The Prospects of the Chinese Economy

by

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Working Paper No. 96

August 2022

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Acknowledgements

The Lau Chor Tak Institute of Global Economics and Finance is grateful to the following individuals and organizations for their generous donations and sponsorship (in alphabetical order):

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The Prospects of the Chinese Economy[§]

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Abstract: We begin with a review of the historical record, and show that between 1949 and 2021, the average annual rates of growth of Chinese real GDP and real GDP per capita are respectively 8.47% and 7.03%, an historically unprecedented achievement over such a long period. We then examine the economic fundamentals and show that there will be adequate supplies of capital, labour and human capital to support China's continued growth. However, increases in fixed-asset investments and government consumption are needed to supplement the increases in household consumption as sources of growth of Chinese aggregate demand. Our projections of the future suggest that the Chinese real GDP will catch up to the U.S. real GDP around 2030 but that the then Chinese real GDP per capita will still be less than a quarter of the U.S. real GDP per capita. The Chinese economy also faces significant potential challenges and risks in the next decade or so, including (1) the de-coupling of the Chinese and U.S. economies; (2) the unavailability of high-technology imports; and (3) economic fragmentation.

[1] Lawrence J. Lau is Ralph and Claire Landau Professor of Economics, The LAU Chor Tak Institute of Global Economics and Finance, The Chinese University of Hong Kong, and Kwoh-Ting Li Professor in Economic Development, Emeritus, Stanford University. This essay draws, in part, on an earlier article of the author's, published in English as "Public Goods Provision and Chinese Economic Development," China and the World: Ancient and Modern Silk Road, Vol. 5, No, 1, March 2022.

The opinions expressed herein are those of the author and do not necessarily reflect the views of the Institute.

1. Introduction

It is my honour and pleasure to contribute this paper in celebration of Prof. YANG Chen Ning's 100th Birthday. Prof. YANG is not only one of the greatest scientists of our age, but also a true patriot--he has always been concerned about the livelihood and welfare of the Chinese people. This essay is dedicated to Prof. YANG and to reassure him that the Chinese economy is alive and well and will continue to grow and prosper for years to come.

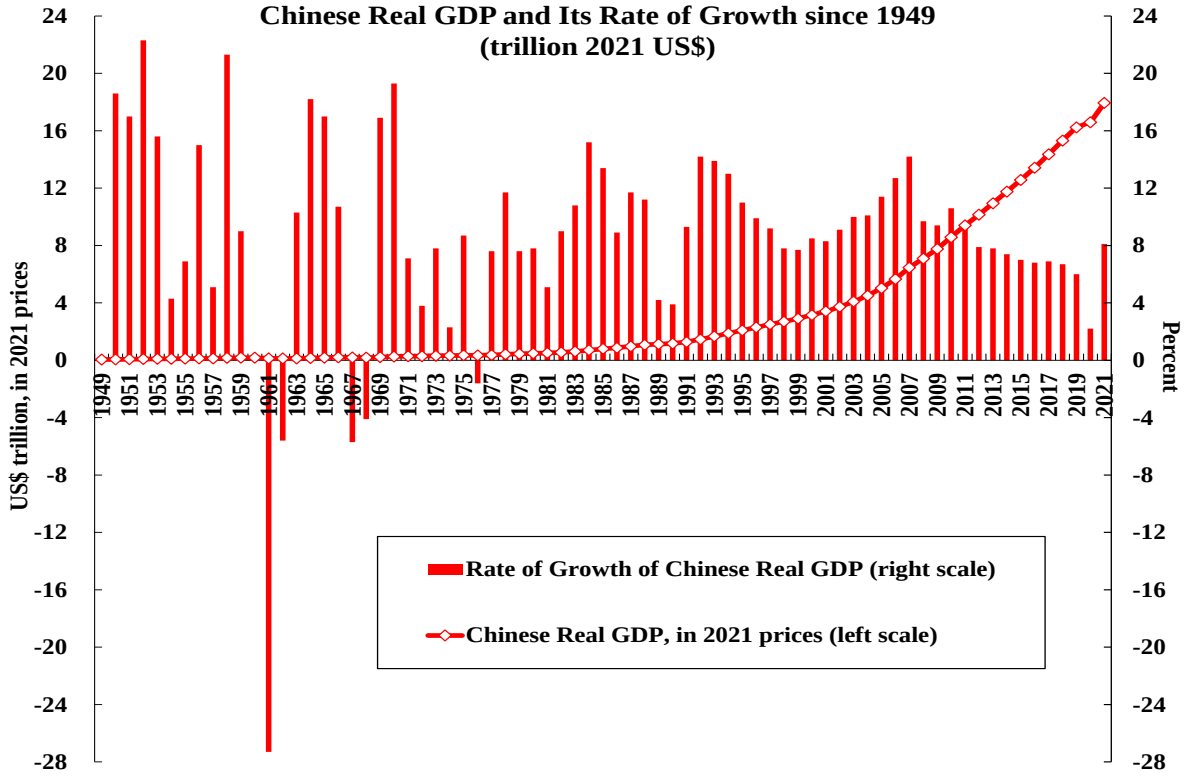
In 2004, soon after I began my term as the Vice-Chancellor of The Chinese University of Hong Kong, I was interviewed by Ms. Liu Qingfeng (劉青峰) on the "Prospects for the Chinese Economy in the Twenty-First Century", which was subsequently published in Twenty-First Century Bimonthly (二十一世紀評論). I am very pleased to have the opportunity to revisit this question and to be able to say that what I said then has mostly come true.

2. Review of the Historical Record

Between 1949 and 2021, Chinese real GDP grew from 329 billion Yuan (US$51.55 billion[2]) to 114.4 trillion Yuan (US$17.94 trillion), in 2021 prices, an almost 350-fold increase (see Figure 2-1). During the same period, Chinese real GDP per capita grew more than 130-fold, from 607 Yuan (US$95.2) to 80,962 Yuan (US$12,699), in 2021 prices (see Figure 2-2).

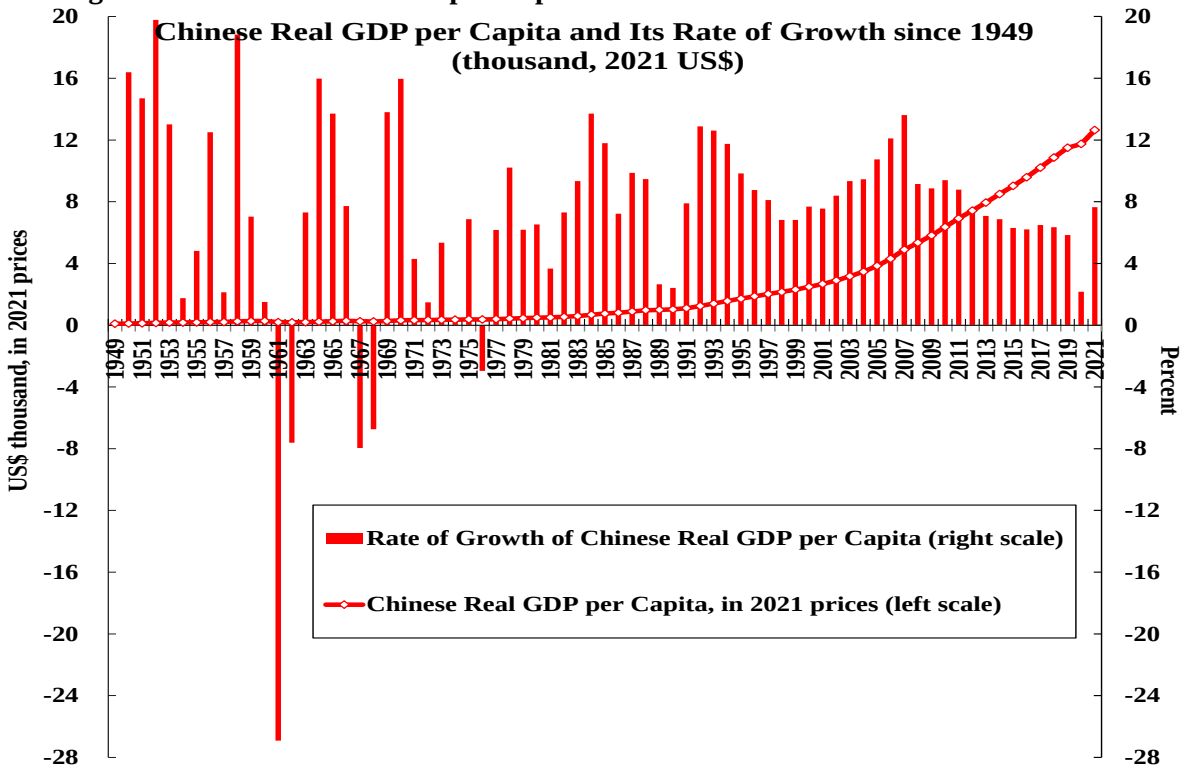
[2] The values in US$ are obtained by converting the values in Yuan in 2021 prices at the market US$/Yuan exchange rate at the end in 2021.

Figure 2-1: Chinese Real GDP and Its Annual Rate of Growth: 1949-2021



Sources: Rates of growth of real GDP from 1950 to 1952 are from National Bureau of Statistics of China (1959). Chinese GDP and its rate of growth from 1952 to 2021 are from the online statistical database of National Bureau of Statistics of China.

Figure 2-2: Chinese Real GDP per Capita and Its Annual Rate of Growth: 1949-2021



Sources: Same as Figure 2-1; Chinese population data from 1949 to 2021 are from the online statistical database of National Bureau of Statistics of China.

Despite the significant fluctuations and volatility of the rates of growth during the two decades from the late 1950s to the late 1970s, which are clearly apparent in both Figures 2-1 and 2-2, the average annual rates of growth of real GDP and real GDP per capita for the entire period from 1949 to 2021 are respectively 8.47% and 7.03%, a truly remarkable and historically unprecedented achievement over a period of more than seven decades. We can attribute this success largely to the economic reform and opening to the world undertaken in 1978, as well as to the long time horizon of the Chinese economic policy makers and their single-minded focus on economic growth from 1978 onwards. With a long enough planning horizon, one can afford to undertake investments in development-leading infrastructure, that is, infrastructure the demand for which has not yet materialised but can be created by the supply itself--infrastructure that may take a long time to fully pay off and is most unlikely to be privately funded.

Between 1978, the beginning of the Chinese economic reform and opening-up, and 2021, Chinese real GDP grew more than 40-fold, from 2.65 trillion Yuan (US$415 billion) to 114.4 trillion Yuan (US$17.94 trillion), in 2021 prices, and real GDP per capita grew almost 30-fold, from 2,749 Yuan (US$431.2) to 80,962 Yuan (US$12,699). During this period of more than four decades, there was not one single year in which the rate of growth of real GDP or real GDP per capita turned negative. The average annual rates of growth of real GDP and real GDP per capita for the post-reform period from 1978 to 2021 are respectively 9.15% and 8.18%, even higher than the average annual rates of growth achieved since 1949. However, the income distribution did become much more unequal during the post-reform period. But despite the significant rise in the value of the Gini coefficient[3] in China since the mid-1980s, the welfare of all Chinese people has also improved significantly.

The Chinese GDP of US$17.94 trillion in 2021 was 78 percent of the U.S. GDP of US$23.0 trillion, making China the second largest economy in the world, just after the U.S.[4] However, the Chinese GDP per capita of US$12,699 remained far behind, at only 18.4 percent of the U.S. GDP per capita of US$68,971, giving China a rank in the eighties among all economies in the world.

[3] The Gini coefficient is a measure of the degree of inequality of the personal income distribution of an economy--the more unequal the income distribution is, the higher the value of the coefficient.
[4] In terms of "Purchasing Power Parity (PPP)" international prices, the Chinese GDP already surpassed the U.S. GDP in 2017, according to the International Monetary Fund and the World Bank.

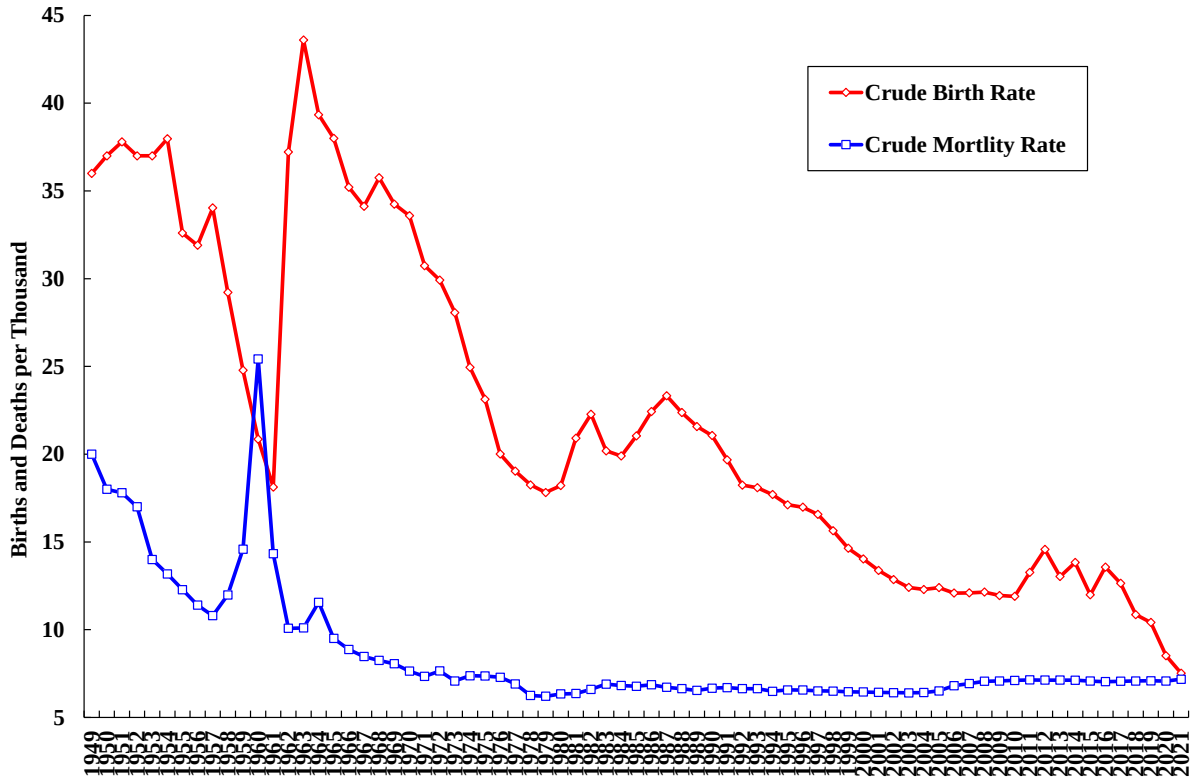
3. The Economic Fundamentals

We now turn to consider the Chinese economic fundamentals. Are there sufficient primary inputs of production—capital and labour—to continue to support Chinese economic growth? The Chinese national savings rate has remained high, currently at approximately 45 percent, certainly the highest in the world amongst major economies. This means that the Chinese investment rate can also remain high, even in the absence of inflows of foreign direct investments or foreign loans. However, recent Chinese demographic developments appear unfavourable—its population is ageing rapidly, with almost zero net growth. But, as will be explained below, the labour supply problems are basically manageable.

The Chinese national savings rate rose from 21.1% in 1952 to 36.8% in 1979 and 45.7% in 2020. It will remain high and provide the necessary resources for additional investments in fixed assets, including infrastructure, human capital, research and development (R&D), and the provision of public goods such as education, healthcare, environmental preservation, protection and restoration, elderly care and poverty alleviation. Household consumption will rise as household income continues to grow and more and more households join the ranks of the middle class. However, as shares of GDP, both household consumption and total consumption (including government consumption) have been on a downward trend for the past sixty years. As of 2020, they were respectively less than 40% and 60% of GDP. Left on their own, they are probably not sufficient to shore up the aggregate demand needed for the economy to continue its growth.

The Chinese crude death rate declined almost continuously from 2.0% in 1949 to 0.72% in 2021, reflecting the general improvements of the economic and public health conditions in China, with the exception of the period of the Great Famine (1959-1961), when it briefly rose above 2.5%. The Chinese crude birth rate also declined from 3.60% in 1949 to 0.75% in 2021, barely above the then crude death rate (see Figure 3-1). This was due, in part, to the rising educational level of women and urbanisation, as well as to the legacy of the "one-child" policy, which was implemented in 1980 and discontinued in 2016.

Figure 3-1: The Crude Birth Rate and Death Rate (Number per Thousand)



Source: National Bureau of Statistics of China.

While the net rate of growth of the total population, the difference between the crude birth and death rates, has been approaching zero (see Figure 3-1), and may even turn negative soon, it is unlikely to result in a serious shortage of labour as yet. The demand for labour can be satisfied through continued urbanisation, that is, by the movement of surplus labour from the rural to the urban areas. Despite the claim that the "Lewis Turning Point" has arrived in China, there still exists substantial surplus labour. The primary (agriculture) sector, which generated only 7.3% of GDP but accounted for 23.6% of total employment in 2020, is still in a position to supply labour to the secondary (manufacturing, mining and construction) and tertiary (service) sectors without affecting its own output.

In addition, the mandatory retirement ages, which have officially remained at 55 for women and 60 for men, an anachronism inherited from the early 1950s, when life expectancy was in the low sixties, are ready for a change. The gradual raising of the mandatory retirement ages, given the current life expectancy at birth of more than 77 years, should help to augment the labour force. In the transition to a new mandatory retirement age of say 65 for all, one can make retirement at 55 for women and 60 for men optional for ten years, so that no one's existing

rights will be abridged.[5] Moreover, the quality of the Chinese labour force has also been improving significantly through various investments in education and public health over the past decades. There has been a significant growth in the quantity of human capital in the Chinese economy (see Section 4 below). Thus, the "efficiency-equivalent" quantity of the labour force continues to grow even though numerically the labour force may no longer be growing. Finally, the adoption of automation and robotics through the application of artificial intelligence can also enhance the effective labour force. The recent elimination of restrictions on the number of children and the possible lowering of the marriage-eligible ages should also help to increase the Chinese birth rate gradually, but it will take a couple of decades before there will be a noticeable impact on the labour force.

China has also been increasing its investment in research and development (R&D), which reached 2.44% of GDP in 2021. Since 2014, it has also strengthened intellectual property right protection significantly by establishing special intellectual property courts with sole nationwide jurisdiction on such matters. The numbers of patents awarded to Chinese discoverers and inventors by respectively the United States Patent and Trademark Office (USPTO), the European Patent Office (EPO), and the China National Intellectual Property Administration (CNIPA), have all been increasing by leaps and bounds in recent years. China is now the recipient of the largest number of patent grants in the world from these three patent offices combined. Indigenous innovation has also been occurring in many areas, for example: 5G communication, the BeiDou Navigation Satellite System, high-speed trains, quantum communication, super-computers, and ultra-high-voltage transmission of electricity. In time, innovation or technical progress should also become an important source of Chinese economic growth.

With a large population and hence a large domestic market, China also enjoys the benefits of economies of scale from both production and marketing, and from learning-by-doing (that is, efficiency improvements resulting from repetitive production of the same good, such as high-speed trains). Moreover, it has the advantage of longer upper tails in the ability distribution because of the size of its population. Furthermore, as a large continental economy,

[5] Opposition to raising the mandatory retirement age also comes from those awaiting to succeed their supervisors. This opposition can be mitigated by instituting term limits for executive positions. For example, a medical doctor is allowed to serve as the head of a hospital for only two terms but can remain as a clinician at the hospital afterwards until the new mandatory retirement age is reached.

the domestic Chinese economy is largely unaffected by external disturbances, similar to that of the U.S. Thus, while the Chinese rates of growth of exports and imports fluctuate like other East Asian economies, the rate of growth of its real GDP has remained relatively stable. Going forward, the Chinese economy will be mostly driven by its own internal demand and not by exports, unlike the four newly industrialised economies of Hong Kong, South Korea, Singapore and Taiwan, and even Japan, but similar to that of the U.S.

4. The Growth of Human Capital

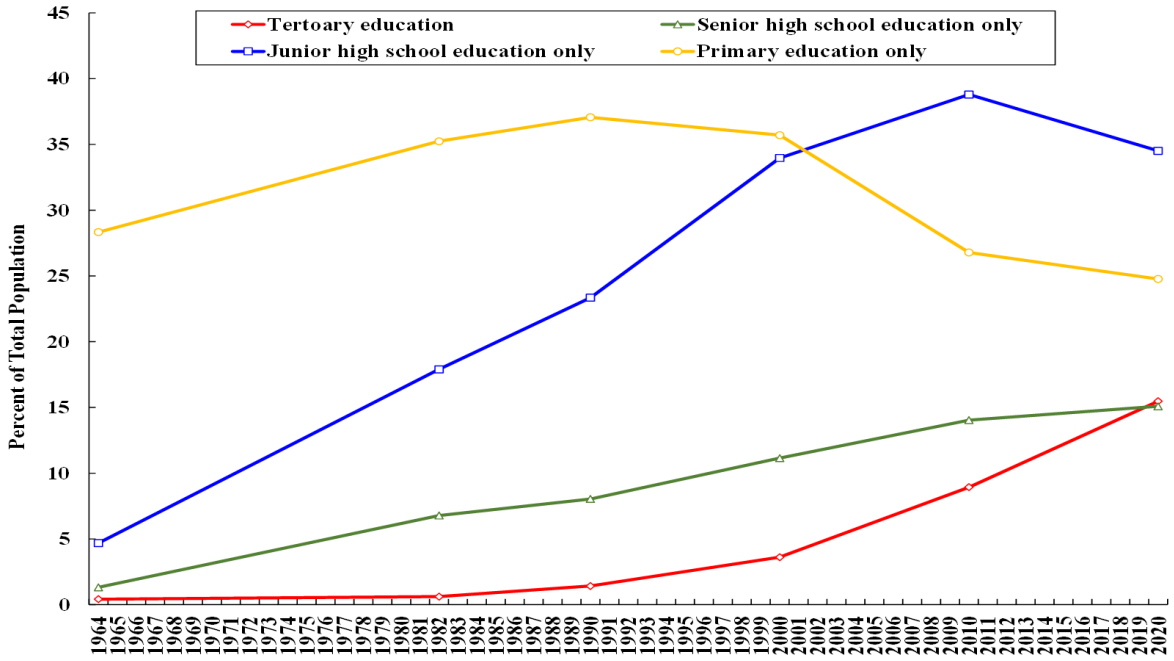
Human capital is also an important source of economic growth. The human capital of an economy is enhanced through education and improvements in public health. Traditionally, for at least a couple of millennia, the Chinese people have always valued education highly, in large part because it was one of the very few channels, if not the only channel, for upward social mobility through the official examination system. In the social hierarchy of old China, up to the early Twentieth Century, scholars were on the very top, followed by farmers, and then by labourers, with the merchants at the very bottom. Being wealthy alone did not improve social status or earn respect.

More generally, literacy and the promotion of Putonghua as the national dialect are clearly public goods because they enable all Chinese people to communicate with one another in both speech and writing. The literacy rate, which must have been way below 50% in 1949, increased from 66.4% in 1964 to 97.3% in 2020, thanks in part to the simplification of the Chinese characters undertaken in the 1950s and codified in 1964. The simplification has been subject to much criticism, some quite justifiable, but it did reduce the number of years of schooling required for an average person to be able to read a newspaper from eight to four years, a major accomplishment.

Mandatory nine-year education for all was introduced in China in 1986. Today, most young people have had at least 12 years of education, even though senior secondary education is still not yet mandatory at this time. The proportions of people with only primary education (the yellow line) or junior secondary education (the blue line) have already peaked and begun to decline (see Figure 4-1). The tertiary enrolment rate of graduates of senior secondary schools was 24.6% in 1989 and rose to 94.5% in 2016. This means almost everyone who wishes to attend a tertiary educational institution is now able to do so. (However, the proportion of the

population aged 18-22 that were enrolled in tertiary education institutions in 2021 was only 57.8%, because not everyone in that age cohort had completed senior secondary school.) The proportion of the total population with tertiary education (the red line), which was only 0.42% in 1964, rose to 17% in 2021, and is expected to increase further with time.[6]

Figure 4-1: Educational Attainment Rates



Source: China Statistical Yearbook 2021.

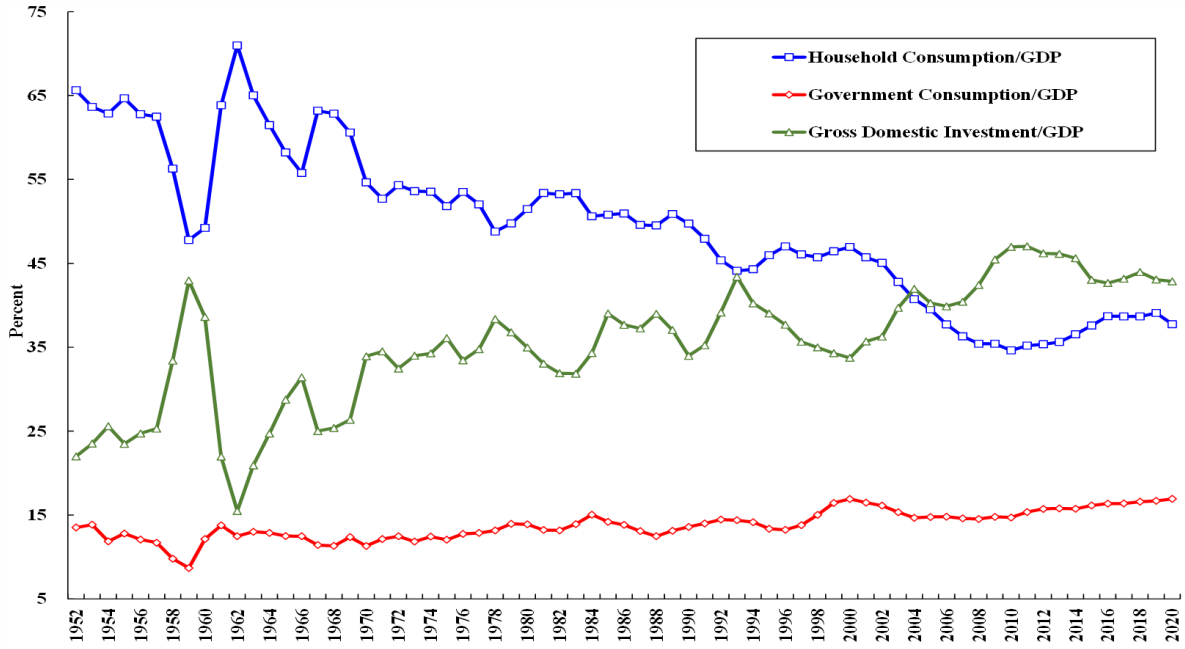
Much improvement has also occurred in healthcare and public hygiene in China. As mentioned above, the population mortality rate declined by more than half from 2.0% in 1949 to 0.72% in 2021. Life expectancy at birth, which was only 35 years in 1949 and 67.8 years in 1981, grew to 77.3 years in 2019, compared to 72.6 years for the world as a whole. Life expectancy at age 60 was 20.21 years in 2020.

[6] The 2021 figures are based on an announcement by the Ministry of Education on 17 May 2022.

5. Sources of Aggregate Demand

What are the sources of Chinese aggregate demand? They are household consumption, government consumption, gross domestic investment and net exports. The share of household consumption in aggregate demand (GDP) has been declining over time, from a peak of almost 71 percent in 1962 to less than 38 percent in 2020. Gross domestic investment, which includes real fixed-asset investment, has become the most important source of aggregate demand since 2004 (see Figure 5-1). It was just below 43 percent in 2020. The share of government consumption, which includes most public goods consumption, has been increasing slowly and gradually from 13.5 percent in 1952 to just below 17 percent in 2020. There is a great deal of room for both government investment and government consumption to grow, especially through increased public goods provision, such as clean air and water and affordable communication, transportation and power. Net exports will continue to decline in relative importance as a component of Chinese aggregate demand given the Chinese objective of a balanced international trade.[7]

Figure 5-1: The Percentage Distribution of the Sources of Aggregate Demand



Source: National Bureau of Statistics of China.

[7] The recent rise in the share of net exports in GDP was due, in part, to the disruptions caused by the COVID-19 epidemic worldwide.

In the short run, all increases in government expenditures have the same macroeconomic effects on both GDP and employment. However, in the long run, increases in real fixed-asset investments augment the real capital stock and increase the real GDP, whereas increases in consumption due to increases in disposable income through, for example, tax cuts and transfer payments, generate no direct lasting benefits. Infrastructural investment, which includes investment in communication, transportation, and power, is complementary to non-infrastructural fixed-asset investment because it can enhance the latter's rate of return. (Think of how a new highway can enhance and facilitate the expansion of trade among the enterprises located en route.) Infrastructural investment can generate benefits that can be widely shared in the economy even though they cannot be fully captured or internalised by the projects themselves. The existence of supporting infrastructure can make the markets even more efficient (the "visible hand" working with the "invisible hand").

In addition, many infrastructural investments in China are "development-leading" investments, with their supplies creating their own demands, as opposed to "development-lagging" investments, that is, investments that are undertaken only when the demands already exist. "Development-leading" infrastructural investments can generate significant externalities and enhance the returns of other fixed-assets investments both public and private.

Real fixed-asset investment, including real infrastructural investment, grew rapidly in China between 2008 and 2017, partly as a response to the Global Financial Crisis of 2008. Since 2017, their rates of growth have considerably moderated. The share of infrastructural investment in total fixed-asset investment ranged between a low of 30 percent and a high of 40 percent between 2003 and 2021, with an average of 35.8 percent. Infrastructural investment in communication and transportation has also helped to make the Chinese economy a single unified market, realising the huge benefits of its economies of scale.[8] However, infrastructural investment frequently generates benefits known as externalities that cannot be captured by the investment itself and hence must be financed or subsidised by the government.

The share of household consumption in household disposable income has also been declining over time, from over 90 percent in 1988 to 68.6 percent in 2021. Moreover, as China

[8] On 26 April 2022, in a meeting of the Central Committee of the Chinese Communist Party on financial and economic affairs, President Xi Jinping called for "all-out efforts to strengthen infrastructure construction" in the country.

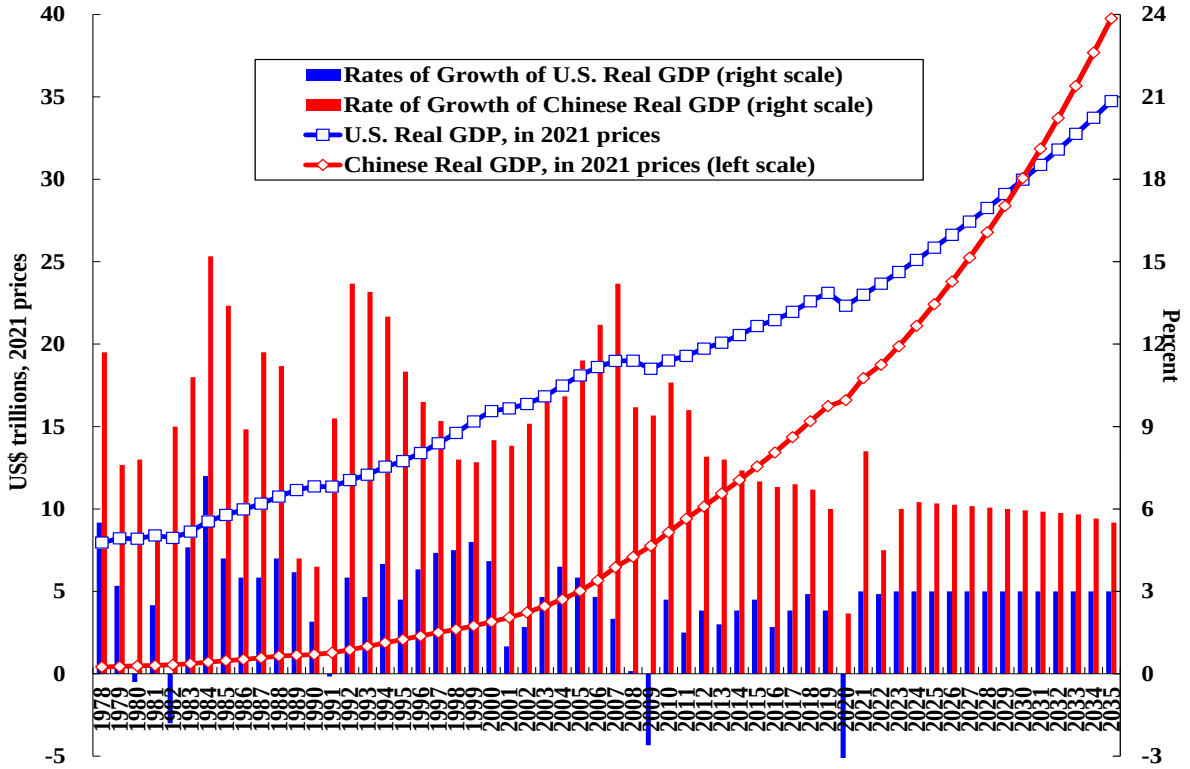
becomes increasingly urbanised, the share of household consumption in household disposable income is likely to decline further, since urban households have a higher propensity to save than rural households. In 2021, the shares of household consumption in disposable income were respectively 84.1 percent for rural households and 63.9 percent for urban households. Between 1949 and 2021, the share of rural population fell from almost 90 percent to slightly more than 35 percent. Thus, increases in household disposable income alone are not likely to be sufficient to increase household consumption significantly as a component of aggregate demand. Increases in fixed-asset investments and government consumption are needed. This is where infrastructural investment and public goods provision can make important contributions.

6. Projections of the Future

Our long-term projections of the levels and the rates of growth of Chinese and U.S. real GDPs and real GDPs per capita are presented in Figures 6-1 and 6-2. They are based on the assumption of a real rate of growth of the Chinese economy of between 4.5 and 6 percent per annum, and a real rate of growth of the U.S. economy of approximately 3 percent per annum, equal to its average rate over the past several decades. In our projections, we have taken into account the short-term negative effects of the recent surges in COVID-19 cases in China and the rising interest rate in the U.S. We assume that the Chinese economy will fall short of its target rate of growth of 5.5 percent for 2022.

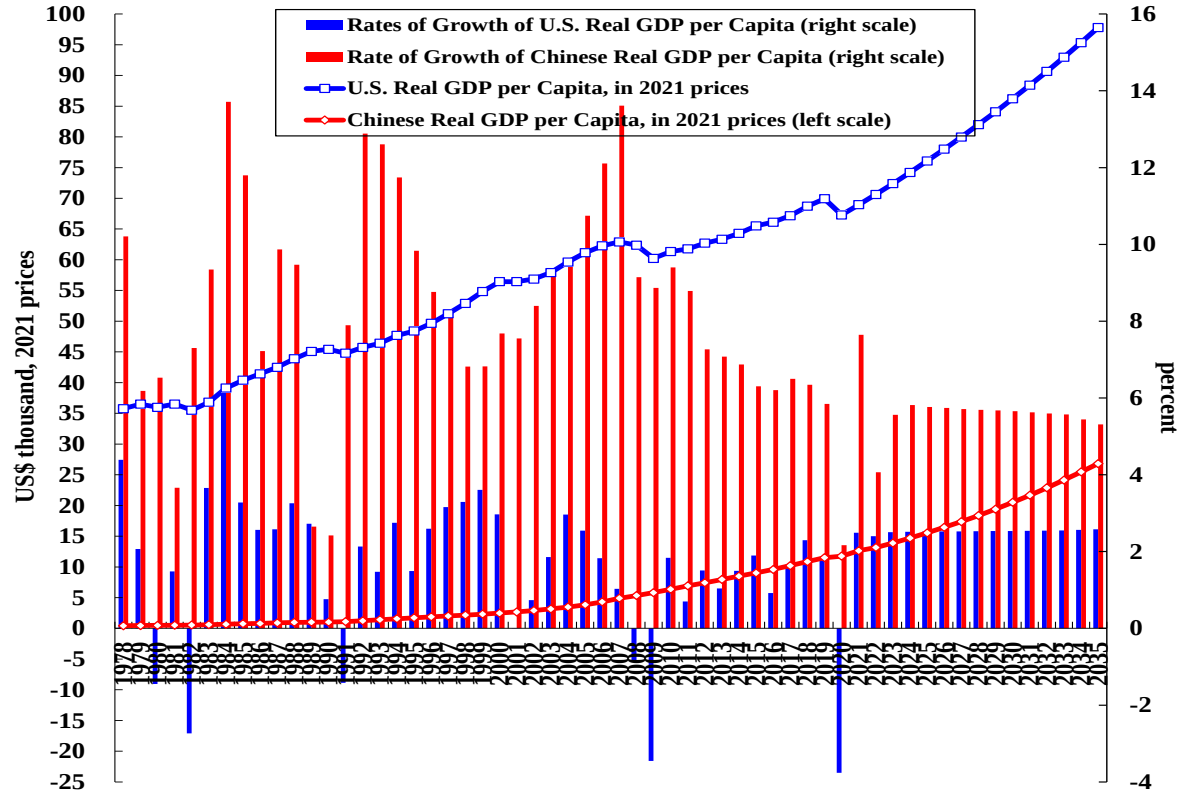
Our projections suggest that the Chinese real GDP will catch up to the U.S. real GDP around 2030, with US$30.07 trillion to the U.S.'s US$29.98 trillion (in 2021 prices). They also suggest that the Chinese real GDP per capita will still be significantly below the U.S. real GDP per capita in 2030, with US$20.5 thousands to the U.S.'s US$86.2 thousands (in 2021 prices), or less than a quarter.

Figure 6-1: Comparison of Actual and Projected Chinese and U.S. GDPs, 2021 US$, and Their Rates of Growth, 1978-2035



Source: Projections made by the author.

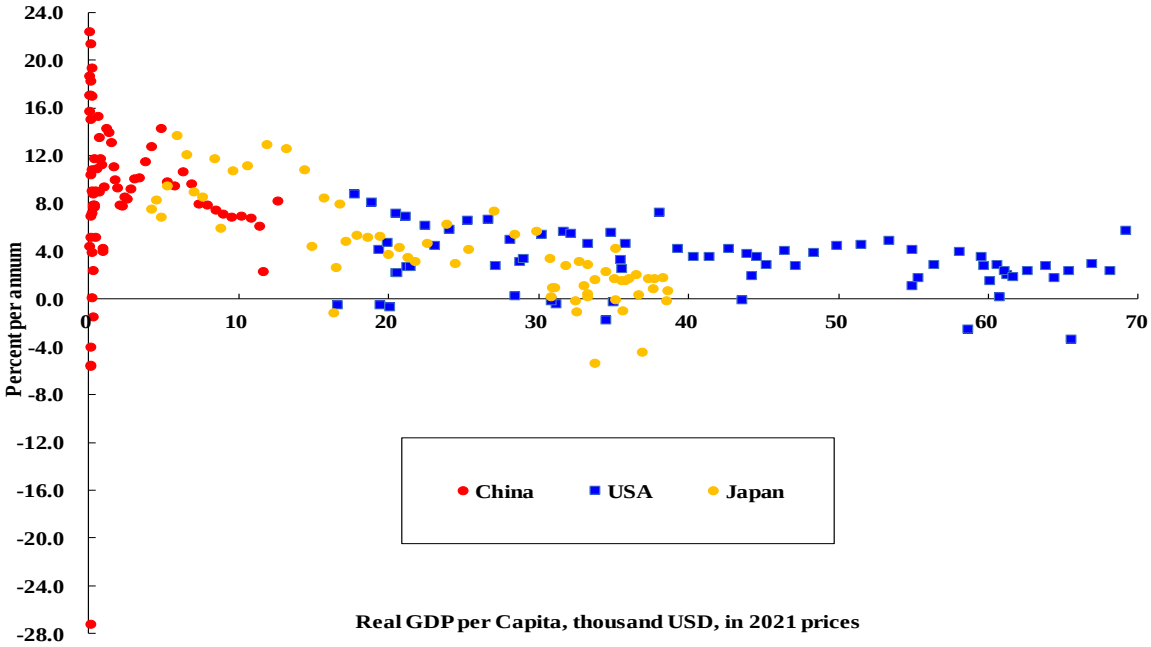
Figure 6-2: Comparison of Actual and Projected Chinese and U.S. GDPs per Capita, 2021 US$, and Their Rates of Growth, 1978-2035



Source: Projections made by the author.

It is clear that the real rate of growth of the Chinese economy has been declining over time (see Figure 2-1 from 2007 onwards) and will likely continue to do so. The Chinese economy cannot be expected to continue to grow at close to 10% per annum indefinitely, as it did between 1978 and 2018. In fact, it is an empirical regularity that as the level of real GDP per capita of an economy rises, the rate of growth of its real GDP will decline. The Chinese economy is no exception. This is demonstrated in Figure 6-3, in which the real rates of economic growth of China, Japan and the U.S. are plotted against their respective real GDPs per capita. As expected, there is a negative relationship between the rate of growth of real GDP and the level of real GDP per capita.

Figure 6-3: Rate of Growth of Real GDP vs. Level of Real GDP per Capita, China, Japan and the U.S.



Sources: National Bureau of Statistics of China; U.S. Bureau of Economic Analysis; Statistics of Japan; International Financial Statistics, IMF.

However, we note that China, with a GDP per capita of US$12,699 in 2021, is currently still operating in the range that permitted average annual rates of growth much higher than 6 percent for both Japan and the U.S. Thus, an assumption of an average rate of growth close to 6 percent for the coming decade or so for the Chinese economy is not unreasonable. Perhaps when Chinese real GDP per capita reaches US$30,000 in 2021 prices, projected to be some time after 2035, the real rate of Chinese economic growth will decline to 5% or below.

7. The Potential Challenges and Risks

The Chinese economy also faces significant potential challenges and risks in the next decade or so. They include: (1) The de-coupling of the Chinese and U.S. economies; (2) The unavailability of high-technology imports; and (3) Economic fragmentation.

The De-Coupling of the Chinese and U.S. Economies

The de-coupling of the Chinese and U.S. economies in some form appears inevitable, partly because of the COVID-19 epidemic and the possibility of the emergence of other viruses in the future, and partly because of the increasing strategic competition between the two countries. China-U.S. strategic competition is the new normal for the coming decade. De-coupling can be thought of as economic de-globalisation, or reverse economic globalisation, which will clearly result in a loss of economic welfare for all participants in the global economy, because everyone will face a reduced set of possible economic choices. De-coupling also disrupts the existing supply chains and can be quite costly in the short run.

However, the de-coupling of the two economies is not without its longer-term benefits. First, it will accelerate the seeking and development of potential second sources in both economies. With a potential second source, the economy is basically protected from the disturbances that may result from the possible interruptions of the supply chain due to unexpected events such as various kinds of natural disasters (earthquakes, tornadoes, tsunamis and volcanic eruptions), wars, revolutions, and other geo-political conflicts. Second, with potential second sources, the monopoly powers of the individual suppliers are significantly reduced (assuming that they can be prevented from collusion), the markets become more competitive, the prices fall, and the consumers and users everywhere will be better off. Third, with two or more sources for each product, service and supply chain, the world economy is also better protected from the possibility of a catastrophic system failure. The supply redundancy can be considered a kind of insurance against complete system failure. Fourth, the de-coupling of the capital markets can reduce the rates of return to both Chinese and U.S. investors. But with the highest national savings rate in the world, the Chinese economy can be essentially self-sufficient in terms of its capital needs. Finally, the reduction or elimination of monopoly power should reduce the usefulness of weaponisation of international economic

policies such as export controls, exclusion from electronic payment and other services, and punitive tariffs, and render them essentially meaningless.

The Unavailability of High-Technology Imports

The unavailability of high-technology imports is caused not only by de-coupling of the Chinese and U.S. economies, but also by U.S. export controls against China imposed on third-country manufacturers of advanced semiconductors and state-of-the-art semiconductor-manufacturing equipment. The unavailability of these imports can cause short-term hardships on some of the Chinese high-technology enterprises. However, it will definitely accelerate a search for substitutes, which will take some time. But it is important to take note that there is often more than one way of accomplishing the same task, and that once something is known to be possible, it is easier to try to find an alternate way. So eventually indigenously developed substitutes will become available in China.

Economic Fragmentation

The fragmentation of the Chinese economy will be bad for China. This may come about with the rise of provincialism or regionalism (similar to the warlordism in the early Twentieth Century). It will have exactly the same negative effects of economic de-globalisation within China itself. The choice sets of each of the fragmented regions will be significantly reduced and the welfare of every such region will be diminished. While this is not a likely scenario, it is a scenario welcomed by countries that do not want to see China grow or become strong. If China were effectively broken up into, say, seven parts, each part would no longer have the economic, political or military strength of a united China, or enjoy the same economies of scale that come with a huge united market. China would become just like another Europe, without the ability to act cohesively and decisively, and that is probably exactly where the U.S., and perhaps Japan too, would like to see China.

8. Concluding Remarks

The economic development of China since the establishment of the People's Republic is characterised by not only quantitative growth, but also significant improvements in the "quality" of growth. Most of the improvements in quality have been brought about through the provision of more and better public goods such as education, public health, and environmental preservation, protection and restoration. The provision of public goods has also raised the potential GDP of the Chinese economy through its effects on increasing the aggregate demand, the real capital stock, the productivity of the labour force, and the rate of return on other fixed-asset investment. Increasing infrastructural investment and the provision of public goods can be a significant source of growth of the domestic aggregate demand for both consumption and investment, over and above what increases in household consumption alone is able to provide. Despite the significant increase in the degree of income inequality in China, as measured by the Gini coefficient, the welfare of all Chinese people has improved significantly since 1978 as a result of its economic reform and opening to the world.

Going forward, the Chinese economy will be domestic demand-driven rather than export-driven. The Chinese economy is not capacity- or supply-constrained. Maintaining an adequate growth of domestic aggregate demand is essential for continued Chinese economic prosperity. Technical progress, or growth in total factor productivity, will also become an important source of Chinese economic growth.

It is also essential for the Chinese economy to maintain openness. Without economic globalisation and accession to the World Trade Organization in 2000, the Chinese economy would not be where it is today. Self-reliance should not be equated to total self-sufficiency. We should always remember that it is a dual-circulation and not a mono-circulation development strategy. Educational exchange between China and the U.S. and the rest of the world should also be maintained and continued as much as possible. In addition to Professor YANG, China has also benefitted greatly from scientists who studied and/or worked abroad, such as DENG Jiaxian, QIAN Sanqiang, QIAN Xuesen and ZHU Guangya. Without them, the "two bombs and one satellite" might not have been possible so soon.

In the 2004 interview, I predicted that the Chinese economy would be able to sustain a high rate of growth until 2035 and catch up with the U.S. economy in terms of GDP in 35 years,

or 2039. It now appears that the Chinese economy will be able to reach parity with the U.S. economy sooner, around 2030. 2030 also happens to be the year of the "tea birthday (茶壽)" for Prof. YANG. We all look forward to an even bigger celebration then.