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China's Economic Growth in Retrospect

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One of the world's defining events of the past several decades has been China's economic ascent. Seventy years ago, when the People's Republic of China (PRC) was founded, the average Chinese adult lived on an income barely above one-fifth the world average; today, the same person is able to enjoy the standard of living of the average world citizen. China is now the world's second-largest economy and largest exporter. This status was not achieved simply through an increase in population. Rather, tremendous structural transformation has taken place, as a result of which the country has one of the most complete production networks in the world. This chapter reviews China's growth experience and explains the main economic and political drivers behind the country's economic success.

In economic terms, there is probably little miracle in China's miraculous growth; the country has followed closely the tenets of neoclassical economics, aiming for high savings, high investment, accumulation of human capital, technological progress, industrialization, and so on. It also enjoyed favorable demographics and international environments during the period of high growth. What is unconventional about China is how the country has adopted those economic precepts. A lengthy period of economic planning before 1978, despite the many mistakes, laid a solid foundation of heavy industry that helped the take-off in the reform era. The country has benefited

tremendously from economic opening, yet it has opened at its own pace and has kept a strong bias toward mercantilism characterized by a managed exchange rate, asymmetric policies toward export and import, and a policy of market-for-technology imposed on foreign direct investment (FDI) in some strategic sectors. Despite a wave of reform in the period 1995–2005, state-owned enterprises (SOEs) still play a significant role in the economy and enjoy privileged access to credit and market.

Over the next thirty years, China is likely to face two strong headwinds. The first is deteriorating demographics and the second is a more haphazard international environment. Deteriorating demographics will render capital accumulation a less attractive driver of sustainable growth; instead, innovation will have to move to center-stage, and domestic policy will have to change accordingly. On the international front, the increasing size of China's economy will require that the country formulate a new approach to international economic relations. Changes will have to come soon. The main purpose of this chapter is to provide some insight into where and how those changes might best occur.

The chapter starts by reviewing China's economic achievements from a historical perspective. It then discusses the four drivers of China's fast growth in the reform era, namely, the preparation undertaken during the planning period, favorable demographics, high saving and capital accumulation, and greater efficiency. This is followed by a concise look at the structural change in the Chinese economy and its consequences. The chapter closes with a brief discussion of the two strong headwinds, aging and a changing international environment, that China will have to deal with in its quest to meet its second centennial goals, to be achieved by the 2049 anniversary of the founding of the PRC.

GREAT ACHIEVEMENTS

The Chinese civilization reached its peak during the Tang and Song dynasties (AD 666–1266). During the subsequent Ming and Qing dynasties (AD 1346–1911), the Chinese economy was locked in stagnation. Although there was some growth in the agricultural sector, per capita income remained suppressed by a growing population. By the mid-nineteenth century, China had entered an extended period of secular decline that halted only with the founding of the PRC. Table 1-1, adapted from Angus Maddison (2001),

provides a vivid account of China's decline and rejuvenation relative to the world over the past three centuries. Before around 1820, both China's population and its GDP kept pace with the rest of the world. After that date, the share of China's population in the world total began to decline, but its share of GDP declined faster. By 1950, per capita GDP in China was merely 21 percent of the world average. The Chinese Communist Party (CCP) inherited a dirt-poor country. Although in 2001, Angus Maddison was too optimistic about China's projected 2015 per capita GDP, China's overall achievement since 1950 was still remarkable.

From a historical perspective, China's economic resurgence started not in 1978 but in 1949. Figure 1-1 presents the growth rates in the period 1954–2018. Between 1954 and 1977, the PRC managed to grow by 6.14 percent per annum. According to the numbers shown in table 1-1, China grew 2.1 percent faster than the rest of the world in each year during the period 1950–2001. However, the growth in the first thirty years was rather haphazard and might be exaggerated by artificially inflated prices of goods produced by heavy industry, a sector deliberately promoted by economic planning. Sustainable growth has occurred only since 1978. In the forty years between

TABLE 1-1. China in Comparison with the World, 1700–2015

| | 1700 | 1820 | 1900 | 1950 | 2001 | 2015 |
|--------------------|---|-------|-------|-------|--------|--------|
| | Population (millions) | | | | | |
| China | 138 | 381 | 400 | 5,47 | 1,275 | 1,387 |
| World | 603 | 1,042 | 1,564 | 2,521 | 6,149 | 7,154 |
| China in world (%) | 23 | 37 | 26 | 22 | 21 | 19 |
| | GDP (billions of 1990 international dollars) | | | | | |
| China | 83 | 229 | 218 | 240 | 4,570 | 11,463 |
| World | 371 | 696 | 1,973 | 5326 | 37,148 | 57,947 |
| China in world (%) | 22 | 33 | 11 | 5 | 12 | 20 |
| | Per capita GDP (1990 international dollars) | | | | | |
| China | 600 | 600 | 545 | 439 | 3,583 | 8,265 |
| World | 615 | 668 | 1,262 | 2,110 | 6,041 | 7,154 |
| China in world | 0.98 | 0.90 | 0.43 | 0.21 | 0.59 | 1.16 |

Source: Adapted from Maddison (2001).

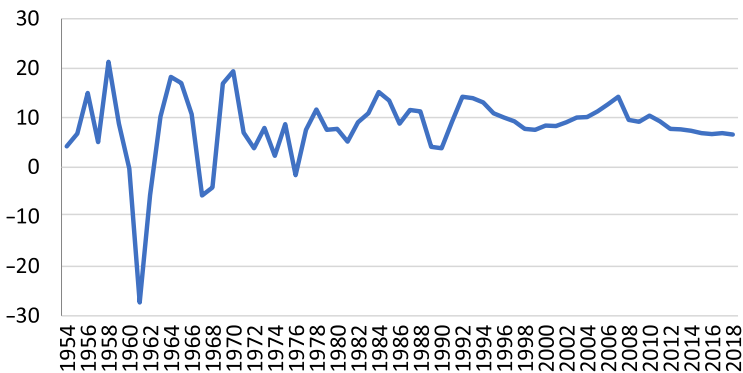
Note: Numbers for 2015 are Maddison's 2001 projections.

1978 and 2018, China's economy managed to grow at an annual rate of 9.44 percent. As a result, in real terms the Chinese economy in 2018 was thirty-seven times as large as it was in 1978.

Apparently, China has been growing much faster than the rest of the world, particularly after 1978. As a result, China's share of the world economy, measured in nominal terms, has increased sharply, from less than 2 percent in 1978 to 16 percent in 2018 (figure 1-2). China's share of world trade was negligible in 1978 but reached 11 percent by 2018. Based on certain projections provided in chapter 2, China's GDP is set to regain its 1820 share of the world total by 2049 and China's per capita income is forecasted to be double the world average.

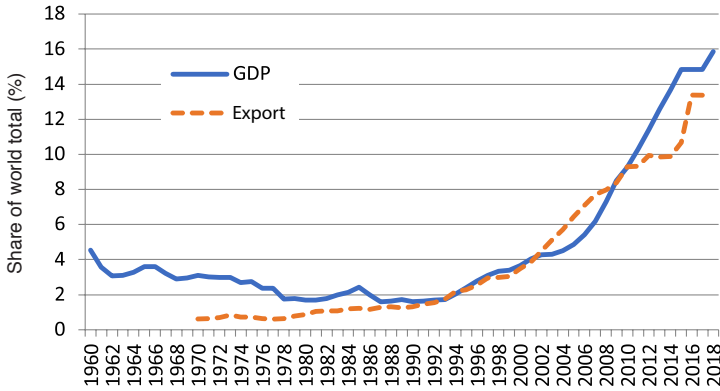
The living standard of the average Chinese person increased by twenty-six times in real terms in the period 1978–2018. Only a few economies in human history have managed to achieve this rapid advance in standard of living. Although income disparities remain large, the rising tide of income has lifted most people's living standard. In particular, poverty has been drastically reduced. In 1978, 30 percent of the Chinese population, or 250 million people, lived below the official poverty line, which was about US\$20 per year. By the end of the 1980s, the poverty rate had been reduced by two-thirds. Today, fewer than 4 percent of the rural population live below the

FIGURE 1-1. Growth Rates of China's GDP: 1954–2018 (%)



Source: National Bureau of Statistics of China (www.stats.gov.cn).

FIGURE 1-2. China's Shares of World GDP and Exports: 1960–2018 (%)



Source: Penn World Table 9.0 (Feenstra, Inklaar, and Timmer 2015).

Note: GDP and export are measured in then current dollars.

poverty line (now about US\$340 per year), and the government's goal is to eradicate absolute poverty by 2020.

GROWTH DRIVERS

The classical theory of growth, promulgated in the 1950s, holds that labor, capital formation, and technological progress are the key drivers of economic growth. China has done a superb job in hewing to these tenets. From an economic perspective, then, there is no miracle to China's miraculous growth. It is worth emphasizing, however, that China began applying the precepts of classical economics even during the planning period. With focused effort, China was able to accumulate a significant stock of capital and build a solid industrial base that was conducive to its economic take-off in the reform era.

Preparation During the Planning Period

The PRC's first thirty years were marked by many failures, some of which were devastating. With painstaking effort, however, the country was able to

establish a relatively solid industrial foundation, particularly in the heavy manufacturing sectors. In 1952, industry was the smallest sector in the economy, and its value added accounted for less than 20 percent of the national GDP; by 1975, industry had overtaken agriculture and the service sector to become the largest sector, and its value added was already 46 percent of the national GDP.¹ The policy China adopted, import substitution, was the state-of-the-art policy prescription for developing countries at the time. What separated China from other countries was China's high saving rate and its more rigorous planning. Despite being one of the poorest countries in the world, China managed to maintain a national saving rate of 25–30 percent most of the time. In addition, the government was able to channel the savings to targeted sectors. Despite its low efficiency, China was able to establish a relatively complete industrial base by 1978, and the country was transformed from an agrarian society into an industrializing one.

There has been a debate about whether the heavy-industry development in the planning period was worthwhile. Yao and Zheng (2008) provided an assessment by calibrating a dynamic general equilibrium model to China's real data. They found that there should be an optimal rate (31 percent) and an optimal length (twelve years) of subsidy provided to heavy industry because heavy industry possesses distinctive technical externalities coming out of roundabout production (in roundabout production, capital goods are produced first, followed by consumer goods). Compared with the optimums, the rate of subsidy implemented by the planning period was 6.6 percentage points higher than the optimal rate and the period of subsidy was thirteen years longer than the optimal length.

In addition to industrial development, China managed to improve the level of education and health of ordinary citizens. Table 1-2, adopted from Yao (2014), presents a comparison of China and India in terms of human and industrial development in 1978. At that time, the average Chinese person was one-fourth poorer than the average Indian, but China achieved higher levels of human and industrial development than India. Specifically, it is clear that China adopted a quite different approach from India's to improving human capital. While India put more emphasis on higher education, China aimed at raising the educational level of ordinary citizens. As a result, China was able to achieve a much higher adult literacy rate than India, even though India produced more university graduates than China until 2002. China's approach paid off in its early stage of economic growth, when a large number of

unskilled workers were needed. China began to expand its higher education after 1998, and this corresponded to China's entry into the middle-income stage (China became a middle-income country in 2002), when more skilled workers were needed. To be sure, China's initial approach to human capital improvement was not designed to push for economic growth but to improve equality for the population. Nevertheless, this approach contributed significantly to the country's economic take-off.

Labor and Demographics

In retrospect, two decisions made by the CCP leadership at the end of the 1970s very much determined China's growth trajectory over the next several decades. One was reform and opening, and the other was family planning. These two decisions were not made out of a well-coordinated process but rather were coincidence. While reform and opening was a conscious decision, family planning was more an unthought-out reaction to the fear of a coming "population bomb" in China—the country's population was estimated to approach one billion at the time, news that astonished the Chinese leadership. Yet the two decisions enhanced each other in the next three decades. Family planning created a favorable demographic structure that helped unleash the potential of reform and opening. A large number of young people moved from the countryside to the city and made tremendous contributions to China's export-led growth and industrialization.

TABLE 1-2. Comparisons of China and India in 1978

| | China | India |
|--|-------|-------|
| Per capita GDP (constant 2000 dollars) | 155 | 206 |
| Adult literacy rate (%) | 65.5 | 40.8 |
| Tertiary school enrollment (% gross) | 0.7 | 4.9 |
| Life expectancy | 66 | 54 |
| Infant mortality rate (%) | 54.2 | 106.4 |
| Share of manufacturing in GDP (%) | 40.0 | 17.0 |
| Share of manufacturing in employment (%) | 17.3 | 13.0 |

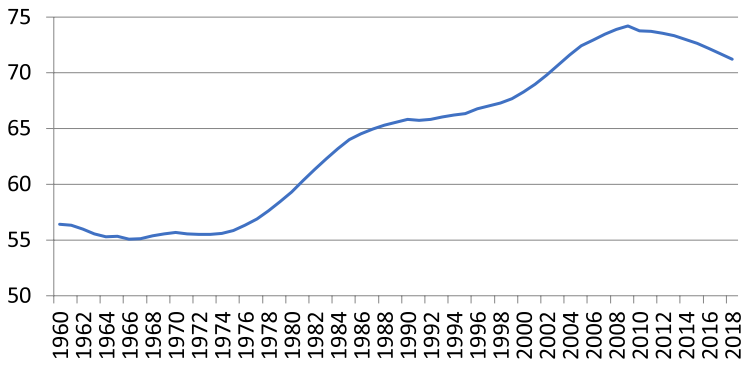
Source: Yao (2014).

Note: China's literacy rate is for 1982 and India's literacy rate is for 1981.

Figure 1-3 presents China's working-age ratios between 1960 and 2018. Before 1976, the ratio hovered at around 55 percent. It then increased to 65 percent by the end of the 1980s, mostly because family planning slowed the birth rate. The 1980s witnessed the restoration of family farming and the beginning of rural industrialization; rising working-age ratios allowed farmers to accumulate more savings from farming, which in turn helped fuel rural industrial development. As the country entered the 1990s, the trend toward rising working-age ratios was mitigated by the demographic echo caused by the baby boomers born between 1962 and 1976. Then, in the first decade of the twenty-first century, another sharp rise in working-age ratios occurred, peaking in 2009 at 74.2 percent. This by far was the most favorable demographic structure that a country has experienced (Bloom et al. 2007). The first decade of the twenty-first century registered the most dramatic growth in recent Chinese history. Much of this growth was driven by labor-intensive export, which benefited tremendously from a favorable demographic structure. Since 2009, the working-age ratio has declined almost as quickly as it rose before that year. Also, China had begun to exit from export-led growth by that time, and favorable demographics were not as badly needed as before. In a sense, China was extremely lucky because its pace of growth in the first thirty years of the reform era almost perfectly matched its demographic transition. The remaining question is whether China can complete the transformation required by a deteriorating demographic structure.

A significant consequence of rising demographic dividends in the first thirty years was a large proportion of migrant labor, mostly young people moving from the countryside to the city. They first worked in labor-intensive exporting factories, then, more recently, shifted to service sectors. Figure 1-4 shows the number of migrant workers (left axis, bars) and their share in the urban population (right axis, solid line) in the period 1993–2017. According to China's National Bureau of Statistics (NBS) definition, a migrant worker is a person who works outside his or her own county and an urban resident is a person who stays in a city for more than 180 days in a year. Figure 1-4 shows that except for a setback caused by the 1997 Asian financial crisis, the number of migrant workers increased until 2014, then stabilized at around 170 million, or about one quarter of China's total labor force. On the other hand, the share of the urban population increased steadily from less than 30 percent in 1993 to almost 60 percent in 2017.

FIGURE 1-3. Working-Age Ratios (Share of Persons Aged 15–64 Years in the Population), 1960–2018 (%)



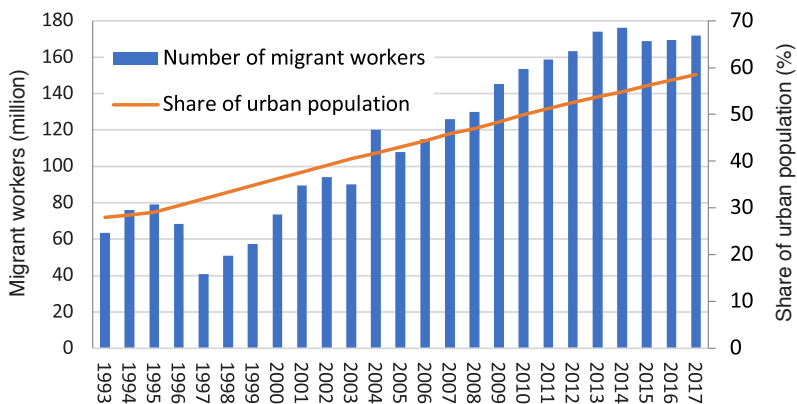
Source: NBS at www.stats.gov.cn.

A favorable demographic structure helped China's growth in the first thirty years in several ways. A direct contribution was a large supply of labor, which enabled China to conduct large-scale labor-intensive export. In the first decade of the twenty-first century, China's exports grew by a factor of 6.33 to reach US\$1.5 trillion. This period coincided with the period of significant growth in the demographic dividends, as shown in figure 1-3. According to the estimates of Tian and coworkers (2013), rising working-age ratios contributed 14.6 percent of China's export growth in the period 2000–2006. The second contribution of a favorable demographic structure was low wages. There was clearly a large amount of surplus labor in the countryside before China joined the World Trade Organization (WTO); the real wage of migrant workers increased slowly, if at all. As a result, industry could enjoy Lewisian growth; that is, it could expand without much increase in labor costs. After great growth in the first decade of the twenty-first century, however, the surplus labor supply was very much depleted.² That depletion coincided with a decline in China's demographic dividends beginning in 2009. This has certainly contributed to China's slowdown in recent years, but the working-age ratio has remained above its 2000 level, and its level effects may remain for a while. One such effect has been a high demand for consumer goods—the third contribution of a favorable demographic structure. Young people consume more than old people when

adjusted for income. This factor has been particularly helpful after China began to rely more on domestic consumption than on exports to generate growth.

Overall, rising demographic dividends were responsible for a quarter of China's economic growth (Cai and Wang 2005). In international comparisons, China's demographic structure is expected to remain favorable until the late 2020s. Once China's baby boomers, born between 1962 and 1976, retire from the workforce, however, the situation is expected to deteriorate. This is a consequence of the strict family planning policy implemented between 1979 and 2015, which has constrained workforce replacement. One of the premises of this discussion is that aging is inevitable, and over the next thirty years it will be incumbent on China to find some ways to adjust to its aging demographic structure. The discussions in subsequent chapters are all based on this premise. In the long run, demography trumps other factors in its effect on a country's growth potential. Whether China is able to meet its second centennial goals depends critically on how successfully it mitigates the negative consequences on economic growth of an aging population.

FIGURE 1-4. Migrant Workers as Share of the Urban Population, 1993–2017

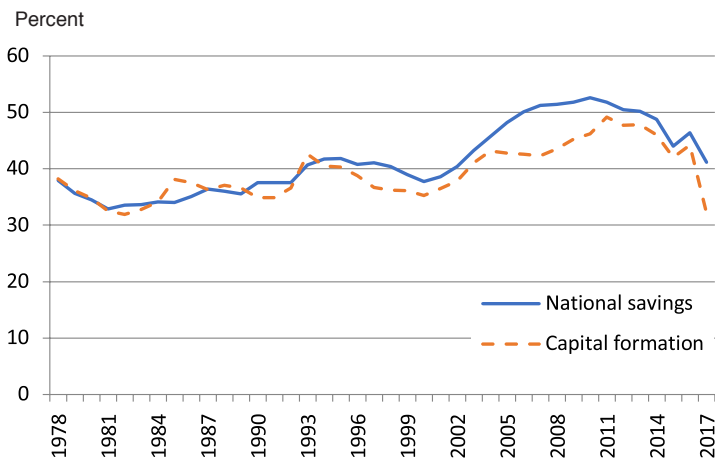


Source: Ministry of Labor and Social Security of China (various years).

Saving and Investment

Capital formation has been central to China's economic growth, both before and after 1978. The national saving rate was between 22 percent and 33 percent in the several five-year plan periods before 1978. In the context of China's very low income level at the time, this was an extraordinarily high rate. After 1978, five periods can be identified (figure 1–5). During the first period, 1978–1982, the national saving rate declined. This was caused by the reversal of the heavy-industry development strategy. During the second period, 1983–1994, the saving rate increased significantly. The third period, 1995–2000, was marked by another decline in the saving rate caused by the restructuring of SOEs, which lowered both urban household income and corporate savings. In the fourth period, 2001–2010, national savings increased dramatically. By 2010, national savings accounted for 52.6 percent of GDP, a rate only a few countries have reached. It is this period that has attracted so much academic research seeking to explain why China's saving rates, both national and household, increased so dramatically. Precautionary saving—saving in expectation of a future income shortfall— and high housing prices are the two most prominent explana-

FIGURE 1-5. Share of National Savings and Capital Formation in GDP, 1978–2017 (%)



Source: National Bureau of Statistics of China (www.stats.gov.cn).

tions offered (for example, Chamon and Prasad 2010; Chen and Qiu 2011). However, precautionary saving motives cannot explain why the saving rates, including the household saving rate, declined in the third period when the old enterprise-based social security system was basically broken because of SOE restructuring. And housing prices cannot explain why the saving rates, again including the household saving rate, declined in the fifth period, from 2011 onward.

A plausible theory that provides a unified explanation for all five periods is Franco Modigliani's life-cycle hypothesis. One of the most important propositions to emerge from the life-cycle hypothesis is that a country's national saving rate is proportional to its GDP growth rate. In his last published paper (Modigliani and Cao 2004), Modigliani and his coauthor applied this proposition to explain the changes in China's national saving rate since 1950. They found that China's rising GDP growth rate could provide a good explanation for the rising saving rate after 1978. In the same vein, they attributed the rising saving rate during the fourth period (2001–2010) to accelerated growth, and its subsequent decline after 2010 they considered to be a result of decelerated growth.

Related to China's high savings is an international debate over China's contribution to global trade imbalances. In 2005, Ben Bernanke considered that a "saving glut," mainly brought about by excessive saving in Asia, was a cause of the American trade deficit (Bernanke 2005). Since then, China's high saving rates have caught international attention. For China's savings to cause global trade imbalances, China has to run a large current account surplus. Figure 1-5 also shows China's share of capital formation in GDP. By definition, the difference between savings and capital formation is a country's current account surplus. Before 1994, China's savings and capital formation were more or less balanced, but since 1994, savings have been consistently larger than capital formation, and the discrepancy was particularly large between 2004 and 2010. It was also during this period that China accumulated a large amount of official foreign reserves. However, China's current account surplus as a share of GDP began to decline, and by 2015–2016 it was barely above 2 percent.³

China's fixed exchange rate regime (FERR) was often picked up by American politicians and some international organizations as the main reason for China's large current account surplus in the period 2004–2010. While the FERR might have helped China export more, it is questionable whether

it was the main cause of China's large current account surplus because a country's current account is a result of both international balances (exports minus imports) and domestic balances (savings minus investment), and the latter is determined by many factors, among which the exchange rate may be a less important one.⁴

At any rate, rebalancing has happened since 2010. Together with its declining share in the current account surplus, the national saving rate dropped faster than it had increased before 2010. In the seven years between 2010 and 2017, the rate declined by an average of 1.63 percentage points each year, reaching 41.2 percent in 2017. It was still high by international standards, but the rebalancing brought about by the drop was significant. Structural adjustments in both international and domestic markets have contributed to this change. In the international market, adjustments in the United States and other advanced economies have slowed the growth of consumption, very much as a belated response to the global financial crisis. Export is no longer a driver of China's growth. In the domestic market, the Chinese economy has gone through several important structural changes, among which deindustrialization has been the most significant. One of the consequences of deindustrialization is a slowdown in saving. A more detailed discussion of this topic is provided later in the chapter.

Total Factor Productivity

According to received wisdom, China's economic growth has been driven solely by capital accumulation ever since Paul Krugman questioned the so-called East Asian miracle (Krugman 1994). Econometric exercises that calculate the Solow residual seem to confirm this view.⁵ For example, a meta-analysis published in 2012 and based on 5,308 observations from 150 primary studies found that the growth of China's total factor productivity (TFP) was only 2 percent per annum and had contributed 20 percent to China's overall GDP growth since 1978 (Tian and Yu 2012). By contrast, in advanced economies the contribution is in the range of 40–50 percent (Kim and Lau 1996). However, there are many problems with using the Solow residual. One of the most significant is that it fails to account for technological progress embedded in capital accumulation. It is undeniable that a factory improves its technological efficiency when it installs new, more advanced equipment, yet this improvement is highly likely to be attributed

to the growth of capital stock when the Solow residual is calculated because the growth of capital stock is the first-order event.

An alternative to using the Solow residual is to calculate TFP growth by the growth in wages and the rate of return on capital (ROC). For that purpose, we may consider the standard Solow model with constant-return-to-scale technology:

$$Y = AK^\alpha L^{1-\alpha}, \quad (1)$$

where Y is national GDP, K is the stock of capital, L is the stock of labor, A is the index of technological progress, and $0 < \alpha < 1$ is capital's output elasticity. Then, using the identity $Y = rK + wL$, where r is the rate of return on capital and w is the wage rate, we get:

$$\hat{Y}_t = \alpha \hat{K}_t + (1 - \alpha) \hat{L}_t + [\alpha \hat{r}_t + (1 - \alpha) \hat{w}_t]. \quad (2)$$

Therefore, TFP growth is

$$\hat{A} = \alpha \hat{r}_t + (1 - \alpha) \hat{w}_t. \quad (3)$$

It is the weighted average of the growth rate of wages and the growth rate of ROC using the output elasticities of labor and capital as the weights. Wages and ROC may be subject to confounding cyclical factors, but in the long run they reflect economic fundamentals.

There are no consistent data for wages, so labor income reported by the NBS's *Flow of Funds Table* is used to substitute for wages (NBS, various years). Accordingly, the labor share of national income is taken as labor's output elasticity $(1 - \alpha)$. ROCs are calculated from macrodata by Lu (2018). Table 1-3 presents the results for the period 1996–2015 for which data are available. On average, labor income grew by 9.2 percent per annum in this period, slightly lower than the GDP growth rate. The change in ROC was highly volatile. Consistent with China's growth cycles, ROC declined before 2000 and after 2008, but increased drastically in between. On average, though, ROC declined by 0.4 percent per annum.⁶ The average contribution of labor income growth to GDP growth was 4.3 percent, whereas growth of ROC contributed -0.2 percent. TFP growth calculated by equation (1.3) is presented in the second-to-last column. On average, it was 4.1 percent per annum. Its share of contribution to GDP growth varied from year to year (exceeding 100 percent in 2001 and 2004), but on average it was 41.9 per-

cent, right in the range of the advanced economies' results but much higher than the results arrived at by other studies.

There has been concern in recent years that capital efficiency has been declining rapidly. The evidence often cited is the increasing incremental capital-output ratio (ICOR). Before 2008, China's ICOR was around 4, close to the numbers put up by other East Asian economies. Since then, it has increased to 6.⁷ However, about half of China's capital investment since 2008 has been spent to improve people's welfare (Zhang 2019). This includes spending on high-speed railways, subways, public utilities, and recreational facilities, all of which usually require government subsidies to operate. China's ICOR would decline drastically if investment in those areas were excluded.

Notwithstanding the increasing share of investment in welfare-improving infrastructure, the declining ROC since 2005 should sound an alarm. This decline has taken a toll on TFP growth. The average rate of TFP growth was 6.1 percent in 1996–2004 but dropped to 2.5 percent between 2005 and 2015. A glance at table 1-3 shows that the decline could be attributed solely to the decline of the ROC. At the time of writing, China's ROC in the manufacturing sector was around 15 percent, about the same as that of the United States but higher than Japan's (Lu 2018). However, the declining trend shows no sign of stopping. To stabilize the ROC, China needs to greatly improve how it allocates capital, particularly to reduce wasteful financial resources received by the SOE sector.

STRUCTURAL CHANGE

The Chinese economy has gone through significant structural changes since the global financial crisis. Two of them are a pivot away from export-led growth and deindustrialization. Together with those two changes, rebalancing has happened. In addition to the drop in the saving and investment rates, the share of labor income has stopped declining and the share of services has increased. On the other hand, overall growth has slowed and begun to rely more on domestic consumption.

TABLE 1-3. TFP Growth Estimated from Growth of ROC and Labor Income, 1996–2015 (%)

| Year | GDP growth rate | Share of labor income | Growth of labor income | Labor share of GDP growth | Share of capital gains | Growth of ROC | ROC share of GDP growth | TFP growth | TFP share of GDP growth |
|---------|-----------------|-----------------------|------------------------|---------------------------|------------------------|---------------|-------------------------|------------|-------------------------|
| 1996 | 10.0 | 53.4 | 14.7 | 7.9 | 46.6 | -0.5 | -0.2 | 7.6 | 76.1 |
| 1997 | 9.3 | 52.8 | 8.1 | 4.3 | 47.2 | -3.5 | -1.7 | 2.6 | 27.9 |
| 1998 | 7.8 | 53.1 | 8.5 | 4.5 | 46.9 | -7.1 | -3.3 | 1.2 | 15.5 |
| 1999 | 7.6 | 52.4 | 6.1 | 3.2 | 47.6 | -2.4 | -1.1 | 2.0 | 26.8 |
| 2000 | 8.4 | 51.4 | 6.3 | 3.2 | 48.6 | -2.7 | -1.3 | 1.9 | 22.8 |
| 2001 | 8.3 | 51.5 | 8.5 | 4.3 | 48.5 | 18.3 | 8.9 | 13.2 | 159.4 |
| 2002 | 9.1 | 50.9 | 8.0 | 4.1 | 49.1 | 3.9 | 1.9 | 6.0 | 65.7 |
| 2003 | 10.0 | 49.6 | 7.2 | 3.6 | 50.4 | 5.0 | 2.5 | 6.1 | 61.1 |
| 2004 | 10.1 | 45.5 | 1.0 | 0.4 | 54.5 | 25.0 | 13.6 | 14.1 | 139.1 |
| 2005 | 11.3 | 41.4 | 1.2 | 0.5 | 58.6 | -2.8 | -1.6 | -1.1 | -9.9 |
| 2006 | 12.7 | 40.6 | 10.5 | 4.3 | 59.4 | 3.9 | 2.3 | 6.6 | 51.9 |
| 2007 | 14.2 | 39.7 | 11.8 | 4.7 | 60.3 | 4.0 | 2.4 | 7.1 | 50.0 |
| 2008 | 9.6 | 43.2 | 19.1 | 8.2 | 56.8 | -15.9 | -9.1 | -0.8 | -8.5 |
| 2009 | 9.2 | 46.6 | 17.9 | 8.3 | 53.4 | -7.2 | -3.8 | 4.5 | 49.2 |
| 2010 | 10.4 | 45.0 | 6.6 | 3.0 | 55.0 | 7.1 | 3.9 | 6.9 | 66.0 |
| 2011 | 9.3 | 44.9 | 9.1 | 4.1 | 55.1 | -3.0 | -1.6 | 2.5 | 26.4 |
| 2012 | 7.8 | 45.6 | 9.4 | 4.3 | 54.4 | -4.7 | -2.6 | 1.7 | 21.7 |
| 2013 | 7.7 | 46.0 | 9.6 | 4.5 | 54.0 | -1.5 | -0.8 | 3.6 | 47.3 |
| 2014 | 7.4 | 46.5 | 9.9 | 4.6 | 53.5 | -5.4 | -2.9 | 1.7 | 23.5 |
| 2015 | 6.9 | 47.9 | 10.1 | 4.8 | 52.1 | -19.0 | -9.9 | -5.1 | -73.4 |
| Average | 9.4 | 47.4 | 9.2 | 4.3 | 52.6 | -0.4 | -0.2 | 4.1 | 41.9 |

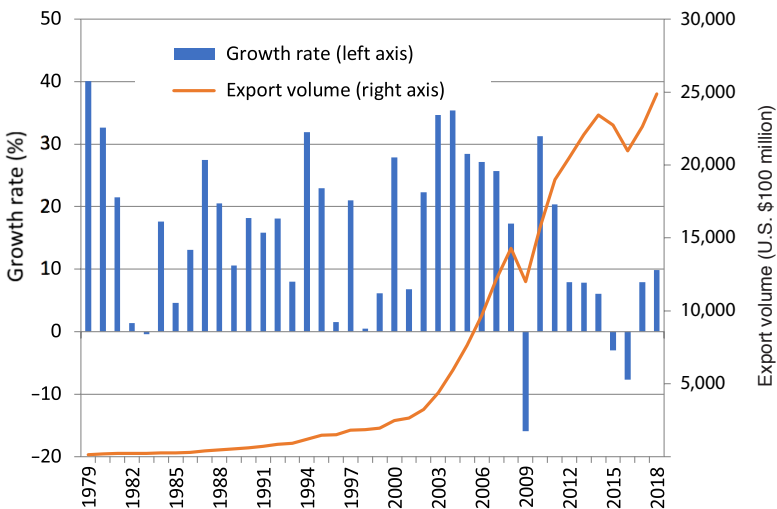
Sources: National Bureau of Statistics of China, “Flow of Funds” (table) (www.stats.gov.cn), and Lu (2018).

Note: TFP, total factor production; ROC, return on capital.

Changes in the Growth Pattern

Chapter 10 provides a detailed account of China's export-led growth and its transition; this section discusses it only from a macro perspective. Before 1978, China had a closed economy and its export was minimal. After 1978, three periods can be identified (figure 1-6). The first period is 1979–2001. There were large fluctuations during this period, but the average growth rate of exports was respectable, reaching 16.0 percent. One of the reasons for this respectable growth was the low starting point of China's exports. By 2001, when China joined the WTO, China's exports had managed to reach only US\$266.2 billion. During the second period, 2002–2008, China's exports grew by an average of 27.3 percent per annum, thanks to the country's accession to the WTO. In a mere seven years, its volume of exports had increased by 5.37 times, to reach US\$1.43 trillion. As a result, China became the largest exporter in the world. The third period is from 2009 on. During this period, the growth of exports dropped to 6.8 percent per annum. In 2009, 2015, and 2016, negative growth was registered. However, China's exports still grew faster than world trade did. At US\$2.49 trillion, China's exports in 2018 made it just below the size of the seventh-largest

FIGURE 1-6. Exports and Their Growth, 1979–2018



Source: National Bureau of Statistics of China (www.stats.gov.cn).

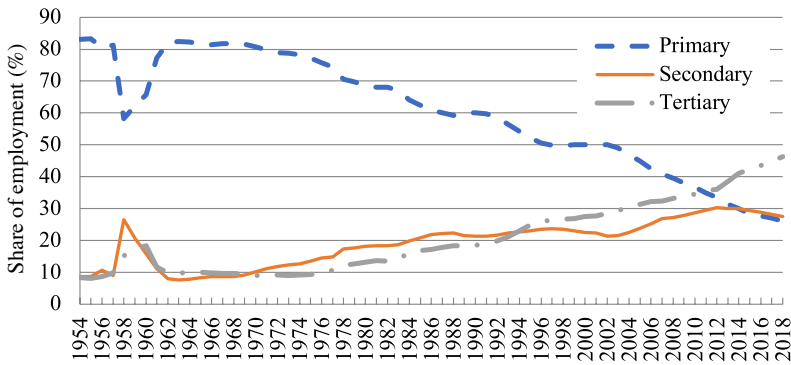
economy in the world (India) for that year. Large economies usually do not have high export/GDP ratios; it is around 10 percent in the United States and 17 percent in Japan. China reached 36 percent in 2007, with the ratio falling since then. Because China's GDP growth rate has been decelerating, it will not be surprising if exports grow more slowly in the future.

Exports contributed greatly to China's overall economic growth in the period 2002–2008. According to Lau and coworkers (2007), exports contributed 11–15 percent of China's GDP through net exports and forward and backward linkages. This means that export growth contributed three to four percentage points, or 30–40 percent of China's GDP growth in this period. In contrast, export's contribution on average has been lowered to around one percentage point since 2008. In some years it was even negative. This is a clear sign that exports are no longer a strong driver of growth, although they remain an important component of the Chinese economy.

Domestically, the Chinese economy has experienced the most significant structural change in decades. After six decades of painstaking industrialization, China entered the stage of deindustrialization right around the time of the global financial crisis. Figures 1-7 and 1-8 present the sectoral shares of employment and value added, respectively. China has followed the common patterns of structural change experienced by successful economies: the share of the primary sector in the national economy declines, the share of the tertiary sector increases, and the share of the secondary sector first increases and then declines. The last pattern is an indicator of industrialization and subsequent deindustrialization. The secondary sector's share of value added reached its peak in 2006 (48.0 percent), and its share of employment did so in 2012 (30.3 percent).⁸ Because the share of employment is usually stickier than the share of value added (which is evident from figures 1-7 and 1-8), it can be concluded that China finished the period of high industrialization and entered a deindustrialization phase in 2012.

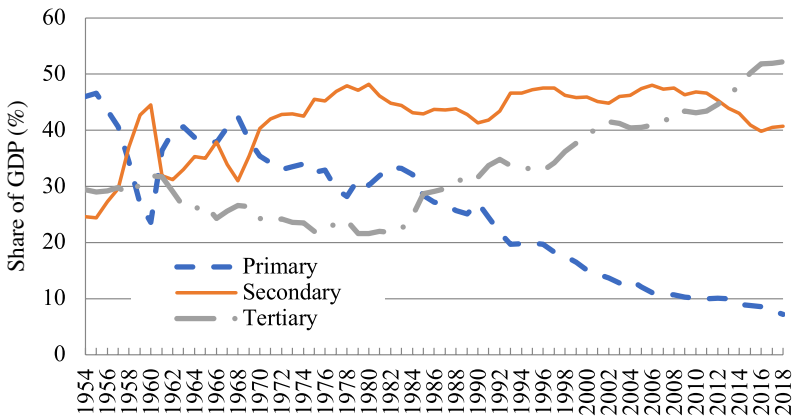
However, China's deindustrialization might have come earlier. Liu, Mao, and Yao (2018) calibrated a dynamic and multisectoral model and found that China's industrialization would have continued to around 2017 had the global financial crisis not occurred. For comparison, it was around 2017 that China reached South Korea's 1990 per capita GDP, when the latter's industrial share of employment reached its peak. China's in-

FIGURE 1-7. Sectoral Shares of Employment, 1954–2018



Source: National Bureau of Statistics of China (www.stats.gov.cn).

FIGURE 1-8. Sectoral Shares of Value Added, 1954–2018



Source: National Bureau of Statistics of China (www.stats.gov.cn).

dustrialization was greatly accelerated by its export-led growth model. In the first decade of the twenty-first century, the secondary sector gained 10 percent in its share of employment, equivalent to its gains in the preceding forty years. Exit from that growth model has taken a toll on China.⁹

Consequences of Structural Change

The first consequence of structural change is a slowing of growth. When exports were able to drive growth, industrial expansion was almost unlimited because demand was not related to domestic consumption. After the economy exited from export-led growth and deindustrialization began, services became the strongest driver of growth, and their demand must be generated endogenously, within the country. During the period 2001–2010, industrial growth contributed on average 47.5 percent to China's overall growth, whereas the corresponding figure for services was 45.8 percent. Between 2011 and 2017, industry's contribution declined to 32.6 percent and the contribution of services increased to 62.2 percent.¹⁰ These figures are indicative of a sea change in China's growth model. For one thing, they meant that many of China's policies aiming at promoting industrial development and export would have to be moderated. Unfortunately, this has not happened yet.

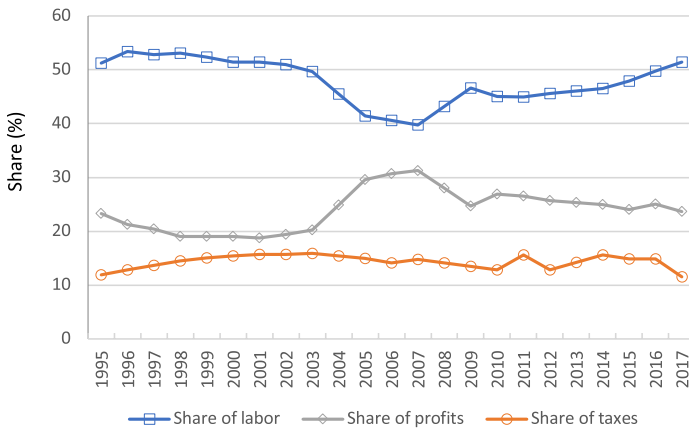
Industrial development is still important, of course. Studies have shown that continuous industrial upgrading is critical for a middle-income country to become a high-income one (Su and Yao 2017). However, industrial upgrading now is not automatically fulfilled by capital accumulation; rather, it must be led by innovation. One overarching theme of this book is how China is meeting the challenge of innovation.

Yet innovation is unlikely to be able to generate very fast growth. A case of comparison is Japan in the 1970s and 1980s. Japan adopted the export-led growth model in the 1950s and 1960s, and its economy was able to grow more than 9 percent per annum. The first oil crisis forced the country to abandon the export model, very much as the global financial crisis would later force China to do the same. Japan successfully transformed its economy into one based on innovation. In fact, Japan dominated the world stage of innovation in the 1970s and 1980s. Yet the country managed to grow only by an average of 3.5 percent between 1973 and 1993. After 1993, the Japanese economy virtually stopped growing. China may be able to do better than Japan did because of internal income disparities and subsequent convergence. But that requires the inland provinces to catch up with the efficiency of coastal provinces, which will not be easy (Yao and Wang 2017). Therefore, China may have to lower its expectations for the growth rate.

Deindustrialization brought more than bad news, though. The rebalancing discussed earlier was one of the good results of deindustrialization. Of

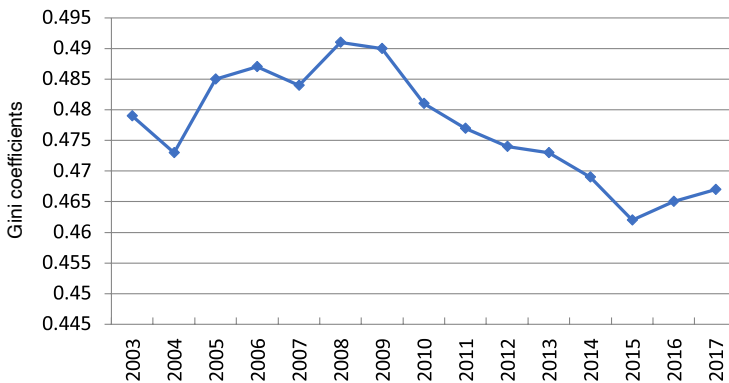
course, declining saving rates also contributed to the slowdown in growth. But in general, increased consumption has brought the Chinese economy back to a more balanced growth trajectory. The most significant good news is that the share of labor income has increased, and consequently, income distribution has become better (figures 1-9 and 1-10).

FIGURE 1-9. Composition of National Income, 1995–2017



Source: National Bureau of Statistics of China, *Flow of Funds Table*.

FIGURE 1-10. Income Gini Coefficients, 2003–2017



Source: National Bureau of Statistics of China (www.stats.gov.cn).

Between 1995 and 2007, the labor share declined by more than ten percentage points. Most of the gains were taken by corporate profit. This had two consequences. One was that income distribution worsened: income and wealth were concentrated among a relatively small number of capital owners. The other was that the saving rate increased because high-income capital owners have a higher propensity to save than lower-income people. Beginning in 2007, though, the labor share began to increase, and by 2017 it had regained 11.7 percentage points.

Several factors contributed to the changes in labor shares. Among them, two were the most significant. One was demographic transition. The declining period of labor shares was the period of rising working-age ratios. Labor was becoming more abundant and wages were suppressed. By around 2007, China had finally reached the Lewis turning point, and rural-to-urban migration began slowing. And finally, by 2010 demography had started to work against fast growth. The other significant factor was structural change (Liu, Mao, and Yao 2018). During the period of industrialization, labor moved from agriculture to industry (and services), and the share of industrial employment increased. But industry is the most capital-intensive sector and pays a higher ratio to capital than agriculture and services. The resulting composition effect lowered the share of labor income in the overall economy. During the period of deindustrialization, labor began to move from both agriculture and industry to services. As a result, the labor share began to increase.

It is widely acknowledged that income inequality is large in China. According to data released by the NBS, the Gini coefficient reached a peak of 0.49 in 2008 (figure 1-10).¹¹ This makes China one of the seriously unequal societies in the world. However, income inequality began to drop after 2008, though it went up a bit in 2016 and 2017. While the geographic relocation of growth—inland provinces have been growing faster than coastal provinces since 2008—was a factor, the most important driver of the decline probably was the increase of labor shares in the national income. Even as it is a desirable objective in itself, improved income distribution is also good for domestic consumption. After tremendous expansion in the period 2003–2012, China’s economy has accumulated a significant amount of excessive capacity; the lack of effective demand has constrained faster growth. When ordinary people enjoy a larger share of national income, domestic consumption increases.

CONCLUSION

China has accomplished one of its two centennial goals. Over the next thirty years, China will face strong headwinds trying to fulfill its second centennial goal of becoming a high-income country on par with the current rich countries. Export-led and extensive expansion is no longer an option. Fortunately, the Chinese economy has successfully started its rebalancing, and innovation has become a strong driver of economic growth. The challenges China faces in the future are now primarily structural.

The first structural challenge is the declining rate of TFP growth. Though innovation will help, it alone cannot be relied on to sustain a very high TFP growth rate. In many areas, China is approaching the world technological frontiers, so it is natural to see the country's technological progress slow. On the other hand, the declining ROC will put more pressure on TFP growth. While much of the ROC's decline can be explained by deteriorating demographics and a slowing of external demand, misallocation in the financial markets cannot be ignored. SOEs take a disproportionate share of financial resources yet are much less efficient than private firms. Reforming the SOEs and the financial sector will be key to sustaining China's growth.

The second challenge is aging. Aging is a gray rhino in China; not much can be done to avoid it. China needs to learn how to continue reasonable growth in the context of an aging society. This requires a paradigm change in the country's policy framework. Several chapters of this book are devoted to discussing this change.

The third challenge is the changing international environment. Because of the sheer size of its population, China changes the world when its income level increases. When 30–40 percent of global growth comes from China, it is inevitable that every country will feel the impacts. The recent Sino-American trade disputes are probably the beginning of a long period of global adjustment to China's rise. Despite China's declining reliance on global demand, its complete production networks and a burgeoning domestic market have prevented the medium-range industries from moving out of the country. There is a possibility that the "flying geese" pattern espoused by economic theory will collapse and the train of global growth will stop at "Station China" for a long time.¹² This would not just be a problem for the rest of the world; it would above all be a problem for China. Instead

of exporting goods to other countries, China must start thinking about how to bring prosperity to all in the world.

NOTES

1. Figures in this section come from *New China Statistics 30 Years* (Beijing: National Bureau of Statistics of China, 1980) if not specified.

2. See Garnaut (2010) and the papers in the same issue of *China Economic Journal*.

3. In 2017, the share went back to 9.1 percent owing to the fast growth of exports. But it became negative in 2018.

4. Economic fundamentals and macroeconomic policy are arguably the more important factors. See Yao (2014) for more discussion.

5. The Solow residual is proposed by Robert Solow in the 1950s to measure an economy's total factor productivity. It is so called because it is the residual growth rate after the contribution of labor and capital is accounted for.

6. In the first half of the 1990s, ROC was about 10 percent. Its decline in the second half of that decade took it to 8.0 percent in 2000. It then began to increase, reaching a peak of 13.7 percent in 2007. After the global financial crisis, it again declined, and by 2015 it had dropped to below 10.0 percent. Decline in this period was faster than in the latter part of the 1990s, reaching 6.2 percent per annum. See Lu (2018) for more details.

7. Calculated from data released by the NBS at www.stats.gov.cn.

8. There is debate whether the NBS's statistics of labor shares were correct. It is possible that the NBS overreported the amount of labor in agriculture because many farmers farm only on a part-time basis. The peak of the industrial labor share often reached 35 percent in other successful economies (such as South Korea). Judging by China's painstaking effort to develop industry, there is a high probability that China did the same.

9. An alternative interpretation is that industrialization in that decade was dramatic and every indicator had already reached its peak by 2012. In other words, China's industrialization was compressed into a very short period of time, and by 2012, deindustrialization was happening naturally.

10. Calculation based on NBS data.

11. Several independent surveys found higher Gini coefficients. For example, the China Family Panel Studies found that the highest Gini coefficient was 0.52, reached in 2010 (Institute of Social Science Survey 2012).

12. The "flying geese" pattern of economic development, proposed in the 1930s to describe technological development in Southeast Asia, holds that wages and other factor prices tend to increase with economic development. Japan was positioned as the lead "goose" in the V formation of Asian developing nations.

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