1. China's New Sources of Economic Growth: A supply-side perspective

Ross Garnaut, Cai Fang, Ligang Song and Lauren Johnston

Introduction

The Chinese economy has continued to absorb massive pressures for structural change since the publication of *China's domestic transformation in a global context* (Song et al. 2015). The increasing scarcity of labour and rising labour costs foreshadowed in *The turning point in China's economic development* (Garnaut and Song 2006) have continued to constrict the old Chinese strengths linked to exports of labour-intensive manufactures. The overhang of excessive investment in infrastructure and heavy industry from the aftermath of expansion to counteract the Global Financial Crisis (GFC) and the debt that funded it requires large structural change independent of the longer-term pressures. The ageing of the Chinese population deriving from low fertility in the reform period has generated special challenges of growing old before getting rich (Johnston et al., Chapter 10, this volume). Global and domestic environmental imperatives have forced a reshaping of priorities for economic development and exerted their own pressure for change away from the old pattern of investment-led growth. Meanwhile, China grapples with the special challenges of transition from the ranks of the world's middle-income countries into the developed world—the challenge of escaping the 'middle-income trap'.

The Chinese Government has remained committed to the directions defined in China's new growth model. The new directions have shaped the Five-Year Plan (FYP) for 2016–20.

The changes in China have taken place within a troubled international economy. Growth in the developed economies has remained weak since the descent into the GFC from late 2007. Developing countries beyond China demonstrate a wide range of experiences. Many continue to grow reasonably strongly through the troubles of the developed world. But the many developing and transitional economies specialising in commodity exports that were carried high by the Chinese resources boom from early in the century to 2011—Brazil, Russia, South Africa, Nigeria and others large and small—have fallen on hard times under China's new model of growth. World trade has expanded less rapidly than output over recent years, removing a source of economic expansion in China and elsewhere.

Savings are well above investment through the developed world and China, generating the lowest market-determined long-term interest rates ever. The Federal Reserve Bank of the United States has moved only tentatively to haul in the most expansionary monetary policy in history. Other central banks through the developed world continued to ease monetary policy in an attempt to lift growth in incomes and output. Investment remains weak, generating a tendency everywhere for economic growth to remain below what had once been regarded as attainable rates. Weak business investment has been the effect and the cause of the lowest productivity growth in modern times—in the developed world and, recently, in China.

Global economic growth fell to 1.5 per cent with the onset of the GFC in 2008 and declined further to −2.1 per cent in 2009. The latter outcome would have been lower still but for the powerful fiscal and monetary expansion that restored Chinese growth to historically strong rates by the end of that year. Global growth recovered briefly in 2010 to an old normal rate of 4.1 per cent, but settled at rates below any sustained period since the middle of the twentieth century: 2.8 per cent in 2011, and then to 2.3 per cent (2012), 2.4 per cent (2013), 2.5 per cent (2014) and 2.4 per cent in 2015.

So China's structural change has been occurring through challenging international circumstances. When slumping demand in the industries supplying the high investment in the later years of investment-led growth in China generated sharp increases in exports of surplus steel and other products, the developed world responded with the strongest protectionist reaction of the twenty-first century. The political consequences of stagnant real incomes in the United States and Europe threaten to further weaken the international environment for Chinese growth.

China's economic growth continued to slow through 2015 and the first half of 2016—as it has done consistently since 2011: the annual growth rate fell to 7.7 per cent in 2012 and 2013, and then further, to 7.3 per cent in 2014 and 6.9 per cent in 2015.

China's new model of economic growth, now embraced as the 'new normal' by the Chinese leadership and embodied in state planning, is meant to generate slower growth, which is a natural accompaniment of a lower investment share of expenditure. Over the past year, there have been periodic fears within Chinese and foreign business and wider communities that Chinese growth is slowing more rapidly than sought by policy. This has generated periods of market disruption and awkward government responses.

China's economic slowdown is part of a deceleration throughout the more prosperous parts of the world, but also has its own causes and characteristics. This book examines the special structural features of economic change in China,

which will determine whether the economy and society experience a smooth transition to high-income country status—or remain mired in the middle-income trap.

China's domestic transformation in a global context (Song et al. 2015) drew attention to a then recent tendency for Chinese growth to come overwhelmingly from growth in the capital stock. Low fertility from early in the reform period had removed increases in the labour force as a significant source of economic growth. This had long been anticipated—together with the many consequences of an ageing population. What had not been anticipated was the decline in total factor productivity (TFP) growth—the reverse of what was required for smooth implementation of the new model of growth. A decline in the rate of investment—required within the new model of growth—would be associated with a large decline in the rate of growth in output unless it was accompanied by a large lift in productivity. There were no signs of such a lift.

The broad macroeconomic story has not changed much over the past year. There are large practical difficulties in measuring TFP growth and those who attempt to measure this dimension of development in China may not have it exactly right. But with the negligible TFP growth continuing in 2014, in the best estimates that we have, there is no reasonable doubt that there is a problem in contemporary economic development in China.

The anticipated decline in rates of growth in the capital stock together with the absence of productivity and labour force growth remove the potential for fiscal and monetary expansion to raise the rate of growth in output for any sustained period.

In standard growth accounting terms, the Chinese adjustment required by the new model of growth involves a moderate deceleration of aggregate growth, contributed by a cessation of growth in the labour force, a large decline in the growth in the capital stock and some acceleration of the growth in TFP. China has to achieve these outcomes within a set of policies that change fundamentally the old negative relationship between economic growth and environmental degradation.

China's new sources of economic growth: Volume 1—Reform, resources and climate change looks closely at each of these elements of the Chinese adjustment. Here we outline some of the big demographic changes affecting growth in the labour force, the drivers of growth in the capital stock and the influences on TFP. We then outline the ways in which each of the book's chapters advance our understanding of the Chinese adjustment.

From Lewis to Solow: China's demographic transition

China's strong growth in the first several decades of the reform era is now the world's leading example of growth in a surplus-labour economy, as analysed by Lewis (1954) and applied to Taiwan by Fei and Ranis (1964) and to Japan by Minami (1973). In the Lewis-type labour-surplus economy, rapid growth in a highly productive and initially small modern sector (mostly urban and industrial) is supported by the flow of labour from the countryside. Average productivity is much lower in the rural than in the dynamic modern sector, and marginal productivity is lower still.

The flow of labour from the countryside does not greatly increase the supply price of labour for a long period—in China's case, from 1978 until about 2006. Wages are anchored by the large number of people in the countryside who offer themselves for modern-sector employment at the going wage rate.

Wages increase more slowly than productivity in the modern sector of the economy. The profit share of income rises, supporting high rates of saving. The tendency for wages to lag behind productivity growth supports high returns on investment, encouraging the investment of the increase in savings in the modern sector of the economy.

Productivity growth at a national level is supported strongly by the shift of people from low-productivity rural to high-productivity modern economic activity. It is supported by the accretion of skills in the growing modern economy, which cannot proceed at a similar rate in the rural sector.

In the first several decades of the reform era, the structure of China's population was increasingly favourable for high rates of growth in output per person.

The One-Child Policy of the reform era reinforced and extended beyond the most prosperous centres the general experience of humanity for fertility to fall as incomes rise with economic growth. The ratio of child dependants to members of the labour force fell. This added a 'demographic dividend' to other forces contributing to rapid economic growth: the high growth of the capital stock and high productivity growth. The demographic dividend, however, provided only a temporary boost to growth in output; eventually, low fertility flows through to low and negative growth in the labour force and to an increase in aged dependence.

When a country enjoys an extended period of growth in its working-age population, alongside a fall in the dependency ratio—the ratio of the sum of the age groups 0–14 and 60-plus over the age group of 15–59 years—the potential

rate of growth is higher than it would otherwise be. The demographic dividend affects growth through several channels and, whatever the rate of growth, the increase in the ratio of the labour force to total population leads directly to increased average income per person.

The period of Lewisian surplus labour came to an end through the second half of the first decade of the new century. In a large, diverse country, the end of the labour surplus came not as a 'turning point' but as a 'turning period'. The rate of increase in wages accelerated unevenly but broadly through the country. During 2004–15, the growth rate of migrant worker wages was 10.7 per cent per annum. Facing pressures from labour shortages and rising labour costs, firms substituted capital for labour in industrial processes. The relative importance of labour-intensive industries shrank as their international competitiveness declined and the relative importance of more technologically sophisticated and capital-intensive industries increased. The economy-wide effect was a higher capital/labour ratio and a fall in the return to capital. China's average return to capital fell from 24.1 per cent in 2004 to 14.7 per cent in 2013 (Bai and Zhang 2014).

The Lewisian stage of economic growth has given way to a neoclassical or Solow stage of growth. Cessation of growth and, recently, a decline in the number of people in the conventional 'working age' group remove an important source of growth in total output. The deceleration in the rate of increase in movement of people from the countryside to the modern economy removes a major source of productivity growth. Lower labour force and productivity growth reduce the incentive to invest. Economic growth comes to rely more heavily on investment in human capital—increases in the education levels and skills of the labour force—and more demanding sources of productivity growth embodying innovation and relying on flexible and sophisticated capital and goods and services markets.

In the neoclassical 'Solow' economy, supply-side reforms to improve the quality of markets and to allow restructuring towards more productive economic activities hold the key to enhancing potential economic growth (Cai 2016).

One important area of supply-side reform relates to removal of obstacles to full utilisation of labour supply. This can slow the loss of the demographic dividend.

The working-age population (aged 15–59) has been falling in absolute terms since 2012. It is estimated that the growth rate of the economically active members of the population aged 15–59 will become negative from 2018. It is therefore important to find ways of utilising as completely as possible the available labour supply, particularly in high-productivity sectors. A 1 percentage point increase in the labour participation rate in 2015 would have corresponded to nine million

additional economically active people in 2015. Reform of the *hukou* (household registration) system in a way that would lead to more complete absorption of migrants into urban life offers a chance to raise the labour participation rate.

The recent relaxation of family planning laws allows families now to have two children. Over time, this will modify the age structure of the population by lifting the fertility rate, which sits at about 1.5 births per woman—far from the replacement level of 2.1. A gradual increase in the fertility rate due to a shift in family planning policies would help to raise China's potential growth rate in the future. To ensure that higher fertility does not lead to a decline in female labour force participation, it will be necessary to improve child care and to expand investment in public-oriented infrastructure such as affordable housing, which can reduce the costs of raising children. Chinese policy is moving towards parents being left to choose how many children they have. There is likely to be some lift in fertility rates for a while, but not by much if China follows the experience of other East Asian countries.

Aoki (2012) found from the East Asian growth experiences that, in the current Solow phase of Chinese development, growth is strongly driven by the accumulation of human capital. There are strong links—at least during certain periods of development—between the formation of human capital and a country's potential growth rate. Manuelli and Seshadri (2014) suggest that the contribution of human capital to economic growth could be even higher than that of increases in productivity. China has greatly increased its expenditure for education and training in recent years and this will contribute to offsetting the effects on growth of a declining labour force.

Changes in productivity

TFP growth has many sources. The transfer of labour from agriculture to industry was particularly important in China under the old model of growth. This process in China has slowed rapidly in recent years. Data from the National Bureau of Statistics (NBS various years) suggest that in the period 2005–10 the rate of increase in the number of rural migrant workers moving to cities was an average of 4 per cent and then fell to 1.3 per cent in 2014 and to just 0.3 per cent in 2015.

Institutional barriers that result from the *hukou* system have brought forward the slowing of growth in rural–urban migration. The *hukou* system prevents large numbers of migrant workers becoming permanent urban residents with full access to social security and education benefits. With rural workers having more market power than previously, and consumption a more important source of growth in demand, these institutional residency hurdles have become more costly.

Reforms to the *hukou* system could slow the decline in the rate at which rural migrant workers move to cities. While labour market reforms would help to hold up growth in TFP as rural–urban migration slows, only the continual improvement of institutions can generate sustained increases in TFP. One new impetus for growth is advancement in science and technology.[1] Another is reform to increase the efficiency with which resources are allocated[2] through institutional changes including improvement of markets. This is referred to as the 'reform dividend'.

Measures to reap a reform dividend include nurturing markets for goods, capital, labour and natural resources including the environment. They include reform of the structures of state-owned enterprises (SOEs), regulations with respect to market entry and exit, policies to encourage entrepreneurial activities including innovation, financial and banking system reform and local government system reform, especially with respect to local public finances. One contemporary policy challenge is how to handle 'zombie firms' associated with overcapacity in several industries.

Macroeconomic policy and the role of investment

The Chinese Government has committed itself to maintaining growth at over 6.5 per cent per annum through the current FYP to 2020, and to do this with little or no growth in the labour force and a much lower rate of growth in the capital stock. This can only be achieved by reform to accelerate growth in TFP. But neither the reform nor the acceleration of growth in TFP is currently a prospect.

As growth slows, the government will come under pressure to increase the rate of growth above the rate of increase of the economy's supply capacity through fiscal and monetary expansion. This can succeed only temporarily. And the attempt will artificially increase investment, as this is the main channel through which fiscal and monetary expansion works. The increase in investment cuts across reform of markets and institutions and feeds back into lower growth in TFP. It is therefore self-defeating.

1 We are going to cover the issues of human capital, technological change and innovation for growth of the Chinese economy in the 2017 China Update book on *China's new sources of economic growth* (Volume 2).

2 In recent Update books, we have put strong emphasis on supply-side reform and restructuring. For example, the 2010 book discusses China's next 20 years of reform and development; the 2012 book covers the issues of rebalancing and sustaining growth in China; the 2013 book touches on the issues of a new model for growth and development; and the 2014 book focuses on deepening reform for China's long-term growth and development.

How, then, can the government resolve the problem posed by potential growth falling below the desired rate? Only by accelerating reform and accepting the possibility of growth falling short of announced goals, at least for a while.

Equity and environmental amenity

China's rebalancing of growth to reduce reliance on investment and to increase TFP at a time of demographic change that is unfavourable to growth is complicated by the simultaneous requirement for more equitable and less environmentally damaging patterns of growth.

The rebalancing and sustenance of growth is complicated but not contradicted by the equity and environmental goals. The reform of the *hukou* system is favourable to labour force and productivity growth as well as to equity. The spread of high-quality education through the countryside and to all urban residents improves both growth and equity.

The macroeconomic adjustment associated with the shift from surplus to increasingly scarce and valuable labour is an inevitable outcome of successful growth over a long period. This is forcing rebalancing along lines favoured by the government and is powerfully favourable for promoting equity in income distribution.

In the early reform period, the concentration of investment in regions that were favourable for economic growth supported rapid economic growth for the national economy. Independently of regional policy, it was the coastal provinces that were in the best position to take advantage of early opportunities for increased integration into the international economy. The coastal provinces and cities experienced rapid growth through the first quarter-century of reform and drew away from inland provinces in average incomes. Now, the faster growth of provinces in central and western China is favourable both for overall growth and for inter-regional equity.

The long-term problem of regional imbalances in development has eased in China since early in the Turning Period. The deceleration of growth in the eastern region started earlier (since 2007) than other regions and the trend continues. The central and western regions' growth rates and contributions to gross domestic product (GDP) have tended to increase continually since 2000, narrowing the regional gaps in growth and development. The deceleration of growth for the central and western regions began about 2012, dragging down the overall growth. However, as latecomers to development, the central and western regions have greater potential than the coastal provinces for continued growth for some time.

While growth that pays no attention to pressure on the global and domestic environment—as in the old model of Chinese economic growth—is consistent with rising economic welfare for a while, beyond some point it undermines the ecological basis for growth in living standards. China had passed that point in 2011 when the Chinese leadership committed the country to a 'new normal' in economic affairs. There is a fundamental sense in which the breaking of the nexus between growth in economic output and degradation of the natural environment is a precondition for sustained economic growth—appropriately defined in human welfare terms.

The Chinese government has made large efforts to weaken the link between economic growth and global and local environmental degradation. Areas of large progress include improving energy efficiency, reducing and capping coal use and reducing resource intensities in production, arresting the deterioration in air and water quality in regions where degradation had been most severe, developing renewable and other new low-emissions sources of energy, and experimenting with models of 'green growth' in some of the regions. Continued progress will require judicious use of both market (such as the establishment of an emission trading system to reduce the use of greenhouse gases (GHGs)) and regulatory (such as implementation and more stringent enforcements of the state regulations on resource exploration and development, air, soil and pollution, land and water use and conservation) mechanisms. Both market and regulatory mechanisms are being applied extensively to changing the relationship between economic growth and pressure on the environment. But the environmental challenges that China still faces are enormous.

This year's book, built around the theme of China's new sources of economic growth, covers many of the issues discussed in this introductory chapter. Here we provide a guide to the content of the following chapters of the book.

The book has two parts. Part I has 11 chapters covering Reform and Macroeconomic Development. In this summary, we divide these into three sets of chapters: Growth in the 'New Normal'; Growth and the Demographic Transition; and Financial Market Performance and Reform. Part II has 8 chapters covering Resources, Energy, the Environment and Climate Change.

Part I: Reform and Macroeconomic Development

Growth in the 'new normal'

Four chapters provide perspectives of recent and prospective overall growth performance, looking at changes in the broad aggregates, including TFP. Garnaut (Chapter 2) updates his (Garnaut 2015) assessment of recent progress under the new model of growth, focusing on the objectives to which the Chinese government has attributed greatest importance. Wang and Zhou (Chapter 4) examine alternative futures for the Chinese economy, depending on the approach to building the new model of growth. Wu (Chapter 5) analyses rates of growth in TFP across industry sectors and draws implications for expectations of growth performance. Wing (Chapter 7) examines links between public finances and risks to growth and reaches strong conclusions about the importance of removing the 'soft budget constraints' left over from earlier in the reform era.

Garnaut (Chapter 2) notes how the fundamental changes in economic strategy defined in earlier Update books (from Garnaut et al. 2013) as the new model of economic growth, are now officially described as the 'new normal'. He sees limited progress on only one of the most prominent of the government's ambitions for the new model of growth. The greatest changes in trajectory relate to the modification of the relationship between economic growth and pressure on domestic and global environmental amenity and stability. China is ahead of its international commitments on reductions in GHG emissions—and needs to be if there is to be any hope of global warming being contained within the limits defined by the United Nations (UN) meeting on climate change in Paris in December 2015. China made rapid progress on the goal of relying more on domestic demand and less on growth in exports and a trade surplus in the immediate aftermath of the GFC, but has fallen back almost to pre-crisis rates of surplus in the past year. There is slight progress in shifting from investment demand to consumption, and so far only limited progress on structural reform to unleash more rapid TFP growth. There has been early but as yet modest progress on reversing the earlier tendency towards greater inequality in the distribution of income.

Wang and Zhou (Chapter 4) use growth accounting techniques to analyse the sources of China's strong economic growth until 2011, the slowdown since then and the prospects under various policy scenarios. They see excessive investment and inadequate consumption as being the largest of several contributors to slower TFP growth from the early twenty-first century. At first this effect on

total growth was obscured by loose monetary policy, which promoted more investment to compensate for lower growth from other sources. This was eventually self-defeating, leading to overcapacity in industries supplying the investment industries—spectacularly for steel and cement—and to economic underperformance. Continuation of recent policies is likely to lead to financial crisis within a few years, and to major underperformance against announced goals. In these circumstances, growth would be likely to slump to an average of 2.9 per cent per annum for 2016–20 and 4.4 per cent per annum for 2020–30. China would be caught in the middle-income group of countries, rather than making the transition to a high-income country. Strong reform to build institutions that support a rapid shift of resources to more productive uses and technological improvement, together with cessation of monetary policies that artificially maintain high levels of investment and inhibit consumption, would lead to a transition to developed country status. Within uninhibited reform policies to raise productivity, growth of around 6.2 per cent per annum could be expected for 2016–20, and higher still in 2020–30.

Wu is one of the stalwarts of measuring TFP growth in China. He has taken this work a step further in Chapter 5. He applies a new technical approach to estimate China's reform era TFP growth. China's industries are aggregated into eight groups according to the extent of the role of government in decisions. Simply by adopting nominal output weights for industries, Wu derives new estimates of historical GDP growth, with an average growth rate of 8.94 per cent for the whole reform period 1980–2012, which is lower than the double-digit official figure. TFP accounted for less than one of those percentage points, and was especially low in industries most subject to government intervention, for example, the 'energy' industries. TFP growth reached its highest level in the 1990s (1.63 percentage point contribution to annual average growth). TFP growth eased from the turn of the century, influenced by the rapid expansion of investment in state-connected industries in the fiscal and monetary expansion in response to the East Asian Financial Crisis. TFP growth then collapsed after 2007, as a result of the even larger fiscal and monetary expansion in response to the recessionary pressures from the GFC.

Amid rising pessimism as to China's growth trajectory, Wing (Chapter 7) identifies some of the characteristics of the Chinese economy that led to current challenges. Like Wang and Zhou (Chapter 4) and Wu (Chapter 5), he highlights the role of the expansionary policies in response to the GFC in inflating the roles of state-connected enterprises, increasing investment to levels that were counterproductive to development, and cutting across the structural reforms that are necessary for sustained strong growth. In outlining important structural reforms that would help to entrench dynamism into China's economy, Wing focuses on the need for China to dramatically rein in the soft-budget constraint

to ensure fiscal sustainability. Correcting manager incentives, broader labour market reform and land reforms, and a strong push toward a more innovative economy are all policies that would help to China to move toward becoming a developed economy. But they will not be implemented unless the state is able to constrain the growth of state-connected industries that are responsible for low productivity, excessive debt and vulnerability to financial instability.

Growth and the demographic transition

Three chapters discuss ways in which two dimensions of China's demographic transition affect China's growth prospects. Cai et al. (Chapter 3) focus on the headwind to growth from the end of the demographic dividend and see reform of the *hukou* system as an important offset to this supply-side cause of deceleration of growth. Meng et al. (Chapter 8) discuss how inhibitions on permanent urban settlement of migrants reduces propensity to consume, and therefore cuts across government goals of increasing the contribution of consumption to increases in demand. Johnston et al. (Chapter 10) examine an old anxiety about the early Chinese transition—about getting old before rich—and gives us reason to reconsider old expectations.

Cai et al. (Chapter 3) discuss the critically important population and labour market dimensions of supply-side constraints on Chinese growth. Alongside excessive investment in industries favoured by the fiscal expansions in response to the East Asian Financial Crisis late in the twentieth century and the GFC 2007–08, China's demographic transition and labour market turning period have been the most important source of the slowdown in TFP in recent years. This chapter explores these dimensions of the growth deceleration in rich detail. The slowdown in transfer of people from rural (not only, or now even mainly, agricultural) to urban employment has been a major source of productivity growth through many channels. Its slowing exacerbates the drag on TFP and output growth that was bound to come with the end of the demographic dividend. Reform of residency rights (the *hukou* system) could allow the continued flow of workers from rural to urban areas over the next decade to help in the balancing of the relatively rapid ageing of China's urban populations. Reform would also contribute to the necessary increase in investment in human capital. Together with allowing working migrants plus families access to urban social security, this can support China's transition to consumption-led growth. It would be an important support for China's transition from upper-middle income to high-income status. The authors encourage Chinese policymakers to eliminate institutional barriers that deter labour supply and TFP growth and to set a target for the growth rate that is aligned with China's stage of development.

Meng et al. (Chapter 8) study the constraints that inhibit rural-to-urban migrants from being more responsive to the needs both of their own families and consequently of the needs of China's economy. The current system of denying access to subsidised education and health services in the rural–urban migrants' cities and towns of residence enforces family separation, the need to split incomes and to increase precautionary savings. Meng and colleagues find that migrant consumption rises with the length of urban residence but that peak consumption is seldom reached thanks to residence restrictions prohibiting long stays. Internal migration reforms are thus fundamental to the next phase of China's economic transition, which relies on much greater contributions of consumption to demand growth.

Johnston et al. (Chapter 10) take a fresh look at a subject that has generated much anxiety in China about the prospects for successfully graduating to developed country status: an unusually strong and early demographic transition is causing China to grow old before average incomes reach high levels. Population ageing has been associated with decline in the share of the population that is of working age since around 2011. Since the early 1980s it has been feared that China's unique 'one child policy' and resulting premature population ageing would inhibit China's transition to a high per capita income economy. This chapter sheds a different light on 'getting old before getting rich'. The studies of transitions into the high-income group of countries that are presented in this chapter show that China is not alone in seeking to rise to high average incomes with an ageing population. China is one of about 30 developing countries with ageing populations. Four countries have recently entered the high-income group despite having an ageing population. The success rate for transition to high-income status is lower for developing countries that have younger population structures. Ageing in developing countries may have a political economy upside: countries that have grown old before becoming rich are more likely to establish fiscally sustainable social security and taxation systems than developed countries that grew old after becoming rich. In the 'old first' countries like China, retirement programs are being established with reference to the fiscal constraints of high age dependence, low ratios of work-age to total population, longer life expectancies and more modest expectations of living standards.

Financial market performance and reform

Four chapters discuss the related questions of financial market efficiency in allocating resources, and changes in industry structure in ways required for the new model of growth. Dollar (Chapter 9) looks at direct foreign investment in China. Roberts and Zurawski (Chapter 12) illuminate complex changes in financial intermediation in China and the need for continuing reform. Huang et

al. (Chapter 6) tell a remarkable story of financial innovation in China, in ways that open our eyes to the possibility of China moving the frontier of global efficiency. Liu et al. (Chapter 11) show how weaknesses in the financial sector have combined with other features of the Chinese economic transition to trigger dramatic stock exchange collapses in 2008–09 and 2014–15.

Two-way direct foreign investment is now an important feature of the Chinese economy. Dollar (Chapter 9) describes the extraordinarily rapid rise of China as a source of international investment over recent years. China is now the second largest international creditor, and is soon to be the first. Until a few years ago, China's investment abroad was very different from that of the established developed creditor countries. It mainly took the form of investing monetary reserves in the official securities of the United States and, to a lesser extent, other developed countries. China's investment abroad is now moving rapidly towards a more normal pattern, with direct foreign investment rapidly becoming more prominent. Dollar notes that Chinese direct investment seems to be characterised by indifference to governance standards in host countries. Dollar argues that China is much more closed than developed countries to inward direct foreign investment and that there would be benefits to both China and its partners in correcting this imbalance.

Roberts and Zurawski (Chapter 12) examine closely the pattern of indebtedness that has emerged recently in Chinese business and the economy. They observe that a rapid build-up in corporate leverage since the late 2000s is fuelling fears for financial stability and growth within and beyond China's borders. Discussion of leverage in China tends to emphasise the role of recent stimulus policies, especially through the financing of investment by SOEs. Analysis of non-financial companies on mainland public stock exchanges shows that SOEs account for the lion's share of overall leverage. However, this masks broader heterogeneity. There is emerging evidence of deleveraging. Private firms have tended to contribute more to leveraging since 2012, especially in the real estate and construction sectors, while mining, utilities and services have reduced their proportionate contribution. Sophisticated analysis throws interesting light on a complex reality. Results from a fixed-effects panel regression suggest a negative association between leverage and profitability and a positive correlation with firm size, collateral and industry leverage patterns. Weaker state-sector profitability and a shift in industry composition towards more highly leveraged sectors such as real estate and construction may explain much of the upward trend in leverage over recent years. Slow adjustment in firm behaviour could make it difficult for China's corporate sector to achieve a rapid deleveraging.

Liu et al. (Chapter 11) look closely at the two crashes in Shanghai's A-share stock market, around 2008 and 2014. This chapter uses new, more efficient econometric techniques to study these dramatic episodes in the wider context

of movement of this Shanghai stock market. Different methods of analysis are assessed, and the most promising applied. Analysis of the two crashes covers November 2006 to January 2009, and May 2014 to July 2015. The two episodes have common characteristics in terms of bubble formation, development and bursting. In both, irrational behaviour, including noise trading and herding behaviour, plays a big part in the dynamics of boom and bust. The absence of a broad array of investment opportunities for Chinese investors and some features of government policies both encourage that irrationality.

Huang et al. (Chapter 6) describe an exciting development of global significance: the rapid emergence of internet banking. Internet finance has a history of more than a decade in China. It includes both information technology (IT) companies providing financial services and financial institutions applying IT to their more traditional services. The speculator rise of internet finance in China has been spurred by financial sector market failure that has resulted in limited access for small firms and low-income households. Huang and colleagues expect internet finance to become an increasingly effective tool for promoting inclusive finance, and that this will help to stimulate consumption, innovation and job-creation. Good outcomes depend upon the building of good infrastructure including for big data, qualified financial professionals and a regulatory approach that manages the balance between risk control and healthy innovation.

Part II: Resources, Energy, the Environment and Climate Change

Sustainable development is a prominent theme of the new model of growth. Eight chapters look at progress and challenges in different areas with implications for sustainable development. The strongest focus is on climate change and reduction in carbon emissions. Liu and Song (Chapter 14) tell the story of problems and so far limited success in adjustment to the realities of the new model of growth in the steel industry—one of the two industries (the other being coal) that are subject to greatest pressure in the new model because of their contribution to carbon and other emissions, as well as because they are inputs to investment goods industries that are meant to decline. Hu et al. (Chapter 13) discuss the promotion of new forms of urban development as one of many approaches to reducing carbon emissions. Zhang (Chapter 17) discusses the ambitious concept of 'ecological civilisation', which has entered official discourse alongside the new model of growth. Green and Stern (Chapter 18) describe and assess Chinese targets for reducing GHG emissions and policies for reaching them in the context of recent Chinese commitments to the international community. Zhao (Chapter 19) draws attention to the complex interrelationship between electricity sector regulation and the attainment of competing environmental and

more traditional economic goals. Wu et al. (Chapter 20) look at links between policies on urban density and GHG mitigation. Buckingham (Chapter 16) looks at reforestation of the Loess Plateau as a wider environmental matter that also has implications for carbon sequestration. Finally, Wang and Zheng (Chapter 15) draw attention to the special problems of water management that are arising with sustained economic growth, and to some of the important links between water and energy.

Liu and Song (Chapter 14) analyse progress in adjustment of one of the pillars of the old model of growth, in the different circumstances of the 'new normal'. The investment-led growth that reached its highest levels from early this century to 2011 required huge expansion of the steel industry. The decline in rates of growth and the investment share of the economy has drastically reduced demand for steel. In steel, coal and cement more than any other industries, the new model of growth requires far-reaching adjustment. China became the world's largest steel producer in 1996. Steel production increased more than six times in a decade and a half, in response to the old pattern of China's growth. China became a net exporter of steel from 2006. Within the new model of growth, domestic steel consumption peaked in 2013. Steel production, however, kept rising until 2015, causing a glut of steel that has affected world markets, caused dozens of trade disputes and massive protectionist responses in the developed countries. The overshoot by Chinese steel producers reflects issues in the structure of the industry, especially with respect to firm size, ownership (roughly equally shared between state and private) and location (proximate to the coast or inland). Reform has proven to be difficult, being delayed by continued distortions in the financial sector. Steelmaking is also under pressure from the high priority of environmental objectives. Fundamental reform and retrenchment of uncompetitive plants is a precondition of return to profitability.

The creation of energy efficient and low-carbon urban hubs is now central to China's sustainable economic growth. By 2020 some 60 per cent of China's citizens are expected to live in cities, compared to just 18 per cent in 1978. Hu et al. (Chapter 13) evaluate China's official low-carbon city pilots along five dimensions: economic growth, energy utilisation, city construction, government support and residential consumption. Cities in the south are ahead of cities in the north in reducing carbon emissions, but the overall level of low-carbon development remains consistently low. To achieve the reorientation required by government objectives and commitments to the international community, further adjustments to policy are required, to develop market support for energy savings, research and development in urban transformation, strategic industry development and the wider use of energy-efficient technologies in China's cities.

Zhang (Chapter 17) examines the emergence of new elements of climate change and energy policy to reconcile continued growth with acceptable domestic and international environmental outcomes. China's government faces intense pressure at home and abroad to reduce its environmental footprint. Since late 2012, this agenda has been driven by the national goal to become an 'ecological civilisation'. This chapter introduces China's energy and environmental goals, and the 10 related mitigation policies and measures. The latter include mandating the closure of small, energy-inefficient electricity plants, and low sulphur requirements for thermal power plants. Other initiatives include the low-carbon city development pilot program, and the wide range of incentives for investment in renewable energy. These have brought victories in immediate battles, but not yet in the war to establish a low-carbon economy.

Green and Stern (Chapter 18) describe the dramatic changes in Chinese policy and outcomes on the relationship between economic activity and GHG emissions that have played a central role in a more positive global outlook on containment of global warming. Most important of all the many changes, China's coal consumption again fell significantly in 2015 after a fall in 2014. It is possible that China's coal consumption reached a peak in 2013, after contributing most of the growth in global coal use from the turn of the century to 2011. This transition away from coal is the result of changes in the structure of China's economy and a far-reaching set of policies. Both are acting to change energy efficiency and the energy supply mix and also the dynamics of energy demand. The trajectory of growth in China's total primary energy consumption has fallen dramatically, from a compound annual rate of more than 8 per cent per year between 2000–13 to less than 1 per cent year-on-year in 2015. The outlook for China's carbon dioxide emissions has changed even more dramatically over the last few years. A less than 2°C mitigation pathway for the world climate system has become feasible, creating a chance for realisation of the goals of the global climate agreement signed by 195 countries in Paris in December 2015.

Zhao (Chapter 19) looks at issues of central importance to implementation of China's climate change objectives: environmental standards, encouragement of low-emissions energy and electricity reform. China's electricity generation sector has been the world's largest since 2011. Coal-fired generation accounts for 70 per cent of installed thermal power capacity and 75 per cent of generation, which is more than double the share in the United States. Together with the high scale of production, this has brought massive environmental externality costs, of national and international consequence. Since the mid-1990s, the government has experimented with firm and consumer-level market mechanisms and reforms for improving the efficiency and reducing the externalities of China's electricity industry. This chapter presents the results from modelling of Chinese consumer willingness to pay via in their monthly electricity bill for clean energy, and from

analysing the results of a survey of the opinion of power generation plants on the effects of various policies on the efficiency of their operations. Market-based regulation has been useful, but is less effective for being imperfectly coordinated with command-and-control mechanisms. Despite continuing massive change, China's electricity sector remains in transition.

Wu et al. (Chapter 20) look at how the density of Chinese cities affects carbon emissions. In March 2014, Premier Li Keqiang announced to China's national legislature that China would declare war on pollution like it did war on poverty. Ensuring that China has energy-efficient low-carbon cities is a big battle in that war. Flagship initiatives moving China in this direction include the Top 1,000 Enterprises Energy Conservation Action Program, the 10,000 Enterprises Conversation Low Carbon Action Program, and mandatory closure of small and inefficient power plants. This chapter discusses China's energy and environmental goals and policy measures, with a focus on the low-carbon urban development experimentation that began in July 2010 in five provinces and eight cities. Green transportation, industry and household energy efficiency and optimisation of space lie at the heart of the bigger agenda to ensure that cities that are housing an increasingly large majority of China's citizens over time will contribute to sustainable development.

In Chapter 16, Buckingham looks at one of many reforestation programmes in China: the reforestation of the Loess Plateau. Historic forest loss has made China one of the world's most forest-deficient countries and also the world's largest importer of timber and wood-based products. Rapid environmental development has also caused widespread damage to soils and water supply. On the other hand, China now has the highest rate of afforestation in the world, and forestry goals also recently began to feature in the FYP. China's post-2020 climate commitments include increasing forest cover by 50–100 million hectares in order to create a 1-gigaton carbon sink. Lessons from a more than two-decade restoration project, in China's Loess Plateau offer a seminal reforestation study and broader policy reference point. Other initiatives have been less successful, partly because forest cover tends to be higher in poorer areas, whose residents battle for their own survival first.

Wang and Zheng (Chapter 15) look at China's challenges and strategies for confronting water shortage. The dynamics of water withdrawal and energy consumption are sensitive to common influences, but few studies have explored these trends together. Wang and Zheng undertake a panel data analysis of 36 industrial sectors 2002–12, and find that the two dominant factors driving water and energy consumption—economic scale and resource intensity—interact with each other. Sectors growing more strongly economically made more effort to improve resource efficiency, of both water and energy. Growth of some industrial sectors including smelting and electricity production led to

rising energy and also water consumption. Optimal policymaking to reduce water and energy consumption would take into account the many interactions between the two.

References

Aoki, M. (2012), Five phases of economic development and institutional evolution in China, Japan and Korea, in M. Aoki, T. Kuran and G. R. Roland (eds), *Institutions and comparative economic development*, Basingstoke, UK: Palgrave Macmillan.

Bai, C. and Zhang, Q. (2014), The rates of return to capital and the analysis of the determinants, *The World Economy*, 10: 3–30.

Cai, F. (2016), *Understanding the slowdown of the Chinese economy: A supply-side perspective*, Working Paper, Beijing: Chinese Academy of Social Sciences.

Cai, F. and Lu, Y. (2013), The end of China's demographic dividend: The perspective of potential GDP growth, in R. Garnaut, F. Cai and L. Song (eds), *China: A new model for growth and development*, Canberra: ANU E Press.

Fei, J. C. H. and Ranis, G. (1964), *Development of the labor surplus economy: theory and policy*, Homewood, Ill.: Richard D. Irwin for the Economic Growth Center, Yale University.

Garnaut, R. (2015), The new model of growth and the global resources economy, in L. Song, R. Garnaut, F. Cai and L. Johnson (eds), *China's domestic transformation in a global context*, Canberra: ANU Press.

Garnaut, R., Cai, F. and Song, L. (eds) (2013), *China: A new model for growth and development*, Canberra: ANU E Press.

Garnaut, R. and Song, L. (eds) (2006), *The turning point in China's economic development*, Canberra: ANU E Press.

Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *Manchester School of Economic and Social Studies*, Vol. XXII (May), pp. 139–191.

Manuelli, R. and Seshadri, A. (2014), Human capital and the wealth of nations, *The American Economic Review*, 104(9): 2736–2762.

McMillan, M. S. and Rodrik, D. (2011), *Globalization, structural change and productivity growth*, NBER Working Paper No. 17143, Cambridge, Mass.: National Bureau of Economic Research.

Minami, R. (1973), *The turning point in economic development: Japan's experience*, Tokyo: Kinokuniya Bookstore.

National Bureau of Statistics (NBS) (various years), *China Statistical Yearbook*, Beijing: China Statistics Press.

Song, L., Garnaut, R., Cai, F. and Johnson, L. (eds) (2015), *China's domestic transformation in a global context*, Canberra: ANU Press.

The Conference Board (2015), *The Conference Board total economy database: Summary tables*, New York: The Conference Board. Available from: conference-board.org/data/economydatabase/.

This text is taken from *China's New Sources of Economic Growth: Reform, resources and climate change, Volume 1*, edited by Ligang Song, Ross Garnaut, Cai Fang & Lauren Johnston, published 2016 by ANU Press, The Australian National University, Canberra, Australia.