

What Makes China Grow?

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Introduction

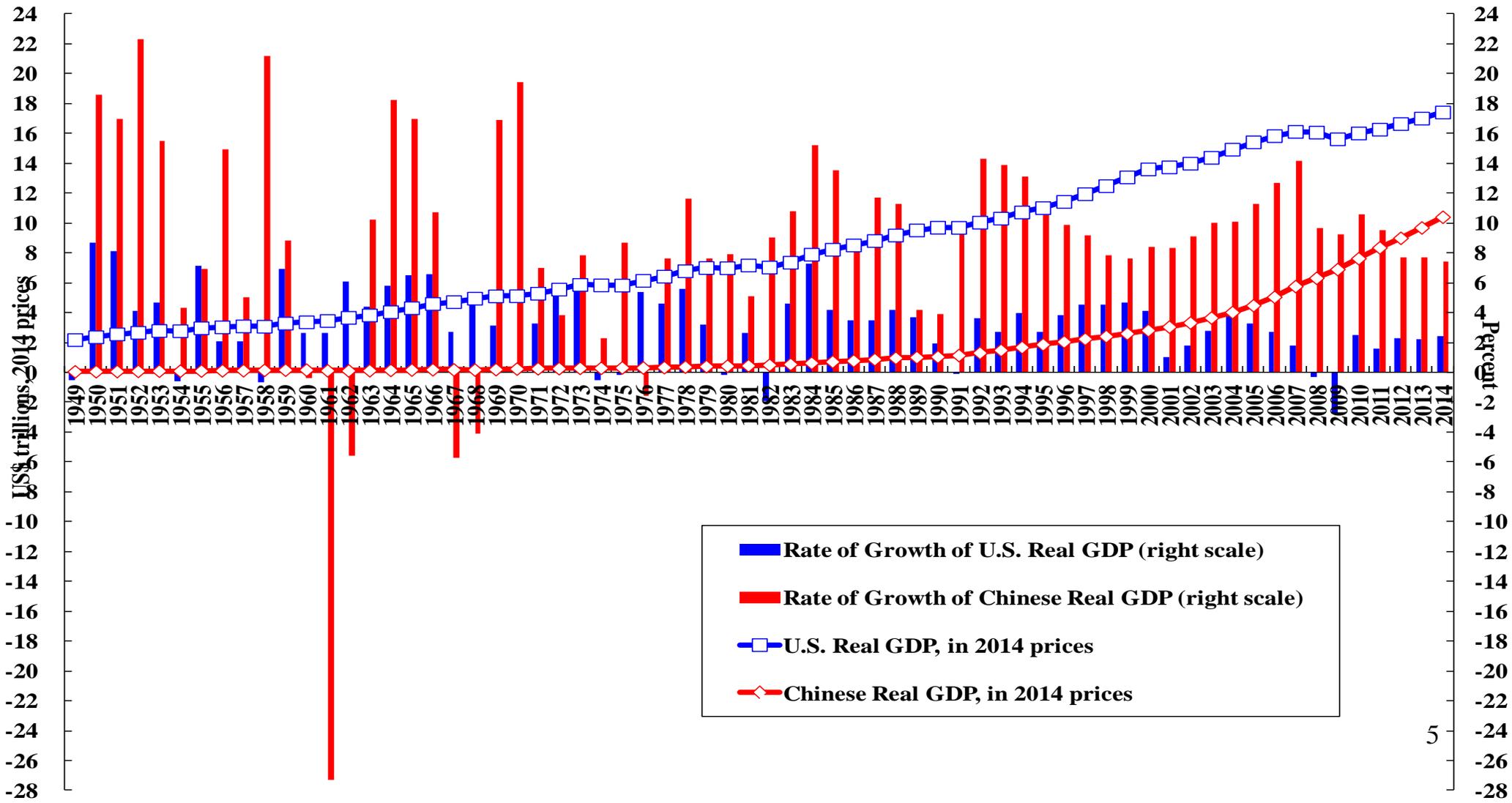
- ◆ China has made tremendous progress in its economic development since it began its economic reform and opened to the World in 1978. It is currently the fastest growing economy in the World—averaging 9.7% per annum over the past 36 years. It is historically unprecedented for an economy to grow at such a high rate over such a long period of time. However, the Chinese economy has begun to slow down, to an annual rate of growth of around 7%, in a process of transition to a “New Normal”.
- ◆ Why has China been able to grow at such a high rate and for such a long period of time? What makes China grow? Will China be able to continue to grow at such a high rate in the future?

Introduction

- ◆ It is useful to compare the growth of Chinese and U.S. real GDP in both aggregate and per capita terms (see the following charts). The red and blue lines represent the levels of real GDP and real GDP per capita of China and the U.S. respectively. The red and blue columns represent the annual rates of growth of China and the U.S. respectively.
- ◆ Between 1978 and 2014, Chinese real GDP from US\$369 billion to US\$10.4 trillion (in 2014 prices), to become the second largest economy in the World, after the U.S. By comparison, the U.S. GDP of approximately US\$17.4 trillion was a little less than 1.7 times Chinese GDP in 2014.
- ◆ However, despite its rapid economic growth in the aggregate, in terms of its real GDP per capita, China is still very much a developing economy.
- ◆ In 1978, the Chinese real GDP per capita was US\$383 (in 2014 prices) compared to the US\$30,472 of the U.S. By 2014, the Chinese real GDP per capita had grown to US\$7,604, still less than one-seventh of the U.S. GDP per capita of US\$54,575.

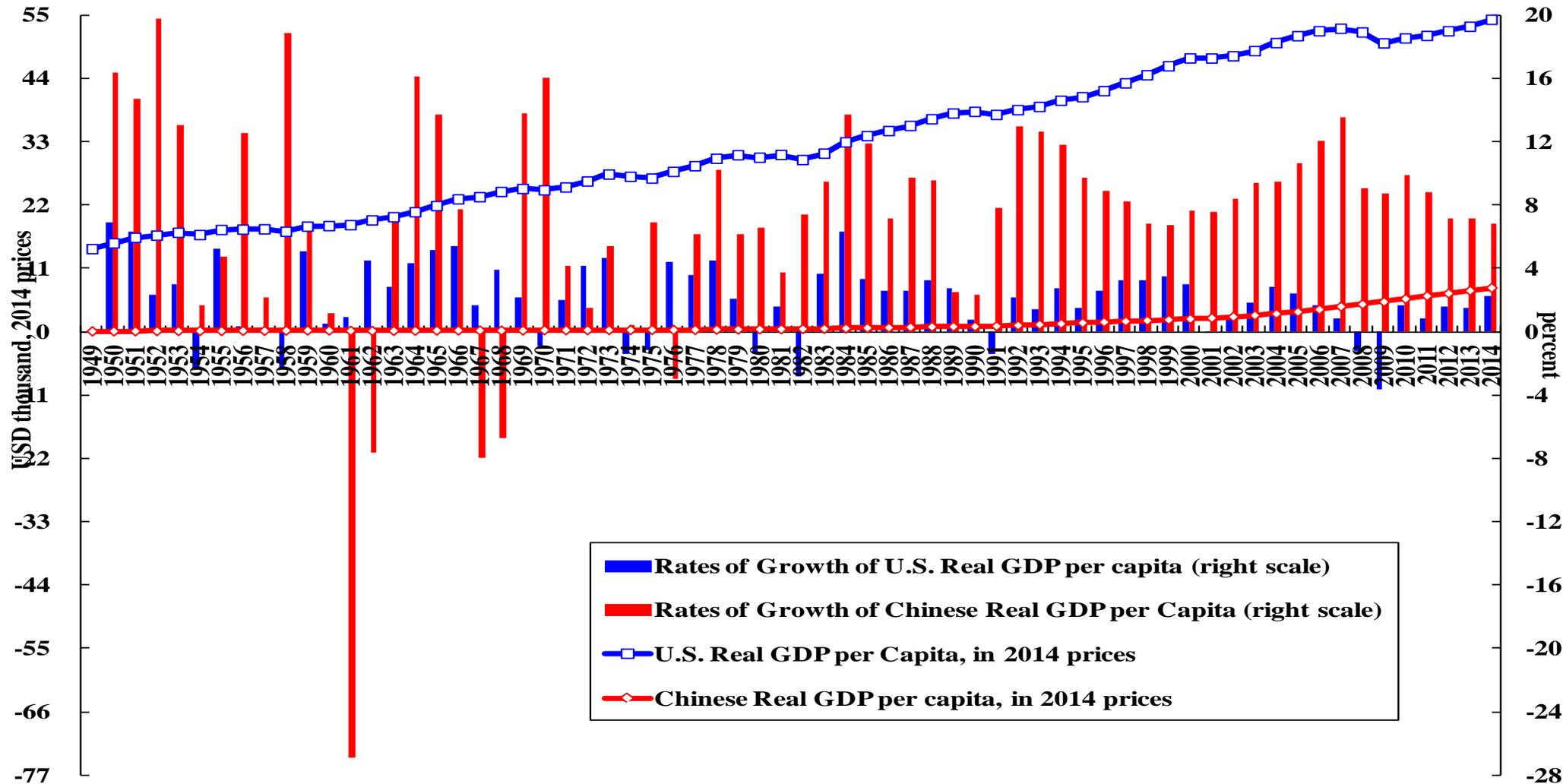
Chinese and U.S. Real GDPs and Their Rates of Growth since 1949 (2014 US\$)

Chinese and U.S. Real GDPs and Their Rates of Growth since 1949 (trillion 2014 US\$)



Chinese and U.S. Real GDPs per Capita and Their Rates of Growth since 1949 (2014 US\$)

Chinese and U.S. Real GDP per Capita and Their Rates of Growth since 1949
(thousand, 2014 US\$)



The Chinese Economic Fundamentals

- ◆ Long-term economic growth of a country depends on the rates of growth of its primary inputs—capital (tangible or physical) and labor—and on technical progress (equivalently, the growth of total factor productivity)—that is, the ability to increase output without increasing inputs.
- ◆ The rate of growth of tangible or physical capital depends on the rate of investment on structure, equipment and basic infrastructure, which in turn depends on the availability of national savings.
- ◆ The rate of technical progress depends on investment in intangible capital (including human capital and Research and Development (R&D) capital).

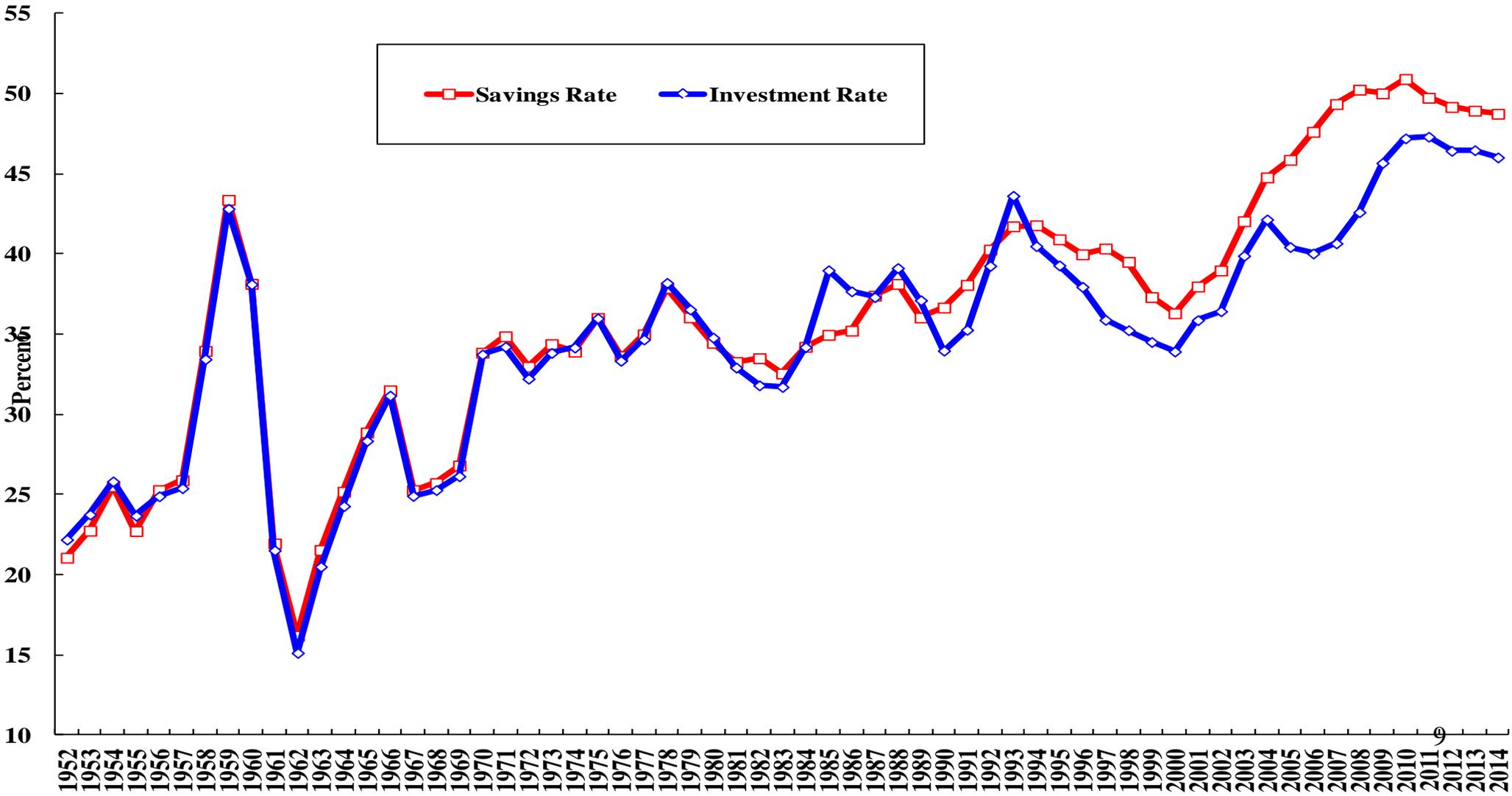
The Chinese Economic Fundamentals:

Capital

- ◆ Chinese economic growth since 1978 has been underpinned by a consistently high domestic investment rate, enabled by a national savings rate above 35% except for a brief start-up period in the early 1950s. The Chinese saving rate has risen to around 40% in the early 1990s and has at times approached or even exceeded 50% in more recent years.
- ◆ The high Chinese saving rate means that the Chinese economy can finance all of its domestic investment needs from its own domestic savings alone, without having to depend on the more fickle foreign capital inflows (including foreign direct investment, foreign portfolio investment, foreign aid, or foreign loans).
- ◆ In particular, it does not need to borrow abroad and bear the potential risks of a large, short-term and often interruptible, foreign-currency denominated debt. The Chinese economy is therefore also more immune from external disturbances than other economies.
- ◆ Thus, the Chinese economy is assured of a high rate of growth of the tangible capital stock.

Chinese National Saving and Gross Domestic Investment as Percents of GDP

Chinese National Savings and Gross Domestic Investment as a Percent of GDP since 1952



The Chinese Economic Fundamentals:

Capital

- ◆ In addition, since new resources can be made available each year from new savings, enabling new investments to be made, the necessity of restructuring, redeploying or privatising existing fixed assets is greatly diminished. Thus, the potentially politically divisive issues such as factory closings and lay-offs and the creation of “losers” can be avoided)..
- ◆ A high national savings rate also allows the normally more efficient non-state sector greater room and greater scope for development and expansion (there is less “crowding out”).
- ◆ However, tangible capital input-driven economic growth has its limitations, because as the stock of tangible capital relative to labor increases, the marginal productivity of tangible capital will begin to decline and will eventually reach a point when additional tangible capital is no longer productive. This is a point made by Prof. Paul Krugman.

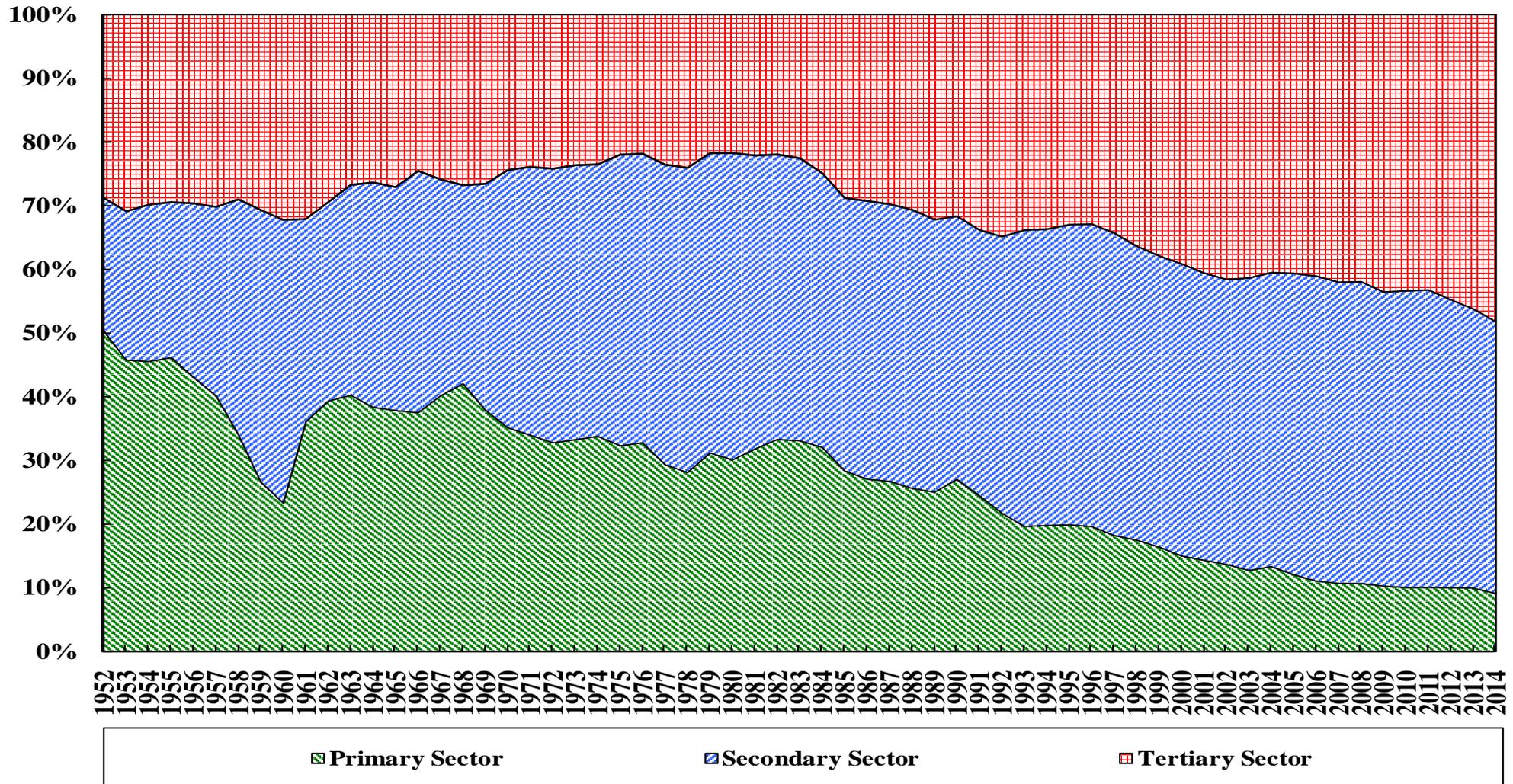
The Chinese Economic Fundamentals:

Labor

- ◆ China, like Japan, Taiwan, and South Korea in their respective early stages of economic development, has an unlimited supply of surplus labor—there is therefore no shortage of and no upward pressure on the real wage rate of unskilled, entry-level labor over an extended period of time.
- ◆ The distribution of Chinese GDP by production-originating sectors in 2014 was approximately: Primary (agriculture), 9.2%; Secondary (manufacturing, mining and construction), 42.6%; and Tertiary (services), 48.2%. (Note that mining is normally included in the primary sector in most other economies.)
- ◆ The distribution of employment by sector in 2014 was: Primary, 29.5%; Secondary, 29.9%; and Tertiary, 40.6%.
- ◆ The agricultural sector employed 29.5% of the Chinese labor force but produced only 9.2% of the Chinese GDP in 2014. Thus labor can be productively transferred to the other two sectors where labor productivities and wage rates are higher as long as complementary capital and demand are available.

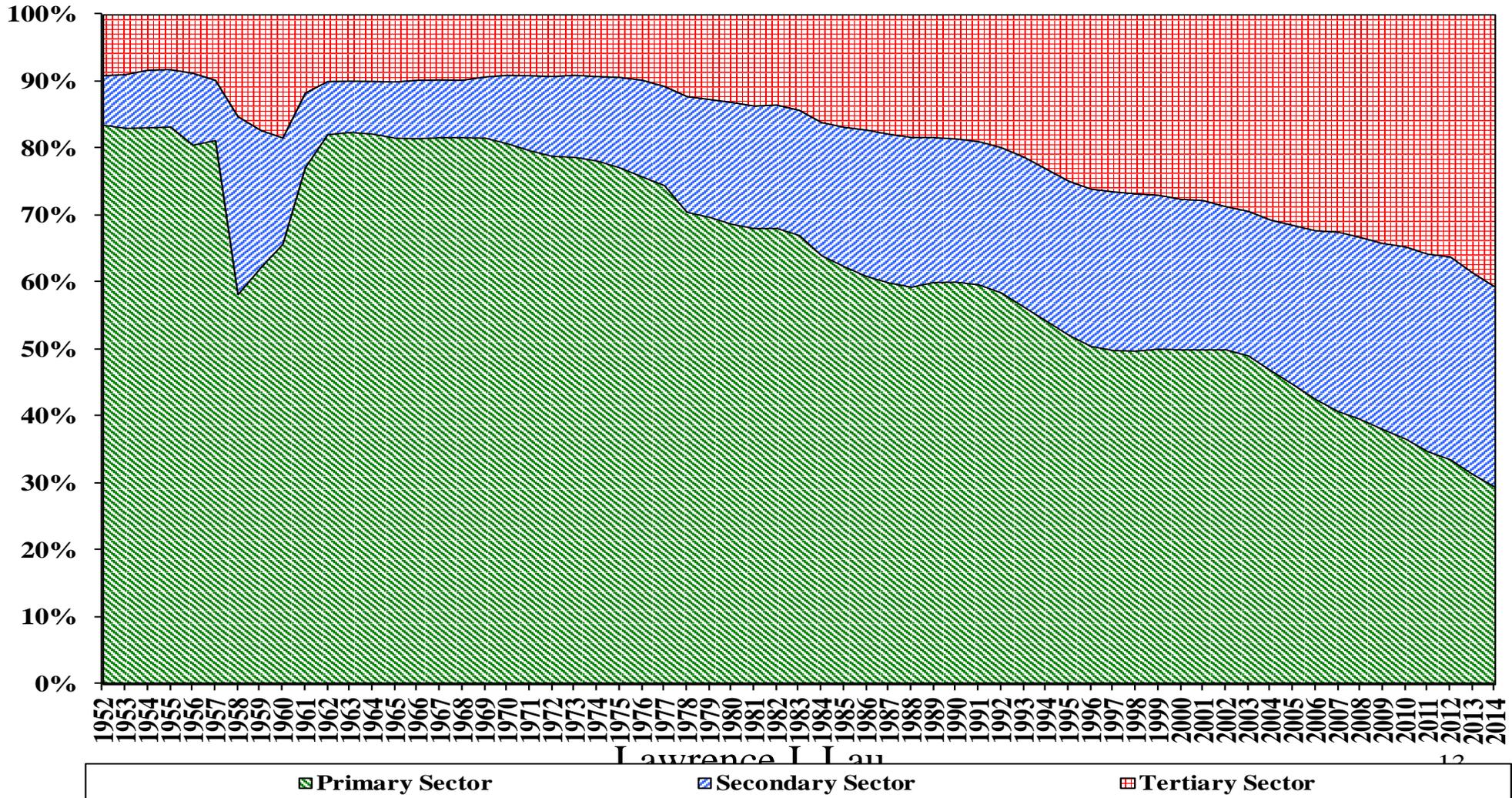
The Distribution of Chinese GDP by Sector Since 1952

The Distribution of GDP by Sector



The Distribution of Chinese Employment by Sector Since 1952

The Distribution of Employment by Sector since 1952



Lawrence I. Lau

The Chinese Economic Fundamentals: Intangible Capital

- ◆ China has a long tradition of emphasis on education and learning (human capital) and will be continuing to increase its investment in human capital. The enrollment rate of tertiary education has been rising rapidly and stands at approximately 30 percent today. It is expected to rise further over the next decades as private tertiary educational institutions become more numerous in response to demand and facilitated by government policy.
- ◆ China has also begun to increase its expenditure on Research and Development (R&D), with the goal of increasing it to 2.2 percent of GDP by 2015.
- ◆ However, relative to many other economies, China lags behind on both investment in human capital and R&D capital.

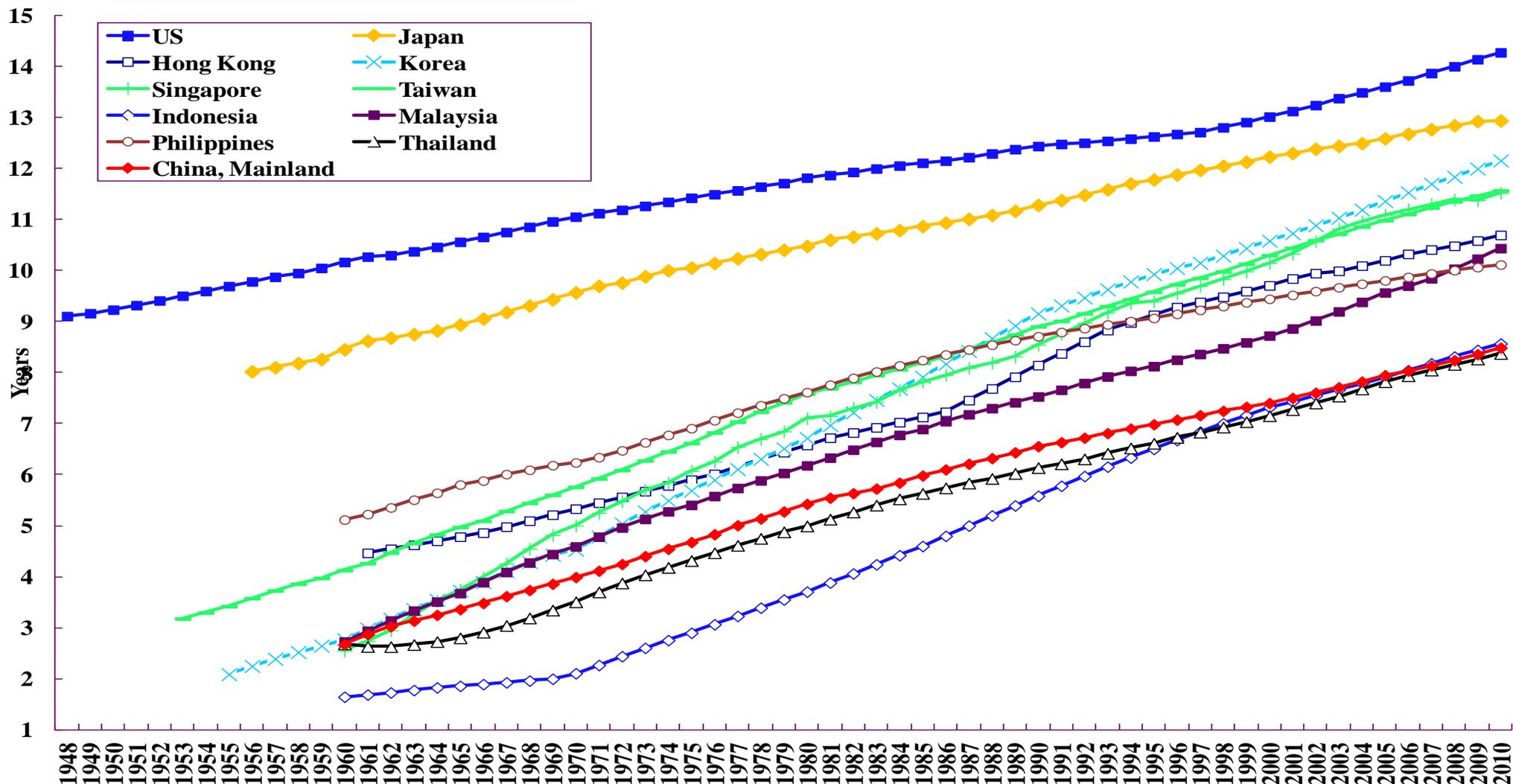
The Chinese Economic Fundamentals:

Human Capital

- ◆ One indicator of the level of human capital in an economy is the average number of years of schooling per person in the working-age population. In the following chart, the average number of years of schooling is compared across selected economies.
- ◆ By this measure, the United States and Japan are the clear global leaders. South Korea has been catching up fast. Most of the other East Asian economies also have quite rapidly increasing levels of human capital but it will take a while before they can catch up with the levels of human capital in the developed economies. China, Indonesia and Thailand have lagged behind in terms of investment in human capital.
- ◆ China has a different definition of working-age population—with a terminal age of 60--and so the number of school years per person in the customary working-age population, that is, up to 65, may well have been higher. It was probably around 10 years per person in 2014.

Average Number of Years of Schooling of Selected Economies (1948-present)

Average Number of Years of Schooling of Selected Economies (1945-present)

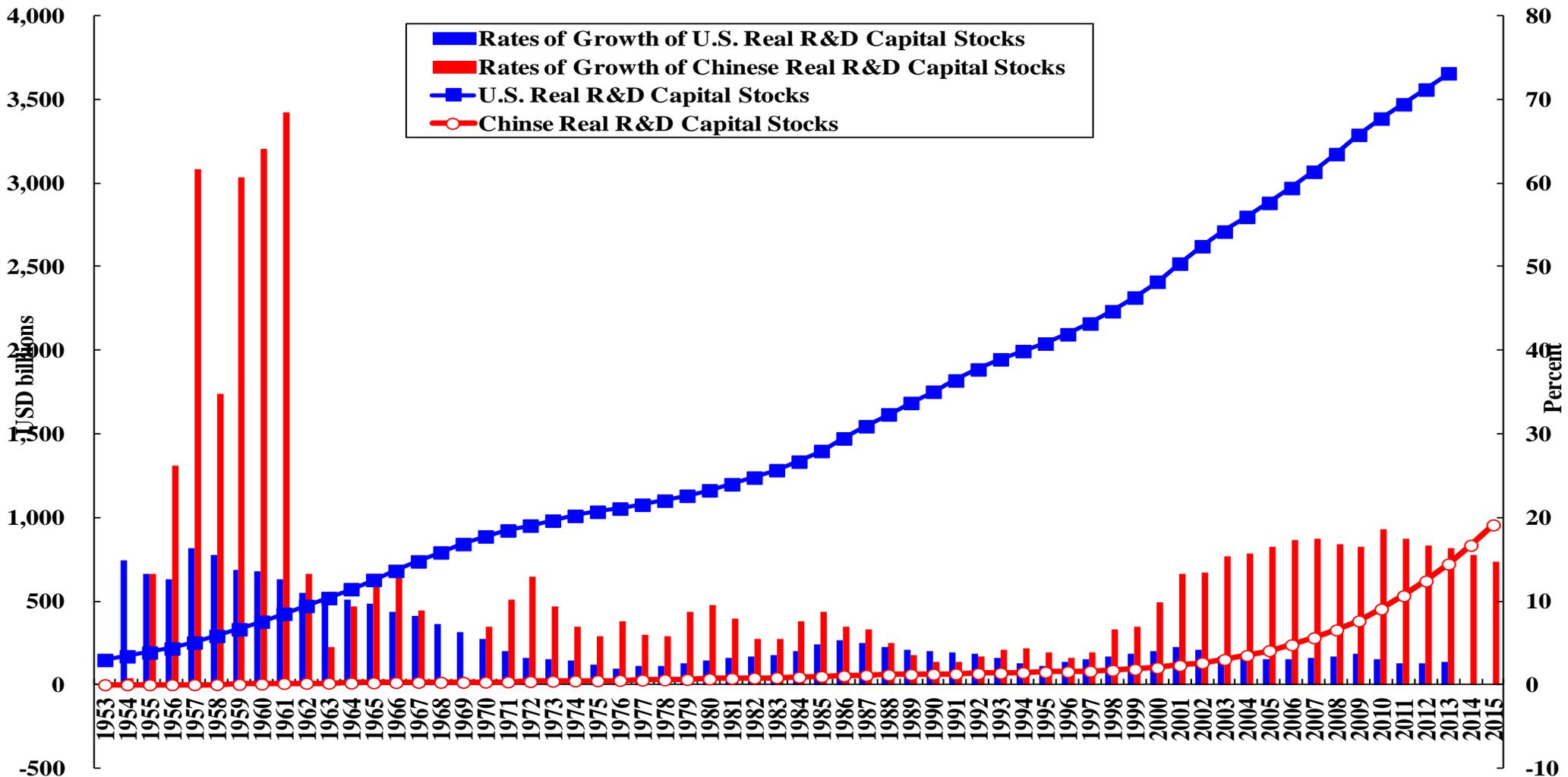


The Chinese Economic Fundamentals: R&D Capital Stock

- ◆ The R&D capital stock, defined as the cumulative past real expenditure on R&D less depreciation of 10% per year, is an useful indicator of innovative capacity. It should quite properly be treated as capital since R&D efforts generally take years to yield any results.
- ◆ Lawrence J. Lau and Yanyan Xiong (2015), in their Working Paper, “Are There Laws of Innovation?”, have constructed R&D capital stocks for the Group-of-Seven (G-7) countries, the East Asian Newly Industrialized Economies (NIEs) and China. The R&D capital stocks of China and the U.S. are presented in the following chart.
- ◆ At US\$3.656 trillion in 2013 (in 2012 prices), the U.S. is the World leader in R&D capital stock. The Chinese R&D capital stock, at US\$722 billion in 2013, has caught up with those of most countries and regions with the exceptions of the U.S., Japan and Germany.

R&D Capital Stocks and their Growth Rates: A Comparison of China and the U.S., 2012 US\$

Real R&D Capital Stocks and their Growth Rates: A Comparison of China and the U.S.
(Billion US\$, 2012 Prices)



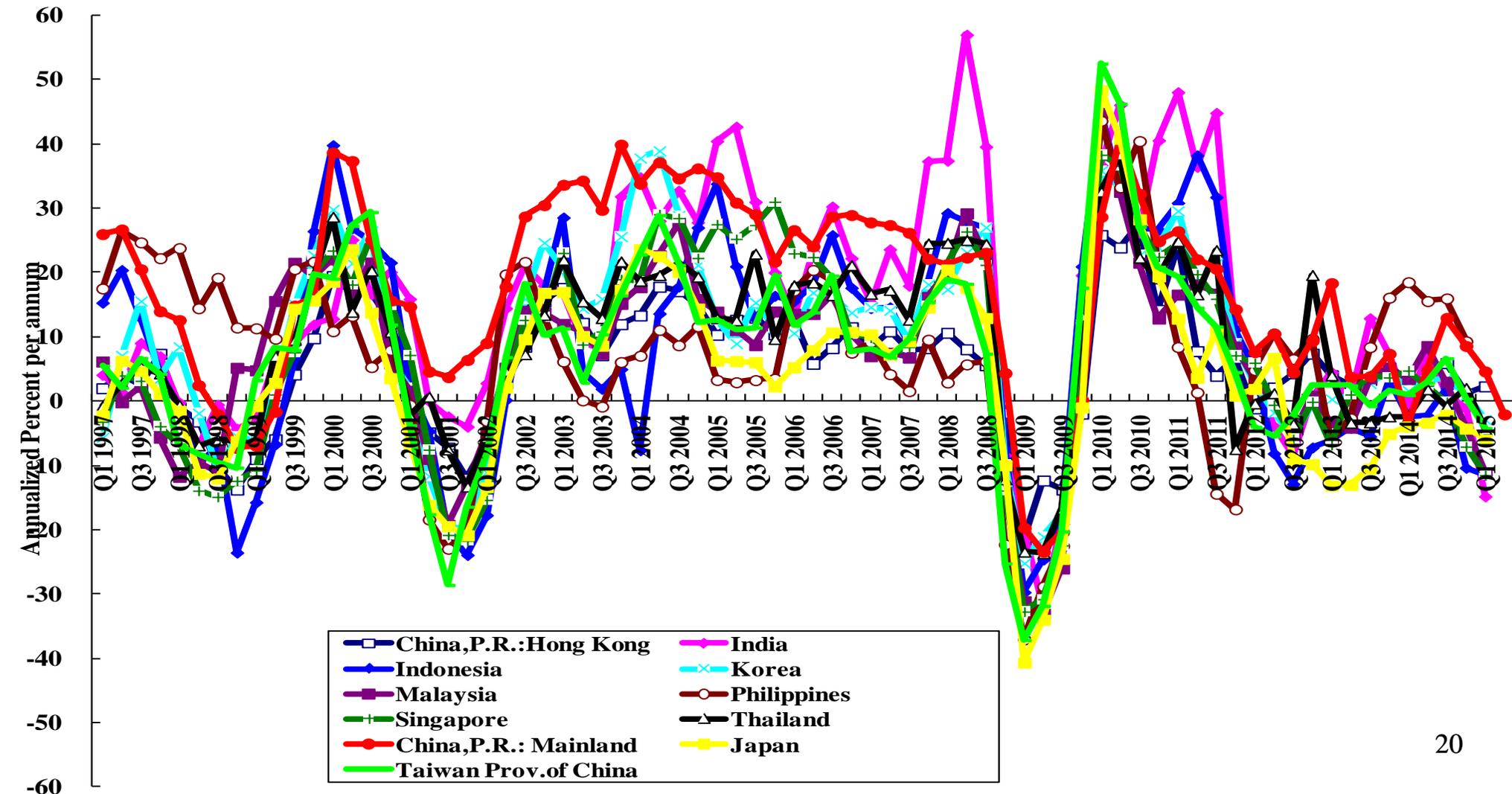
The Chinese Economic Fundamentals:

The Size of the Domestic Economy

- ◆ The huge domestic market of 1.37 billion consumers with pent-up demand for housing and transportation and other consumer goods and services (e.g., education, health care, and more recently, elderly care), enables the realization of significant economies of scale in production, based entirely on the domestic market in China.
- ◆ The huge domestic market also greatly enhances the productivity of intangible capital (e.g., R&D capital and goodwill including brand building) by allowing the fixed costs of the R&D for a new product or process or advertising and promotion in brand building to be more easily amortised and recovered.
- ◆ Another important implication of the size of the domestic economy is the relatively low external dependence. Thus, while the rates of growth of Chinese exports and imports fluctuate like other economies, the rate of growth of Chinese real GDP has been relatively much more stable.

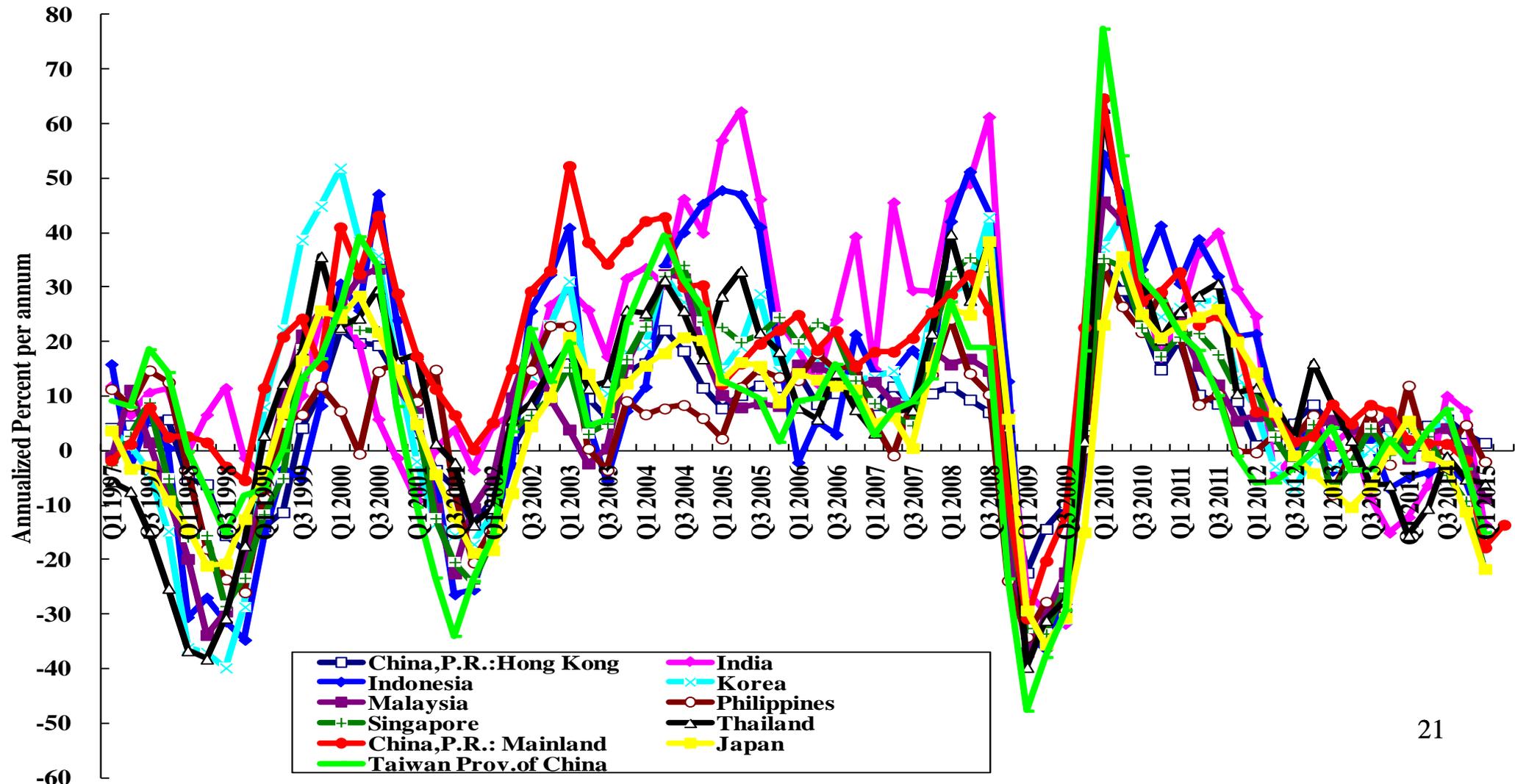
Quarterly Rates of Growth of Exports of Goods: Selected Asian Economies

Quarterly Rates of Growth of Exports of Goods: Selected East Asian Economies



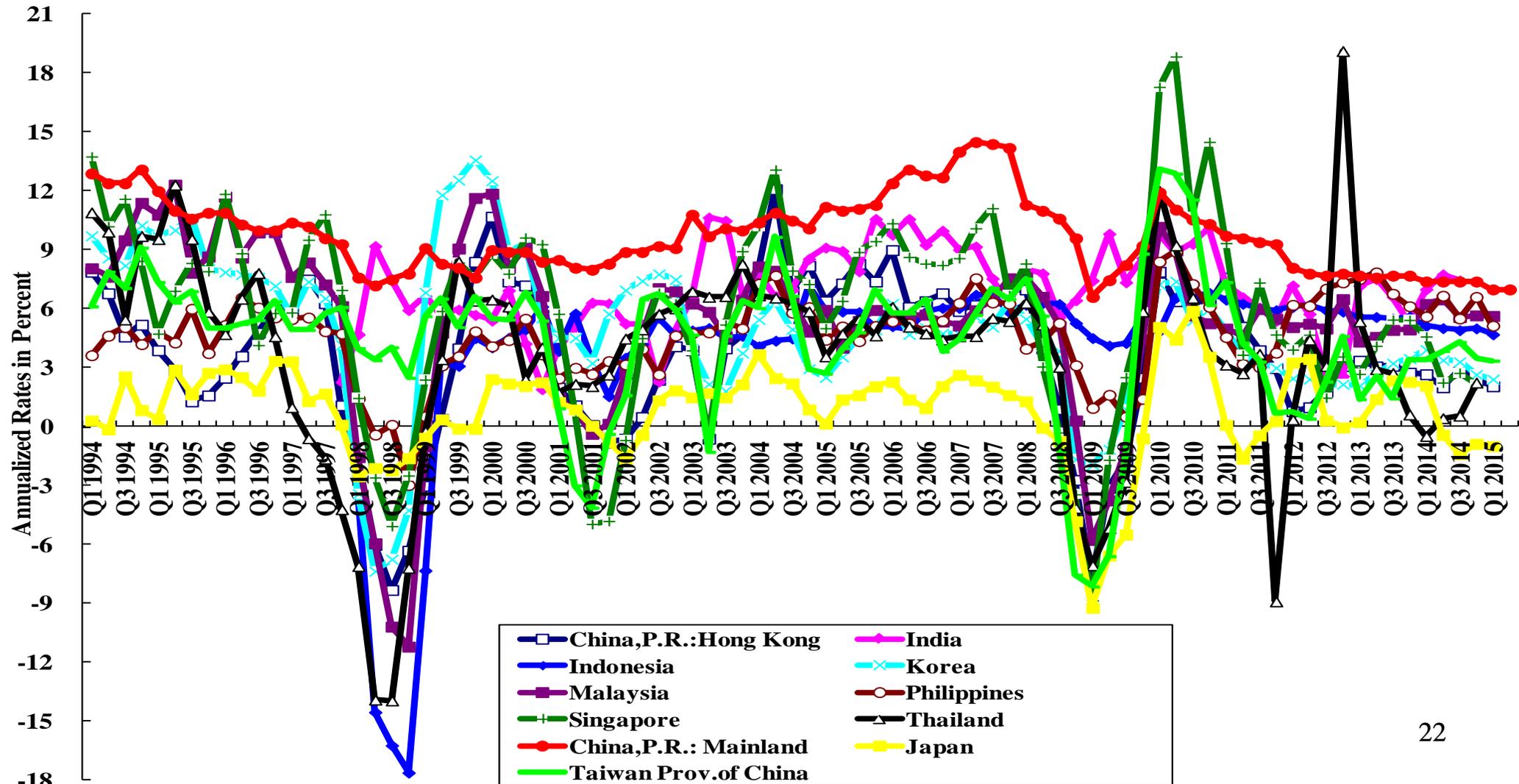
Quarterly Rates of Growth of Imports of Goods: Selected Asian Economies

Quarterly Rates of Growth of Imports of Goods : Selected East Asian Economies



Quarterly Rates of Growth of Real GDP, Y-o-Y: Selected Asian Economies

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



The Chinese Economic Fundamentals: Relative Backwardness

- ◆ In addition to a high national savings rate, a large pool of surplus labor, rising investment in intangible capital (human capital and R&D capital), and the large size of its economy, China also has the advantage of relative backwardness.
- ◆ The Chinese economy has:
 - ◆ The ability to learn from the experiences of successes and failures of other economies;
 - ◆ The ability to leap-frog and by-pass stages of development (e.g., the telex machine, the VHS video players, the fixed landline phones); and
 - ◆ The possibility of creation without destruction (e.g., online virtual bookstores like Amazon.com do not have to destroy brick and mortar bookstores which do not exist in the first place; internet shopping versus brick and mortar malls).

The Inherent Economic Inefficiency of Central Planning

- ◆ However, while good economic fundamentals are necessary for a sustained high rate of growth of an economy, they are by no means sufficient.
- ◆ In the thirty years between 1949, the year of the founding of the People's Republic of China, and 1979, the first full year of the Chinese economic reform and opening, China had the same economic fundamentals, but did not experience a sustained high rate of growth during that period. Why?
- ◆ The short answer is that the Chinese economy before its economic reform of 1978 operated under mandatory central planning, with its inherent economic inefficiencies.

The Inherent Economic Inefficiency of Central Planning

- ◆ For various reasons, a centrally planned economy always operates in the interior of its set of production possibilities. They are:
 - ◆ Incomplete information;
 - ◆ Failure to optimise; and
 - ◆ Lack of incentives.
- ◆ Thus, the output of such an economy can in principle be increased by simply moving to the frontier from the interior of the set of production possibilities without any increase in the inputs. The existence of inherent inefficiency therefore also implies the existence of surplus potential output.
- ◆ However, if there is a way to provide the necessary autonomy and incentives to the producers, then without increasing the aggregate inputs assigned under the central plan, aggregate output can be increased.
- ◆ On the eve of the beginning of economic reform and opening in 1978, the Chinese economy still operated under a mandatory central plan, and therefore had significant surplus potential output waiting to be realized.

Reform without Losers—

The Chinese Strategy for Economic Reform

- ◆ We have identified two factors that contributed to Chinese economic success: favourable economic fundamentals and the existence of surplus potential output. But these factors were also common to other transition economies such as those of the former Soviet Union and the Eastern European countries.
- ◆ However, only China was able to transition from a closed centrally planned to a market economy smoothly, stably and successfully, without incurring significant adjustment costs.
- ◆ It turns out that the choice of strategy for the economic transition matters. In the former Soviet Union and Eastern European socialist countries, the strategy adopted for the transition was the so-called “shock therapy” or “big bang” strategy—that is, a strategy that calls for the immediate and full abolition of the mandatory central plan, relying completely and solely on the newly introduced and still relatively primitive free markets, which lacked the necessary facilitating and supporting institutions.
- ◆ The Chinese Government did not adopt the “shock therapy” or the “big bang” strategy to implement its economic reform.

Reform without Losers—

The Chinese Strategy for Economic Reform

- ◆ Instead of dismantling the mandatory central plan all at once, the Chinese Government adopted the “Dual-Track” approach. While introducing enterprise autonomy and free markets, it also continued to enforce the existing central plan. There were thus simultaneously two tracks in the economy: a “Plan Track” and a “Market Track”, which operated in parallel but separately from each other.
- ◆ The “Plan Track”—the pre-existing central plan remained unchanged and the rights and obligations of individuals, households, communes, enterprises and townships under the central plan continued to be enforced by the government.
- ◆ The “Market Track”—all markets for goods and services were instantaneously open, with prices determined by supply and demand in the markets.
- ◆ Everyone was free to participate in the Market Track provided that his or her obligations under the Plan Track had been fulfilled.

Reform without Losers—

The Chinese Strategy for Economic Reform

- ◆ The “Dual-Track” approach ensured that no one would be made worse off than before as a result of the economic reform. The principle of “Reform without Losers”, that is, the avoidance of the creation of net losers in the process of economic reform, was almost always followed in the first couple of decades of economic reform.
- ◆ “Reform without Losers” was able to maximise popular support for and minimise political opposition to economic reform, thus preserving social stability in the process. This experience is probably unique in the annals of economic development.
- ◆ An easy way to understand “Reform without Losers” is that it involves the “grandfathering” of the existing vested interests so that they do not suffer any net losses as a result of the economic reform.
- ◆ Moreover, such a strategy often can not only make everyone better off than before but also enable the economy to achieve full economic efficiency (see Lawrence J. Lau, Yingyi Qian and Gerard Roland (2000)).

Reform without Losers—

The Chinese Strategy for Economic Reform

- ◆ It should be noted that “Reform without Losers” is possible in part because of the existence of the prior economic slack but also requires a strong state to continue to enforce the central plan.
- ◆ Ultimately, in the late 1990s, the centrally planned part of the Chinese economy, which had been contracting relative to the market part of the economy, became sufficiently insignificant so that the mandatory features of the central plan could be gradually phased out. The transition to an open market economy in goods and services (but not yet in factors) was thus completed.

The Sources of Chinese Economic Growth

Rate of Growth of Output (1978-2014)	9.72%
Rates of Growth of Inputs (1978-2013)	
Tangible Capital	10.83%
Labor	1.88%

- ◆ The realization of the surplus potential output from the initial economic slack resulting from central planning;
- ◆ The growth of tangible capital and labor inputs;
- ◆ The growth of the intangible inputs such as human capital and R&D capital;
- ◆ Technical progress (growth of total factor productivity (TFP));
- ◆ The realization of the economies of scale; and
- ◆ Of course, the low costs of transition from a centrally planned to a market economy also helped.

The Sources of Chinese Economic Growth: The Realization of the Surplus Potential Output

- ◆ Lawrence J. Lau and Huanhuan Zheng (2015), in their working paper, “How Much Slack Was There in the Chinese Economy Prior to Its Economic Reform of 1978?”, find that the pre-existing slack in the Chinese economy before it undertook its economic reform and opened to the World would amount to 50% if the actual output in 1978.
- ◆ On the assumption that the Chinese real GDP in 1978 was 50% higher than it actually was, the implied average annual rate of growth of the Chinese economy between 1978 and 2014 would have been 8.49% instead of 9.72%. Thus, the reduction of the economic slack that existed before 1978 would account for approximately 1.23 percentage points of the economic growth over the past 36 years, or approximately 12.5 percent of the post-1978 economic growth. The remaining economic growth of 8.49% per annum can be attributed to the growth of the primary inputs, technical progress or growth of total factor productivity, and economies of scale.

The Sources of Chinese Economic Growth: The Effects of Economies of Scale

- ◆ Given the huge size of the Chinese economy, economies of scale can also be a significant source of growth. The existence of economies of scale implies that given the same rates of growth of the tangible and intangible inputs, China will be able to achieve a higher rate of growth of its real output than a smaller economy. A 10 percent difference in the rates of growth can make a huge difference in the levels of GDP in a few decades.
- ◆ Moreover, the existence of significant economies of scale can increase the return to fixed investment and investment in R&D may also lead to higher investment rates than otherwise.
- ◆ The degree of returns to scale at the economy-wide level cannot be straightforwardly estimated from the data of a single economy alone, as the effects of economies of scale are often confounded with those of technical progress or growth of total factor productivity.
- ◆ The assumption used by the late Dr. Edward F. Denison for the degree of returns to scale for the U.S. is 1.1, that is, if all inputs are doubled, output will be increased by 1.1 times.

The Sources of Chinese Economic Growth: The Effects of Economies of Scale

- ◆ However, a meta-production function approach, first introduced by Lau and Yotopoulos (1989) and extended by Boskin and Lau (1992), can be used to identify and separate the effects of economies of scale and technical progress.
- ◆ Michael J. Boskin, Haiqiu Guo and Lawrence J. Lau (2015), in their forthcoming study, “Technical Progress and G-7 Economic Growth”, find the degree of local returns to scale of the U.S. to be 1.20 in 1960 and 1.11 in 2007. The average returns to scale over this period would be 1.155, somewhat larger than Denison’s assumption.
- ◆ Assuming that this estimate of the returns to scale also applies to the Chinese economy on average, it would mean that over a 36-year period, from 1978 to 2014, the difference between increasing returns to scale and constant returns to scale will account for 51.2% of the Chinese real GDP in 2014. It also means that out of the rate of growth of 9.72%, economies of scale accounts for 1.25 percentage points, or 12.91 percent of the measured economic growth over this period.

The Sources of Chinese Economic Growth:

The Monopsonistic Labor Market

- ◆ The actual share of labor in GDP in China is very low compared to other economies. It can be estimated at approximately 0.45. However, it is believed that the production elasticity of labor is higher, at approximately 0.6. Labor is just systematically underpaid—the state still employs directly or indirectly more than 50% of the urban labor force as of 2010.
- ◆ Since there exist increasing returns to scale, capital, as the residual claimant, is not necessarily paid its marginal product; but because labor is actually underpaid, capital can be either underpaid or overpaid relative to its marginal product.
- ◆ With returns to scale amounting to 1.155, and the production elasticity of labor estimated as 0.6, the production elasticity of capital may be estimated as 0.555. Thus, the relative weights of capital and labor are 0.48 versus 0.52, almost equal.

The Sources of Chinese Economic Growth

Competitive Labor Market Case

Sources of Chinese Economic Growth, 1978-2014	Percentage Points	Percent
Elimination of Pre-Existing Economic Slack	1.23	12.65
Growth of Tangible Capital	6.61	68.01
Growth of Employment	0.73	7.54
Technical Progress	-0.11	-1.11
Economies of Scale	1.25	12.91
Total	9.72	100.00

Monopsonistic Labor Market Case

Sources of Chinese Economic Growth, 1978-2014	Percentage Points	Percent
Elimination of Pre-Existing Economic Slack	1.23	12.65
Growth of Tangible Capital	5.20	53.54
Growth of Employment	0.98	10.05
Technical Progress	1.05	10.85
Economies of Scale	1.25	12.91
Total	9.72	100.00

The Sources of Chinese Economic Growth:

Summary

- ◆ We note that the elimination of the pre-existing economic slack and economies of scale account for respectively 1.23 and 1.25 percentage points, or a total of 2.48 percentage points of the Chinese economic growth of 9.72% between 1978 and 2014.
- ◆ If we subtract 2.48% from 9.72%, we obtain 7.24%. This average annual rate of growth has been achieved by quite a few other economies in the past.
- ◆ In more conventional growth accounting, the effect of the elimination of the pre-existing economic slack would have been captured as technical progress or the growth of total factor productivity.
- ◆ Similarly, the effects of economies of scale would also have been attributed to technical progress or the growth of total factor productivity.

Concluding Remarks

- ◆ Chinese economic growth during the past 36 years can be mostly attributed to the growth of tangible inputs—tangible capital and labor, and in particular, tangible capital—rather than the growth in intangible capital or technical progress, just as the past economic growth of other East Asian economies at a similar stage of economic development.
- ◆ The successful Chinese experience strongly reaffirms the fundamental importance of having and maintaining a high investment rate, enabled by a high national savings rate, and surplus labor.
- ◆ In addition, the size of the Chinese domestic economy is a favourable factor allowing the ready realization of economies of scale and reducing vulnerability to external disturbances.
- ◆ The economic slack, inherent in any previously centrally planned economy, can be a significant source of economic growth upon transition to a market economy. In the Chinese case, it accounted for one-eighth of the Chinese economic growth since 1978.