses to be cannibalized; there can be “creation without destruction”
 - ◆ e.g., facsimile machines instead of telexes; video compact discs instead of VCRs; a new keyboard layout; mobile and wireless telephones instead of fixed lines; debit and credit cards instead of checks
- ◆ The possibility of influencing/setting standards--the markets are potentially large enough in China for the benefits of economies of scale to be realized and for it to have a significant influence on future standards
 - ◆ e.g., Linux; wireless telephone standards (CDMA)
- ◆ The possibility of local adaptation--taking advantage of local conditions
 - ◆ e.g., the Legend story—language; local supply and demand conditions, e.g., stability of the voltage of the electric power supply
- ◆ Transformation of the “Old Economy” through the information and communication technology

Internet Users in China



The New Economy Levels the Playing Field between Large and Small Firms

- ◆ Small firms can have access to services and supplies heretofore only available to large firms
 - ◆ E.g., by bringing down the cost of securities trading, Charles Schwab and E-trade benefit small investors proportionally much more than large investors
 - ◆ Rapid delivery services and warehousing facilities, e.g., Federal Express, are available to both large and small firms
- ◆ Small firms can also become more accessible to their customers and potential customers through the Internet with only marginal expenditures on advertising and public relations
- ◆ Small firms have access to large firms as potential suppliers in a global supply chain
- ◆ The Chinese economy with its high and potentially even higher concentration of smaller firms and more primitive information infrastructure (and thus the potential for leap-frogging) may benefit much more from the new economy than other more developed economies
 - ◆ E.g., B2B dot.coms seem to have relatively greater success in East Asia than in the United States

Economic Problems

- ◆ Employment.
- ◆ Chinese accession to the World Trade Organization (WTO).
- ◆ Social security.
- ◆ Reform of state-owned enterprises (SOEs).
- ◆ Banking and financial reforms.
- ◆ Corruption.

Political Uncertainties

- ◆ Domestic stability—domestic stability can be maintained as long as the economy performs well and the gap between the have's and have-not's does not become too large. The agricultural procurement program, the establishment of the social security fund, the Western Development Initiative, and the renewed focus on education are all intended to address these issues.
- ◆ The succession
 - ◆ It is expected to be smooth and predictable (no surprises)
 - ◆ Young technocrats will be moving up to ministerial ranks
- ◆ Cross-Strait relations—is unlikely to improve significantly as long as the Taiwan side does not wish to return to the “one-China” consensus of 1992; however, progress on the “three links” may be possible if both sides agree to separate economics from politics.
- ◆ U.S.-China relations—is expected to remain steady on average but it will have its ups and downs—neither close ally nor implacable foe—from strategic partner to strategic competitor to strategic cooperation—the range of options is quite narrow for both sides