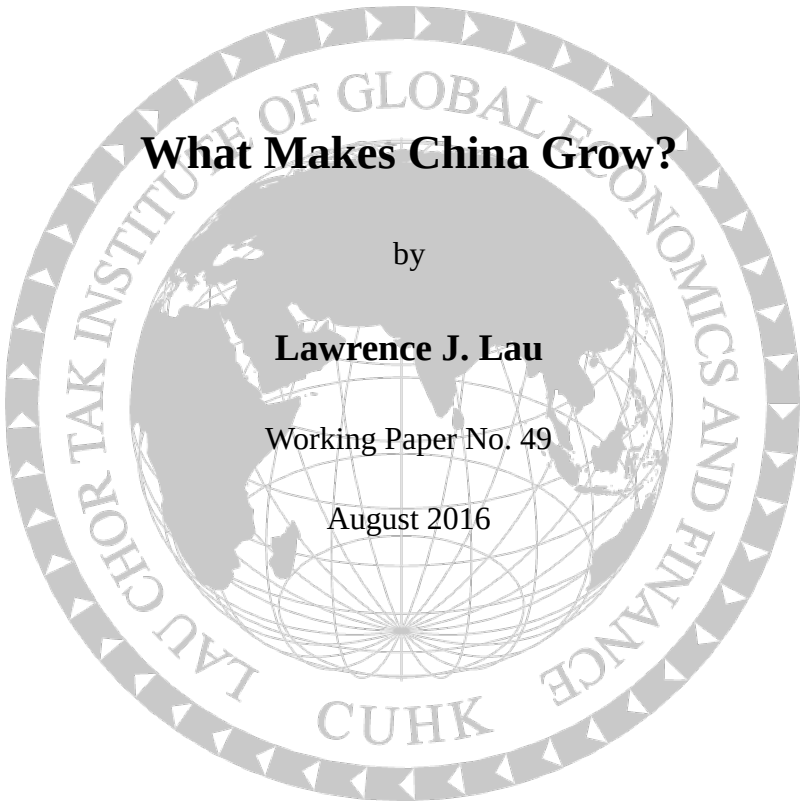


# What Makes China Grow?

by

**Lawrence J. Lau**

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# What Makes China Grow?

**Lawrence J. Lau**[1]

August 2016

**Abstract:** 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 (even though it has begun to slow down, to around 7% year-on-year growth). It is, however, historically unprecedented for an economy to grow at such a high rate over such a long period of time. Why has China been able to do so? What makes China grow? Will China be able to continue to grow at such a high rate in the future? The Chinese economic fundamentals, the Chinese initial conditions in 1978, as well as the economic reform policies and measures adopted and implemented by China are examined and analyzed. Long-term development of the Chinese economy is also assessed and long-term forecasts are generated and reported.

[1] Ralph and Claire Landau Professor of Economics, The Chinese University of Hong Kong, and Kwoh-Ting Li Professor in Economic Development, Emeritus, Stanford University. This paper was presented at Global Economic Modeling: A Conference in Honor of Lawrence Klein, held at the Institute for International Business, Rotman School of Management, University of Toronto, Toronto, Canada, on 11th June 2015. It will be published as a chapter in Peter Pauly, ed., Global Economic Modeling, Singapore: World Scientific Publishing Company, 2017, forthcoming. The author is grateful to Ayesha Macpherson Lau, Mingchun Sun, Yanyan Xiong and Huanhuan Zheng for their valuable comments but remains solely responsible for any errors. All opinions expressed herein are the author's own and do not necessarily reflect the views of any of the organizations with which the author is affiliated.

**1. Professor Lawrence R. Klein and China**

It is my honor and privilege to participate in this Conference in Memory of Professor Lawrence R. Klein. Professor Klein was an intellectual giant. He was a pioneering econometrician, having constructed the first econometric model of the United States, the Klein Model I, and followed it with a succession of increasingly larger and more sophisticated econometric models, including the Wharton Econometric Model. He not only founded Project LINK, a global project linking national econometric models together for joint prediction and simulation, as one country's exports must be the imports of other countries, with Robert Aaron Gordon, Bert G. Hickman and Rudolf R. Rhomberg, but also acted as the patriarch of the extended Project LINK family. To me personally, he was a selfless mentor, an exemplary role model, and a most respected and dear friend.

In the late 1960s, through the introduction of Professor Bert Hickman, my colleague at Stanford, Professor Klein invited me to construct the first econometric model of China and contribute it as one of the national models in Project LINK. Thus began my long association with Professor Klein and Project LINK. Professor Hickman and I also constructed aggregated and disaggregated trade matrix models that were used in the linkage of the national econometric models. In 1979, Professor Klein invited me to join the first delegation of the American Economic Association to the People's Republic of China, led by him and hosted by the Chinese Academy of Social Sciences. This was the first time I visited China as an adult. We were received by Vice-Premier GU Mu. Professor Klein then followed up with organizing the "The Summer Palace Workshop on Econometrics" in 1980, with one hundred participants drawn from all over China. This was the first introduction of econometrics in China. In addition to Professor Klein, there were six faculty members in the Workshop—Professors Theodore Anderson, Albert Ando, Gregory Chow, Cheng Hsiao, Vincent Su and me. We were received by Vice-Premier YAO Yilin. Our Workshop eventually led to the establishment of the Institute of Quantitative and Technical Economics at the Chinese Academy of Social Sciences. Later, Professor Klein also served as an Adviser to the State Planning Commission of the People's Republic of China for one U.S. Dollar a year.

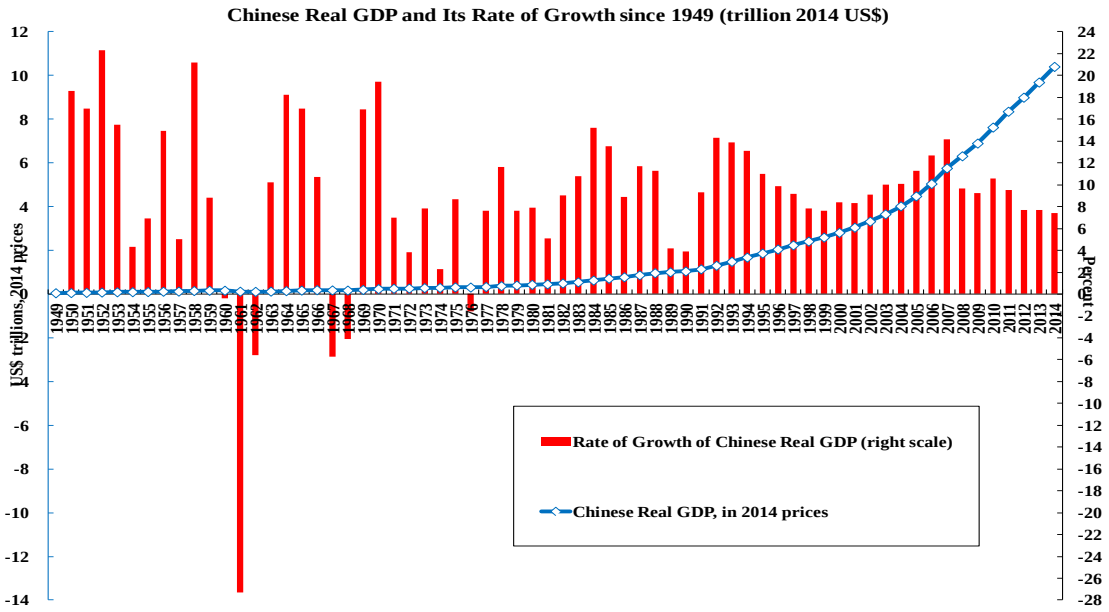
In 2010, at the Thirtieth Anniversary Celebration of the Summer Palace Workshop on Econometrics, Professor Klein, who was not able to attend but sent a pre-recorded videotape, laid down the challenge: Can the highly successful Chinese

economic growth since its economic reform and opening in 1978 be explained? What are the factors common to all economies that have been able to grow successfully? And what are the factors unique to the Chinese economy due to its own history and circumstances? This study is an attempt to provide a preliminary answer.

## 2. 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. Between 1978 and 2014, Chinese real GDP grew more than 28 times, from US369 billion to US$10.4 trillion (in 2014 prices), to become the second largest economy in the world, after the U.S (see Chart 1, in which the levels and the rates of growth of Chinese real GDP are presented). By comparison, the U.S. real GDP of approximately US$17.4 trillion was a little less than 1.7 times Chinese real GDP in 2014. However, the Chinese economy has recently begun to slow down, to around 7% year-on-year growth, in a process of transition to a "New Normal".

**Chart 1: Chinese Real GDP (2014 US$) and Its Rate of Growth since 1949**



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? Of course, the adoption and implementation of the correct economic policies and measures by the Chinese Government, led by the Chinese Communist Party, and their uninterrupted continuity since 1978, are important reasons for China's highly successful record of economic growth. However, we shall also examine the Chinese economic fundamentals as well as the Chinese initial conditions in 1978 to analyze why the adopted and implemented economic reform policies and measures were so effective in China.

During this same period, China also had to face many domestic and international challenges and several financial crises, such as the East Asian currency crisis of 1997-1998, the bursting of the internet bubble in 2000, the global financial crisis of 2007-2009 as well as the European sovereign debt crisis. China was able to survive all of these crises relatively unscathed, even maintaining a healthy rate of real economic growth. The Chinese Government leaders have demonstrated their ability to confront these challenges and solve difficult problems. The Chinese economy has recently begun a process of transition to a "New Normal", with a lower annual rate of growth of between 6.5 percent and 7 percent, a cleaner environment, and a greater contribution from innovation than from the growth of tangible inputs.

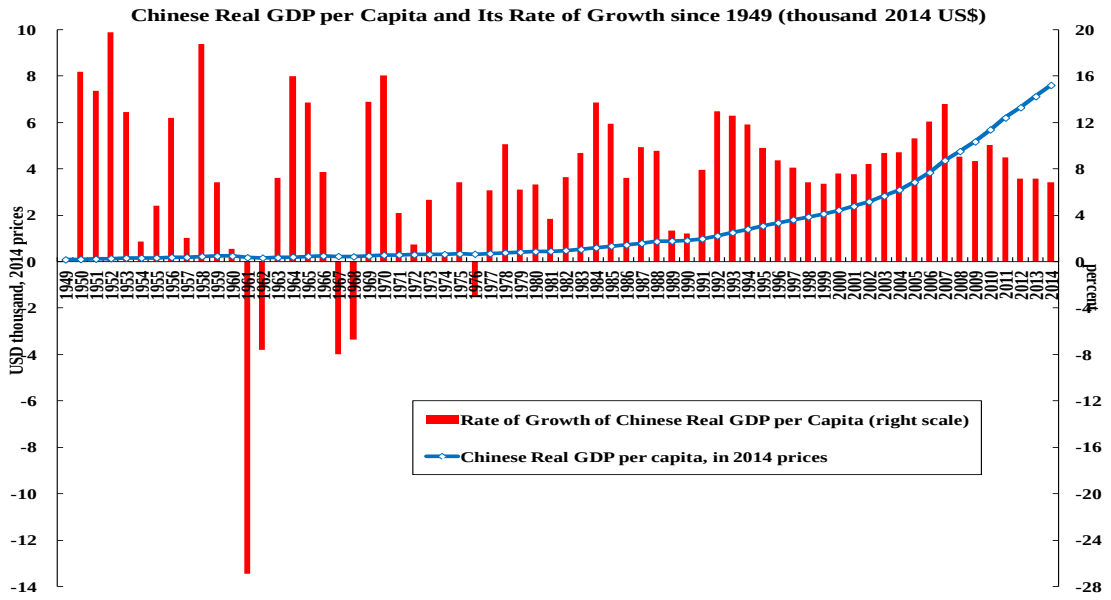
In Chart 2, the performance of the Chinese economy before and after its economic reform began in 1978 is compared. It is clear that the Chinese economy has done significantly better in almost every dimension—real GDP, real consumption, exports and imports—under the economic reform, on both an aggregate and a per capita basis. The only economic indicator that has performed worse is the rate of inflation, which rose from 0.53% per annum in the pre-reform period to 5.2% per annum in the post-reform period.

**Chart 2: Key Performance Indicators Before and After Chinese Economic Reform of 1978**

| | Growth Rates percent per annum | |
|---|---|---|
| | Pre-Reform Period | Post-Reform Period |
| | 1952-1978 | 1978-2014 |
| **Real GDP** | **6.13** | **9.72** |
| **Real GDP per Capita** | **4.04** | **8.65** |
| **Real Consumption** | **5.02** | **9.19** |
| **Real Consumption per Capita** | **2.96** | **8.13** |
| **Exports** | **9.99** | **16.76** |
| **Imports** | **9.14** | **15.98** |
| **Inflation Rates (GDP deflator)** | **0.53** | **5.19** |

However, despite its rapid economic growth in the aggregate, in terms of the level of its real GDP per capita, China is still very much a developing country. In 1978, Chinese real GDP per capita was only US$383 (in 2014 prices), or approximately 1.25 percent of the then U.S. real GDP per capita. Between 1978 and 2014, Chinese real GDP per capita grew 19.8 times, to US$7,604 (see Chart 3, in which the levels and the rates of growth of Chinese real GDP per capita are presented). However, it was still less than one-seventh of the U.S. GDP per capita of US$54,575 in 2014.

**Chart 3: Chinese Real GDP per Capita and Its Rate of Growth (2014 Prices) since 1949**

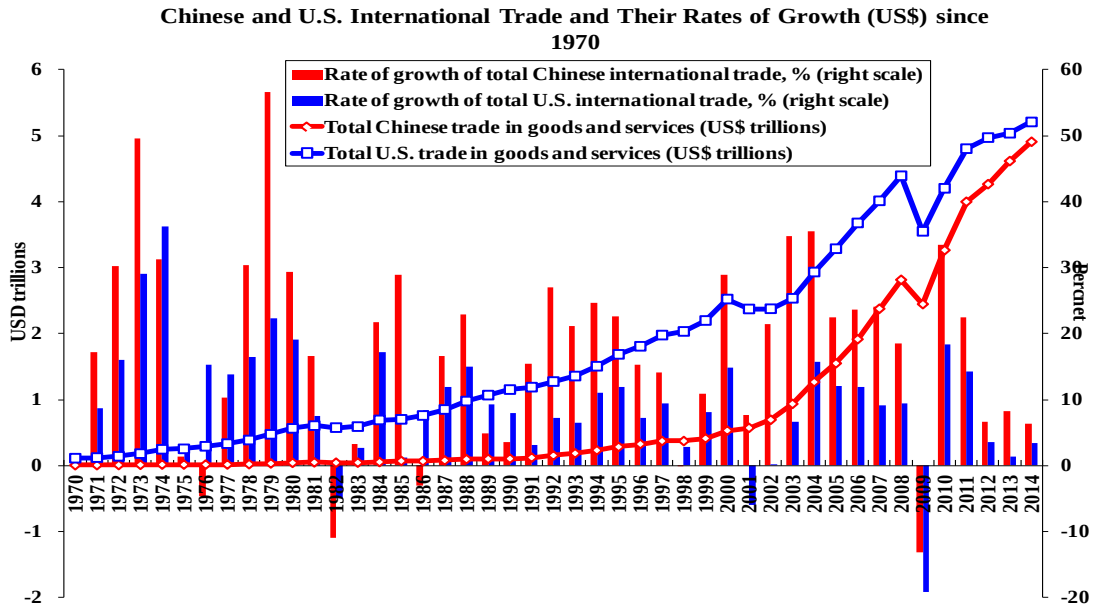



While many problems have arisen in the Chinese economy within the past decade—for example, increasing income disparity at both the inter-regional and intra-regional levels, uneven access to basic education and health care, environmental degradation, inadequate infrastructure and corruption—it is fair to say that every Chinese citizen has benefitted from the economic reform and opening to the world since 1978, albeit to varying degrees, and few want to return to the central planning days.

Chinese international trade in goods and services has also grown very rapidly since the beginning of its economic reform in 1978, and the rate of growth accelerated after Chinese accession to the World Trade Organisation (WTO) in 2001. Chinese total international trade grew from US$20.3 billion in 1978 to US$4.91 trillion in 2014, making China the second largest trading nation in the world, just after the U.S. with its total international trade of US$5.21 trillion. (See Chart 4, in which the red lines and red columns represent the levels and rates of growth of Chinese international trade respectively, and the blue lines and blue columns represent the levels and rates of growth of U.S. international trade respectively). While China is the largest exporting nation in terms of goods and services (US$2.565 trillion in 2014), followed by the U.S. (US$2.356 trillion), the U.S. is the largest importing nation in terms of goods and services (US$2.85 trillion), followed by China (US$2.342 trillion). China

is also the largest exporting nation in terms of goods alone, followed by the U.S. The U.S. is the largest exporting as well as importing nation in terms of services, followed by respectively the United Kingdom and Germany.

**Chart 4: Chinese and U.S. International Trade (US$) and Their Rates of Growth since 1970**

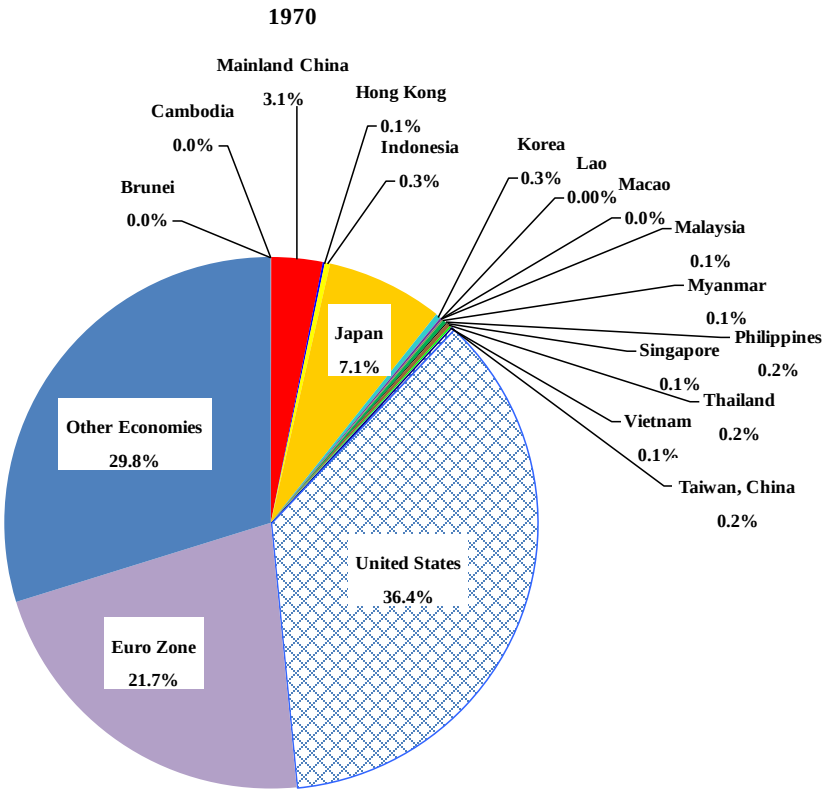



## 3. China in the Global Economy

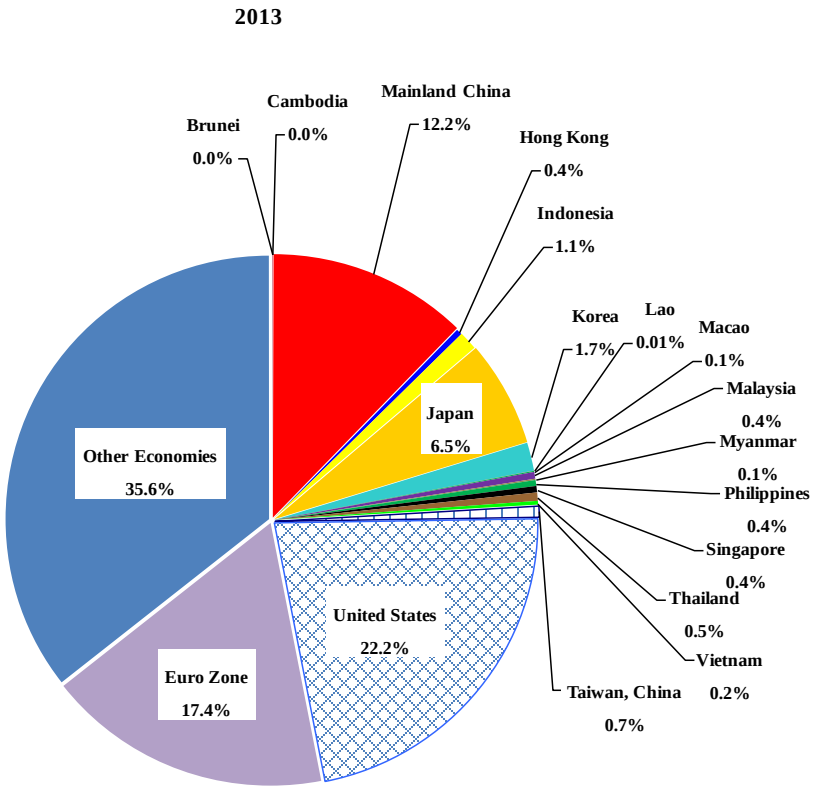
The most important development in the global economy during the past thirty-six years is the reform and opening of the Chinese economy and its participation in the world. As a result, the center of gravity of the global economy, in terms of both GDP and international trade, has been gradually shifting from North America and Western Europe to East Asia, and within East Asia from Japan to China. In 1970, the United States and Western Europe together accounted for almost 60% of world GDP. By comparison, East Asia (defined as the 10 Association of Southeast Asian Nations (ASEAN)--Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam--+ 3 (China including Hong Kong, Macau and Taiwan, Japan and the Republic of Korea) accounted for approximately 10% of world GDP. (Hong Kong, the Republic of Korea, Singapore and Taiwan are also known collectively as the East Asian "Newly Industrialized Economies (NIEs)".) By 2013, the share of the United States and Western Europe in world GDP has

declined to approximately 40%, whereas the share of East Asia has risen to around 25% (see Charts 5 and 6). The Japanese share of world GDP declined from a peak of almost 18% in the mid-1990s to 6.5% in 2013 while the Chinese share of world GDP rose from 3.1% in 1970 and less than 4% in 2000 to over 12.2% in 2013 (see Chart 7).

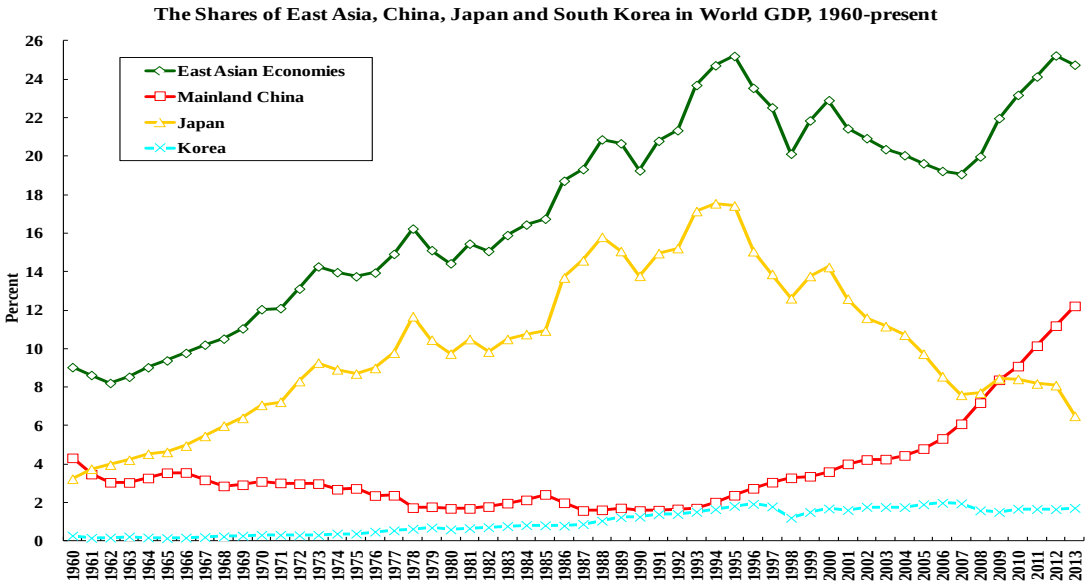
**Chart 5: The Distribution of World GDP, 1970, US$**



## Chart 6: The Distribution of World GDP, 2013, US$




## Chart 7: The Shares of East Asia, China, Japan and South Korea in World GDP, 1960-present



A similar shift has occurred in the distribution of world trade. In 1970, the United States and Western Europe together accounted for almost 60% of world trade in goods and services. By comparison, East Asia accounted for 9.5% of world trade. By 2013, the share of United States and Western Europe in world trade has declined to 41% whereas the share of East Asia has risen to almost 28%. (See Charts 8 and 9.)

**Chart 8: The Distribution of Total International Trade in Goods and Services, 1970**

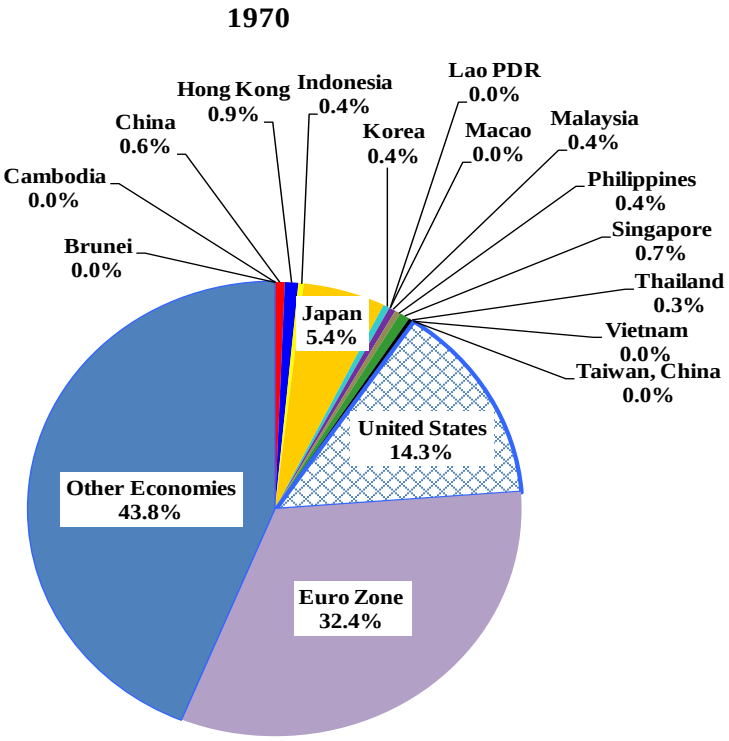
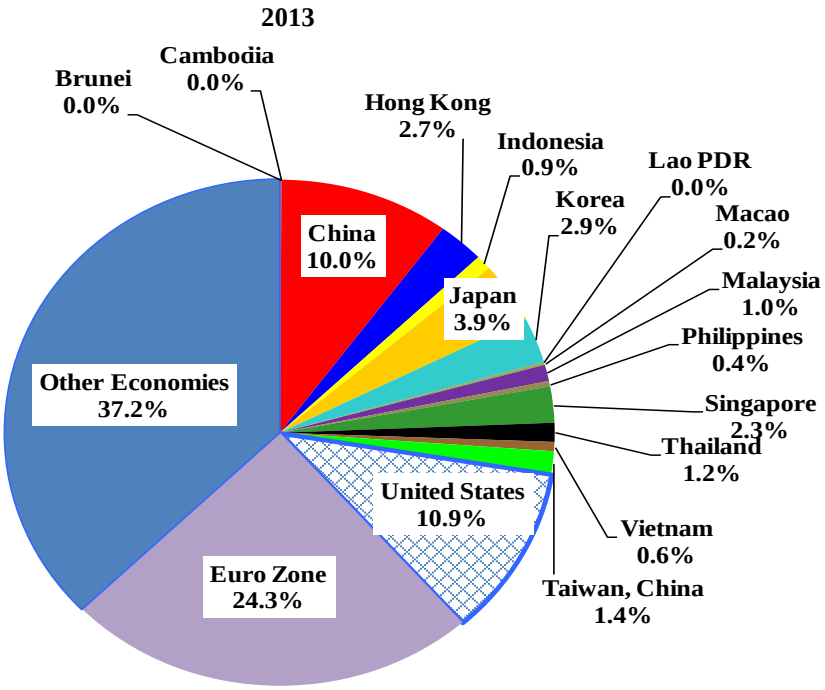


**Chart 9: The Distribution of Total International Trade in Goods and Services, 2013**




The Chinese share of world trade rose from 0.6% in 1970 to over 11% in 2013 (see Chart 10). The growth in Chinese international trade may be attributed in part to the reform of the Chinese exchange rate system in the early 1990s, accompanied by a significant devaluation, to Chinese accession to the World Trade Organisation in 2001, and to the expiration of the Multi-Fibre Agreement governing world trade in textiles. China has also become either the most important or the second most important trading partner of almost all of the economies in the Asia-Pacific region (see Chart 11).

**Chart 10: The Chinese Share of Total World Trade, 1950-present**

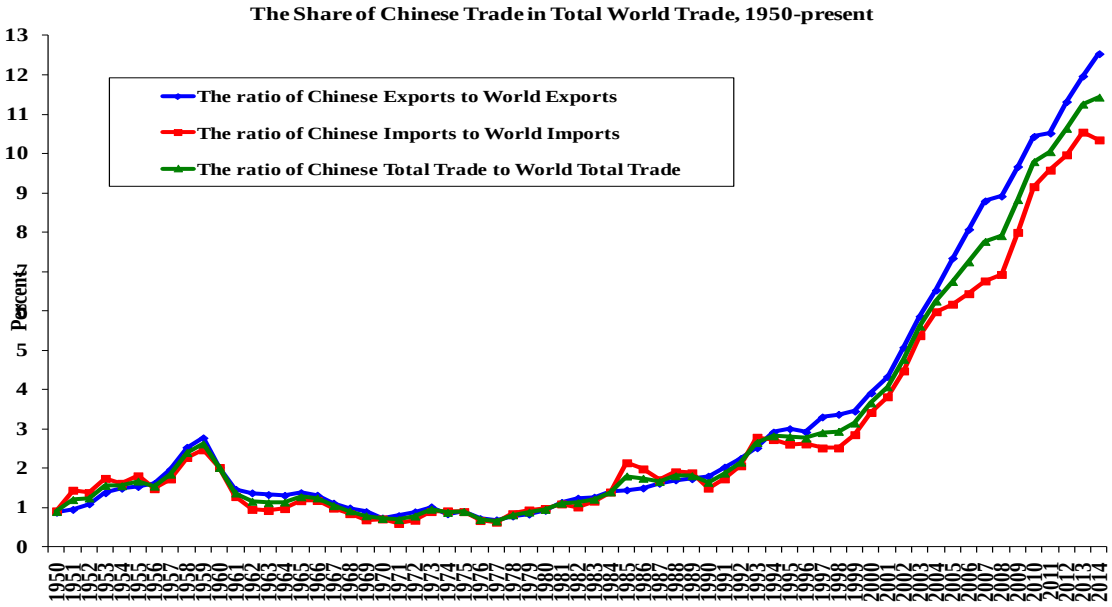



**Chart 11: The Ranks of China as Trading Partner of Asia-Pacific Countries/Regions and Vice Versa, 2013**

| Country/Region | Chinese Rank as Trading Partner of Country/Region | Rank of Country/Region as Trading Partner of China |
|---|---|---|
| Australia | 1 | 7 |
| Brunei | 3 | 104 |
| Cambodia | 1 | 78 |
| Hong Kong | 1 | 2 |
| Indonesia | 1 | 16 |
| Japan | 1 | 3 |
| Korea | 1 | 4 |
| Laos | 2 | 90 |
| Macau | 1 | 85 |
| Malaysia | 1 | 8 |
| Myanmar | 1 | 51 |
| New Zealand | 1 | 43 |
| Philippines | 2 | 27 |
| Singapore | 1 | 11 |
| Taiwan | 1 | 5 |
| Thailand | 1 | 13 |
| United States | 2 | 1 |
| Vietnam | 1 | 18 |

Contrary to the public impression, the ratio of Chinese exports of goods and services to GDP is actually relatively low compared with other economies (see Chart 12). Among large economies, only Japan and the U.S. have a lower share of exports in GDP than China. This is a reflection of the fact that China is a large continental economy, with relatively abundant diversified natural resources and a huge domestic

market. Most of the other East Asian economies (except Japan) are either export-oriented or were export-oriented when they began their processes of economic development. Their exports to GDP ratios have been and continue to be much higher than that of the Chinese economy. The same is true of the ratio of Chinese imports of goods and services to GDP (see Chart 13) and for the same reasons.

**Chart 12: Exports of Goods and Services as a Share of GDP in Selected Economies**

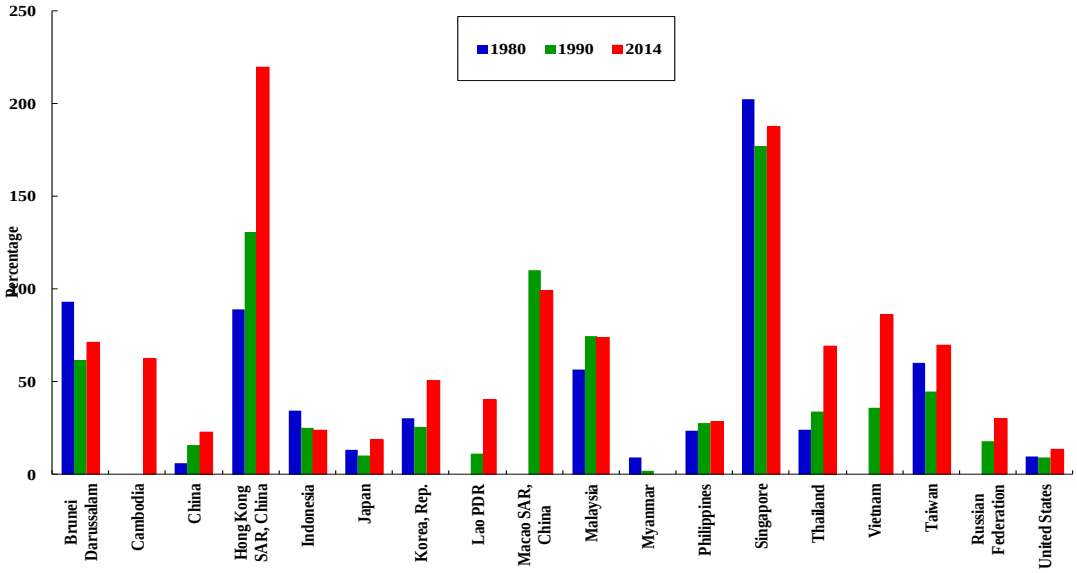
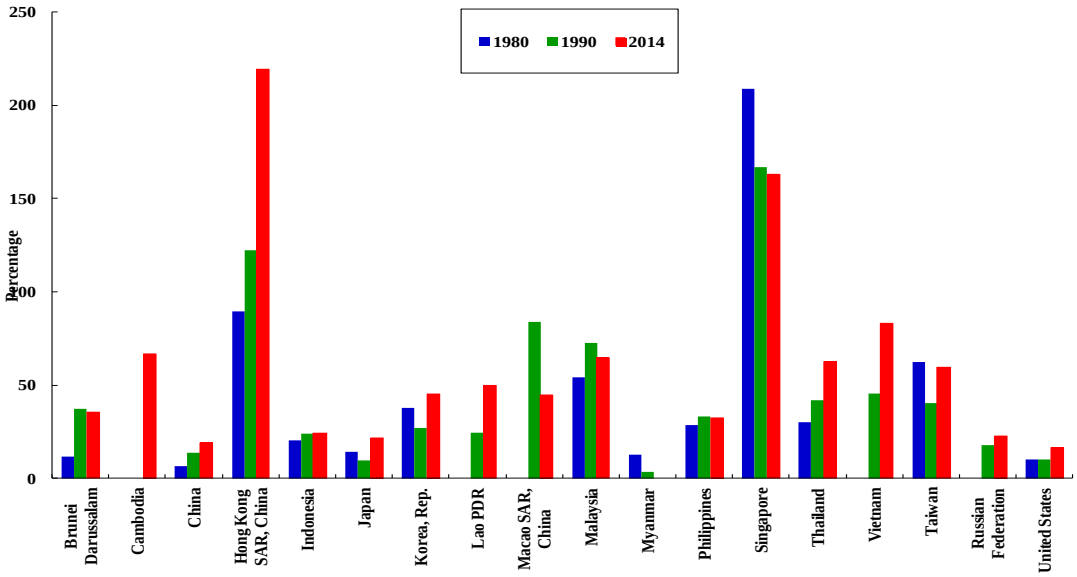
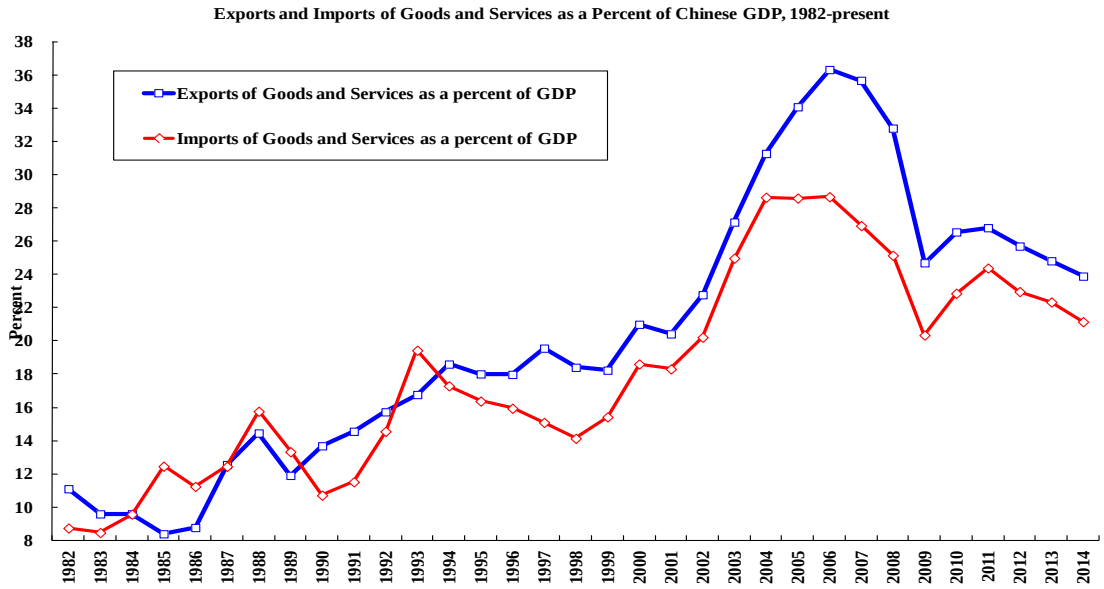



**Chart 13: Imports of Goods and Services as a Percent of GDP: Selected Economies**



In Chart 14, Chinese exports and imports as a share of its GDP over time are presented. It is clear that these shares peaked in 2006 and have been declining steadily since then. Moreover, the Chinese trade surplus as a percent of its GDP has also begun to decline as well. This trend is expected to continue in the future.

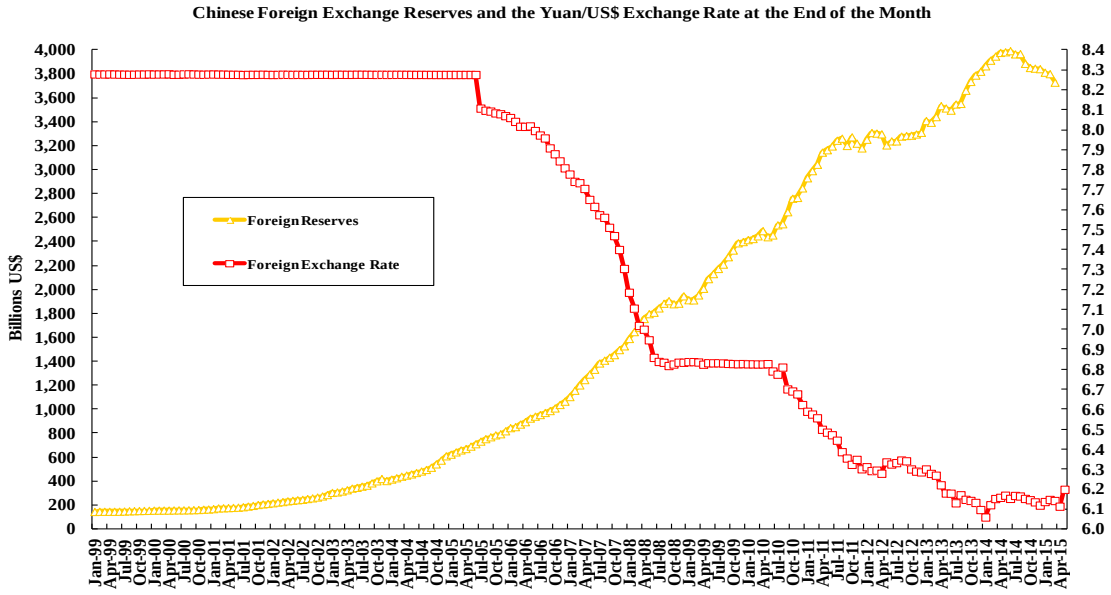
**Chart 14: Exports and Imports of Goods and Services as a Percent of Chinese GDP, 1952-2014**




China has also opened its economy to inbound foreign direct investment (FDI). China imported from abroad capital goods as well as advanced technology that enhanced its domestic production capacity. Foreign direct investment also enabled the surplus resources of the Chinese economy, principally labor, to be productively employed.

As a result of the accumulated trade surpluses and to a lesser extent the net capital inflows since the mid-1990s, the Chinese official foreign exchange reserves have also risen steadily, reaching a peak of approximately US$4 trillion in mid-2014, and becoming the largest official foreign exchange reserves held by any central bank in the world (see Chart 15).

**Chart 15: Chinese Foreign Exchange Reserves and the Yuan/US$ Exchange Rate**




In the meantime, the exchange rate of the Chinese currency, the Renminbi or Yuan, vis-a-vis the U.S. Dollar, has also undergone huge changes during the past 36 years (see Chart 16). In 1978, US$1 is worth less than 2 Yuan. In order to maximize the benefits of the policy of economic reform and opening, the Chinese Government began to devalue the Renminbi significantly with respect to the US$ in 1980, to a more competitive and sustainable level. For a few years in the early 1990s, China maintained dual exchange rates: an official rate and an "adjustment" rate determined in a market restricted to Chinese exporters and importers with import licenses. At the time, foreign exchange certificates (FECs) were also used by foreign visitors to China instead of the Renminbi. China implemented full current accounts convertibility in 1994. In both nominal and real terms, the Renminbi has been appreciating relative to the U.S. Dollar since 1994, but especially after 2005 (see Chart 17).

**Chart 16: Nominal Exchange Rate of the Renminbi, Yuan/US$, 1978-present**

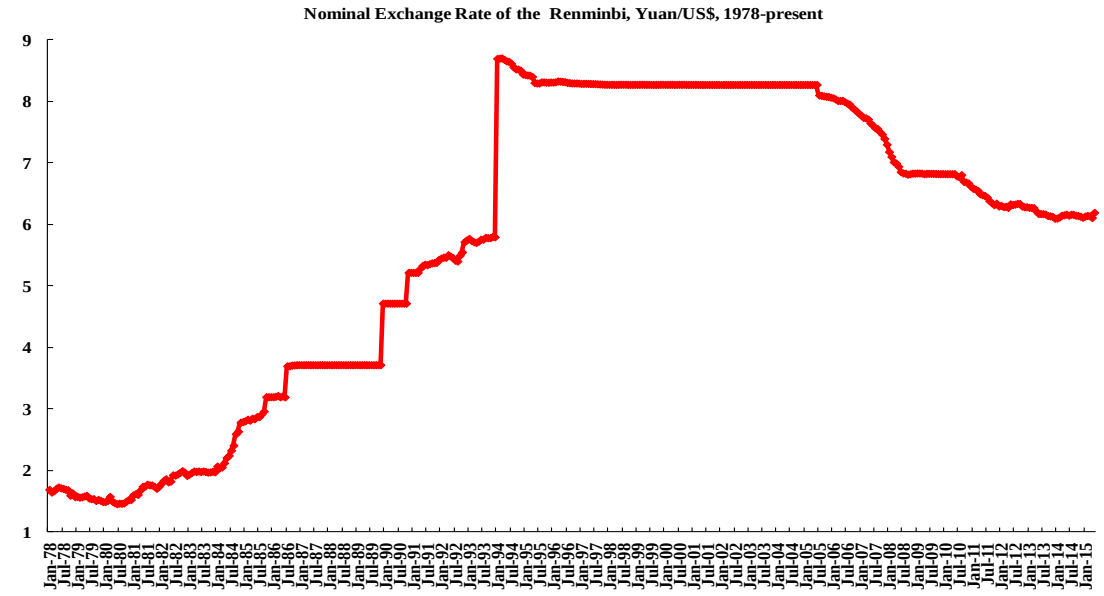
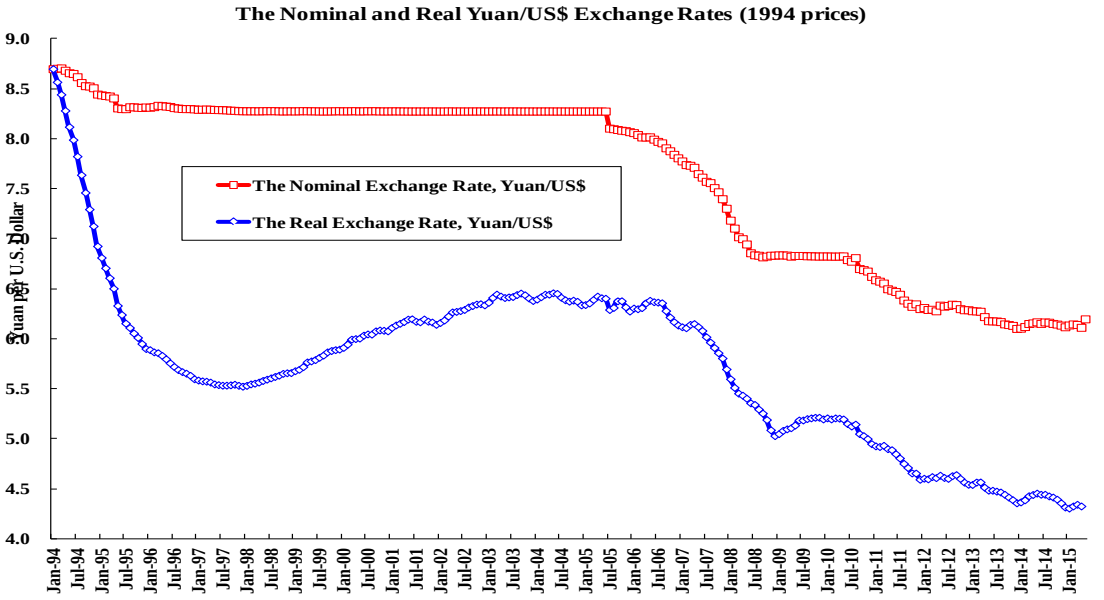


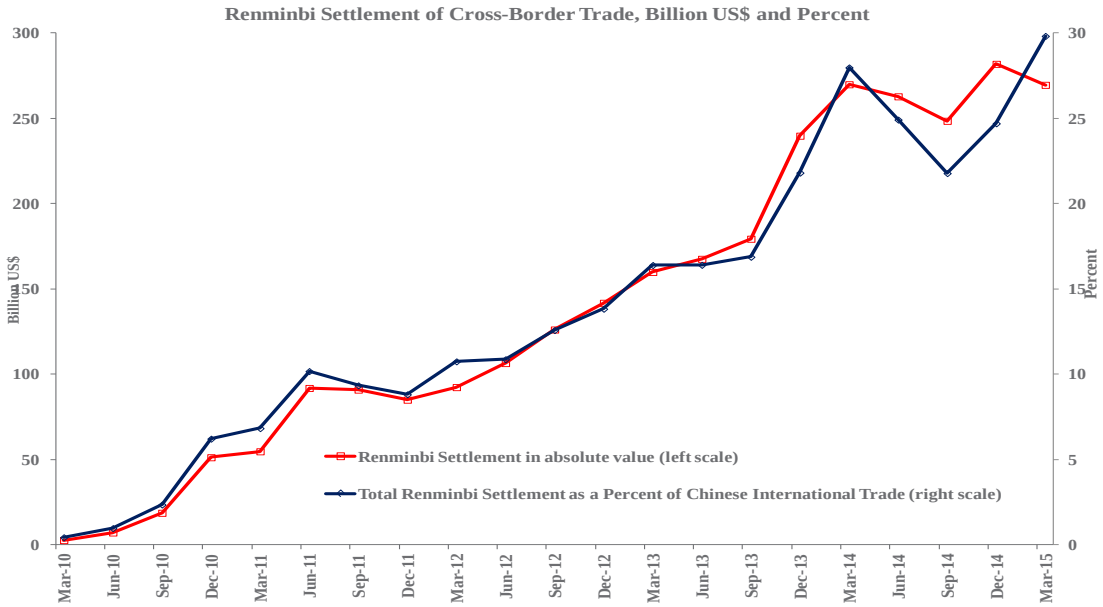

**Chart 17: The Nominal and Real Yuan/US$ Exchange Rates**




Since 2010, the Renminbi has been increasingly used as an invoicing and settlement currency for cross-border transactions, especially those involving Chinese enterprises as transacting parties. The proportion of Chinese international trade settled in Renminbi has grown rapidly, from almost nothing in the first quarter of 2010 to 30% of the total value of Chinese international trade in goods in the first quarter of 2015, equivalent to US$270 billion (see Chart 18). In terms of absolute

value, more than a US$1 trillion worth of Chinese international trade is now settled in Renminbi annually.

**Chart 18: Renminbi Settlement of Chinese Cross-Border Trade, Billion US$ and Percent**




The Renminbi is also used for foreign direct investment and portfolio investment both inbound and outbound, but its use can be further expanded. The central banks and monetary authorities of many countries and regions have entered into swap agreements with the People's Bank of China, the central bank of China, which facilitate the use of Renminbi as an invoicing and settlement currency. In Charts 19 and 20, the share of each major country in world trade is compared to the share of its currency used in world trade settlement in 2010 and in April 2015 respectively. In 2010, the Renminbi was not even within the top twenty currencies used in world trade settlement. By April 2015, it became the fifth most used currency in world trade settlement. However, even though China accounted for approximately 12 percent of world trade, the Renminbi accounted for only 2.1% of world trade settlement in April 2015; and while the U.S. had a similar share of world trade as China, the U. S. Dollar accounted for 45.1% of world trade settlement in April 2015. By comparison, Japan accounted for 5.1% of world trade and its currency, the Yen, accounted for 2.7% of world trade settlement in April 2015. There is still plenty of room for the expansion of the use of Renminbi for cross-border trade settlement in the future. If the Japanese experience is any guide, the use of the

Renminbi for world trade settlement should double or even triple over the next few years.

**Chart 19: Distribution of World Trade Settlement Currencies versus World Trade, 2010**

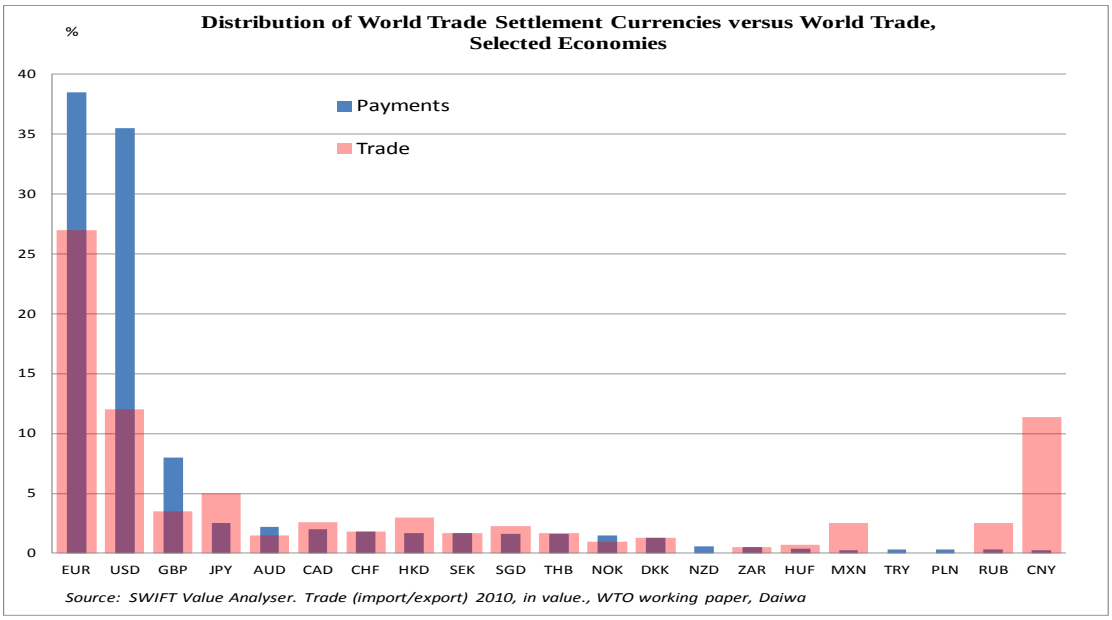
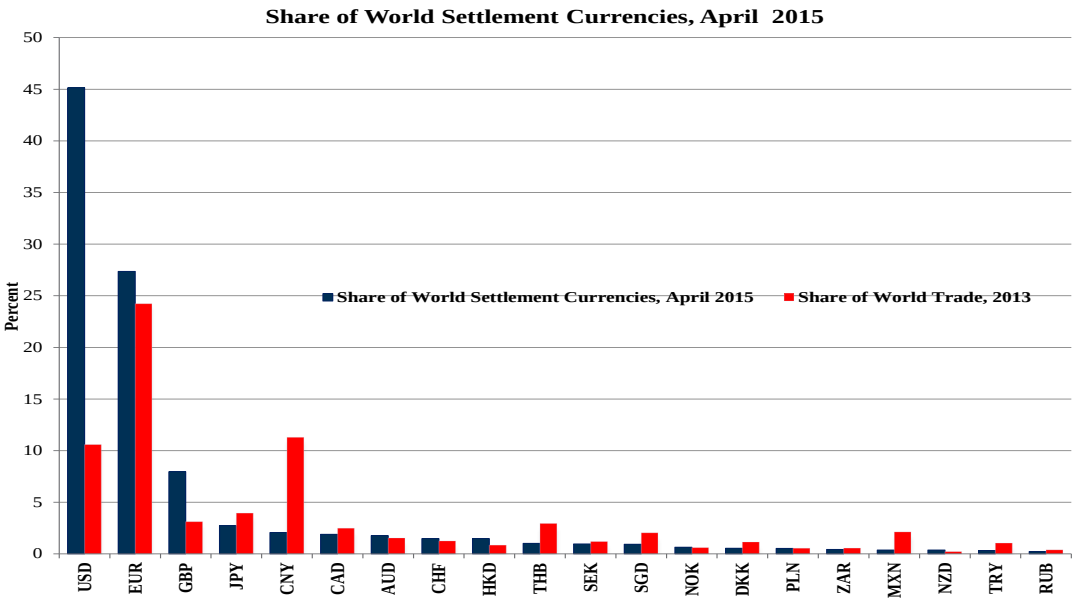



**Chart 20: Distribution of World Trade Settlement Currencies versus World Trade, April 2015**



The exchange rate of the Renminbi relative to the U.S. Dollar is likely to hold steady or appreciate modestly over the next few years. This should facilitate the further expansion of the use of the Renminbi for the invoicing and settlement of international transactions. Capital account convertibility is expected to be achieved for the Renminbi before 2020. It can occur sooner if short-term capital flows, both outbound and inbound, can be appropriately regulated or "discouraged", for example, with the imposition of a "Tobin tax"[2] on capital account inflows and outflows.

One reason the Chinese economy has been able to survive the successive financial crises, beginning with the 1997-1998 East Asian currency crisis, followed by the global financial crisis of 2007-2009, the European sovereign debt crisis, as well as the successive quantitative easings on the part of the U.S. Federal Reserve Board (QEI, II and III), the Bank of Japan and the European Central Bank (ECB), relatively unscathed is its relative insulation from the financial disturbances in the world economy through its maintenance of controls on both inflows and outflows of capital. Moreover, China did not have to depend on foreign capital because of its own high domestic saving rates. Potential contagion from abroad has therefore been minimized.

## 4. The Chinese Economic Fundamentals

The 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 (or 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).

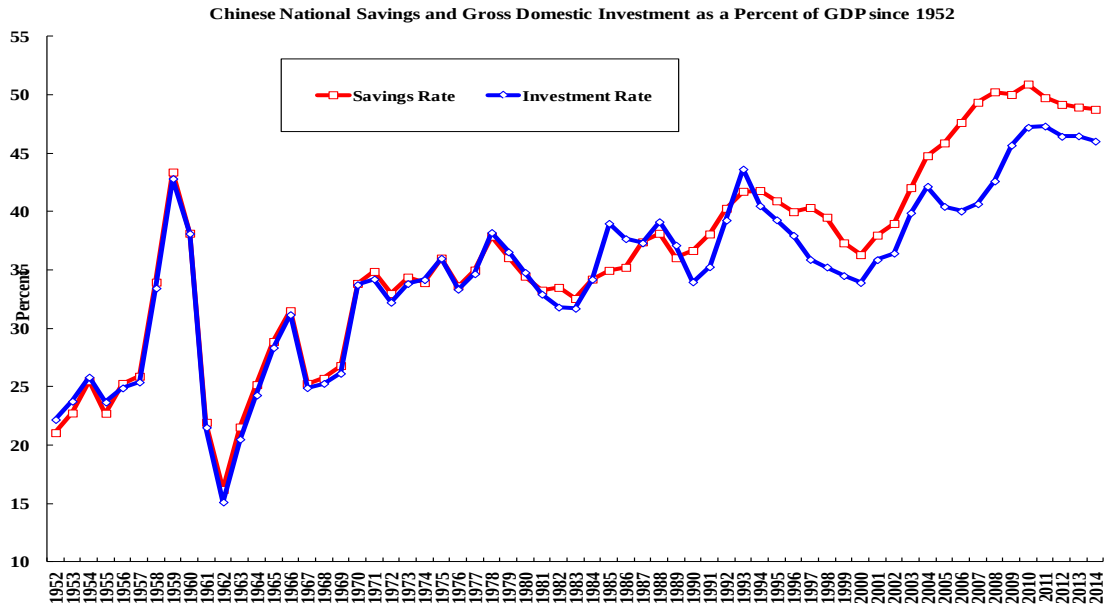
The most important source of Chinese economic growth over the past 36 years has been the growth of inputs, principally the growth of tangible capital (structure, equipment, and basic infrastructure), and not technical progress. Thus, past Chinese

[2] This is a financial transaction tax, first proposed by Professor James Tobin (1974), Nobel Laureate in Economic Sciences, which can be applied to currency conversion transactions.

economic growth was mainly due to “working harder, not working smarter”. The growth of tangible capital accounts for the bulk, approximately 75 percent of the measured economic growth in China. This experience is not unlike those of other East Asian economies such as South Korea and Taiwan and even Japan as well as that of the United States at a similarly early stage of economic development. The growth of inputs, principally tangible capital, has always been found to be the most important source of growth at an early stage of development. This is especially true of economies with initially abundant supplies of surplus labor.

Chinese economic growth since 1978 has been underpinned by a consistently high domestic investment rate, enabled by a national savings rate on the order of 30% and above except for a brief start-up period in the early 1950s (see Chart 21). Since the early 1990s, the Chinese national saving rate has stayed around 40% and has at times approached or even exceeded 50% in more recent years. This means, among other things, that the Chinese economy can finance all of its domestic investment needs from its own domestic savings alone, thus assuring a high rate of growth of the tangible capital stock 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. Hence the Chinese economy is also more immune from external disturbances than other economies. In addition, since new resources are made available each year from new savings, enabling new investments to be made, the necessity of restructuring, redeploying or privatizing existing fixed assets is greatly diminished (thus making it more possible to avoid potentially politically divisive issues and the creation of “losers”). A high national savings rate also allows the normally more efficient non-state sector greater room and greater scope for development and expansion as there is less likelihood of “crowding out”.

**Chart 21: Chinese National Saving and Gross Domestic Investment as Percents of GDP**




The national saving rate in China will remain high in the foreseeable future even though it is expected to decline gradually, in part, because the household or labor share of GDP is relatively low, below 50 percent (the household disposable income was approximately 43 percent of GDP in 2014), and that the Chinese enterprises, especially the state-owned enterprises, distribute little or no cash dividends, reinvesting almost all of their profits.

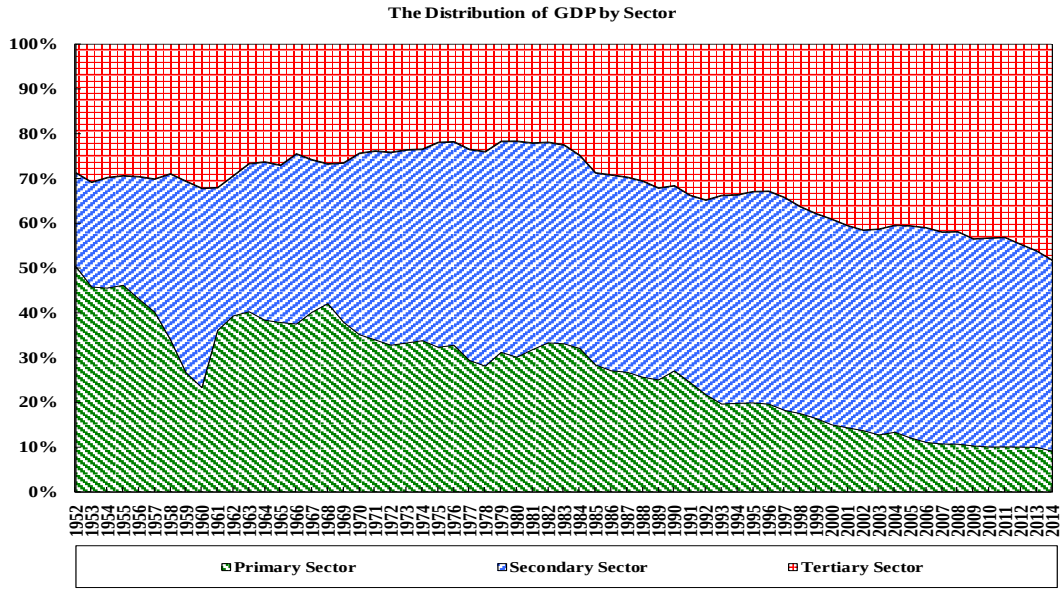
However, tangible capital input-driven economic growth has its limitations, because as the stock of tangible capital relative to labor increases, the marginal productivity of tangible capital will begin to decline and will eventually reach a point when additional tangible capital is no longer productive. This is a point made by Professor Paul Krugman (1994).

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. This means the Chinese economy can continue to grow without being constrained by the supply of labor or by rising real wage rates of unskilled, entry-level labor over an extended period of time. Investment in tangible or physical capital such as structure, equipment and physical infrastructure is very productive under conditions of surplus labor. As long as there is sufficient complementary domestic physical capital, the surplus labor can be gainfully employed and enable the real

output of the economy to grow rapidly. This is exactly what the late Professor W. Arthur Lewis (1954), Nobel Laureate in Economic Sciences, said in his celebrated paper on surplus labor sixty years ago.

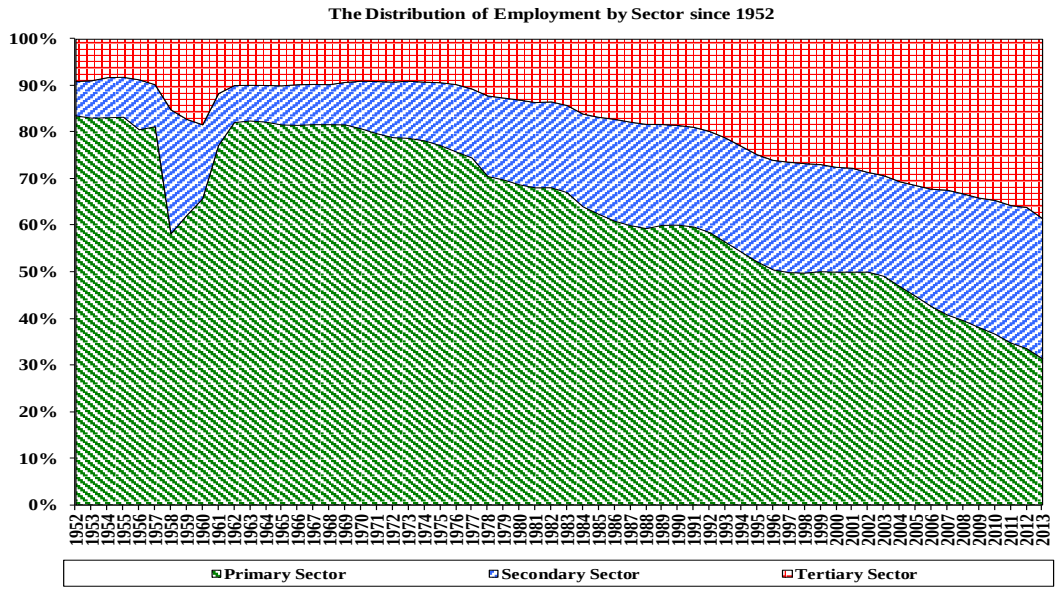
The distribution of Chinese GDP by originating sectors in 2014 was approximately: Primary (agriculture), 9.2%; Secondary (manufacturing, mining and construction), 42.6%; and Tertiary (services), 48.2% (see Chart 22). (Note that mining is normally included in the primary sector in most other economies.)

**Chart 22: The Distribution of Chinese GDP by Originating Sector since 1952**




By comparison, in 2013, the distribution of employment by sector was: Primary 31.4%, Secondary 30.1%, and Tertiary 38.5% (see Chart 23). The agricultural sector employs 31.4% of the Chinese labor force but produces only 10% of the Chinese GDP in 2013. 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. Hence, as long as the percentage of labor force employed in the primary sector significantly exceeds the percentage of GDP originating from the primary sector, there will be little or no upward pressure on the real wage rate of unskilled, entry-level labor in the secondary and tertiary sectors. Surplus labor will continue to exist in the Chinese economy.

**Chart 23: The Distribution of Chinese Employment by Sector since 1952**




Even with increases in the levels of minimum wage rates in the different provinces, regions and municipalities, the real wage rate of unskilled, entry-level labor for the country as a whole has basically remained stable and is expected to be stable for a long time because of the continuing existence of significant surplus labor in the Chinese economy. However, there is upward pressure on the real wage rates of skilled and experienced labor, which is actually in short supply, especially as Chinese enterprises move up the value-added chain. But given the trend of rapid expansion of Chinese tertiary education in recent years, with 6 million new graduates projected annually, the increase in the real wage rate of even skilled labor is likely to be relatively limited going forward.

China has a long tradition of emphasis on education and learning (human capital) and will be increasing its investment in human capital. The enrollment rate of tertiary education has been rising rapidly and stands at almost 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 from the current 1.8 percent to 2.2 percent of GDP by 2015. However, relative to many other economies, China lags behind in investment in both human capital and R&D capital. (This deficit and gap will be further discussed in Section 13 below.)

The size of the Chinese economy is a natural advantage. The huge domestic market of 1.34 billion consumers with pent-up demand for housing and transportation and other consumer goods and services (e.g., education and health care) enables the realization of significant economies of scale in production. The huge domestic market also greatly enhances the rate of return on investment in 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 amortized and recovered. For intangible capital, once the initial fixed costs are recovered, any additional revenue is almost all pure profit. Brand-building enables the owners of brand names to have much more pricing power and higher profit margins than enterprises that do only OEM (original equipment manufacturing) business. The huge domestic market also facilitates active Chinese participation in the setting of product and technology standards, for example, in fourth-generation (4-G) standards for telecommunication, and sharing the economic benefits of such standard-setting.

An economy with significant economies of scale will grow faster than an economy with constant returns to scale given the same rates of growth of the measured inputs. The degree of returns to scale at the economy-wide level is not precisely known. The assumption used by Edward F. Denison (1961) 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. On the assumption that this also holds for the Chinese economy, it implies that Chinese economic growth will be 10 percent higher each year than an economy with the same rates of growth of capital and labor inputs but without the economies of scale. Of course, the effects of economies of scale are sometimes confounded with those of technical progress or growth of total factor productivity (there is an identification problem). However, if there were economies of scale at all, they should be manifested in the Chinese economy.

Suppose the annual rates of growth of the inputs in the economy are 7%. Under constant returns to scale, the economy will grow at 7% per annum. However, under increasing returns to scale of degree 1.1, the economy will grow at 7.7% per annum. In 10 years, the economy with economies of scale will be 7% larger than the one without; in 20 years, 14%; and in 40 years, 31%, a significant difference. Thus, the existence of economies of scale can make a huge difference in the level of GDP in

a few decades. Moreover, economies of scale can increase the rates of return to investment and may lead to higher investment rates than otherwise.

Another important and favorable implication of a large domestic economy is the relatively low degree of external dependence and hence vulnerability. Large continental economies, such as China, Russia and the United States, are likely to be self-sufficient in many of the resources because of their large size and geographically diversified location. These economies are also mostly driven by their internal demands, and not by international trade. For example, exports have never been very important to the U.S. economy, and the U.S. economy has never been dependent on international trade, except perhaps in the 19th Century. The Chinese economy is similar—China has adequate supplies of most natural resources domestically (with the possible exception of oil). Chinese economic growth in the future decades will be mostly driven by internal demand rather than exports.

The powerful advantage of a large economy can be seen by an examination of Charts 24, 25 and 26 on the rates of growth of exports, imports and real GDP of selected Asian economies (with the red line representing China). The charts show that even though Chinese exports and imports fluctuate like those of all the other selected Asian economies, the rate of growth of Chinese real GDP has remained relatively stable compared to those of the other economies. It is relatively immune to external economic disturbances.

**Chart 24: Quarterly Rates of Growth of Exports of Goods: Selected Asian Economies**

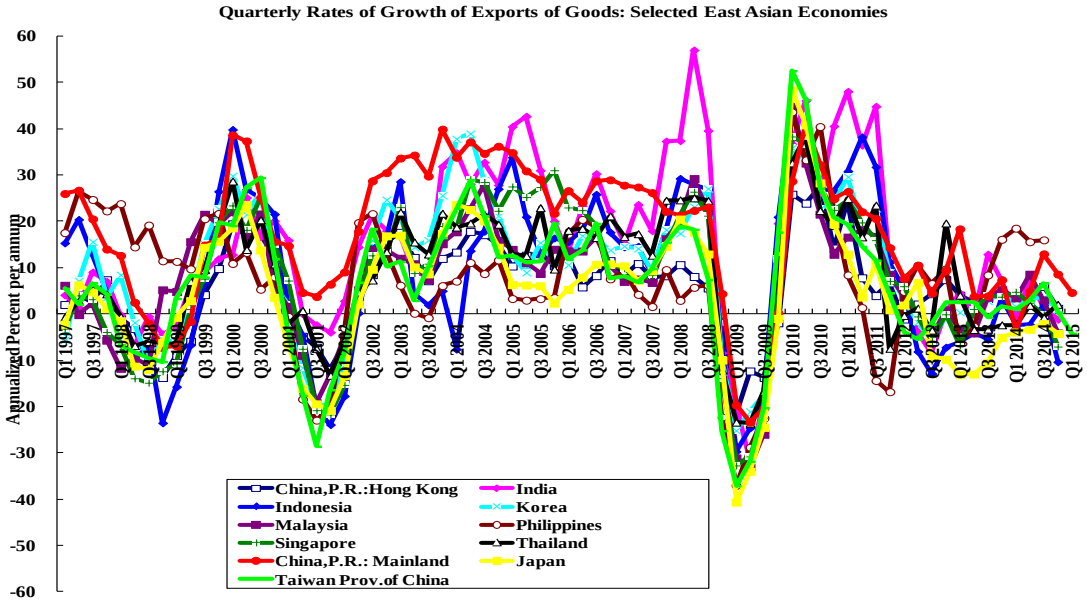


**Chart 25: Quarterly Rates of Growth of Imports of Goods: Selected Asian Economies**

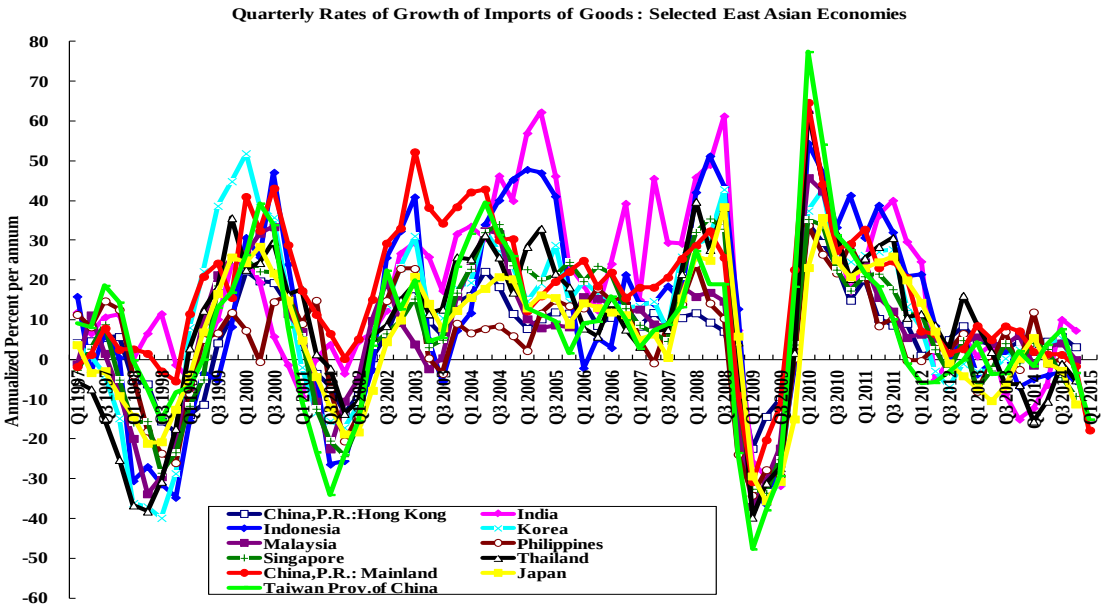
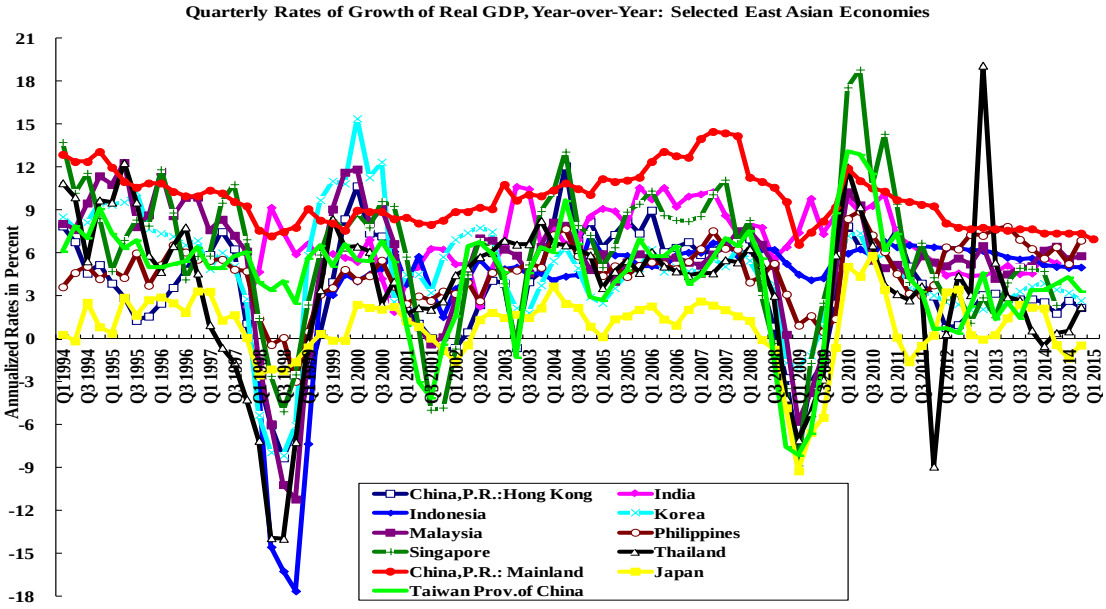



**Chart 26: Quarterly Rates of Growth of Real GDP, Y-o-Y: Selected Asian Economies**




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, which has enabled the Chinese economy to learn from the experiences of successes and failures of other economies; to leap-frog and by-pass stages of development (e.g., the telex machine, the VHS video-tape player, the fixed landline telephone are all mostly

unknown in China); and to have 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 takes away business from brick and mortar malls).

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 1978, the first year of the Chinese economic reform and opening to the world, China also had (1) a high domestic saving rate; (2) an unlimited supply of surplus labor; and (3) a large domestic economy. But the Chinese economy did not experience a sustained high rate of growth during that period. Similarly, the former Soviet Union also had a high rate of tangible capital accumulation as well as a large domestic economy, but did not experience a sustained high rate of economic growth either.

**5. The Inherent Economic Inefficiency of Central Planning**

Why didn't China and the former Soviet Union experience sustained high-rate economic growth despite favorable economic fundamentals? The short answer is that both the Chinese economy before its economic reform of 1978 and that of the former Soviet Union operated under central planning, with its inherent economic inefficiencies. From 1953, when China adopted its First Five-Year Plan, to the end of the last Century, the Chinese economy operated under a series of mandatory central plans. Similarly, the former Soviet Union and the East European countries operated under central planning until 1989.

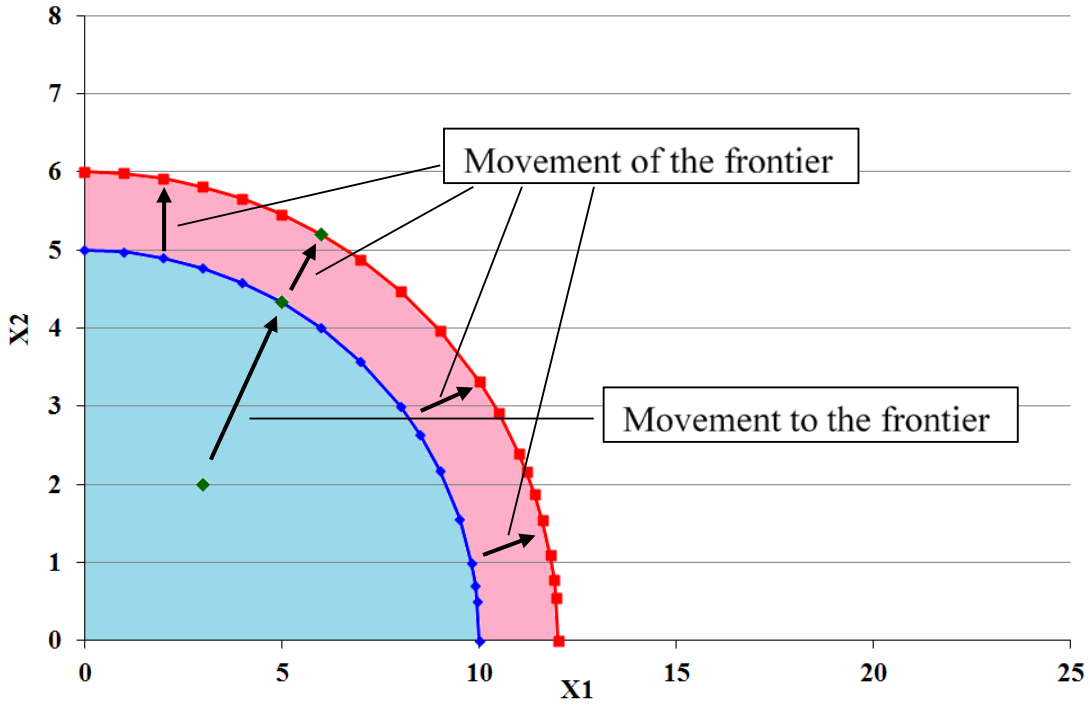
A principal characteristic of a centrally planned economy is the administrative allocation, rather than market allocation, of scarce resources. What goods and services to produce? How much to produce? Where to produce them? What raw materials and parts should be used to produce them? From which enterprises should the raw materials and parts be bought? To which enterprises should the outputs be sold? All of these decisions are made by the central planners and embodied in the mandatory central plan. Enterprises do not have any autonomy in these decisions. The prices of goods and services are also completely determined in the central plan. They do not necessarily reflect relative scarcities in the economy, and do not play any

role in the equilibration of market supply and demand. The prices are only used for accounting purposes.

Why is there inherent economic inefficiency in a centrally planned economy? We begin by defining what economists mean by efficiency. A production allocation or plan for an economy is said to be efficient if for given aggregate quantities of inputs (the tangible capital stock and labor), no output of any good or service can be increased without decreasing the output of another good or service. In other words, there is no slack: the economy is operating on the frontier of its set of production possibilities. A production allocation or plan is said to be inefficient if it is possible to increase the output of any good or service without decreasing the output of any other good or service. In other words, the economy is operating in the interior of its set of production possibilities.

It is important to understand and distinguish between the two different ways in which the real output of an economy can be increased: either through an outward movement of the frontier of the set of production possibilities, or through a movement from the interior of the set of production possibilities set to its frontier. The first way can only occur either through an increase in the inputs, tangible and intangible, or from the adoption of a more efficient technology imported from abroad. The second way can occur even in the absence of any increase in the inputs or technology transfer. It can be regarded as a pure increase in domestic economic efficiency, resulting in an increase in actual output, but without an increase in potential output. In Chart 27, the expansion of the old production possibilities set (shaded in blue) to include the area shaded in red, is accompanied by the movement of the old production possibilities frontier (the blue line) to the new (the red line). The movement from the old production point to the blue line represents a movement from the interior of the old production possibilities set to the old frontier.

**Chart 27: Movement of the Production Possibilities Frontier versus Movement to the Frontier**




But for various reasons—incomplete information, failure to optimize and the lack of incentive--a centrally planned economy always operates in the interior of its set of production possibilities. Thus, output can always be increased by simply moving to the frontier from the interior of the set of production possibilities, without any increase in inputs. The existence of this inherent inefficiency therefore also implies the existence of surplus potential output. In order to understand why there always exists inefficiency and hence surplus potential output in a centrally planned economy, we consider the following simple example drawn from agriculture.

There are two farm households, A and B. Each has a hectare of land. Both cotton and rice are needed by the economy. The central planner's problem is to decide—which household should grow cotton and which household should grow rice, as well as how much of each crop to grow. First of all, there may be a problem of insufficient or incorrect information. The central planner may not know which plot is more suitable for growing cotton and which plot is more suitable for growing rice. Moreover, the central planner may not know whether Farmer A can grow cotton better than Farmer B or vice versa. If the central planner makes any mistake in the

assignment of production responsibilities, a simple exchange of the assignment can increase aggregate output without having to increase any input.

Second, even with full, complete and accurate information, it is still possible for the central planner to fail to optimize. The optimization problem may be too large or too complex; or the problem may not be well-behaved (for example, there may be non-convexities); or the problem may have multiple possible distinct solutions.

Third, there is also the problem of a lack of incentives on the part of the farmers to become more efficient—to try to move to their respective production possibilities frontiers. Under a centrally planned system, the farmers are generally wary of exceeding the assigned production targets even if they are in principle able to do so. To them, if they manage to produce outputs that exceed the assigned production targets, not only would their income not increase, so that the extra efforts would have been in vain, but also the assigned production targets for the following year might be raised, making it more difficult for them to fulfill their then obligations. (This is sometimes referred to as the "ratchet" effect.) Thus, under a centrally planned system, the best strategy for the farmers is to each try to produce the respective assigned target output and not to exceed it.

However, if there is a way to provide the necessary incentives to the farmers, then without increasing the aggregate inputs assigned under the central plan, aggregate output can also be increased. For example, the farmers can be given the autonomy to grow anything on their plots once they have fulfilled their obligations under the central plan, and to retain the resulting profits and to bear the resulting losses, if any; or they can also be allowed to exchange their assigned responsibilities with each other. The combined outputs of the two farmers will be higher than before without any increase in the aggregate inputs.

On the eve of the beginning of its reform and opening in 1978, the Chinese economy still operated under a mandatory central plan, and therefore had significant surplus potential output or slack. The countries of the former Soviet Union and Eastern Europe were all centrally planned economies on the eves of their economic transitions and thus also had similarly significant surplus potential outputs. If the surplus potential outputs can be fully exploited and realized, the real rates of growth of these economies can become very high, even without any significant growth in

their aggregate inputs, at least in the near term. With growth in aggregate inputs, the economies should be able to grow even faster.

We may therefore conclude that for an economy under central planning, there always exists inefficiency and hence surplus potential output. Moreover, the surplus potential output should and can be realized with the introduction of economic reforms granting autonomy to the producers and providing incentives for them through the free markets, even without an increase in the aggregate inputs.

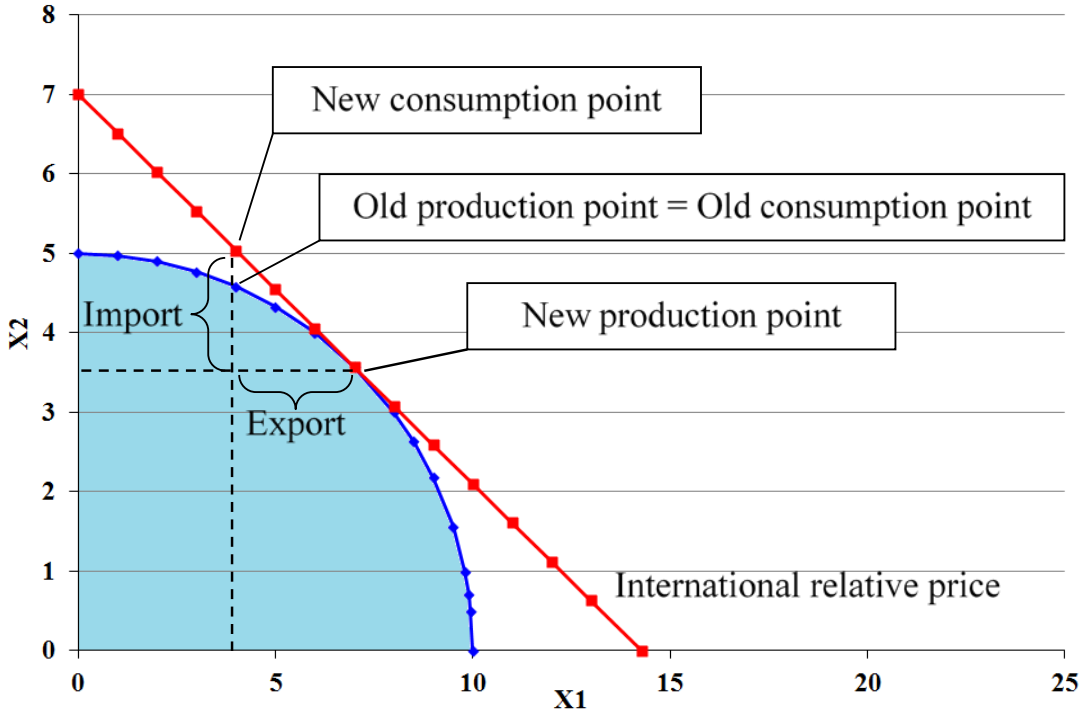
**6. The Benefits of an Open Economy**

What are the benefits of an open economy? The "Theory of Comparative Advantage" tells us that free and voluntary trade between two trading partner countries always benefit both (although the distribution of the gains between them and within them may not be uniform). Exporters and importers will tend to benefit, whereas import-competing industries and their workers may lose. An economy may also benefit from the ability to import and augment resources not sufficiently available domestically using its export revenues or relying on foreign direct investment, foreign portfolio investment, foreign loans and foreign aid. Technology transfer is another way in which an economy can benefit, resulting in an expansion of its set of production possibilities (equivalently the outward shifting of its production possibility frontier).

Chart 28 makes it clear how opening the economy to the rest of the world always improves aggregate social welfare. For an economy without international trade, the consumers can only consume what can be produced domestically. The consumption possibilities set is therefore the same as the production possibilities set (the area shaded in blue). With international trade, the consumption possibilities set becomes the entire area of the triangle bounded by the international price line (red line) tangent to the production possibilities set and the vertical and horizontal axes, which properly contains the old consumption possibilities set in the absence of trade. Since every consumption plan (combination of good 1 and good 2) in the old consumption possibilities set is attainable with trade, but not every consumption plan in the new consumption possibilities set is attainable in the old consumption possibilities set, aggregate social welfare must be higher with trade, because more consumption choices are available. As shown in Chart 28, without trade, the economy operates at

the old production point which is the same as the old consumption point. With trade, the economy operates at the new production point but through exports and imports achieves the new consumption point, with the same quantity of good 1 as and a higher quantity of good 2 than the old consumption point. Aggregate social welfare must have increased.

**Chart 28: Opening the Economy Enhances Domestic Economic Welfare**




Even if the international relative price is the same as the domestic relative price in the absence of international trade, so that the optimal combination of the goods to be produced remains the same with or without international trade, given the possibility of exports and imports, every point on the international relative price line is a possible domestic consumption plan. The domestic consumption point can be different from the domestic production point, and the resulting aggregate social welfare must also be higher with international trade. Thus, it is possible for aggregate social welfare to increase even if the production possibilities set remains the same as the economy opens to the world.

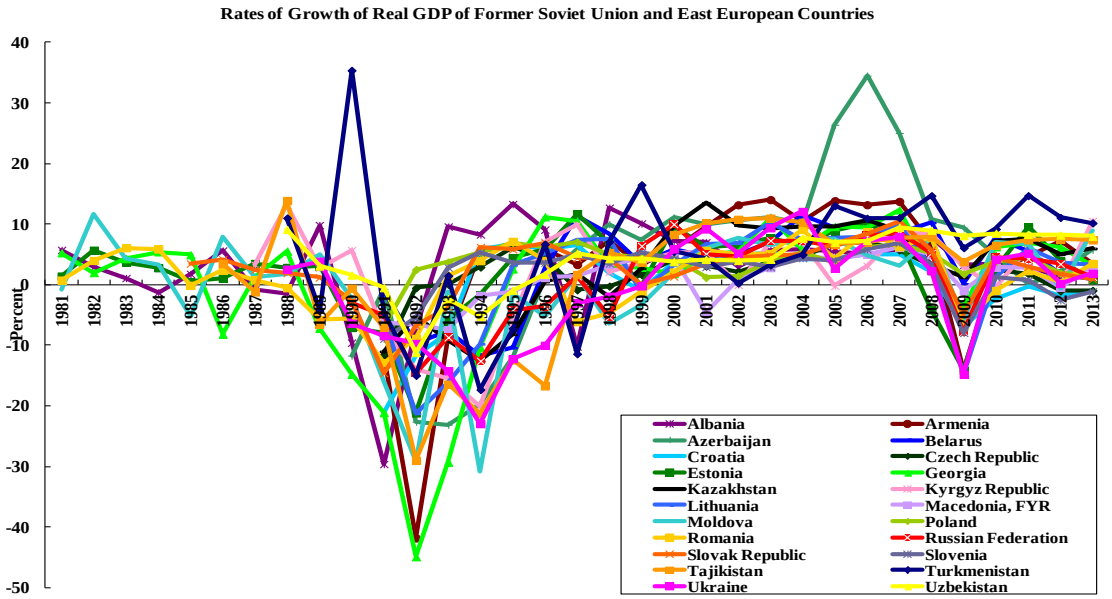
It may be thought that with the inherent economic inefficiency of a centrally planned economy, its real rate of growth must be very high as it makes its transition from a centrally planned to a market economy. Similarly, one should expect

aggregate social welfare to rise as an autarkic economy opens to the world. However, empirically, this turns out not to be true in general, except for the few rare cases such as the Chinese economy.

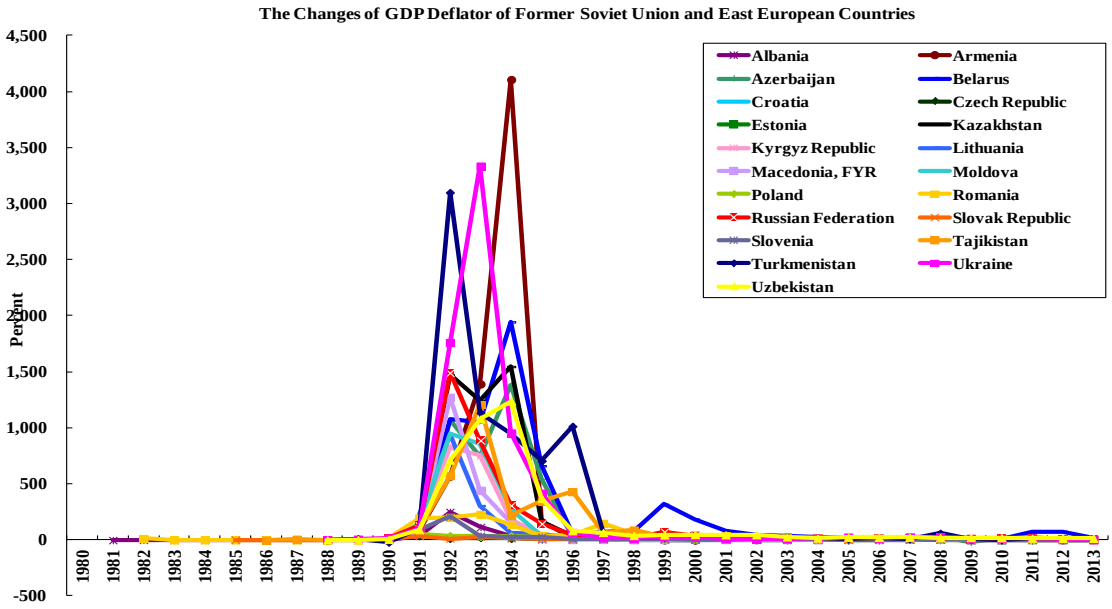
## 7. The Transition from a Closed Centrally Planned to an Open Market Economy

In the former Soviet Union and the formerly socialist Eastern European countries, the transition from a closed centrally planned economy to an open market economy beginning in the late 1980s was both difficult and painful. Many of these countries experienced negative real rates of growth for approximately a full decade, from 1989 to 1999 (see Chart 29) and suffered from extremely high rates of domestic inflation (see Chart 30). Real GDPs per capita in these formerly centrally planned economies took even longer to recover to the same levels of 1989, the year in which central planning was first abandoned (see Chart 31). For example, the real GDP per capita of Russia (red line) did not recover to its 1989 level until 2007.

**Chart 29: The Rates of Growth of the Real GDP of Former Soviet Union and Formerly Socialist Eastern European Countries**

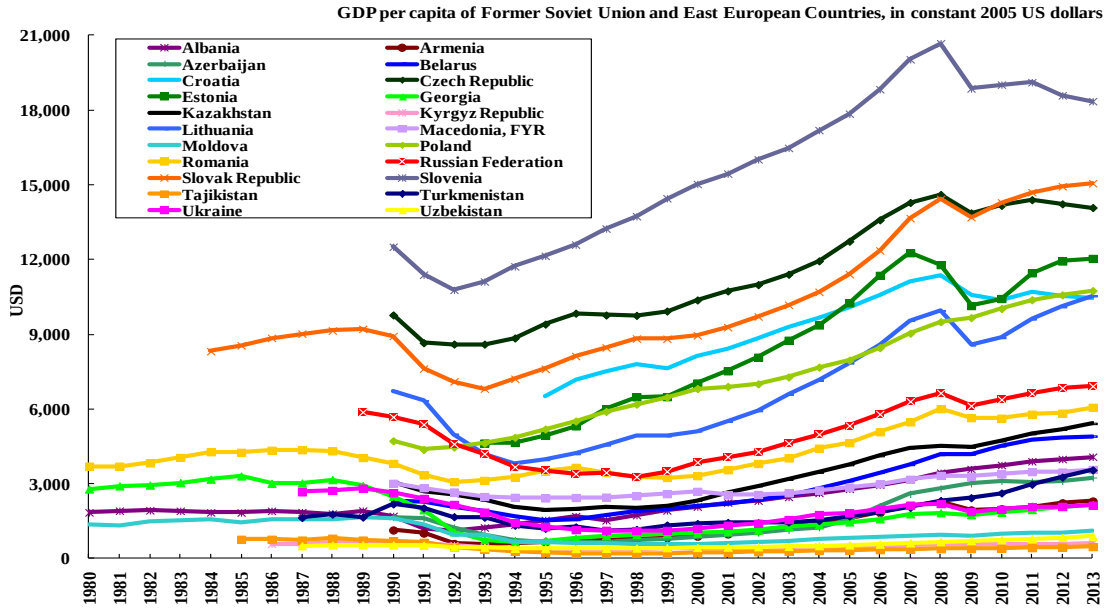


## Chart 30: The Annual Rates of Inflation of Former Soviet Union and Formerly Socialist Eastern European Countries




Note: Georgia is omitted because some of its data are off the scale of the chart.

## Chart 31: The GDP per Capita of Former Soviet Union and Formerly Socialist Eastern European Countries (2005 US$)




In contrast, the transition from a closed centrally planned economy to an open market economy in China beginning in 1978 was smooth and highly successful (see Charts 1 and 3). Both Chinese real GDP and real GDP per capita have grown

rapidly and continuously beginning in 1978. There was not even a single year of decline in either aggregate or per capita real GDP as in the other formerly centrally planned economies.

**8. Reform without Losers--The Chinese Strategy for Economic Reform**

We have identified two factors that contributed to Chinese economic success since 1978: favorable economic fundamentals and the prior existence of surplus potential output. But these factors were also common to other transition economies such as those of some of the former Soviet Union and the formerly socialist Eastern European countries. What Section 7 above has shown is that for a previously centrally planned economy, even though there might have been good economic fundamentals and prior economic inefficiency (and hence surplus potential output), introduction of producer autonomy and the free market and opening to the world may not be sufficient to ensure a successful economic transition and a high rate of real economic growth. Only China was able to do so.

Why was the Chinese economic reform and opening to the world so successful? Why was China able to achieve a smooth and successful transition from a closed centrally planned economy to an open market economy while some of the other countries attempting similar transitions failed so miserably? It turns out that the choice of strategy for the economic transition matters. In the former Soviet Union and the formerly socialist Eastern European 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. In China, instead of dismantling the mandatory central plan all at once, the Chinese Government adopted the “Dual-Track” approach: introducing “conditional” autonomy and free markets in goods and services on the margin while continuing to enforce the existing central plan. “Conditional” autonomy means that for a household, a village, a commune, a township, or an enterprise, as long as it has already fulfilled its assigned obligations under the mandatory central plan, it is free to engage in any other economic activity and sell the resulting goods and services produced on the free markets at market-determined prices if it wishes to do so.

There were therefore in the Chinese economy simultaneously a “Plan Track” and a “Market Track”, which operated in parallel but separately from each other. As everyone—a commune, a township, a village, an enterprise, a household or even an individual--had the option of staying with the pre-reform arrangements under the mandatory central plan, with identical rights and obligations as before (both prices and quantities), no one would be worse off under the “Dual-Track” approach. Thus, there could not be any “losers”; and in addition, everyone had the opportunity to “win”. All the “vested interests” were “grandfathered”, as they did not have to suffer any losses. This “Dual-Track” approach as implemented in China can be shown to be not only Pareto-improving, that is, making everyone better off (hence creating no losers), but also would enable the economy to achieve full economic efficiency (see Lau, Qian and Roland (2000)).

All economic reforms are supposed to generate a net increase in aggregate social welfare, if not in real GDP, of the entire economy. Economic reform requires government leadership; it cannot occur autonomously, otherwise it would have occurred on its own already. However, most economic reforms create both winners and losers in the economy. While it is true that in the aggregate, the gains from economic reform should outweigh the losses, it is often difficult, if not impossible, to redistribute the gains so that no one is worse off. And the redistribution, if any, has to be implemented by a government with the authority, the power and the will.

The key to the success of the “Dual-Track” approach is that the production targets in the mandatory central plan are entirely fixed and must be fulfilled at the fixed plan prices before autonomy and participation in the free markets are allowed. Thus, profits and losses (taxes and subsidies) of enterprises under the central plan remain the same before and after the introduction of the “Dual-Track” approach. Differences between plan and free market prices of plan-assigned inputs and consumption goods constitute feasible lumpsum transfers among enterprises and households. The government, by continuing to enforce the plan, ensures that this de facto redistribution built into the plan continues to take place. Thus, the continued planned consumer goods deliveries enable the maintenance of the pre-reform standard of living for all people as a floor. Since no one has to lose and everyone could win, opposition to the economic reform was minimized, support for the reform was maximized, and social stability was preserved. Such a win-win strategy for economic reform has the best chance of success.

As a result of the "Dual-Track" approach, the Chinese economic reform proceeded smoothly and did not result in economic chaos or contraction as in the former Soviet Union and the formerly socialist Eastern European countries. The Chinese economy was able to continue to grow rapidly in the midst of its transition from a closed centrally planned economy to an open market economy. 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 feasibility of the dual-track approach depended critically on the continued enforcement of the rights and obligations under the existing central plan, which in turn depended on whether the central government had sufficient authority, credibility, power and will to do so. Credibility of state enforcement, and expectations thereof, affect the behavior of enterprises and households, and hence their degree of compliance with the central plan (post-reform). The governments of the former Soviet Union and the formerly socialist East European countries all became relatively weak around 1989, and did not really possess the ability to continue to enforce the pre-existing central plans. And after the former Soviet Union evolved into the Commonwealth of Independent States, what used to be domestic trade became international trade overnight, which became even more difficult for the successor governments to control and operate. It was therefore almost impossible for these countries to avoid the creation of losers.

The Chinese Government, in the implementation of its economic reform, tried to minimize as much as possible the creation of losers and the impact of the reform on the existing economic system and the vested interests. At the same time, it also tried to allow new value and new winners to be created on the margin. Examples of reform measures that preserve pre-existing vested interests include the introduction of the "household responsibility system" in agriculture, the township and village enterprises in the rural areas, the special economic zones, the "processing and assembly" trade, the reforms of the foreign exchange system and the national taxation system. Related to the principle of "reform without losers" is the idea of treating

existing people and new people differently even though they may be in identical situations. "New People, New Way; Old People, Old Way"[3] is the Chinese contribution to the method of implementing new economic reform. It embodies the idea of "grandfathering"—whatever rights and privileges (and obligations) a person had before the reform, he or she would have the option of retaining the same afterwards and thus would not have to lose anything. In a way, the two-tiered wage structure used in some enterprises and industries (e.g., the airline industry) in developed market economies also reflects the same underlying considerations—"grandfathering" minimizes opposition to any reform by vested interests.

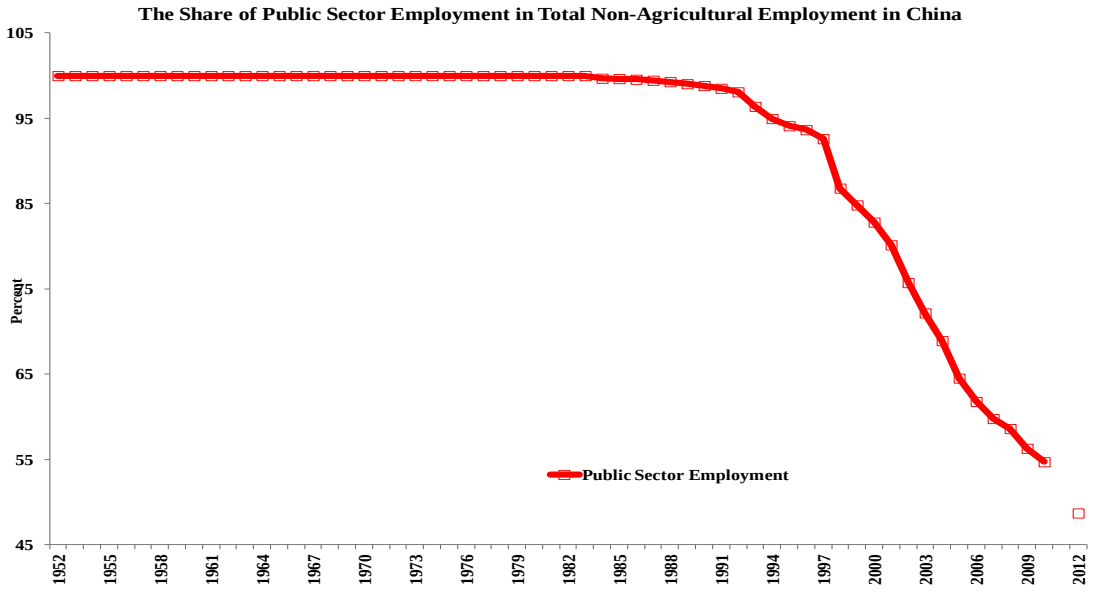
**9. The Monopsonistic Labor Market in China**

Before the economic reform of 1978, the Chinese Government was the sole employer for workers in China and could set the wage rates for all workers in the urban areas. As the sole employer, the Chinese government exercised its monopsonistic power and pursued a low-wage policy, resulting in a low share of labor in GDP. The low-wage policy was designed to increase national savings so that the needed investments can be financed. The objective of the low-wage policy was similar to the "price scissors" policy of maintaining a large gap between industrial prices and agricultural prices adopted by the former Soviet Union.

Even after the economic reform of 1978, the Chinese central government, together with all the local governments, its affiliated units, and the state-owned enterprises, has remained the largest employer in China and continued to exercise its monopsonistic power to keep the wage rates low. Even in 2010, Chinese private employers still accounted for less than half of the total Chinese employment of workers. The low wage rate paid by the largest employer have kept the wage rates paid by the other employers low (see Chart 32).

[3] In Chinese, "Xinren Xinbanfa, Jiuren Jiubanfa (新人新办法, 旧人旧办法)".

**Chart 32: The Share of Public Sector Employment in Total Non-Agricultural Employment in China**




This low-wage policy has had two effects: first, it has kept both the labor share (and the household share) of GDP low; and secondly, it has created large profits for state-owned as well as private enterprises. The low household share of GDP has in turn resulted in a lower Chinese household consumption to GDP ratio, currently between 30 and 40 percent, than in most other economies with a comparable real GDP per capita, because the Chinese households have less disposable income to spend. The saving rate of Chinese households out of their disposable income may be estimated at approximately 30%, comparable to ethnic Chinese households in the economies of Hong Kong and Taiwan. The large profits of the enterprises, both state-owned and private, have resulted in a higher national saving rate in China than in most other economies, because the enterprises, especially the state-owned enterprises, declare little cash dividends and save and re-invest almost 100 percent of their profits. It has been recently reported that the wages and salaries of civil servants will be raised by almost 60%. This is great news. It will not only lead to a significant increase in the consumption of their households but also to a general increase in wages and salaries across the board.

## 10. The “Wild Geese Flying Pattern”--The Further Advantage of China’s Size

Professor Kaname Akamatsu (1962) was the first to introduce the metaphor of the "wild-geese-flying pattern" of East Asian economic development, which suggests that industrialization will spread from economy to economy within East Asia as the initially fast-growing economies, beginning with Japan, run out of surplus labor and face labor shortages, rising real wage rates, and quota restrictions on their exports, and need to relocate some of its industries to lower-cost economies. The fastest-growing economy will thus slow down and a lower-cost economy will take over as the fastest-growing economy.

Thus, East Asian industrialization spread from Japan to first Hong Kong in the mid-1950s, and then Taiwan in the late 1950s, and then South Korea and Singapore in the mid-1960s, and then Southeast Asia (Thailand, Malaysia, Indonesia) in the 1970s, and then to Guangdong, Shanghai, Jiangsu and Zhejiang in China as China undertook economic reform and opened to the world beginning in 1978. During this industrial migration, the large trading firms such as Mitsubishi, Mitsui, Marubeni and Sumitomo of Japan and Li and Fung of Hong Kong played an important role as financiers, intermediaries, quality assurers, and managers of logistics and supply chains.

However, this metaphor actually applies not only to East Asia but also to China itself because of its large size. Within China, industrialization first started in the coastal regions and then would migrate and spread to other regions in the interior—to Chongqing, Henan, Hunan, Jiangxi, Shaanxi and Sichuan—as real wage rates rose on the coast. As the coastal regions began to slow down in their economic growth, the regions in the central and western regions of China would take their turns as the fastest growing regions in China. China as a whole will therefore be able to maintain a relatively high rate of growth for many more years to come.

## 11. China as a Surplus Economy

With a high domestic investment rate of over 40% of its GDP, China in the early 2000s has begun to evolve into not only a surplus labor economy but also a surplus capital economy. The high domestic investment rate, enabled by a high national saving rate, has resulted in massively excess manufacturing capacities almost everywhere—in coal, steel, cement, glass, ship-building, aluminum, solar panels, etc. The average capacity utilization rate in many manufacturing industries is around 70%.

Given the excess manufacturing capacities, Chinese real GDP going forward is actually not supply-constrained but aggregate demand-determined. As long as there is aggregate demand, there will be sufficient supply forthcoming to meet the demand. However, the growth of exports and fixed investment in manufacturing and residential housing can no longer be the principal drivers of the growth of Chinese aggregate demand.

How did the surplus economy come about? It came about because of massively excess fixed investment in manufacturing and in residential housing. Fixed investment in manufacturing was undertaken by both state-owned and private enterprises without regard to its potential rate of return, often supported by local government officials eager to increase local real GDP and employment. Fixed investment in residential housing was undertaken by developers at the local level, often also with the support of local governments.

Since the performance of Chinese local government officials are judged by key performance indicators which include the growth of the local GDP and employment, they have a strong incentive to do whatever is possible during their term of office to increase both. Beginning in the early 2000s, the local government officials began to realize that they could make use of the land under their control to finance the development of local manufacturing industries, such as steel, cement and glass as well as residential housing. In order to protect the local manufacturing industries that were established with their support, the local governments imposed, illegally, effective bans on the use of competitive manufactured products of non-local origin within their respective jurisdictions. Moreover, since a local government official is usually promoted to a different locality at the end of his or her term, he or she is not too concerned with the longer-term viability of these fixed investments in manufacturing, leaving them for the successor to deal with. Private enterprises also participated in making fixed investment in manufacturing and in residential real estate development, either with the support of local government officials or with loans made possible by a loose credit culture. Furthermore, many residential real estate developments are financed by pre-sales of units yet to be constructed rather than by construction loans from commercial banks.

Thus, as long as there is growth in Chinese aggregate demand, the Chinese economy should be able to continue to grow at an average annual rate of between 6.5 percent and 7 percent for the next five to ten years, more or less independently of

what happens in the rest of the world. The growth of Chinese aggregate demand will come principally from domestic demand, consisting of public infrastructural investment, public goods consumption, and household consumption. Public infrastructural investment will consist of high-speed railroads, urban mass-transit systems (China and the world cannot afford "a car in every garage"); facilities for the support of universal free or low-cost internet access in urban areas; and affordable housing through urban slum clearance and renewal. Other public infrastructural projects can include the construction of sea water desalination plants as an alternative source of fresh water supply in the coastal areas in northern China and storage facilities for a national strategic petroleum reserve. Continually rising urbanization can not only increase the demand for public infrastructure and housing, but also promote the growth of the service sector, on both the supply and the demand sides. Public goods consumption (including the necessary related investments) can consist of education, health care, care for the elderly, and environment control, preservation and restoration--securing cleaner air, water and soil. Household consumption, especially from the fast expanding and rising middle class, has actually been growing quite rapidly since the first quarter of 2009. The rates of growth of real retail sales have been running at approximately one and a half times the rates of growth of real GDP. However, it will be a long time before Chinese household consumption can become the principal driver of Chinese economic growth. The share of disposable household income in Chinese GDP was approximately 43% in 2014. Even if the household saving rate declines to zero, household consumption cannot possibly exceed 50% of GDP, compared to between 65% and 70% for developed economies.

Both public infrastructural investment and public goods consumption require the leadership and support of the central and local governments. While expenditures on public goods consumption, including the necessary related investments, will count as GDP, much of the benefits of these expenditures may not be pecuniary, for example, cleaner air, water and soil, better education, better national health, etc., and may not be fully reflected in the conventional measurement of GDP. However, the increase in general social welfare as a result of these expenditures is definitely real. Moreover, increasing public goods consumption is an effective method of redistribution in kind. For example, since everyone breathes the same air, if the air is cleaner, both the wealthy and the poor benefit equally; and better access to health

care may benefit the lower-income households more. Expansion of public goods consumption can thus also reduce the real income disparity.

In order to reduce the further growth of excess manufacturing capacity, one must reduce the moral hazard in borrowing and hence in investing. Vigorous enforcement of loan collection and bankruptcy laws and prosecution of bribery and financial fraud will help to reduce moral hazard. However, a change in the set of "key performance indicators" for the local government officials may also be necessary, so that the production and supply of public consumption goods such as the environmental enhancement (air, water and soil quality), education, health care, elderly care, and long-term economic viability and sustainability are also taken into account in addition to short-term growth in real GDP and employment.

**12. The Importance of Expectations**

Expectations of the future are important determinants of enterprise and household behavior, which in turn determines whether an economy grows or stagnates. Expectations often have the ability to be "self-fulfilling." If everyone believes that the economy will do well and act accordingly, by investing and consuming, the economy will indeed turn out to do well, and vice versa. The Chinese central government has the proven credibility to change expectations through its plans and actions.

In 1989, there was the June 4 incident, as a result of which economic growth ground to a virtual halt in the years that followed. However, in early 1992, Mr. Deng Xiaoping undertook his famous southern tour, urging people everywhere to take advantage of the opportunity to invest, which changed expectations in the entire country overnight. Enterprises started investing and households started consuming. As a result, 1992, 1993 and 1994 were boom years. In 1997, at the height of the East Asian currency crisis, Premier ZHU Rongji held the Renminbi/US$ exchange rate steady amidst the external chaos, and thus managed to maintain the confidence of the investors and consumers about China's economic future, and succeeded in keeping the economy growing. In 2008, after the collapse of Lehman Brothers, the export orders received by Chinese enterprises declined by 50 percent overnight, because of the frozen banking sector in the U.S. and other developed economies, creating widespread panic. Barely six weeks later, Premier WEN Jiabao launched the 4 trillion Yuan

economic stimulus program, which once again helped to hold the confidence of Chinese enterprises and households in their economic future and changed their expectations. The Chinese economy has continued growing since.

In all of these cases, the Chinese government was able to turn around the very negative expectations about the future of the Chinese economy into positive ones, and in so doing greatly reduced the uncertainty pertaining to the future and increased general business confidence. These changes in turn fueled investment booms that resulted in the subsequent economic growth. Expectations will continue to play an important role in the Chinese economy. A strong central government with the power to mobilize aggregate demand can credibly change expectations in a positive direction to keep the economy growing.

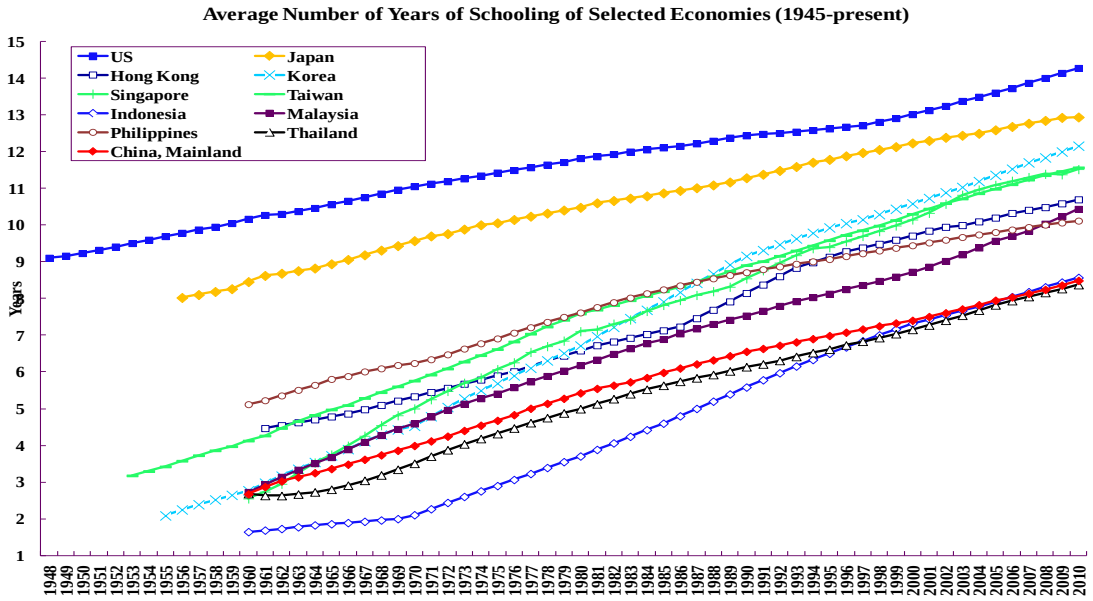
**13. The On-Going Economic Challenges**

Despite its record of great success during the past thirty-six years, the Chinese economy still faces many significant on-going challenges: the rapidly aging population, corruption, rising income disparity, environmental degradation, excess manufacturing capacity, excess supply of residential real estate, shadow banking, local government debt, the deficit in human capital and the innovation gap, to name only a few. However, a hard landing of the Chinese economy seems unlikely. The principal challenge facing the Chinese economic policy makers is not so much the growth of real GDP but employment. In 2013, 13 million new jobs were created. In 2014, 10 million new jobs were created. The employment target is achievable because the service sector (46.1% by GDP and 38.5% by employment) is now larger and growing faster than the manufacturing sector (41.9% by GDP and 30.1% by employment). An expansion of the service-sector GDP creates 30% more employment than an expansion of the manufacturing-sector GDP by the same amount and requires much less fixed investment. Space does not allow a discussion of all of the economic challenges. We shall focus on the two challenges that have the most significant implications for long-term economic growth—the deficit in human capital and the innovation gap.

First, we examine the Chinese deficit in human capital relative to other economies. 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 Chart 33,

the average number of years of schooling of the working-age population is compared across selected economies. By this measure, the United States and Japan are clearly the 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 human capital, but China has been expanding its tertiary education sector rapidly and can be expected to catch up to the levels of the developed economies by 2020 or so.

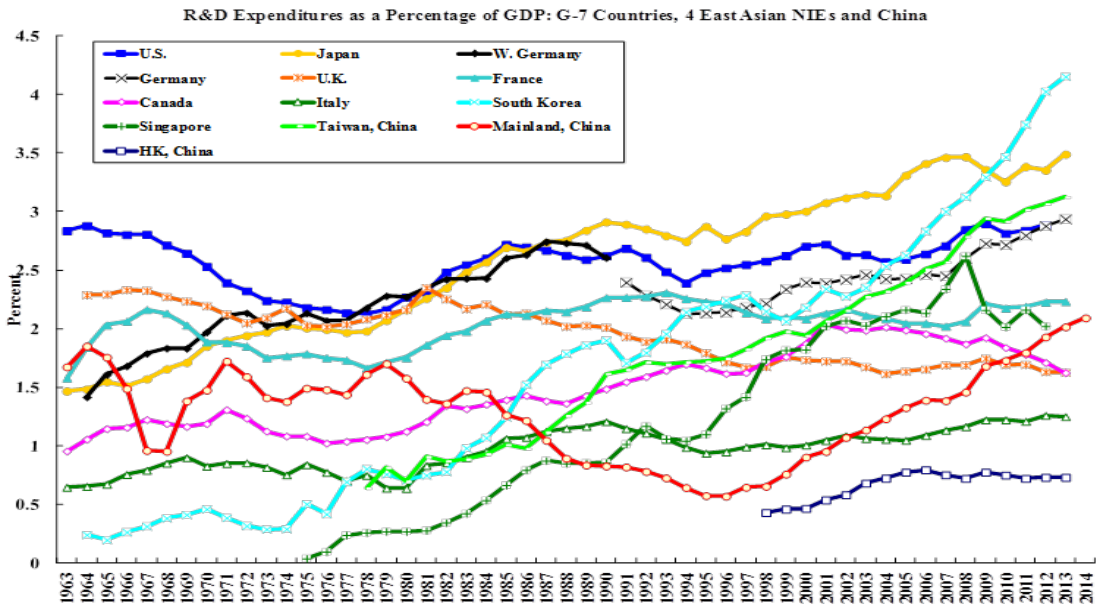
**Chart 33: Average Number of Years of Schooling of the Working-Age Population, Selected Economies (1945-present)**




Second, we examine the innovation gap between China and the developed economies. Investment in R&D capital is important for promoting innovation (technical progress). China has also begun to invest more heavily in R&D in recent years—its R&D expenditure has been rising rapidly, both in absolute value, and as a percentage of GDP; but it still lags behind the developed economies as well as the newly industrialized economies of East Asia. (The Chinese R&D Expenditure/GDP ratio is targeted to reach 2.2% in 2015, still below the historical average of 2.5% for the U.S.) The Republic of Korea currently leads the world with the percentage of its

GDP expended on R&D exceeding 4%, followed by Japan, with an average ratio of 3% over the past quarter of a century (see Chart 34).[4]

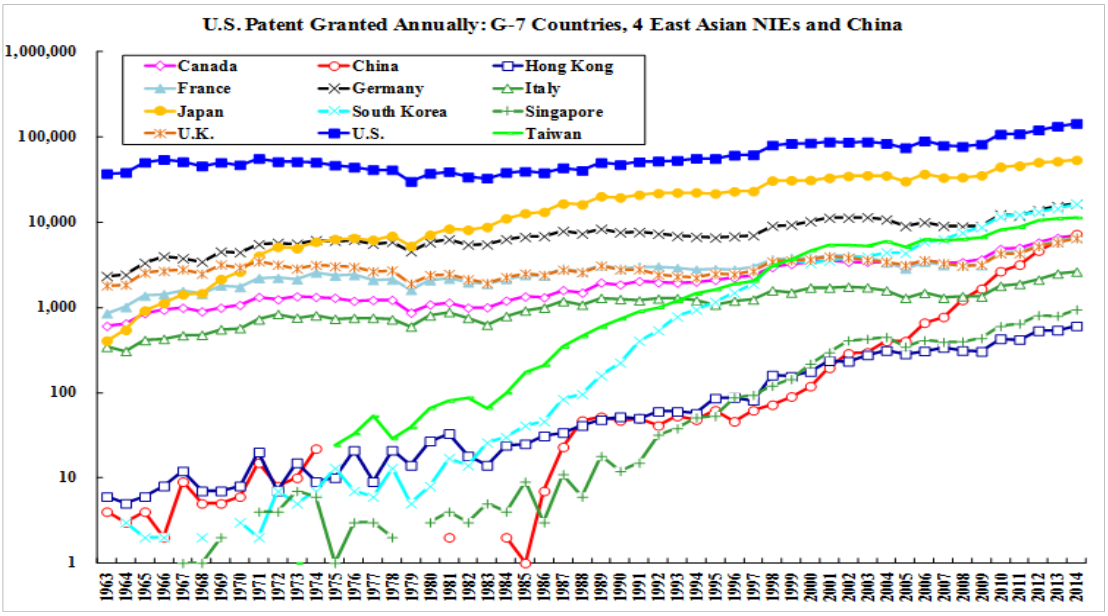
**Chart 34: R&D Expenditures as a Ratio of GDP: G-7 Countries, 4 East Asian NIES & China**




One indicator of the potential for innovation, or national innovative capacity, is the number of patents created each year. In Chart 35, the number of patents granted in the United States each year to the nationals of different countries, including the U.S. itself, over time is presented. The U.S. is the undisputed champion over the past forty years, with 144,621 patents granted in 2014, followed by Japan, with 53,849. (Since these are patents granted in the U.S., the U.S. may have a home advantage; however, for all the other countries and regions, the comparison across them should be fair.) The number of patents granted to Chinese applicants in the United States each year has increased from the single-digit levels prior to the mid-1980s to 7,236 in 2014. The number of domestic patents granted to domestic applicants in China reached 185,000 in 2014, a number second only to Japan (225,571 in 2013) in terms of domestic patent grants to domestic applicants. China aims to increase the stock of Chinese patents in force held by Chinese nationals from 4 per 10,000 inhabitants in 2013 to 14 per 10,000 inhabitants by 2020. However, it is not clear whether these patents are all comparable in quality to those approved in the U.S.

[4] The discussion on R&D is based on Lau and Xiong (2015) as well as their unpublished research.

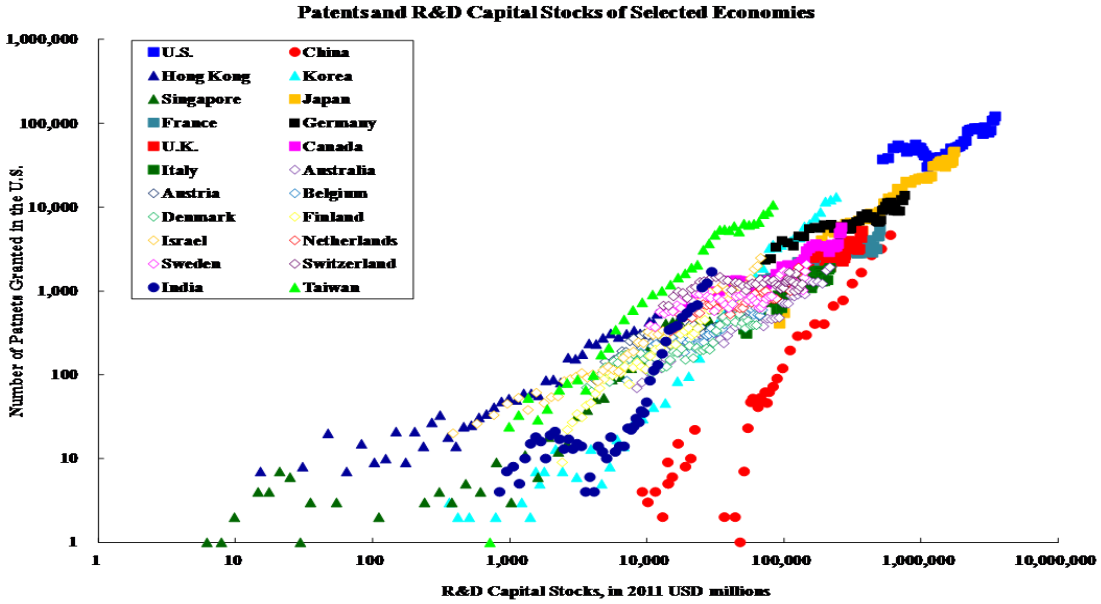
**Chart 35: Patents Granted in the United States: G-7 Countries, 4 East Asian NIEs & China**




The stock of R&D capital may be defined as the cumulative past real expenditure on R&D less depreciation of 10% per year. It should quite properly be treated as capital since R&D efforts generally take years to yield any results. Since China has had both a much lower R&D expenditure to GDP ratio and a much lower GDP than the United States and other developed economies in the past, it will take more than a couple of decades before the Chinese R&D capital stock can catch up to the level of U.S. R&D capital stock. In 2013, Chinese R&D capital stock was only US$ 727 billion (in 2013 prices) compared to the United States' US$ 3.7 trillion. On per capita terms, China would be even further behind.

The stock of R&D capital can be shown to have a direct causal relationship to the number of patents granted. (See Chart 36, in which the annual number of U.S. patents granted is plotted against the R&D capital stock of that year for each economy). Chart 36 shows clearly that the higher the stock of R&D capital of an economy, the higher is the number of patents granted to it by the U.S. It will take at least a couple of decades before the level of Chinese R&D capital stock can catch up to that of the U.S. and hence to the number of U.S. patents granted each year.

**Chart 36: Patents Granted in the United States and R&D Capital Stocks, Selected Economies**




However, successful innovation also depends on the existence of competition and free entry to markets. Monopolies are generally not very good in innovation and not very good in making full use of their own discoveries and inventions. China must create and maintain a competitive market environment with free entry and exit so as to encourage innovation in addition to investing in human capital and R&D capital. Moreover, in order to encourage innovation, China also needs to protect intellectual property rights vigorously, a direction in which it has been moving.

## 14. The Long-Term Economic Outlook

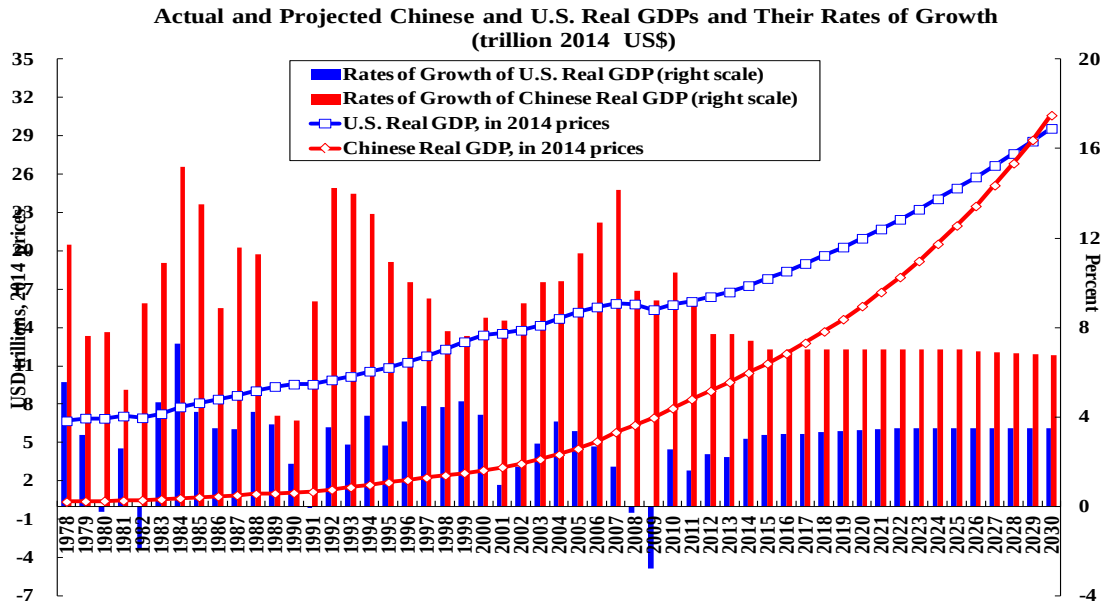
Going forward, will the Chinese economy continue to grow at close to 10 percent per annum in the future? The short answer is no, for many reasons. The target rate of growth under the "New Normal" is between 6.5 percent and 7 percent per annum. However, it is important to realize that because the Chinese economy is now much bigger--a 7-percent rate of growth today will generate an absolute increase in real GDP equivalent to what a 14-percent rate of growth would have done ten years ago. On the supply side, the Chinese economy will still have strong economic fundamentals--a high domestic saving rate, abundant labor, and a huge domestic market that enables the realization of economies of scale—for a couple of decades. Moreover, advances in the information and communication technology have enhanced

the positive effects of economies of scale even further. On the demand side, Chinese economic growth will be driven by the growth of its own internal demand, consisting of public infrastructural investment, public goods consumption as well as household consumption, rather than the growth of exports, or fixed investment in the manufacturing sector, or high-priced residential real estate.

In the medium term, say three to five years from now, economic stimulus is unlikely to be inflationary because of the excess manufacturing capacities already in place, especially if the economic stimulus is carefully targeted. In the longer term, there is still a great deal of room for Chinese GDP to grow. There is still significant surplus labor. Both the tangible capital and the intangible capital per unit labor in China are still relatively low compared to the developed economies. Moreover, there is substantial scope for improvement in human capital and R&D capital. China has also been gradually changing from its role as the world's factory to the world's new growth market. It is already the world's largest exporting country and is on its way to becoming the largest importing country in goods and services combined in a couple of years.

It is projected that the Chinese and the U.S. economies will grow at average annual real rates of approximately 7% and 3.3% respectively between 2015 and 2030 (see Chart 37). Chinese real GDP is projected to catch up to U.S. real GDP in approximately 15 years' time--around 2030, at which time both Chinese and U.S. real GDP will exceed US$28 trillion (in 2014 prices). This is approximately three times the Chinese GDP and not quite two times the U.S. GDP in 2014. By then, China and the U.S. will each account for approximately 15% of world GDP. One may consider that the projected rates of economic growth for China and the U.S. may be a little on the optimistic side. However, the year in which the two GDPs become approximately the same will not be too far off.

**Chart 37: Actual and Projected Chinese and U.S. Real GDPs and Their Rates of Growth**




By 2030, the Chinese real GDP per capita is projected to exceed US$21,000 (in 2014 prices), which would still be just a quarter of the projected then U.S. real GDP per capita of US$83,600. It will take around 45 years from now, almost till 2060, for China to catch up to the United States in terms of real GDP per capita. By that time, Chinese GDP is likely to be more than three times the U.S. GDP, and will account for perhaps 30 percent of world GDP (depending on the rates of growth of other economies, especially the developing economies of today), the same percentage of world GDP that China had in the early 19th Century, according to an estimate made by Professor Angus Maddison (2006).

## 15. Concluding Remarks

The highly successful experience of Chinese economic growth over the past 36 years (as well as those of other East Asian economies) strongly reaffirm 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 favorable factor allowing the ready realization of economies of scale and reducing vulnerability to external disturbances. However, these favorable factors alone were not sufficient, as the Chinese economy did not experience sustained economic growth between 1949 and 1978.

Economic reform and opening to the world in 1978 allowed the realization of the surplus potential output, helped to enhance and assure the efficiency of the Chinese economy and facilitated technology transfer from abroad. It is the unique achievement of China that in its transition from a closed centrally planned economy to an open market economy, it was able to use a "Dual-Track" rather than the "Big-Bang" approach, which ensured the success of reform without creating losers. Such a strategy maximized support, minimized opposition and preserved social stability. It led to win-win for all. Moreover, the "Dual-Track" approach also enabled the economy to achieve full economic efficiency. As a result, the Chinese economic transition was smooth, stable, successful and sustainable.

Chinese economic growth during the past 36 years can also be 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 speed of Chinese economic growth can be sustained longer than in other East Asian economies principally because of the size of the Chinese economy and its surplus labor and more recently its surplus capital.

Continuing economic growth going forward will depend mostly on the growth of internal demand (infrastructural investment, public goods consumption and household consumption) and not on exports and not on fixed investment in manufacturing capacity in the existing industries or residential real estate. China is a large continental country like the United States and will similarly develop into a largely internal-demand driven economy. International trade and international investment will not have a decisive impact on the Chinese economy in the future. Eventually, Chinese exports as a percent of its GDP should be relatively low, in the teens. Chinese economic growth will be marginally, but not critically, affected by a large decline in its exports, as demonstrated by its experience in the past several years as well as during the 1997-1998 East Asian currency crisis. Thus, it will be able to survive even prolonged economic recessions or stagnation in the European and U.S. economies.

Given the huge excess capacities in the Chinese manufacturing industries, in the time frame of the next five to ten years, Chinese real GDP, as mentioned above, will not be supply-constrained but will be primarily determined by aggregate demand. China should have no problem achieving a rate of real economic growth of between

6.5 percent and 7 percent. Thus, the goal of doubling real GDP per capita by 2020, declared in 2013, should be readily achievable. The "New Normal" is neither a "boom" of close to double-digit rates of growth, nor a "bust" of negative or low single-digit real rates of growth. There will be both sufficient supply and demand in the Chinese economy to support continuing growth.

Beyond that, on the basis of its strong economic fundamentals, China should also be able to continue to grow at about the same average annual rate for the following decade, more or less independently of what happens in the rest of the world. In the longer run, Chinese economic growth will make a transition from being driven by the growth in tangible inputs to the growth in intangible inputs and innovation.

Is the Chinese economy a miracle or a bubble? A bubble is a transitory and unsustainable phenomenon that is ready to self-destruct any time. But the Chinese economy has been growing at a sustained high real rate of almost 10% per annum for the past 36 years, and is expected to continue to grow between 6.5 percent and 7 percent per annum for another couple of decades. It cannot therefore possibly be a bubble. And the model of Chinese economic development has also been adopted and emulated, at least in part, by Vietnam, another economy in the process of transitioning from a centrally planned to a market economic system, with some degree of success. It is also a model for other potential transition economies such as Cuba, Laos and North Korea. As the Chinese economic development experience can be replicated and reproduced elsewhere, it cannot be considered a miracle either. What is not replicable is its economies of scale. The only economy that has the potential of benefitting from economies of scale to the same degree as China is India.

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