6 Growth and Structural Change

Economic growth, in the simplest meaning of the term, can be visualized as an increase in the total amount of goods and services available. This is measured by the growth of GDP, which is the total of all the value added in an economy. Adjusting for population growth gives the total amount of goods and services available per individual, that is, GDP per capita. The development process is a gradual but steady and sustained increase in output per capita. Output increases because society accumulates physical capital to equip workers to become more productive and because households boost the productivity of their family members by investing more into human capital, especially health and education. Technology becomes more sophisticated as better-educated, better-equipped workers become more adept at their work. In addition, many structural changes occur in regular patterns as the economy is reshaped by the actions of many individuals.

The previous chapter began the discussion of structural change with one of the most important aspects of structural change, the shift from a rural to an urban society. In this chapter the discussion of structural change is broadened to take a comparative perspective on growth, labor, and the changing distribution of GDP. China's economic development has followed a process that shares many common features of structural change with other developing countries. One purpose of this chapter is to provide benchmarks that show how far China has come along a common development path, as well as to discuss problems with Chinese data. At the same time, by drawing out the common features, this chapter also highlights the ways in which the Chinese pattern was unusual and distinctive. The emphasis in the preceding chapter was on the unique institutions that impeded structural change in the case of the urban–rural divide; the emphasis in this chapter is on the common processes that drive structural change and growth in all economies.

The comparative and structural perspective illuminates several aspects of China's economy. First, although China's development processes resemble

those in other economies, China is also unusual in three respects: China invests more than other economies, concentrates more on manufacturing than other economies, and has grown more rapidly than other economies. Second, the structural perspective helps explain why China is growing so rapidly. High investment accounts for a great deal of China's rapid growth. In addition, China is at the stage of economic development where very rapid structural change provides an impetus for high-speed growth. Third, a structural perspective provides a basis for projecting China's future development. Because structural change occurs in regular patterns, we can expect that China will repeat many of the changes undergone by earlier-developing East Asian economies. In particular, we should expect China's rapid growth to continue for another decade and then begin to moderate as labor force growth slows and rural-to-urban shifts wind down. Structural change is associated with social change: As industry and modern services grow, new urban social groups emerge that have higher incomes and new skills. New markets and new social possibilities emerge along with those groups.

6.1 GROWTH

China grew fast between 1949 and 1978, but growth really took off after the beginning of reform in 1978. Moreover, the acceleration of economic growth coincided with the slowing of population growth, so per capita growth accelerated even more dramatically. According to official data, shown in Table 6.1, average annual GDP growth accelerated from 6% in the pre–1978 period to 9.6% in the 1978–2005 period. At the same time, population growth decelerated from 1.9% per year before 1978 to only 1.1% after 1978. As a result, per capita GDP growth more than doubled, jumping from 4.1% to 8.5% annually. China's post–1978 growth experience has been extraordinary by any standard.

6.1.1 Data and the Measurement of Growth

The data shown in Table 6.1, and indeed used throughout this text, are official Chinese data. How reliable are these data? First, they are the most reliable

Table 6.1
Growth of per capita GDP (average annual growth rates, percentage)

	GDP	Population	GDP per capita
1952–1978	6.0	1.9	4.1
1978–2005	9.6	1.1	8.5

data we have. That is, there is no plausible alternative set of data for China, and no one has ever demonstrated that the extensive Chinese numbers published are mutually contradictory or inconsistent with externally verifiable facts. So the truth is that we have no choice but to use official data. And after all, the official data are the product of a data-collection network systematically analyzed by a large group of conscientious government statisticians. Having said this, there are many reasons to emphasize that the data are neither as precise nor as reliable as we would like. China is both a transition economy and a developing country. GDP data from most developing countries are prone to substantial errors, and statistical accuracy is a problem in transitional economies because the magnitude of change is so large.

Especially troubling is that China made a transition to a new data-collection system in 1998 that was in some respects a failure. Attempting to adjust data-collection procedures to an economy with many more small-scale businesses, the National Bureau of Statistics (NBS) shifted to sample survey estimates of the size of small-scale industry and services. The resulting GDP numbers were not only arguably less reliable than before, but were also difficult to corroborate with consistent pastime series. Indeed, during 2005 the NBS revised GDP upward by 16% to reflect a more inclusive count of small-scale service providers primarily in transport, retailing, and restaurants. (These new estimates are used through this textbook.) Moreover, the 1998 changeover to the new system happened to coincide with a period of exceptionally rapid change in the real economy, and so our picture of the 1998–1999 period is especially indistinct. As discussed in Chapter 14, the problem is particularly acute with respect to energy data, which completely breaks down at that time. Unfortunately, Chinese data are not necessarily becoming more accurate.

Three sets of problems afflict Chinese data: prices, coverage, and politics. First, official statistics do not adequately correct for the effects of inflation. The GDP deflator, the measure of inflation that is used by official government statisticians to convert nominal (current-price) GDP growth to real (constant-price) growth, grows more slowly than almost every other measure of inflation. Ren (1997) and Young (2003) present good accounts of the data, together with convincing arguments for the use of alternative price indexes. Using different price indexes lowers the overall GDP growth rate by 1.6 percentage points annually for the period Young examines (1978–1998). This problem is most acute for the 1980s, when inflation was rampant. Since 1996, prices have been stable, and this problem has become less serious. Second, statisticians have a very hard time accounting for the expanding scope of the economy. Twenty-five years ago, China did not produce color televisions, to say nothing of computers. Chinese statisticians tend to count fast-growing items like computers

by valuing them at their early, very high, prices, which overweights them and therefore overstates growth. But there are also fast-growing items that had very low prices at the beginning of the era, such as health care and housing. Many of these were rationed at the beginning of the period but are now readily available at market prices. Counting these items at their beginning-of-period prices creates another source of inaccuracy, but one that tends to understate growth. The net effect is unclear.

Third, and finally, data collection is intertwined with politics in China in a way that reduces the accuracy of statistics. The NBS has a monopoly on statistical collection, so the benefits of a competitive market place have not reached the data field yet. Many crucial data series—including GDP—are used as success indicators for local officials, who therefore have incentives to inflate or otherwise distort the numbers that are reported. Moreover, the Communist Party monopoly over the press affects the way economic news is reported. For example, when revisions are made to GDP data, they are almost never used to revise growth rates downward, even when doing so would seem to be logically appropriate. These are serious problems, and they tell us to use caution with Chinese data and accept the data only within a fairly large margin of error.

6.1.2 Growth in Comparative Perspective

The problems discussed in the preceding section do not indicate, however, that Chinese economic growth is somehow illusory. Quite the contrary: some key elements of the economy are fully verifiable; for example, exports have grown much more rapidly than GDP and are fully corroborated by the independent statistics of importing countries. If China's GDP were actually growing significantly more slowly than official figures indicate, exports would have increased their share of GDP even more dramatically, and it would be difficult to explain how exports had grown so much more rapidly than GDP. China's dramatic export boom only makes sense in the context of a rapidly growing GDP. There are a number of similar cases of readily verified series (fiscal revenues, for example). As noted before, no alternate procedure for assessing China's growth meets basic consistency checks; and finally, rapid growth and transformation correspond to the commonsense evidence of personal experience. Overall, then, there is likely to be some upward bias to the official recorded growth rates, but it will not change the fundamental picture of rapid growth. Allowing for inadequate deflation during the 1980s and early 1990s, and perhaps for an undercount of GDP in 1978, we might well adjust Chinese GDP growth by lowering it one to two percentage points per year. Such an adjustment would put China's per capita GDP growth at around 7% per year for

the entire 1978–2005 period. This is still the most sustained period of rapid economic growth in human history.

Growth of per capita GDP above 6% for a prolonged period of time is not unprecedented, but worldwide it has only happened in three episodes, all of them in East Asia. First, Japan led the way with growth of GDP per capita slightly above 8% per year for 18 years, from 1955 to 1973. After 1973, Japanese growth moderated, but it remained healthy until the end of the 1980s. Second, during the 14-year period from 1982 through 1996, several East Asian economies grew at very high rates. During this period, annual growth of GDP per capita in Korea was 7.4%; in Taiwan 7.1%; and in Thailand 6.8%. However, these economies experienced a fairly dramatic economic shrinkage after 1996 and slower growth thereafter, suggesting that some part of the rapid growth before 1996 might have been unsustainable. The third episode is China since 1978. China's contemporary growth thus represents the third major East Asian growth surge. After correction for statistical overstatement, China's growth is probably not more rapid than the other two. However, China's growth is still unique: it affects many more people than the two previous episodes; and China's growth surge is still going strong after 27 years, far longer than the other two episodes.

6.1.3 Instability in Growth

Figure 6.1 shows that there has been a pronounced cyclical pattern to GDP growth post–1978. There have been four periods of especially rapid growth, close to or surpassing 10% per year. Peaks are evident in 1978, 1984–1985, 1992–1994, and 2003–2005. Each peak growth period produced serious strains on the economy, including inflation and sectoral bottlenecks, and was followed by a phase of retrenchment and slower growth. Long-term growth is clearly a good thing, but it does not follow that maximum growth in a short time period is always desirable. Growth must be sustainable to deliver its benefits. Although China exhibits significant macroeconomic instability, so far each retrenchment has been followed by a renewed growth cycle, and there is no obvious reason why rapid Chinese growth cannot be sustained for another decade.

6.2 INVESTMENT

Closely related to China's rapid growth is the enormous investment effort China has made over the past 25 years. Ironically, since China has abandoned the Big Push socialist development strategy, its investment rate has actually

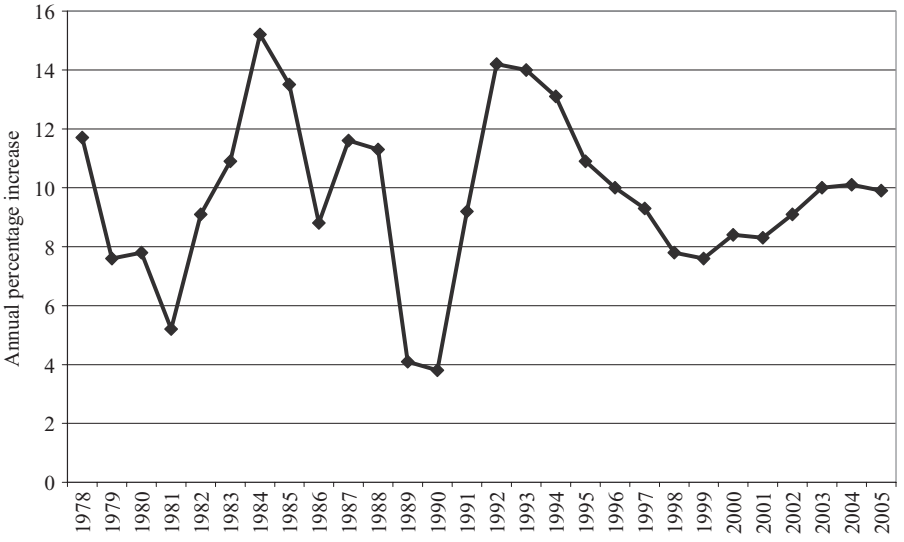

Figure 6.1
Annual GDP growth, 1978–2005

risen. Indeed, the most immediate explanation for China's rapid growth has been the very high rate of investment China has sustained. The basic facts are shown in Figure 6.2, which shows total capital formation and its two components, fixed capital formation and inventory accumulation. We are most interested in fixed capital formation (shown in a solid line), which corresponds to new factories, roads, and housing and which is fundamental to economic growth. Gross fixed capital formation was already around 30% of GDP at the end of the 1970s, and it stayed in that range through most of the 1980s. During the 1990s, however, fixed capital formation increased to about 35% of GDP, before taking another jump upward to 40% of GDP in 2004. Fixed capital formation surpassed 40% of GDP in 2005. China's investment rate is not only high, but also rising. Some part of the most recent increase in investment may well be unsustainable, part of a macroeconomic phase of overheating, but the long-term trend to an increased fixed investment ratio is clear.

Have we ever seen investment rates this high before? Yes, but only in exceptional circumstances. Again, the two previous episodes of rapid growth in East Asia were also characterized by high investment, although not quite as high as China today. Japan invested 35%–37% of GDP in gross fixed capital formation during 1970–1973 at the very end of its long boom. Korea sustained a very high fixed investment rate from 1990–1997, peaking at 39% in 1991.

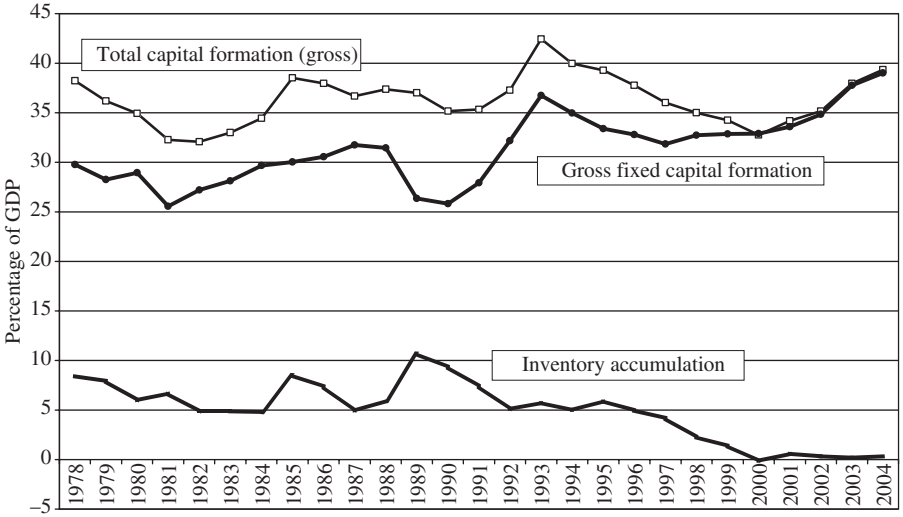

Figure 6.2
Gross capital formation

For brief periods in the mid-1990s, Thailand and Malaysia invested over 40% of their GDPs in fixed capital (1993–1996 and 1995, respectively). Thailand and Malaysia achieved their very high investment rates to a significant extent by relying on inflows of foreign direct investment, which equaled 5%–6% of GDP. Japan and Korea, however, did not rely on foreign investment to any significant degree at all.

China certainly hosts a significant amount of foreign investment, amounting to about 4% of GDP over the last decade. However, unlike Thailand and Malaysia, China has not run a current account deficit in recent years and thus is not dependent on foreign capital inflows to finance its domestic investment. On balance, Chinese investment is fully financed through Chinese domestic saving. Thus Chinese domestic saving rates are also very high, as they must be to finance the prodigious investment effort. Of course, foreign investment still plays an important role in the Chinese economy. In essence, China uses the opportunities and skills that foreign direct investment brings to identify and develop productive investment projects. The increased return created by these more productive projects contributes to keeping the overall investment rate high.

High investment is a major explanatory factor and precondition for rapid growth in China, as it has been in previous episodes of rapid East Asian growth. Clearly, a big part of the answer to the question "Why is China growing

so fast?" is simply "Because it invests so much." We can better understand China's experience—and in turn use the Chinese example to shed light on global economic growth—by looking at some of the basic relationships between investment and growth. Particularly during the 1940s through the 1960s, economists examining development and growth tended to see investment as the key to growth. Development economists argued that the first task of development was to increase investment from, say, 5% of national income to 15% or more. (Today most economies already invest more than 15% of national income, and China, obviously, invests much more than this.) The simplest possible growth model, called a Harrod-Domar model, is one that includes only fixed capital as a source of growth: this simple model can make sense only if labor is so abundant that labor to work the new capital is always available at insignificant cost. In that case, a model can be structured by defining a constant capital/output ratio. That is, set a parameter, $k = K/Y$, where small k represents the number of units of capital (K) required to produce each unit of GDP or income (Y). In a reasonably well functioning economy we might expect this capital/output ratio to be a number between roughly 3 and 6. Assume that in a given economy, such as China, this ratio is fixed in the short term and equal to 4. The output (GDP) is given by the capital stock:

$$Y = 1/k \times K$$

And growth is given by the increment in the capital stock:

$$dY = 1/k \times dK$$
$$dY/Y = 1/k \times dK/Y$$

Since, if we ignore depreciation, dk/Y = Investment/Y; then call the growth rate g and the investment rate i, so that growth is a linear function of investment:

$$g = i/k$$

In China's case, as the investment rate is pushed up to 40% of GDP, the growth rate of the economy as a whole approaches 10% (10% = 40%/4). Clearly, this simple relationship captures something important about the Chinese growth experience.

While illuminating, this perspective is too limited. In the first place, international experience shows that the relationship between investment and growth is not so straightforward and that it cannot explain very much of the variation in the growth experience across countries. A significant investment

effort is a prerequisite to growth, but today virtually all economies invest more than 15% of GDP, and yet some are growing robustly while others are not growing at all. In fact, even for a single economy, the investment rate tends to be relatively persistent over the long term, but countries' growth rates can fluctuate dramatically, as indeed China's experience also demonstrates. While there is definitely an association between investment and growth, the relationship is neither as strong as we might expect, nor the causality as clear as predicted (Blomstrom, Lipsey, and Zejan 1996; Easterly and Levine 2001). The East Asian growth experiences clearly depend on a significant investment effort, but not necessarily on the extremely high investment rates that characterize China or Korea. The economy of Taiwan, for example, has achieved very rapid growth, but fixed capital formation was only occasionally pushed above 30% (and the last time was in 1980). Even if investment fuels growth, investment is costly. Resources are diverted from consumption, so investment involves "belt tightening." The challenge over the long run is to understand how economies achieve sustained increases in the productivity with which labor and capital are used.

In a standard economic viewpoint we would expect to see that continuous increases in capital gradually run into diminishing returns. The rate of investment is thus ultimately determined by the rate of return on investment: investors will continue to put money into investment until the marginal returns fall to their cost of capital. Even in the standard "neoclassical" view of growth, then, while the investment rate is an immediate determinant of growth, it is still necessary to understand the productivity of investment to explain the rate of investment. In another view of the growth process, the key factor in growth is technology change, which responds to different factors than just investment. In this view, "idea gaps" are more important than differences in fixed capital endowments in explaining performance. Because technology transfer can lead to jumps in the productivity of an economy, it is the most fundamental determinant of growth. In this view, the ability to absorb technology is determined endogenously by an economy's education, institutions, and policy. Investment does not necessarily run into diminishing returns—since technology is "nonrival" and can be shared without cost—but investment is no longer the decisive factor in explaining growth, either. These alternative views apply to the case of China.

China is an unusual case precisely because the investment rate has remained high under dramatically different economic systems and regimes. During the Big Push period the investment rate stayed high regardless of the productivity of investment because of government's direct role. China's transition to a

market economy was unique in that gross fixed capital formation never dropped below 25% of GDP, even in the lowest years (1981 and 1989–1990). This is dramatically different from other transitional economies, where investment was similarly high under the command economy but collapsed during the transition. Further, China only gradually reduced that part of investment that is basically waste. Figure 6.2 shows that *total* capital formation is composed of both fixed capital formation and inventory accumulation. While some inventory accumulation—buildup of stockpiles in factories and stores—is a necessary part of economic growth, market economies typically spend less than 1% of GDP on inventory accumulation, except during unanticipated recessions. China, like other command economies, consistently spent over 5% of GDP on inventory accumulation, largely because of the buildup of worthless, low-quality or unsuitable product. These levels of inventory accumulation can serve as an indicator of the persistence of command-economy-type inefficiency in the system. China displayed this inefficiency through the mid-1990s but still managed to keep investment high. Then, after the second phase of reform in the late 1990s, inventory accumulation fell to essentially nothing. The economy could have adapted by increasing consumption's share in GDP; instead, investors responded to the improved productivity of the economy by stepping up investment. Total investment rose past its previous heights. Because none of this was inventory accumulation, total fixed investment soared well past its previous heights.

A key element of the Chinese experience, then, is one of consistently high investment that appears to be sustained by a gradual increase in the productivity performance of the economy. This interpretation is supported by the fact that inflows of foreign direct investment have remained strong, indicating that foreign businesses continue to find profitable projects in which to invest. High investment rates "cause" economic growth, in a mechanical sense, but are also themselves a symptom of productivity improvements that are the ultimate source of economic growth. Explaining these improvements, though, is challenging. At a minimum, skill, institutions, and policies have to be adequate to support productive investments, and national actors have to be willing to defer consumption, maintain their own saving rates, and plow resources back into investment. These topics are covered elsewhere in this book.

6.3 STRUCTURAL CHANGE: COMMON PATTERNS

The sustained increase in output per capita that comes from the development process is caused by accumulation of new physical and human capital, and by

improvements in productivity. Productivity increases because existing jobs are upgraded and, equally important, because workers leave existing jobs in the traditional sector and move into modern sectors, where productivity and the potential for future growth are higher. Thus the long-term growth of output is inevitably associated with important structural changes. These can be traced both through the labor force and through GDP.

All countries begin development predominantly agricultural. In the early stages of development, farmers make up the bulk of the labor force, and most value added is in agriculture. As development proceeds, certain common patterns of structural change are observed that are associated with the growth away from a predominantly agricultural economy and to an industrialized and diversified economy. The simplest way to track these changes relies on classifying all economic activity into three sectors: primary (agriculture, including fisheries, forestry, and animal husbandry); secondary (including mining, manufacturing, construction, and utilities); and tertiary or service (including transportation, communications, household and business services, social services, and technology and education).

The first obvious change during the development process is that the share of the labor force in the primary sector declines. As economies begin to move out of low-income status and into the ranks of middle-income economies, the absolute number (and not just the share) of workers in agriculture begins to decline. The remaining farm laborers boost their productivity and are able to feed the entire country. This process continues indefinitely: a high-income country like the United States has only 3% of its labor force in agriculture. Rozelle (2004, 60) calls the decline in agriculture's share the "iron law of development." It may seem initially that agriculture plays an entirely passive role, shrinking steadily as the economy modernizes. In fact, successful developing economies typically experience modernization of the agricultural sector as an early and integral part of overall development. As will be discussed in Chapter 11, agricultural development "feeds" the broader process of economic growth in a number of fundamental ways: providing food at low cost, which keeps wages economy-wide at reasonable levels; releasing workers for growing modern sectors; and providing a source of finance and markets for modern growing sectors. Healthy agricultural development leads to more rapid development overall.

The process of industrialization, starting from a small base, gradually changes the structure of the economy. The secondary sector grows through the initial stages of development, increasing the number and share of workers and the share of GDP. Industry does not grow forever, though. At a certain point the industrial share of GDP levels off. Moreover, as industrial productivity

continues to rise, the share of workforce in industry declines. There is no iron law for industry-sector development; country experience is diverse and reflects individual specialization and endowment. However, an "average" pattern is that the industrial share of GDP tends to increase until a country reaches an income level of around $10,000 GDP per capita, evaluated at purchasing power parities (PPP; Box 6.1), and then levels off, and may even decline. Manufacturing—the most important part of the secondary sector—typically peaks at about 20%–25% of GDP, but there is considerable variation.

The tertiary, or service, sector displays even more diversity. During the early phase of development the share of the service (tertiary) sector does not necessarily change by a large proportion. Many underdeveloped economies have large proportions of their labor force engaged in services. However, these are predominantly low-value jobs: small-scale retail and repair, hauling goods, and personal services. Early development in these economies may result in a declining agricultural share and an increasing industrial share without a large change in tertiary employment. However, above the threshold that we can set roughly at $10,000 per capita PPP GDP, the service sector's share inevitably increases, since both primary and secondary sectors are declining. As an economy like that of the United States reaches a GDP per capita of $40,000,

Box 6.1
Purchasing Power Parities (PPP)

GDP for each country is initially calculated on the basis of that country's currency, so China's GDP is calculated first in RMB. However, in order to make comparisons among countries, we need to convert GDP or GDP per capita into some common benchmark currency, most often the U.S. dollar. The simplest way to do so is simply to use the prevailing exchange rate. However, conversion using exchange rates is often unsatisfactory, because the price structures of different countries can be extremely different, varying according to relative scarcities, and exchange rates can sometimes fluctuate dramatically. An alternative is to calculate PPPs. For China, this means first calculating how many RMB it takes to purchase a given basket of goods and services, and then comparing this figure to the U.S. dollar cost of an equivalent basket in the U.S. economy. This ratio is then used to value the "purchasing power" of the RMB, which allows us to express Chinese GDP per capita in comparable PPP-adjusted dollars. This procedure is especially useful for evaluating living standards or the incidence of poverty, and we will use it in Chapter 9 when we discuss those topics.

In addition, when a PPP calculation is done for many different countries, it gives us a common benchmark to evaluate the development process. The computation is difficult because the bundles of goods and services produced and consumed in different economies vary quite significantly. PPP calculations require a great deal of data, and no two calculations will be exactly the same. However, a number of large comparison projects (including one by the World Bank) have produced PPP estimates according to a consistent methodology for a large number of economies. The discussion of common patterns of structural change in the text is based on World Bank series of PPP-adjusted GDP per capita. According to the World Bank, China's PPP-adjusted GDP per capita was almost $5,000, in constant 2000 dollars, in the year 2004.

it has 70% of its employment in services. Let us now see how well these patterns apply to China.

6.4 STRUCTURAL CHANGE IN CHINA: LABOR

China's labor force is huge: the economically active population was 740 million according to the 2000 census. A very high, and increasing, share of the population is of working age, and a very large share of the working-age population does in fact participate in the labor force. These facts are discussed more fully in the following two chapters, but they are introduced here to provide background for the process of structure change in the labor force. Labor-force structural change takes place in the context of unrelenting pressure on the employment-generating capability of the economy. The ability of the growing modern sector to absorb labor is a key determinant of the economy's ability to transform itself.

As Figure 6.3 shows, at the end of the planned economy era in 1978 the Chinese labor force reflected both the fact of underdevelopment and the distortions imposed by the administrative regime that divided urban and rural. At that time the remarkably high figure of 71% of the workforce was engaged in agriculture. (The overall rural share of the labor force, including rural

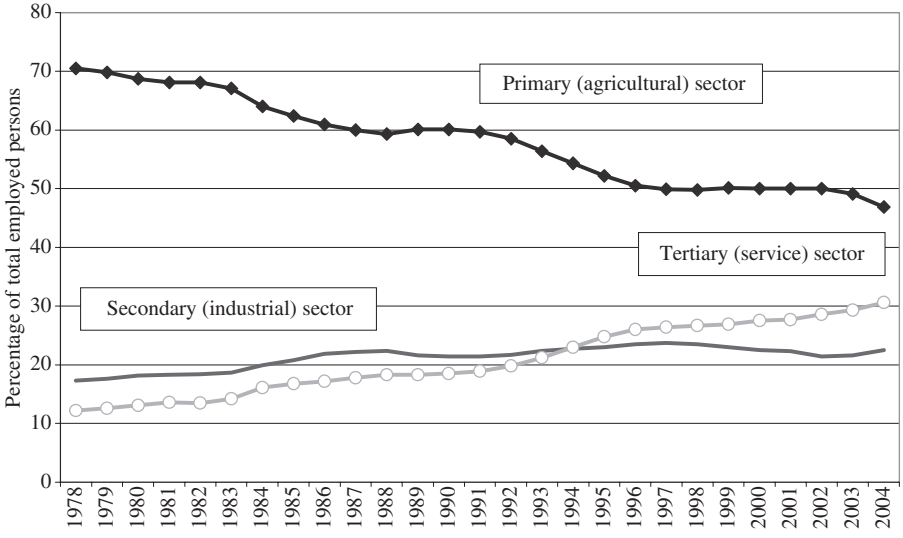

Figure 6.3
Structural change in employment

industry and service along with agriculture, was 76% at this time.) Following common patterns of structural change, the share of the labor force in agriculture has declined significantly since 1978, and it fell significantly below 50% for the first time in 2004. Especially rapid bursts of structural change took place in three periods: from 1983 through 1987, from 1991 through 1996, and after 2003. The first burst shows the early success of rural reforms: as collectives were disbanded and farm output surged in the early 1980s, millions of farmers left to take up new nonagricultural jobs, especially those in TVEs (Chapter 12). The second burst occurred in the early 1990s, as economic growth surged and restrictions on rural-to-urban migration were significantly reduced. The third burst corresponded with the 2003 investment-driven acceleration of the economy. Periods of more rapid economic growth are also periods of expanding opportunity for rural workers and of accelerating structural transformation. The absolute number of agricultural workers reached a peak of 391 million in 1991, and it has since started its long, steady decline. By the end of 2004 the number of agricultural workers reached 353 million, for a cumulative decline of about 10%. China no longer has a clear majority of its workers in agriculture; China is thus no longer a predominantly agricultural economy. But with half of its workers still in agriculture, China remains on the doorstep of a modern economy, with much transformation still ahead.

Particularly noteworthy is the very slow pace of structural change between 1996 and 2002. The exodus of workers from agriculture slowed dramatically after 1996 because of the impact of state-sector restructuring. State enterprise downsizing led to mass layoffs in state-run factories (Chapter 8). The urban unemployment rate increased sharply and created a much more difficult urban job market for potential rural-to-urban migrants. Indeed, the proportion of the labor force in industry has been a little above 20% since the late 1980s, while industrial output has continued to grow as a share of GDP. This is consistent with a view of Chinese industry as characterized by many underemployed workers through the mid-1990s, many of whom were subsequently let go. The release of surplus workers caused the structural transformation of the labor force to stall out temporarily at the turn of the century, resuming only after 2003.

Figure 6.3 also shows the gradual growth of China's late-developing service sector. The share of workers in services in 1978—merely 12%—is astonishingly low. There is some undercount involved here, since statisticians are unlikely to have captured all the employees of urban industrial work units who were actually providing services to other work-unit employees. But it is undoubtedly true that, as noted in Chapter 3, socialist development involved a neglect of investment in the service sector, as well as discrimination against

individual service providers. Given that background, it would be expected that market transition should create a dramatic expansion in service-sector employment. Figure 6.3 certainly shows vigorous service-sector growth, as its share of the work force has climbed steadily to more than 30% in 2004. Nevertheless, given the depth of suppression of the service sector pre–1978, one could have expected an even more impressive growth. Moreover, many middle-income developing countries have 40% or more of their labor force in services. China's low figure may reflect an undercount of small-scale service businesses. But even adjusting for under-reporting, it appears that reforms have had a slow and relatively weak impact on increasing the employment of service sectors. This may be due to the fact that while market opening and diversification have proceeded strongly in goods-producing sectors (primary and secondary sectors), the government has maintained near monopoly controls over a number of higher-skill service sectors, including those relating to finance. Since the late 1990s, as industrial restructuring has caused a reduction in manufacturing employment, service employment has begun to grow somewhat more rapidly and has taken up some of the workers displaced from industry. This is a favorable sign, and it indicates that the economy has the potential to generate more service-sector employment, thereby providing new jobs for underemployed and low-productivity workers in agriculture and industry.

6.5 STRUCTURAL CHANGE IN CHINA: GDP

Structural change can be viewed through the changing shares of total GDP produced by the primary, secondary, and tertiary sectors. Unlike in the case of labor, which we could measure simply by counting bodies, GDP must be measured in value. Therefore, we must choose an appropriate price standard for comparison and properly treat changing prices over time. These issues are particularly important in the case of China because the Big Push socialist development strategy imposed distortions both on the price system and on the true structure of the economy. As discussed in preceding chapters, the priority placed on industrial development, together with the need to ensure a source of budgetary revenues, led the socialist government to follow a high-price policy for industrial output, leading to an overstatement of industry's contribution to GDP. Prices of agricultural products and services were, in relative terms, undervalued. At the same time, however, planners followed a development strategy that gave priority to industry, leading to a precocious real development of industry.

The result of these factors is that China's GDP in 1978, measured in the prices of that year (1978), was dominated by industry. The secondary sector produced 48% of total output, agriculture only 28%, and the service sector a tiny 24%. Working for the distorted prices set by the government, an industrial worker was over seven times as productive as an agricultural worker. During the post–1978 reforms, many of the distortions imposed on the price system by the government pre–1978 were eliminated. The gradual opening of the economy to competition and international trade, along with the elimination of government price controls, drove down the relative price of manufactured goods, compared with services and agricultural products. Industry displayed the lowest rate of inflation, while at the same time enjoying the highest real growth rate in the economy. Price changes and real growth rates were thus negatively correlated in China. This is a common phenomenon observed in growing economies, but the effect is especially large in China because the initial-period price distortions were very big and growth has been especially rapid.

The negative correlation between price and real growth means that the output of the three sectors in China has grown at roughly similar rates when valued at current prices (since higher growth tends to offset lower price inflation, and vice versa). As a result, measured at current prices, the sectoral composition of GDP in China seems to display no consistent trend. For example, the share of industry in current price GDP has never surpassed the 48% recorded in 1978, and even in 2004 that share was only 46%. The constantly shifting price base of current prices cannot give a true measure of structural change. The best alternative is to use constant prices from a relatively recent year, since we have good reason to believe that recent prices are closer to world prices and since we know that earlier prices were highly distorted. When we do so, using the implicit sectoral GDP deflators to revalue sectoral output to a constant-price basis, the long-run pattern of structural change emerges clearly. Figure 6.4 uses prices from 2004 to measure structure and structural changes through 2005. It also provides another look at the structure of the economy in 1978 by looking at shares of GDP measured in 2004 prices. Using this price base, agriculture produced 42% of GDP, while industry produced 29% in 1978. This more moderate number means that China in 1978 did not display such an unusually high level of industrialization early on as initially appears. Moreover, when 1978 output is revalued according to the more realistic prices of 2004, an industrial worker is not quite three times as productive as a farmer (instead of seven times as productive). A productivity differential of this magnitude would be similar to that reported in other developing countries, and reflects reasonably well the better education and equipment that industrial workers have compared to farmers. In both these respects, China

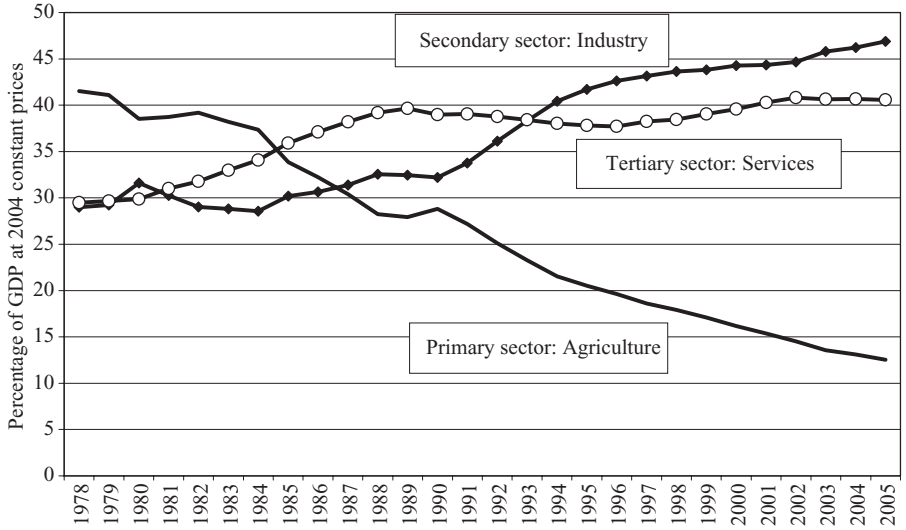

Figure 6.4
Composition of GDP

turns out to be a less extreme outlier than one would have concluded just by looking at current price data.

Figure 6.4 displays a clear picture of structural change since 1978. Two periods can be discerned. During the first period, from 1978–1990, structural change was moderate and marked by complex trends. Agriculture's share declined, slowly at first, as reformers gave renewed priority to agriculture in the six years through 1985. The service sector grew rapidly, reflecting its strong recovery from the highly repressed conditions of the command economy era. By contrast, the industrial share increased relatively slowly, growing by only three percentage points through 1990. However, with the renewal of economic reform and rapid growth after 1991, structural change resumed with renewed intensity. Rapid industrial growth dominated the process. The share of GDP originating in industry jumped from 32% in 1990 to 42% in 1995, and then continued to trend upward, surpassing 46% in 2004. Indeed, the industrial boom has been so overwhelming that the share of services, which we would normally expect to be increasing in a rapidly growing economy at China's income level, has leveled off around 40% of GDP since 1990 (even after incorporating higher estimates of service sector value-added revised to correct an undercount of small-scale service providers). During this industrial boom, agriculture's share of GDP has resumed its rapid decline, sliding from 29% of GDP in 1990 to 13% in 2004 (measured in constant 2004 prices). China is leaving behind its history as a predominantly agricultural economy as it

undergoes rapid industrialization, but its service sector still lags behind the explosively growing manufacturing economy.

6.6 STRUCTURAL CHANGE AND GLOBALIZATION

China's industrial share in 2004 was extremely high. Industry includes mining, petroleum extraction, and utilities, which of course vary substantially across countries and which are not particularly large in China. For international comparative purposes, it is most useful to compare the share of GDP that is produced in manufacturing. In China, manufacturing makes up three quarters of the overall secondary sector (which includes construction as well as industry). Thus, manufacturing value-added accounted for 35% of China's GDP in 2004. This a very high share of manufacturing in GDP for a large country. A few countries have concentrated 35% of GDP in manufacturing (Brazil in 1982 and Thailand in 2003; Malaysian manufacturing accounted for 33% of GDP in 2000), but none of these countries has quite reached China's extreme levels of concentration or sustained it as long. Clearly, China's high manufacturing share is related to China's high investment rate, which keeps the demand for materials and machinery high, and to government policies that foster industrial growth. It is thus ironic that since China abandoned the Big Push strategy, both its investment rate and its manufacturing share have risen to unprecedented highs.

However, it is also clear that China's high manufacturing share is closely related to its emergence as "the world's factory." Globalization changes some of the patterns of structural change. As China emerges as a favored site for certain types of manufacturing worldwide, and as it clusters certain stages of Asia-wide manufacturing networks, it clearly can continue to expand its manufacturing sector for a longer period than if it were not so integrated into world industry (Chapter 16). An instructive contrast, touching on globalization and also on economic development patterns, is with India. The pattern of structural change in India is shown in Figure 6.5. Like China, India shows a steady decline in the share of agriculture in its overall GDP. But the relationship between change in industry and services is reversed in the two economies. In India, industry's share has remained roughly constant, while services have climbed to more than 50% of GDP. Each country has established a comparative advantage in one broad sector, then developed along a path of steady growth in the comparative-advantage sector. In that sense, globalization and international trade create additional opportunities for specialization and apparently "unbalanced growth" that would not exist in an economy less integrated with the world.

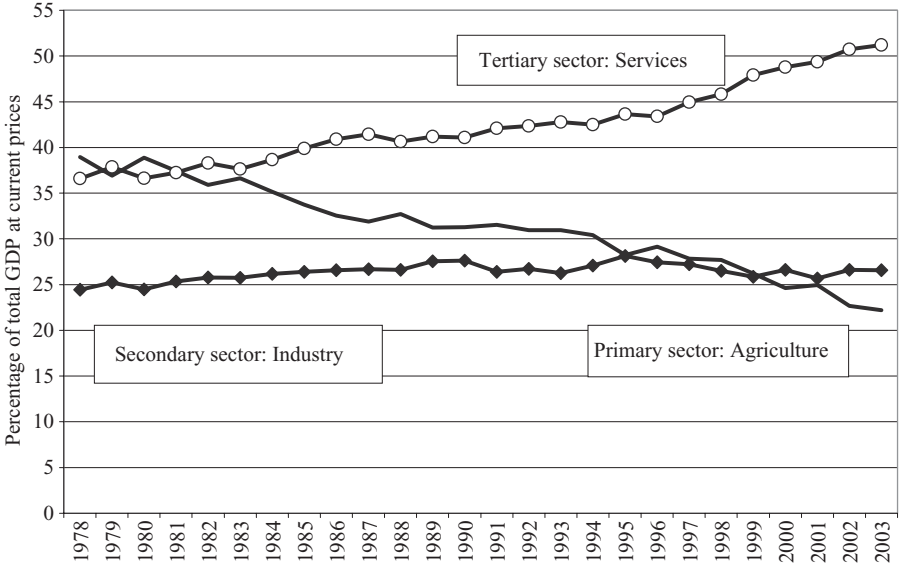

Figure 6.5
Composition of Indian GDP

6.7 CONCLUSION

Economic growth has been intertwined with structural changes throughout China's economic development process. By examining the benchmarks of structural change, we have been able to identify where China has forged its own unique path in a process of dynamic development. China's command economy and Big Push industrialization strategy included policies restricting labor mobility and controlloing prices, as well as neglecting agriculture and services. These policies all had ramifications for China's growth and structural changes that caused a divergence from the development-process benchmark. Yet, despite these divergences, China has followed general patterns of development found throughout the world. Today China is a vast diverse nation with an unusually large manufacturing sector, highly developed urban centers, a lagging service sector, and underdeveloped rural areas. The process of structural change is well under way, but continued restructuring is on the horizon. In the next chapter, we turn to a discussion of China's demographic structure and the unique benefits and challenges it poses to China's further economic and social development.

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Suggestions for Further Reading

For a good discussion of the regularities of structural change in development, see Perkins et al. (2001). World Bank (1997) has a very accessible discussion of structural change and productivity growth in China. The literature on Chinese growth is very large: Holz (2005) lays out the main considerations in an approachable form, with an emphasis on labor quality.

Sources for Data and Figures

Figure 6.1: *SYC*, post–1993 revised according to NBS (2006).

Figure 6.2: *SYC* (2005, 64). An approximation based on GDP expenditure side data, revised post–1993 on the assumption that fixed investment and inventory accumulation remain the same as in earlier data, but total GDP revised as in NBS (2006).

Figure 6.3: *SYC* (2005, 118).

Figure 6.4: *SYC* (2005, 51, 53); post–1993 revised according to NBS (2006).

Figure 6.5: World Bank, World Development Indicators.

Table 6.1: National Accounts Division (1997); *SYC* (2005, 51, 53); post–1993 revised according to NBS (2006).

The discussion in the text, as well as the data presented in Figures 6.1, 6.2, and 6.4 are based on the revisions of GDP data after 1993 presented by NBS (2006). These revisions increased 2004 GDP by 16.8%, primarily because of a 48.7% upward revision in the value of tertiary sector output, better covering small-scale businesses. A number of unresolved questions have required compromises: Data have been presented here in a way that is the *least* favorable to the chapter's arguments. For example, Figure 6.2 is created with investment taken from the earlier unrevised expenditure accounts (thus, assumed unchanged), but normalized by the larger postrevision GDP figure.

The weakest parts of the national accounts data are the implicit price deflators. Young (2003) estimated that GDP growth in the 1978–1998 period was 8.1%, instead of the officially recorded 9.7%, based primarily on alternative price indexes. Even more troubling, the NBS has several times revised nominal values without changing constant price growth rates, thus in effect using changes in implicit deflators to make up the difference. For example, TVE industrial output was revised downward after the 1995 industrial census, but industrial and GDP growth rates were never lowered. In the most recent revisions, industrial output in 2004 was found to be higher than previously recorded, but industrial growth rates were not revised upward (though service sector growth was). The new official GDP growth rate, incorporated into Table 6.1, is higher than the previous rate, but lower than it should have been had industrial output growth been revised upward. I owe this point to Carsten Holz.

Comparative data on investment rates, growth rates, and structure are from World Bank, World Development Indicators.

Taiwan data are from Taiwan CEPD (2005).

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