Economic Challenges Facing China in the Coming Decades

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A Preview

- The Chinese Economy Today
- The Prospects for Continued Rapid Economic Growth
- The Economic Challenges
- Concluding Remarks

The Chinese Economy Today

- Mainland China is currently the fastest growing economy in East Asia and the World—averaging approximately 10% per annum since the beginning of economic reform in 1978.
- Between 1978 and 2006, Chinese real GDP grew from US$180 billion to US$2.68 trillion (2006 prices) (4th largest economy in the world) and real GDP per capita grew from US$190 to US$2,026. By contrast, the U.S. GDP (approximately US$13.0 trillion) and GDP per capita (approximately US$44,000) are respectively 5 and 22 times the comparable Chinese figures in 2006.
- Despite its rapid growth, China is still a developing economy in terms of its real GDP per capita. An economy is generally considered to be developed if its GDP per capita exceeds US$10,000.

The Chinese Economy Today

	1978	2006
	US$ (2006 prices)	
Real GDP	180 bill.	2.68 trill.
Real GDP per capita	190	2,026

The Chinese Economy Today

	U.S.	China
	US$ (current prices)	
2006 GDP	13.0 trill.	2.68 trill.
2006 GDP per capita	44,000	2,026

The Chinese Economy Today

- The distribution of Chinese GDP by originating sector has become approximately: Primary, 12.5%; Secondary, 47.5%; and Tertiary, 40%. But the bulk of the labor force, approximately half of the total, is still in the primary sector, ensuring that there is no upward pressure on the real wage rate for unskilled entry-level labor for decades to come.

The Chinese Economy Today

- China is one of the very few socialist countries that have made a smooth transition from a centrally planned to a market economy. It is a model for other transition economies and potential transition economies.
- The rate of interest (the price of money) and the exchange rate are the only prices that are still administratively managed on the margin, in addition to the prices of different forms of energy, which are also regulated.
- The private (non-state) sector accounts for more than 75% of GDP and an even greater percentage of employment compared to essentially 0% in 1978. Increasingly, even public utilities, such as electric power and water, are managed by private enterprises.

The Chinese Economy Today

- The Eleventh Five-Year (2006-2010) Plan for Economic and Social Development of China is an indicative rather than a mandatory plan. It is more a set of guidelines.
- Under the Eleventh Plan, the policy of an open-door to international trade and direct investment is not only affirmed but also further enhanced. Other important objectives are an increase of personal consumption, especially in the rural areas, and maintenance of social harmony and long-term sustainability.

The Eleventh Five-Year Plan for Economic and Social Development

- The Plan also calls for the doubling of per capita GDP between 2000 and 2010—implying a rate of growth of 7-8% for the rest of the decade (and doubling again between 2010 and 2020).
- Rapid economic growth is not the only objective:
  - Encouraging thrift, conservation and efficiency
  - Promoting social harmony
  - Ensuring long-term sustainability

The Chinese Economy Today

- More and more Chinese enterprises will be making foreign direct investments overseas, much as their Japanese counterparts did in the 1970s and 1980s.
- The investment by the Chinese "Government Investment Corporation (GIC)" of US$3 billion in the Blackstone Group is only 1 percent of its total expected capitalization of US$300 billion.
- The Chinese objective is to maintain an overall balance of payments equilibrium (of zero) going forward. With its official foreign exchange reserves standing at US$1.066 trillion at year-end 2006 (and more than 1.2 trillion today), China has overtaken Japan to become the country with the largest official foreign exchange reserves and certainly does not need a higher level of reserves.

The Chinese Economy Today

- China is often referred to as the “World’s Factory” because of the dominant position of its exports in the markets for light manufactured goods such as textiles, apparel, shoes, electrical and electronic appliances, and furniture around the world, on the basis of its low real wage rate (surplus labor).
- However, the Chinese total (direct+indirect) domestic value-added on these exports remains low, averaging 46.6%. Moreover, almost 60 percent of Chinese exports is conducted by foreign-invested enterprises. Thus, a high proportion of the “profits” from the Chinese export trade accrues to foreign rather than Chinese nationals.

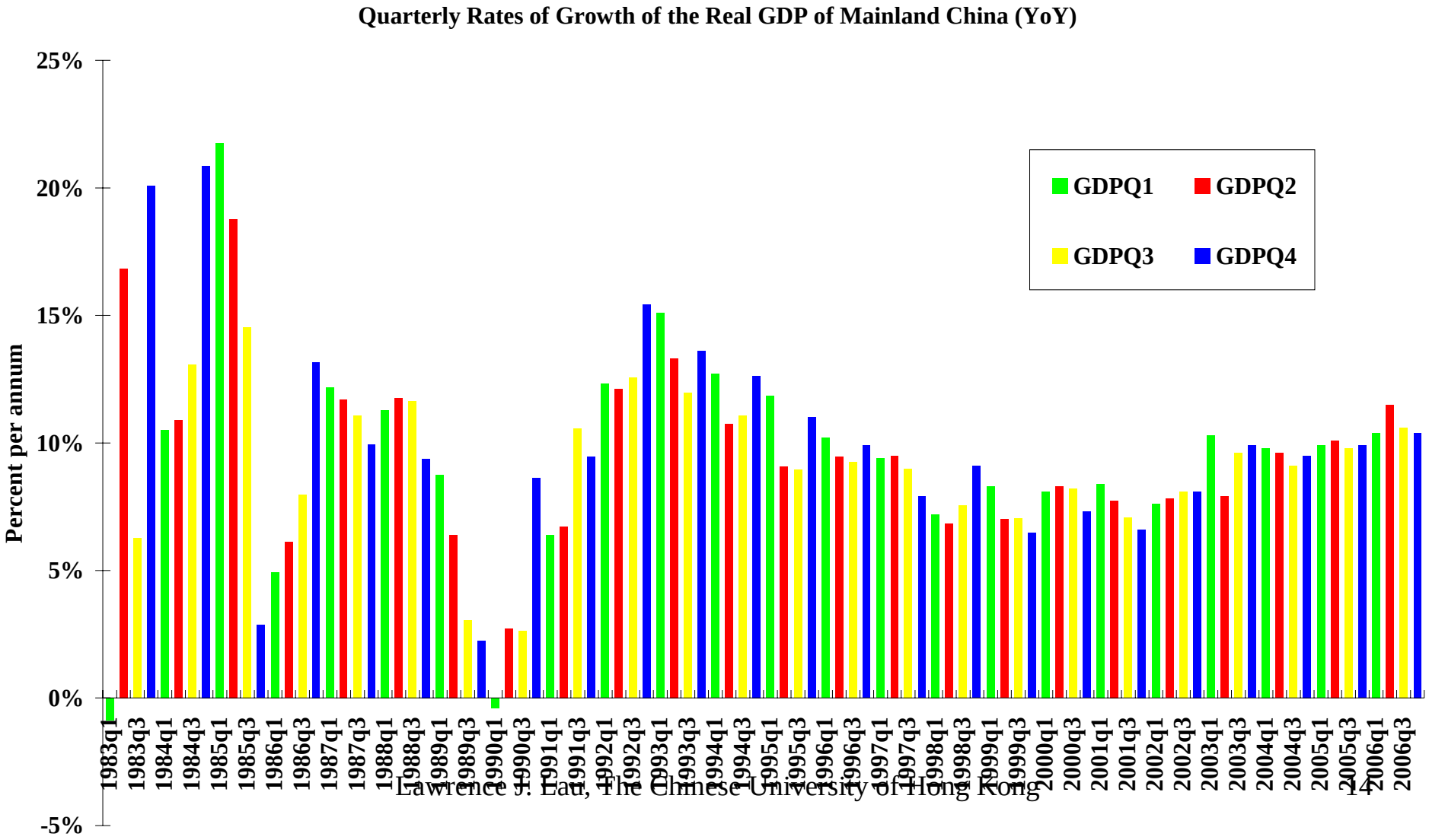
The Chinese Economy Today

- China is also rapidly becoming the "World's Market" because of its increased demands for goods and services around the world:
  - It is the World's major user and importer of oil, minerals, and other natural resources and primary raw materials.
  - It has also become the World's fastest-growing market for consumer goods, such as automobiles, cell phones, and tourism services, and producer goods such as aircrafts, computers, mass-transit systems, nuclear power plants and specialty steel.
- It has been an engine of growth for the Asia-Pacific region (Northeast Asia, Southeast Asia, Australia and New Zealand) since 2000. China runs a trade deficit vis-à-vis almost all countries in East Asia. It has become the most important trading partner for Hong Kong, South Korea and Taiwan.

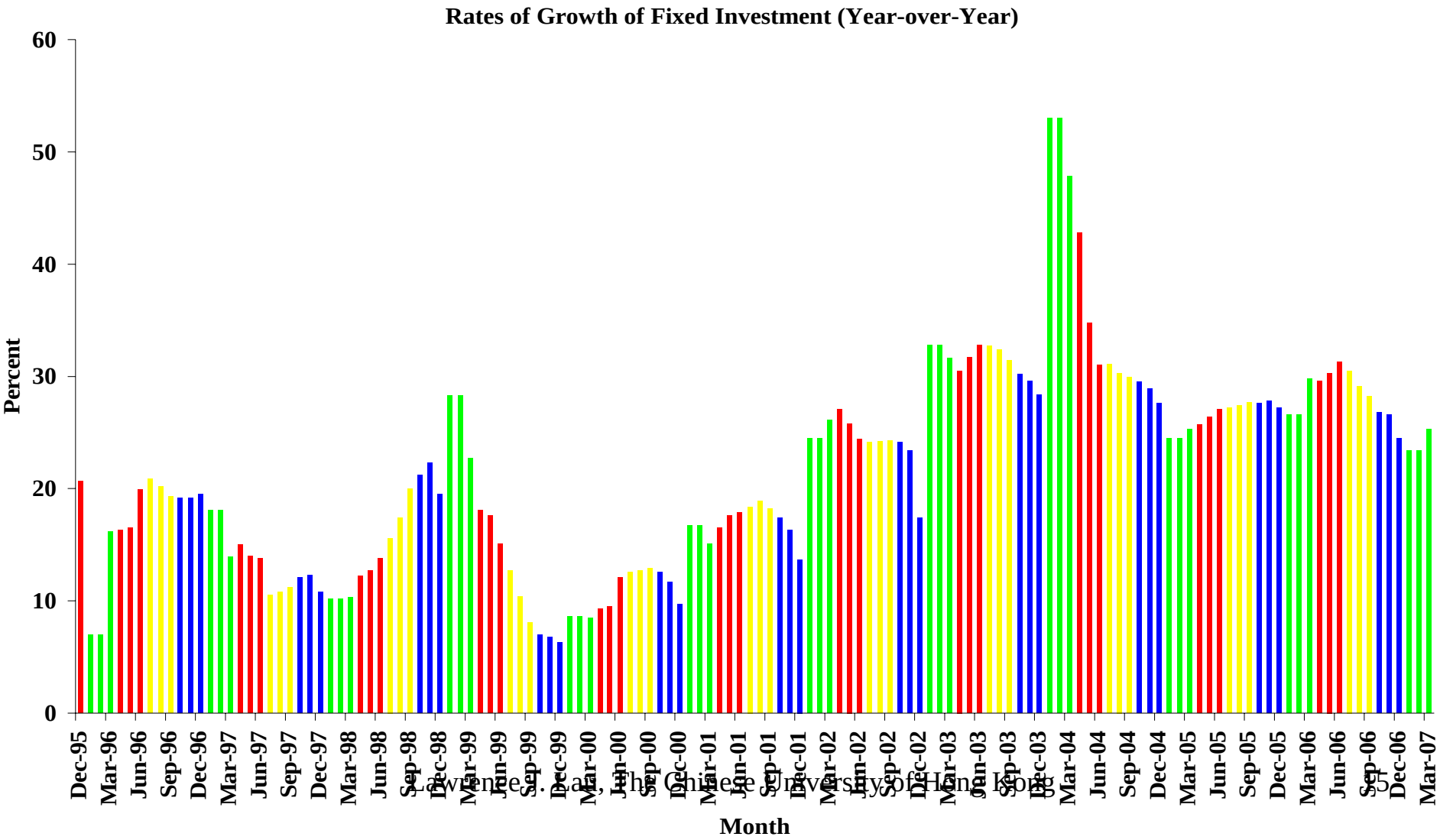
The Chinese Economy Today

- The Chinese economy grew 10.1% in 2004, 10.4% in 2005 and 10.7% in 2006.
- However, the apparent acceleration of the measured rate of growth does not seem to be consistent with other indicators that the economy has been slowing—including the appearance of excess capacity in many sectors; rising increases in stocks (inventories); the slowdown in the rate of growth of exports and imports (and in export orders) for several consecutive months; and the decline in the price of real estate in major cities. The national income statistics do not seem to reflect the slowdown adequately.

Quarterly Rates of Growth of the Real GDP of Mainland China (Year-over-Year)



Rates of Growth of Gross Fixed Investment, Year-over-Year



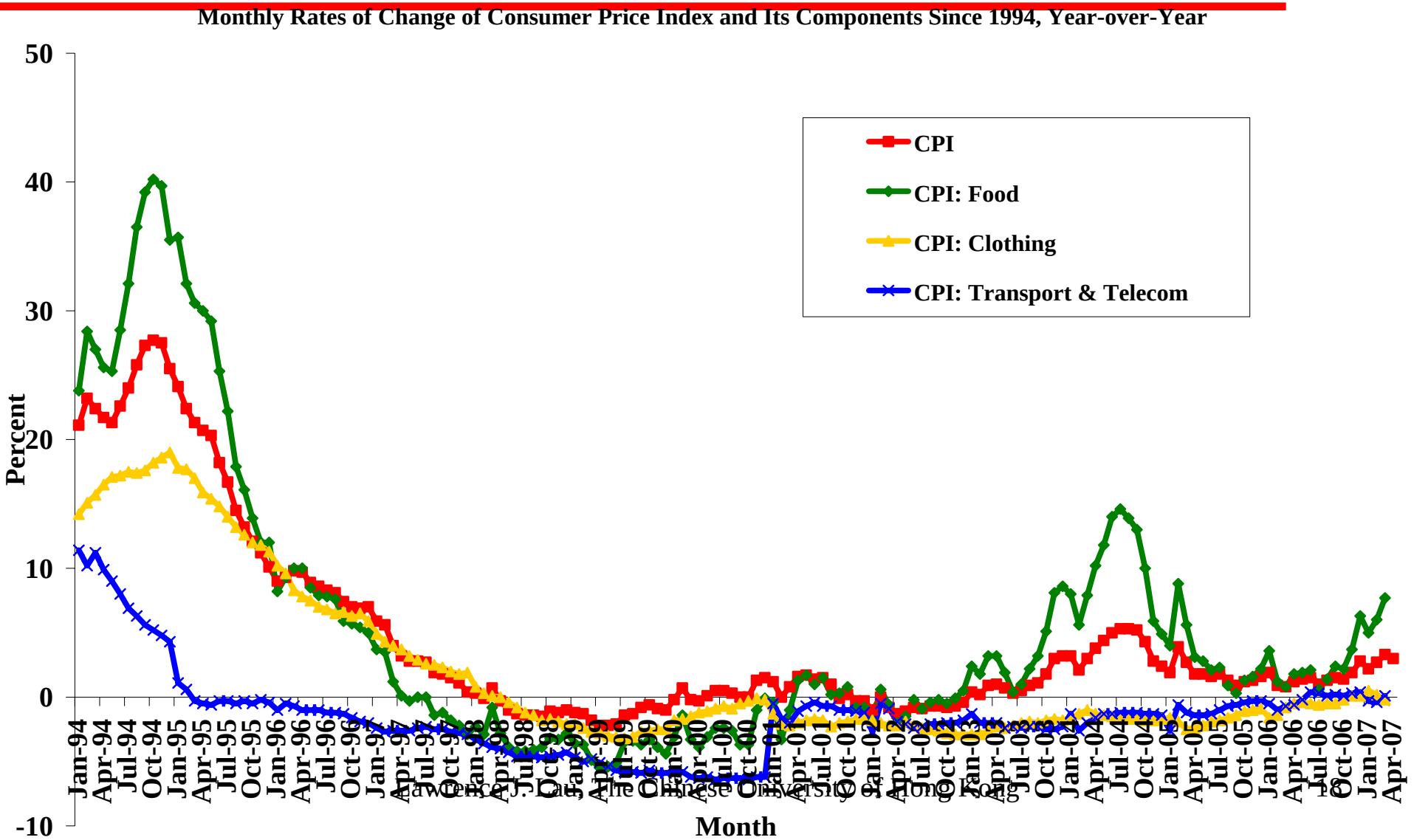
The Chinese Economy Today

- We attribute this inconsistency to the fact that the quarterly rate of growth Year-over-Year is a lagging indicator, the lack of provision for recognizing the decline in the value of inventories, the inability to separate the pure appreciation in the price of undeveloped raw land from the value added of enterprises engaged in real estate development and the continued apparent rapid growth in the measured personal consumption of services due in part to the previous under-estimation of its level.
- One other factor that may also be relevant is that this is the year in which provincial and local leaders are considered for possible promotions. A higher reported rate of growth of the provincial or local real GDP in 2006 can be helpful.

The Rate of Inflation

- The Consumer Price Index (CPI) reportedly grew 1.5% in 2006, following a 1.8% increase in 2005. The People's Bank of China projected a rate of growth of the consumer price index (CPI) for 2007 to be 3%.
- Inflation has remained low thus far, especially the core rate of inflation, that is, the rate of inflation net of changes in the prices of energy and agricultural goods, despite the relatively high rate of growth of the money supply (M2). The relatively low inflation rate was the result of the stabilization of agricultural prices at their current levels and the excess capacity in many sectors such as steel and cement, driving down prices from their peaks, and that much of the growth in the money supply was absorbed by the growth of transactions in assets (financial and real) rather than goods and services.
- Prices of goods, services and assets have been declining, albeit at different rates, pointing to a gradual economic slow-down.

Monthly Rates of Change of the CPI, Year-over-Year



The Rate of Inflation

- China has always been a surplus labor economy. The real wage rate will remain stable as long as 40% of the labor force continues to be in the primary (agricultural and mining) sector, but producing only 12.5% or less of GDP. There will be little upward pressure on the real wage rate of unskilled entry-level workers for at least a couple of decades to come.

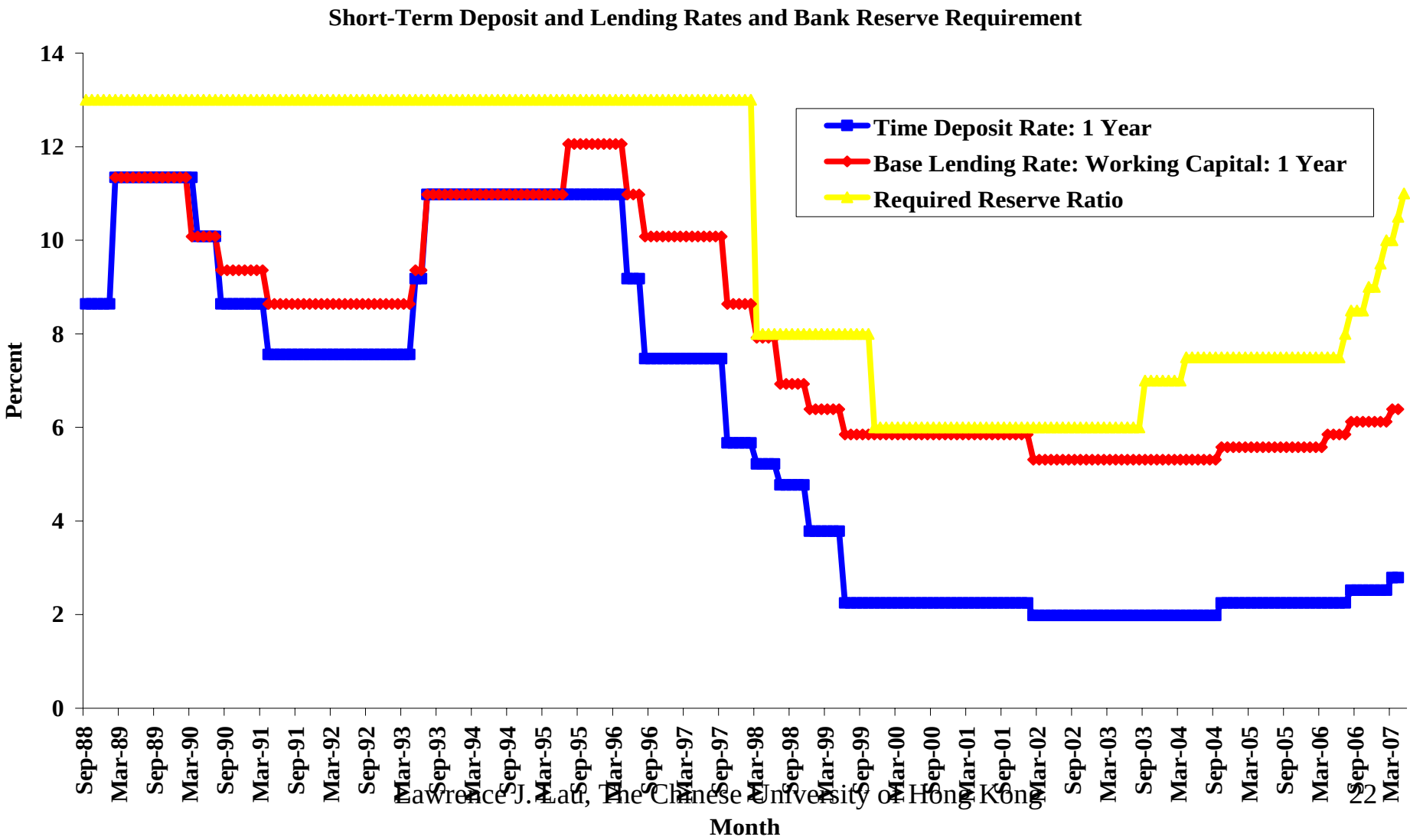
The Rate of Inflation

- However, paradoxically, China is also a capital-surplus economy. The national saving rate is in the mid-40s, with a similarly high investment rate.
- There is a great deal of liquidity in the Chinese commercial banking system. Credit is easily available to state-owned enterprises as well as enterprises controlled or sponsored by provincial and local governments. Many such enterprises, or at least their executives, behave as if the loans do not need to be repaid if the investment projects fail. As a result of this moral hazard, there is chronic excess demand for credit, and hence excess investment.
- Small increases in the rate of interest are useful only as a signal of the central government's resolve to exercise macroeconomic control but are unlikely in and of themselves deter many of these enterprises from their investment projects.

The Rate of Inflation

- The excess investment often results in excess capacity in many industries, especially capital-intensive ones. With excess capacity and a saturated domestic market, the enterprises in many sectors have begun to cut prices in order to compete, despite the rising costs of raw materials and energy. The margins of many enterprises are squeezed. The variable costs are barely covered. And any remaining excess supply is put on the world market as a last resort, even at a loss (in the sense that the total costs, including fixed costs, fail to be fully recovered). Thus, Chinese exports have helped to keep the world rate of inflation from rising.
- However, this situation cannot continue forever. With mounting losses, selling and exporting at a loss will eventually come to an end. The rates of growth of exports and export orders have already been declining over the last several months of 2006.
- The rate of growth of imports has declined even faster, indicating a slowdown in the investment boom.

Short-Term Deposit and Lending Rates & Bank Reserve Requirement



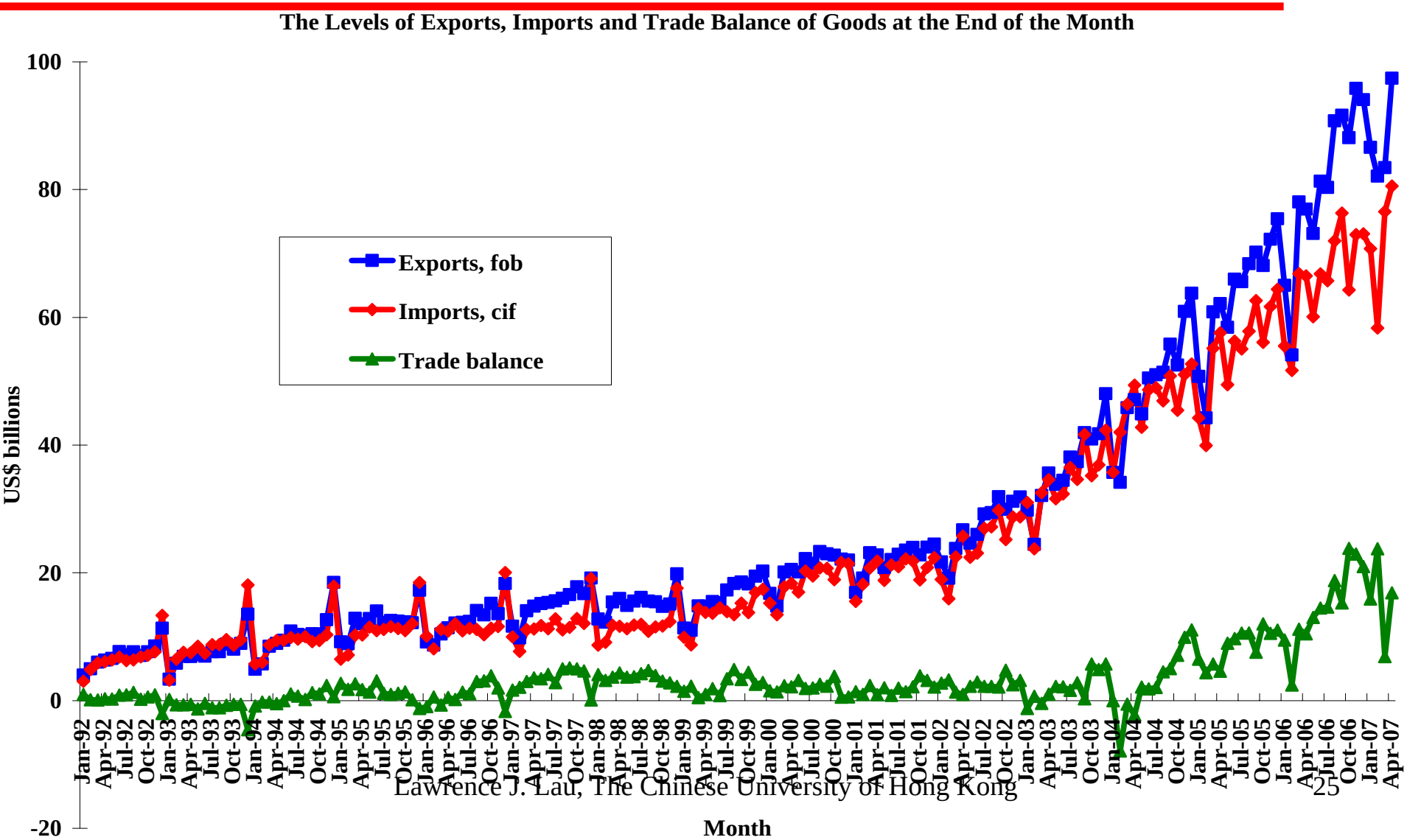
International Trade and Investment

- Chinese international trade has been growing at double-digit rates in recent years, more than twice the rate of growth of world trade as a whole and is expected to continue to do so in the future, albeit probably at lower rates.
- Total Chinese exports and imports of goods amounted to US$1.76 trillion in 2006, an increase of 24% from US$1.42 trillion in 2005. China is the third largest trading nation in the world, after United States and Germany.
- Exports have continued to grow during the first half of 2007, in part in anticipation of the imposition of export taxes and the reduction in the value-added tax rebate on the exports, but the rate of growth is expected to slow in the second half as the new tax policy on exports is implemented.

International Trade and Investment

- In 2005, exports of goods alone grew 28.4% to US$762.0 billion while imports grew 17.6% to US$660.1 billion; resulting in a trade surplus in goods of US$101.9 billion, or 7.2% of total trade in goods and 4.5% of GDP.
- In 2006, exports grew 27.2% to US$969.08 billion. Imports grew only 20.0% to US$791.61 billion. The trade surplus was US$177.47 billion, or 10% of total trade in goods and services and 6.7% of GDP.
- Taking goods and services together, China had a trade surplus of US$92 billion in 2005, or 5.76% of total trade in goods and services and 4% of GDP.
- However, prior to 2005, the annual Chinese trade surplus was on average below US$30 billion.

Exports, Imports and Trade Balance: Monthly Data



International Trade and Investment

- Exports by foreign-invested enterprises account for 58.5% of total exports. More than 50% of total exports are "processing" exports, that is, production for exports only based on imported intermediate inputs, raw materials, and equipment.
- Chinese exports are still characterized by a relatively low direct domestic value-added—estimated to be 20.4% for all exports and 17.7% for exports to the U.S. The indirect domestic value-added is also very low—estimated to be 26.2% for all exports and 19.1% for exports to the U.S. (Thus a 10% revaluation of the Renminbi will result in a less than 2% net increase in the direct costs of Chinese exports to the U.S. in US$ terms, and hence a very limited impact on the volume of Chinese exports to the U.S.)

International Trade and Investment

- The rapid increase in the **measured** Chinese trade surplus during the past couple of years may be attributed to
  - The expiration of the quota system of the Multi-Fibre Agreement which effectively restricted Chinese exports of textiles in years prior to 2005;
  - The appreciation of the Yuan by 8 percent relative to the U.S. Dollar implies that if in real terms the exports and imports remain unchanged, the exports will be worth more in US$ terms and imports less in US$ terms and hence the trade surplus will rise, until the real quantity of exports begins to fall and the real quantity of imports begin to rise because of the price effects. But the price effects themselves are expected to be small.
  - The decrease in the use of under-invoicing of exports and over-invoicing of imports because of the change in the expectation of the relative benefits of holding Yuan and US$. The prevailing view is that the Yuan is likely to appreciate relative to the US$. Enterprises in China (whether Chinese or foreign-owned) are therefore more willing to hold the Yuan rather than the US$. The incentive for under-invoicing of exports and over-invoicing imports has declined. It is even possible that over-invoicing of exports and under-invoicing of imports are occurring.

International Trade and Investment

- Despite the existence of capital controls, there are many channels of leakages, for both inflows and outflows. For example, the statistical discrepancy in the International Monetary Fund statistics has changed directions in recent years. Over- and under-invoicing, for transfer pricing, tax avoidance, and other purposes, are prevalent, especially in international transactions between connected parties (e.g., in intra-firm trade, which accounts for almost 60 percent of Chinese exports).
- Over- or under-invoicing of exports and imports by 5% is normally undetectable. 5% of Chinese international trade in goods in 2006 amounts to almost US$90 billion. This is comparable to the magnitude of the swing in the statistical discrepancy of Chinese balance of payments in the International Monetary Fund statistics.
- Due to the imminent equalization of the tax rates on domestic and foreign-invested enterprises in China, it is possible that the foreign-invested enterprises in China may once again prefer under-invoicing of exports and over-invoicing of imports.

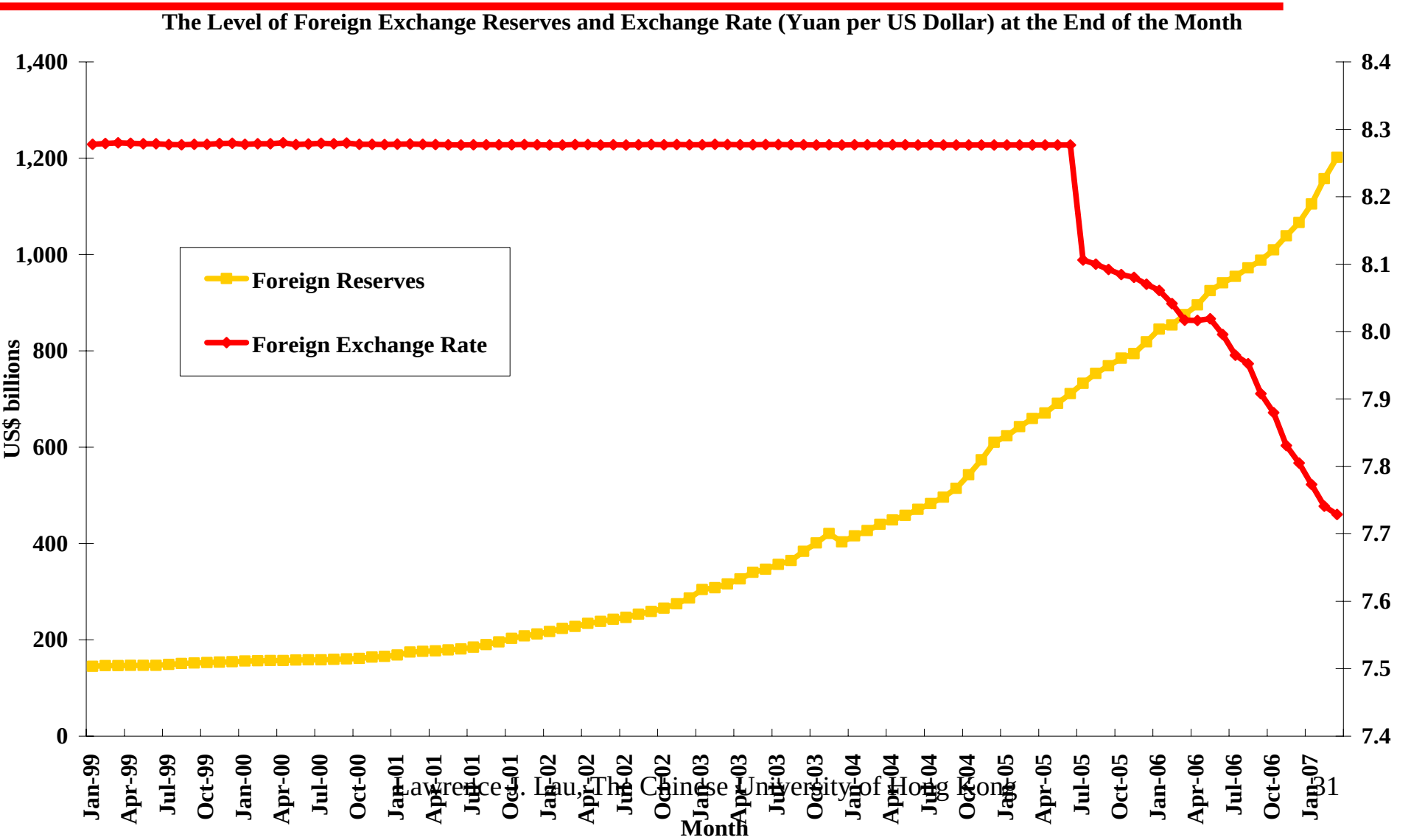
The Renminbi

- China reverted to a “managed floating rate” system for the Renminbi on July 21, 2005, with a modest revaluation of 2.1%. China operated a “managed floating rate” system since it unified its exchange rates and introduced current-account convertibility on January 1, 1994, when the exchange rate was 8.7 Yuan per US$. The de facto pegged exchange rate system was actually adopted in July, 1997 in response to the East Asian currency crisis, by greatly narrowing the daily band of fluctuation to almost nothing around 8.28 Yuan per US$.
- Since July 2005, the Renminbi has appreciated slowly and gradually. On May 15, 2006, the Renminbi exchange rate crossed the psychologically important barrier of 8 Yuan per U.S. Dollar. On January 11, 2007, it rose above 7.80 Yuan per U.S. Dollar, the same parity as the Hong Kong Dollar.
- Overall, the Yuan has appreciated approximately 8% since July, 2005. For 2006 as a whole, the Yuan appreciated approximately 3.4%.

The Renminbi

- The exchange rate is allowed to fluctuate within a daily band, originally set at 0.3% in either direction. The band has recently been widened to 0.5%.
- Revaluation, if any, is likely to continue to be gradual and modest.
- Full convertibility is likely within ten years although its net impact on the exchange rate is uncertain. Many observers expect the Renminbi exchange rate to fall with the introduction of full convertibility, at least initially, because of the one-off effect of portfolio diversification and re-allocation and because of possible capital flight on the part of the wealthy private entrepreneurs.

Foreign Exchange Reserves and the Exchange Rate, End of the Month



The Prospects for Continued Rapid Economic Growth

- Chinese economic reform has been most successful. Everyone is better off by a large margin compared to 1978. No one wishes to roll back the economic reform.
- In the aggregate, Chinese economic growth since 1978 has been mostly driven by the growth of tangible or physical inputs, principally tangible or physical capital such as structures and equipment and physical infrastructure, and not by technical progress or growth in total factor productivity. In particular, there was relatively little investment in intangible capital (e.g., R&D, human capital, advertising and good will).

The Potential for Continued Economic Growth

- The growth of tangible capital inputs accounts for the bulk (over 80 percent) of the measured economic growth in China. The tangible capital stock has been growing at approximately 15 percent per year.
- The absence of overall technical progress is however typical of economies in their initial stages of economic growth. It was true for the United States in the 19th Century, for Japan from the Meiji Restoration of 1868 to the World War II, and for the East Asian newly industrialized economies of Hong Kong, South Korea, Singapore and Taiwan until the mid to late 1980s.

Advantages of the Chinese Economy: Capital and Labor

- A high national savings rate of currently in the mid-40s. China is therefore self-sufficient in capital and not dependent on foreign direct investment or foreign loans to maintain its high rate of investment.
- An almost unlimited supply of surplus labor—there will not be any upward pressure on the real wage rate of unskilled entry-level labor for decades to come.

The Fundamental Importance of Domestic Savings

- The bulk of the gross domestic investment in China is financed by domestic savings. Except for a short early start-up period in the early 1950s, the Chinese domestic savings rate has always been high, on the order of 30 percent. In recent years, it has approached 40-50%.
- Foreign direct investment accounts for approximately 10 percent of gross domestic investment in China. While helpful, and important in terms of bringing technology, markets, new business models and methods, and knowhow to China, foreign direct investment and foreign loans are neither necessary nor sufficient to sustain the rapid economic growth of China.
- This underscores the fundamental importance of domestic savings in Chinese economic growth--without the domestic savings financing the investment, the rapid growth of the tangible capital input would not have been possible; and without the rapid growth of the tangible capital input, the rapid growth of real output would not have been possible.

The Advantages of a High Domestic Savings Rate

- A country with a high savings rate does not need to rely on foreign savings—does not need to borrow abroad and bear the potential risks of a large, and often interruptible, foreign-currency denominated debt.
- With new resources being made available each year from new savings, enabling new investments to be made, the necessity of restructuring and redeploying existing investment is greatly diminished (thus making it more possible to avoid creating losers).
- Moreover, with a high domestic savings rate, the non-state sector (which is generally more efficient) can grow without significant large-scale privatization, which can themselves be socially disruptive.

China’s Gross Domestic Investment as a Percent of GDP

The Advantages of a High Domestic Savings Rate

- Latin American economies are the chronic sufferers of a low domestic savings rate. They are therefore forced to augment their domestic savings by borrowing abroad in foreign currency. But loans have to be repaid sooner or later. When that happens, domestic investment will have to fall below domestic savings, and economic growth may not be sustainable; and in the repayment process currency crises will often result.
- The low domestic savings rate in Russia made it necessary for Russia to privatize and restructure, a process which resulted in approximately a decade of declining real GDP and the creation of many losers.

Advantages of the Chinese Economy: A Large Domestic Market

- A large domestic market permits the realization of economies of scale.
- A large domestic market also allows a significant influence on the development and setting of technological standards for the domestic as well as the world markets.
- A large domestic market also enhances the returns to R&D and other forms of intangible capital. Economies of scale in the creation and utilization of intangible capital imply that the rate of return increases more than proportionally with the size of the market. The fixed development costs of innovative technologies can be more easily recovered from a large base of domestic demand.

Economic Challenges--Sustainability

- However, the Chinese economy faces many potential challenges in the coming decades. For examples:
  - The potential for macroeconomic and financial instability
  - Excessive investment (high national savings rate)
  - Integration of the national market
  - Vulnerability to external disturbances
  - Insufficient investment in intangible capital
  - Environmental degradation
  - Adverse demographic development

Social Challenges—Social Harmony

- It also faces many potential social challenges. For examples:
  - The rising income inequality (between urban and rural, between regions, and between individuals)
  - An insufficient social safety net
  - Corruption
  - Political participation

The Sources of Macroeconomic Instability: Boom and Bust Cycles

- The macroeconomic instability in China is caused primarily by boom and bust cycles in real fixed investment undertaken by enterprises, public and private. These boom and bust cycles are driven mostly by domestic demand and not by external disturbances.
- Because of moral hazard, a boom inevitably leads to excess capacity and low investment returns, sowing the seeds of a subsequent bust and a decline in real fixed investment by enterprises—hence a boom and bust cycle.
- Bad investments result in lower rates of return not only for themselves but also for otherwise good investments through their competition for resources (capital, raw materials, talents, markets) and ruinous price competition. However, the excess capacity does help prevent prices of manufactured goods from rising in China.

The Sources of Macroeconomic Instability: The Spillover Effects

- The macroeconomic instability in China can also be caused by the spillover (domino) effects of failures of large enterprises propagating through the economy.
- Because of the high debt-to-equity ratios, enterprises are much more prone to fail, and when an enterprise fails, it may drag down otherwise sound enterprises—suppliers and financial institutions, with it, setting off a domino effect.
- It is important in the long run to maintaining a positive real rate of interest on loans. A negative real rate of interest on loans encourage moral hazard and the excessive use of debt.

The Relative Ineffectiveness of Traditional Instruments

- Raising the lending rate is not effective in discouraging excessive investment (or loan demand) because of the existence of moral hazard—most borrowers are either not personally financially liable for any losses (e.g., as the executives of state-owned enterprises (SOEs)) or otherwise do not intend to repay in the case of failure of the enterprises/projects, but stand to make substantial gains in the event of success. Raising the reserve requirement ratio does help to restrain the expansion of bank loans.
- While aggregate quantity constraints—whether through changes in the reserve requirement ratio or the target for new loans—and other direct administrative means may be reasonably effective, they run the risks of deterring both good and bad projects at the same time.

The Sustainability of Chinese Economic Growth—Efficiency of Investment

- The efficiency of investment in tangible capital can be greatly enhanced if the commercial banks can adopt international practices in the procedures for loan approval and disbursement.
  - (1) Full implementation of the equity requirement (the equity requirement must be high enough that in the case of failure it should hurt so that it is a useful indicator of the confidence of the borrower in the eventual success of the investment project);
  - (2) The (progress) construction method of disbursement (both the equity and loan portions of the financing should be disbursed directly by the lender to the contractors and suppliers so that there is no possibility of diversion of the loan proceeds).
- The above procedure does not guarantee success of the funded project but helps to screen out the worst projects because the entrepreneur stands to lose the equity investment and in the event of failure of the project, there is still residual value for the lender because the full amount of both equity and debt has been invested into the project.

The Sources of Financial Instability

- The Chinese financial sector, however, is vulnerable because of the high debt to equity ratios of most enterprises and for the economy as a whole. There is a high proportion of indirect (credit) financing relative to direct (equity) financing.
- Enterprises with high debt-to-equity ratios are prone to failure, brining down not only themselves but also their suppliers, customers and even lenders.
- Direct (equity) financing should be encouraged:
  - Encouraging enterprises to pay cash dividends;
  - Elimination of double taxation of corporate profit—leveling the playing field between debt and equity financing—making cash dividends of publicly listed companies deductible against profit in the same way as interest payments;
  - Cash dividends can serve as a reliable signal of an enterprise's corporate health; and
  - Intensified enforcement of security laws and regulation and supervision of both the securities market and the securities companies.

Excessive Investment

- Aggregate personal consumption is low in China not because it is crowded out by investment. On the contrary, the high investment rate is caused by the low consumption rate (high savings rate) and the abundance of liquidity in the commercial banks.
- There are many reasons for the high savings rate (low personal consumption) in China.
  - (1) The absence of a credible social security system (pension, health care, unemployment);
  - (2) The inadequate provision of social services (education, health care);
  - (3) The relative unavailability of consumer credit; and
  - (4) The unequal distribution of income (high-income households have low marginal propensities to consume).

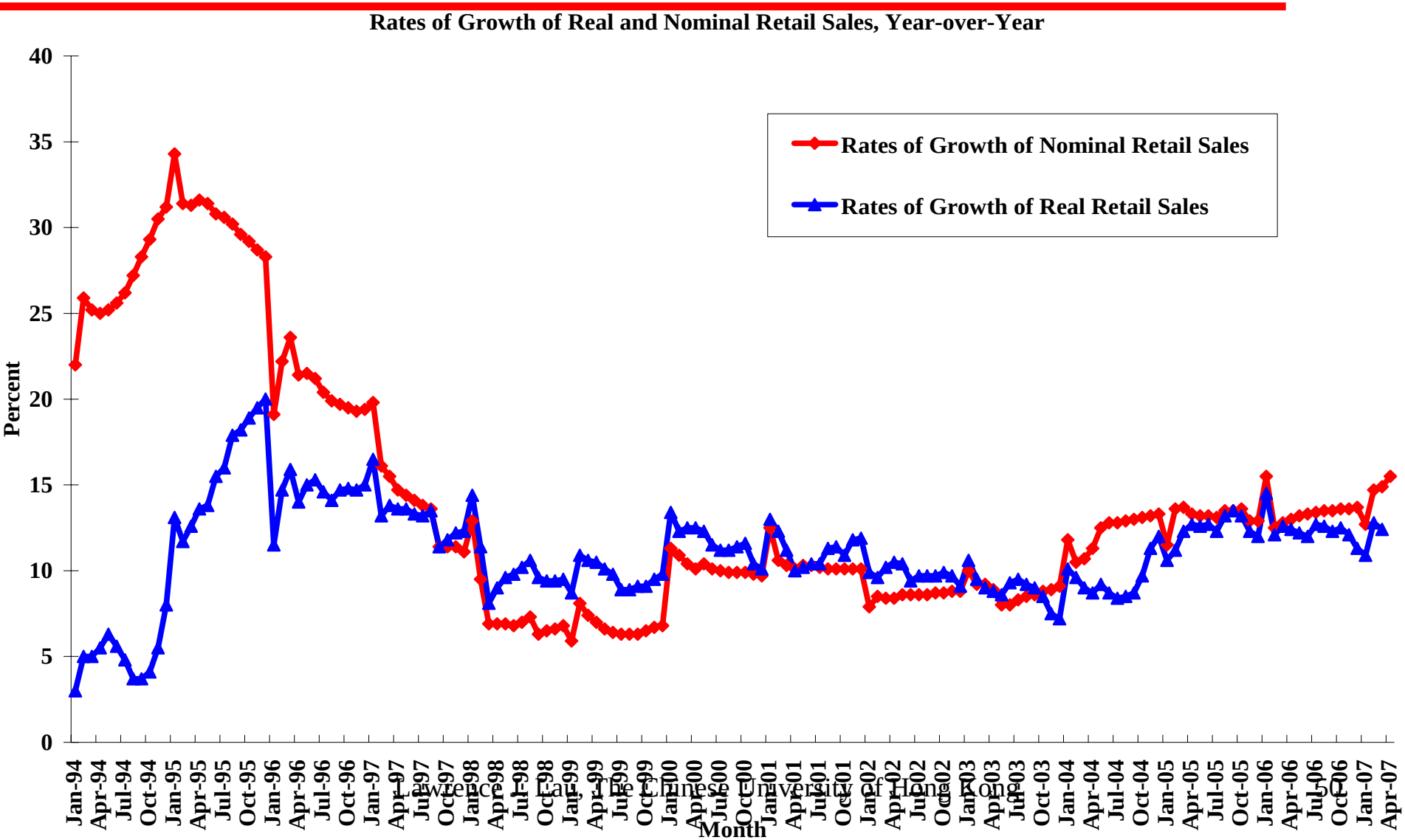
The Growth of Personal Consumption

- However, China's consumer market did register a steady and relatively fast growth since 2005. It is expected to grow faster than the rate of growth of GDP. Personal consumption of services is extremely difficult to measure accurately.
- More recent data suggest that household consumption has been rising as a percentage of household income. Survey data indicate that on average, the savings rates of households in Mainland China, Hong Kong and Taiwan are all around 30%. Thus, the high national savings rate must be due to savings by enterprises (the central government typically runs a small budget deficit).
- Continuing significant demand for consumption can come from two sources, both related to urbanization—affordable owner-occupied housing and transportation.

The Growth of Personal Consumption

- The time has come for the government to promote and build mass-transit systems in both old and new cities. An efficient and clean mass transit system can reduce the demand for automobile usage (but not necessarily ownership) and hence environmental pollution and traffic congestion. It also permits the government to plan the urban locational patterns for commercial, industrial, and residential uses efficiently and effectively.
- The demand for other consumer durables—automobiles, motorcycles, bicycles, electrical appliances, furniture—many of which are also housing-related, will continue to be strong, especially in the urban areas on the coast.
- There has been and will continue to be a rapid increase in the demand for personal consumption services—education, health care, food and beverages services, and tourism.

Rates of Growth of Nominal and Real Retail Sales, Year-over-Year



Insufficient Investment in Intangible Capital

- Paul Krugman's hypothesis—economies that rely solely on the growth of tangible inputs will eventually stop growing.
- The incremental capital-output ratio (ICOR) has been rising in China, that is, more and more tangible capital is required in order to produce an additional unit of real output. Gross fixed investment has been rising faster than the increase in output at an increasing rate.
- This is the combined effect of two phenomena:
  - (1) Diminishing marginal productivity of tangible capital; and
  - (2) Rising inefficiency of investment in tangible capital (duplication, ruinous competition, waste).
- However, in terms of tangible capital per unit labor, China is still far below the industrialized economies and hence still has a long way to go before diminishing marginal productivity of tangible capital begins to hit.

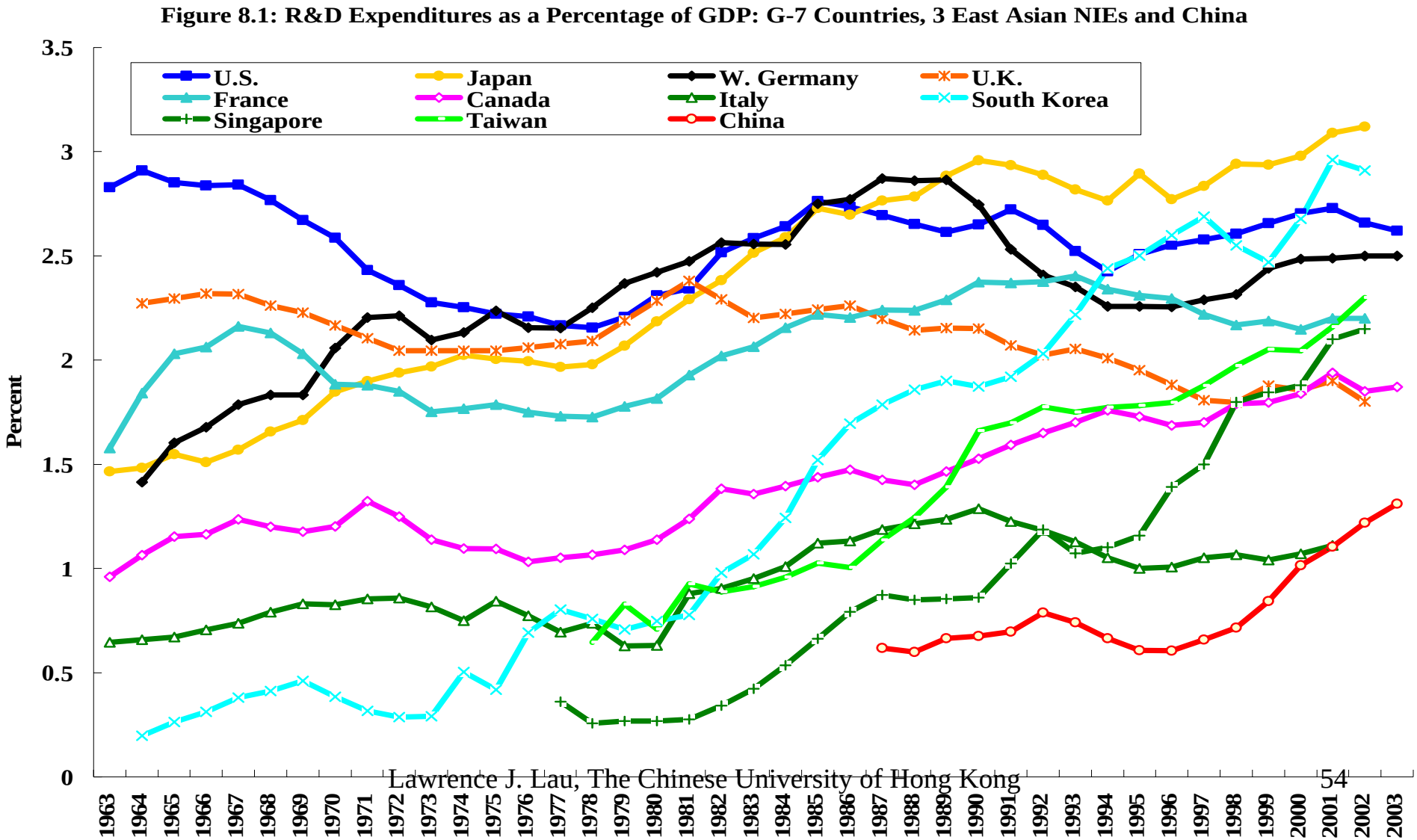
The Sustainability of Chinese Economic Growth—Intangible Capital

- In the long run, in order to sustain the economic growth, there must be investment in intangible capital—R&D, human capital, good will, advertising, brand building, management information system.
- Intangible capital is complementary to tangible capital (for example, software enhances the productivity of a personal computer) and counters the effect of diminishing marginal productivity of tangible capital.
- Japan, South Korea and Taiwan have all been able to shift their growth from tangible inputs-driven growth to intangible capital or equivalently technical progress-driven growth.

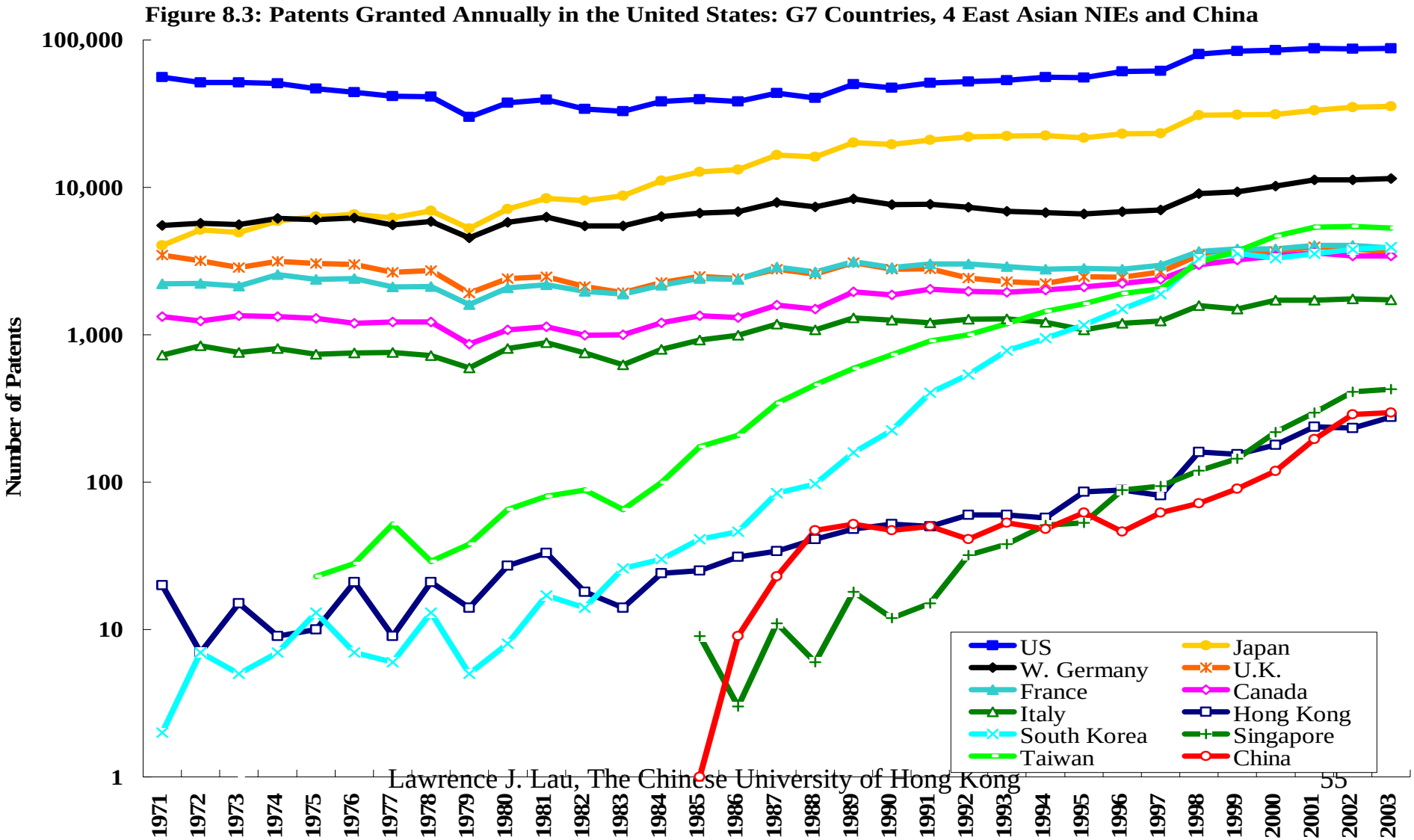
Insufficient Investment in Intangible Capital

- The growth of tangible capital inputs accounts for the bulk (over 80 percent) of the measured economic growth in China. The tangible capital stock has been growing at approximately 15 percent per year.
- The absence of overall technical progress is however typical of economies in their initial stages of economic growth. It was true for the United States in the 19th Century, for Japan from the Meiji Restoration of 1868 to the World War II, and for the East Asian newly industrialized economies of Hong Kong, South Korea, Singapore and Taiwan until the mid to late 1980s.

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

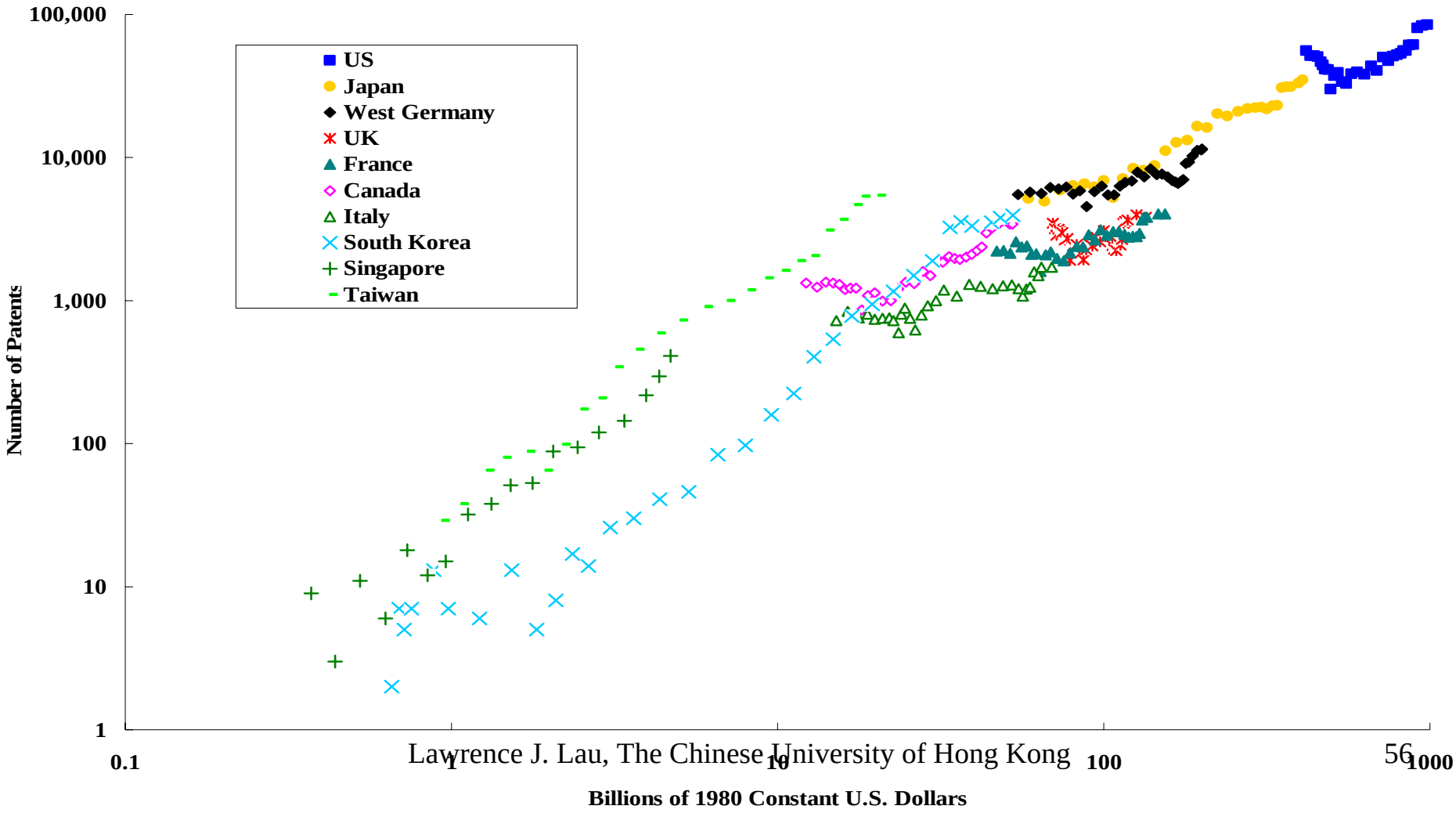


Patents Granted in the United States: G-7 Countries, 4 East Asian NIEs & China



Patents Granted in the United States and R&D Capital Stocks, Selected Economies

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



Vulnerability to External Disturbances

- Despite fluctuations in exports and imports, the rate of growth of Chinese real GDP has remained remarkably stable at 8-10%. This is due to the combination of two factors: the relatively low share of exports in GDP, and the relatively low domestic value-add content of Chinese exports.
- Chinese economic growth to date has also been investment-led, as opposed to consumption-led or export-led, with the bulk of the investment domestically financed. Foreign direct investment accounts for less than 10% of aggregate domestic gross fixed investment.

Vulnerability to External Disturbances

- Exports constitute approximately 35% of Chinese GDP; however, the direct domestic value added content of Chinese exports is low. It averages 20.4% on exports to the world, and 17.7% on exports to the United States.
- Thus, the GDP originating from exports is only approximately 7% (35% times 20% = 7%).
- 7% of GDP is a very significant amount that will result in hardships if lost; however, even if the 7% does not grow, the economy will do fine if the remaining 93% continues to grow.
- Even if we include both direct and indirect value-added, which amount to 46.6% of exports, the GDP originating from exports would constitute approximately 16%.

Vulnerability to External Disturbances

- The Chinese economy is therefore not too vulnerable to external disturbances. 16% of GDP is a great deal to lose; but if 16% of the economy does not grow, but the remaining 84% continues to grow, the economy will be fine.
- It might, however, be vulnerable to interruption of foreign energy supplies. Thus China must pursue a policy of:
  - (1) Energy conservation;
  - (2) Imposition of a gasoline tax so that the retail price of gasoline approaches the levels comparable to those of Western Europe and Japan;
  - (3) Intensified development of coal resources;
  - (4) Establishment of strategic petroleum reserves.

The Relative Stability of the Rate of Growth of Real GDP

- Moreover, gross domestic investment is mostly financed through domestic savings rather than foreign investment or loans.
- Foreign direct investment (FDI) accounts for less than 10% of gross domestic investment in China, a relatively small proportion.

Targeting Balanced Trade

- China has also revised its international trade policy recently and is no longer aiming at a trade surplus or further increases in its official foreign exchange reserves. Going forward, it will try to achieve basically balanced trade.
- If and when the Renminbi becomes fully convertible, and a reserve currency for some countries, China will even begin running a trade deficit.

Long-Term Economic Growth: Three Paradigms of Chinese Economic Growth

- Domestic demand-driven growth--the large 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 regions and China must rely on internal demand for further economic growth. Total value-added from exports (direct+indirect) constitutes only 16 percent of Chinese GDP.
- The "wild-geese-flying pattern" metaphor of East Asian industrial migration over time, first introduced by Akamatsu, 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 to Fully Exploit the Advantages of a Large Domestic Market?

- Availability of infrastructure (transportation and communication, including the internet)
- Maintenance of a domestically open economy (the equivalent of the “interstate commerce” clause of the U.S. constitution)—no inter-provincial tariff or non-tariff barriers
- Maintenance of an internationally open economy--the role of the "open door” (WTO)
- Affirmation of tangible and intangible property rights and the rule of law in the economic sphere--a national commercial and tax court empowered to settle all commercial and tax disputes, including intellectual property rights, on a nationwide basis

The Sustainability of Chinese Economic Growth—Environmental Protection

- Enforcement of environmental protection laws on air and water against polluters.
- Promotion and encouragement of the use of renewable and non-polluting energy sources—solar energy, wind energy, and geothermal energy, co-generation.
- Promotion of a recycling economy (e.g., making an enterprise responsible not only for the quality of its products but also for their ultimate disposal).

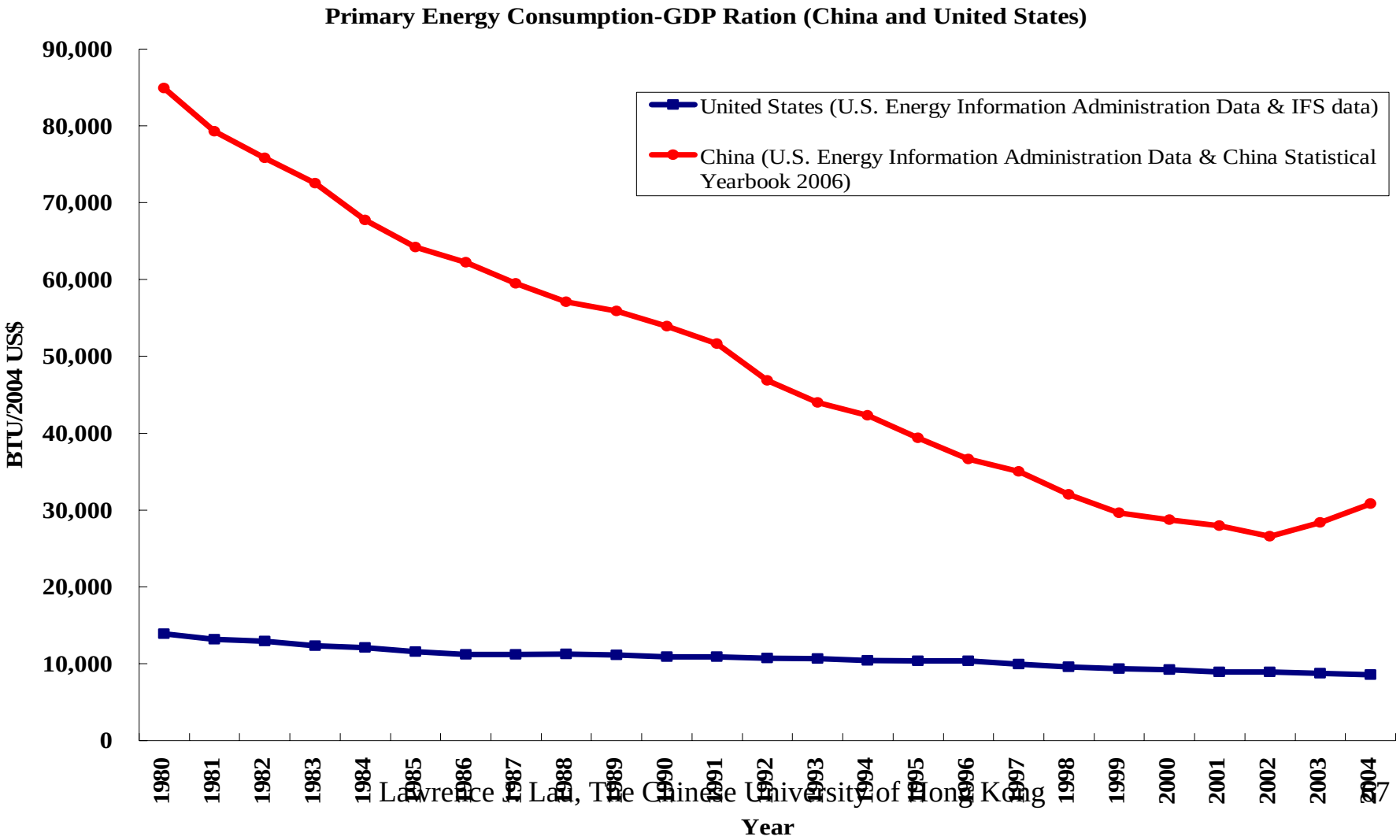
Environmental Degradation

- Energy consumption in China has been growing more slowly than real GDP until 2002.
- Energy efficiency, in terms of energy consumption per unit GDP, has actually improved significantly during the past two decades, until the last couple of years.
- It is, however, still considerably higher than those of the United States, Japan, and other developed economies. This is due, in part, to the lower price of energy to the end users; but also, in part, to the different sectoral composition of GDP originating—which in turn also depends on the domestic consumption patterns (e.g., the distribution between goods and services).

Energy Efficiency

- It is also affected by differences in life-styles: locational patterns, including residential patterns, densities, types of housing, types of transportation, temperature preferences, etc.
- It is also affected by the differences in the energy efficiency of the existing capital stocks of both the enterprises and the households—structure and equipment, housing, automobiles—which are legacies of the historical actual and expected prices of energy.
- But this also indicates considerable room for further improvements in energy efficiency in China.

Primary Energy Consumption-GDP Ratios (China and the United States), 1980-2004



Incentives—Appropriate Pricing and Taxation of Energy

- Pricing must reflect economic scarcities. Thus the prices of the different forms of energy--oil, natural gas, coal--should be set at world levels. Low-income households can be protected through lifeline rates on different forms of energy, e.g., electricity. Similar rate structures can be used to protect the existing enterprises and their employment without encouraging expansion of uneconomical and inefficient uses of energy.
- One can also use peak-load pricing for electricity which lowers the capital costs of providing electricity through higher utilization rates.
- Pricing must also reflect externalities. Externalities can also be priced in through the imposition of taxes on specific industries and/or products. For example, the price of gasoline, if left to the market, may not reflect the (social) costs of congestion, air pollution and global warming. Thus, a gasoline tax can be justified.
- Also, for certain investments, the private rate of discount may be higher than the appropriate social rate of discount and thus may require public subsidies or regulation.
- Wherever possible, the externalities should be internalized so that the total social costs are fully reflected.

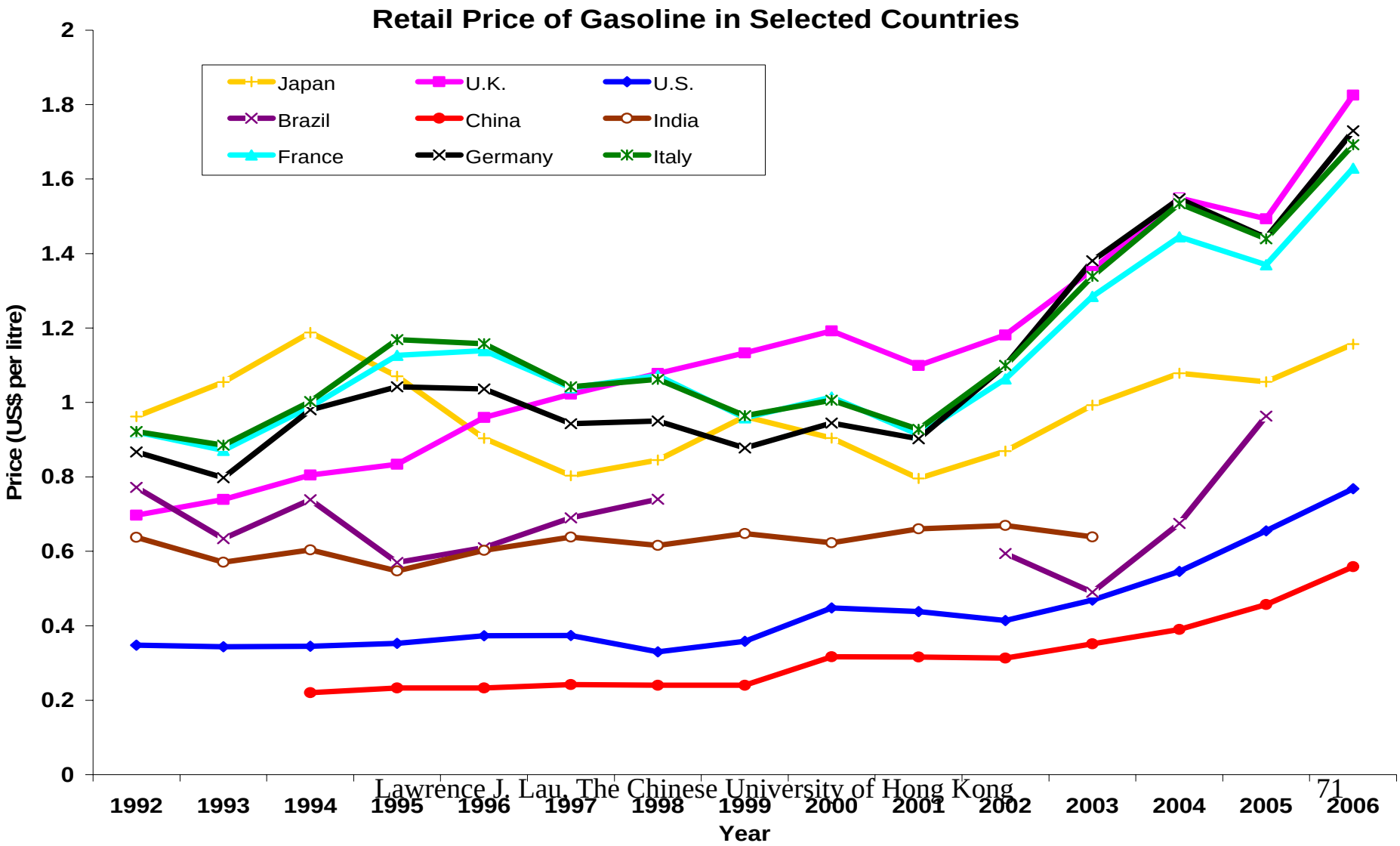
Incentives

- Incentives for capital cost-operating cost substitution—for examples: better insulation and construction of buildings lead to lower energy consumption for the useful life of the building; energy-efficient light bulbs are more expensive; more durable products; buildings with higher ceiling height per floor for better natural ventilation and reduced demand for air conditioning; solar heating systems. The government can provide credit subsidies for financing these incremental capital expenditures.
- (For example, triple-paned windows are more expensive but houses equipped with them consume much less energy. Without incentives the developers are likely to opt to use single-paned windows to lower the up-front capital cost.)
- The government can also mandate energy efficiency standards. For example, the government can mandate double-paned windows in regions where the average winter temperature is below a certain level.

Incentives—The Gasoline Tax and the "Gas Guzzler Tax"

- The retail price of gasoline in China is among the lowest in the world, even lower than in the United States. China can impose a tax on gasoline that is similar in order of magnitude to that in the Western Europe and Japan.
- It is a myth that the high price of domestic gasoline deters the development of the automobile industry. Both Japan and Western Europe have long had high retail prices of gasoline and both have prosperous automobile manufacturing firms.
- China can also impose a gas guzzler tax (license fee) linked to the fuel efficiency of the automobile that penalizes inefficiency.
- The gasoline tax and the "gas guzzler" tax can reduce the externalities generated by the use of the automobile (e.g., congestion and public health (including loss of productive time), local and global environmental pollution, as well as global warming).

Retail Prices of Gasoline in Selected Countries



The Gasoline Tax and the "Gas Guzzler" Tax

- The best time to impose and/or raise gasoline taxes and other user taxes is before there are too many automobile owners, not afterwards. It becomes politically difficult or even impossible to do so once the majority of the households own and depend on automobiles for their daily transportation needs.
- The gasoline tax does not necessarily discourage automobile ownership—it does change the relative demands for different types of automobiles by making it more advantageous to acquire more "fuel-efficient" automobiles. It does have impact on the usage of automobiles, especially if a good alternative mode of transportation is available.
- Such taxes as the gasoline tax and the "gas guzzler" tax are likely to be progressive in China because only high-income people are likely to have private automobiles. It may therefore be viewed as another means of "redistribution".

The Implementation of the Gasoline Tax and Other Measures

- The gasoline tax can be flexibly structured so as to maintain the retail price of gasoline (in real terms) at a stable level, independently of the short-term fluctuations in the world price of oil.
- The proceeds of the gasoline tax can be used to finance public investment in mass transportation. But it can also be done in a revenue-neutral manner, reducing the income taxes of the low income households, providing some compensation for the increase in the retail price of gasoline.
- Access fees to the central business districts during peak periods, as used in Singapore, are also an option.
- The promotion of a car rental industry and the encouragement of ride-sharing and car-pooling.

The Dynamic Processes

- It takes time for the energy-consumption characteristics of the capital stock of both the enterprises and households to change—it can be five years or even longer—one has to await the replacement or retrofitting of the existing capital stock with new investment. But early signaling is essential to the users.
- Even the announcement of planned future price/tax increases, holding current price/tax constant, can have a substantial impact because they affect directly the expectations and hence the choice of new capital equipment in terms of its energy efficiency in the future.
- For example, one can announce today an increase in the gasoline tax to take effect three years from now. It will have a large impact as users turn over their stock of automobiles over the next three years. However, it will not have an immediate impact on the owners of existing automobiles, there by smoothing the adjustment processes of both the automobile owners and the automobile industry.

The Dynamic Processes

- The experience of the oil shocks in 1973 and 1980 showed that while there was little adjustment in the short run, there would be substantial adjustment in the long run, so much so that the oil price had to come back down in the early to mid-1980s.
- An early announcement or phasing in of a future increase in the gasoline price permits smooth and orderly adjustment by enterprises and households so that any transitional hardship can be minimized.

Inter-Fuel Substitution

- Diversification of types and sources of primary energy, including hydroelectric, nuclear, solar, wind, biomass and natural gas.
- Nuclear power has an advantage over hydrocarbons because it is more environmentally friendly and it is recyclable. France and Japan generate a very large percentage of their electricity with nuclear power plants.
- Safety may be an issue but can be avoided by careful siting and the use of efficient transmission lines.

Development and Commercialization of New Technologies

- Hydrogen and fuel cell technologies, breeder-reactor, super-conducting transmission lines, “storage of electricity,” and more efficient batteries.
- China has the potential of leap-frogging because it has a vast domestic market but no strong vested interest yet to protect, no large existing investment that must be amortized. It is relatively low cost for China to switch to a hydrogen car but not so for the United States because of all the sunken investment in the stock of automobiles, in the invested structures and equipment of the automobile industry, and in the extensive gasoline-based fuel distribution system.
- The hybrid car can be more widely promoted.

A Collective Life-Style Choice

- What is an appropriate temperature for the summer? For the winter?
- What types of cities are the best for China (and for the world)?
- "A car in every garage" is a nightmare scenario for China and the World. (Imagine 400 million automobiles on the road and a replacement demand of at least 40 million automobiles a year eventually!)
- Urban sprawl and the traffic congestion that it generates are the natural outcomes of the growth of cities in the absence of adequate urban planning.
- Convenient, user-friendly urban mass transit is the only feasible substitute to the automobile, but it works effectively only in cities with high-density residential and non-residential neighborhoods.

A Collective Life-Style Choice

- Thus, one of the most important policy choices with long-term implications facing China is what can be described as a choice of urban life-style: Does China want its existing and future cities to be like Los Angeles and San Jose, where automobile ownership is a necessity, or London, New York, Paris and Singapore, where convenient and efficient mass transit systems exist and automobile ownership and/or use are genuine choices?
- It is critical for China to maintain a viable alternative to the automobile as a means of daily urban travel for the vast majority of the middle class, in addition to bicycles and walking.

A Collective Life-Style Choice

- However, such urban life-style choices must be made early on. Once made, often by default, they cannot be easily reversed. For example, it is far too late for Los Angeles and San Jose to try to become a city like New York—the low density and the sprawl have basically made such a change impossible.
- The modes of mass transportation also require a collective governmental choice as well as integrated urban planning and regulation on density, land use, spatial distribution and transportation routes. They must take into account the externalities and cannot be left alone to the invisible hand of the market.

A Collective Life-Style Choice

- Providing urban residents with a viable and workable system of mass transportation does not necessarily mean that they will not have the opportunity for automobile ownership just an option for less automobile use. Nor does it imply that the domestic automobile industry cannot be effectively developed. (Look at Japan and Western Europe.)
- Mass transit systems must be user-friendly to encourage greater utilization—fast, clean, efficient, and easy accessibility. The Paris Metro was designed so that any one standing anywhere in Paris is no more than 400 meters away from a station.
- The greatest success of mass transit systems is achieved where there is a relatively high density pattern of distribution of the urban population. However, in order to achieve high densities, urban planning is essential.
- Thus, there will have to be high density living rather than free-standing single family homes in urban China.

A Collective Life-Style Choice

- There are significant economies of scale in heating and cooling, e.g., houses share walls, incorporation of new technologies.
- Complementarity between the efficiency in land use and the efficiency in the consumption of resources, e.g., high density housing enhances the efficiency of mass transit and public transportation systems, and the availability of convenient mass transit reduces the demand for automobiles and for gasoline, and hence congestion and pollution.
- Life-style choices—design of furniture and appliances to fit in small spaces so as to make small spaces seem larger.

The Role of the Urban Middle Class

- The emergence of an urban middle class has both positive and negative implications on energy conservation and environmental protection. One the one hand, the urban middle class demands many products and services (e.g., automobiles and gasoline) that are both resource-intensive and environmentally unfriendly. On the other hand, the urban middle class, being better educated, tends to be more socially and environmentally conscious and values the quality of life.

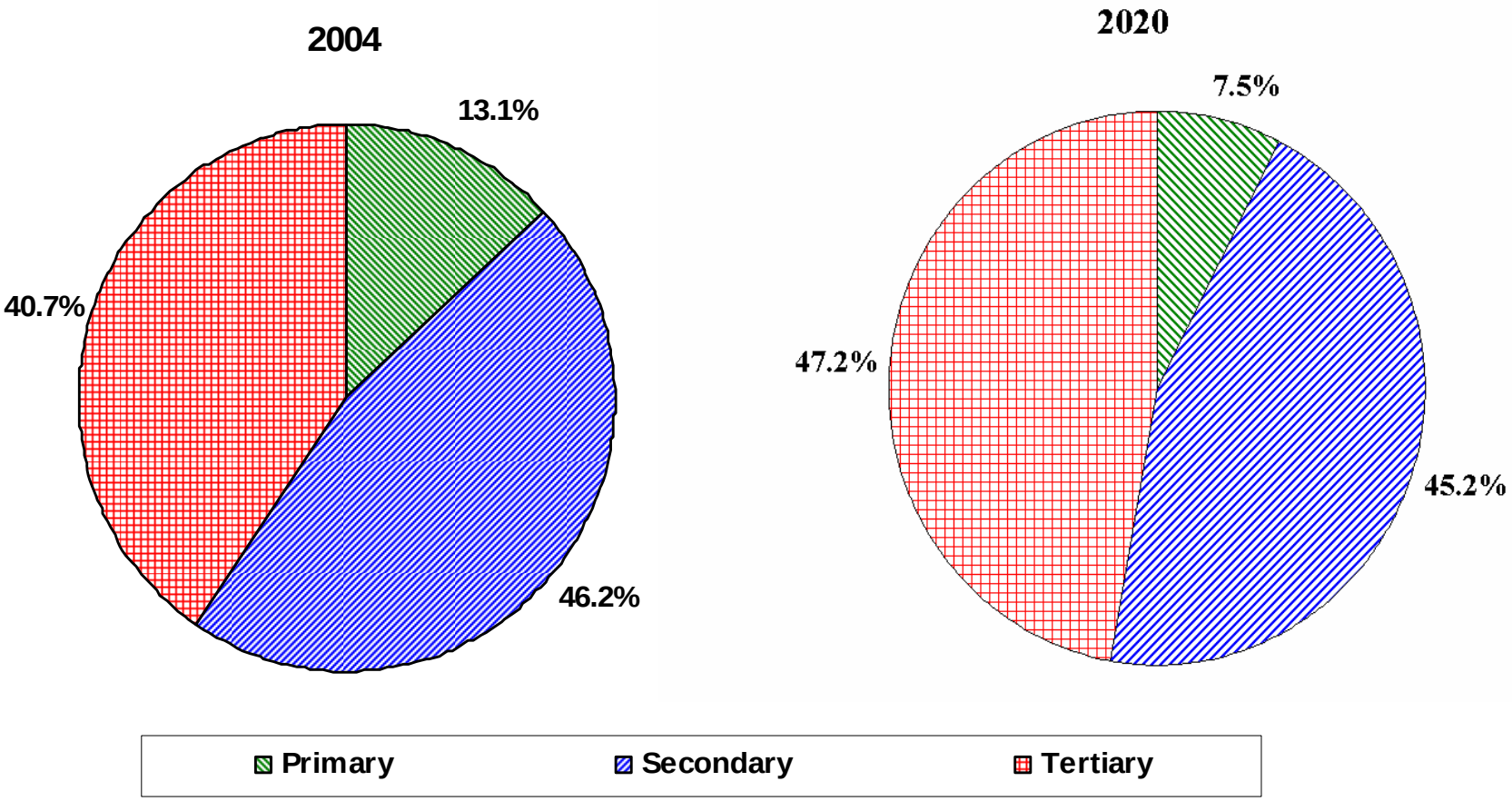
Adverse Demographic Development

- The Chinese population is aging rapidly, in part because of the one-child policy, and in part because of the increase in life expectancy as a result of the significant improvement in the living standards.
- Fortunately, the one-child policy is successfully enforced only in the urban areas. In rural areas, multiple-child households are still common.
- There also begin to be changes or exceptions to the one-child policy—it does not apply to ethnic minorities, one can pay for the right to have a second child legally (as in Shanghai), and a married couple of single children is allowed to have two children. My own favorite proposal is a one-boy policy.

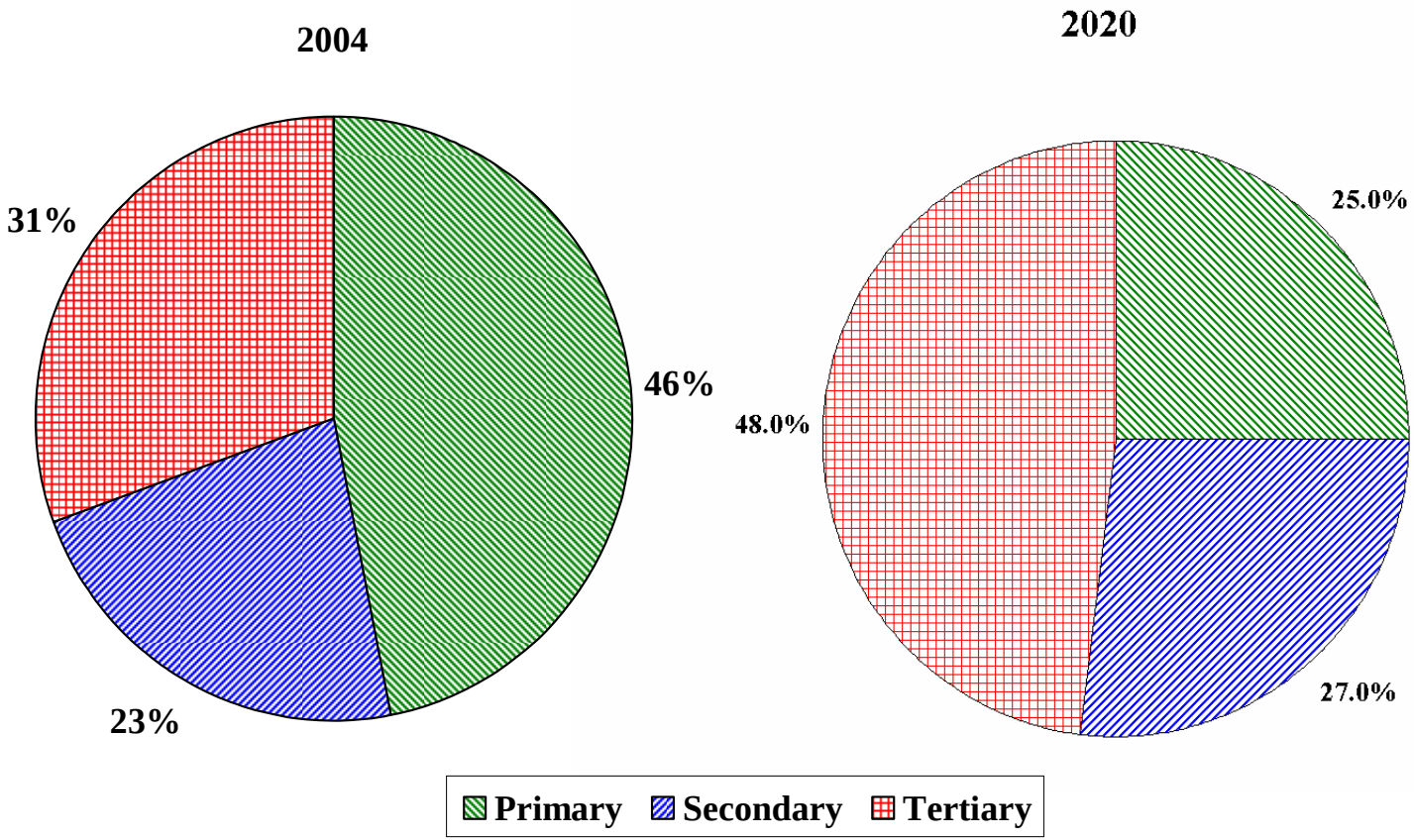
Demographic Development

- Chinese population is expected to peak around 2035. Thereafter it will begin a slow decline.
- There will also be a rise in the dependency ratio; however, this is not necessarily negative as it will lead to a lower national savings rate.
- In 2025, GDP originating from the primary sector would have fallen below 7.5%; however, employment in the primary sector would still constitute over 20% of the total labor force, indicating that substantial surplus labor will still exist in the Chinese economy—consequently the real wage rate of unskilled entry-level labor will remain low and stable during at least the next couple of decades.

The Structure of the Economy: GDP



The Structure of the Economy: Employment



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 8%.
- The source of this growth will come primarily from tangible capital accumulation, supported by a national savings rate of over 30% (in 2005, the savings rate approached 50%), 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 may be projected to be US$6.8 trillion (exceeding the then aggregate GDP of Japan and slightly less than one half of the then aggregate U.S. GDP).
- Some time between 2030 and 2040, aggregate Chinese GDP may reach the same level as aggregate U.S. GDP.

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.

Prospects for Economic Growth

- Chinese 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 to 80% in another decade.
- There is significant complementarity between the Chinese and industrialized economies such as the Group-of-Seven--the industrialized economies do not export anything that China exports (and have not done so for decades) and China does not export anything that the industrialized economies export. It is this complementarity that maximizes the potential gains from free trade between the two sides.