Rising China

Global Challenges and Opportunities

Other titles in the China Update Book Series include:

1999 China: Twenty Years of Economic Reform

2002 China: WTO Entry and World Recession

2003 China: New Engine of World Growth

2004 China: Is Rapid Growth Sustainable?

2005 The China Boom and its Discontents

2006 China: The Turning Point in China's Economic Development

2007 China: Linking Markets for Growth

2008 China's Dilemma: Economic Growth, the Environment and Climate Change

2009 China's New Place in a World of Crisis

2010 China: The Next Twenty Years of Reform and Development

Rising China

Global Challenges and Opportunities

Jane Golley and Ligang Song (eds)

THE AUSTRALIAN NATIONAL UNIVERSITY

E PRESS

社会科学文献出版社
SOCIAL SCIENCES ACADEMIC PRESS(CHINA)

ANU E PRESS

Published by ANU E Press
The Australian National University
Canberra ACT 0200, Australia
Email: anuepress@anu.edu.au
This title is also available online at: http://epress.anu.edu.au

CHINA BOOK INTERNATIONAL

Co-published with SOCIAL SCIENCES ACADEMIC PRESS (CHINA) under the China Book International scheme. This scheme supports co-publication of works with international publishers.

National Library of Australia Cataloguing-in-Publication entry

Title: Rising China : global challenges and opportunities / edited by Ligang Song and Jane Golley.

ISBN: 9781921862281 (pbk.) 9781921862298 (ebook)

Notes: Includes bibliographical references and index.

Subjects: Economic development--China.
International economic relations.
China--Economic conditions.
China--Social conditions.

Other Authors/Contributors:
Song, Ligang
Golley, Jane, 1971-

Dewey Number: 338.900951

Book design and layout by Teresa Prowse, www.madebyfruitcup.com

Cover image: Lujiazui Central Green Park, Stock photo, File #: 15979747

Contents

Tables

Figures

Abbreviations

ABS	Australian Bureau of Statistics
ADB	Africa Development Bank
ADB	Asian Development Bank
ASEAN	Association of South-East Asian Nations
ASEAN+3	Association of South-East Asian Nations Plus Three
BEC	Broad Economic Classification
BIS	Bank for International Settlements
BRICS	Brazil, Russia, India, China and South Africa
CBA	Carbon Budget Accounts
CBDR	Common but Differentiated Responsibilities
CDB	China Development Bank
CEPII	French Institute for Research on the International Economy
CIRR	Commercial Interest Reference Rates
CNOOC	China National Offshore Oil Corporation
CNPC	China National Petroleum Corporation
CO2	Carbon Dioxide
CRS	Congressional Research Service
CULS	China Urban Labour Survey
DAC	Development Assistance Committee
DRC	Democratic Republic of Congo
DSF	Debt Sustainability Framework
ELICOS	English Language Intensive Courses for Overseas Students
ETDZs	Economic and Technological Development Zones
FDI	Foreign Direct Investment
FEER	Fundamental Equilibrium Exchange Rate
FIRB	Foreign Investment Review Board
FTA	Free-trade Agreement
G2	Group of Two
G20	Group of Twenty
G7	Group of Seven
G8	Group of Eight

GDP	Gross Domestic Product
GFC	Global Financial Crisis
GHGs	Global Greenhouse Gases
GM	General Motors
GNI	Gross National Income
HIPC	Highly Indebted Poor Countries
HKMA	Hong Kong Monetary Authority
HT1	Electrical and Electronic Products
HT2	Other High-technological Products
ICP	International Comparison Program
IEA	International Energy Agency
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
KBR	Kellogg, Brown and Root
KTP	Kartu Tanda Penduduk
LIBOR	London Interbank Offered Rate
LNG	Liquefied Natural Gas
LT1	Textile and Apparel Products
LT2	Other Low-technological Products
M&As	Mergers and Acquisitions
MNCs	Multinational Corporations
MNEs	Multinational Enterprises
MofCOM	Ministry of Commerce
MT1	Automotive Products
MT2	Medium-technological Processing Products
MT3	Engineering Mechanical Products
NBS	National Bureau of Statistics
NCEE	National College Entrance Examination
NDRC	National Development and Reform Commission
NEA	National Energy Administration
NEC	National Energy Commission
NOCs	National Oil Companies
ODA	Official Development Aid
ODI	Outward Direct Investment

OECD	Organisation for Economic Cooperation and Development
OOF	Other Official Flows
PBC	People's Bank of China
PC	Personal Computer
PECC	Pacific Economic Cooperation Council
PLAN	People's Liberation Army Navy
PMI	Purchasing Managers Index
PPP	Purchasing Power Parity
PWT	Penn World Tables
QDII	Qualified Domestic Institutional Investors
QE	Quantitative Easing
QE2	Quantitative Easing 2
QFII	Qualified Foreign Institutional Investors
R&D	Research and Development
RHS	Rural Household Survey
RMB	renminbi
RP	Resource-based Products
RUMiCI	Rural–Urban Migration in China and Indonesia
SAFE	State Administration and Foreign Exchange
SDR	Special Drawing Rights
SEZs	Special Economic Zones
Sinopec	China Petroleum & Chemical Corporation
SLOC	Sea Lines of Communication
SMEs	Small and Medium Enterprises
SOEs	State-owned Enterprises
SPR	Strategic Petroleum Reserve
SPV	Special-Purpose Vehicle
Susenas	Survei Sosial Ekonomi Nasional
T-bills	Treasury bonds
TFP	Total Factor Productivity
TFR	Total Fertility Rate
TRIMs	Trade-Related Investment Measures
TRIPS	Trade-Related Aspects of Intellectual Property Rights
TTE	TCL-Thomson Electronics
UHS	Urban Household Survey
UMS	Urban Migrant Survey

UNDP	UN Development Programme
VET	Vocational Education and Training
WTO	World Trade Organisation

Contributors

Deborah Brautigam
Professor, International Development Program, School of International Service, American University, Washington, DC. Department of Comparative Politics, University of Bergen, Norway.

Chunlai Chen
Crawford School of Economics and Government, The Australian National University, Canberra.

Yin-Wong Cheung
Department of Economics E2, University of California, Santa Cruz.

Weihua Dang
China Centre for Economic Research, Peking University, Beijing.

Yang Du
Division of Labour and Human Capital, Institute of Population and Labour Economics, Chinese Academy of Social Sciences, Beijing.

Christopher Findlay
School of Economics, University of Adelaide, Adelaide.

Paul Frijters
Research School of Economics, ANU College of Business and Economics, The Australian National University, Canberra.

Geoffrey Garrett
The US Studies Centre, the University of Sydney, Sydney.

Jane Golley
Australian Centre on China in the World, The Australian National University, Canberra.

Yiping Huang
China Centre for Economic Research, Peking University, Beijing and Crawford School of Economics and Government, The Australian National University, Canberra.

Andrew B. Kennedy
Crawford School of Economics and Government, The Australian National University, Canberra.

Kunwang Li
School of Economics, Nankai University, Tianjin.

Guonan Ma
Representative Office for Asia and the Pacific, Bank for International Settlements, Hong Kong.

Robert N. McCauley
Monetary and Economic Department, Bank for International Settlements, Switzerland.

Huw McKay
Westpac Bank, Sydney.

Xin Meng
Research School of Economics, ANU College of Business and Economics, The Australian National University, Canberra.

Budy Resosudarmo
The Arndt-Corden Department of Economics, Crawford School of Economics and Government, The Australian National University, Canberra.

Peter E. Robertson
Business School, University of Western Australia, Perth.

Ligang Song
Crawford School of Economics and Government, The Australian National University, Canberra.

Bijun Wang
China Centre for Economic Research, Peking University, Beijing and Crawford School of Economics and Government, The Australian National University, Canberra.

Huiyao Wang
Centre for China and Globalisation, Beijing.

Jiao Wang
China Centre for Economic Research, Peking University, Beijing.

Meiyan Wang
Division of Labour and Human Capital, Institute of Population and Labour Economics, Chinese Academy of Social Sciences, Beijing.

Xiaolu Wang
National Economy Research Institute, China Reform Foundation, Beijing.

Wing Thye Woo
Department of Economics, University of California, Davis and The Central University of Finance and Economics, Beijing.

Yongsheng Zhang
Development Research Centre of the State Council, Beijing.

Zhongwei Zhao
The Australian Demographic & Social Research Institute, ANU College of Arts & Social Sciences, The Australian National University, Canberra.

Acknowledgments

The China Economy Program (CEP) gratefully acknowledges the financial support for the China Update 2011 provided by Rio Tinto through the Rio Tinto-ANU China Partnership, the Australian Agency for International Development (AusAID), and the support provided by colleagues from the Australian Centre on China in the World at The Australian National University.

1 China's Rise in a Changing World

Jane Golley and Ligang Song

Whereas the last three decades of the twentieth century witnessed China rising on to the global economic stage, the first three decades of the twenty-first century are almost certain to bring with them the completion of that rise, not only in economic, but also in political and geopolitical terms. China is now the second-largest economy in the world as measured by national accounts and is well on the way to becoming the largest economy in real terms in the not too distant future. The Chinese economy has contributed positively to world economic growth for decades, even during the global financial crisis (GFC) in which strong domestic growth played a pivotal role in ensuring that world economic growth stayed in positive territory. China's integration into the global economy has brought one-fifth of the global population into the world trading system, which has increased global market potential and integration to unprecedented levels. The increased scale and depth of international specialisation propelled by an enlarged world market have offered new opportunities to boost world production, trade and consumption, with the potential for increasing the welfare of all the countries involved.

While many of the global and national benefits of China's economic rise are clear for all to see, so too are many of the costs. China's integration into the global economy has forced a worldwide reallocation of economic activities. This has increased various kinds of friction in China's trading and political relations, as well as generating several globally significant externalities, relating to the following: 1) increased competition from China's low-cost production and the accompanying rising share of Chinese-made products provided to the world market; 2) China's role in global economic imbalances; 3) rising commodity prices, including energy and minerals prices, caused largely by China's rapidly increasing demand for resources to fuel its development; and 4) rising greenhouse emissions, resulting from the rapid pace of industrialisation and increasing standards of living in China (Song 2010).

China's rising economic weight in the global economy is not only affecting its economic and political relations with the rest of the world, but is also changing the global and regional economic and political landscapes in fundamental ways. As pointed out by Findlay and O'Rourke (2007:545), 'in the longer run, the gradual rise of India and China to their natural roles as major economic and political superpowers [is] not only the best news for global human welfare in a generation, but promise[s] to raise a variety of geopolitical challenges which as yet remain unpredictable'. Whatever these challenges turn out to be, China faces the critical task of managing its rise in a way that is palatable to both the domestic and the world communities. A necessary counterpart to this task is that of the world community finding ways to accommodate China's rise that ensure the future stability and prosperity

of the world economy and polity. In this sense, it is probably safe to say that accommodating a rising China is the most important task facing the world community in the first half of the twenty-first century.

The emergence of major trade and financial imbalances between regions has been the key characteristic of the global economy in recent years. In the real economy, the ever-increasing trade imbalance between the United States and China has been the main contributing factor. China has achieved a position of major relevance in terms of the real economy, with global shares of output, trade, emissions and commodity consumption that rank it as a tier-one power. It has, however, a financial system and a framework of exchange arrangements that presently prevent it from achieving equivalent heft in the financial sphere, with the intermediation of real economy imbalances left by default to the financial systems of industrialised countries. To correct this imbalance, China will need to further deepen the reform of its financial system in order to pave the way for liberalising its capital account and achieving the full convertibility of its currency.

It is against this backdrop of imbalances that China and the other major nations must seek to alter the composition of their economic activity and eventually their balance sheets. The intense distress experienced across the globe as the process of financial de-leveraging accelerated in the middle of the GFC and the uneven signs of stabilisation observed since then have not reduced the enormity of the task.

For China, consistent with the goal of rebalancing the economy, the next wave of rapid growth will need to focus on higher value-added manufacturing, a shift towards the domestic market, a shift of the centre of gravity of growth from the coast to the interior, a vast expansion of the service sector, and the dynamism of small and medium, predominantly private, firms (Overholt 2010). Boosting domestic consumption will take time but there are some clear reform options that will play a positive role, including the development of the social welfare system and the urbanisation of the large number of migrant workers. China can also contribute to the task of rebalancing not by exporting less but by importing more. Moving towards a market-based exchange rate regime is part of the structural approach to addressing the imbalance issues.

Given the sheer size of the Chinese economy, in combination with the extent of its global integration, virtually any structural adjustments in China will have global consequences. Consider as an example the question of how China should best manage its vast quantity of US dollar-denominated assets against the background of dollar depreciation. On the one hand, the depreciation of the dollar generates a real adjustment in boosting US exports and slowing its imports, thereby improving its trade account balance. On the other hand, the depreciation of the dollar also generates a financial adjustment through capital gains for the United States set against the losses for the rest of the world (Serven and Nguyen 2010:7). This presents a major financial risk for China given its massive stock of cross-border assets and its ongoing move towards international financial integration. Given such a risk,

> the diversification of China's cross-border assets away from US dollar assets and short-term assets issued by the United States and other countries is appropriate and inevitable. It is part of a pattern of financial globalisation that has generally positive, as well as occasional negative, implications for the international financial system and the global economy. (Truman 2008:178)

On this occasion, however, should China choose to do so, it would precipitate a further fall of the US dollar, thereby putting more pressure on the United States to raise its interest rates, which is hardly ideal for a country still recovering from crisis. The increasing interdependence of these two major economic powers in terms of trade, investment and now finance as well suggests that cooperation is no longer an option, but a necessity; and in many instances, this point extends across the entire globe.

To assist with bilateral and multilateral cooperation, there is a pressing need for structural adjustments in the institutions that govern the international political and economic system. This is because maintaining relatively open and fair, multilateral political, trading and financial systems is the only effective way in which the behaviour of rising powers can be constrained by a rules-based system, while those of incumbent powers become more accommodating and cooperative. In a world in which China is increasingly expected to play a leadership role, this multilateral framework will provide an important institutional basis from which the expansion of international trade can continue to be a positive-sum rather than a zero-sum game. Only then can globally common goals such as macroeconomic stability, financial integration, poverty reduction, climate change and regional and international security be achieved with success (Song 2010).

The chapters contained in this volume delve into the issues touched on above, and many others besides, to reflect upon the wide range of opportunities and challenges that has emerged in the context of a rising China. While some chapters focus on key bilateral relationships (including with the United States and Australia), others offer either comparative perspectives (for example, with Indonesia on migration and with India on sources of economic growth) or Chinese perspectives on global goals (such as constraining climate change and reforming the international economic system). Some chapters focus on particular markets (for example, petroleum), others on key internal problems (urbanisation and ageing) or on certain aspects of China's global integration (such as the outward direct investment of China's manufacturing firms and China's economic activities in Africa). Despite the wide range of topics and approaches, an overriding theme is this: China's rise is occurring not just in a changing world, it is significantly changing that world as well.

Huw McKay gets the ball rolling in Chapter 2 with his assessment of China's economic performance during the past half-decade of global economic turbulence. McKay demonstrates how China's macroeconomic policy stance is driven by efforts to balance public and private economic activity, which is the key to tracking China's economic growth. He uses up-to-date real estate and infrastructure activity as proxies for the private and public sectors, respectively, to demonstrate this point, before examining China's policy response to the global crisis and consequent slowdown in the domestic economy. While China's counter-cyclical policies support the continuation of high rates of economic growth, the challenge lies in finding ways to achieve this goal that, unlike present methods, do not compound long-term structural problems.

In the wake of the GFC and with the ongoing rise of emerging economies, there is general consensus that the current international economic order—characterised by US leadership, the US dollar as the cornerstone of the international monetary system, and the roles of key international organisations including the World Bank, the International Monetary Fund (IMF) and the World Trade Organisation (WTO)—is in need of reform. There is, however, virtually no consensus on the direction in which this reform should head. Yiping Huang, Weihua Dang and Jiao Wang take this as their starting point in Chapter 3, which addresses this issue from China's perspective. Their analysis begins with the question of revolution or reform, followed by considerations of the roles of the G2, G7 and G20, the need for IMF reforms, and the optimal global reserve system. The authors conclude with their take on what China wants, what it can offer and what its responsibilities are in terms of shaping a harmonious, cooperative and stable new international order.

Since 2008, China has taken a number of initiatives to promote the international role of the renminbi (RMB). In Chapter 4, Yin-Wong Cheung, Guonan Ma and Robert McCauley interpret these initiatives as part of a medium-term strategy to denominate some of China's international claims in RMB as a means of sharing the currency exposure of China's international balance sheet. While acknowledging some of the constraints to RMB internationalisation—including the hotly debated issue of currency undervaluation and misperceptions about the RMB–US dollar link—the chapter is essentially optimistic about the future opportunities for both China and its trading partners to denominate some of their risks in RMB.

In Chapter 5, Kunwang Li and Ligang Song enter the debate regarding whether or not the technological content and quality of China's exports are commensurate with China's current level of development. They contend the views of Dani Rodrik, who, among others, has claimed that China is punching well above its weight in terms of export quality, as evidenced by the rising share of high-technology exports. Li and Song take a closer look at China's role in internationally fragmented production processes to show that this view overstates China's export quality—by attributing the foreign technology already embodied in imports of parts and components as China's own. Their calculations indicate that, to the contrary, China is in fact punching below its weight in terms of technological and quality upgrading. Li and Song call for policy measures to speed up China's climb up the global technological ladder during the next phase of growth and development.

A book on the global implications of China's rise would be incomplete without a chapter on foreign direct investment (FDI), with cumulative inflows of close to US$1 trillion in the past three decades. In Chapter 6, Chunlai Chen provides an up-to-date assessment of China's changing attitude towards FDI—from restricting to passively attracting and then to actively selecting inward FDI—as reflected in the evolution of its FDI policies, laws and regulations. Despite China's significant progress in conforming to the WTO's investment-related principles, Chen calls for further improvements with respect to transparency, national treatment and the protection of intellectual property rights. While Chinese policy makers need to ensure that FDI policies are consistent with their own internal development goals, the provision of equal incentives and opportunities for foreign and domestic firms, combined with stronger enforcement of intellectual property rights, will be essential for sustaining China as a globally competitive destination for FDI in the future.

In Chapter 7, Bijun Wang and Huiyao Wang turn to the more recent phenomenon of China's outward direct investment (ODI), which has surged since 2004 to make China the world's largest developing economy investor and fifth-largest investor after the United States, France, Japan and Germany. Wang and Wang focus on the ODI of China's manufacturing firms and argue that the modern globalised world in which these firms are operating is substantially different from the world that faced multinational corporations (MNCs) decades ago. As such, their motivations and competitive advantages are also quite different, with the majority of Chinese firms seeking technology, rather than cheap labour, and with the support of a range of preferential policies under the Central Government's 'Going Out' strategy. This (often non-transparent) government support poses the fairly unique problem facing Chinese firms in global markets: that of convincing host-country political parties, lobby groups, competitors, communities and the media that 'ODI with Chinese characteristics' is not something to be feared.

Andrew Kennedy discusses China's 'petroleum predicament' in Chapter 8, highlighting both the challenges and the opportunities facing China (and implicitly, the rest of the world) in its search for energy security. While Chinese leaders are clearly aware of the necessity of dealing with the inevitable rise in China's import dependence on oil, Kennedy argues that the policies adopted so far have not gone far enough, focusing as they have on unilateral efforts to build up domestic capacity and on bilateral agreements with energy-producing states. He calls for stronger multilateral engagement with other prominent oil importers, and in particular with the International Energy Agency. This would not only enhance the prospects for global petroleum security, but would also be an opportune way for all involved to signal a cooperative stance in dealing with China's rise.

Yongsheng Zhang's Chapter 9 addresses one of, if not, the greatest global problems of the twenty-first century: combating global climate change. For Zhang, there are two prerequisites for achieving the long-term goal of controlling global temperature rises at 2°C through to 2050: global carbon equity and low-carbon growth. The first calls for industrialised countries to take responsibility for their historical emissions, which remain present in the atmosphere and thereby constrain the emission space available for development in the less developed parts of the world. By incorporating these into country-level per capita emission entitlements, Zhang shows that industrialised countries have run up serious emission deficits, which, if acknowledged, would provide the incentive for a dramatic shift in their modes of growth—towards low-carbon growth. Despite his pessimism when it comes to global climate change negotiations, Zhang is optimistic about the role that China can play in facilitating this shift, which he sees as a great opportunity for the most profound development transformation since the Industrial Revolution.

Geoffrey Garrett and Wing Thye Woo provide us with Chapters 10 and 11, respectively, on the changing nature of Sino–American relations—the most critical bilateral economic relationship on the global stage. Garrett produces an extremely balanced assessment of what the world might expect as the United States enters a period of relative economic decline (vis-a-vis Asia and as opposed to dramatic collapse), while still maintaining a dominant cultural and political reach. Garrett argues that the massive stakes involved in the relationship—both the upside of their enormous economic ties and the downside of the damage that armed conflict would incur—should give us confidence that both countries will continue to

manage their relations effectively in the foreseeable future. He notes that the biggest issues for both countries are in fact domestic, rather than concerning the relationship between the two—a point also made by Woo with specific reference to improving bilateral trade imbalances. Garrett is optimistic that the inevitable frictions as a rising power confronts a waning one will be outweighed by the increasing diplomatic skills of each power in managing these frictions, as seen in their responses to the global financial crisis. Likewise, Woo is hopeful that enlightened self-interest will guide the United States and China to be earnest in defusing their bilateral trade tensions.

The Australia–China economic relationship is examined in Chapter 12 by Christopher Findlay. Findlay provides a wide range of evidence to show that this relationship has moved from strength to strength, with China not only being Australia's number-one trading partner, but also now the largest source of foreign students and tourists (two key service export sectors), as well as an increasingly important source of investment in the resource sector, which has underpinned Australian prosperity in recent decades. Findlay makes it clear, however, that this strengthening economic relationship is not without challenges, of which he identifies three sets: the 'now' challenge, the 'end of the boom' challenge and the challenge of grasping new opportunities. His conclusions point to a broad set of policy and institutional reforms that will be required for Australia to continue to benefit from its relationship with China in the future, relating to resource taxation, migration, visas and airline services, labour productivity and flexibility, and ongoing reductions in barriers to trade.

Apart from the consensus that Chinese aid in Africa has increased rapidly in recent years, there is little agreement on the details of this contentious issue. Deborah Brautigam contributes to the ongoing debate in Chapter 13, which provides clear insight into what constitutes Chinese 'development aid' in Africa, where it is going and in what quantities, the motivations behind it, and its impact on African economic development. In so doing, she makes the critical point that only a small proportion of the variety of instruments used by the Chinese for official finance in Africa can be categorised as official development aid (ODA). Grasping the realities of Chinese development aid and economic cooperation (much of which is not aid) in Africa is an essential prerequisite for understanding the many issues surrounding China's engagement in Africa—for the African countries themselves, for Africa's traditional partners, and for China itself.

Peter Robertson takes on the world's present and future 'titans' in his comparative analysis of Chinese and Indian economic growth in Chapter 14. Robertson draws on the neoclassical growth model to argue that, contrary to widely held beliefs, China's remarkable growth performance during the past three decades might have far more to do with the growth in its human-capital stock than with the growth in its physical-capital stock. His estimates show that the growth of human-capital stock has accounted for a significant proportion of economic growth in both countries to date, but particularly in China, where significant achievements have been made in increasing the proportion of the workforce with secondary or higher levels of educational attainment. The key challenge for both countries lies in ensuring that their vast populations—in urban and rural areas alike—are provided with equal opportunities to equip themselves with the education and skills that will be a key source of growth for the two titans in the decades ahead.

In Chapter 15, Paul Frijters, Xin Meng and Budy Resosudarmo provide a comparative analysis of China and Indonesia—two of the world's most populous countries in which millions of migrants have made significant contributions to economic development. In particular, they examine how different institutional settings in China and Indonesia affect the wage outcomes of rural-to-urban migrants. Although both countries are rapidly urbanising, Chinese cities place heavy restrictions on migrants' access to high-wage occupations, while Indonesian cities are far more *laissez faire*. Their analysis shows that Chinese migrants earn significantly less than their urban residential counterparts, while Indonesian migrants earn slightly more. This difference highlights the need for Chinese policy makers to reform the 'two-class residency system' in Chinese cities—an increasingly urgent issue in light of the unstoppable process of urbanisation and the purported commitment to reducing income inequality.

China's dramatic economic rise during the past three decades has been accompanied by—and indeed, to some extent caused by—the most rapid 'demographic transition' experienced at any time anywhere in world history. In Chapter 16, Zhongwei Zhao examines this transition from a global perspective, identifying some of the key challenges China is facing as it enters the unique situation of getting old before it gets rich. Arguing that a relaxation of the one-child policy is unlikely to impact significantly on future fertility rates, Zhao calls for careful consideration of the long-term impact of below-replacement fertility and the appropriate policy response. A basic prerequisite for preparing for the upcoming challenges is an improvement in demographic data collection and quality, without which it will be impossible to know what lies ahead for Chinese demographic change, and its economic consequences.

In Chapter 17, Yang Du and Meiyan Wang look more closely at one of China's key demographic challenges—that of population ageing, and what it might mean for patterns of household consumption in the future. Du and Wang show that the determination of consumption choices over the life cycle is complicated in China's case by its status as a developing and transitional economy, with insufficient resources for elderly support, a pension system still under construction, and incomplete health and education system reforms. They draw on a recent urban household survey to examine the relationship between ageing and household consumption—an understanding of which is particularly important in the context of the Chinese leadership's goal of increasing the role of domestic demand in China's economic growth. Their findings suggest that the weak state of the healthcare system might be the biggest constraint to raising consumption in China's ageing society.

Finally, in Chapter 18, Xiaolu Wang examines the urban development strategy in China from an international perspective. He takes up the ongoing debate as to whether the Government's urbanisation strategy should focus on the development of small and medium-size cities and towns, or whether, instead, China should allow and encourage the emergence of 'mega-cities'. His econometric analysis using cross-country data shows that the percentage of China's population living in mega-cities is far below international common practice, with the implication that an additional 273 million people should transfer to mega-cities in the coming two decades. As with so many issues surrounding China's development process, the sheer size of its population presents the greatest challenge of all.

Bibliography

Cooper, N. R. 2008, 'Global imbalances: globalisation, demography and sustainability', *Journal of Economic Perspectives*, vol. 22, no. 3, pp. 93–112.

Findlay, R. and O'Rourke, K. H. 2007, *Power and Plenty: Trade, war, and the world economy in the second millennium*, Princeton University Press, Princeton, NJ, and Oxford, UK.

McKay, H. and Song, L. 2010, 'China as a global manufacturing powerhouse: strategic considerations and structural adjustment', *China & World Economy*, vol. 18, no. 1 (February), pp. 1–32.

Overholt, W. H. 2010, 'China in the financial crisis: rising influence, rising challenges', *The Washington Quarterly*, vol. 33, no. 1, pp. 21–34.

Serven, L. and Nguyen, H. 2010, *Global imbalances before and after the global crisis*, Policy Research Paper 5354, The World Bank, Washington, DC.

Song, L. 2010, China's rapid growth and development: an historical and international context, Presented at the Thirty-Fourth PAFTAD Conference on China's Role in the World Economy, 7–9 December 2010, Peking University, Beijing.

Truman, E. M. 2008, 'The management of China's international reserves: China and a sovereign fund scoreboard', in M. Goldstein and N. R. Lardy (eds), *Debating China's Exchange Rate Policy*, Peterson Institute for International Economics, Washington, DC, pp. 169–93.

2 China's Turbulent Half-Decade

Huw McKay[1]

Introduction

The second half of the first decade of the twenty-first century was a turbulent one for China and the world. The period opened and closed with the macroeconomic policy stance tilted towards restraint. In between times, an immense stimulatory package was assembled, executed and withdrawn. The economy experienced two periods of uncomfortably high inflation on either side of a period of outright price declines. This chapter offers a framework for considering Chinese economic performance of recent vintage while tracing the shifting contours of policy in this volatile era.

The chapter proceeds in the following manner. First, a framework for making sense of the Chinese economic cycle through the sectoral rotation of investment is presented. Second, economic conditions in the lead-up to the crisis are surveyed, with an emphasis on the domestic imbalances that accrued in this period of extremely rapid expansion. Third, the stimulatory policies enacted in response to the combination of a huge external shock and a domestic slowdown are outlined and analysed. Fourth, the key elements of the recovery are considered and assessed from both cyclical and structural perspectives. Fifth, the normalisation path of the most important macroeconomic and sector-specific policies is laid out, up to and including recent moves to actively restrain growth and inflation.

A simple framework for tracking China's economic cycle

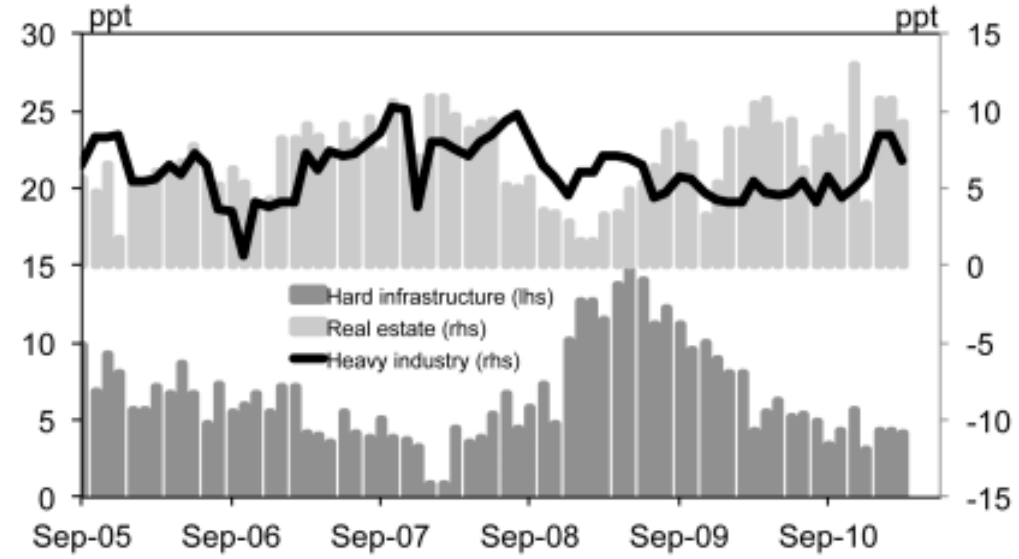
At the heart of the Chinese economic cycle are administrative efforts to achieve a balance between public and private activity. The dominant contributions to fluctuations in Chinese economic growth come from fixed investment (Figure 2.1). The three largest contributors to fixed investment growth in China are real estate, heavy industry and infrastructure. To stylise somewhat, it is useful to think of real estate activity as a proxy for the private sector, infrastructure activity as a proxy for the public sector and heavy industrial activity as derived demand reflecting developments in these two major end-user sectors.

It is unusual to see real estate and infrastructure activity elevated simultaneously given the logical implications of this situation for heavy industrial activity; the economy would soon overheat. Equally, if real estate and infrastructure were both subdued at the same

time, recession would inevitably threaten. Easing off on infrastructure while real estate has momentum, and responding swiftly with infrastructure projects when private activity tails off, is Chinese counter-cyclical policy making 101.

This framework offers a simple and intuitive lens for tracking Chinese economic growth. It is particularly useful for the decade of the 2000s. The enthusiastically embraced housing reforms of the late 1990s have elevated residential real estate to a position of major macroeconomic importance. China's relatively low level of capital stock per worker and obvious infrastructure deficits, coupled to the high observed level of capital formation to gross domestic product (GDP) (McKay and Song 2010:4–7) and the long-term imperative to integrate the currently fragmented provincial economy, place infrastructure provision at the heart of the growth model.

Figure 2.1 Contributions to fixed investment growth



Note: Contributions to the year-ended growth rate in percentage points. See Appendix 2.1 for definitions of these categories.

Many will criticise this schema because it excludes explicit reference to the export sector. The case for assigning exports a primary role in Chinese economic growth has been made many times, by Chinese and foreign observers alike (Akyuz 2011; Ljungwall 2006; Xu 2010). Others argue that the impact of exports is significantly overstated (Anderson 2007; He and Zhang 2010; Keidel 2008). The debate in many cases boils down to how exports are measured, or, more precisely, to what degree the import component of exports is allowed for.[2]

Herrerias and Orts (2010) and Roberts and Rush (2010) offer balanced summaries of the debate, concluding that each is a major contributor to growth. It is not the aim of this chapter to reopen this question. It is the author's long-held position that exports are important but not primary in driving Chinese economic growth (see, for example, the discussion in McKay 2008:17–25). The following discussion sits comfortably within that tradition.

The lead-up to the crisis

The era under consideration comes with a ready-made dividing line in the form of the dramatic collapse of global financial markets and international trade in the latter months of 2008. While the closed nature of China's exchange arrangements shielded the economy from the worst of the financial shock, the collapse in trade activity was a major imposition for the real economy. Even so, contrary to the expectations of many, aggregate activity levels were quite resilient to the trade implosion. The major levers of domestic demand responded with alacrity to the various policy stimuli put in place, enabling respectable economic growth in the face of the extraordinary external drag.

A discussion of the years preceding the financial crisis needs to begin a little before the onset of the half-decade that gives this chapter its name. In 2003, the economy was recovering strongly from the shocks of the East Asian financial crisis and the shallow global recession of 2001. At the centre of the rebound were an investment boom in heavy industry and a surge in international trade associated with China's World Trade Organisation (WTO) accession of 2001. It was the former trend that the domestic authorities saw as a destabilising one in need of a mitigating policy response. With a number of energy, resource and emissions-intensive sectors adding excessive new capacity at a febrile pace, policy intervened in April 2004. A list of overheated heavy-industrial sectors was compiled. These industries were to have their access to credit tightened appreciably. Approval standards for new projects increased in stringency, and centrally driven rationalisation programs were instituted (Huang and Jha 2004).

The microeconomic tightening response to the specific issues of 2004, which was successful in slowing heavy industrial capacity expansion, saw a couple of years of relatively balanced investment growth in 2005 and 2006. The fact that the Eleventh Five-Year Plan (2006–10) was enacted under the umbrella of a tight fiscal policy stance contributed to a healthy but not dramatic expansion of capital formation at this time. The deceleration of import growth associated with a slower rate of heavy industrial expansion and more effective competition by local producers of machinery and capital goods, at a time when global demand for Chinese exports was booming, saw a dramatic widening of the trade position in these years. So, while domestic demand growth was relatively stable through this period, the net export contribution to GDP growth rose substantially, pushing overall growth above 11 per cent.

Heavy industrial investment made a comeback in 2007 as the administrative interpretation of the 2004 framework began to loosen enough to enable a material acceleration of activity. Coming at a time when the real estate industry was also booming (rapid price rises, high sales turnover and a major construction upswing), net exports were on the way to adding 2.5 percentage points to annual GDP growth, capital inflows were extremely strong and inflation pressures were building, the need for a new round of macroeconomic tightening measures was inescapable.

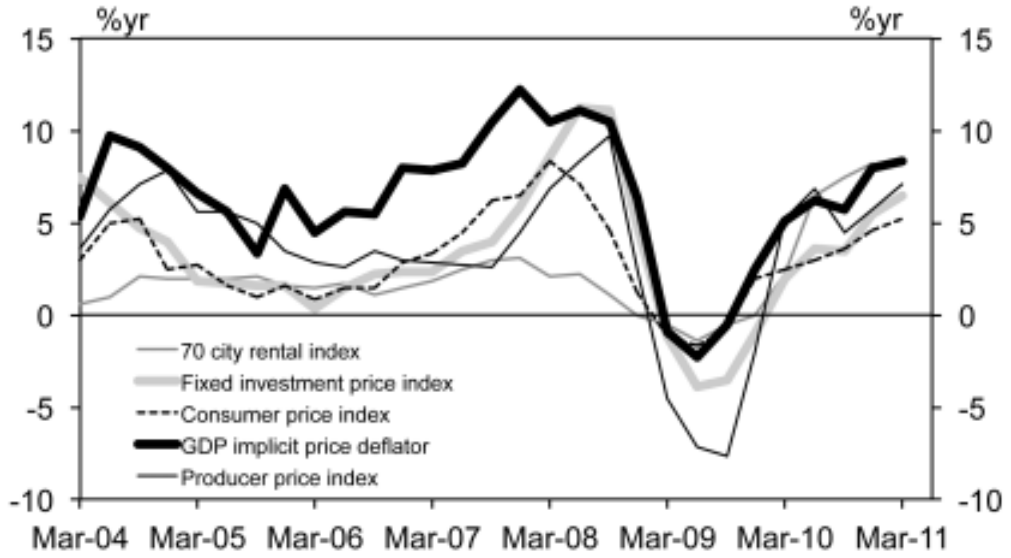
Monetary and credit policies were progressively tightened from the first half of 2007 through a combination of price, market-based and administrative measures (including interest rate increases, expanded open-market operations, increased reserve requirements for banks, quantitative credit restrictions and exchange rate appreciation). The central

fiscal position moved into surplus and the Central Government's capital works program was allowed to essentially stagnate. Direct administrative controls were placed on activity in real estate and the designated 'overheated' sectors of 2004. Export subsidies for a long list of energy-intensive products were lowered, scrapped or in some cases converted into outright export taxes. The exchange rate was allowed to rise more quickly than the modest pace of appreciation that was engineered in the initial years following the July 2005 peg exit.

The economy reportedly expanded by a remarkable 14.2 per cent (real) in calendar year 2007, but the momentum of growth peaked in the March quarter of that year (18.1 per cent at a seasonally adjusted annualised rate) and decelerated from that point forward as tightening measures began to have an impact. In the background, the support for Chinese growth coming from the external sector was also diminishing. The first clear signs of financial strain were beginning to show in the United States around mid-2007, while that country's housing market, on which so much in the financial sphere depended, was exhibiting recessionary tendencies.

Even so, commodity prices were running hot, turning China's terms of trade sharply negative. China's import bill spiked as energy and iron ore prices hit record levels in the first half of 2008. Simultaneously, a 'global food crisis' drove agricultural prices skywards, helping to push Chinese annual consumer price inflation to a peak of 8.5 per cent. The implicit price deflator for GDP peaked at an annual rate of 12.2 per cent (Figure 2.2). The jump in inflation encouraged what with hindsight can be described as 'late-cycle' tightening measures imposed on an economy that was already decelerating.

Figure 2.2 Various measures of Chinese inflation



An industry that was particularly vulnerable at this time was housing. The sector had been engaged in a frenetic upswing, fuelled principally by the mobilisation of savings that sought superior inflation-adjusted long-run returns to those available from either bank deposits or the equity market. The former were unattractive due to the low real rates imposed by bureaucratic fiat. The latter were unattractive due to the huge volatility of returns and the omnipresent threat of a potentially overwhelming supply of state-owned shares should the administration choose to bring them to market (Rule 2005; Walter and Howie 2011). Housing, on the other hand, benefited from capital gains and holding tax vacuums (Morinobu 2006), strong underlying demand from new urban residents and upgrading demand from those moving up the income scale, plus an overtly supportive stance from local government, where revenues from land sales were becoming increasingly important.

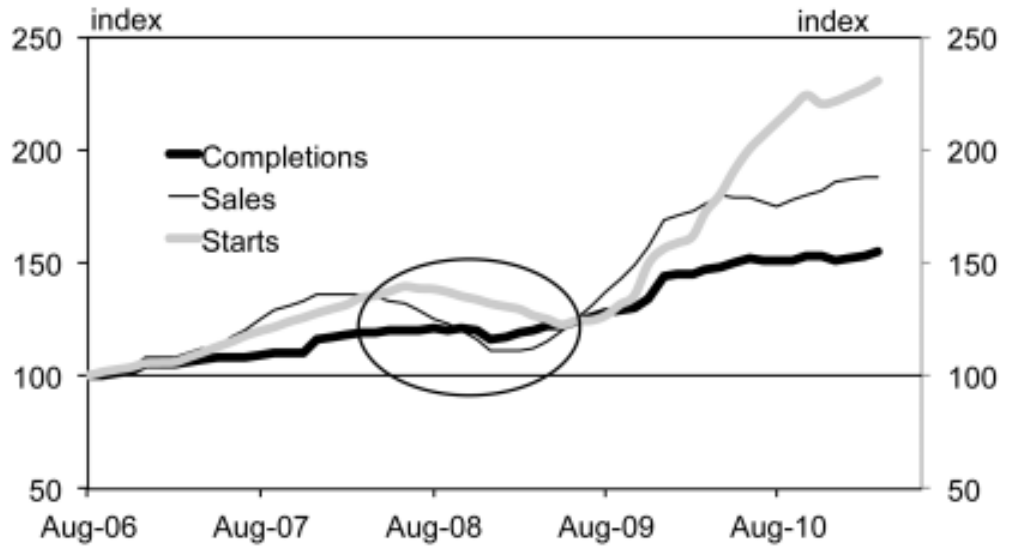
These strong fundamentals and the supportive policy backdrop, in addition to an upward march of 'price discovery' as the overall stock of dwellings was incrementally commercialised, had led to a major boom. This in turn attracted speculative players, some of whom had transferred funds from the equity market, which had been struggling since liquidity conditions had begun to be tightened. At the margin, capital inflows also supported the property market, as onshore investors repatriated funds held abroad for deployment at home. An increase in the supply of mortgage loans from the banking system (from a very low initial level) completed the picture.

The rise in valuations saw affordability decline alarmingly, essentially locking out potential first-time buyers on average incomes from entering the owner-occupier class in the major cities. Additionally, as most of the new commercial stock coming onto the market was pitched at the luxury end, turnover was becoming concentrated among investors rather than first-time or upgrading owner-occupiers.

This combination of trends made housing vulnerable despite the strong apparent underlying demand fundamentals. With investors making up a large proportion of sales, a policy stance that penalised this group could be expected to create a major disruption, which it did. As the required cash-down payment for non–first-home purchases was increased along with interest rates, investor demand began to flag and overall sales accordingly softened.

This left developers with a growing stock of unsold inventory on their hands. Accordingly, they shifted their focus from bringing new projects to market to concentrating on selling what was already completed, with discounting the main tool at their disposal. Discounts were initially ineffective and the volume of sales (measured in square metres of floor space) fell so low that it was insufficient to absorb new completions, let alone existing stock already on the market (Figure 2.3).

Figure 2.3 The real estate sector: starts, sales and completions



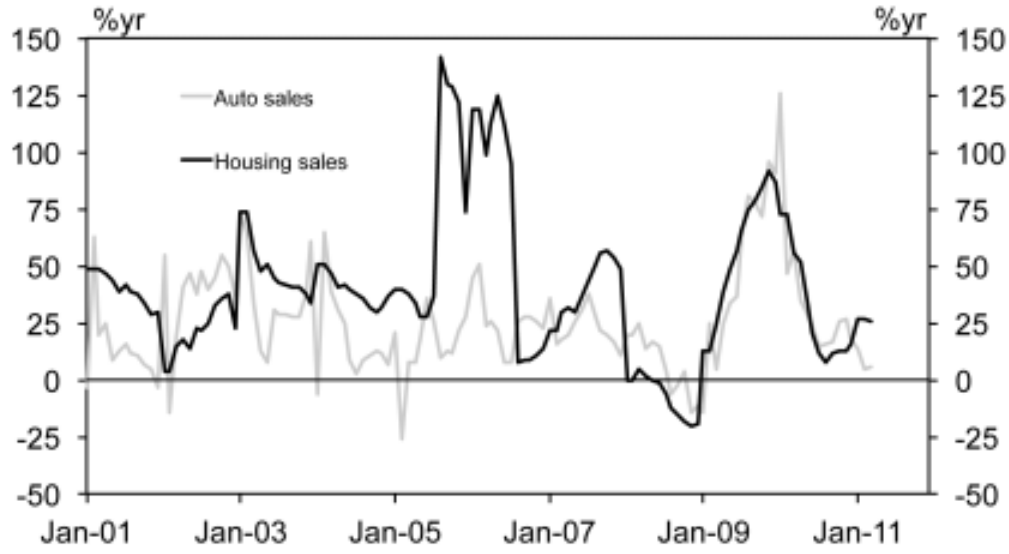
Note: Underlying data are in square metres. Indices are based at August 2006.

This disconnect had predictably negative consequences for construction activity. The impact on upstream heavy industrial sectors such as steel and cement was considerable. The demand for raw materials and electricity shrank as intermediate-goods producers wallowed in unanticipated inventory gluts and lowered output in response.

The worst moments for housing coincided with the peak of the global disruption to economic activity from October 2008 to February 2009. Yet it is clear that the housing correction would have played out on a material scale irrespective of the external shock, given the market and policy dynamics that were in play. While the reversal of capital inflow and the deleterious impact on sentiment from the collapse of global trade undoubtedly played a role in the woes of real estate, they were neither catalytic nor central to the process.

The auto industry also went through a very difficult phase at this time, with sales declining from an annualised rate of 11 million in January 2008 to just 8 million by December of the same year (Figure 2.4). The fortunes of the auto sector neatly encapsulate the complex interplay between the economic cycle and the virtuous circles of structural uplift experienced by a successively developing low-income economy. It also exhibits major backward and forward linkages to other sectors (Baker and Hyvonen 2011), with substantial demand for upstream intermediate goods and components in addition to a major distribution network downstream. These characteristics, and relatively low rates of both import and export penetration,[3] make it a bellwether for the overall state of the economy. In 2008, auto sales lived up to this designation, faithfully reflecting the growing burden of tight policy on discretionary activity.

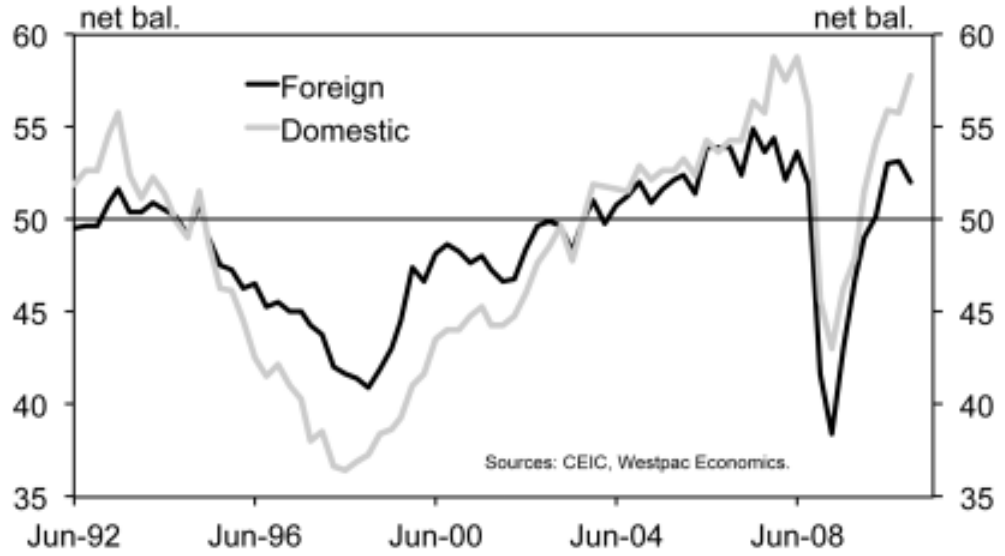
Figure 2.4 Housing and auto sales



The response to the external crisis and the domestic slowdown

Confronted with a haemorrhaging export sector, a housing market correction and a major inventory problem in heavy industry, the Government's initial response to crisis was to announce a modest package in October 2008 that featured policies designed to bring about favourable structural change in the economy. In other words, it targeted consumption and refrained from the easy path of supporting housing and heavy industry directly. As the business surveys (the first information on economy received in the monthly data round) from home and abroad filtered in through early November, describing a remarkable evaporation of international trade in October, it was clear, however, that 'good' policy would have to be subordinated to pragmatic concerns for the interim.

Figure 2.5 5000 enterprises survey: domestic and foreign order books



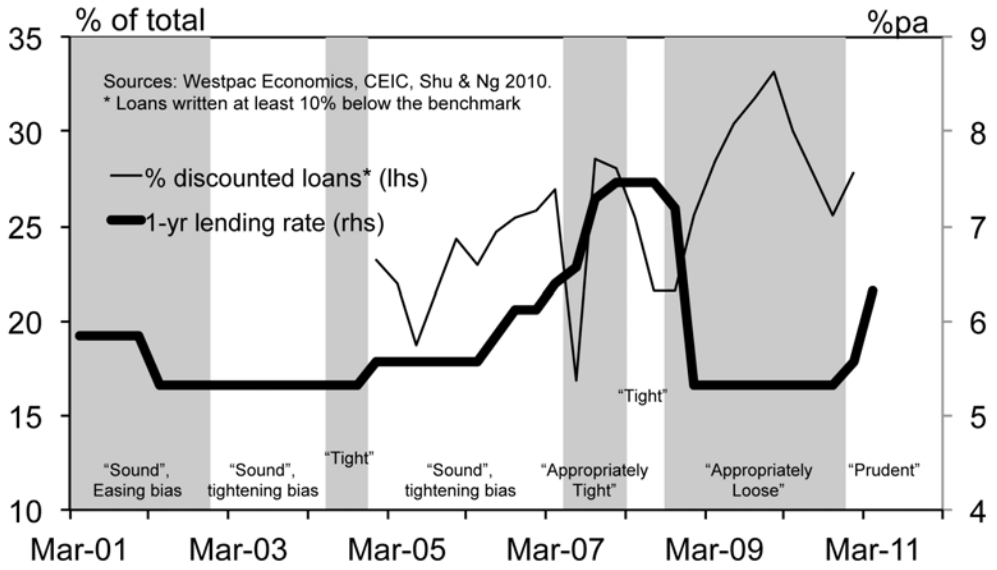
China's second stimulus package was equivalent to almost 14 per cent of GDP, spread over two years, and would focus on transport and power infrastructure (45 per cent), reconstruction spending associated with the terrible losses of the Sichuan earthquake (20 per cent), rural infrastructure and environmental projects (18 per cent), social services and tax breaks (10 per cent) and public housing (7 per cent). Further, the aggregate policy environment was shifted to outright accommodative—'appropriately loose' was the official phrase (Shu and Ng 2010:14)—and sector-specific incentives were introduced for housing, autos and household appliances.

The removal of the annual lending quota was central to the easing of monetary conditions. New loans equivalent to 52 per cent of GDP were extended in the first half of 2009 (Figure 2.5). A rapid reduction in required reserve ratios freed liquidity in the banking system and lending rates were cut (Figure 2.6). The proportion of loans that were extended at a discount to benchmark rose considerably, in line with a rapid take-up of bank financing by the state-owned enterprise (SOE) sector. The rise in the contribution of SOEs to overall investment growth and the dramatic lift in infrastructure combine to illustrate the dominant forces in the growth rebound of 2009 (Figure 2.7).

The nature and scale of the package well illustrate the magnitude of the shock that the administration was trying to offset. Essentially, the administration eschewed careful structurally aligned policies and went for growth in the most reliable manner possible. The trade-offs attached to this decision were many, and the negative structural impacts will influence the path and composition of economic activity for some time to come. The positive is that the surge in infrastructure investment has enhanced the supply side of the economy considerably, particularly on the logistics side. So, while the encouragement of heavy industry, real estate speculation and the further embedding of the huge SOEs in

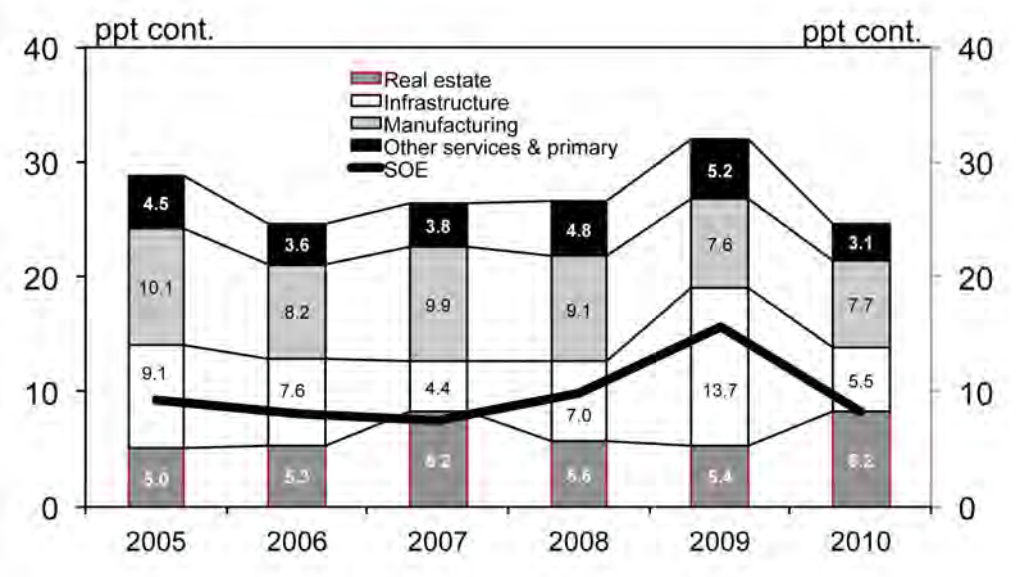
their comfortable monopolies are at the top of the list of negative legacies of the stimulus package, the rapid increase in transport infrastructure represents an impressive leap in the direction of integrating China's fragmented regional economies into a unified mega market.

Figure 2.6 Policy stance, lending standards and lending rates



Notes: Shaded areas demarcate monetary policy phases as defined in Shu and Ng (2010) along with their narrative description. The percentage discounted lines series indicates the proportion of loans extended at a discount of at least 10 per cent to the benchmark rate.

Figure 2.7 Contributions to fixed investment growth



Note: The stacked columns sum to annual fixed investment growth, but the SOE contribution is to be considered separately.

The maintenance of the easy policy stance was accommodated by inflation falling into negative territory. The producer price index and the consumer price index were both down on a year earlier for three straight quarters in 2009; the GDP deflator fell to –2.3 per cent year-on-year in the June quarter; property prices fell and the rental price index likewise (Figure 2.2). Indeed, China's relative price level was a source of real exchange rate depreciation at this time while the nominal exchange rate appreciated sharply in effective terms (see Figure 2.9 and commentary below).

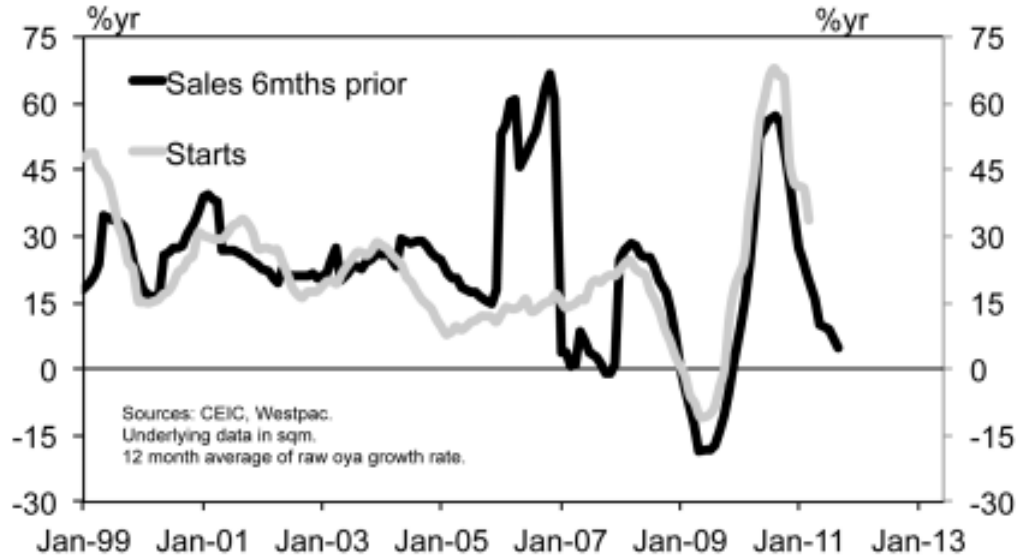
Elements of the recovery

The nature of the recovery from an activity perspective ensured that it was highly resource (and emissions) intensive. Metal and energy prices collapsed along with global economic growth in late 2008 and remained under pressure in to early 2009. The firming of Chinese domestic demand, however, as the stimulus efforts bore fruit put raw material import volumes on an unambiguous recovery trajectory by the June quarter of 2009, over and above the usual seasonal increase at this time. Iron ore import volumes were already rising strongly by February 2009, with crude oil volumes just a few months behind.

Housing turnover recovered in spectacular fashion as pent-up demand from both owner-occupiers and investors—kept latent for much of 2008 for reasons of affordability and policy restraint respectively—was unleashed. The policy initiatives sponsoring the shift included lower minimum repayments for house purchases, stamp duty and value-added tax waivers, a shortening from five years to two years of the minimum holding period for tax-exempt housing transfers and the extension of first-home buyer perks to second-home purchasers (HKMA 2010). The turnaround between the last tightening measure on real estate (August 2008) and the first easing measure (October 2008) illustrates the speed at which the downturn took hold.

The strong sales demand produced by this cavalcade of initiatives enabled developers to clear the excess inventory they had accumulated during the downturn and again look to expand. Historically, the growth of housing sales leads the growth of housing starts (measured in volume terms) by about six months and this relationship held tightly during the recovery phase (Figure 2.8). The surge in starts duly lent support to the growth of fixed investment, which was already trending higher in response to the infrastructure program. The order books of heavy industrial manufacturers were full again. In terms of annualised GDP growth, the four quarters of calendar year 2009 read like so: 7.1 per cent for March, 14.8 per cent for June, 10.6 per cent for September and 10.9 per cent for December. By the end of 2009, high-speed domestic demand growth was fully reinstated.

Figure 2.8 Housing sales and starts



Note: Underlying data are in square metres.

The reader should recognise this combination of trends from the framework put forward at the beginning of the chapter. The framework posited that if infrastructure investment is elevated, the economy cannot afford to have real estate booming simultaneously, as heavy industry will be encouraged to accelerate alarmingly and overheating pressures will inevitably emerge. China was experiencing exactly that set of circumstances in the first half of 2010.

As the pipeline of infrastructure projects instituted as part of the stimulus package was still under way by the time housing was fully back on its feet, inflation began to brew. Individual city housing markets were beginning to look quite frothy, with Beijing in the vanguard of this phenomenon. Tighter policy was clearly required.

The first tentative signs that the administration was looking to normalise the policy stance came in the second half of 2009. First, the Central Economic Working Meeting stated that investment should focus on bringing existing projects to fruition, rather than seeking out new ventures. This was a clear statement that the pipeline of activity was considered ample and that by not actively replenishing it, the authorities were signalling that slower growth down the track was their desired outcome. The overt support for the housing market began to be reduced in late 2009 as well, with the tax-exempt holding period put back to its original five years in December. In January, the minimum deposit for second-home purchases was returned to its usual level of 40 per cent from the 'concessionary' rate introduced in late 2008.

The bank reserve requirement was lifted for the first time since the crisis in January 2010, with follow-up increases in February and May. Sectoral tightening commenced in earnest with the clampdown on the property market in April. The new measures reversed

all accommodative housing policies and introduced more onerous credit criteria than existed before the crisis, for both investors and first-home buyers. The loophole was that the new measures were designed principally for the Beijing market and the wording of the edict gave substantial autonomy to other jurisdictions to interpret them based on local conditions. The predictable result was that while housing sales in Beijing fell sharply, other cities recovered quickly after an initial dip as local governments failed to fully apply the strictures. Even so, slowly but steadily, tight policy is getting on top of housing sales nationwide, with price increases and turnover showing material signs of deceleration in early 2011.

The Government's overall approach to housing encompassed demand and supply-side measures. Local authorities have been asked to submit policies and targets for improving housing affordability in their jurisdictions. The Twelfth Five-Year Plan (2011–15) incorporates a target to boost the supply of affordable public housing by 36 million units, with a 'mandatory' 10 million units to be completed in 2011 ('Chinese Vice Premier calls for building of 10 mln affordable housing units this year', *Xinhua*, 25 February, <http://news.xinhuanet.com/english2010/china/2011-02/25/c_13748574.htm>). Experimental property holding taxes were introduced in Shanghai and Chongqing, with plans to go nationwide; policies to inhibit land-hoarding practices were introduced; as were the institutions of price caps, ownership limits and fixed prices edicts; and land-supply targets for affordable housing projects were increased sharply.

Indications are that the demand/supply fundamentals at the aggregate level are shifting into an alignment that will improve affordability in coming years, with a surge in housing starts in 2010 running well ahead of sales. The concern is that the composition of the new supply—once the observed jump in starts transitions to completions—will be skewed too heavily towards the high end of the market. That would predict a mismatch between the real demand from owner-occupiers and the actual properties available for sale.

Local government project financing platforms, which were a major transmission mechanism for the monetary easing of 2009, were first mentioned as a macro-prudential risk in the early months of 2010. Banks were soon directed to reduce lending to these vehicles and to closely monitor the performance of loans already extended. As local governments dominate public capital formation, accounting for approximately 90 per cent of projects, this move was a clear indication that the policy stance was shifting. It was also confirmation that a further negative legacy of the stimulus package was coming to light: weakened financial system balance sheets due to policy loans.

Looking at the issue from another angle, one indication of the tightness of policy before the crisis was the decline in the size of new investment projects being instituted in China's coastal provinces for the first two months of calendar years 2007 and 2008. A signal that investment was set to rebound at a terrific pace was the jump in the size of new investment starts in early 2009. The strength of the pipeline was reinforced by the impressive project size reported in early 2010. The fact that the renewed tightening of policy of the second half of 2010 was having an impact can be read in the reduced size of project starts from early 2011. The recent decision to scale back on the expansion of the high-speed rail network ('High speed railway infrastructure investment to be trimmed', *China Securities Journal*, 5 April 2011, <http://www.cs.com.cn/english/ei/201105/t20110504_2866408.html>), both

in 2011 and over the course of the Twelfth Five-Year Plan, in the wake of the disgrace and dismissal of the Railways Minister in February 2011, is a sectoral illustration of what is becoming very evident in the aggregate figures.

From a cyclical point of view, the authorities are facing a challenging outlook. Looking at the next two years through the three-sector framework, the likelihood of a simultaneous slowdown seems quite high if policy remains on its present course. The fact is that by pursuing a dual-stimulus strategy of boosting both infrastructure and real estate, the administration must face the reality that they are both vulnerable to slowdown at the same time. That in turn creates the possibility that a recession could be a result when stimulus is withdrawn and policy begins to restrain activity. Consider the facts: the infrastructure upswing peaked some time ago, fiscal policy is on a tightening trajectory, local government financing has been constrained, the number of new starts has dwindled nationally and the size of projects in the coastal provinces has declined. That deceleration was offset by the robust strength of real estate investment in 2010. With sales turnover essentially flat on average across the country since mid-2010, new supply looks, however, to be excessive once the observed volume of starts becomes completions. That would mean that developers would be left with unsold stock on their hands. That in turn would encourage them to redirect their energies from expanding construction to reducing their inventory. If infrastructure activity were still subdued when this adjustment process occurred then heavy industry would be facing an unintended inventory build of its own. A correction in the growth rate would be avoidable.

For the chain of events hypothesised above to play out in reality, the authorities would need to stand aside and allow both the infrastructure and the real estate cycles to proceed according to their own rhythms without further intervention from the centre. An easing of the policy stance, either to reinvigorate the infrastructure pipeline or to lean less heavily on housing activity, could allay fears that a coincident slowdown of these two bellwether industries is on the way. The longer-run opportunity costs of such an intervention, however, make the policy calculus highly complex. First, housing affordability for ordinary citizens would be greatly assisted by a strong increase in dwelling supply that outran realisable demand for a period. Second, the many negative implications of overt 'pro-growth' resource, energy and emissions-intensive policies are now well understood and therefore the threshold conditions for their use are much higher than in previous cycles. Three, the risk that inflationary expectations embed themselves at an uncomfortably high level is real and is taken very seriously. Four, high inflation rates have the effect of a regressive tax and are thus inconsistent with the administration's goal of improving outcomes in the area of equality. Five, financial system balance sheets are already somewhat burdened by policy loans made in recent times. Six, the retardation of the infant market-driven capital allocation mechanism imposed by the move to stimulate must be reversed as part of any normalisation process or 'exit strategy'.

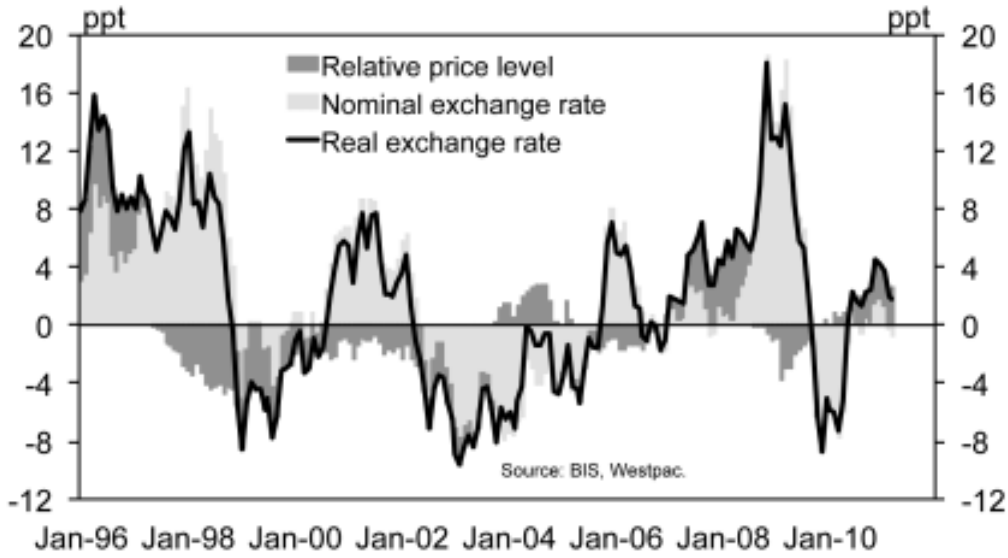
The weight of these arguments would seem to point towards a protracted period of restrictive policy settings even if growth were to record multiple outcomes below, say, 9 per cent. Indeed, a protracted period of below-trend rates of expansion is required

to reduce the considerable inflationary pressures that have accumulated in the system. Making an *ex ante* judgment that a slowdown is required and holding one's nerve when that slowdown arrives are very different things.

The exchange rate

Somewhat curiously, while all other arms of policy were set to aid expansion by late 2008, the exchange rate policy was set with an indirect contractionary bias. By abruptly ending flexibility in the fixing rate of the US dollar to the renminbi (RMB) from August 2008, at a time when the US dollar appreciated on a broad front, China's nominal and real effective exchange rates appreciated sharply (based on the Bank for International Settlements [BIS] measures displayed in Figure 2.9) while its exporters were dealing with rapidly declining sales and shrinking margins. This was essentially a repeat of the East Asian crisis foreign exchange policy response, when China maintained its peg to the US dollar despite what must have been a great temptation to devalue to maintain a semblance of competitiveness with other emerging markets. While China drew plaudits from its trading partners for its show of restraint in the late 1990s, it received few laurels this time around. Indeed, it was not long after the depths of the crisis that China again came under international pressure to resume nominal appreciation against the US dollar, with countries such as Brazil and India joining the chorus. This pressure came despite the fact that the RMB was significantly above its pre-crisis level in real effective terms, while most emerging markets had not reclaimed more than a modest portion of their intra-crisis real effective depreciations.

Figure 2.9 Decomposition of annual changes in the real exchange rate



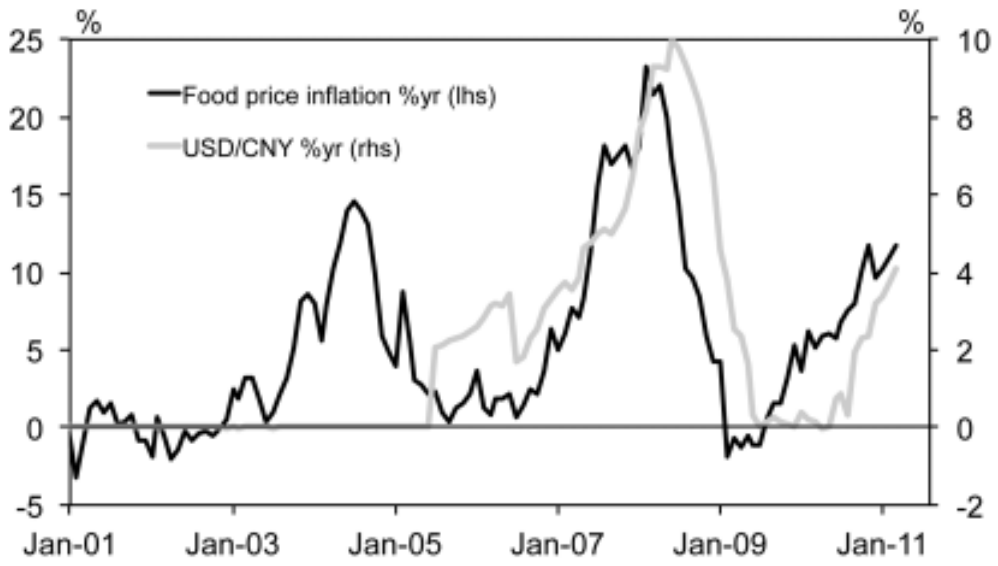
Note: Annual percentage change in the BIS broad real effective exchange rate measure decomposed into moves in the nominal effective exchange rate from the same source and changes in the inflation differential embedded in the real estimate, measured as a residual.

It is not obvious from the trade data that China was suffering greatly from an appreciated real exchange rate. While foreign orders and new exports orders lagged their domestic equivalents in the 5000 enterprise survey and the manufacturing Purchasing Managers Index (PMI) survey respectively, and imports reclaimed their pre-crisis levels five months before exports, domestic demand differentials between China and its trading partners were stark and these results might be inferred without reference to the currency. Export growth itself looked robust enough, reclaiming the 20 per cent threshold in six-month annualised terms in August 2009, and maintaining an average of 32.4 per cent since that time (the comparable number for imports is 41.8 per cent). The contribution of net exports to GDP growth was negative in all four quarters of 2009 and again in the March quarter of 2010, but it was positive in the remaining quarters.[4] In annual terms, the net exports contribution swung from 2.5 percentage points in 2007, to 0.8 percentage points in 2008, to −3.7 percentage points in 2009, and back to 0.8 percentage points in 2010.

Export margins, which might be interpreted as a threshold level for the affordability of nominal exchange rate appreciation, did come under stress though, indicating that profitability was a major concern through the worst of the shock. One proxy of export margins[5] narrowed from 6.8 per cent in December 2007 to a trough of 3.6 per cent in January 2009, before recovering to 6 per cent by February 2011.

The nominal US dollar/RMB exchange rate was maintained at 6.83—17.5 per cent below the old pegged level of 8.28—between August 2008 and June 2010.[6] The rate of appreciation observed since that time has seemingly been calibrated to both trends in the overall foreign exchange market and the state of domestic inflation. The pace of appreciation has been stepped up materially as the inflationary pulse has quickened, with annualised moves in the US dollar/RMB rate at times approaching 10 per cent. With food prices an element in the inflation increase, the close relationship shown in Figure 2.10 is intuitive. As of 5 May 2011, the US dollar/RMB was 5 per cent below the 6.83 it was held at through the crisis and 21.6 per cent below the old peg.

Figure 2.10 Food prices and the nominal exchange rate



Conclusion

This chapter has presented a high-level review of developments in the Chinese economy in a turbulent period. Beginning with the boom in heavy industrial investment of 2003, the broad contours of economic activity and policy were traced up to the early months of 2011. The context for the discussion was a framework that prioritises fixed investment as the major dynamic agent in Chinese economic growth. The period under review opened and closed with aggregate policy tilted towards actively restraining activity, with the weight of fiscal and monetary tightening bearing down on the three key elements of the investment cycle: real estate, infrastructure and, by extension, heavy industry. In between, the authorities responded to a huge external shock, in tandem with a policy-induced internal slowdown, with a major stimulus package that served to entrench rather than improve upon existing structural issues. Thus, despite its conspicuous cyclical success in reinstating high growth, the package has left a negative structural legacy and a few cyclical ones as well.

As the decade unfolds, the authorities will be challenged to reassume their role as instigators of positive structural change and reduced inequality, while maintaining elevated rates of economic growth alongside acceptable rates of inflation. The immediate challenge is to deal with uncomfortably high inflation. A little further out a fundamental question will be presented: how to deal with the potential for a simultaneous slowdown in the three core sectors without sacrificing structural imperatives. How the authorities address that question will have relevant implications for how smoothly China is able to navigate the transition from low to high middle-income status. That is a question that the whole world has a stake in.

Bibliography

Anderson J. 2007, 'Is China export-led?', *UBS Investment Research 'Asian Focus'*, 27 September.

Baker, M. and Hyvonen, M. 2011, 'The emergence of the Chinese automobile sector', *Reserve Bank of Australia Bulletin*, March Quarter, pp. 23–30.

Chinese Economic Review 2011, 'China slashes railway budget, slows rail speeds', *Chinese Economic Review*, 14 April, <http://newcer.chinaeconomicreview.com/en/content/china-slashes-railway-budget-slows-rail-speeds>

Herrerias, M. J. and Orts, V. 2010, 'Is the export-led growth hypothesis enough to account for China's growth?, *China and World Economy*, vol. 18, no. 4 (July–August), pp. 34–51.

Hong Kong Monetary Authority (HKMA) 2010, 'Mainland economic outlook for 2010', *Mainland Economic Monitor*, Special Note 01/2010, 12 January, Hong Kong Monetary Authority.

Huang, Y. and Jha, R. 2004, 'China and India: short-term macroeconomic outlook', in R. Garnaut and L. Song (eds), *China: Is rapid growth sustainable?*, Asia Pacific Press, Canberra.

Keidel, A. 2008, *China's economic rise—fact and fiction*, Policy Brief No. 61 (July), Carnegie Endowment for International Peace, Washington, DC, <http://www.carnegieendowment.org/files/pb61_keidel_final.pdf>

Ljungwall, C. 2006, 'Export-led growth: application to China's provinces, 1978–2001', *Journal of Chinese Economic and Business Studies*, vol. 4, pp. 109–26.

McKay, H. 2008, *Asian industrialisation: a strategic analysis with a memorandum on the Australian response*, Global Dynamic Systems Centre Working Papers No. 4 (June), The Australian National University, Canberra.

McKay, H. and Song, L. 2010, 'China as a global manufacturing powerhouse: strategic considerations and structural adjustment', *China and World Economy*, vol. 18, no. 1 (February), pp. 1–32.

Morinobu, S. 2006, *The rise and fall of the land myth in Japan: some implication to the Chinese land taxation*, PRI Discussion Paper Series No. 06A-08 (March), Japanese Ministry of Finance Policy Research Institute, Tokyo.

Rule, T. 2005, 'How are equity markets performing in China?', in R. Garnaut and L. Song (eds), *The China Boom and Its Discontents*, Asia Pacific Press, Canberra.

Shu, C. and Ng, B. 2010, 'Monetary stance and policy objectives in China: a narrative approach', *HKMA China Economic Issues*, no. 1/10 (January).

Walter, K. E. and Howie, F. J. T. 2011, *Red Capitalism: The fragile financial foundation of China's extraordinary rise*, John Wiley & Sons, Singapore.

Xu, Y. 2010, 'China's export-led growth strategy: an international comparison', *China and World Economy*, vol. 18, no. 4 (July–August), pp. 18–33.

Appendix 2.1

Fixed investment categories in Figure 2.1 are defined as:

Heavy industry

- Petroleum, coking and nuclear fuels processing
- Chemical material and product
- Medical and pharmaceutical products
- Chemical fibre industry
- Rubber products
- Plastic products
- Non-metal mineral product
- Smelting and pressing of ferrous metals
- Smelting and pressing of non-ferrous metals
- Metal products
- Universal equipment manufacturing
- Special purpose equipment
- Waste resources and materials recovery and process
- Transportation equipment

Hard infrastructure

- Gas and water production and supply
- Water conservancy, environmental management
- Transport, storage and postal service

Fixed investment categories in Figure 2.7 are defined as:

Manufacturing is a secondary industry excluding extractive industries.

Infrastructure includes those industries defined as hard infrastructure in Figure 2.1, plus soft infrastructure sectors

- Information transmission, computer and software
- Education
- Health care, social security and welfare (HW)
- Public administration and social organisation

Real estate includes investment by the construction industry.

Other services and primary includes agriculture, the extractive industries and services sectors not allocated elsewhere.

Endnotes

1. Unless specified otherwise, the references to economic data in this chapter, and the information contained in the figures, are the author's calculations based on underlying information accessed via the CEIC subscription data service. Seasonal adjustment is performed in E-Views 6 using Census X-12.

2. As of 1.40pm Australian eastern standard time on 29 April 2011, Google searches for the terms 'China export led growth strategy', 'China investment led growth strategy' and 'China investment and export led growth strategy' returned 1.46 million, 2.41 million and 821 000 hits, respectively. So, investment-led growth wins a very unscientific straw poll. It also illustrates the media's stubborn refusal to engage in complexity and nuance, with the relatively low score for the dual drivers of growth thesis.

3. On the latest data (February 2011), imports make up a very modest 4.5 per cent of completed vehicle units sold. Exports constitute an even lower 3.3 per cent share of domestic production. These figures hide the high import composition of domestically finished vehicles. In 2009, the value of finished-vehicle imports (US$15.5 billion) was less than the value of imported parts and accessories (US$17 billion).

4. Note that annual national accounts estimates on an expenditure basis are not yet available for 2010. Further, the March quarter of 2011 is likely to see a negative contribution from net exports.

5. The simple average of profits as a proportion of revenue in the following highly trade-exposed sectors: textiles, garment, footwear and headgear manufacturing, leather, fur, down and related, furniture manufacturing, cultural, educational and sport articles, electric machinery and equipment, communication, computer and other electronic equipment, instruments, meters, cultural and office machinery.

6. Additionally, the return to flexibility has been accommodated with a quite aggressive move towards internationalising the currency, principally through championing the use of the RMB in trade settlements.

3 Reform of the International Economic System:
What does China want?

Yiping Huang, Weihua Dang and Jiao Wang

Introduction

The current international economic system, which was first established in the mid-1940s, contains three key features. First, the United States is a dominant leader in designing and enforcing the international economic rules. Second, the US dollar has been the cornerstone of the international monetary system, both before and after the breakdown of the Bretton Woods system. And finally, three international organisations—the International Monetary Fund (IMF), the World Bank and the World Trade Organisation (WTO)—are responsible for maintaining international economic order.

For more than half of a century, this system facilitated steady growth of the global economy. Recently, however, there have been growing calls for reform of the international economic system. Two important events, in particular, have strengthened these demands. The first has been the ascendancy of the emerging market economies, which naturally calls for some of these to move from the periphery to the centre-stage of international economic decision making. The second was the sub-prime crisis in the United States, which has raised serious questions about the future international roles of the United States and the US dollar.

The current international economic system is modelled mainly on the economic systems of the industrialised countries, especially that of the United States. It promotes free trade, free investment, free markets and strict market discipline. But the latest sub-prime crisis revealed some problems with the US system. Economists have since raised questions about the effectiveness of monetary policy, financial regulations and the international reserve system. While there might not be consensus about what should happen next, there is general consensus that this system needs to be adapted to suit the new global economic and market conditions.

The world economy is indeed very different today from more than 60 years ago when the current system was first set up. Towards the end of World War II, most developing economies collapsed, suffering from serious and widespread poverty problems. They received financial assistance for, and policy advice on, poverty alleviation and economic development from international organisations and industrialised countries; however, these developing countries made little contribution to the design and enforcement of international economic rules.

Today, however, the emerging market economies are already important players in the world economy. Of the world's 20 largest economies, more than half are emerging market economies. For instance, the five BRICS countries (Brazil, Russia, India, China and South

Africa) account for 42 per cent of the world's population and 18 per cent of global gross domestic product (GDP). Many emerging market economies have already begun to assert their influence in world economic affairs through the Group of Twenty (G20) summit process. It is now appropriate for the advanced and emerging market economies to work together in changing some of the international economic rules.

China is likely to play an important part in the transformation of the international economic system. China is already the second-largest economy in the world according to market-based GDP measures and might overtake the United States as early as 2013 according to the purchasing power parity-based GDP measure (Feenstra et al. 2011). China's international economic influences have grown exponentially, especially in international markets for labour-intensive manufactured goods, raw materials and commodities and foreign exchange.

This chapter focuses on the central question of the likely nature of Chinese participation in this international reform process. One critical question is: what does China want? We intend to answer this question based on our best understanding of the Chinese position on a number of selected important subjects, including the transformation of international governance, restructuring of international organisations, and reform of the international monetary system. But it is important to point out that these only represent our best interpretation of the official position, not the official position itself.

Our main arguments can be summarised as follows. First, China wants reform, not revolution, of the international economic system. It recognises that the world has become a multipolar system, with a number of large economies possessing significant influence on the world economy. But we share universal economic values, such as free trade and investment, and are keenly interested in working with the other major countries in building a 'harmonious world' (Hu 2007). While some existing rules are in urgent need of reform, we want to improve the existing international economic system, not abandon it.

Second, China sees the G20 as the best compromise between representativeness and efficiency for dealing with international economic issues and is interested in making it a permanent institution. The Sino–US partnership will probably be a cornerstone of China's international economic relations. But China is not ready to formalise the institutional arrangement of a Group of Two (G2) for global economic affairs. China promotes collaboration between the BRICS countries but regards it more as a platform for formulating policy positions among key emerging market economies, not as a parallel organisation alongside the G20.

Third, China is in favour of any restructuring initiatives that give more influence to emerging market economies within international organisations such as the IMF and the World Bank. While these organisations have made important contributions to China's economic reforms, their governance and rules should be reformed to better reflect the new reality of the world economy. International Monetary Fund reforms, for instance, should allocate more voting shares to the developing countries, give up the practice of appointing Europeans to its managing directorship, abandon the US veto power and set policies more appropriate for emerging market economies.

Fourth, China supports reforms of the international monetary system but sees avoiding the sudden collapse of the US dollar as critical. The transition of the global reserve system is likely to be a long-term process. China, the United States and the other major economies of the world should work together to ensure a smooth transition of the role of the dollar, which is critical for providing a stable global economic environment. China also wishes to internationalise the renminbi (RMB), which could eventually become part of a multi-reserve system.

Finally, as a responsible large country, China will also need to introduce reforms to its own economic system and take proactive action to support and sustain an open, fair and efficient international economic system. It can take leadership roles in some global economic areas such as economic rebalancing, the Doha Round and climate change. The setting of domestic policies should take into account the reaction functions of the other countries. China should move further towards a market economy by, for instance, introducing market-based interest and exchange rates and reducing the influence of the state on economic activities.

Changing the international economic order: revolution or reform?

'Keeping a low profile' in international affairs has been a key strategy set by Chinese leader Deng Xiaoping. Over the years, however, different interpretations of this strategy have emerged. Some have regarded it as a historical shift of foreign policy from confrontation to cooperation in international affairs, parallel with the transition in domestic policy from class struggle to economic construction in 1978. Others, however, have interpreted it as a way of buying time for economic development.

In October 2007, Chinese President, Hu Jintao, called for 'people of all countries [to] join hands and strive to build a harmonious world of lasting peace and common prosperity' (Hu 2007). This suggests clearly that cooperation is a long-term policy strategy for China. In December 2010, State Councillor Dai Bingguo published an article to articulate in more detail China's long-term policy positions in international affairs (Dai 2010). Specifically, he rejected the speculation that China might want to seek hegemony once it becomes industrialised. In other words, China wants to work within the existing framework. This principle should be applicable to areas of both foreign policy and economic cooperation.

The trouble, however, is that, as many international experts have observed, so far China has not articulated its official position on what it expects or wants from reforms of the international economic system. Perhaps a major exception was the proposal by Zhou Xiaochuan, Governor of the People's Bank of China (PBC), to transform the IMF's special drawing rights (SDR) in early 2009 (Zhou 2009). Even this proposal, however, has been regarded more as an academic exploration than a concrete policy recommendation.

The lack of Chinese vision for the future international economic system creates uncertainties for the reform process. A couple of factors might explain the lack of a Chinese version of the blueprint. The policy strategy that the Chinese policymakers adopted during their own economic reform was the so-called 'crossing the river by touching the stones'.

Given the spectacular failure of the central planning system in the pre-reform period, these policymakers presumably no longer have much faith in a 'blueprint'. After all, economic systems are not mechanical or biological bodies. Reformers have to frequently adjust their policy strategies, responding to new economic environments. The Chinese Government did not have a blueprint when it started economic reforms in the late 1970s and, given the subsequent success of these reforms, perhaps opting for no blueprint seems the optimal policy strategy.

More importantly, as China is a new power in the global economy, the question of reforming the international economic system is a new subject for Chinese scholars and officials. Recently, there have been some debates inside China regarding the future direction of the international economic system. Some have argued that maintenance of the status quo is in China's best interest, while (a minority of) others believe that it is time for China to change the rules for the world. Given the difference of opinions within China, it will likely take time for the Chinese leaders to assess the situation and formulate official positions.

One worrying development—alongside China's rapid ascendancy as a global economic power—is the growing nationalistic sentiment that has emerged in line with China's sound macroeconomic performance during the sub-prime crisis. Some scholars began to suggest that China should say no to the United States. This recommendation itself might not appear to be a major problem. But the underlying thinking is that China has been frequently bullied by US hegemony in the past half-century, and now it is payback time. This line of thinking is worrying since it advocates confrontation in international economic relations.

Dai's (2010) timely policy paper clearly rejects the argument that China should now challenge the existing world powers. In fact, most Chinese policymakers acknowledge that China is the main beneficiary of the existing international economic system. Without the open and favourable external environment, China would not have been able to achieve rapid economic growth for the past 30 years. Policy advice from the IMF and the World Bank, even if not always fully adopted, also helped China to avoid some major policy mistakes (Yi 2011). The continuation of some of the key features of this system, including free trade and the free flow of capital, is in the best interests of both China and the rest of the world.

It is not surprising that there are some tensions between China and the existing powers of the international economy. The first type of tension relates to potential conflict between existing and rising powers. As China is likely to overtake the United States to become the largest economy in the world in the coming decade or two, suspicions of the other party's intentions are common on both sides. In particular, transitions of world leadership from one nation-state to another in the past were often resolved through wars. Although such suspicions have not led to actual conflicts between China and the United States, they could cause difficulties for cooperation in the international economic system.

The second type of tension is ideological in nature. Unfortunately, many in the West still view China as a typical communist country. Such perceptions deepened in the wake of the global financial crisis as the state and state-owned enterprises (SOEs) gained more power over economic activities in responding to the crisis. As a result, many foreign and domestic experts are confused about the future direction of Chinese economic reform—in particular,

whether China will move towards deepening market-oriented reform or reverse back to state control of the economy. These changes could also reduce trust between China and the rest of the world.

The third type of tension is typical between advanced market economies and emerging market economies with regard to the ideal economic system. Most advanced market economies believe in a free-market system with limited state intervention in economic activities, although clearly to a lesser extent in much of Europe than in the United States. During the past decades, most emerging market economies have adopted market-oriented reforms and consequently achieved remarkable economic growth. Many of them, however, remain cautious about completely liberalised markets, including the full liberalisation of their capital accounts, especially with regard to short-term capital flows.

These potential tensions require careful management through different arrangements at the bilateral, regional and international levels. Many of them can be eased through enhanced mutual understanding and deepened cooperation. In a globalised economy, the rise of China does not have to come at the cost of the United States or other major economies in the world; as evidenced in the past 30 years, this is not a zero-sum game. Together with the United States, China has a strong interest in supporting the thrust of the existing system and any positive suggestions for reforming the existing system initiated by China or other emerging market economies are likely to be in the interest of the United States as well.

Moreover, the differences between China and the existing major economic powers might diminish over time as China continues its reform and becomes more globalised and the world's ruling institutions themselves become a multipolar system. The IMF's recent decision to permit temporary use of capital-control measures is one such example.

China demands changes to the international economic system because it no longer reflects the reality of the world economy. It is also because it is no longer the most credible or efficient arrangement, given, for instance, the weakening position of the US dollar. And, finally, it is because the current system is not fair in some areas, such as the dominance of the United States and some European countries in international economic organisations. Reforms are urgently needed to give a stronger voice to the emerging market economies as a whole in international economic decisions. International economic rules should also better reflect new economic and market conditions, such as the complex array of financial products in global financial markets. The world also needs a new international reserve system that can support continued stable growth of the global economy.

The ultimate goal of the Chinese demands for reform is to make the new international economic system more representative, fairer, more efficient and more sustainable. China has no intention of completely rebuilding the system. It is not interested in developing a competing system alongside the existing one. The world economy has become more of a multipolar system and developing countries, including China, should have more influence on important international economic decisions.

International economic governance: G2, G7 or G20?

The main international architecture built in the postwar period centres on the UN system. Representing more than 200 country members, it is also the most democratic international organisation. The Bretton Woods system has two major economic institutions governing international economic affairs: the IMF, charged with the tasks of macroeconomic surveillance and financial stability; and the World Bank, devoted to poverty alleviation and economic development in developing countries. Alongside these there is the WTO, which helps maintain law and order in international trade in goods and services.

All these institutions have played important roles in facilitating world economic development in the postwar period. But they also have some important deficiencies. Since they operate mainly on consensus, it is often difficult to make decisions quickly. For instance, the five permanent members of the UN Security Council—the United States, the United Kingdom, France, Russia and China—all have veto power and often disagree with each other on some important decisions. This was especially so during the Cold War.

The Group of Seven (G7) was a response by the United States and its main allies to this undesirable situation. The United States, the United Kingdom, Germany, France, Japan, Italy and Canada formed a new group outside the UN/Bretton Woods system to decide on important global economic and political issues. These countries shared some common interests. They were all industrialised economies and democratic countries, and they were all strong political supporters of US leadership in global affairs.

Clearly, the G7 had a legitimacy problem, as it was not formed through multilateral arrangements (the G7 was later expanded to the G8 by including Russia after the fall of the Berlin Wall). That is why the group is often called the 'rich countries' club'. But for quite a long time, this representativeness did not cause any practical issues for the G7. After all, with more than half of the world's GDP, the G7 could make important decisions unilaterally. And these decisions in turn had a significant influence on the directions of the world economy, which are not necessarily consistent with the interests of other countries. The importance of the other economies, whether or not they also adopted the decisions of the G7, was marginal.

The well-known Plaza Accord was a good example of such a unilateral agreement. On 22 September 1985, the Governments of France, West Germany, Japan, the United States and the United Kingdom signed an accord at the Plaza Hotel in New York City to address the global imbalance problem. The accord required the major current account surplus countries, Japan and West Germany, to appreciate their currencies and to expand their fiscal spending, while the main deficit countries, the United States and the United Kingdom, depreciated their currencies and reduced their fiscal deficits. This agreement worked, at least temporarily, in reducing the imbalances.

Whether or not the Plaza Accord was a good arrangement was, however, a different issue. In retrospect, the accord focused on short-run currency and fiscal policies, but did not help root out the imbalance problems. Imbalance problems of all these major economies surged again in the following decades, contributing to the global imbalance problem the world faces today.

With the rapid growth of emerging market economies, especially China, during the past decades, neither the G7 nor the G8 is any longer an appropriate mechanism for international policy making. Another Plaza Accord by the G7 today, for instance, would be even less effective in addressing the global imbalance problem.

The World Bank estimates that, on a purchasing power parity (PPP) basis, China's GDP per capita was $6828 (international dollars) in 2009, instead of the US$3744 recorded in official statistics. According to the Penn World Tables (PWT) project, however, the PPP income data of the World Bank still underestimated Chinese income by about 20 per cent due to overestimation of price levels. Adjusting for this, China will overtake the United States to become the world's largest economy in 2013 (Feenstra et al. 2011).

The rise of the Chinese economy has fundamentally changed the structure of the world economy. The industrialised countries dominated the global economy in the past, but this is no longer the case. This was behind recent calls for the United States and China to form a Group of Two (G2) to manage world affairs (Bergsten et al. 2008; Zoellick and Lin 2009). The G2 is an innovative idea responding to the changing world economy. The joint leadership of the United States and China, representing the industrial and emerging market economies, respectively, certainly sounds more suitable for the new world economic reality.

Responses by the Chinese leadership to this proposal, however, have been quite negative, probably for several reasons. First, while it is already the second-largest economy in the world—thanks primarily to its large population—China is still a lower middle-income country. Its GDP per capita is still ranked ninety-fifth among the 180 countries covered by the IMF, and as such it is still a long way from the world economic frontier. China has by no means become a world economic leader. In other words, real economic conditions do not support China sitting at the head table of the world economy alongside the United States.

Second, China does not command the necessary support globally to become a part of a G2. For decades, China regarded itself as a member of the developing world. During the past decade or so, however, the interests of China and those of other developing countries have diverged significantly. While China shares some common interests with other emerging market economies—evidenced by cooperation at the BRICS and the Association of South-East Asian Nations Plus Three (ASEAN+3)—China does not enjoy a clear leadership role among the developing countries as the United States does among the industrialised economies. To a certain extent, sitting at the head table with the United States might actually weaken China's alliance with other emerging market economies.

Third, China is itself at the centre of confronting many global issues such as climate change and global imbalances. A G2 mechanism would probably make China the focus of these global tensions. A multilateral framework would be much more favourable for China—both for the purpose of negotiation and for eventual resolution of these problems.

Finally, China is not yet ready to be a key rule maker for the world economy. It is still learning about the existing rules. Some policy makers complain that China does not have a sufficient stock of talented people who can participate in international economic negotiations. Political constraints make Chinese participation in international rule making

even more difficult. For instance, Chinese negotiators often do not have enough autonomy in closing deals with other partners at international forums. In short, China does not yet have the institutional capacity to become a key rule maker together with the United States.

These points, of course, do not mean that bilateral cooperation between China and the United States is unimportant. On the contrary, dialogue and cooperation between the world's largest industrial economy and the world's largest developing country are vital for management of important international economic issues. The Sino–US partnership is probably the most important bilateral relationship for not only China but also the world as a whole. The regular Strategic and Economic Dialogue is a good example of such a partnership in addressing bilateral issues.

For the reasons pointed out above, the Chinese Government favours the G20 mechanism for international economic governance. The G20 was originally established as a ministerial forum in 1999 in Germany, right after the East Asian financial crisis. At the height of the global financial crisis in late 2008, then US President, George W. Bush, called for a G20 summit in Washington, DC, to discuss collective actions against the crisis and recession. This started the biannual summit practice, which is already a powerful economic decision-making body. The G20 has made important progress in controlling financial risks, supporting economic recovery and reforming financial regulatory systems.

Like the G7, the G20 also has a legitimacy issue, as these 20 countries were not elected by other countries. But as former Australian Prime Minister Kevin Rudd once put it, the G20 is the best compromise between efficiency and representativeness. The G20 includes 11 developing-country members. Meanwhile, G20 countries account for more than 80 per cent of the world economy and population. They could make important decisions that are significant enough in influencing trends in the world economy.

Alongside the G20 process, the BRIC countries have also become an important group in international affairs. On 16 April 2009, leaders of Brazil, Russia, India and China held the first BRIC summit in Russia to discuss some international economic issues. Two years later, the leaders invited the President of South Africa to attend the BRICS summit in Sanya, China. The leaders agreed on a wide range of issues, including supporting reform of the global reserve currency system, advancing trade and investment liberalisation and promoting economic cooperation among themselves. It is still unclear if the BRICS will eventually evolve into a tightly structured international organisation like the G7 or the G20, but it could become an important caucus within the G20, helping to formulate policy positions for developing-country members.

IMF reforms: voting shares, senior executives and veto power

While the G20 summit has become a powerful mechanism for international economic decision making, it is not yet a normal international organisation. To become a permanent and stable economic institution, the G20 needs further development in at least two areas. One is management of the G20 summit's daily operations. And the other is the implementation and follow-up of G20 decisions. To achieve these, the G20 could set up a

permanent secretariat. It could also utilise existing international institutions, such as the IMF, to implement its important policy decisions, such as financial regulation, monetary policy and macroeconomic surveillance.

But international organisations in their current forms are not well suited for carrying out such tasks. Taking the IMF as an example, its relations with many countries, especially those once hit by financial crises, are not smooth. During the East Asian financial crisis, the IMF provided financial assistance to those crisis-affected countries—mainly Indonesia, Korea and Thailand. But such assistance came with strict policy conditionality, which required these economies to tighten fiscal policies, raise interest rates and close weak financial institutions. Such measures probably pushed these economies deeper into recession.

These policies also cost the IMF precious confidence and trust among some policy makers in Asia. Some Asian leaders have since become uninterested in the international role of the IMF. When discussing regional monetary and financial cooperation issues in Asia, some officials made it clear that they would support any initiatives as long as these had nothing to do with the IMF. Another example was during the global financial crisis: when Korea needed external liquidity support in late 2008, it went to the Federal Reserve, not the IMF. This development significantly undermined the IMF's role as the global lender of last resort.

These bad experiences with the IMF are reflected in part in the organisation's rigid implementation of conventional economic beliefs: it is critical to enforce market discipline even at times of financial crisis in order to avoid moral hazard problems. Not closing down the insolvent financial institutions, for instance, would encourage excessive risk taking in the future. Such actions, however, destabilise social and macroeconomic conditions during financial crises. Fortunately, the IMF's policy position has already started to change. At the height of the sub-prime crisis in the United States, the Treasury Department injected capital into a number of large financial institutions to avoid the rapid spread of systemic risks.

These international organisations have, however, a deeper problem: they are dominated by the United States and other industrialised economies. Policy prescriptions have therefore often been drawn from the experiences of advanced market economies. Some of these policies are clearly not appropriate for developing countries and have generated painful consequences. For instance, the IMF generally discourages any restrictions on cross-border capital flows. Most developing countries, however, are not strong enough to withstand volatile short-term capital flows given the quality of their financial regulations and institutions. This is one of the reasons developing countries have experienced frequent financial crises in recent decades.

The developing countries do not have much influence on the decisions reached by most international economic institutions. For example, each country's SDR quota with the IMF is a weighted average of GDP (50 per cent), openness (30 per cent), economic flexibility (15 per cent) and international reserves (5 per cent). This formula obviously favours industrialised countries. The United States accounts for 17 per cent of the total voting share, which allows the United States to influence the decision making of the IMF.

Over the years, with the rapid growth in emerging market economies, the distribution of SDR quotas has become even more unequal. Western Europe is significantly over-represented relative to its economic weight. Before the global financial crisis, the BRIC

countries combined accounted for 40 per cent of the world population and 15 per cent of global GDP, but their voting shares were only 12 per cent of the total. More importantly, of the 180 IMF members, at least two-thirds are developing countries and do not have any say in the IMF's decisions.

The good news is that the industrialised countries have already agreed to gradually reform the IMF system. The latest reform reallocated 6 percentage points of the voting shares from European countries to emerging market economies. After this reform, China has the third-largest voting share, after the United States and Japan. Brazil, China, India and Russia are all among the top-10 member countries of the IMF.

For many developing countries, however, IMF reforms are far from over. Despite the latest redistribution of SDR quotas, emerging market economies remain significantly under-represented. In particular, of the IMF's 24 executive directors, European countries still occupy four seats: the United Kingdom, Italy, Germany and France. Many Asian countries are demanding that these European countries give up at least two seats. The voting shares of the BRICS and other developing countries should also be further increased to give them greater influence on the organisation's decision-making processes.

Second, currently there are implicit rules that the World Bank appoints an American to be the president while the IMF nominates a European to be its managing director. Such practices are unfair and discriminatory. As international organisations, neither the World Bank nor the IMF should be allowed to appoint nationals only from specific countries to their highest positions. The selection process should focus more on the candidates themselves rather than their nationality.

And, finally, the United States is not willing to give up its veto power to make the IMF a true international organisation. This veto power indicates two presumptions. One, the IMF as an international organisation will continue to be dominated by the views of the United States. And, two, the United States has the best policy skills among members. The latest sub-prime crisis, however, revealed important deficiencies of the US financial system and its economic policy. Many developing countries have criticised the United States for its irresponsible policies, such as the quantitative easing (QE) monetary policy and its spill-overs to the world economy. While the United States will remain the most important member of the IMF for some time, it no longer makes sense to leave the final decision-making power entirely in its hands.

Alongside reforms of the IMF's governance structure, developing and industrialised-country members should start to work on the rules and policies. For instance, the IMF should monitor macroeconomic development and financial risks of all major economies without exception, including the United States. It should also look into the issue of expanding the SDR basket for possible inclusion of some emerging market economy currencies. It should review the conditionality terms, striking a balance between supporting economic stability and avoiding moral hazard problems.

The IMF potentially has an important role to play in the evolution of the international economic system, such as macroeconomic surveillance, financial regulation, global liquidity management and, possibly, certain functions of global central banking. All these, however, will be dependent on the successful transformation of the IMF itself, particularly its

representativeness, governance structure and policy approaches. Recognising the rising importance of the emerging market economies relative to the industrialised countries should be an important part of that transformation.

Global reserve system: US dollar, SDR or renminbi?

The US dollar has been a cornerstone of the international economic system in the postwar period. The Bretton Woods system established in 1944 contained two important pegs: the US dollar was pegged to gold and most other currencies were pegged to the dollar. The Bretton Woods system broke down in 1971 when US President Richard Nixon de-pegged the dollar from gold as dollar supply outpaced the growth of gold. After that, most countries gradually shifted to flexible exchange rate regimes. But the US dollar remained the most important global reserve currency.

The international community's confidence in the dollar started to deteriorate from the late 1990s when the US twin deficits started to grow rapidly. During the early years of the twenty-first century, America's current account deficits continued to widen and its debt accumulated rapidly. Many experts argued that this was a result of the US Federal Reserve's loose monetary policy, especially low interest rates, which encouraged excessive consumption and investment (Eichengreen 2009). Some also attributed the problem to the so-called Triffen Dilemma: the growing need for the global reserve currency, the US dollar, required the United States to run increasingly large current account deficits, which eventually hurt investors' confidence in the dollar (Yu 2009).

This was the reason many experts continuously called for diversification of foreign reserves held by many governments and central banks around the world, especially in Asia. According to IMF data, the average proportion of the dollar assets in total foreign exchange reserves dropped by almost 10 percentage points during the 10 years before the sub-prime crisis. Some experts worried about a dollar crisis, as a result of competitive selling of dollar assets around the world. But the dollar crisis has not occurred. In fact, in the wake of the sub-prime crisis, the dollar appreciated as investors still regarded the United States as a safe haven at uncertain times.

Questions about the dollar's future role are, however, not likely to go away quickly. Zhou Xiaochuan's proposal of transforming the IMF's SDR into a supranational reserve currency was a response to the concerns about the current global reserve system (Zhou 2009). Zhou recommended several detailed steps for reform of SDR, including expanding the SDR basket, establishing official exchange rates between SDR and other major international currencies, using SDR in some international economic transactions, and issuing assets denominated in SDR. Later, the UN Commission of Experts on Financial and Monetary Reforms, chaired by Joseph Stiglitz, also presented a similar proposal to create a supranational reserve currency (UN Commission 2009).

The creation of a supranational currency is an intelligent idea to bypass the inherent conflict between global function and national policy of a global reserve currency. The idea can be traced back to Keynes (Zhou 2009). Special drawing rights, in particular, are a key subject in discussion of reform of the international monetary system at the G20 meetings.

The role of SDR could at least be expanded in areas of reserve investment and liquidity management. But as the first step, the basket—which currently includes the US dollar, the euro, the British pound and the Japanese yen—needs to be expanded to include some prominent emerging market economy currencies. The next adjustment, however, will not take place until 2015, with the last adjustment completed in 2010.

Yi Gang, the Deputy Governor of the PBC and Administrator of the State Administration and Foreign Exchange (SAFE), recently made a proposal for expanding SDR by first creating shadow SDR (Yi 2011). The IMF has two criteria for a currency to be included in SDR: the share of a country in global trade and the share of a country's currency in international financial transactions. According to these, China proposed that the IMF creates shadow SDR in 2011 by including additional currencies from the BRICS countries. It can then calculate the shadow SDR index or exchange rates and continuously adjust the weights in the following years. In 2015, the IMF could officially expand the SDR basket by including these emerging market currencies.

The creation of a supranational currency, even if it succeeds in the end, is likely to be a very long-term process. It would require individual countries to surrender their monetary sovereignty and to form a global central bank. These are difficult, if not impossible, requirements for the foreseeable future.

What is most likely to happen now is a multi-reserve currency system. On the one hand, the US dollar can no longer dominate the global financial system like it did during the past half-century. On the other hand, there is no readily available alternative to replace the dollar. Therefore, the US dollar might remain as one of the most important reserve currencies in the world, although its importance might decline over time. At the same time, some other currencies, such as the euro, will play greater roles (Huang 2010).

In a way, this has already been happening. During the past 10 years, the share of euro assets in global foreign exchange reserves increased steadily, alongside the decline of the share of dollar assets. One important question is whether the multi-reserve system has room for emerging market currencies to play roles. Currently, the reserve currencies are all from industrialised countries. But as the significance of emerging market economies increases, shouldn't these economies, particularly the BRICS countries, also play a part in the global reserve system?

The international role of the Chinese currency is a subject heatedly debated both in China and abroad. At the G20 workshop on the international monetary system in Nanjing in April 2011, for instance, most officials from the G20 countries agreed that the RMB should be included in the SDR basket. The sticky issue, however, is whether this inclusion should be conditional on capital account convertibility and exchange rate flexibility.

The internationalisation of the RMB was renewed during the global financial crisis. This was at least in part a response to the perceived dimming outlook for the dollar. From mid-2008, the PBC significantly narrowed the band of the RMB exchange rate but at the same time accelerated the pace of internationalisation of the currency.

Systemic reform of the RMB policy started from the beginning of 1994 when the PBC unified the market and official exchange rates and adopted the managed float regime. The RMB appreciated gradually in the following years, until the East Asian financial crisis. Following disruptions during the Asian financial crisis and the US sub-prime crisis, the RMB resumed a managed-float regime from 19 June 2010. But in general, the exchange rate remains very rigid and the currency is probably still undervalued—evidenced by large current account surpluses and rapidly accumulating foreign reserves.

In December 1996, the PBC announced to the IMF the realisation of current account convertibility. While the realisation of full capital account convertibility has been repeatedly delayed due to various external financial crises, steps towards capital account liberalisation have continued, including the adoption of the qualified foreign institutional investors (QFII) and the qualified domestic institutional investors (QDII) schemes for portfolio investment, the use of RMB for settlement of international economic transactions with neighbouring countries, and the establishment of an offshore RMB market in Hong Kong. In fact, some central banks, such as those in Thailand and Russia, have already started to hold RMB in their foreign exchange reserves.

But the RMB is still a long way from being internationalised. The PBC still intervenes heavily in foreign exchange markets and important controls remain on cross-border capital flows, especially outward direct investment, debt financing and portfolio investment. And, most importantly, it is up to the international market, not the Chinese authorities, whether or not the RMB will eventually become an international currency.

China clearly sees the need to reform the international monetary system. It is also interested in promoting internationalisation of the RMB. It is, however, in the best interest of China and the rest of the world to ensure a smooth transition of the global reserve system. In particular, China, the United States and other major economies should work together to support a stable US dollar. After all, the dollar is still the most important currency for China's external economic transactions and accounts for about 60 per cent of its more than $3 trillion foreign reserves.

China's demands, roles and responsibilities

We conclude this chapter by answering three questions relating to China's position on reform of the international economic system: what does China want? What can China offer? And what are China's own responsibilities?

What does China want?

China wants the transformation of the international economic system to reflect the new reality of the world economy, especially the increasing importance of emerging market economies. At the same time, China also wishes to preserve the positive features of the current system that have contributed to global economic prosperity during the past decades, especially the promotion of free trade, free flows of capital and globalisation. China has been the main beneficiary of the current international system and is keen to help improve it. China is not interested in building a completely new system alongside the existing one.

But the new international economic system should give more influence to emerging market economies and should pay more attention to the conditions of developing countries when making economic rules.

China supports the G20 process, which probably represents the best compromise between efficiency and representativeness. The G7 or G8—the so-called rich countries' club—is an institution of the past. China values the partnership with the United States but does not seek to institutionalise a G2 framework for international economic affairs.

International organisations should take on more global responsibilities, such as macroeconomic surveillance, financial regulation and global liquidity management. But before that they will also need to introduce reforms in order to become more representative, more efficient, more effective and fairer. The governance structure of international organisations should be changed to better reflect the growing importance of the emerging market economies. And the making of international economic rules should also pay more attention to the actual conditions of the developing countries.

The global reserve system is in urgent need of reform. Chinese officials recently proposed a shadow basket of SDR to include some currencies of the BRICS countries before the next official SDR adjustment in 2015. In the perceivable future, however, a multi-reserve system is more likely. China is interested in seeing the RMB play a part in the future, alongside the euro and some other currencies. For the time being, however, it is in the best interest of China, the United States and the rest of the world to ensure a stable dollar.

What can China offer?

As the largest and most dynamic emerging market economy, China can also contribute to the smooth reform of the international economic system. This is consistent with China's goal of working with other countries to build a harmonious world. As China has demonstrated in the past, in negotiations on the sticky issues of climate change and global rebalancing, it prefers to resolve problems through cooperation, not confrontation.

The Sino–US partnership is a necessary but not sufficient condition for international economic cooperation in many areas. The regular Strategic and Economic Dialogue between the two countries is an important platform for the two sides to exchange views on key bilateral and multilateral issues. China can also work with the other BRICS members to form emerging market policy positions and jointly push these proposals in global platforms such as the G20 and the IMF.

China can help support a stable dollar in foreign exchange markets, such as through smooth management of its large foreign exchange reserves. But this requires cooperation by the United States in the proper management of its fiscal and monetary policies. China can also assist the rebalancing process by proactively reducing its own current account surplus. It is probably also in China's own interest to contain trade protectionism around the world and to help conclude the Doha Round of trade negotiations.

What are China's own responsibilities?

First, as the world's second-largest economy, China needs to abandon its small-country mentality. Economic decisions made by any large countries should take into account the possible reactions of other countries. Exchange rate policy serves as a good example. Currency distortions in a small country do not have any impact on the rest of the world, but those in a large country such as China can cause significant changes in global trade and production structures.

Second, nationalistic sentiment is very harmful for China's further opening up to the outside world. In particular, conspiracy theories have been popular in discussions of external economic relations, especially those with the United States. If we cannot effectively minimise the influence of Cold War mentalities on international economic policy decisions, we will not be able to become a credible partner for other countries in reforming the international economic system.

Third, China should further promote liberalisation of its own economy and move closer to a market economy, including reforms of its exchange rate regime, capital account controls and distortions in other factor markets. At the same time, China should also promote private sector development and contain the influence of the state sector, especially in international economic areas. This is critical for supporting an open and efficient international economic system.

And, finally, it is probably also time for China to learn to work with the United States and other G20 members to provide public-goods services for the world economy. In line with China and the other emerging economies asking for more rights, they should also share more of the responsibility for maintaining a stable global economic environment, enforcing the international economic rules and assisting countries temporarily struck by unfavourable shocks.

Bibliography

Bergsten, C. F., Freeman, C., Lardy, N. and Mitchell, D. J. 2008, *China's Rise: Challenges and opportunities*, Peterson Institute of International Economics, Washington, DC.

Dai, B. 2010, 'Stick to the path of peaceful development', *China Daily*, 13 December, <http://www.china.org.cn/opinion/2010-12/13/content_21529346.htm>

Eichengreen, B. 2009, 'The dollar dilemma: the world's top currency faces competition', *Foreign Affairs*.

Feenstra, R., Ma, H., Neary, P. and Prasada Rao, N. S. 2011, How big is China? And other puzzles in the measurement of real GDP, Yanfu Lecture, 22 April 2011, National School of Development, Peking University, Beijing.

Garnaut, R. and Huang, Y. 2001, 'China's integration into the world economy', in R. Garnaut and Y. Huang (eds), *Growth Without Miracles: Readings on the Chinese economy in the era of reform*, Oxford University Press, UK, pp. 436–58.

Huang, Y. 2010, 'Renminbi policy and the global reserve system', in J. D. Sachs, M. Kawai, J. W. Lee and W. T. Woo (eds), *The Future Global Reserve System—An Asian perspective*, Asian Development Bank, Manila.

Hu, J. 2007, Work report of the 16th Central Committee of the CCP, Delivered at the 17th CCP Congress, October 2007, Beijing.

UN Commission 2009, Report of the Commission of Experts of the President of the United Nations General Assembly on reforms of the international monetary and financial system, United Nations Conference on the World Financial and Economic Crisis and its Impact on Development, 24–26 June 2009, New York, <http://www.un.org/ga/president/63/interactive/financialcrisis/PreliminaryReport210509.pdf>

Yi, G. 2011, Reform of the international monetary system, Lecture delivered at Peking University, 3 May 2011, Beijing.

Yu, Y. 2009, The road map of reform of the international monetary and financial system, Reference prepared for the UN Commission of Experts on Reforms of the International Monetary and Financial Systems, New York.

Zhou, X. 2009, *Thinking on the Reform of International Currency System*, People's Bank of China, Beijing, <www.pbc.gov.cn/publish/english/963/index.html>

Zoellick, R. B. and Lin, J. Y. 2009, 'Recovery rides on the "G-2"', *Washington Post*, 6 March 2009.

4 Why Does China Attempt to Internationalise the Renminbi?

Yin-Wong Cheung, Guonan Ma and
Robert N. McCauley[1]

Introduction

The global financial crisis shone a spotlight on the US dollar as a pivot in international finance as it gave rise to a dollar shortage in 2008 more acute than that of the 1950s (McCauley and McGuire 2009; McGuire and von Peter 2009). The US authorities relieved the dollar shortage by entering into dollar swaps with central banks on an unprecedentedly broad scale and, with major central banks, in unlimited amounts (CGFS 2010). Before long, market concerns switched to possible excess dollar liquidity as the US Federal Reserve carried out repeated programs of large-scale bond purchases (the second dubbed the 'QE2' [quantitative easing 2] policy).

The temporary dollar shortage and the subsequent worries over a dollar glut served to highlight the dependence of the international financial system on a currency subject to national management. In particular, the crisis put at risk international trade between countries outside the United States as banks in either country had difficulty rolling over dollar liabilities in the interbank market in order to finance their trade. More recently, economies outside the United States have tried to build dams to divert dollar inflows away (see IMF 2011; McCauley 2010). To a system engineer, it might appear to be a negligent design that left such a 'single point of failure' in the international financial system.

Policy-driven internationalisation of the RMB

Against this backdrop, a number of recent policy initiatives suggest that the Chinese authorities have adopted a proactive strategy to promote the international use of the renminbi (RMB). By currency internationalisation, we mean the use of a currency by non-residents to invoice trade, to make payments and to denominate assets and liabilities. The archetypal transaction in an internationalised currency is a non-resident selling a bond denominated in the currency to another non-resident in a market located outside the country ('offshore market'). The change in the Chinese approach is evident in the contrast, for instance, between Dobson and Masson (published in 2009 but written in early 2008) and Gao and Yu (2011) (also see Chen and Cheung 2011; Cheung et al. 2011). In what follows, we first discuss the possible rationales for this strategy, contrasting the experiences of China and Japan, and then briefly sketch the policies undertaken so far.

Rationale and strategy

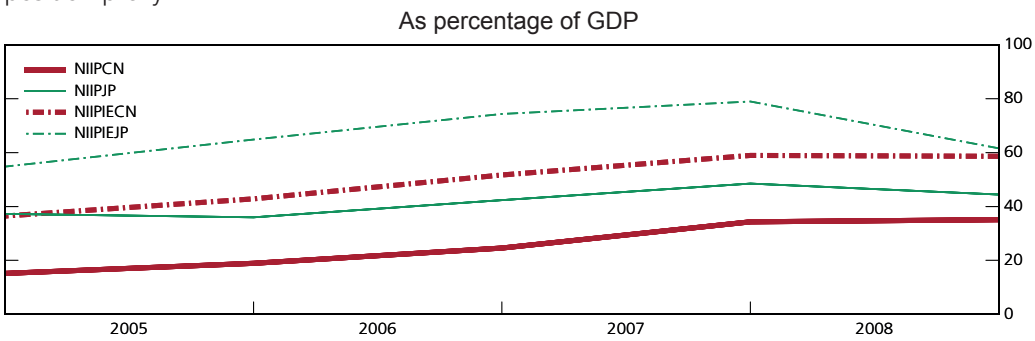
Why has policy turned to promote the international use of the RMB? Most commentary has interpreted this strategy as deriving from doubts about the US dollar as a store of value or as intending to build a sphere of financial influence in East Asia. There might be something to these interpretations. We emphasise instead, however, a strategy to share the specific risk imbedded in China's international balance sheet—namely, a large and rapidly increasing foreign exchange exposure. This exposure derives from the combination of China's openness to direct investment from the rest of the world, its current account surpluses, and the lack of internationalisation of the RMB.

Like many advanced economies, China has a short position in its own currency and a long position in other currencies (counting inward direct investment and inward portfolio equity as RMB liabilities). Such positions can arise from no more than a simple cross-border exchange of equities, with balanced current accounts all around. To illustrate, one can imagine two islands of equal size, population and fertility but distant enough from each other to enjoy different weather from year to year. They agree to exchange each year a share of each other's harvests (that is, they swap equities). As a result, each naturally has a long position in the other's harvest (currency). In fact, China has allowed the rest of the world to share more of its harvest than has Japan. In particular, non-residents have a stake in China's equities (direct investment and portfolio) equivalent to 24 per cent of China's gross domestic product (GDP) (Ma and Zhou 2009), while non-residents of Japan have a stake in Japan's equities of only 17 per cent of Japan's GDP.

China, like Japan, has a large second source of its net long position in foreign currency: persistently large current account surpluses. Since the early 2000s, these flows have cumulated into a stock known as the net international investment position: the difference between the nation's external assets and liabilities. Current account surpluses build up a net creditor position, while current account deficits build up a net debtor position. As can be seen in Figure 4.1, China's net international asset position is converging with that of Japan, at 40–50 per cent of GDP. While Japan's position built up over a generation, China's position has in just a decade swung from a net debtor of some 10 per cent of GDP to a net creditor of 37 per cent in 2009 (Ma and Zhou 2009).

For China, the rest of the world's equity position and the net international investment position simply sum to China's long position in foreign currency. This sum was approaching 60 per cent of China's GDP in 2009 (Figure 4.1). Most of this risk is concentrated in the government sector in the form of foreign exchange reserves financed by RMB liabilities (required reserves and central bank bills). If some of China's claims on the rest of the world were denominated in RMB, this would reduce its long foreign currency position from this level. But none of China's claims on the rest of the world is RMB denominated.

Figure 4.1 Net international investment positions and net long foreign exchange position proxy



Note: Net international investment positions (NIIPCN for China and NIIPJP for Japan) and net long foreign exchange position proxy (NIIPIECN for China and NIIPIEJP for Japan) as a percentage of GDP.

Sources: The People's Bank of China, various years; Bank of Japan, various years.

Japan shows how the international use of a creditor country's currency can allow the rest of the world to share in a creditor country's foreign currency risk. Even a modest internationalisation of the yen means that the rest of the world uses the yen to some extent to denominate both liabilities and assets, allowing the rest of the world to share Japan's aggregate foreign exchange exposure. In particular, Lane and Shambaugh (2010) estimate that Japan has net yen claims on the rest of the world to the extent of a modest 2 per cent of GDP. Taking this into account, China, in its short life as a substantial creditor nation, has already racked up as much aggregate foreign exchange exposure in relation to GDP as Japan (that is, by 2009 China's dotted line in Figure 4.1 would reach Japan's if Japan's net yen claims were subtracted).

How has Japan accumulated net claims denominated in yen on the rest of the world? On the asset side of Japan's international balance sheet, there are official reserves of about $1 trillion—by definition, all held in foreign currency. But in addition—and in contrast with China—Japanese insurance companies, pension funds and mutual funds hold a stock of securities twice the size of the official reserves. The Bank of Japan reports that of these almost one-third—amounting to 11.6 per cent of GDP—was yen denominated.

In sum, even though China's net international assets as a share of GDP remain smaller than those of Japan, its aggregate long position in foreign exchange is already as large as that of Japan, if not larger. This owes both to the greater share of GDP in foreign holdings of equities in China resulting from large foreign direct investment (FDI) inflows for the past two decades and to a lack of internationalisation of the RMB hitherto. Given the combination of openness to FDI and capital controls that has kept the rest of the world from borrowing RMB, China has an acutely skewed international balance sheet: long foreign currency, not least the dollar, and short domestic currency.

The medium-term strategy of denominating some of China's external claims in the RMB would go in the direction of normalising this skewed position. We call this strategy of denominating China's claims on the rest of the world in RMB one of 'renminbising' China's international assets. Let us be clear: the renminbisation of China's international assets is a particular aspect of the broader process of RMB internationalisation. As noted above,

internationalisation happens when non-residents use the RMB, whether to lend or to borrow. The renminbisation of China's foreign claims requires that *non-residents borrow in RMB from residents*. We stress that the resulting sharing of the foreign exchange risk currently imbedded in China's international balance sheet provides a key motive for the broader process of internationalising the RMB.

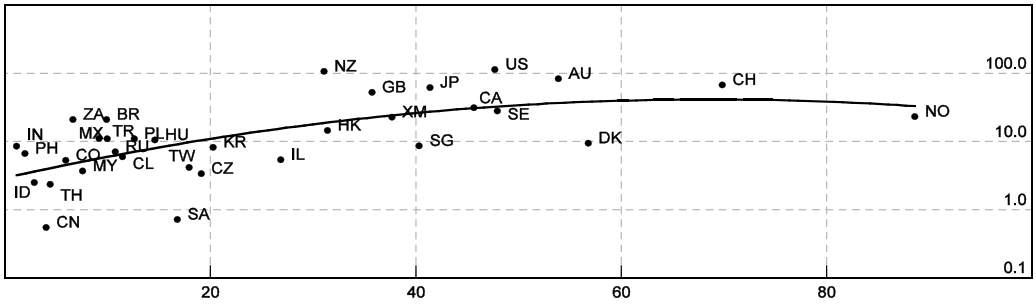
Conceivably, over the medium term, something like one-third of China's non-reserve holdings of securities might come to be denominated in RMB, or an even higher proportion if China's efforts meet with greater success than Japan's. In this scenario, China's sovereign wealth fund, pension funds and insurance companies could to a significant extent diversify away from Chinese *credit risk*, by buying RMB securities issued by non-Chinese firms, banks and sovereigns, without taking on *foreign currency risk*.

In addition to the private holding of bonds issued by non-residents in domestic currency, China could lessen its aggregate exchange rate risk by denominating more of its official external claims in RMB. For instance, the Japan Bank for International Cooperation, an official international development agency, lends yen to foreign governments and firms. Its loans in yen reached $119 billion in 2008, compared with its foreign currency loans of $41 billion. The yen loans amount to close to 3 per cent of Japan's GDP about the mid-2000s. As China expands its aid operations in Asia, Africa and Latin America, it will have considerable scope to denominate its official international claims in RMB.

While denominating and settling trade in domestic currency might encourage greater international use of the RMB over the medium term, it is unlikely to directly spread the foreign exchange risk of China to the rest of the world in any significant way. Taking again Japan as an example, Takagi (2011) reports that in 2002, 36.7 per cent of Japanese exports were yen denominated, compared with 25.5 per cent on the import side. For China to accumulate substantial net trade claims on the rest of the world, an even larger asymmetry between exports and imports would be required and this is not likely.[2] That said, the invoicing of trade in RMB could play a supporting role by encouraging the rest of the world to issue bonds and take on official debt denominated in RMB, thereby working to encourage the global sharing of the foreign exchange risk in China's international balance sheet.

Eventually, the internationalisation of the RMB—its use to denominate bonds, official credits and trade—could result in the RMB gaining heft as a currency in the foreign exchange market. There is ample room for the RMB to advance in this regard as it is used more for financial transactions and internationally. In April 2010, global central banks reported global daily trading in RMB of $34 billion, with most of that occurring outside China and in non-deliverable form.[3] Even if turnover in China is underreported, limited use for financial transactions and by non-residents kept global RMB trading about level with the current account transactions of China—a very low ratio for a country of China's income per capita (Figure 4.2). In contrast, the Indian rupee turned over at a rate about 10 times the current account transactions of India—implying much higher financial transactions in the Indian case. Given India's income per capita, the rupee punches well above India's weight (McCauley 2011; McCauley and Scatigna 2011). Indeed, highly internationalised currencies such as the dollar, euro and yen turn over something like 100 times their respective current transactions. In other words, the internationalisation of the RMB has a long way to go.

Figure 4.2 Ratio of foreign exchange turnover to trade in relation to GDP per capita, April 2010



Notes: Horizontal axis = GDP per capita, in thousands of US dollars; vertical axis = ratio of foreign exchange turnover to trade, semi-logarithmic scale. Foreign exchange turnover includes not only over-the-counter but also exchange-traded turnover, which is most significant for the Brazilian real, the Indian rupee and the Korean won.

Sources: IMF, various years; FOW TRADEdata; Futures Industry Association, various years; BIS Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, various years; authors' estimates.

The medium-term strategy of replacing dollar claims on the rest of the world with RMB claims would also have implications for the euro's exchange rate. An alternative strategy to re-denominating China's external claims would be to diversify holdings away from the dollar and into other major currencies such as the euro and the yen. If China sold dollar-denominated bonds and bought euro-denominated bonds then the euro would come under upward pressure against the dollar (Blanchard et al. 2005).[4] China's shifting of its claims from the dollar to the RMB would not exert such pressure on the dollar/euro rate.

The two distinct strategies of renminbising foreign assets and diversification to the benefit of the euro can be pursued simultaneously and can also be combined. Thus, the People's Bank of China (PBC) has undertaken to purchase notes from the International Monetary Fund (IMF) denominated in special drawing rights (SDR) in an amount up to SDR32 billion over the three years to 25 August 2012; and the Chinese authorities have also urged consideration of including the RMB in the SDR basket. Were China ultimately to provide dollars to the IMF in exchange for such bonds, it would be diversifying from the dollar into the euro, and to a lesser extent the yen and sterling, since these currencies along with the dollar form the SDR basket. This should be understood as more diversification across the major currencies rather than as a use of the RMB to re-denominate China's claims on the rest of the world.[5]

If the strategy of internationalising the RMB were pursued to the point of making the currency's role in international finance commensurate with the weight of China as a trading nation, it would have implications for the IMF's SDR. The last five-year review of the SDR valuation, in December 2010 (IMF 2010b), set out two criteria for inclusion of a currency in the SDR. First is whether the scale of exports of goods and services places a currency among the top-four currency areas in the world (treating the euro area as just one of the top four). Second is whether the currency is freely usable, meaning that it is widely used and widely traded in the foreign exchange market.

These two criteria cut quite differently for the RMB. The first criterion places it in the SDR basket in the 2010 review—albeit with a weight that would reflect near-zero holdings of RMB in official reserves. Satisfying the second criterion could, however, be a much more distant prospect. In particular, while bilateral trading agreements could satisfy the 'widely used' aspect, the 'widely traded' aspect of the RMB has a long way to go (as shown above). With the Presidents of France and the United States having publicly considered inclusion of the RMB in the SDR, and a working group in the Group of 20 (G20) having taken up the question, it is not safe to make predictions regarding the conditions or the pace of such inclusion. For present purposes, what should be emphasised is that, once the RMB is included in the SDR basket, China's shifting claims on the rest of the world from dollars into SDR would combine the strategies of currency diversification across major currencies and of re-denominating external claims in RMB.

Policies to promote greater international use of the RMB

In an apparent departure from its previous hesitancy and go-slow stance, the Chinese Government has, since late 2008, proactively rolled out a number of measures aimed at increasing the international use of the RMB. First, the PBC has signed bilateral RMB currency swap agreements with eight central banks, totalling more than RMB800 billion (US$120 billion). Such agreements permit swaps between the RMB and the local currency of the counterparty for a maturity of up to three years, which is extendable (Table 4.1). Memories of the dollar liquidity shortage and contracting trade flows during the global financial turmoil might potentially give this policy initiative some traction, though the practical challenges remain formidable. The PBC reports that, so far, RMB30 billion of these RMB800 billion swap agreements have been activated (PBC 2011).

Table 4.1 Bilateral currency swap agreements with the People's Bank of China

Date of agreement	Counterparty	Size of swap lines
12 December 2008	Bank of Korea	RMB180 billion and KRW38 trillion
20 January 2009	Hong Kong Monetary Authority	RMB200 billion and HK$227 billion
8 February 2009	Bank Negara Malaysia	RMB80 billion and MYR40 billion
11 March 2009	National Bank of the Republic of Belarus	RMB 20 billion and BYR8000 billion
23 March 2009	Bank Indonesia	RMB100 billion and IDR175 trillion
2 April 2009	Central Bank of Argentina	RMB70 billion and ARS38 billion
9 June 2010	The Central Bank of Iceland	RMB3.5 billion and ISK66 billion
23 July 2010	Monetary Authority of Singapore	RMB150 billion and SG$30 billion

Note: All agreements have a maturity of three years and are renewable.

Source: PBC web site (<www.pbc.gov.cn>).

These swaps can be seen as backstopping the second initiative, denominating and settling trade in RMB. In April 2009, the Chinese State Council approved a pilot scheme for cross-border trade settlement in RMB, initially involving Shanghai and four other Chinese cities in Guangdong Province, on the one hand, and Hong Kong on the other. Since mid-2010, the pilot has expanded to cover 20 of the 30 Chinese provinces and to involve any overseas trading partner. By the end of 2010, Chinese exporters involved in the pilot scheme

increased to more than 40 000 firms from the initial hundreds. In dollar terms, the volume of RMB trade settlements has risen from 0.2 per cent of China's total trade flows in 2009 to some 3 per cent in 2010. Cui et al. (2009) estimate that as much as 30 per cent of China's US$2.5 trillion annual exports and imports could be settled in RMB if there was full capital account convertibility. As noted above, this experiment in cross-border trade settlement in RMB would result in both RMB-denominated foreign claims and RMB-denominated liabilities for China. So far, the Hong Kong Monetary Authority (HKMA) is known to have activated RMB10 billion of its RMB300 billion swap line with the PBC to facilitate the smooth operation of cross-border RMB trade settlement.

The recent Chinese imports settled in RMB have, in combination with the longer-standing provision for Hong Kong residents to switch deposits into RMB, led to a significant build-up of RMB funds in Hong Kong. Banks in Hong Kong first started offering RMB deposits in 2004, which were initially available only to Hong Kong residents who were able to leave standing orders to acquire up to RMB20 000 a day per account—a daily quota of RMB conversion that remains valid today. The RMB deposit base in Hong Kong is, however, increasingly fed by RMB paid to settle RMB-denominated Chinese imports. Thus, RMB deposits rose by a factor of four in 2010, as both more Hong Kong residents converted deposits and more exporters took payment in RMB, in part owing to strong expectations of RMB appreciation. As of the end of 2010, RMB deposits in Hong Kong stood at 5 per cent of Hong Kong's total deposits but still remained below 0.5 per cent of China's total domestic bank deposits.[6]

Third, with the explicit endorsement of Beijing, Hong Kong is shaping up as the hub for the offshore deliverable RMB market. Two-thirds of total RMB trade settlements involve Hong Kong. Hong Kong banks may now open accounts and provide services related to RMB for any local or overseas corporate client. Tellingly, the Chinese Government has now issued RMB-denominated bonds in Hong Kong, in addition to those issued by Chinese and foreign banks, international organisations and multinational corporations (Table 4.2). Although in many cases such 'Dim Sum bonds'—RMB-denominated bonds issued by residents or non-residents offshore in Hong Kong—would only increase China's RMB-denominated foreign liabilities (or equivalently increase China's long foreign currency position), the move might promote the role of the RMB in offshore financial transactions generally. The RMB is traded freely in Hong Kong's spot and forward markets, with a daily trading volume between US$300 million and US$1 billion in recent months. In a nutshell, the RMB, once in Hong Kong, is almost fully convertible and can behave quite differently from its onshore cousin in terms of yields and pricing.

Fourth, in parallel with the growth of the offshore RMB market, incremental internationalisation of the RMB bond market *inside China* can bring the benefits of greater diversity of issuers and investors to a large but not very liquid market. Recall that in 2005, the International Financial Corporation and the Asian Development Bank issued RMB1.13 billion and RMB1 billion of Panda bonds (RMB-denominated bonds issued by non-residents onshore), respectively, with the requirement that the proceeds be used to fund domestic lending and investing (Table 4.3). Panda bond issuance helps to widen the range of credit exposures for domestic investors in RMB-denominated bonds. The rule requiring the proceeds of Panda issues to be used in China was changed in September 2010.

Now, international institutions, with the approval of the State Administration of Foreign Exchange (SAFE), may remit overseas the proceeds from Panda bond sales either in RMB or in foreign currencies. This policy change represents another step in the experiment of liberalising the capital account and widening the international use of the RMB and, crucially, gives China RMB-denominated foreign claims on the rest of the world (Yu 2008).

Table 4.2 RMB-denominated bonds issued in Hong Kong

Date	Issuer	Amount (RMB bn)	Coupon rate (%)	Duration (years)
July 2007	China Development Bank	5.0	3.00	2
August 2007	Export–Import Bank of China	2.0	3.05	2
September 2007	Bank of China	3.0	3.15	2
			3.35	3
July 2008	Bank of Communications	3.0	3.25	2
August 2008	China Construction Bank	3.0	3.24	2
August 2008	Export–Import Bank of China	3.0	3.40	3
September 2008	Bank of China	3.0	3.25	2
			3.40	3
June 2009	HSBC China	1.0	SHIBOR + 38bp	2
July 2009	BEA China	4.0	2.80	2
August 2009	China Development Bank	2.0	2.45	2
August 2009	China Development Bank	1.0	SHIBOR + 30bp	2
August 2009	HSBC	2.0	2.60	2
September 2009	China Ministry of Finance 3	6.0	2.25	2
September 2009	China Ministry of Finance 2.5		2.70	3
September 2009	China Ministry of Finance 0.5		3.30	5
July 2010	Hopewell Highway Infrastructure	1.4	2.98	3
August 2010	CITIC International Bank	0.5	2.68	1
August 2010	HSBC CD	0.1	2.00	0.5
August 2010	McDonald's	0.2	3.00	3
September 2010	Bank of China	2.2	2.65	2
September 2010	Bank of China	2.8	2.90	3
October 2010	Asian Development Bank	1.2	2.85	10
October 2010	China Development Bank	2.0	3M SHIBOR 5-day average +10bp	3
October 2010	SINOTRUK	2.7	2.95	2
November 2010	China Development Bank	3.0	2.7	3
November 2010	UBS (HK)	0.2	2.50	2
November 2010	China Resources Power	1.0	2.90	3
November 2010	China Resources Power	1.0	3.75	5
November 2010	China Merchants Group (HK)	0.7	2.90	3

Date	Issuer	Amount (RMB bn)	Coupon rate (%)	Duration (years)
December 2010	Caterpillar	1.0	2.0	2
December 2010	China Ministry of Finance	2.0	1.0	3
December 2010	China Ministry of Finance	2.0	1.8	5
December 2010	China Ministry of Finance	1.0	2.48	10
December 2010	Export–Import Bank of China	1.0	1.95	2
December 2010	Export–Import Bank of China	4.0	2.65	3
December 2010	ANZ Bank	0.2	1.45	2
December 2010	Galaxy Entertainment Group	1.38	4.625	3
December 2010	China Power International Development	0.8	3.2	5
December 2010	VTB Capital	1.0	2.95	3
January 2011	World Bank	0.5	0.95	2
January 2011	Sinochem	3.5	1.8	3
January 2011	International Finance Corporation	0.15	1.8	5
February 2011	PCD Stores	0.75	5.25	3
February 2011	YFY Cayman	0.3	3.1	3
February 2011	Beijing Capital Land	1.15	4.75	3
February 2011	Road King	1.3	6.0	3

Sources: Authors' calculations; web sites of HKMA (<www.info.gov.hk/hkma/>) and PBC (<www.pbc.gov.cn>).

Table 4.3 Panda bonds issued in China

Issue date	Issuers	Size (RMB bn)	Rate (%)	Maturity (years)
October 2005	Asian Development Bank	1.00	3.34	10
October 2005	International Finance Corporation	1.13	3.40	10
November 2006	International Finance Corporation	0.87	3.20	7
December 2009	Asian Development Bank	1.00	4.20	10
May 2010	Bank of Tokyo–Mitsubishi UFJ (China)	1.00	Negotiated	2

Note: Panda bonds that had been issued as of January 2011 are presented.

Source: Authors' own estimates.

On the investor side, the Chinese authorities have allowed access by designated foreign banks to the interbank bond market. This is a clear step forward from the very limited bond market access afforded through the Qualified Foreign Institutional Investor scheme. This scheme allowed investors to buy only those bonds listed on the stock exchange, whereas the interbank bond market provides the more liquid trading platform and features better prices. To date, some 20 overseas banks have won approval, subject to a quota, to invest offshore RMB accumulated through trade settlement into China's huge onshore interbank bond markets.

This new possibility highlights how offshore holdings of RMB could become more attractive if they were endowed with greater cross-border mobility. It is well known that, hitherto, China's capital control has been substantial and extensive (Cheung and Qian 2010; Ma and McCauley 2008; Tsang 2010). The internationalisation measures described above have made RMB outflows sizeable and relatively easy. Once offshore, RMB flows back onshore have been restricted mainly to the trade channel (and other specially approved mechanisms such as case-by-case FDI using RMB). Renminbi-linked but dollar-settled bonds have been sold by Chinese real estate firms in Hong Kong precisely because of the anticipation of greater ease in getting the SAFE approval for dollars rather than for RMB. The Chinese Government accepting dollars more readily than RMB points to a very cautious management of offshore RMB returning onshore. The interbank bond access, therefore, represents notable progress.

While much of the discussion above of Chinese policy concerns its advantages for the Chinese, it should be remembered that it takes two to tango. Why should external obligors eventually accept the denomination of their liabilities in RMB? Some aid recipients might look the gift-horse in the mouth by resisting concessional credit in RMB. Thus, the Chinese Government could follow Japan's lead and extend foreign aid loans in RMB in the future. For instance, the China Development Bank (CDB 2009) reports that 4.7 per cent of its RMB2.9 trillion loans are made outside the mainland. These amounted to RMB135 billion—equivalent to about US$20 billion. Were such loans to be extended in the future, they could be denominated in RMB.

In general, borrowers in the rest of the world would be bound to ask themselves two questions before agreeing to borrow in RMB. First, is such borrowing subject to the risk of rapid appreciation against other currencies? After all, at present the Chinese bear the balance sheet risk of a sudden appreciation of the RMB against foreign currencies. Were parties outside China to share in this risk then the incentives for China to prevent such an appreciation would be to some extent attenuated (a moral hazard point: the distribution of risk might affect behaviour). Second, a more subtle question, but still relevant to external parties considering whether to borrow RMB, is whether it is likely to track the US dollar closely?

The following two sections take up these questions. Should potential RMB obligors outside China be deterred by the prospect of a sharp appreciation of the RMB? Or should the RMB be expected to shadow the US dollar so closely as to offer little diversification advantage as a currency in which to denominate obligations?

Risk of a sharp appreciation to renminbisation

One precondition for renminbisation is that borrowers in other countries are willing to hold their liabilities denominated in RMB. If the RMB is perceived to be severely undervalued and subject to a prospective sharp appreciation, firms or sovereigns outside China would be unwilling to hold liabilities denominated in RMB, which would stymie the process of RMB internationalisation.

The concern over—or in some cases, hope of—a sharp appreciation is not uncommon among observers who argue that the RMB is substantially undervalued. Yet the observed RMB movements and exchange rate policies in recent years do not reinforce the likelihood of this outcome. After a temporary suspension during the recent global financial crisis, China, on 19 June 2010, returned to the 'managed floating exchange regime' adopted in 2005. As in 2005, the recently stated policy calls for steady and gradual change in the value of the RMB (PBC 2010b), and resembles an upward crawl against the dollar (Ma and McCauley 2011a, 2011b).

There are both academic and policy studies that suggest the RMB is substantially undervalued. Indeed, the 2010 IMF Article IV Consultation Staff Report (IMF 2010a) assesses that the RMB 'remains *substantially* below the level that is consistent with medium-term fundamentals' (emphasis added). The Chinese authorities, however, offered alternative interpretations of evidence that the report used to draw the undervaluation assessment. The report's assessment was also not agreed to by several directors of the IMF Executive Board (IMF 2010a).

There is no shortage of estimates of the degree of RMB misalignment, and the estimated extent of undervaluation varies considerably from one study to another. The differences in the estimates come not only from different model specifications but also from models with similar theoretical underpinnings.

Table 4.4 presents some recent estimates of the degree of RMB misalignment. Most of these estimates were obtained from typical theoretical frameworks including relative purchasing power parity (PPP), the Penn effect, the productivity approach, the behavioural equilibrium exchange rate model, the fundamental equilibrium exchange rate approach, and the macroeconomic balance effect approach.[7] One striking observation is the dispersion of these misalignment estimates, ranging from a 49 per cent undervaluation to a 36 per cent overvaluation. Even if we drop the ad-hoc deviation from the trend estimates, the remaining estimates are still spread over a rather wide range. Most of these studies, surprisingly, overlook or understate the notorious difficulty of determining the extent of RMB undervaluation.

Table 4.4 Some recent estimates of the degree of RMB misalignment

Estimate (%)	As of	Source
–41	14 October 2010	The Economist (2010), Big Mac index
–33	March 2009	Cline and Williamson (2010), FEER
–31*	2005	Subramanian (2010), Penn effect
–21**	End of 2008	Goldstein and Lardy (2009), external balance
–17.5**	2009	Wang and Hu (2010), FEER, external balance
–10	Q1 2010	Tenengauzer (2010), external balance
–2.56	Q4 2009	Stupnytska et al. (2009), BEER
5	2008	Cheung et al. (2010b)
13.4	Q4 2008	Hu and Chen (2010), FEER
16.8	September 2009	Cheung et al. (2010b), relative PPP, real US$/RMB bilateral exchange rate
36	December 2009	Cheung et al. (2010b), real PPP, trade-weighted exchange rate

* the average of estimates from adjusted data

** the average of estimates

Notes: FEER refers to fundamental equilibrium exchange rate and BEER refers to behavioural equilibrium exchange rate. As for the Penn effect, see the discussion in the text.

The overarching issue is, of course, how to define a currency's appropriate (or, in economic jargon, its equilibrium) value. In addition to the difficulty that economists have encountered in predicting exchange rate changes (Meese and Rogoff 1983), they have had a hard time agreeing on a benchmark for an appropriate exchange rate value (Cheung et al. 2005). A direct implication of this literature is that the prospect of having a commonly agreed framework to assess RMB valuation is pretty unpromising. In the absence of a consensus exchange rate model, potential borrowers in the RMB will naturally interpret with great caution assertions about the level of the RMB's undervaluation.

Figure 4.3 illustrates some of the difficulties in assessing the degree of RMB misalignment. It depicts the IMF's trade-weighted real effective exchange rate index for the period 1980–2009 with a higher value meaning a stronger Chinese currency. The sample mean and linear trend estimated over the available sample are also plotted. One typical measure of currency misalignment is the deviation from a deterministic trend. In this case, the deviation from the trend indicates a 36 per cent *over*valuation and the deviation from the mean gives a 7.5 per cent *under*valuation at the beginning of 2010.

Figure 4.3 Misalignment via linear trends, real exchange rate (trade weighted)

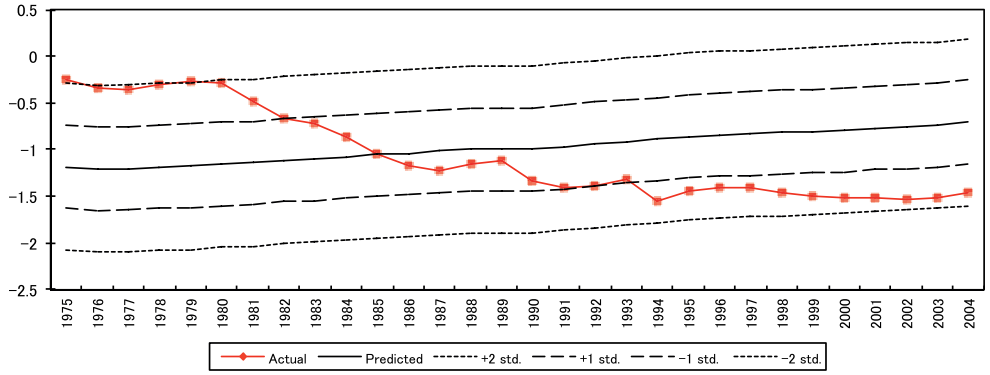
The relevance of Figure 4.3 is not its implied misalignment estimates but the fragility and sensitivity of these estimates, which in turn offer a glimpse into the reason behind the widely diverse RMB misalignment estimates in Table 4.4. For instance, the use of different measures of 'trend' could lead to very different misalignment estimates. It is obvious that, if we start with the sample period from 1994, the trend deviation measure will yield some substantial *under*valuation estimates. Further, different misalignment estimates could be generated by using different price deflators and by using a broken trend or a nonlinear trend instead of a linear trend. For more elaborated frameworks for assessing currency valuation, the analogues of these sources of ambiguities are the specification uncertainty, the sample period selection, and the choice of data series. Thus, a proper assessment of currency misalignment requires agreement on both theory and empirics.

Cheung et al. (2007) highlight the uncertainty surrounding any calculation of the extent of RMB undervaluation. We recap their argument based on the well-known Penn effect, which refers to the robust empirical positive association between national price levels and real per capita incomes across countries documented by a series of University of Pennsylvania studies (Kravis and Lipsey 1983, 1987; Kravis et al. 1978; Samuelson 1994;

Summers and Heston 1991). One message is that while one can obtain a quantitatively large misalignment estimate, it is hard to argue that the estimated misalignment amounts to statistically significant evidence of undervaluation.

The point is illustrated in Figure 4.4, which traces out: 1) the actual real RMB exchange rate (the diamond line; higher values indicate a stronger, more appreciated RMB); 2) the 'equilibrium' real exchange rate predicted by the empirical exchange rate and income relationship (the solid line); and 3) the one and two standard error bands associated with the predicted equilibrium rates (the dotted lines). Undervaluation is observed when the actual rate is lower than the predicted rate.

Figure 4.4 Actual and predicted RMB values



Source: Authors' estimations.

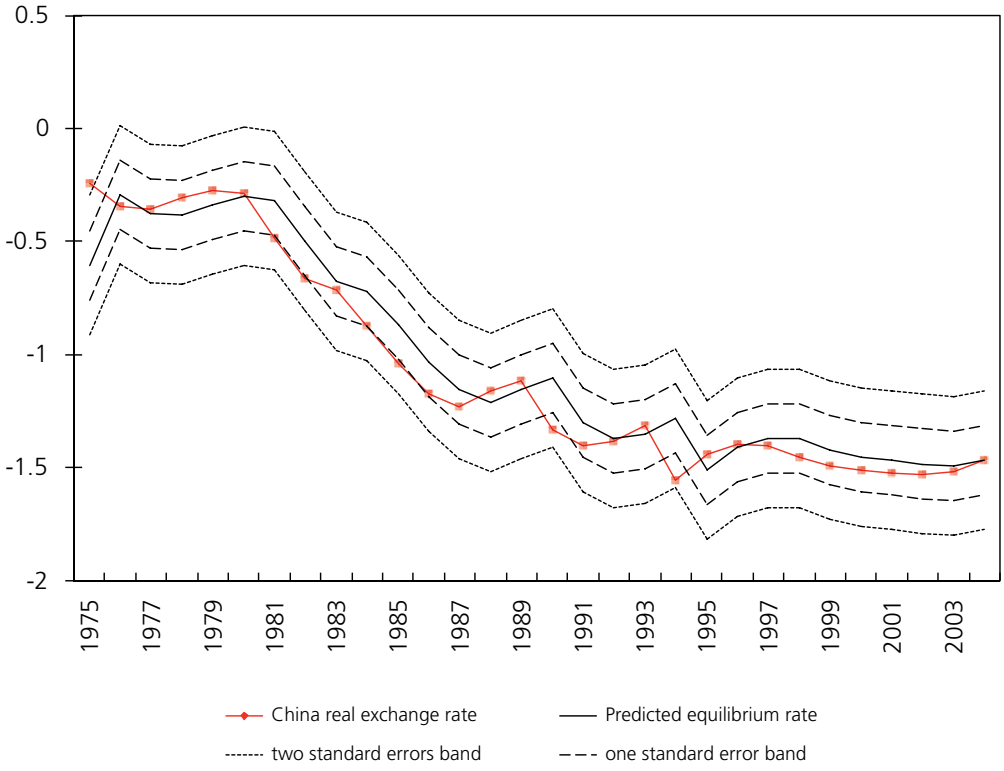
One important feature of Figure 4.4 is the width of the standard error bands. The wide range underscores the uncertainty surrounding exchange rate determination. The evidence suggests that, in the 2000s, the RMB was undervalued and its value was less than its predicted equilibrium value—but also that its value remained within the two standard error band. This is the criterion that applied economists commonly use to assess if the evidence is statistically significant or not.

Key to this analysis is the reliability of the data on the Chinese real income level. The data used to generate results presented in Figure 4.4 were based on the 1993 International Comparison Program benchmark. Some emerging economies including China and India did not fully participate in the 1993 International Comparison Program. Thus, the data for these countries are 'projected' and, hence, subject to some unknown errors.

In 2008, the World Bank, in cooperation with the Asian Development Bank, reported new relative price estimates that are derived from the 2005 International Comparison Program benchmark.[8] Cheung et al. (2010b) assess the implication of this data revision for assessing RMB misalignment. Essentially, they re-estimate the Penn effect regression using data derived from the new relative price estimates, which are deemed to offer a more accurate description of China's economy.

The implications for misalignment estimation are summarised in Figure 4.5, which has the same format as Figure 4.4. The startling outcome is that these new data imply a substantial reduction in the estimated degree of RMB undervaluation; most of the recent misalignment estimates are within the one standard error band. Indeed, the most recent data give a 5 per cent *over*valuation estimate of the RMB in 2008.

Figure 4.5 Actual and predicted RMB values based on 2010 vintage data



That is, previously reported undervaluation estimates could be spurious results from using unrevised and now outdated information to evaluate the current economic environment. This data revision and its consequence for the estimation highlight another dimension of the difficulty in accurately assessing the degree of RMB misalignment.

Do these studies imply the RMB is *not* undervalued? No, weak empirical evidence does not exclude the possibility of undervaluation. The evidence, in fact, is so weak that we could not reject a wide range of hypotheses related to RMB valuation. Instead of arguing for undervaluation or overvaluation, the relevant message is that it is hard to deliver a RMB undervaluation verdict that meets the standards of careful empirical work expected of academic study.

Even under thick smoke, governments and firms in China's trading-partner countries still have to make a decision about whether to denominate their debts in RMB. In practice, policymakers and corporate treasurers operate in the here and now of the real world and

not in the academic universe. The difficulty of drawing a clear verdict does not necessarily mean that there is no undervaluation. Nonetheless, it is prudent to avoid formulating strong policy recommendations based on weak empirical evidence.

An alternative approach is to ask the question: from a practical point of view, should we choose the currency denomination of our debt based on the assumption that the RMB carries a massive and potentially costly jump risk? Given the contradictory empirical evidence presented above and elsewhere, reputation matters. In the economic arena, the Chinese authorities are perceived to follow a gradualist approach and to focus on economic stability. A massive RMB revaluation is seen as posing the risk of serious disruption to China's domestic economy and its extensive production and trade networks with other Asian economies. If the recent experience of gradualism is given weight, the prospect of a substantial RMB revaluation should not block the internationalisation of the RMB.

The US dollar link and the renminbisation of China's external assets

The prevailing view among both market participants and academics has been that the RMB has moved from a simple dollar peg (1994–2005) to an upward crawl against the dollar (mid-2005 to mid-2008) and then back to a dollar peg during the global financial crisis of mid-2008 to mid-2010. If this were so then the internationalisation of the RMB would surely be inhibited by the prospect of a continued link to the dollar. All the liquidity advantages of US-dollar markets would favour inertia, while the RMB as a store of value would offer, by hypothesis, little but the dollar plus noise. The RMB would amount to no more than an illiquid dollar, which is likely to be unpopular among market participants. Worse yet, if its course in mid-2005 to mid-2008 and since mid-2010 were just an upward crawl against the dollar, it would work against obligors taking on RMB debt. Why borrow in the RMB if, as things stand, there would be little or no interest savings compared with dollar debt but the prospect of a trend appreciation against the dollar?

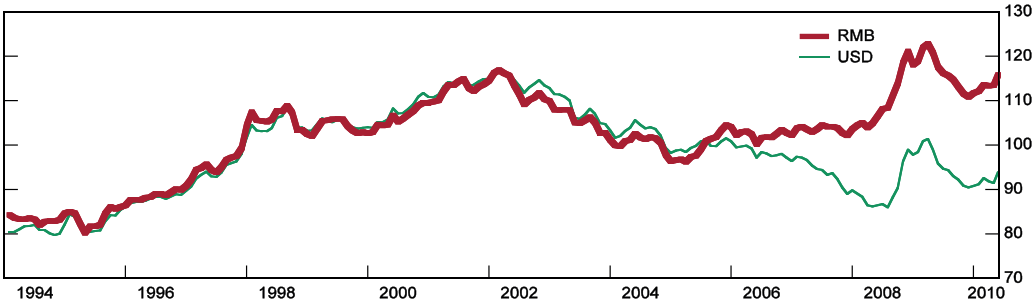
This conventional wisdom, with its possible negative implication for RMB internationalisation, is not well founded. If, indeed, the Chinese authorities have made an intellectual and practical break from the dollar, and even if the global financial crisis led them to revert to the dollar for a time, the RMB stands a better chance of being accepted by obligors. Ma and McCauley (2011a, 2011b) present evidence that the post–July 2005 regime for the RMB was not just a crawling dollar peg. Instead, from mid-2006 and mid-2008, the Chinese authorities appeared to manage the RMB against its trade-weighted basket in a manner similar to the longstanding management of the Singapore dollar. Several arguments lend support to this interpretation of the evolving post-2005 RMB regime.

First, two Chinese flagship central bank reports (PBC 2008; SAFE 2008) cited the Bank for International Settlements (BIS) effective exchange rate measure of the RMB when discussing trends in the RMB exchange rate, suggesting increased attention given to the effective exchange rate in RMB management. This signalled a break from the tradition established

during the East Asian financial crisis. Indeed, as argued by Fung et al. (2009), in terms of maintaining both trade competitiveness and price stability, effective RMB stability would generally serve China better than bilateral dollar stability.

Second, during 2006–08, the effective RMB and the effective US dollar moved mostly in opposite directions—amply demonstrating the lost influence of the dollar cycle on the effective RMB during this episode (Figure 4.6). This is another sign of the RMB moving away from a pure dollar peg.

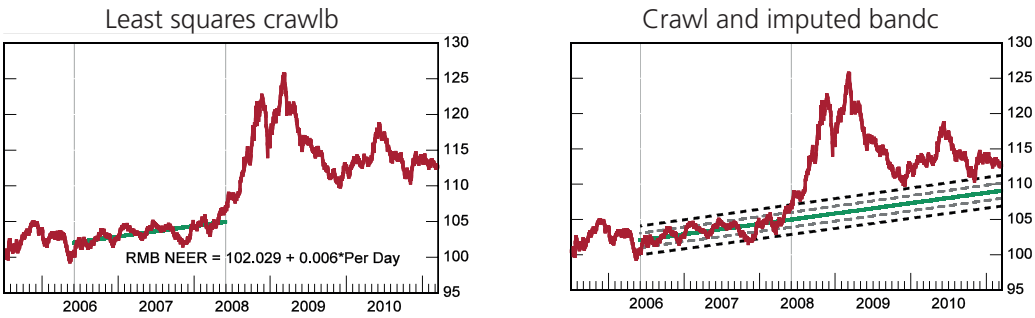
Figure 4.6 Nominal effective exchange rates of the RMB and US dollar (2005 = 100)[a]



[a] BIS broad indices based on 58 economies, monthly data.

Source: BIS web site (<www.bis.org/>).

Figure 4.7 Nominal effective exchange rate for the Chinese RMB index (2005 = 100)[a]



[a] BIS effective exchange rate broad index based on 58 economies.

[b] The trend line is estimated over the two-year period of 1 June 2006 to 30 May 2008, regressing the RMB NEER against a trading-day trend. The adjusted R-squared is 0.48, while both the constant term and the trend coefficient are statistically significant at 1 per cent.

[c] The thick dotted lines represent ±2 per cent of the trend line, while the thin dotted lines represent ±1 per cent of the trend line.

Sources: BIS web site (<www.bis.org/>); authors' estimations.

Finally, Ma and McCauley (2011a, 2011b) provide econometric evidence that in this two-year period, the foreign exchange value of the RMB showed a tendency to revert to a mean defined by an upward crawl against its trade-weighted basket. Specifically, much in the manner of the Singapore-style exchange rate policy, the effective RMB seemed to describe a 2 per cent annual crawl within a ±2 per cent band (Figure 4.7).

Nevertheless, the RMB abruptly returned to a tight peg against the US dollar in July 2008 and appreciated substantially in effective terms as a result of a stronger dollar. One possible explanation is that the Chinese authorities chose to revert to a reliable and trusted anchor at a time of significant financial market turbulence. The two-year experiment with basket management for the RMB was apparently interrupted in response to the deepening global financial crisis. A reversion to dollar stability allowed the effective RMB to pierce the upper edge of the estimated band on a steep appreciation path (Figure 4.7). Given the marked strength of the dollar in the latter part of 2008, the Chinese authorities would have had to allow a considerable decline in the RMB against the dollar in order to maintain effective exchange rate stability. This policy shift in RMB management would be consistent with broad policy concerns about sustained weakness of the RMB vis-a-vis the dollar, given structurally large Sino–US trade imbalances, as well as a new priority to anchor market confidence in times of global financial instability due to the dollar's safe-haven role.

With more normal trading conditions in global foreign exchange markets, the considerations that led to management of the RMB against its trading partners' currencies could come again to the fore. Indeed, the Chinese central bank announced in June 2010 that the 'special measure' of a return to a dollar peg in response to the global financial crisis would be dropped in favour of a return to a managed float in reference to a basket of currencies (PBC 2010b).

A RMB less tied to the dollar could be a more attractive currency in which to borrow, especially if the currencies of China's regional trading partners come to share its movement against the major currencies. The Asian experience from mid-2006 to mid-2008 suggested such co-movement between some East Asian currencies and the RMB. East Asian currencies managed against their respective trade-weighted currency baskets can show relative stability against each other, owing to the similarity of these baskets (Girardin 2011; Ma and McCauley 2011a, 2011b). For instance, given similarities in basket composition, when the Chinese were managing the RMB's effective exchange rate and the Malaysians were managing the ringgit's effective exchange rate, the ringgit/RMB was fairly stable. This offers an informal approach for stabilising currencies both in effective terms (globally), which is important for these outward-oriented economies, and in bilateral terms within East Asia. Though it was overwhelmed by the effect of the global financial crisis on major currencies and capital flows in mid-2008, such an informal approach can create more favourable conditions for an evolution towards monetary cooperation over time in Asia. For present purposes, stability between the RMB and Asian currencies could make the RMB an attractive currency in which to borrow.

Through some combination of tighter trade links and management, East Asian currencies could come to trade with less volatility against the RMB than against the dollar, euro or yen. In this case, the RMB could serve as a natural currency in which firms and governments in the region would denominate their debts.

In sum, the notion that the RMB has been and therefore will remain basically in the orbit of the dollar requires that the evidence of a two-year experiment in 2006–08 be ignored. If the RMB is once again managed more broadly, there is no reason to consider that China's trading partners will find denominating their debts in the RMB uninteresting.

Conclusions

The global financial crisis might make the rest of the world more open to taking on some of the currency risk in China's international balance sheet. China's interest in sharing some of that rapidly building risk predated the crisis. We interpret the recent policies adopted by the Chinese authorities as setting the stage for RMB internationalisation that would allow the rest of the world to denominate debt in RMB. But if trading partners consider that the RMB is subject to a big jump risk then near-term prospects for denominating more of China's foreign assets in RMB would be weak, though the wider external use of the currency through further building up of China's RMB-denominated foreign liabilities could even accelerate. And if trading partners dismiss the RMB simply as the US dollar with a greater or lesser trend appreciation then prospects for its internationalisation would also be weak. We have presented evidence to suggest that these views are easily overstated, and that therefore they understate the prospects over time for the internationalisation of the RMB in general and the renminbisation of China's external assets in particular.

Of course, full internationalisation ultimately requires a fully open capital account. The steps that China is taking should be seen as permitting internationalisation to begin within capital controls and so far mostly in the offshore RMB market based in Hong Kong. Lifting the remaining capital controls to allow the full internationalisation of the RMB remains a policy for another day.

Bibliography

Asian Development Bank (ADB) 2007, *Purchasing Power Parities and Real Expenditures*, December Asian Development Bank, Manila.

Bergin, P. R., Glick, R., Taylor, A. M. 2006, 'Productivity, tradability, and the long-run price puzzle', *Journal of Monetary Economics*, vol. 53, no. 8, pp. 2041–66.

Blanchard, O., Giavazzi, F. and Sa, F. 2005, *The U.S. current account and the dollar, Brookings Papers on Economic Activity*, no. 1, Brookings Institution, Washington, DC, pp. 1–66.

Chen, X. and Cheung, Y.-W. 2011, 'Renminbi going global', *China & World Economy*, vol. 19, pp. 1–18.

Cheung, Y.-W. and Qian, X. W. 2010, 'Capital flight: China's experience', *Review of Development Economics*, vol. 142, pp. 227–47.

Cheung, Y.-W., Chinn, M. D. and Fujii, E. 2007, 'The overvaluation of renminbi undervaluation', *Journal of International Money and Finance*, vol. 26, pp. 762–85.

Cheung, Y.-W., Chinn, M. D. and Fujii, E. 2010a, 'Measuring misalignment: latest estimates for the Chinese renminbi', in S. Evenett (ed.), *The US–Sino Currency Dispute: New insights from economics, politics and law*, A voxeu.org Publication, Centre for Economic Policy Research, London, ch. 10, pp. 79–90.

Cheung, Y.-W., Chinn, M. D. and Fujii, E. 2010b, 'Measuring renminbi misalignment: where do we stand?', *Korea and the World Economy*, vol. 11, pp. 263–96.

Cheung, Y.-W., Chinn, M. D. and Garcia Pascual, A. 2005, 'Empirical exchange rate models of the Nineties: are any fit to survive?', *Journal of International Money & Finance*, vol. 24, pp. 1150–75.

Cheung, Y.-W., Ma, G. and McCauley, R. N. 2011, 'Renminbising China's foreign assets', *Pacific Economic Review*, vol. 16, pp. 1–17.

China Development Bank (CDB) 2009, *Annual Report 2008*, China Development Bank, Beijing.

Cline, W. R. and Williamson, J. 2010, *Notes on equilibrium exchange rates*, Policy Brief PB10-2, January, Peterson Institute for International Economics, Washington, DC.

Committee on the Global Financial System (CGFS) 2010, *The functioning and resilience of cross-border funding markets*, CGFS Report No. 37, March, Committee on the Global Financial System, Bank for International Settlements, Basel.

Cui, L., Chang, S. and Chang, J. 2009, 'Exchange rate pass-through and currency invoicing in China's exports', *HKMA China Economic Issues*, no. 2/09.

Dobson, W. and Masson, P. 2009, 'Will the renminbi become a world currency?', *China Economic Review,* vol. 20, pp. 124–35.

Dunaway, S. and Li, X. 2005, *Estimating China's equilibrium real exchange rate*, IMF Working Paper, WP/05/202, International Monetary Fund, Washington, DC.

Dunaway, S., Leigh, L. and Li, X. 2009, 'How robust are estimates of equilibrium real exchange rates: the case of China', *Pacific Economic Review*, vol. 14, pp. 361–75.

Elekdag, S. and Lall, S. 2008, 'International statistical comparison: global growth estimates trimmed after PPP revisions', *IMF Survey Magazine*, 8 January.

Fung, S., Klau, M., Ma, G. and McCauley, R. 2009, 'Implications of refined renminbi effective exchange rates with Asian entrepot and intra-regional trade', in Y.-W. Cheung and K.-Y. Wong (eds), *China and Asia: Economic and financial interactions*, Routledge, London, pp. 178–93.

Frankel, J. 2006, 'On the yuan: the choice between adjustment under a fixed exchange rate and adjustment under a flexible rate', *CESifo Economic Studies*, vol. 52, pp. 246–75.

Gao, H. and Yu, Y. 2011, 'Internationalisation of the renminbi', in Y.-W. Cheung and G. Ma (eds), *Asia and China in the Global Economy*, World Scientific Publishing, Singapore.

Genberg, H., McCauley, R., Persaud, A. and Park, Y.-C. 2005, *Official reserves and currency management in Asia: myth, reality and the future*, Geneva Reports on the World Economy No. 7, International Centre for Monetary and Banking Studies and Centre for Economic Policy Research, Geneva and London.

Girardin, E. 2011, *A de facto Asian-currency unit bloc in East Asia: it has been there but we did not look for it*, ADB Institute Working Paper No. 262, 14 January, Asian Development Bank, Manila.

Goldstein, M. and Lardy, N. 2009, *Debating China's Exchange Rate Policy*, Peterson Institute of International Economics, Washington, DC.

Hu, C. and Chen, Z. 2010, 'Renminbi already overappreciated: evidence from FEERs (1994–2008)', *China Economist*, vol. 26, pp. 64–78.

International Monetary Fund (IMF) 2010a, *People's Republic of China: 2010 Article IV consultation—Staff report*, International Monetary Fund, Washington, DC, <http://www.imf.org/external/pubs/ft/scr/2010/cr10238.pdf>

International Monetary Fund (IMF) 2010b, R*eview of the Method of Valuation of the SDR*, 26 October, International Monetary Fund, Washington, DC.

International Monetary Fund (IMF) 2011, *Recent Experiences in Managing Capital Inflows: Cross-cutting themes and possible policy framework*, 14 February, International Monetary Fund, Washington, DC.

Kravis, I. B. and Lipsey, R. E. 1983, *Toward an explanation of national price levels*, Princeton Studies in International Finance No. 52, International Finance Centre, Princeton University, Princeton, NJ.

Kravis, I. B. and Lipsey, R. E. 1987, 'The assessment of national price levels', in S. W. Arndt and J. D. Richardson (eds), *Real Financial Linkages Among Open Economies*, MIT Press, Cambridge, Mass., pp. 97–134.

Kravis, I. B., Heston, A. and Summers, R. 1978, *International Comparisons of Real Product and Purchasing Power*, The Johns Hopkins University Press, Baltimore.

Japan Bank for International Cooperation (JBIC) 2008, *Annual Report 2008*, Japan Bank for International Cooperation, Tokyo.

Lane, P. R. and Shambaugh, J. C. 2010, 'Financial exchange rates and international currency exposures', *American Economic Review*, vol. 100, no. 1, pp. 518–40.

Ma, G. and McCauley, R. N. 2008, 'The efficacy of China's capital controls—evidence from price and flow data', *Pacific Economic Review*, vol. 13, pp. 104–23.

Ma, G. and McCauley, R. N. 2011a, 'The evolving renminbi regime and implications for Asian currency stability', *Journal of the Japanese and International Economies*, no. 25, pp. 23–38.

Ma, G. and McCauley, R. N. 2011b, 'The implications of renminbi basket management for Asian currency stability', in Y.-W. Cheung, V. Kakkar and G. Ma (eds), *The Evolving Role of Asia in Global Finance*, Emerald Group Publishing Limited, Bradford, UK.

Ma, G. and Zhou, H. 2009, *China's evolving external wealth and rising creditor position*, BIS Working Papers No. 286, Bank for International Settlements, Basel.

McCauley, R. 2010, 'Managing recent hot money inflows in Asia', in M. Kawai and M. Lamberte (eds), *Managing Capital Flows in Asia: Search for a framework*, Edward Elgar, Cheltenham, UK.

McCauley, R. 2011, The internationalisation of the renminbi, Presented to Second Annual International Conference on the Chinese Economy, 'Macroeconomic Management in China: Monetary and financial stability issues', Hong Kong Institute for Monetary Research, 13–14 January 2011, <http://www.hkimr.org/cms/upload/news_app/news_0_56_McCauley_speech_HKIMR_14Jan2011.pdf>

McCauley, R. and McGuire, P. 2009, 'Dollar appreciation in 2008: safe haven, carry trades, dollar shortage and overhedging', *BIS Quarterly Review*, December, pp. 85–93.

McCauley, R. and Scatigna, M. 2011, 'Foreign exchange trading in emerging currencies: more financial, more offshore', *BIS Quarterly Review*, March, pp. 67–75.

McGuire, P. and von Peter, G. 2009, 'The US dollar shortage in global banking', *BIS Quarterly Review*, March, pp. 47–63.

Meese, R. and Rogoff, K. 1983, 'Empirical exchange rate models of the Seventies: do they fit out of sample?', *Journal of International Economics*, vol. 14, pp. 3–24.

People's Bank of China (PBC) 2008, *China's Monetary Policy Report*, May, People's Bank of China, Beijing.

People's Bank of China (PBC) 2010a, *China's Regional Financial Development in 2009*, June, People's Bank of China, Beijing.

People's Bank of China (PBC) 2010b, Further reform of the RMB exchange rate regime and enhancement of the RMB exchange rate flexibility, Policy announcement, 19 June 2010, People's Bank of China, Beijing, <http://www.pbc.gov.cn/english/detail.asp?col=6400&id=1488>

People's Bank of China (PBC) 2011, *China's Monetary Policy Implementation Report for the Fourth Quarter of 2010*, February, People's Bank of China, Beijing.

People's Bank of China and International Monetary Fund (PBC and IMF) 2009, *Note Purchase Agreement Between the People's Bank of China and the International Monetary Fund*, Beijing.

Samuelson, P. 1964, 'Theoretical notes on trade problems', *Review of Economics and Statistics*, vol. 46, no. 2, pp. 145–54.

Samuelson, P. 1994, 'Facets of Balassa–Samuelson thirty years later', *Review of International Economics*, vol. 2, no. 3, pp. 201–26.

State Administration of Foreign Exchange (SAFE) 2008, *China Annual Balance of Payments Report 2007*, [in Chinese], State Administration of Foreign Exchange, Beijing.

Stupnytska, A., Stolper, T. and Meechan, M. 2009, *GSDEER on track: our improved FX fair value model*, Global Economics Weekly No. 09/38, 28 October, Goldman Sachs Global Economics.

Subramanian, A. 2010, *New PPP-based estimates of renminbi undervaluation and policy implications*, Policy Brief PB10-18, April, Peterson Institute for International Economics, Washington, DC.

Summers, R. and Heston, A. 1991, 'The Penn World Table (Mark5): an expanded set of international comparisons', *Quarterly Journal of Economics*, vol. 106, no. 2, pp. 327–68.

Takagi, S. 2011, 'Internationalisation of the yen: unfinished business or mission impossible?', in Y.-W. Cheung and G. Ma (eds), *Asia and China in the Global Economy*, World Scientific Publishing, Singapore.

Tenengauzer, D. 2010, 'RMB: the people's currency', *EM FX and Debt Spotlight*, 21 April, Bank of America–Merrill Lynch.

The Economist 2010, 'Our Big Mac index shows the Chinese yuan is still undervalued', *Economist.com*, 14 October 2010.

Tsang, S. 2010, Internationalisation and full convertibility of the renminbi, <http://www.sktsang.com/ArchiveIII/Tsang_RMB_20100717.pdf>

Wang, T. and Hu, H. 2010, 'How undervalued is the RMB?', *Asian Economic Perspectives*, 13 April, UBS Investment Research.

World Bank 2008a, *Comparison of New 2005 PPPs with Previous Estimates: Appendix G revised—Global purchasing power parities and real expenditures*, The World Bank, Washington, DC.

World Bank 2008b, *Global Purchasing Power Parities and Real Expenditures: 2005 International Comparison Program*, International Comparison Program and International Bank for Reconstruction and Development, The World Bank, Washington, DC.

Yu, Y. 2008, 'Panda bonds could help China avoid the risks of US Treasury bonds', *East Asia Forum*, 19 December, <http://www.eastasiaforum.org/2008/12/19/panda-bonds-could-help-china-avoid-the-risks-of-us-treasury-bonds/>

Endnotes

1. We thank Claudio Borio for his helpful comments and suggestions and Magdalena Erdem, Eric Chan and Lillie Lam for research assistance. Cheung acknowledges the financial support of faculty research funds of the University of California, Santa Cruz. The views expressed are those of the authors only and should not be interpreted as those of the Bank for International Settlements (BIS).

2. Indeed, since the introduction of cross-border trade settlements in RMB in 2009, the value of Chinese imports settled in RMB has been much larger than the value of Chinese exports settled in RMB. This has resulted in a noticeable build-up of RMB liquidity offshore, which is part of the RMB-denominated foreign liabilities on the balance sheet of the People's Bank of China. In other words, the currency mismatch on China's international balance sheet has become more acute in the short term as a result of the first steps towards RMB internationalisation.

3. In non-deliverable transactions, forward trades are settled in dollars because Chinese capital controls prohibit RMB to be paid out to offshore accounts without documentation of underlying trade transactions.

4. Only if dollar and euro-denominated bonds were perfect substitutes in investors' portfolios would such a diversification by China have no effect (much like sterilised intervention under the same assumption) (see Genberg et al. 2005).

5. The ultimate effect on the foreign exchange market would depend on the behaviour of the borrower from the IMF. If the latter received its SDR-denominated credit from the IMF in dollars, added the sum to its reserves, but sought to match its SDR-denominated liability then it would sell some of the dollars for euro, yen and

sterling. Under these assumptions, the effect on the foreign exchange market would be much the same as if China itself had diversified from the dollar to the SDR. It should also be noted that by exchanging a dollar bond for the IMF bond, China would be diversifying by obligor as well as currency.

6. Offshore RMB are often described as if they are only in Hong Kong; indeed, as of 2010, more than 90 per cent of offshore RMB were concentrated in Hong Kong. But offshore RMB are also to be found in Kuala Lumpur and Singapore and could eventually be traded in other international financial centres. In early 2011, for instance, the Bank of China started offering RMB bank accounts and related services in New York.

7. See, for example, Cheung et al. (2010a, 2010b) for a discussion of these approaches.

8. For discussions about the 2005 International Comparison Program benchmark and the related data revision issues, see ADB (2007); Elekdag and Lall (2008); and World Bank (2008a, 2008b).

5 The Technological Content of China's Exports and the Need for Quality Upgrading

Kunwang Li and Ligang Song

Introduction

Over the past 30 years, trade liberalisation has gone hand-in-hand with domestic economic transformation in China. As a result, the Chinese economy has been increasingly integrated with the world economy. China's ever-increasing exports have positively contributed to its rapid economic growth in the following ways: trade encourages investment, which confers externalities on an economy, particularly if the investment goods come from abroad; greater trade means larger volumes of output and greater scope for specialisation, leading to learning by doing; and trade also leads to technology transfer, which enhances the prospect of faster total productivity growth (Thirlwall 2006). Over the period 1978–2008, the average annual growth rate of China's exports reached 18.1 per cent—much higher than the average growth rate of total world exports of about 6 per cent over the same period. In 2009, China surpassed Germany to become the world's largest exporter of commodities. China's exports now account for about 10 per cent of the world's total exports.

Consistent with China's underlying comparative advantage and pattern of change, the pattern and composition of its exports have also changed over time—from the predominant reliance on primary goods such as petroleum and agricultural products at the beginning of the reform period to labour-intensive products such as textiles and clothing during the first two decades of reform, further to capital-intensive products such as steel, machinery and automobiles in the current phase of industrialisation, and increasingly to technology-intensive products such as some hi-tech equipment, bio-products and green technology.

China is currently still at the mid-phase of industrialisation as measured by its current per capita income plus other macroeconomic indicators such as auto penetration, metal and energy intensity, capital stock per capita or the level of urbanisation. This means that its rapid manufacturing-led growth is expected to persist for some time and exports of manufactured products from China to world markets will continue to dominate the changing pattern of the global division of labour and to impact consequently on the ongoing structural changes in China and its trading partners.

China now, however, faces tremendous pressures and challenges to change its economic structure by accelerating the technological progress in its industries, upgrade its production towards producing high value-added products, and improve product quality and efficiency. This is mainly because China must seek to alter the composition of its economic activities to address issues of global imbalances, low efficiency and overcapacity in certain sectors of the economy, to respond to the conflict between its current growth model and the biosphere at

local, national, regional and global levels, and to readjust its growth strategy in responding to the rising costs of labour, land, energy and minerals (McKay and Song 2010). A key task for China to succeed in making the necessary adjustment in its economic structure is to find ways of accelerating the pace of technological catch-up, through which it can realise quality upgrading in production and export, and ultimately achieve more balanced growth.

The improvement of export quality is not confined just to those more sophisticated manufacturing products, but applies also to low-end labour-intensive manufacturing products. This is because rising productivity could make a wider range of activities profitable, extending further up the lists of capital intensity and technological sophistication, without necessarily placing any pressure for contraction on labour-intensive industries in the traded-goods sector (Garnaut 2010).

A simple measure for capturing this progress is to examine how the technological content of China's exports changes and how the quality of its exports is improving over time. The purpose of this chapter is therefore to explore the dynamism of China's export structure from two dimensions: the changes in the technological content of its exports in the context of China's position in international vertical specialisation, and changes in the quality of its exports over time, which reflects the progress of industrial upgrading and the outcomes of learning by doing. The chapter also discusses some policy implications for understanding China's export growth and the risks involved for China to continue reliance on its current export-oriented growth model.

Technological content of China's exports: a review

Since the mid-1990s, the proportion of Chinese manufactured exports has accounted for more than 90 per cent of the total exports from China. Since then, the commodity composition of manufactured exports has undergone great change (Table 5.1). From 1995 to 2009, the export share of China's low technology-intensive (and labour-intensive) products—though still accounting for a relatively large share in China's total exports—declined from 48 per cent to 31 per cent, which is still well above the world average share of 14 per cent. This suggests that on the one hand, the relative abundance of labour in China remains a key determinant of manufactured trade in low-technology labour-intensive products. On the other hand, the dynamic characteristics of China's exports also show that the proportion of high technology-intensive products has increased significantly—rising from 15 per cent to 34 per cent during the same period. The proportion of medium technology-intensive (and capital-intensive) products has also shown a rising trend, but at a much slower rate of change. The comparison with the world averages shows that the changes in the structure of China's exports have been significantly faster than the world average, especially for high technology-intensive products. In this chapter, we will explore whether this shift in export structure towards high technology-intensive production has marked a significant change in China's underlying comparative advantage, and whether the trend means that China has been catching up with more advanced industrialised countries in terms of its overall level of technology and narrowing the gap of economic development with industrialised countries.

Table 5.1 Changing structure of exports by levels of technology: China and the world, 1995–2009 (per cent)

		1995	2000	2005	2009
Low tech	China	48.4	42.5	33.0	31.8
	World	16.6	15.1	14.2	14.0
Mid tech	China	18.1	19.1	21.4	23.6
	World	33.2	31.8	33.1	31.8
High tech	China	15.2	24.5	33.2	34.0
	World	19.0	19.0	20.5	20.2
Others	China	18.3	13.9	12.4	10.7
	World	31.1	30.5	32.2	34.0

Notes: Manufactured exports are classified as low, medium or high technology intensive based on the export classifications used in Lall (2000). 'Others' includes primary goods and resource-based manufactured goods.

Sources: Authors' calculations using the data taken from Information Center of China Customs (various years) and UNSD (n.d.).

The increasing sophistication of China's exports, especially with respect to the increasing quality and technological content, has generated some debate in the literature regarding the implications of this change for understanding the growth of exports from China. As Rodrik (2006) says, 'it is not how much but what you export that matters'. Some studies empirically support the view that China's export structure is becoming more and more sophisticated over time, including Rodrik (2006), who finds that the rapid growth of Chinese exports is increasingly biased in favour of its exports with high complexity or high technology content. As these products have both higher productivity and a higher tendency for growth, their development has led to a rapid increase in overall exports. Rodrik also finds that the complexity of China's exports is much higher than that of countries with the same level of development or a similar pattern of factor endowments, with its export structure being more similar to that of high-income countries. This suggests that China's foreign trade pattern does not follow exactly its underlying comparative advantage, but instead has demonstrated a pattern of development that is inconsistent with the level of China's current development. In other words, China might have achieved some kind of technological leapfrogging that is reflected in its patterns of exports. Schott (2008) also argues that China's export structure is increasingly overlapping in quality with industrialised countries. Using the same method as Rodrik (2006), Yao and Zhang (2008) estimate the domestic technological content of exports of two Chinese coastal provinces producing a huge amount of trade—namely, Jiangsu and Guangdong. They conclude that the domestic technological content of China's exports shows a V-shaped dynamic, suggesting that the technological content of China's exports is now at a stage of acceleration. Based on this finding, they conclude that the domestic technological content of China's exports will continue to rise in the future.

These analyses could, however, be misleading in that they might overlook the particularities of Chinese export trade, especially with respect to the variations of the structure of China's exports and the pattern of trade growth. Since the mid-1990s, China's integration with the global economy has intensified the international segmentation of production processes, and has accelerated the process of transferring labour-intensive

stages of production from other countries to China. Since the end of the 1990s, processing trade has continually accounted for half of Chinese foreign trade. After 2008, although the position of processing trade weakened, the proportion of processing trade in total trade remained at 48 per cent. Processing trade reflects the fact that China is in the downstream stage of international production fragmentation. Basic research, research and development (R&D) expenses and the intermediate stages of production are located mostly in foreign countries. China basically imports intermediate goods, then processes or assembles them domestically and mainly exports the final products to the United States and European and other industrialised markets. Thus, the technological content or complexity of its exports is not entirely provided by the Chinese producers, but rather should be partly attributed to foreign firms. Without considering China's special position within this international vertical specialisation, there will be an overestimation of the results of the complexity or technological content of the overall exports. Yao and Zhang (2008) note this problem, and develop a more reasonable definition of domestic technological content in China's exports. They use the same methods as Rodrik and others, which rank the technological content of export goods by their 'income content'. This approach means that the technological level or complexity embodied in production and trade is consistent with the general level of income among different countries. The more similar their income levels are, the more similar levels of technological contents they have in production and trade. This kind of approach has the limitation that it tends to look at the impact of horizontal differentiation between products (production technological condition can be seen as homogeneous) but overlooks vertical differentiation. In the international trade theories concerning product differentiation, export growth can be realised not only by the extensive margin on products and the expansion of product varieties, but also by the quality margin. It is therefore critical to examine vertical specialisation as well, in order to arrive at an accurate picture of China's export quality and technological content.

Technological content of exports with vertical specialisation

With the deepening of international specialisation, which has extended from inter-industry and intra-industry specialisation to intra-product specialisation, vertical specialisation among production processes has become the new source of international trade development. Along with continually decreasing costs of transportation and communication, different stages of production have been increasingly dispersed into different countries or regions, leading to the rapid development of component trade (Li et al. 2010). Techniques used at different stages of the vertical production chain will be different. From upstream to downstream production stages, there exists an ascending trend of labour intensiveness in the production process as the processes themselves have become more standardised. The opposite trend in the embodied technology in these processes occurs, however, as competition forces upstream firms to become more innovative in developing new products as well as new ways of production. In this context, the nearer to the end of the production chain a country is located, the higher will be the proportion of the embodied technology of its exports coming from other countries.

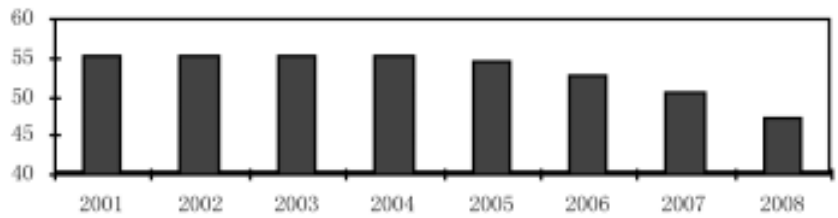
To examine how China positions itself in the production chain of international specialisation, we use the Broad Economic Classification (BEC) method to divide China's foreign trade into different production stages. Table 5.2 shows that China's imports of intermediate products, though declining, account for relatively high shares in its total imports, while exports are predominantly final products. Within the intermediate-goods imports, the proportion of parts and components shows a declining trend, but has always been higher than the proportion of semi-finished products. Final product exports comprise mainly consumer goods, but the proportion of capital-goods exports is increasingly rising, with a trend that looks likely to surpass that of consumer goods in the near future. This pattern of trade in China generally reflects the fact that Chinese manufacturing has tended to concentrate in the downstream phase of international vertical specialisation. As shown in Figure 5.1, after joining the World Trade Organisation (WTO), China's processing trade has maintained the same proportion of about 50 per cent of total exports, with a declining trend demonstrated only in recent years. Such a trend of declining share of component trade might reflect the fundamental structural changes in China's position in international specialisation.

Table 5.2 China's pattern of trade by stage of production, 1995–2009 (per cent)

	Imports		Exports	
	1995	2009	1995	2009
Total	100.0	100.0	100.0	100.0
Primary goods	9.7	24.5	4.5	1.0
Manufactured goods	90.3	75.5	95.5	99.0
Intermediate goods	61.0	53.2	31.3	37.6
Semi-finished goods	14.7	22.8	7.4	17.6
Parts and components	46.3	30.5	23.9	20.0
Final goods	29.3	22.3	64.2	61.3
Consumption goods	7.0	6.1	52.4	32.5
Capital goods	22.3	16.2	11.8	28.8

Source: Authors' calculations using the data taken from Information Center of China Customs (Various years).

Figure 5.1 Share of processing trade in China's total exports



Source: Authors' calculations using data taken from Information Center of China Customs (Various years).

This pattern of China's trade and specialisation raises a cautious note when one examines the relationship between changes in China's export structure and the technological content of exports. The question we ask is whether the improvement of the export structure reflects technological progress in production?

To better explain changes in the technological level of China's exports, we calculate the structure of exports with processing trade and without processing trade and compare them to see whether there are substantial differences in the technological content of China's exports under the two circumstances. Here we apply the product technology classification standard in Lall (2000) to divide manufactured exports into four categories: resource-based products (RP), low-technological products, medium-technological products, and high-technological products. Within the category of low-technological products there exist two subcategories: textile and apparel products (LT1) and other low-technological products (LT2). Within the category of medium-technological products there exist three subcategories: automotive products (MT1), medium-technological processing products (MT2), and engineering mechanical products (MT3). Within the category of high-technological products there exist two subcategories: electrical and electronic products (HT1) and other high-technological products (HT2). There are altogether eight categories of products.

During 2001–08, the proportion of high-tech manufactured exports showed a trend of continuous annual growth, which exceeded that of low-tech manufactured goods to become the most important product type of export. At the same time, exports of medium-tech manufactured goods also showed a trend of continuous annual expansion.

The results also show that the proportions of MT1, MT3, HT1 and HT2 products in China's overall exports have increased (Table 5.3). We can see that the types of products that have demonstrated an increasing trend in the proportion of exports are all located at the higher end of the technological chain. Although the proportions of LT1 and LT2 products showed a declining trend in total exports and were less than those of the HT1 and MT3 products in 2008, the total proportion of about 30 per cent of low-tech products in total exports in China continued to occupy an important position. That is, the advantages of cheap labour in China still play an important role in determining its pattern of exports.

Table 5.3 Structure of China's manufactured exports by product, 2001–08 (per cent)

Year	Resource based	Low tech		Medium tech			High tech	
		LT1	LT2	MT1	MT2	MT3	HT1	HT2
2001	9.4	23.1	17.2	1.6	5.0	12.9	23.1	2.2
2002	9.0	22.7	15.5	1.7	4.4	14.0	26.1	2.1
2003	8.2	20.5	15.2	1.7	4.7	14.1	28.2	2.3
2004	7.8	17.8	15.2	1.9	5.4	14.0	30.3	2.6
2005	8.0	18.2	14.8	2.0	4.8	14.6	30.4	2.7
2006	7.9	17.7	15.3	2.1	4.5	15.2	31.3	2.6
2007	8.0	14.1	18.4	2.3	4.4	16.9	29.3	2.8
2008	8.3	15.6	14.2	2.7	4.8	16.7	28.3	3.1

Source: Authors' calculations using the data taken from Information Center of China Customs (Various years).

Among China's exports of manufactures, the proportions of LT1, LT2 and HT1 products are higher than the world average, while those of MT1, MT2, MT3 and HT2 are lower than the world average (from 2000 to 2005). The medium-tech manufactures comprise mainly automotive products, medium-tech processed products and engineering machinery, which are all capital-intensive products. These calculations show that the proportion of China's automobile exports has been less than one would expect given the rapid growth of that industry in China. Part of the reason for this might be the fact that the industrial concentration of the automotive industry is relatively low and the industry depends heavily on imported technology. But we can also see that the proportion of such exports has gradually been increasing. The proportions of China's medium-tech processed exports, such as chemical products and synthetic fibres, are lower than the world average, indicating that the technological level in these categories of exports has further room to develop. The proportion of exports of engineering machinery was slightly lower than the world average, but in recent years it has shown a steady upward trend and has now reached the world average. HT1 products have become the greatest force in influencing China's export growth. Such a conclusion seems to confirm the point of view of Rodrik, Schott and others. It is noteworthy, however, that we observe the unsatisfactory performance of exports of medium-tech manufactured goods (MT1, MT2 and MT3), and these kinds of products best reflect China's technological depth. The export share of these three products has been lower than that of the world average (from 2000 to 2005).

The calculations show that changes in the exports of these listed products might not be an accurate reflection of China's technological level. Because of the high share of processing trade, the technology level embodied in China's exports might come mainly from other countries or regions through the direct investments of multinational corporations. If we analyse a country's trade structure and examine the competitiveness of its export products merely using the traditional technological content method of classification, we can only tell what kind of products the country exported, without gaining knowledge about the true technological content for the country. It is therefore important that we eliminate the impact of processing trade in order to more accurately assess the technological content of China's exports.

Table 5.4 shows the structure of manufactured exports without including processing trade. In contrast with the findings above, this shows clearly that low-tech manufactured exports occupy the absolute dominant position in China's total exports. The proportion of high-tech exports of manufactured goods is even lower than that of medium-tech products, which has the lowest share of exports among the three categories. Although the proportions of medium and high-tech products such as MT1, MT2, MT3 and HT1 products have also shown a rising trend, the absolute proportions of these products are very low compared with low-tech manufactures of LT1 and LT2, which themselves are lower than the world average and are not the main force in determining China's overall exports. At the same time, the proportion of HT1 products has shrunk a great deal compared with the previous analysis and is far below the world average. In the category of low-tech manufactures, the proportion of LT1 products has declined since 2006, but the proportion of LT2 products actually shows an upward trend, both of which together maintained a level of 40 per cent—higher than the 30 per cent figure found without removing processing trade. LT2 has replaced the previous

dominant position of HT1 products in this ranking. These results show that of those exports for which the production process has been truly finished in China, low-tech products still account for a large proportion, and, in that context, cheap labour is still the largest source of comparative advantage in determining China's pattern of foreign trade.

Table 5.4 Structure of China's manufactured exports excluding processing trade, 2001–08 (per cent)

Year	Resource based	Low tech		Medium tech			High tech	
		LT1	LT2	MT1	MT2	MT3	HT1	HT2
2001	18.1	33.1	20.7	2.7	6.8	10.1	5.9	2.5
2002	16.8	34.9	19.3	2.7	6.7	9.7	7.4	2.4
2003	15.6	33.2	20.9	3.1	7.0	10.0	8.0	2.2
2004	13.9	29.7	22.6	3.5	9.2	10.3	9.0	1.9
2005	13.7	30.6	22.7	3.6	7.8	10.9	9.1	1.7
2006	12.7	29.3	24.0	3.9	7.2	11.4	9.9	1.6
2007	12.4	23.6	29.2	4.2	6.7	12.7	9.8	1.6
2008	12.2	23.4	23.8	4.6	6.9	15.1	12.2	1.9

Source: Authors' calculations using the data taken from Information Center of China Customs (Various years).

The sharp reduction of the export proportions of HT1 and HT2 products when processing trade is eliminated from the calculation confirms our initial speculation that among most of China's exports of high-tech products, products involving processing trade account for a large proportion. After removing processing trade, the proportion of exports of HT1 products declines sharply, which might more accurately reflect the actual technological level of China's exporting enterprises.

On the other hand, because processing trade is carried out mainly by foreign-owned enterprises, the proportion of processing trade in local enterprises' exports is far lower than that of foreign enterprises. Despite the significant decline of the proportion of high-tech products after removing processing trade, the growth rate of various types of products remained at a higher level compared with the situation before removing processing trade (not including resource-based products and that of HT2 products is slightly lower than before). For HT1 products, their average annual growth rate after removing processing trade was 45 per cent, while that of the previous case without excluding processing trade was 32 per cent. This might show that there is growth potential for increasing the technological level of China's local exporting enterprises, which is consistent with the conclusion of Yao and Zhang (2008).

The evidence above is a negation of the point of view of Rodrik and others by showing that the technological content embodied in the product does not accurately reflect China's own technological level. In reality, the international specialisation in which China has been involved has deepened further into the intra-product level. It is therefore not a clear-cut process to determine how much of the technological content of China's exports is determined by its own contribution. Without taking this fact into account, one might greatly overestimate the technological content of China's exports. In fact, the fundamental

pattern of China's foreign trade does not break away from its underlying comparative advantage. This also suggests that China's export structure does not much exceed the level of its development.

China's position on the quality ladder

If technological content is an important indicator for measuring the improvement of trade structure then product quality can be used more directly to reflect whether a country's export structure has experienced a 'substantial' change. Differences between product qualities are linked to differences in consumers' evaluations of these qualities. These evaluations about product quality are reflected in changing consumer preferences and consequently product prices, with the reservation prices of high-quality products being higher than those of low-quality products. Therefore, we can use the price of a product as a proxy to evaluate its quality. In the international market, for the same kinds of products coming from different countries, the ones with higher prices are often of relatively higher quality. The export price is usually expressed by an indicator of unit value, which is defined as the amount or value of exports divided by the quantity of exports. There are some flaws to using export-value indicators to measure export quality (Aiginger 1995, 1997), but it is a simple method to use.

Here we use the price–quality range method to divide exports into three categories by their quality: low-quality products, medium-quality products and high-quality products (Fontagné et al. 2007). The specific sub-method is as follows.

We first calculate the world average export unit value, $\overline{UV}$ (the trade-weighted average unit value of exports of the same product from all countries), at the product level. If the export unit value of a product is below 75 per cent of the world average then it is considered a low-quality product; if the export unit value of a product is higher than 125 per cent of the world average then it is regarded as a high-quality product; and the products with export unit values ranging between those two levels are regarded as medium-quality products. That is, the export unit values for low-quality products lie in the interval $[0, 0.75\overline{UV}]$; those for medium-quality products lie in the interval $[0.75\overline{UV}, 1.25\overline{UV}]$ and those for high-quality products lie in the interval $[1.25\overline{UV}, \infty]$.

Data measuring the quality of exports are collected from BACI database of the French Institute for Research on the International Economy (CEPII) (Gaulier and Zignago 2010). The BACI database includes export unit values and trade data for products at the HS six-digit level, in which the transportation costs and insurance costs have been removed when providing the unit value.

Table 5.5 shows the quality distribution of manufactured products for some of the world's leading export countries including China in 2007. First, the quality of export products of industrialised countries is obviously higher than that of the developing countries, which verifies the positive correlation between the level of economic development and the product quality. Second, we find that China has a special export quality range among the countries listed. The share of high-quality products in China's manufactured exports is not only far below the world average, but also significantly lower than those countries with similar

levels of development, such as Brazil, India and Mexico. On the other hand, the share of low-quality products ranks the highest in China's manufactured exports, and China is the only country whose low-quality products account for more than half of the country's total manufacturing exports. Therefore, China's exports depend more on low-quality products, which become the main driving force to promote China's export growth. From this point of view, China not only has a large gap in quality with the industrialised countries, it also has a gap with developing countries.

Table 5.5 Structure of manufactured exports by quality for selected countries, 2007 (per cent)

	High quality	Medium quality	Low quality
China	11.9	37.9	50.2
Germany	32.9	36.4	30.6
United States	27.4	42.6	30.0
Japan	28.4	36.7	34.9
France	32.3	37.5	30.2
Italy	31.3	37.0	31.7
United Kingdom	34.1	34.6	31.3
Korea	27.1	38.0	34.8
India	16.9	45.7	37.4
Brazil	13.1	47.3	39.6
Mexico	19.8	39.4	40.8
World	24.7	37.8	37.5

Source: Authors' calculations using the data taken from Gaulier and Zignago (2010).

The dynamic characteristics of the qualities of Chinese exports are shown in Table 5.6. During 2001–07, the proportion of high-quality products in China's manufactured goods showed a declining trend—falling from 14.8 per cent in 2001 to 11.9 per cent in 2007; low-quality products showed similar trends of decline; while the proportion of medium-quality products showed an increasing trend. These results show that upgrading of the quality of Chinese exports has been taking place only in medium-quality products, while the upgrading of high-quality products had not shown any obvious sign of increase by 2007.

Table 5.6 Structure of China's manufactured exports by quality, 2001–07 (per cent)

		2001	2002	2003	2004	2005	2006	2007
Total	High quality	14.8	12.7	9.2	10.2	17.1	11.3	11.9
	Medium quality	28.4	26.9	24.2	24.0	33.1	46.2	37.9
	Low quality	56.8	60.4	66.7	65.9	49.8	42.5	50.2
High tech	High quality	15.0	13.4	10.4	11.9	17.0	12.9	10.1
	Medium quality	13.5	17.3	17.2	18.6	31.5	48.1	34.8
	Low quality	71.6	69.3	72.5	69.5	51.5	39.0	55.1
Medium tech	High quality	13.7	12.9	7.8	8.5	15.3	8.8	13.5
	Medium quality	25.8	24.4	20.9	21.4	33.9	45.6	35.3
	Low quality	60.5	62.7	71.3	70.0	50.9	45.6	51.2
Low tech	High quality	14.0	11.2	7.8	7.1	18.8	11.0	12.3
	Medium quality	35.3	33.2	29.1	27.7	33.0	46.0	42.7
	Low quality	50.7	55.7	63.2	65.2	48.2	43.0	44.9

Source: Authors' calculations using the data taken from Gaulier and Zignago (2010).

The dynamic change in China's manufactures with different types of technological content appears to be unique. For example, relative to the medium and low technology-intensive products, the proportion of high-quality products in high-tech manufactured exports is the lowest, while that of the low-quality products is the highest. This confirms the so-called assertion of 'low-end processing in high-end industry'. This is also consistent with the conclusion in the previous section that the proportion of high-tech manufactured goods sharply declined after removing processing trade from total trade.

These analyses could indicate that China's exports are in a relatively disadvantageous position in terms of international competition for quality. In these circumstances, one could ask why China's exports have maintained such rapid growth momentum in the international market. An answer to this question goes beyond China's rich factor endowments of cheap labour and even the Government's export-encouraging policies to look at the competitive strategies of Chinese enterprises. For a long time, Chinese enterprises have taken full advantage of cheap labour, using the means of low cost-based price competition to explore the international market continuously, particularly for those enterprises involved in export processing. In order to be price competitive, enterprises have paid more attention to cost control, and less attention to quality improvements. China's exporters therefore rely heavily on the export of low-cost, low-quality products to boost export growth. As the proportion of processing trade is too high in China's high-tech exports, high-tech products tend to have low-end processing and assembly in the domestic production processes with low value added. This is the basic reason why China's exports can be sold at cheap prices with low quality in the international market.

Risks in China's low-quality and low-cost export growth model

With this conclusion, we can now evaluate the growth pattern of China's exports. Needless to say, the low-quality, low-cost export growth model has been a great success in the past three decades. Such a model for export growth, however, involves more and more risks in the changing international business environment. First, China is entering an era in which its 'demographic dividend' will begin to be exhausted (Wang and Cai 2009). This will have some important implications for future growth in China. According to the experiences of Japan and other industrialised countries, the negative impact of an ageing workforce on labour productivity needs to be made up by faster progress in innovation, otherwise it will be difficult to reverse the decline of productivity growth. More importantly, in the context of this analysis, against the background of rising wages and other costs of production, Chinese enterprises will be compelled to innovate in order to maintain their competitiveness on international markets. This will further push the structural change in the economy moving in the direction of producing and exporting more high value-added goods with improved quality.

Second, relying predominantly on low price competition has put great pressure on the exporting enterprises themselves. Although low price competition has allowed Chinese enterprises to occupy larger international market shares, it has also constantly squeezed corporate profits. Such a competitive strategy is not conductive to the sustainability of exporting enterprises and threatens their survival in the long term. As observed by Steinfeld (2007:291):

> Chinese firms are structured in a fashion that allows them to compete extremely effectively on the basis of low cost in relatively low-value manufacturing activities. The problem is that this structure does not easily allow them to move upward in the production chain into more innovative, higher-return activities: control over brands, provision of unique services, or development of proprietary knowledge. To the extent that Chinese firms remain shut out of these activities and locked in basic manufacturing, they have no choice but to compete on the basis of cost, thus eroding their profit margins and further inhibiting efforts to upgrade.

Third, due largely to this low-cost-based competitiveness of China's exporters on international markets, the Chinese Government is extremely sensitive about policy adjustments that might nevertheless be appropriate, including renminbi (RMB) appreciation. This prevents China from exercising a more independent exchange rate policy in its macroeconomic management in the face of global imbalances and domestic economic overheating. Another example is that to protect its exporters in the face of low-cost competition, the Government has to implement the export tax rebate policy, which encourages the export of a large number of processing enterprises. As a result, part of the government tax rebate has become the main source of profit of these enterprises. Such a policy is distortionary in that it disturbs the 'level playing field' or the incentive structure of the enterprises and thereby is not conducive to the long-term development of those enterprises. For example, if there is total abolition of this policy, many companies could face bankruptcy. That is why such a policy is always recurring. Moving towards producing high

value-added products with high quality by exporting enterprises will ease the pressure on the policy front as those products with high selling prices are less sensitive to policy changes with respect to the exchange rate and tax rebates.

Fourth, the expansion of China's low-cost, low-quality exports could easily lead to trade disputes, especially with industrialised countries. Precisely because the Chinese enterprises have an obvious price advantage in international competition, their exports have had a great impact on the similar industries and enterprises in importing countries, which can easily trigger trade protectionism in these countries. China has become the largest targeted country of anti-dumping in the world. According to the statistics released by the WTO, from 1995, when the WTO was founded, to June 2008, there were altogether 3305 anti-dumping investigations launched worldwide, of which 640 cases were taken against China—accounting for nearly one-fifth of all the cases. Table 5.7 shows the distribution of anti-dumping cases of the United States during 2002–08. It shows that China has the highest number either in the investigation and adjudication in the US anti-dumping cases or for the anti-dumping tax rates being imposed. Trade barriers imposed on goods made in China are harsh and discriminatory. Again, following the discussion of this chapter, it is clear that for the long-term interest of Chinese exporting enterprises, it is critical for them to move up the value chain in producing and exporting their products. This is because those high value-added and more differentiated products better match consumer preferences in industrialised countries and therefore are less likely to be subject to anti-dumping claims.

Table 5.7 US anti-dumping claims against its most frequently investigated trading partners

Rank	Partner	Investigations	Injury (share)	Only country in investigation (share)	Mean duty
1	China	56	44 (78.6%)	24 (42.9%)	158.4%
2	India	14	5 (35.7%)	2 (14.3%)	44.1%
3	Korea	10	3 (30.0%)	0	27.8%
4	Japan	9	3 (33.3%)	5 (55.6%)	104.0%
5	Germany	7	2 (28.6%)	0	78.7%
6	Mexico	6	3 (50.0%)	0	26.4%
7	South Africa	6	1 (16.7%)	3 (50%)	121.39%
8	Canada	6	1 (16.7%)	5 (83.3%)	20.88%
	Total	114	62 (54.4%)	39 (34.2%)	128.5%

Sources: Bown (n.d.); USITC (2008).

Conclusions

This chapter examined the changes in China's export structure from two dimensions: the technological content and the quality of exporting products. We find that after considering the impact of international vertical specialisation, the technological content of Chinese exports demonstrates a pattern of change that is different from what the literature has portrayed to be the case. The proportion of high-tech products has dropped significantly,

and the domestic technological content of exports has not increased significantly. The super-normal export growth model mentioned by Rodrik (2006) and others does not exist in China after removing processing trade from China's total trade.

A policy implication is that China has long been dependent on low-cost and low-quality products to boost its export growth. The high-tech content of China's exports is strongly dependent on foreign technology embodied in processing trade. The chapter points out that such an export growth model has a number of risks and therefore cannot be sustained. It is therefore necessary to alter the pattern of China's export growth in the future. China has now become the largest manufacturing producer in the world. The next task is to ensure that Chinese firms move up the value chain in producing high-quality products in the next phase of their growth and development. For enterprises to be more innovative, it is important for the Government to implement policies on innovation through increasing R&D expenses and investment for education and training. It is also important to deepen institutional reform, including those reform measures undertaken at the firm level, such as changes in corporate governance addressing innovation issues through proper incentives. In realising this, China can complete the shift from relying predominantly on the traditional strategy of low-cost price competition to relying mainly on the quality-oriented strategy of non-price competition on global markets.

Bibliography

Aiginger, K. 1995, The unit value as a complementary indicator for the assessment of the competitive position of the USA, EU and Japan, Paper presented to the conference On the Future of Industry in Advanced Societies, MIT, Boston.

Aiginger, K. 1997, 'The use of unit values to discriminate between price and quality competition', *Cambridge Journal of Economics*, vol. 21, no. 5, pp. 571–92.

Amiti, M. and Freund, C. 2008, *An anatomy of China's export growth*, Policy Research Working Paper Series 4628, The World Bank, Washington, DC.

Bown, C. n.d., *Anti-Dumping Database Version 5.0*, Brandeis University, Waltham, Mass., <http://www.brandeis.edu/~cbown/global_ad/>

Cui, L. and Syed, M. 2007, *The shifting structure of China's trade and production*, IMF Working Paper WP07-214, International Monetary Fund, Washington, DC.

Fontagné, L., Gaulier, G. and Zignago, S. 2008, 'Specialization across varieties and North–South competition', *Economic Policy*, vol. 23, no. 53, pp. 51–91.

Garnaut, R. 2010, 'Macroeconomic implications of the turning point', *China Economic Journal*, vol. 3, no. 2 (July), pp. 181–90.

Hummels, D. and Klenow, P. 2005, 'The variety and quality of a nation's exports', *American Economic Review*, vol. 95, pp. 704–23.

Information Center of China Customs various years, *China Customs Statistics*, Information Center of China, Beijing.

Lall, S. 2000, 'The technological structure and performance of developing country manufactured exports, 1995–1998', *Oxford Development Studies*, vol. 28, no. 3, pp. 337–69.

Li, K. and Wang, X. 2009, 'China's foreign trade: trends and issues after WTO accession', in C. Chen (ed.), *China's Integration With the Global Economy*, Edward Elgar, Cheltenham, UK, pp. 19–36.

Li, K., Song, L. and Zhao, X. 2010, 'Component trade and China's global economic integration', in A. U. Santos-Paulino and Wan, G. (eds), *The Rise of China and India: Impacts, prospects and implications*, Palgrave Macmillan, New York, pp. 241–61.

McKay, H. and Song, L. 2010, 'China as a global manufacturing powerhouse: strategic considerations and structural adjustment', *China and World Economy*, vol. 18, no. 1 (February), pp. 1–32.

Rodrik, D. 2006, 'What's so special about China's exports?', *China and World Economy*, vol. 14, no. 5, pp. 1–19.

Schott, P. 2008, 'The relative sophistication of Chinese exports', *Economic Policy*, vol. 53 (January), pp. 5–49.

Steinfeld, E. S. 2007, 'Innovation, integration, and technology upgrading in contemporary Chinese industry', in Karen R. Polenske (ed.), *The Economic Geography of Innovation*, Cambridge University Press, UK, pp. 289–309.

Thirlwall, A. P. 2006, *Growth & Development: With special reference to developing economies*, [Eighth edition], Palgrave Macmillan, New York.

United Nations Statistics Division (UNSD) n.d., *United Nations Commodity Trade Statistics Database*, United Nations Statistics Division, New York.

United States International Trade Commission (USITC) 2008, *Import Injury Investigations. Case statistics (FY 1980–2007)*, December 2008, United States International Trade Commission, Washington, DC.

Wang, D. and Cai, F. 2009, 'The demographic dividend and sustainability of China's economic growth', in F. Cai and D. Yang (eds), *The China Population and Labour Yearbook. Volume 1: The approaching Lewis turning point and its policy implications*, Brill, Leiden and Boston, Mass., pp. 65–83.

Yao, Y. and Zhang, Y. 2008, 'Dynamics of the domestic technological contents of China's exports, evidence from the whole country and from Jiangsu Province and Guangdong Province', *Social Science in China*, no. 2 (March), pp. 67–82.

6 The Development of China's FDI Laws and Policies after WTO Accession

Chunlai Chen

Introduction

Policies and reforms relating to foreign direct investment (FDI) have been among the most fundamental aspects of China's economic reforms. During the past three decades, China's change of attitude from restricting to passively attracting and then to actively selecting inward FDI has been fully reflected by the evolution of its FDI policies, laws and regulations. Given China's global ranking as an FDI destination and the vast quantity of FDI inflows into its domestic economy (accumulative FDI inflows of about US$1000 billion during the past three decades), this reform process relating to FDI appears to have been extremely successful.

After China's accession to the World Trade Organisation (WTO) in 2001, China further liberalised its FDI regime in conformity with WTO rules and requirements. In terms of trade in goods, China progressively lowered its tariffs and phased out non-tariff measures, with its simple average tariff rate dropping from 42.9 per cent in 1992 to 15.3 per cent at the beginning of 2002, and further to 9.8 per cent in 2010. China has also made substantial commitments in services, opening up more sectors to international trade than any other WTO member. Furthermore, China agreed to fully implement the General Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) to provide intellectual property rights protection and enforcement, while also committing to comprehensively implement the Agreement on Trade-Related Investment Measures (TRIMs) after entering into the WTO, and to reduce foreign investment barriers and to liberalise its FDI regime.

China's accession to the WTO has had a positive impact on its FDI policy regime, particularly with regard to national treatment and transparency. Meanwhile, it has also provided the impetus for China to improve its competition policies, industrial policies and intellectual property rights protection and enforcement. The development of China's FDI laws and policies since WTO accession has been marked by the rapid development of a systematic regulatory framework to facilitate and regulate FDI. Two characteristics are prominent. First, emphasis has been placed on the creation and development of a more consistent and systematic regulatory framework. Second, more efforts have been made to create and amend the legislation in conformity with international rules and requirements for FDI.

This chapter aims to provide an overview of the development of China's FDI laws and policies since its WTO accession. The next section discusses the main changes in the three laws governing the legal entities of FDI firms—namely, the Equity Joint Venture Law, the

Contractual Joint Venture Law and the Wholly Foreign-Owned Enterprise Law. The main features of the Provisions on Cross-Border Mergers and Acquisitions (M&As) and the Anti-Monopoly Law are then presented, followed by a discussion of the development and adjustments of industrial policies for FDI. The chapter then analyses the unification of the tax system for domestic and FDI firms, before drawing some conclusions regarding future liberalisation prospects and challenges.

Amendments of laws governing the legal entities of FDI firms

According to China's laws, foreign investors may choose three main legal entities to invest in China—namely, equity joint ventures, contractual joint ventures, and wholly foreign-owned enterprises. In the 1990s, some new forms of FDI were gradually allowed, such as limited companies with foreign investment and foreign-invested holding companies.

The Equity Joint Venture Law was issued in 1979, and was China's first law permitting and governing the establishment and operations of foreign economic entities in its territory. In 1986, to accommodate the needs of foreign investors and to attract more FDI inflows, the Chinese Government issued the Wholly Foreign-Owned Enterprise Law. In 1988, the Contractual Joint Venture Law was finally adopted.

The Equity Joint Venture Law was amended in 1990 to abolish the stipulation that the chairman of the board of an equity joint venture should be appointed by Chinese investors and to add the provision of protection from nationalisation.

In 1994, China issued the Company Law. The Company Law did not do away altogether with the three legal entities of FDI firms. Instead, it attempted to reclassify them under one of the two classes of companies: the limited-liability company and the company limited by shares. Based on the Company Law, foreign joint ventures and wholly foreign-owned enterprises are all limited-liability companies.

To meet the requirements of entering the WTO, the Chinese Government amended the Wholly Foreign-Owned Enterprise Law and the Contractual Joint Venture Law in 2000, and the Equity Joint Venture Law in 2001 substantially.[1] The amendments removed earlier restrictions in the areas of foreign exchange balance requirements, raw materials and equipment sourcing, mandatory export requirements, and reporting of business plans. These legislative amendments represent the first major step on the part of the Chinese Government to honour its commitments under pending WTO membership. The key amendments are listed below.

Abolition of the foreign exchange balance requirement

Previously, FDI firms were required to balance their own foreign exchange income and expenses. Pursuant to the earlier requirements, where an FDI firm desired to make payments or remittances in foreign currency outside China, these had to be made from the company's own foreign exchange funds. The foreign exchange balancing requirement has now been deleted from the law. Foreign direct investment firms may now purchase foreign currency from commercial banks under the new legal regime, subject to the satisfaction of the relevant foreign exchange control rules.

Equal access to domestic and overseas suppliers

Foreign direct investment firms were required under previous laws to give priority to domestic suppliers when sourcing their raw materials and equipment. The new amendments permit free sourcing of raw materials, fuel, components, and so on from either China's domestic market or overseas, without priority requirements favouring domestic suppliers.

Removal of the mandatory export requirement

Previously, the Wholly Foreign-Owned Enterprise Law required FDI firms to export at least 70 per cent of their production, except where special exemptions were granted, such as for advanced technology contributions. Mandatory export requirements were also imposed on joint ventures, in order to support the earlier foreign exchange balance requirement. Under the newly adopted amendments, mandatory export requirements have been removed. China will encourage the use of advanced technology and the export of products, but each FDI firm shall be free to allocate sales of its products to either China's domestic or its export market.

Abolition of business plan filing

Previously, FDI firms were required to file their production and business plan with the relevant government authority. The newly adopted amendments repeal this requirement, as the current focus for government control is on macroeconomic matters, rather than the operations of individual enterprises.

In 2005, China fundamentally amended the Company Law. The new Company Law,[2] which came into effect on 1 January 2006, is a significant reform of the old Company Law. The old Company Law had been criticised for various deficiencies, especially in terms of corporate governance. The new Company Law simplifies company establishment requirements and statutorily expands the rights of shareholders in China's companies.

The provisions of the new Company Law apply to FDI firms to the extent that they do not conflict with the statutes governing these investment vehicles—namely, equity joint ventures, cooperative joint ventures and wholly foreign-owned enterprises. Each of these forms of FDI firms is organised in China as a limited-liability company. The statutes and associated regulations provide for specific and unique provisions concerning each of these three legal entities of FDI firms in China. Where the unique provisions do not apply, the provisions of the new Company Law apply.

The issue of provisions on cross-border mergers and acquisitions and the Anti-Monopoly Law

During the past two decades, global FDI flows have been dominated by cross-border M&As, particularly in the services sector. Cross-border M&As in China have, however, been very limited due to the tight restrictions imposed by the Chinese Government. Since 2003, the Chinese Government has permitted foreign investment through cross-border M&As in a limited fashion. To fulfil its WTO commitments, and to further liberalise the FDI regime and attract more FDI, China issued the Interim Provisions on Mergers and Acquisitions of Domestic Enterprises by Foreign Investors[3] in 2003 (also referred to hereinafter as 'the Provisions'). This is the first comprehensive set of regulations on cross-border M&As in China.

After a three-year trial period of the Interim Provisions on M&As, on 8 August 2006, six Chinese ministries jointly issued the Provisions on Mergers and Acquisitions of Domestic Enterprises by Foreign Investors,[4] which took effect on 8 September 2006. The Provisions establish new rules for foreign investors acquiring interests in China's domestic companies.

The Provisions apply to any M&As by foreign investors, including foreign companies, foreign-invested investment companies registered in China, and foreign-invested enterprises (collectively referred to as 'foreign investors') of domestically registered companies, including limited-liability companies, companies limited by shares, state-owned enterprises, private companies and foreign-invested enterprises (collectively referred to as 'domestic companies').

The Provisions define that a merger or acquisition of a domestic enterprise by foreign investors could mean either an equity acquisition or an asset acquisition. An equity acquisition is defined as the acquisition by foreign investors of equity interest in a domestic company or the subscription by foreign investors of new equity in a domestic company, resulting in the conversion of such a domestic company to an FDI firm. An asset acquisition is defined as including both: 1) the establishment of an FDI firm by foreign investors with the purpose of using the FDI firm to acquire and operate assets purchased from domestic companies; and 2) the direct acquisition of assets from domestic companies by foreign investors who then use those assets for establishing an FDI firm.

The Provisions represent a further opening towards cross-border M&As in line with standard international practice in that they allow for the first time the acquisition of equity interests held by shareholders of a Chinese domestic company by payment of equity interests held by shareholders of an overseas company or new shares issued by an overseas company. The Provisions increase corporate transparency by requiring parties to a cross-border acquisition to disclose whether or not they are affiliated with each other and, if they are under the common control of the same entity, to provide additional information regarding the purpose of the acquisition and whether the appraisal results conform to fair market value. The Provisions make specific and detailed provision for the use of a special-purpose vehicle (SPV) overseas by Chinese domestic firms making acquisitions in China—an important addition in view of the generally unrecorded but widespread practice of

'round-tripping' by Chinese companies seeking to benefit from incentives offered to foreign investors. The Provisions also establish interim anti-monopoly review procedures to protect market competitiveness and stability until the anti-monopoly law is promulgated.

On the other hand, the Provisions add a new screening requirement on cross-border M&A transactions in which the foreign investor obtains controlling rights of a domestic enterprise if the acquisition: 1) involves a major industry; 2) has or might have an impact on national economic security; or 3) might result in the transfer of famous trademarks or traditional Chinese brands. The lack of definition of terms, including 'major industry', 'impact' on 'national economic security', 'famous' trademarks and 'traditional' Chinese brands, appears to render the new screening requirement less than wholly transparent. The creation of a new layer of screening is in addition to the examination and approval process based on the *Catalogues for Guidance of Foreign Investment Industries*. It does not appear consistent with the repeatedly expressed intention of the Chinese authorities to streamline FDI approval procedures.

Although there are differences of opinion regarding whether the Provisions actually encourage or restrict foreign investment, there are positive indications that the legal environment for inward cross-border M&As in China is becoming more flexible (for example, use of shares as consideration) and settled (for example, more detailed approval procedures have been introduced).

After more than 10 years of debate and drafting, China enacted its first ever Anti-Monopoly Law,[5] in 2007, commencing operation on 1 August 2008. Article 1 of this law states that it was enacted for the purpose of preventing and prohibiting monopolistic activities; protecting fair market competition; promoting efficiency of economic operation; protecting the legitimate rights and interests of consumers and social public interests; and promoting the healthy development of a socialist market economy. The law sets out various rules regarding the regulation or prohibition of monopoly agreements, including resale price maintenance, price fixing, and anti-competitive supply and market practices. Various agreements may be exempted from the prohibition of monopoly agreements, including those that relate to technology development, cost reduction and resources preservation. Undoubtedly, the Anti-Monopoly Law will have significant implications on FDI in China, especially for FDI through cross-border M&As.

The Anti-Monopoly Law itself does not distinguish between foreign and domestic businesses. Until July 2009, however, foreign investors were also subject to pre-merger notification and competition review under the Provisions on M&As. In order to ensure that the Provisions on M&As agree with the Anti-Monopoly Law and the Provisions of the State Council on Thresholds for Declaration of Concentrations of Undertakings, the Chinese Government made some revisions to the Provisions on M&As and the new Provisions on Mergers and Acquisitions of Domestic Enterprises by Foreign Investors,[6] to take effect in July 2009. The new Provisions on M&As conform to the pre-merger notification and review provisions in the Anti-Monopoly Law, so that foreign buyers would be subject to only one competition notification and review requirement, under the Anti-Monopoly Law.

According to the Anti-Monopoly Law, if market concentration reaches the threshold of declaration, a declaration must be lodged in advance with the Anti-Monopoly Authority under the State Council. Cross-border M&As are regarded as one method of increasing concentration, and should certainly be regulated. The new Provisions on M&As add one article to regulate the same standard and requirement as the Anti-Monopoly Law in order to maintain consistency across different laws and regulations. Meanwhile, a few linguistic changes have been made in order to avoid controversy and misunderstanding. The modification in the new Provisions on M&As ultimately ensures the general terms' accurate use in different laws and regulations.

Adjustments of industrial policies for FDI

China has comprehensive industrial polices to guide FDI into targeted industries in accordance with its economic and industrial development strategy. In 1995, China issued the Interim Provisions on Guiding Foreign Investment and the *Catalogue for the Guidance of Foreign Investment Industries* (hereinafter referred to as the Catalogue). This was the first time China used laws and regulations to guide FDI. The interim provisions were formulated in order to provide guidance for FDI towards sectors that suit China's national economic and social development plan, and protect the lawful rights and interests of foreign investors in accordance with relevant state laws governing FDI and the requirements of state industrial policy. As a general industrial policy, the Catalogue is a longstanding tool of the Chinese authorities to reflect their decisions and approach towards FDI in various industries at different stages of Chinese economic development. Foreign investors shall first consult with the most updated catalogue to confirm the entry possibility and mode of investment vehicle in the industries in which they intend to invest.

To suit the development of FDI and fulfil China's commitments to the WTO in trade and investment liberalisation, in 2002, China issued the Provisions on Guiding the Orientation of Foreign Investment.[7] The provisions classify FDI into 'encouraged', 'permitted', 'restricted' and 'prohibited' categories. Foreign direct investment in encouraged industries is normally eligible for various incentives and investors are also permitted to establish wholly foreign-owned enterprises, equity joint ventures or cooperative joint ventures. In the event that any industries are not listed in the Catalogue, unless otherwise forbidden by other applicable laws and regulations, FDI is generally permitted and the investment may take vehicles of wholly foreign-owned enterprises, equity joint ventures or cooperative joint ventures with no restriction on Chinese or foreign partners being the majority shareholder. Foreign direct investment in restricted industries is subject to strict governmental examination and approval case by case, and the investment vehicle is possibly limited to equity joint ventures or cooperative joint ventures under which Chinese partners shall hold majority interests in some cases. Foreign direct investment in prohibited industries by any foreign investors is not allowed by any means.

According to the provisions, China encourages both a greater geographic dispersion of FDI inflows within China and more FDI inflows into targeted economic sectors and industries, such as agriculture, resource exploitation, infrastructure, and environmentally friendly,

export-oriented and high-technology industries. To accommodate the implementation of the provisions, China amended the *Catalogue for the Guidance of Foreign Investment Industries* in 2002[8] and 2004.[9]

In addition to the national industrial catalogue on guiding FDI, China issued and implemented a series of regional and sectoral industrial catalogues to guide FDI. For example, as part of the Western region development strategy, China issued the *Catalogue of Priority Industries for Foreign Investment* in the Central-West Region in 2000, which was subsequently amended in 2004 and 2008.[10] To encourage FDI in high-tech industries, to accelerate the pace of introducing advanced technologies from abroad, to strengthen abilities of internal assimilation and independent innovation, and to further improve the quality and level of FDI, China issued the *Catalogue of Encouraged Hi-Tech Products for Foreign Investment* in 2003,[11] which was further amended in 2006.[12]

In 2007, China's National Development and Reform Commission and Ministry of Commerce jointly revised and promulgated the *Catalogue for the Guidance of Foreign Investment Industries* (amended in 2007),[13] which replaced its 2004 version and took effect on 1 December 2007.

Compared with its 2004 version, the 2007 Catalogue has not only increased the total number of entries, it has also dramatically expanded the number of 'encouraged' entries. The changes to the Catalogue reflect China's continued effort to attract FDI in accordance with its economic, regional and industrial development strategies. Under the 2007 Catalogue, FDI in traditional manufacturing sectors and export-oriented projects will no longer be encouraged; instead, FDI in high technology, new materials production, high-end equipment, modern agriculture and high-end services, such as modern logistics, has been newly encouraged. Projects associated with heavy pollution or high resources consumption, and exploration of important non-renewable mineral resources, will be forbidden. Some environmentally friendly and energy-saving projects will, however, be welcome. In order to balance regional development, FDI in the central, western and north-eastern regions will also be encouraged. For national economic and 'spiritual' security, some strategic and sensitive industries, such as Internet-based services, are forbidden for FDI.

In April 2010, the Chinese State Council released new regulations on foreign investment (State Council 2010). According to the new regulations, China will improve good business conditions, welcome foreign investment in high-tech industries, service sectors, energy saving and environmental protection, but FDI into polluting and energy-intensive projects or industries running at overcapacity is strictly prohibited. China will continue to support Chinese A-share-listed companies in further introducing strategic investors from home and abroad, and standardise foreign companies' investment in domestic securities and cross-border M&A transactions. Qualified foreign-funded companies are allowed to go public and issue corporate bonds or medium-term bills in China. Multinationals are encouraged to set up regional headquarters, research and development (R&D) centres, procurement hubs, financial management and other functional offices in China. Foreign direct investment firms are also encouraged to increase their investment in China's central and western regions, particularly in environmentally friendly and labour-intensive companies ('China unveils

new rules for foreign investment', 14 April 2010, *People's Daily Online*, <http://english.peopledaily.com.cn/90001/90778/90861/6949654.html>). The new regulations set out the general guidelines for revising the Catalogue in 2011.

To implement the new regulations, in April 2011, the Legislation Department of the State Council issued the *Notice for Public Consultation on the Catalogue for the Guidance of Foreign Investment Industries (Amendment Draft for Consultation)*,[14] which is amended jointly by the State Development and Reform Commission and the Ministry of Commerce and will replace the 2007 Catalogue in June–July 2011. Compared with the 2007 Catalogue, now encouraging FDI in strategic new industries and modern services is the most important change.

To support the development of strategic new industries, the new Catalogue adds a number of industries to the encouraged category, including research, development and manufacturing of aero, airspace and environmental friendly materials; manufacturing of key components of new-energy automobiles; research, development and manufacturing of Internet system equipment, software and chips; and construction and operation of vehicle battery recharging stations. In contrast, the manufacturing of whole automobiles is dropped from the encouraged category.

To promote the development of the services sector, the new 2011 Catalogue adds lease and business services, venture investment enterprises, intellectual property services and professional training into the encouraged category, while no longer restricting medical care and health institutions. Foreign direct investment in the construction and operation of villas is, however, prohibited.

These changes demonstrate that China is serious about upgrading its industrial structure through utilising foreign capital in order to achieve sound and healthy economic development. The new Catalogue is expected not only to increase FDI inflows into China but also to improve the industrial and sectoral structure, regional distribution, and the quality of FDI inflows.

Unification of the tax system for domestic and FDI firms

From the early 1980s to 2007, China extensively but selectively used tax incentives to guide FDI into its designated regions, economic sectors and industries (Wang 1997). China's tax incentive policies for FDI firms have had two key features. First, the tax incentives offered in the special economic zones (SEZs) and economic and technological development zones (ETDZs) located in the open cities were much more favourable than in other open regions. Second, the tax incentives were more favourable for technologically advanced and export-oriented FDI firms. The extensive tax incentives offered to FDI firms not only distorted global capital markets, causing potential diversion of global FDI flows, but also distorted domestic capital markets, creating incentives for round-tripping FDI, and at the same time created unfair competition between domestic firms and FDI firms.

In 2007 China issued the Enterprise Income Tax Law,[15] unifying the tax rates for foreign and domestic enterprises. The new tax rate for both domestic and foreign enterprises is 25 per cent. The law took effect on 1 January 2008. The new law has unified the two existing tax codes—one for domestic firms, the other for FDI firms—into one and represents a fundamental change in China's tax policy. Many of the tax incentives and tax holidays that existed in the old code for foreign investors have been changed or eliminated.

The new corporate income tax law and the unification of the tax rate will certainly and substantially reduce the incentive for FDI round-tripping. The impacts of the new tax law on domestic and FDI firms are, however, unclear.

Although the current nominal income tax rate is set at 33 per cent, the actual average income tax burden on China's domestic firms is 25 per cent ('Parliament adopts corporate income tax', *Xinhua News Agency*, 16 March 2007, <http://news.xinhuanet.com/english/2007-03/16/content_5854950.htm>). So, the new tax law, on average, will not reduce the actual tax burden of domestic firms.

The current actual income tax burden on FDI firms is 15 per cent ('Parliament adopts corporate income tax', *Xinhua News Agency*, 16 March 2007, <http://news.xinhuanet.com/english/2007-03/16/content_5854950.htm>). On average, the new income tax law will increase the tax burden of FDI firms by 10 percentage points. The new tax law is likely to have some negative impact on FDI firms, especially in the short term on small-scale, labour-intensive, quick-profit-earning enterprises from developing economies.

Despite the potential negative impact on FDI firms, the unified corporate income tax is likely to have a very limited effect on foreign investment in China, and especially on large multinational enterprises (MNEs), for the following reasons.

First, the average corporate income tax rate for the world's 159 countries and regions that levy corporate income tax is 28.6 per cent, and the average corporate income tax rate for China's 18 neighbouring countries and regions is 26.7 per cent ('Parliament adopts corporate income tax', *Xinhua News Agency*, 16 March 2007, <http://news.xinhuanet.com/english/2007-03/16/content_5854950.htm>). China's proposed unified tax rate of 25 per cent therefore remains quite competitive, so the change is unlikely to have a major effect on foreign investment.

Second, numerous surveys of international investors have shown that tax incentives are not the most influential factor for MNEs in selecting investment locations. Foreign investors are of course interested in tax rates, but more important are such factors as the broad investment climate, including the domestic market; the cost and availability of labour; basic infrastructure; and economic and political stability.

Third, China's overall investment environment is quite competitive, with relatively efficient public services, good infrastructure, a large and fast-growing domestic market, abundant and well-educated human resources, low labour costs, and macroeconomic and political stability, making China one of the most attractive locations for FDI. According to the 2005 Foreign Direct Investment Confidence Index (A.T. Kearney 2007), in 2005 China was the most attractive FDI location in the world. China has maintained its lead in the index for the fourth consecutive year.[16] Once again, China is the top FDI location for first-

time investors, with more than half (55 per cent) of investors expected to make first-time investments there in the next three years. One in five FDI dollars for first-time investments will be committed to the Chinese market. China has successfully overcome the perceived risk associated with first-time market entry, which is typically the biggest barrier to generating new FDI.

Fourth, the new tax law still has preferential stipulations. According to the tax law, China will continue to offer tax incentives to investment in projects concerning environmental protection, agricultural development, water conservation, energy saving, production safety, high-technology development and public welfare undertakings. High-technology enterprises can still enjoy a 15 per cent income tax rate, and small and medium-sized enterprises with slim profits are required to pay income tax at only 20 per cent. Certain tax breaks will also be granted to enterprises in SEZs and less-developed western areas of the country.

Fifth, the new tax law also provides a five-year transitional period to offset the impact on foreign companies. The income tax rate will be gradually increased to 25 per cent during this period, and old foreign enterprises can still enjoy tax breaks within a regulated time limit as before.

Therefore, the new tax law will bring China's tax laws more in line with international standards, which satisfies a WTO commitment to equal treatment for domestic and overseas investors. The change in the tax law not only proves that the Chinese Government is determined to continue its reform and opening-up policies in order to improve investment conditions, but will also help to create a more consistent tax climate for the operations of FDI firms.

On 18 October 2010, the State Council issued the Notice on Unification of City Maintenance and Construction Tax and Education Surcharge for Domestic Enterprises, Foreign Invested Enterprises, and Foreign Individuals.[17] Foreign direct investment firms and foreign individuals were exempt from the city maintenance and construction tax and education surcharge; such taxes apply only to domestic enterprises and Chinese nationals. Starting from 1 December 2010, China began levying the city maintenance and construction tax as well as the education surcharge on FDI firms and foreign individuals, symbolising the end of 'super national treatment' offered to FDI firms and marking the beginning of a fully unified national tax system for domestic and foreign companies ('China ends foreign firms' ''super-national treatment''', *People's Daily Online*, 1 December 2010, <http://english.peopledaily.com.cn/90001/90778/90861/7217484.html>). China's move to unify the tax system is consistent with relevant WTO provisions and shows that the country is gradually moving towards common international rules.

Conclusions

Although China has achieved substantial progress in its FDI policy reform within a relatively short period, comparing China's current FDI policy with the WTO's investment-related principles, China's current FDI policy can be further improved, particularly in respect to transparency, national treatment and the protection of intellectual property rights.

With respect to the principle of transparency, China maintains a complex application process for FDI approval, which needs to be simplified and made more transparent through further policy reform.

In terms of national treatment, on the one hand, since the initial offer in the early 1980s of tax incentives to FDI firms, China has extensively but selectively used tax incentives as 'economic levers' to guide FDI into its designated regions, economic sectors and industries. Recent changes to the tax regime for FDI firms mark the beginning of a fully unified national tax system for domestic and foreign companies. This is a step in the right direction towards bringing China's tax laws more in line with international standards and creating a more consistent tax climate for the operations of FDI firms.

On the other hand, to protect some industries and domestic firms, the Chinese Government has introduced regulations to prohibit or restrict FDI participation in some sectors and industries considered to be strategic, sensitive or threatening to national economic and spiritual security. Therefore, foreign investors are not treated equally in accessing and doing business in certain areas in China. The application of national treatment will not only level the playing field between foreign and domestic firms, but will also provide equal incentives and opportunities for various types of FDI and different groups of foreign investors.

Protection of intellectual property rights has long been an issue in China. The weak legal framework and particularly the weak enforcement for intellectual property rights protection in China will not only deter the inflows of FDI with high technology, but will also have a negative impact on foreign investors' decisions to bring technology into China. This could be one of the main reasons for the low level of FDI inflows from industrialised countries into China. Although there has been some improvement, it is still very important for China to further improve the legal framework and strengthen the enforcement for intellectual property rights protection if it wants to attract high-technology FDI inflows from the world's industrialised countries.

China's overall investment environment remains attractive, with relatively efficient public services, good infrastructure, abundant and well-educated human resources, low labour costs, fast economic growth, a huge and growing domestic market, and macroeconomic and political stability. These factors continue to make China one of the most attractive locations for FDI worldwide, with inflows reaching US$105.74 billion in 2010—the highest level in China's inward FDI history. A serious commitment by the Chinese Government to further liberalise its FDI regime in accordance with its WTO commitments and to address the shortcomings outlined above will compound these positive factors and enable China to remain one of the top FDI destinations in the world in the decades ahead.

Bibliography

Kearney, A.T. 2007, *2005 Foreign Direct Investment Confidence Index*, A.T. Kearney, Chicago, Ill., viewed 18 April 2011, <http://www.atkearney.com/images/global/pdf/FDICI_2005.pdf>

Kearney, A.T. 2010, *2010 Foreign Direct Investment Confidence Index*, A.T. Kearney, Chicago, Ill., viewed 18 April 2011, <http://www.atkearney.com/index.php/Publications/foreign-direct-investment-confidence-index.html>

State Council 2010, *State Council's Regulations on Further Improvement on the Work of Utilising Foreign Direct Investment*, [in Chinese], 13 April 2010, State Council, Beijing, viewed 18 April 2011, <http://www.gov.cn/zwgk/2010-04/13/content_1579732.htm>

Wang, R. (ed.) 1997, *Report on Foreign Direct Investment in China: Industrial distribution of foreign direct investment*, Economic and Management Press, Beijing.

Endnotes

1. *Law of the People's Republic of China on Foreign-Capital Enterprises*, Revised 31 October 2000, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=51034>; *Law of the People's Republic of China on Chinese–Foreign Contractual Joint Ventures*, Revised 31 October 2000, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=51032>; *Law of the People's Republic of China on Chinese–Foreign Equity Joint Ventures,* Revised 15 March 2001, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=51033>

2. *The Company Law of the People's Republic of China*, Revised 27 October 2005, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=50878>

3. *Interim Provisions on Mergers and Acquisitions of Domestic Enterprises by Foreign Investors*, 7 March 2003, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=51173>

4. *Provisions on Mergers and Acquisitions of Domestic Enterprises by Foreign Investors*, Revised 8 August 2006, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=66925>

5. *Anti-Monopoly Law of the People's Republic of China*, 30 August 2007, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=85714>

6. *Provisions on M&As of Domestic Enterprises by Foreign Investors*, Revised 22 June 2009, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=108906>

7. *Provisions on Guiding the Orientation of Foreign Investment*, 11 February 2002, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=51267>

8. *Catalogue for the Guidance of Foreign Investment Industries*, Amended 11 March 2002, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=51272>

9. *Catalogue for the Guidance of Foreign Investment Industries*, Amended 30 November 2004, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=87902>

10. *Catalogue of Priority Industries for Foreign Investment in the Central-West Region*, Amended 23 December 2008, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=101064>

11. *Catalogue of Encouraged Hi-Tech Products for Foreign Investment*, 2 June 2003, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=51273>

12. *Catalogue of Encouraged Hi-Tech Products for Foreign Investment*, Revised 31 December 2006, [in Chinese], viewed 18 April 2011, <http://www.bjmbc.gov.cn/web2/fcsArticleDetail.jsp?article_id=11723920890001>

13. *Catalogue for the Guidance of Foreign Investment Industries*, Amended 31 October 2007, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=87372>

14. *Catalogue for the Guidance of Foreign Investment Industries (Amendment Draft for Consultation)*, April 2011, [in Chinese], viewed 18 April 2011, <http://www.fdi.gov.cn:8080/pub/FDI/wzyj/zcfgyj/P020110412321086714049.pdf>

15. *Enterprise Income Tax Law of the People's Republic of China*, 16 March 2007, viewed 18 April 2011, <http://www.fdi.gov.cn/pub/FDI_EN/Laws/law_en_info.jsp?docid=76240>

16. According to the *2010 Foreign Direct Investment Confidence Index* (A.T. Kearney 2010), China remains the top-ranked destination by foreign investors—a title it has held since 2002.

17. *Notice on Unification of City Maintenance and Construction Tax and Education Surcharge for Domestic Enterprises, Foreign Invested Enterprises, and Foreign Individuals*, 18 October 2010, [in Chinese], viewed 18 April 2011, <http://www.chinatax.gov.cn/n8136506/n8136593/n8137537/n8138502/9938060.html>

7 Chinese Manufacturing Firms' Overseas Direct Investment:

Patterns, motivations and challenges

Bijun Wang and Huiyao Wang

Introduction

The widespread perception of industrialised countries as homes of multinational corporations (MNCs) and emerging markets as hosts of MNCs has been firmly rooted. These were, however, MNCs in the past, which were nowhere near as active or visible as they are today. In recent years, China and India, major Latin American economies such as Brazil and Mexico, and South Africa have all spawned their own MNCs (Dunning et al. 2007).

The well-established explanation for the emergence of MNCs from developing and transitional economies is the investment development path—a concept first proposed by Dunning (1981a). This put forward the idea that the rise of a country's income per capita would initially draw in increasing amounts of foreign direct investment (FDI), and subsequently lead to outward direct investment (ODI).

While it is well known that FDI has been one of the important factors contributing to the Chinese economic miracle, it is perhaps less well known that China is now an important player in the global scene of ODI as well. From 2003 to 2009, Chinese ODI flows grew at 55 per cent annually on average. This growth exceeded that of FDI into China during the same period, although the stock of Chinese ODI is still limited.

Studies of Chinese ODI are relatively new, but growing rapidly in number. Most studies have been descriptive in nature, reviewing historical trends, changing composition and the evolution of government policies (see, for instance, Deng 2003, 2004; Wu and Chen 2001). Some have focused on in-depth case studies, especially of high-profile ODI cases (such as Liu and Li 2002). A number of recent studies examined empirically the determinants of Chinese ODI (Buckley et al. 2007). All these analyses provided valuable insights into understanding the pattern and characteristics of Chinese outward investment.

Systematic research on the role of China as an outward direct investor remains, however, insufficient and incomplete. For instance, we do not have an accurate measure of the distribution of Chinese ODI in manufacturing by different types of firms, across either countries or industries. We also do not know much about the performance of Chinese ODI firms. This is largely because of the unavailability of comprehensive disaggregated data. The only official data comprehensively reporting Chinese ODI are published annually by China's Ministry of Commerce, which reports only aggregate data.

To partially fill this vacancy, we collect approved ODI projects reported on the National Development and Reform Commission (NDRC) web site with disclosed investment amounts from 2003 to 2009. The collected number of Chinese ODI projects is 226, in which 104 are made by manufacturing firms. Among these 104 projects, we exclude 30 projects, which invest in mining, quarrying and petroleum, and use the remaining 74 projects as the sample in this chapter.[1]

Based on these data, the questions this chapter explores are: what is the pattern of Chinese manufacturing firms' ODI? Do Chinese manufacturing firms possess competitive advantages like those from industrialised economies when they began to internationalise, and, if not, what are the advantages of Chinese manufacturing firms? What is their purpose of investing abroad and how do they realise that? And what are the challenges they face?

In this chapter, we find that Chinese ODI in manufacturing is quite different from that in other sectors. The main investors are private firms rather than state-owned enterprises (SOEs). And the majority of investments in manufacturing have gone to industrialised economies. We also find that Chinese manufacturing firms' ODI is dominantly motivated by seeking technology and other strategic assets—mainly brand names. To achieve this goal, setting up overseas research and development (R&D) centres and joint ventures with incumbent firms, clustering and going abroad, and mergers and acquisitions (M&As) of overseas firms have become the most widely used methods for Chinese firms to invest overseas.

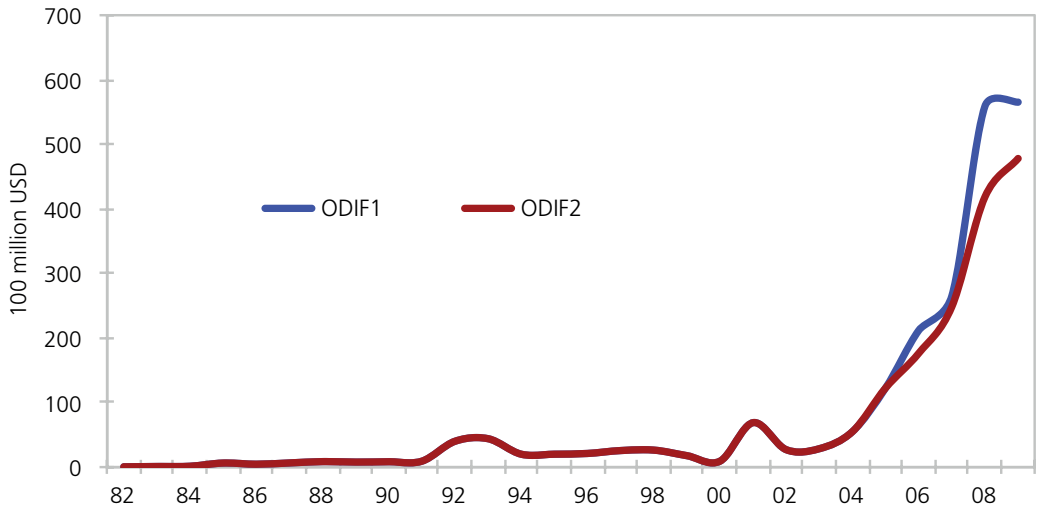
We argue that unlike yesterday's MNCs from industrialised countries, Chinese MNCs rarely have firm-specific ownership advantages—notably, core technology, organisational and management skills, and brand names. What they do have is a variety of home-country specific advantages, such as financial support from the Government and comparative advantage in certain labour-intensive industries. Compared with ODI by industrialised countries half a century or more ago, Chinese firms today face totally different circumstances—characterised by globalisation in general and China's integration into the world in particular.

We also argue that the success of Chinese manufacturing firms' ODI rests with their capacity to consolidate and to operate the acquired strategic assets, and with their ability to set up win-win relationships with not only target firms but also the local community in the host country.

Scale, investor and destination

Before 2004, the size of Chinese ODI was rather trivial. Since then, it has grown significantly, alongside dramatic expansion of China's current account surplus and the appreciation of the renminbi (RMB). Total ODI flow increased from US$2.9 billion in 2003 to US$56.5 billion in 2009, registering an average growth rate of 55 per cent (Figure 7.1). As a result, its global share rose from 0.5 per cent to 5.1 per cent during the same period. In 2009, China was not only the largest developing-country investor but also the fifth-largest investor in the world, following the United States, France, Japan and Germany.

Figure 7.1 Chinese ODI flows (ODIF), 1982–2009

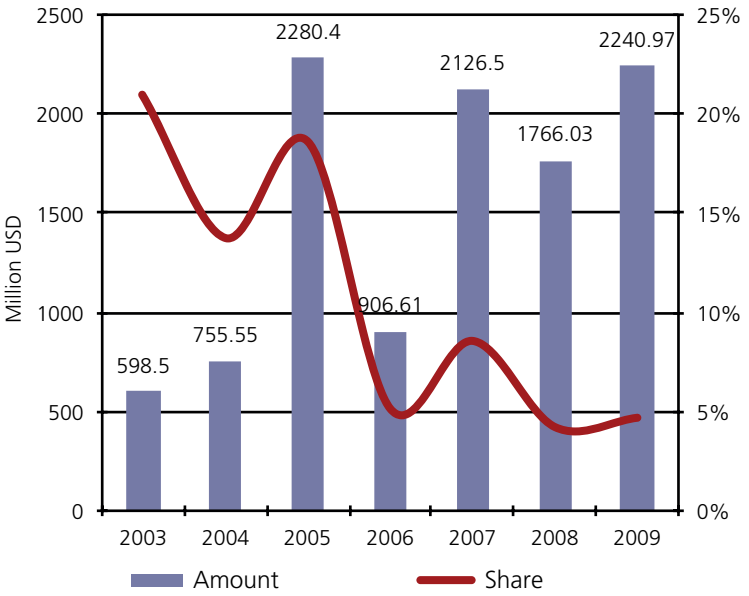


Notes: In ODIF1, data from 2002 to 2005 are non-financial ODI, while data from 2006 to 2009 are all the ODI. In ODIF2, data from 2002 to 2009 are all non-financial ODI from China.

Sources: Data from 1982 to 2001 are from UNCTAD (2005); data from 2002 to 2009 are from MofCOM (various years).

Chinese ODI in manufacturing has, however, not increased that much during this time. After a sharp increase in 2005, which was probably a result of Lenovo's acquisition of IBM's personal computer (PC) business, Chinese ODI flow in manufacturing returned to about US$1 billion in 2006. There was a further jump in investment in 2007, reaching US$2.1265 billion. Then, under the influence of the global financial crisis, Chinese ODI in manufacturing contracted about 17 per cent in 2008, but quickly rebounded to a new high in 2009.

Figure 7.2 Chinese ODI flow in manufacturing, amount and share (of total non-financial ODI), 2003–09



Source: MofCOM (various years).

As a result of its relatively slow growth, the share of manufacturing in Chinese total ODI decreased from 21 per cent in 2003 to 5 per cent in 2008 and 2009 (Figure 7.2). This compares with 24 per cent for industrialised countries and 15 per cent for developing economies (Table 7.1). Accordingly, China has more investment in the primary sector, mainly in mining, quarrying and petroleum, and the service sector.

The decreasing share of Chinese ODI in manufacturing is partly because of the large scale of Chinese ODI in resources such as oil and iron ore. Also, although the administrative procedure of examination and approval on ODI has been streamlined, it is still a slow process. To invest abroad, Chinese firms must first get approval from the National Development and Reform Commission (NDRC), the Ministry of Commerce (MofCOM), China Customs and the State Administration of Foreign Exchange at various levels. This process is clearly deleterious for facilitating Chinese manufacturing firms investing abroad, and might result in many missed opportunities. One side effect is that an estimated 50 per cent of private firms in Zhejiang Province bypass the official approval procedure when investing abroad (Huang 2010).

Table 7.1 Industry distribution of ODI flows, 2006–08 (per cent)

Sector/industry	Industrial country	Developing economy	World	China
Primary	7.8	8.4	8.0	18.7
Agriculture, hunting, forestry and fishing	0.0	0.3	0.1	0.6
Mining, quarrying and petroleum	7.8	8.1	7.9	18.1
Manufacturing	24.1	15.0	23.2	4.7
Services	60.0	69.3	60.9	76.6

Source: Huang and Wang (2011).

The only official data comprehensively reporting Chinese ODI are published annually by China's Ministry of Commerce, but they report only aggregate data.[2] To get more detailed information, we collect approved ODI projects reported on the NDRC web site with disclosed investment amounts from 2003 to 2009. We focus below on the 74 overseas investments made by Chinese manufacturing firms.

The pattern of Chinese ODI in manufacturing has some special characteristics in comparison with that of other sectors. First, the main investors in manufacturing are private firms rather than SOEs, with 62 per cent of the total number and 64 per cent of the total amount of investment made by private firms (Table 7.2). In contrast, the main investors in Chinese ODI as a whole are SOEs, which accounted for 72 per cent of total Chinese ODI on average between 2006 and 2009. Second, the majority of investments in manufacturing go to industrialised economies rather than to developing economies. For private firms, industrialised economies were the destination of 65 per cent of projects and 81 per cent of the total amount of investments. For SOEs, these shares were even greater, reaching 87 per cent and 95 per cent, respectively (Table 7.2). In contrast, from 2003 to 2009, the average Chinese ODI in industrialised economies accounted for only 40 per cent of China's total ODI.

Table 7.2 Selected destinations of Chinese manufacturing ODI, 2003–09

Private firms			SOEs		
Economies	Number	Amount (US$100 m)	Economies	Number	Amount (US$100 m)
United States	6	19.310	South Korea	2	5.999
South Korea	2	3.828	France	2	4.086
Hong Kong	6	3.734	Italy	1	2.500
Laos	1	1.972	Australia	1	1.776
Vietnam	5	1.770	Austria	1	1.389
Bermuda	1	1.350	United States	5	1.195
Germany	10	1.251	Germany	7	0.953
Japan	2	1.096	United Kingdom	1	0.870
India	1	0.600	Netherlands	1	0.478
Singapore	1	0.550	Laos	2	0.390
Russia	2	0.489	Egypt	1	0.350
Canada	1	0.350	Czech Republic	1	0.300
Cambodia	2	0.338	Luxembourg	1	0.293
Mexico	1	0.276	India	1	0.291
Australia	1	0.098	Japan	1	0.046
Italy	1	0.068			
Ethiopia	1	0.050			
Nigeria	1	0.020			
Mali	1	0.015			
Total	46	37.164	Total	28	20.9
Share of all (%)	62.2	64.0	Share of all	37.8	36.0
Developing	16	6.880	Developing	4	1.031
Share of private (%)	34.8	18.5	Share of SOEs	14.3	4.9
Developed	30	30.284	Developed	24	19.884
Share of private (%)	65.2	81.4	Share of SOEs	85.7	95.1

Source: Authors' calculations based on data collected from NDRC web site.

Multinationals without advantages

Existing theory asserts that ODI firms have to possess some kind of unique and sustainable competitive advantage in exploring foreign markets (ownership-specific advantages).

- Those relating to the possession and exploitation of monopoly power that stem from, or create, some kind of barrier to entry to final product markets by firms not possessing them (Bain 1956; Hymer 1976).

- Those relating to the possession of a bundle of scarce, unique and sustainable resources and capabilities, which essentially reflect the superior technical efficiency of a particular firm relative to those of its competitors (Dunning 1958; Safarian 1966)—for example, patents, a recognised brand or production process capabilities.
- Those relating to the competencies of the managers of firms to identify, evaluate and harness resources and capabilities from throughout the world and to coordinate these with the existing resources and capabilities under their jurisdiction in a way that best advances the long-term interests of the firm. These advantages are especially stressed by organisational scholars such as Bartlett and Ghoshal (1989) and Prahalad and Doz (1987).

In addition to these ownership advantages (O), Dunning (1981b, 2001) proposes the eclectic paradigm and incorporates another two advantages—location and internalisation—that qualify a firm to go abroad. Location-specific advantages (L) refer to the benefits of locating in a particular foreign country that are conducive to a firm creating or utilising ownership advantages. Internalisation-specific advantages (I) arise from a firm's managerial, organisational and institutional capabilities to efficiently exploit its ownership-specific assets.

Chinese firms, however, do not appear to possess these firm-specific advantages. Their competitive capability after three decades of reform is still painfully weak in relation to the global giants. They are weak in technology, management capability and brand name. For SOEs, they are still under the administrative constraints of government agencies. For some non-state enterprises, while they have shown some degree of entrepreneurship, they still do not compete globally (Nolan 2001).

China's advantage in manufacturing has been focusing on non-technologically famous products, such as steel, coal, cement, televisions, washing machines, refrigerators, airconditioners, microwaves and motorbikes. But even for these products, Chinese firms contribute mainly assembling and manufacturing, as they do not possess the core technologies. On the contrary, they rely heavily on importing core components and technology. For example, Galanz is now the world's largest microwave manufacturer, but it still depends on importing the key component, 'permatron'; and while China has now become the world's largest airconditioner manufacturer, cabinet-type airconditioners still rely on a scroll compressor made by US companies and convertible frequency airconditioners still rely on Japanese technology.

As a result, China's foreign technology dependency ratio is more than 50 per cent, while that of industrialised economies is no more than 30 per cent, and that of the United States and Japan is roughly 5 per cent (Lu and Zhang 2007). More than half of the 'Made in China' products rely on foreign technology—mainly from the United States, Japan and Germany (Li 2007). This situation means that China's manufacturers enjoy only a fairly small profit margin, with most of the profits accruing to foreign MNEs for their provision of technology, design and other services. It further results in the passive role of, and ability for, Chinese firms to engage in core technology and R&D.

China also lacks world-famous brands. As seen in Table 7.3, according to the '100 World Best Brands in 2009', eight of the top 10 were US companies, and not one brand out of the 100 belongs to a Chinese company. Looking at the top-10 Chinese brands, with the exception of Haier, the other nine brands are owned by the Chinese Central Government, concentrating on monopolised and highly controlled industries such as finance, energy, telecommunications, petrochemicals and space. The only private firm is the household electrical appliances producer Haier. Its brand value is, however, relatively low, amounting to US$9.4 billion.

Table 7.3 The world's and China's top-10 brands, 2009

2009 world's best brand				2009 Chinese best brand		
Rank	Name	Value (US$ billion)	Country	Rank	Name	Value (US$ billion)
1	Coca-Cola	68.7	US	1	ICBC	18.3
2	IBM	60.2	US	2	State Grid	17.5
3	Microsoft	56.6	US	3	CCTV	15.9
4	General Electric	47.8	US	4	China Mobile	15.6
5	Nokia	34.9	Finland	5	China Life Insurance	12.1
6	McDonald's	32.3	US	6	China Aero Space	10.5
7	Google	32.0	US	7	Sinochem	10.1
8	Toyota	31.3	Japan	8	China Railway	10.1
9	Intel	30.6	US	9	Haier	9.4
10	Disney	28.4	US	10	BOC	9.3

Sources: The world's best brand is reported by Interbrand Consulting Group; China's best brand is reported by the World Brand Lab.

Nevertheless, this does not mean that Chinese firms investing abroad do not have any advantages. In fact, Dunning (2000) accepts that the competitive advantages of MNCs from developing countries are probably different to those considered by the prevailing theory. The *World Investment Report* (UN 2006) summarises three segments of the competitiveness of the MNCs from developing countries.

- The first types are expertise and technology-based ownership advantages in a number of industries, including consumer electrical and electronic products, food and beverages, heavy industries and transportation equipment.
- The second types are advantages gained from access to home-country resources and activities where the government could exert great influence. Some of these advantages derive from early application of new technologies (a latecomer advantage). Others come from the availability of cheap funds, which are ultimately the result of high saving rates, trade surpluses, or high commodity prices.
- And the third type is achieved through specialisation in part of the production value chain. This is often seen in industries such as electronics, automobile components, and garments.

For China, compared with the primary and service sectors, the manufacturing sector has a revealed comparative advantage in terms of performance in export markets and development in the domestic economy (Huang and Wang 2011).

On the one hand, with 60 years of development, China has established a mature manufacturing system. It has standard, if not necessarily up-to-date, technology in certain industries such as mechanical manufacturing, metal smelting, household appliances, and textiles (Li 2007). The mature technology in these industries is well matched to the requirements of China and other less developed economies.

On the other hand, Chinese ODI firms enjoy strong support domestically. China itself is a huge market, which means that firms losing profits in overseas markets can be compensated by selling their goods in the domestic market. For instance, Chinese consumer electronics producer TCL has been losing profits in overseas markets, but it survives with the profits from selling in the domestic market. The Chinese Government has attached a high strategic role to China's 'going global' strategy. To facilitate Chinese ODI, government policy centres on five areas: creating incentives for ODI; streamlining administrative procedures, including greater transparency of rules and decentralisation of authority to local governments; easing capital controls; providing information and guidance on investment opportunities; and reducing investment risks (Buckley et al. 2008; Lu et al. 2010; Luo et al. 2010).

Chinese private firms have their own particular advantages. They are small with simple management structures and good adaptability and entrepreneurship. They concentrate in highly competitive, labour-intensive industries and they tend to have higher productivity than their SOE counterparts (Dougherty et al. 2007). They are also more easily accepted compared with SOEs by host countries, particularly when investing in strategic resources and high-technology sectors.

Chinese manufacturing firms' industry-specific and home-country-specific advantages do, however, make up for their lack of firm-specific or ownership-specific advantages. On the contrary, the former advantages could well be a double-edge sword.

In particular, such government involvement can be a hazard as well as a boon for at least three reasons. First, firms sometimes have to make a balance between the funding support from the Government and the possible loss of freedom (Child and Rodrigues 2005). Second, government involvement might be resisted by the host countries' authorities, who might be concerned by the political motives of Chinese investors. And third, strong government financial and policy support might induce domestic firms to rush into ODI, with their investment decisions being based on the available cheap state bank credit and state subsidies, rather than on their own technology and managerial capabilities and the investment opportunity itself (Lu et al. 2010).

Motivation and entry strategy

Should Chinese firms conduct ODI after accumulating enough firm-specific or ownership-specific advantages? The answer is: not necessarily. The existing FDI theory is based on the experience of MNCs from industrialised countries. Dunning's OLI framework, however,

does not explain how MNC latecomers from developing countries achieve initial competitive advantages, and how MNE latecomers catch up with MNE early movers over time (Li 2003; Li 2007; Matthews 2002, 2006; Yeung 1994).

With the rise of Japan and Asia's four 'Little Dragons' (Taiwan, South Korea, Hong Kong and Singapore), it is found that multinational firms from these areas did not begin with core competitiveness. Instead, they began from a resource-meagre position seeking connections with the technological and business mainstream (Matthews 2002). Moreover, compared with ODI by industrialised countries half a century or more ago, Chinese firms are now facing totally different circumstances.

Economic globalisation, for one thing, means the progressive removal of barriers to cross-border flows of goods, services, capital and labour, which reduces the cost of operating overseas. This, combined with the Chinese Government's encouragement by providing cheap funds and fiscal subsidies, and the host country's attractiveness by offering preferential policies, leads Chinese firms to conduct ODI well before they have accumulated enough firm-specific or ownership-specific advantages to become well-established players in their own industries.

Globalisation also means the integration of national economies into a single global economy. This results in intense competitive pressures at home, with firms no longer able to shelter behind protectionist barriers (Bartlett and Ghoshal 2000). This is especially the case for Chinese private manufacturing firms, which face severe competition from foreign-invested firms and do not enjoy the many government-provided benefits of SOEs (Buckley et al. 2002; Child and Rodrigues 2005). This gives private firms—especially in highly competitive industries—a strong motivation for going abroad to strategically acquire those assets such as R&D facilities, technologies, brands, distribution networks and managerial competencies. This type of ODI is identified as 'asset augmentation', in contrast with the more traditional 'asset exploitation'.

In addition to seeking technology, brands and distribution networks, Chinese manufacturing ODI firms also have numerous other motivations.

- 'Institutional escapism' (Witt and Lewin 2007): Many Chinese firms go abroad to avoid competitive disadvantages incurred by operating exclusively in the domestic market (Boisot 2004). Such disadvantages include regional protectionism, limited access to capital, lack of developed intellectual property rights and under-provision of training and education (see, for example, Zhang 2005).
- Market seeking: The Chinese domestic market has become saturated for a large portion of manufactured products, such as mechanical and electrical products, and household appliances. It is estimated that the overcapacity of the Chinese manufacturing sector has reached 40 per cent (Li 2007). Those manufactured products are, however, still demanded in other countries, and this needs to be satisfied through exports. Despite the progress in liberalising trade, non-trade barriers and trade protectionism still exist, especially after the global financial crisis, and are often targeted at China (Peng et al. 2008). To bypass these trade barriers, firms with more export experience are likely to engage in ODI (Buckley et al. 2008).

- Efficiency seeking: China's continuous high-speed growth has been attributed to its cheap labour. In recent years, however, labour costs in China have been increasing, along with rising industrial land-usage fees. There are also much stricter requirements for environmental protection. All these factors increase Chinese manufacturing firms' production costs at home and force them to seek cheaper locations for production. For example, China is now the largest foreign investor in Vietnam.
- Natural resource seeking: With limited domestic resources and rising world prices, Chinese manufacturing firms have the motivation to exploit host countries' endowments such as oil, gas, and timber.

To see what kinds of motivations dominate Chinese manufacturing firms' ODI, we classify the 74 projects collected from the NDRC web site based on the definitions by Buckley et al. (2006) and Dunning (1993), and shown across the columns in Table 7.4.

As seen in Table 7.4, technology seeking is the dominant motivation for Chinese manufacturing firms' ODI. This is true for both private firms and SOEs. Market seeking is the second important motivation of Chinese manufacturing firms—accounting for 28 per cent of projects and 15 per cent of the total.

Comparatively, seeking natural resources is a less significant motive. Only 6.5 per cent of private firms and 3.4 per cent of SOEs conduct ODI for this reason. This finding does not contradict the eye-catching Chinese firms buying oil, iron ore and other resources around the world. As already mentioned, the 74 projects collected exclude those investing in mining, quarrying and petroleum, which are usually made by large enterprise groups rather than pure manufacturing firms.

Seeking efficiency is the least consideration for investing abroad, especially for SOEs. Only 4.21 per cent of investment overall and 1.2 per cent of investment by SOEs is for efficiency seeking (Table 7.4). This phenomenon is perhaps because there is a huge hinterland in China. Facing rising production costs in coastal areas, Chinese firms could choose to reallocate their production to the central and western regions.

Table 7.4 Motivations of Chinese manufacturing firms' ODI[a]

		Market seeking	Natural resource seeking	Technology seeking	Other strategic asset seeking[b]	Efficiency seeking
Private firms	Number	10	3	14	9	10
	Per cent	21.7	6.5	30.4	19.6	21.7
	Amount	3.09	2.938	6.217	22.722	2.193
	Per cent	8.3	7.9	16.7	61.1	5.9
SOEs	Number	11	1	13	2	1
	Per cent	39.3	3.6	46.4	7.14%	3.5
	Amount	5.72	1.776	10.425	2.743	0.25
	Per cent	27.35	8.49	49.85	13.12	1.20
Total	Number	21	4	27	11	11
	Per cent	28.38	5.41	36.49	14.86	14.86
	Amount	8.815	4.714	16.642	25.465	2.443
	Per cent	15.18	8.12	28.65	43.85	4.21

[a] The motivation of institutional escapism is hard to identify without an in-depth case study, so we do not include this in the calculations.

[b] 'Other strategic asset seeking' refers to extending and augmenting the current stock of firm-specific advantages rather than being used to exploit new markets directly. Such FDI is normally aimed towards the acquisition of brands and improved access to distribution channels and tacit assets.

Source: Authors' calculations based on data collected from the NDRC web site.

For Chinese manufacturing firms, there are generally four strategies for seeking technologies and brand names.

The first strategy is to set up overseas R&D centres. Establishing R&D subsidiaries, especially in industrialised countries, is not only conducive to accessing foreign technological assets, but also captures the externalities created by host-country technology clusters and centres of innovation (UNCTAD 2005). Huawei Technologies of Shenzhen has established 17 research institutes in countries including the United States, Germany, Sweden, Russia and India since 1999. It has also established more than 20 innovation centres with world-leading operators such as Intel, Texas Instruments, Freescale Semiconductor, Qualcomm, Infineon, Microsoft, IBM and HP. Assisted by these ventures, Huawei ranked second after Ericsson in terms of market share in the global tetherless access market in 2009. Galanz, China's leading manufacturer of microwaves, airconditioning and small home appliances, has invested more than $20 million in an R&D centre in Seattle in order to improve its own proprietary technological capability (Deng 2007). Haier Group, the leading Chinese home appliance manufacturer, has also set up design and R&D centres in Los Angeles and Boston to develop, acquire and transfer technology to help the head office develop home appliances that meet the needs and wants of local consumers (Deng 2007).

The second strategy is setting up joint ventures with incumbent firms, mainly located in advanced economies. This strategy is exemplified by TCL, China's largest television firm. In November 2003, TCL and Thomson SA of France announced the creation of a joint

venture known as TCL-Thomson Electronics (TTE) to produce televisions and DVD players worldwide. TCL took a 67 per cent stake in the joint venture, with Thomson SA holding the rest of the shares, and it was agreed that televisions made by TCL-Thomson would be marketed under the TCL brand in Asia and the Thomson and RCA brands in Europe and North America. The joint venture, TTE, enables TCL to take advantage of Thomson's longstanding foothold in North America and Europe, and core proprietary technology such as RCA, owner of the well-recognised Nipper trademark. The joint venture, TTE, also enables TCL to have access to Thomson's world-class R&D capabilities in Singapore, Mexico and Villingen/Angers in Europe. In April 2004, TCL announced the creation of another joint-venture firm. It injected €55 million in setting up a mobile phone joint venture with French mobile company Alcatel for a 55 per cent shareholding. Through this transaction, TCL gained access to the European cellular phone market and secured the technological basis for TCL's differentiation advantage (Deng 2007).

The potential risk for this strategy is that the Chinese firm might be subject to the dominance of its foreign partner in terms of technology and identity, and it might incur the opposition of the foreign partner if it launches its own brand and turns into a competitor (Child and Rodrigues 2005).

The third strategy involves M&As of overseas firms. This strategy has become one of the most widely used methods for Chinese firms, largely because it provides rapid access to proprietary technology, brand names and quicker establishment of R&D capabilities. This strategy also could pre-empt similar moves by competitors.

The most well-known example is Lenovo's US$1.75 billion purchase of IBM's PC business in 2005. After the acquisition, Lenovo became the third-largest PC producer in the world. From the transaction, Lenovo also acquired the 'Think' family of products, which was frequently ranked as a premium brand leader and best-in-class in the global PC industry. Moreover, Lenovo has been able to take advantage of IBM's advanced worldwide distribution and sales network, and PC research centres in Raleigh, North Carolina. Meanwhile, Lenovo was recognised as the preferred supplier of PCs to IBM and allowed to use the IBM brand for five years.

Lenovo's transaction was just a prelude to Chinese manufacturing firms' overseas M&As. Between 2005 and 2009, according to incomplete statistics, there were 15 transactions, with a total amount of US$904.7 million (Table 7.5). Almost all target firms of these M&As are located in industrialised countries, especially Germany and the United States. Industries such as machine tools, household electrical appliances, automobiles and parts, textiles and concrete machinery are of particularly great interest to Chinese manufacturing firms for overseas M&As (Table 7.5).

Table 7.5 Major Chinese manufacturing firms' overseas M&As, 2005–09

Investing firm	Investment (US$ m)	Target	Host country	Year
Shanghai Electric Industrial Company	1.2	Wohlenberg, leading company in producing CNC heavy turning machines and CNC machine tools	Germany	2005
TCL	10.0	Go Vedio Company's 20 trademarks and 24 patents	US	2005
Nanjing Automobile Group	87.0	MG Rover Group	UK	2005
Shanghai Baolong Industries	4.0	Dill, one of the world's first tyre-valve manufacturers	US	2005
Danyang Dare Technology Group	7.0	VCampus Corporation	US	2005
Zhejiang Hongsheng Group	5.0	GROSS Textile Machinery	Germany	2006
Suntech Power Holdings	107.0	PV Manufacturer MSK	Japan	2006
Hangzhou Machine Tool Group	7.5	ABA Z&B Grinding Machine Co. Ltd	Germany	2006
Dalian Machine Tool Group	13.8	German Zimmermann Company, world-leading manufacturer of five-axis gantry milling	Germany	2006
Sichuan Century Shuanghong Display Devices Co. Ltd	99.9	ORION PDP Co. Ltd	Korea	2006
Harbin Measuring & Cutting Tools	13.0	KELCH, high-end CNC tool and cutter producer	Germany	2007
Goldwind Science & Technology	60.4	Vensys Energy AG	Germany	2008
Changsha Zhonglian Heavy Industry Technology Development Co. Ltd	250.0	Forme Acciaico SpA, concrete machinery manufacturer	Italy	2008
Xi'an Aircraft Industry Group	138.9	FACC, Boeing aircraft parts company	Austria	2009
Beijing Jingxi Heavy Industries	100.0	Delphi, auto parts supplier	US	2009

Source: Authors' calculations based on data collected from the NDRC web site.

The fourth strategy is 'clustered going abroad'. This strategy is gaining importance among Chinese private small and medium enterprises (SMEs). Chinese private SMEs are characterised as small scale with widespread distribution and flexible operations. When going abroad, they usually make full use of the network of overseas Chinese migrants. This helps them to be better informed of the local opportunities and challenges and to overcome the disadvantages of foreignness. The Chinese Government has played a critical role in helping these small firms to cluster their investments abroad by setting up overseas industrial and scientific and technological parks.

Most of these facilities are located in developing countries as a way of shifting Chinese labour-intensive industries and/or industries with overcapacity abroad. Some are located in industrialised economies to take advantage of local technological spill-over effects and the knowledge of host-country producers and consumers.

As an example, Tianjin Business Industrial Park was set up in 2004 in South Greenville, Carolina, in the United States. This industrial park covers 30 million sq m, with a total investment of US$10 million, and has assisted Chinese SMEs in seeking investment opportunities and setting up marketing and sales networks across the United States. Two years later, the Tongling Technology Group invested US$30 million to set up the Science and Technology Industry Zone in Atlanta, Georgia. In addition to the United States, China also set up an industrial park in Korea in 2007, aiming to attract high-tech enterprises in fields such as information technology, electronics, biological engineering and new materials.

Challenges ahead

Despite the dramatic growth of Chinese ODI, the overall performance of those investing firms to date is not all that promising, with recent research indicating that only 30 per cent of Chinese ODI firms make a profit, 40 per cent break even, and the remaining 30 per cent make a loss (Ding 2007). One example is TCL's joint venture with French mobile company Alcatel, which has resulted in huge losses for TCL.

Investing abroad involves huge risks for any firm, and especially for Chinese firms. Lacking ownership or firm-specific advantages, a large number of Chinese manufacturing firms have invested abroad for asset augmentation rather than asset exploitation. Even in the case of asset-augmenting ODI, however, as Dunning (2000) points out, firms should also possess some unique, sustainable resources and capabilities.

These resources and capabilities are positively associated with a firm's absorptive capacity, which refers to the firm's ability to recognise the value of new, external information, to assimilate it, and to apply it to commercial ends (Cohen and Levinthal 1990). In fact, the real challenge pertains to post-acquisition difficulties. These include: how to build up win-win relationships with foreign stakeholders; how to reconcile different cultures at the national and corporate levels; how to organise globally dispersed complex activities; how to deal with foreign regulators, unions, employees and local communities; how to absorb the acquired technology; and how to operate acquired brand names.

Chinese manufacturing firms do not have sufficient ability and experience in handling the above problems. The differences in institutional backgrounds between China and the host country make Chinese firms more likely to have conflicts with foreign stakeholders, local regulators, employees and communities with regard to managerial philosophies, corporate culture, incentive schemes, leadership styles, and formalised managerial procedures (Luo and Tung 2007).

The poor corporate governance and management skills of Chinese firms weaken their ability to consolidate, absorb and operate the acquired strategic assets. For Chinese SOEs, due to unclear definition of property rights, their owners are often absent and vague, while managers do not have enough incentives to operate well and are without sufficient and effective supervision. These defects might obstruct corporate governance in the foreign subsidiary. For Chinese private firms, despite clearly defined property rights, they are usually under the tight rein of individuals or families, which is unfavourable for absorbing talented people and forming professional management.

Another challenge that Chinese manufacturing ODI firms have to face is the possibility of entry barriers in industrialised countries. This is partly because of the differences in ideology between China and Western society, which often results in fairly critical reports about China and its rising economic power. Given that the Western political system is characterised by a separation of powers, with checks and constraints on each other, it is inevitable that the ability of Chinese firms to invest will be influenced by various parties including different government departments, political parties, local government and interest groups (Tang 2009). The unfamiliarity of Chinese firms with this system presents them with a unique challenge to overcome.

The entry barriers Chinese firms face should not be entirely blamed on the host country; Chinese firms could also do with some self-examination. The problem both for SOEs and for private firms associated with weak corporate governance is their lack of transparency. As a result, outsiders in the host country know little about these investing firms. In turn, many Chinese firms do not communicate sufficiently with local media and communities. This kind of self-enclosed behaviour inevitably increases the host country's suspicion of the true intent of these firms.

Meanwhile, Chinese firms could also reflect upon what they actually bring to the host country. The Chinese Government has spared no effort in attracting FDI into China because foreign firms bring with them not only capital, but also technology, employment and other positive spill-over effects. Conversely, if Chinese firms going abroad intend only to bring back technology and resources, no wonder the host country is resistant to such investments.

Therefore, the reduction of entry barriers rests with, on the one hand, how sufficiently and effectively Chinese manufacturing firms can communicate and develop public relations with host country's involved parties, media and community. On the other, it also rests on whether Chinese firms can successfully establish win-win relationships with not only the target firm, but also the local community, and with better consideration of the benefits for the host country more generally.

Conclusions

While the emergence and integration of China into the global economy has attracted worldwide attention, systematic research on the role of China as an outward direct investor is still insufficient and incomplete. This chapter has made an attempt to fill this gap, focusing on Chinese ODI in manufacturing in particular.

Unlike in other sectors, Chinese ODI in manufacturing is dominated by private firms investing in industrialised economies, rather than by SOEs in developing economies. Unlike the MNCs of industrialised countries in the past, Chinese MNCs rarely have firm or ownership-specific advantages, such as core technology, management skills and brand names. While the private firms have shown some entrepreneurship, they are yet to become globally competitive, while the SOEs also still suffer from the administrative constraints of government agencies.

We found that, instead of these traditional advantages, Chinese manufacturing firms' ODI is motivated predominantly by seeking technology and markets. A range of strategies was identified for achieving this goal, with mergers and acquisitions of overseas firms becoming the dominant one in recent years.

What Chinese manufacturing firms do have is a variety of home-country specific advantages, relating to preferential policies under the Chinese Government's 'going global' strategy, a well-established manufacturing system, and comparative advantage in certain industries. Whether these are ultimately advantages, however, depends on the capacity of each firm to consolidate, operate the acquired strategic assets, and bridge the various gaps between the firm and the range of relevant parties in the host country.

The share of manufacturing in Chinese total ODI is low and decreasing. This is partly because of the large scale and growth of Chinese ODI in resources such as oil and iron ore. More importantly, it reflects that the channel for Chinese ODI is not smooth, given the cumbersome administrative procedure involved. There is no question that some administrative controls are necessary—particularly to prevent the excessive purchasing of 'junk' firms with low asset prices in the wake of the global financial crisis, and to ensure due diligence before investing. Even so, a reduction in the amount of red tape and further streamlining are required.

China is currently aiming to transform its growth model towards a more sustainable, inclusive and environmentally friendly pattern. Investing abroad, especially by manufacturing firms, is a valuable channel for realising this transformation. It also provides the incentive for the deepening of SOE reforms and for improving the competitiveness of China's domestic private firms. In the current international environment for MNEs—which is quite different from that in the 1980s and 1990s faced by Japanese and Korean firms, and in the 1950s and 1960s faced by American firms—Chinese firms need to find their own way to internationalise their operations. Based on the experience of Chinese economic development, the key principles of gradualism, decentralisation and market-driven engagement should ensure that Chinese ODI takes on the best 'Chinese characteristics', and leaves behind the rest.

Bibliography

Bain, J. S. 1956, *Barriers to New Competition*, Harvard University Press, Cambridge, Mass.

Bartlett, C. A. and Ghoshal, S. 1989, *Managing Across borders: The Transnational Solution*. Harvard Business School Press, Boston.

Bartlett, C. A. and Ghoshal, S. 2000, 'Going global: lessons from late movers', *Harvard Business Review*, vol. 78, pp. 132–42.

Beamish, P. and Wang, H. 1989, 'Investing in China via joint ventures', *Management International Review*, vol. 29, no. 1, pp. 57–64.

Boisot, M. 2004, Notes on the internationalisation of Chinese firms, Unpublished paper, Open University of Catalonia, Barcelona.

Buckley, P. J, Clegg, J. and Wang, C. 2002, 'The impact of inward FDI on the performance of Chinese manufacturing firms', *Journal of International Business Studies*, vol. 33, no. 4, pp. 637–55.

Buckley, P., Clegg, J., Cross, A., Liu, X., Voss, H. and Zheng, P. 2007, 'The determinants of Chinese outward foreign direct investment', *Journal of International Business Studies*, vol. 38, pp. 499–518.

Buckley, P. J., Cross, A. R., Tan, H., Liu, X. and Voss, H. 2006, *An examination of recent trends in Chinese outbound direct investment*, CIBUL Working Paper, Centre for International Business Studies, University of Leeds, UK.

Buckley, P. J., Cross, A. R., Tan, H., Liu, X. and Voss, H. 2008, 'Historic and emergent trends in Chinese outward direct investment', *Management International Review*, vol. 48, no. 6, pp. 715–48.

Chang, S. J. 1995, 'International expansion strategy of Japanese firms: capability building through sequential entry', *Academy of Management Journal*, vol. 38, no. 2, pp. 383–407.

Cheung, Y. and Qian, X. 2009, *The empirics of China's outward direct investment*, CESifo Working Paper No. 2621, Ifo Institute for Economic Research, Munich.

Child, J. and Rodrigues, S. B. 2005, 'The internationalization of Chinese firms: a case for theoretical extension?', *Management and Organization Review*, vol. 1, no, 3, pp. 381–410.

Cohen, W. M. and Levinthal, D. A. 1990, 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly*, vol. 35, no. 1, pp. 128–52.

Deng, P. 2003, 'Foreign direct investment by transnationals from emerging countries: the case of China', *Journal of Leadership and Organizational Studies*, vol. 10, no. 2, pp. 113–24.

Deng, P. 2004, 'Outward investment by Chinese MNCs: motivations and implications', *Business Horizons*, vol. 47, no. 3, pp. 8–16.

Deng, P. 2007, 'Investing for strategic resources and its rationale: the case of outward FDI from Chinese companies', *Business Horizons*, vol. 50, pp. 71–81.

Ding, G. 2007, 'Chinese firms' global operations: status quo, problems and strategy', in *Chinese Multinational Enterprises to the World for 2007*, China Economics Publishing House, Beijing, pp. 77–82.

Dougherty, S., Herd, R. and He, P. 2007, 'Has a private sector emerged in China's industry? Evidence from a quarter million Chinese firms', *China Economic Review*, vol. 18, no. 3, pp. 309–34.

Dunning, J. H. 1958, *American Investment in British Manufacturing Industry*, George Allen & Unwin, London, [reprinted by Arno Press, New York].

Dunning, J. H. 1981a, 'Explaining the international direct investment position of countries: towards a dynamic or developmental approach', *Weltwirtschaftliches Archiv*, vol. 117, pp. 30–64.

Dunning, J. H. 1981b, *International Production and the Multinational Enterprise*, Allen & Unwin, London.

Dunning, J. H. 1993, *The Globalization of Business*, Routledge, London and New York.

Dunning, J. H. 2000, 'The eclectic paradigm as an envelope for economic and business theories of MNE activity', *International Business Review*, vol. 9, no. 1, pp. 163–90.

Dunning, J. H. 2001, 'The eclectic (OLI) paradigm on international production: past, present and future', *International Journal of the Economics of Business*, vol. 8, pp. 173–90.

Dunning, J. H. 2006, Space, location and distance in international business activities, Paper presented at annual meeting of European Academy of International Business, Fribourg, Switzerland.

Dunning, J. H., Kim, C. and Park, D. 2007, *Old wine in new bottles: a comparison of emerging market TNCs today and developed country TNCs thirty years ago*, SLPTMD Working Paper, Oxford University, UK.

Huang, M. 2010, *The Investigation of Chinese Private Firms' Going Abroad*, China Financial and Economic Publishing, Beijing.

Huang, Y. and Wang, B. 2011, 'Chinese outward direct investment: Is there a China model?', *China & World Economy*, vol. 19, no. 4, pp. 1–21.

Hymer, S. 1976, *The International Operations of National Firms: A study of direct foreign investment*, MIT Press, Cambridge, Mass.

Li, G. 2007, *Chinese Firms' Overseas Direct Investment Analysis Report*, China Economics Publishing House, Beijing.

Li, P. P. 1994, 'Strategy profiles of indigenous MNEs from the NIEs: the case of South Korea and Taiwan', *International Executives*, vol. 36, no. 2, pp. 147–70.

Li, P. P. 2003, 'Toward a geocentric theory of multinational evolution: the implications from the Asian MNEs', *Asian Pacific Journal of Management*, vol. 20, pp. 217–42.

Li, P. P. 2007, 'Towards an integrated theory of multinational evolution: the evidence of Chinese multinational enterprises as latecomers', *Journal of International Management*, vol. 13, pp. 296–318.

Liu, H. and Li, K. 2002, 'Strategic implications of emerging Chinese multinationals: the Haier case study', *European Management Journal*, vol. 20, no. 6, pp. 699–706.

Lu, J. and Zhang, Z. 2007, 'Enterprises' own intellectual property rights and going global strategy', in *Chinese Firms' Overseas Direct Investment Analysis Report*, China Economics Publishing House, Beijing.

Lu, J., Liu, X. and Wang, H. 2010, 'Motives for outward FDI of Chinese private firms: firm resources, industry dynamics, and government policies', *Management and Organization Review*.

Luo, Y. and Tung, R. L. 2007, 'International expansion of emerging market enterprises: a springboard perspective', *Journal of International Business Studies*, vol. 38, pp. 481–98.

Luo, Y., Xue, Q. and Han, B. 2010, 'How emerging market governments promote outward FDI: experience from China', *Journal of World Business*, vol. 45, no. 1, pp. 68–79.

Matthews, J. A. 2002, 'Competitive advantages of the latecomer firm: a resource-based account of industrial catch-up strategies', *Asia Pacific Journal of Management*, vol. 19, pp. 467–88.

Matthews, J. A. 2006, 'Dragon multinationals: new players in 21st century globalization', *Asia Pacific Journal of Management*, vol. 23, pp. 5–27.

Ministry of Commerce (MofCOM) various years, *Bulletin of China's Outward Foreign Direct Investment*, Ministry of Commerce, Beijing.

Nolan, P. 2001, *China and the Global Economy*, Palgrave, Basingstoke, UK.

Peng, M. W., Wang, D. and Jiang, Y. 2008, 'An institutional-based view of international business strategy: a focus on emerging economies', *Journal of International Business Studies*, vol. 39, no. 5, pp. 920–36.

Prahalad, C. K. and Doz., Y. L. 1987, *The Multinational Mission: Balancing local demands and global vision*, The Free Press, New York.

Safarian, A. E. 1966, *Foreign Ownership of Canadian Industry*, McGraw Hill, Toronto.

Tang, H. 2009, 'Chinese firms' overseas direct investment: risk analysis and solution', in *Report on the Development of Chinese Firms Going Abroad 2009*, People's Publishing House, Beijing, pp. 381–90.

United Nations (UN) 2006, 'FDI from developing and transition economies: implications for development', in *World Investment Report*, United Nations, Geneva.

United Nations Conference on Trade and Development (UNCTAD) 2005, *World Investment Report, 2003–2005*, UNCTAD, New York.

Wang, H. 2006, 'Ten models of Chinese enterprises going global', [in Chinese], *International Economic Cooperation Research*, April, Chinese Ministry of Commerce, Beijing.

Witt, M. A. and Lewin, A. Y. 2007, 'Outward foreign direct investment as escape response to home country institutional constraints', *Journal of International Business Studies*, vol. 38, no. 4, pp. 579–94.

Wu, H.-L. and Chen, C.-H. 2001, 'An assessment of outward foreign direct investment from China's transitional economy', *Europe–Asia Studies*, vol. 53, no. 8, pp. 1235–54.

Yeung, H. W. 1994, 'Third world multinationals revisited: a research critique and future agenda', *Third World Quarterly*, vol. 15, pp. 297–317.

Zhang, J. 2005, 'China's corporate cost advantage is a myth', *Financial Times*, 29 April, p. 19.

Endnotes

1. Although Chinese ODI in mining, quarrying and petroleum is also of great interest and significance, we do not include that in our analysis for two reasons: first, the nature of such investment is quite different from that of investments in other industries, and as such should be analysed separately; second, a large proportion of investment in mining, quarrying and petroleum is conducted by large conglomerates, whose business scope ranges from manufacturing to other service sectors such as retail and wholesale, trade, real estate, and so on.

2. It reports Chinese ODI flow and stock to each country and each industry, but does not report Chinese ODI flow and stock to each country by industry.

8 China's Petroleum Predicament:

Challenges and opportunities in Beijing's search for energy security

Andrew B. Kennedy

Introduction

If China's rise is one of the most important stories of this new century, China's growing appetite for energy is one of its most striking subplots. Between 2000 and 2009, China's energy consumption more than doubled as its economic growth went into overdrive. By one estimate, China accounted for 63 per cent of the world's new energy demand during that period (BP 2010:40). China now consumes 47 per cent of the world's coal, 19 per cent of its hydroelectric power, and 10 per cent of its oil (BP 2010:38). In 2009, according to the International Energy Agency (IEA), China surpassed the United States as the world's largest energy consumer (IEA 2010b:602).

China's soaring appetite for energy has sparked growing concern amongst its rulers and intellectual elite about the country's 'energy security'—traditionally defined as the ability of a country to procure sufficient, affordable and reliable energy supplies (IEA 2007:160). Indeed, whereas the *People's Daily* mentioned 'energy security' (*nengyuan anquan*) only once in the year 2000, the paper published 476 different articles using the term between 2008 and 2010.[1] For many Chinese observers, China's biggest problem in this regard is its mounting reliance on energy imports and the external vulnerability that these imports imply. Others take a less traditional view and highlight China's domestic energy challenges, especially the unreliability of its power sector and the environmental costs imposed by its heavy reliance on coal. In both cases, the concern is that energy represents a growing challenge that China must confront (Kennedy 2010).

This chapter focuses on China's search for energy security with respect to oil in particular. While coal remains the dominant energy source for China, oil poses a unique challenge for the country. Indeed, China remains far more dependent on the outside world for oil than for any other energy source. In 2009, China imported less than 4 per cent of its natural gas, but 53 per cent of its oil (BP 2010:24, 27; IEA 2010b:135). Both of these figures are set to rise in the decades ahead, but China will remain more dependent on imports for oil than for natural gas for the foreseeable future, especially since China appears to possess substantial shale-gas reserves. There are also a number of alternatives to natural gas, which is typically used for chemical feedstock and power generation. In contrast, there is no ready substitute for oil as a transport fuel, notwithstanding growing interest in alternative-fuel vehicles within China. As its oil imports grow, China is therefore becoming increasingly dependent on the outside world for a crucial resource.

The following analysis begins by documenting the dimensions of China's 'petroleum predicament' in more detail, outlining the future trajectory of China's demand for oil and noting the Government's limited ability to control this demand. It then evaluates the way in which the Chinese Government has sought to enhance its energy security as its oil imports have grown. While the Government has certainly taken the challenge seriously, the policies adopted thus far have focused primarily on unilateral efforts to build up its own capabilities and bilateral deals with energy-producing states. As discussed below, some of these policies have not meaningfully enhanced China's energy security, while others have limitations or remain insufficiently developed. The chapter concludes by noting that China needs to develop stronger multilateral cooperation with other prominent oil importers to enhance its energy security more substantially in the future.

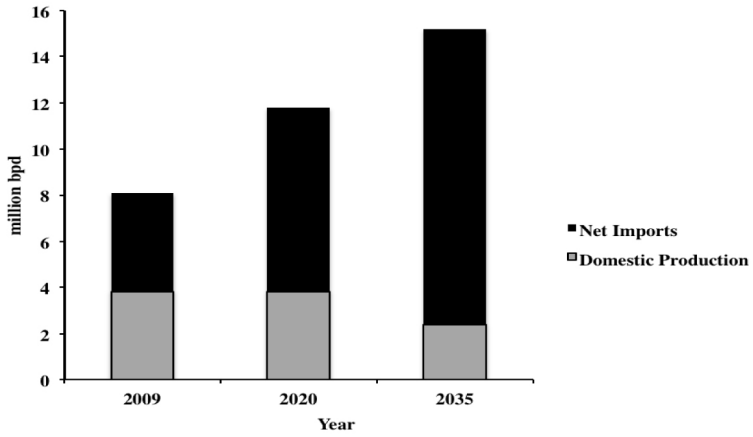
China's petroleum predicament

China's appetite for oil is soaring. Whereas in 2000 China consumed 4.8 million barrels per day (bpd), by 2009 that figure had jumped to 8.6 million bpd (BP 2010:11). The IEA projects that by 2035, China's demand will exceed 15 million bpd, making it the largest oil consumer in the world (IEA 2010b:105).

China's growing thirst for oil reflects first and foremost the dramatic growth of its transportation sector. China's automobile market emerged as the largest in the world in 2009, with total vehicle sales reaching 13.6 million, and in 2010 the total surpassed 18 million ('China 2010 auto sales reach 18 million, extend lead', *Bloomberg*, 10 January 2011, <http://www.bloomberg.com/news/2011-01-10/china-2010-auto-sales-reach-18-million-extend-lead-update1-.html>; 'China car sales top U.S.', *Reuters*, 11 January 2010, <http://www.reuters.com/article/2010/01/11/us-autos-idUSTRE60A1BQ20100111>). Air travel has become much more popular, too, with total flights by domestic carriers nearly doubling to 1.75 million between 2003 and 2009 (Liang et al. 2010). Looking ahead, the IEA expects transport-related oil demand in China to triple between 2008 and 2035 as more and more Chinese acquire their own cars and air travel becomes more popular. If so, transportation will account for 64 per cent of China's oil demand by 2035—up from 40 per cent in 2008 and 25 per cent in 1990 (IEA 2010b:670).

China's growing demand for oil and its stagnating domestic production mean that its oil imports will continue to soar in the decades ahead. In 2009, China imported 4.3 million bpd, or 53 per cent of its supply (Figure 8.1). The IEA projects that by 2035, China will import nearly 12.8 million bpd, or 84 per cent of its supply (IEA 2010b:135). China will thus be even more exposed to the risk of international supply disruptions than it is today. The imports will also be costly. If oil costs US$113 a barrel in 2035, as the IEA predicts, China's oil imports will cost the country more than US$525 billion (IEA 2010b:101).

Figure 8.1 China's future oil supply: domestic versus imported



Source: International Energy Agency, *World Energy Outlook 2010*.

To be sure, the Chinese Government is working hard to control the growth of its demand for oil, and thus its demand for oil imports. Starting in 2004, for example, China began adopting some of the world's toughest fuel economy standards, exceeded only by those of Europe and Japan (Oliver et al. 2009). In 2010, Beijing made alternative-fuel vehicles one of seven 'strategic industries' targeted for rapid growth before 2015 ('China sets growth goal for new strategic industries', *China Daily*, 19 October 2010, <http://www.chinadaily.com.cn/business/2010-10/19/content_11427572.htm>). The electric-vehicle (EV) industry in China is already making progress, in fact, and government officials hope to produce one million EVs annually by 2020 (Fang and Wong 2010). The rapid rolling out of high-speed rail will also serve to constrain the country's growing thirst for oil.

Nonetheless, while these are all important steps, for the foreseeable future they will not reduce China's growing dependence on imported energy, but merely limit how rapidly it grows. In fact, even if China succeeds in rapidly deploying electric vehicles after 2015, it would still depend on imports to meet two-thirds of its crude-oil demand in 2030, according to McKinsey and Company (2009:79). While that is less than the 80–90 per cent import dependence that China's leaders fear, it is still higher than today's level. In addition, it should be noted that the Chinese Government is not doing all that it could to constrain the country's oil demand. While China now takes a more flexible approach to setting fuel prices than it has in the past, they remain regulated by the Central Government to mitigate the impact on inflation. Indeed, authority over energy prices continues to rest with the National Development and Reform Commission (NDRC), an organisation charged with macroeconomic management and inflation control rather than energy reform. The National Energy Administration (NEA), in contrast, remains poorly staffed, and it is unclear if or when the organisation will be elevated to ministerial status and whether it will gain greater authority over energy prices in the future (Downs 2010:182–4).

In short, China is destined to rely more and more on the outside world for oil in the coming decades, notwithstanding its considerable efforts to control domestic demand. For that reason, China's leaders are pursuing a variety of supply-side policies to ensure their country's access to oil supplies in the future, as discussed in the next section.

China's struggle for oil security

China's supply-side policies to address its growing dependence on imported oil make an impressively broad list. They include efforts to support the international expansion of its own national oil companies (NOCs), to diversify its sources of supply, to strengthen its naval capabilities, and to develop its own strategic petroleum reserve (SPR). The following discussion considers each of these initiatives in turn.

The NOCs go out

For more than a decade, the Chinese Government has encouraged its NOCs and other state-owned enterprises (SOEs) to 'go out'—to invest overseas and gain greater access to resources abroad. The NOCs themselves were already eager to go abroad to expand their reserves and increase profits. The China National Petroleum Corporation (CNPC), for example, had been looking for opportunities to invest overseas as early as the late 1980s, particularly as domestic opportunities began to look comparatively meagre. The Government's subsequent support for the NOCs' international expansion emerged in the late 1990s as the Government sought to transform some of its SOEs into internationally competitive corporations. Government support also developed as the country was becoming increasingly dependent on imported oil; it was believed that oil produced by Chinese companies abroad would be a more secure source of supply than that purchased on international markets (Downs 2006:35–9).

The NOCs have sought to make the most of the Chinese Government's support over the past decade. Foreign investments have been made not only by the three major NOCs—CNPC, the China Petroleum & Chemical Corporation (Sinopec), and the China National Offshore Oil Corporation (CNOOC)—but also by smaller energy players such as Sinochem and CITIC Energy. Overall, Chinese companies were involved in 43 separate foreign oil and gas acquisition deals between 2002 and 2010—deals that were worth roughly US$65 billion.[2] As a result, the NOCs now operate in 31 different countries around the world. They have equity production in 20 of those countries, though most of it is concentrated in Kazakhstan, Venezuela, Sudan and Angola. By the first quarter of 2010, the NOCs' overseas equity shares had reached 1.36 million bpd—nearly one-third of China's net imports for 2009 (Jiang and Sinton 2011:17, 39–40).

The question remains: how much has the NOCs' international expansion actually enhanced China's energy security? NOC investments have certainly supported the expansion of oil production worldwide over the past decade, even as oil markets have tightened and prices have increased. In that sense, the investments of the NOCs have enhanced not only China's energy security, but that of other major oil consumers as well. Yet the contribution of these investments to global production is limited. As noted above, the NOCs' overseas equity production reached 1.36 million bpd in early 2010, but global crude-oil production in 2009 was just less than 68 million bpd (IEA 2010b:119).

It is unclear whether besides making a small contribution to the expansion of global supply, the NOCs 'going out' strategy has improved China's energy security. It has been shown, for example, that the NOCs do not necessarily send the oil they produce overseas back to China. Instead, the NOCs apparently prefer to let market considerations dictate where it is sold. China's equity production in Venezuela, for example, has not

been shipped back to China, not only because of the distance involved but also because Venezuelan crude has not in the past been compatible with Chinese refining capabilities. Some of CNPC's equity production in Kazakhstan is also being sold on the international market. And while oil exports from Sudan and Angola to China are considerable, it remains unclear how much of the NOCs' production in these countries is actually shipped back to China (Jiang and Sinton 2011:18–19).

Nor is it reasonable to assume that oil produced by the NOCs would somehow be cheaper or more available to China in a supply crisis. Physical disruptions that impede the flow of oil to China will affect foreign and Chinese firms alike, and the NOCs have shown little inclination to grant Chinese customers a discount when prices are high. In fact, the NOCs responded to rising crude prices prior to 2008 by *reducing* supplies of refined products to the Chinese market, resulting in widespread shortages at the pump, since price controls did not allow them to pass their rising costs on to customers (Downs 2010:184). The autonomy the NOCs exhibited in this case underscores the Government's limited ability to control their activities—a limitation that reflects both the NOCs privileged political status and the weakness of China's governance capacity in this sphere (Downs 2006:16–24). Today, some senior Chinese officials appreciate that the NOCs are motivated more by profit than by patriotism, and that the expansion of their assets overseas does not necessarily enhance China's energy security (Bradsher 2010).

There is even concern that the NOCs' international expansion might actually detract from China's welfare and security. Some analysts have charged that the NOCs routinely overpay for equity stakes in foreign oil fields, thanks to generous financial support from the Chinese Government. If so, their expansion could be seen as enriching the oil companies at the expense of national welfare. Recent analyses, however, suggest that this accusation might not be well founded. The scholar Bo Kong (2010:92), for example, has argued that cases of overpayment seem to have taken place only in the early stages of the NOCs' international expansion, when they were comparatively inexperienced. More recent research by Julie Jiang and Jonathan Sinton (2011:17) has uncovered no evidence of systematic or intentional overpayment.

A more compelling charge against the NOCs is that their international expansion has caused China to become entangled with 'pariah' states and thereby complicated its relations with the United States and Europe. Several years ago China's close relations with Sudan—intended to support CNPC's activities in the country—led Western critics to dub the 2008 Olympics in Beijing 'the Genocide Olympics' (Economy and Segal 2008). The criticism evidently stung: China subsequently made a greater effort to support international efforts to address the crisis in Sudan. More recently, the NOCs' continuing interest and activities in Iran have raised the prospect that the United States will impose sanctions on Chinese firms. The NOCs might calculate that they have more to gain from investing in Iran than they stand to lose from American sanctions, and they might lobby the Chinese Government to support them accordingly (Downs and Maloney 2011). Yet with Beijing already working to limit the deterioration of Sino–American relations over issues ranging from currency values and maritime disputes to North Korea, it is hard to believe that greater tension over Iran would be in China's national interest.

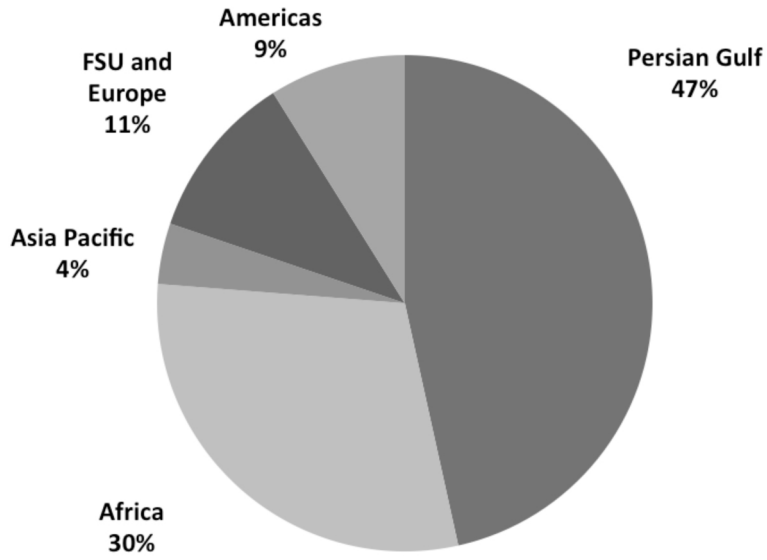
On balance, the NOCs 'going out' does not seem to have enhanced China's energy security to any great extent. While it has made a marginal contribution to the global production of crude oil, it does not guarantee greater flows of that oil to China, and it does not mean that oil will be more available to China in a supply crisis. On the other hand, while suggestions that the NOCs are impoverishing China by overpaying for assets are probably going too far, there is evidence that the NOCs are complicating China's foreign relations. In short, the NOCs' expansion is a positive development for the companies themselves, but it is far from clear that this is the case for China as a whole.

Diversifying sources of supply

Winston Churchill once famously observed that 'safety and certainty in oil lie in variety and variety alone' (quoted in Yergin 2006:69). China has certainly sought to heed this advice over the past two decades. In 1995, China relied on just two regions—the Persian Gulf and the Asia-Pacific—for 88 per cent of its crude-oil imports (Downs 2006:31). Within the Asia-Pacific, China was supplied mainly by Indonesia, which alone accounted for nearly one-third of China's total imports. By 2005, China had significantly diversified its import mix. That year, African countries accounted for 31 per cent of China's imports, and China also imported significant quantities from the Americas and the former Soviet Union, with Russia supplying 10 per cent of China's imports (Downs 2006:31). Nonetheless, China's gains were limited. China remained just as reliant on the Middle East in 2005 as it had been 10 years before, with 46 per cent of its imports coming from the Persian Gulf. In addition, because China was now heavily reliant on Africa as well as the Middle East, it was now more dependent on a single chokepoint—the Strait of Malacca—than it had been before, with nearly 80 per cent of its oil imports flowing through the Strait. As of 2010, this situation still obtained: China still imported 77 per cent of its crude from Africa and the Persian Gulf (Figure 8.2).

It is against this backdrop that China has sought to further diversify its energy import mix through a series of 'loan for oil' and 'loan for gas' deals in the past few years. In particular, in the midst of global financial distress, Chinese state-owned banks made loans worth US$77 billion to nine different oil and gas-producing countries—all of which are located outside the Middle East—in 2009 and 2010 (Jiang and Sinton 2011:41). In return, China's NOCs were able to conclude a series of agreements with these countries and expand their international business. The deal with Russia promised to supply China with 300 000 bpd over 20 years through a new pipeline system, which began making commercial deliveries on 1 January 2011. The agreement with Brazil, meanwhile, promised China 150 000 bpd in 2009 and 200 000 bpd from 2010 to 2019. Agreements reached with Venezuela appear to have arranged Chinese purchases of up to 450 000 bpd between 2010 and 2020. In each of these cases, China will pay market prices for the oil it buys (Downs 2011:39–53).

Figure 8.2 China's crude-oil imports by region, 2010



Note: The figures do not sum to 100 per cent due to rounding.

Source: Lin F. 2011, *Xinhua China Oil,* Gas & Petrochemicals (OGP).

These 'loan for oil' deals might be seen as further enhancing China's energy security by establishing new supply relationships. The new pipeline with Russia is particularly noteworthy in this regard. Russia could previously ship 200 000 bpd to China by rail, and the pipeline will add an additional 300 000 bpd of capacity. Nonetheless, even if plans to expand the pipeline to 600 000 bpd capacity are completed, it would provide only 7.5 per cent of China's projected imports in 2020 if it functioned at full capacity (IEA 2010b:135). Russia is thus not going to replace the Persian Gulf as China's primary oil supplier in the foreseeable future. Russia's reliability as an energy supplier is also open to question—a point ruefully noted by some Chinese analysts (Zhao 2007:41). And while China is also reaching out to Venezuela and Brazil, and is now constructing a refinery so that it can process Venezuelan crude, it remains unclear how much oil will be shipped from the Americas to China given the distance involved.

China's recent 'loan for oil' deals thus have only limited potential to further diversify its import mix away from its main suppliers today. Perhaps in recognition of this fact, Beijing has also sought to diversify the route its oil shipments take as they wend their way towards China from the Middle East and Africa. In 2009, CNPC signed a memorandum of understanding with Myanmar to construct parallel oil and gas pipelines that would connect the Chinese Province of Yunnan with the Indian Ocean. The oil pipeline in particular will allow a portion of China's crude shipments to bypass the Malacca Strait on their way to China, while also saving 1200 km of travel distance (Jiang and Sinton 2011:34). Yet the 440 000 bpd capacity of the oil pipeline could have carried only 14 per cent of China's imports from Africa and the Middle East had it been operational in 2009—and that fraction is destined to shrink as China's oil imports continue to grow in the future. China also appears to be involved in developing rail and road infrastructure that will connect

Pakistani ports on the Arabian Sea with western China, prompting speculation that China is developing an even closer connection with the Persian Gulf (Harrison 2010). Yet as far as transporting oil is concerned, this connection will be even more constrained than the pipeline through Myanmar (Erickson 2010). Estimates suggest that the rail system would be able to carry only 175 000 bpd, assuming it was to be completely dedicated to oil transport. It would also be much more costly to transport oil in this manner, making it economically uncompetitive, and the rail link will transit mountainous terrain that is vulnerable to avalanches, flooding, seismic activity, and insurgency. Building a pipeline along this route would be problematic as well, due to both economic and security considerations (Erickson and Collins 2010:101–3).

In sum, while China has succeeded in diversifying its supply portfolio to some degree since the 1990s, the country will continue to rely on the Persian Gulf and Africa for a high percentage of its oil imports in the years to come. Most of these imports, in turn, will travel to China entirely by sea, given the paucity of alternative options. In this context, it is not surprising that China is thinking more and more about ways to secure its seaborne shipments of oil.

Protecting supply lines

China's growing reliance on seaborne oil imports has raised a variety of concerns about the security of the sea lines of communication (SLOC) through which its oil shipments flow. Oil tankers might become targets for pirates or terrorists, particularly when forced to transit narrow choke-points. Chinese analysts also worry that the US Navy, in conjunction with allied forces, could cut off seaborne oil shipments to China in the event of a military conflict over Taiwan. There is particular concern about China's imports from the Middle East and Africa, given the country's heavy reliance on these regions and the fact that shipments from them must traverse the narrow Malacca Strait. The phrase 'the Malacca Dilemma' has emerged in China to connote both China's heavy reliance on the Strait and the fact that this reliance poses distinct security challenges for China at the same time.

The above concerns, in combination with China's growing dependence on maritime trade more generally, have helped to motivate China's interest in developing its own blue-water navy in recent years. While to date the modernisation of the People's Liberation Army Navy (PLAN) has focused on submarine capabilities and area denial missions around China's periphery, attention has shifted in recent years to operations further afield. In an indication of this emerging interest, China is rapidly restoring the *Varyag*, a Soviet aircraft carrier purchased in 1998 that could be used for training purposes as well as a model for a future ship. Analysts now project that the PLAN could build its own 50 000–60 000-tonne conventional carrier by the middle of this decade and a nuclear-powered carrier by 2020 (Collins and Erickson 2011). Chinese military officials and analysts are also actively discussing the kind of overseas support network that the PLAN would need to support operations far from China's shores (Chase and Erickson 2009:8–11). Military and security officials have also become more directly involved in energy policy making in China in recent years. The 21 members of China's National Energy Commission (NEC), for example, include both the Deputy Chairman of the military's General Staff and the Minister of State Security (Bradsher 2010).

To what degree would the development of a blue-water navy enhance China's energy security? A robust force that would allow China to challenge the United States for sea control would provide the country with the means to counter an American-led blockade. Such capabilities would take a long time to develop, however, and they would be quite costly as well. Nor would it be money well spent, since the threat of an American blockade is largely a chimera. The United States would be highly unlikely to attempt such a blockade, since the ensuing disruption of the Chinese economy would inevitably have repercussions for the American economy as well. The United States would not be pressuring China so much as engaging in 'mutually assured economic destruction', given the growing interdependence of the two economies. Even if the United States were to attempt a blockade of China, it would probably not be very successful (Collins and Murray 2008). If the blockade were implemented far from China's shores—around the Malacca Strait, for instance—it would be extremely difficult to differentiate oil bound for China from that bound for other countries, including Japan and South Korea. A given tanker might carry oil bound for several countries, and ownership of the oil within a tanker can easily change during the course of its journey. If the blockade operations were undertaken close to China, in contrast, blockading vessels would be vulnerable to attacks from Chinese submarines and land-based forces. Taking these points together, the chances that the United States and its allies would both attempt to impose an oil blockade against China and largely succeed in this endeavour are vanishingly small.[3]

In contrast, a more modest naval force focused on more limited missions would arguably be more useful from the standpoint of China's energy security. Although it would not allow the PLAN to compete with the US Navy, it would allow China to support international efforts to combat piracy and terrorism around major shipping lanes. In fact, the PLAN has recently begun to support such efforts—notably by participating in the multinational initiative to combat piracy off the coast of Somalia since late 2008. In February 2011, the Chinese Government proudly claimed that PLAN vessels had escorted more than 3400 Chinese and foreign ships through these waters, while also rescuing 33 ships from pirate attacks ('Latest Chinese naval escort fleet leaves for Somali waters', *People's Daily Online*, 22 February 2011, <english.peopledaily.com.cn/90001/90776/90883/7295227.html>). To be sure, naval patrols are only part of the solution to this problem; equally important are measures that shippers are taking to protect themselves and long-term efforts to establish political order within Somalia. Even so, there is an acute need for greater naval patrolling at present, since the area afflicted by piracy off the coast of East Africa is now the size of Western Europe ('No stopping them: for all the efforts to combat it, Somali piracy is posing an ever greater threat to the world's shipping', *The Economist*, 3 February 2011, <www.economist.com/node/18061574?story_id=18061574&fsrc=rss>). There is thus an opportunity for China to play a greater role in such efforts in the future.

In short, the extent to which China's emerging naval capabilities augment the country's energy security in the future depends on the kind of force that is developed and the types of missions that it undertakes. Mounting a naval challenge against the United States would be quite costly, would alienate other Asian countries, and would not address a threat that is

likely to materialise. Focusing on more limited capabilities, in contrast, would allow China to build on its recent participation in multinational anti-piracy efforts and, in doing so, address a real challenge that both China and the international community face today.

Building a domestic reserve system

China is also actively building its own strategic petroleum reserve (SPR) to bolster its energy security. The construction is proceeding in three stages ('Factbox: China's strategic oil reserve plan', *Reuters*, 20 January 2011). The first phase, which has already been completed, reportedly holds 102 million barrels—enough for about 24 days of net import requirements at 2009 levels. The second phase is currently being filled and will reportedly expand China's holdings by another 170 million barrels. The third phase, which is scheduled to be completed by 2020, will expand China's SPR to approximately 500 million barrels. That would cover 116 days of oil imports at 2009 levels, but only 63 days of imports at levels projected for 2020. China's oil companies also have their own commercial reserves, in addition to the SPR. Chinese media reported in March of this year that these held another 168 million barrels, but the figure remains unverified (Zhou and Shen 2011).

China's investment in its SPR system has the potential to make a significant contribution to the country's energy security. The SPR will provide Beijing with new policy options in the event that its supply of oil imports is disrupted in the future—and it is clear that this is a real danger. The world has seen 10 major oil-supply disruptions since the mid-1950s, and four of these occurred between 2001 and 2010 (IEA 2010a:11). In 2011, political unrest in the Middle East has further underscored the danger of supply disruptions and prompted prices to jump in response. In short, while the cost of constructing a reserve system is considerable, China's SPR is a worthwhile investment.

Nonetheless, China's SPR will be a much more effective instrument if it is used in coordination with the reserve systems of other countries. International Energy Agency members are required to maintain stocks that can meet at least 90 days of net import demand and, at the end of 2009, total stocks in the organisation's members stood at 4.2 billion barrels (IEA 2010a:7). In the event of future supply crises, Beijing is likely to find itself drawing on its own reserves at the same time that other major importers are drawing on theirs, since supply disruptions are far more likely to affect many countries at once than just China alone. Should China's actions fail to be coordinated with those of other countries, or should China's response be insufficiently transparent, oil traders are more likely to be confused than reassured, and instability in the markets will persist. It is thus important that Beijing develop more robust cooperation with other major oil importers—a point considered in more detail below.

The opportunity for greater multilateralism

To date, China has focused primarily on unilateral and bilateral measures to enhance its energy security. It has encouraged its oil companies to invest overseas, developed relationships with new suppliers, looked to develop a blue-water navy, and begun to construct its own oil reserve system. The preceding discussion makes clear that these measures—by themselves—have limited potential to alleviate China's 'petroleum

predicament' significantly. In the future, China should develop a more well-rounded approach by investing more in multilateral initiatives. The following discussion focuses on the possibility of greater coordination with the IEA in particular.

Since the 1970s, the IEA has been the primary mechanism through which major oil importers coordinate their responses to supply disruptions. In the event of a crisis, the organisation allows member countries to coordinate efforts to restrain demand and to bring additional supplies to the market through the release of reserve stocks (IEA 2010a:6).[4] With China emerging as the world's second-largest oil consumer, as well as its second-largest importer, it would seem only natural that the organisation now includes China as a member. Nonetheless, while China has taken part in a number of IEA meetings in recent years as a 'major dialogue partner', it remains outside the organisation.

There are several attributes of the IEA that make it difficult for China to become a member. First, the agreement establishing the IEA in 1974 envisioned the group's members being drawn from the Organisation for Economic Cooperation and Development (OECD). China is not an OECD country, and is not about to become one in the next few years, so this would seem to preclude Chinese membership. Nonetheless, the United States has signalled that it is prepared to open the doors to China in the interest of maintaining the institution's relevance; in late 2008, the Bush administration expressed its support for China joining the IEA, and the Obama administration has made it clear that it would welcome Chinese membership as well ('Hearing of the Senate Foreign Relations Committee; subject: the nomination of Kurt Campbell to be Assistant Secretary of State for East Asian and Pacific Affairs', *Federal News Service*, 9 June 2010; Kennedy 2010:141). China's lack of OECD membership should thus not be seen as an insuperable obstacle, but a complication to be managed. Second, China's oil reserves do not yet meet IEA standards, which as noted above require members to maintain stocks that can meet at least 90 days of net import demand. Yet China is probably not too far from meeting this requirement, if one includes both its growing SPR and its industry stocks; in 2009, IEA Director, Nobuo Tanaka, estimated that China's total reserves could meet 86 days of net imports ('China close to IEA membership', *Oil & Gas News*, 19 July 2009).[5] Lastly, there is the question of whether the IEA's Governing Board can reform its voting structure in a way that satisfies both its 27 existing members and its potential members, which could include not just China but also India and Russia (Colgan 2009:8–9). While this is a nettlesome issue, it does not preclude China from pursuing membership by making clear the reforms that it would like to see implemented if it were to join.

Perhaps the most fundamental obstacle to China becoming an IEA member is Beijing's own hesitation about joining the organisation. Chinese officials reportedly worry that joining the IEA would undermine its freedom to use its SPR as it saw fit, and there is also concern about the degree of transparency the IEA would require.[6] Yet it should be possible to reassure Beijing on these points. First, while the IEA Governing Board in theory has the ability to make legally binding decisions by majority vote, in practice, it is a means of facilitating agreements among its members, and decisions by consensus are the norm (Keohane 1984:217–40; Scott 1994:184–8). Moreover, the IEA has no ability to actually enforce its decisions, so it is unclear how it could make China comply with a decision that Beijing did not support. Second, while joining the IEA would impose new reporting requirements on China, increasing the transparency of its energy sector would reduce

uncertainty and thus a potential source of volatility in international markets. Indeed, even some Chinese experts have begun to argue that China ought to join the IEA. In their view, it would not only improve international cooperation between major energy consumers, but also strengthen China's voice in the energy arena and reassure other states about China's impact on energy markets and institutions as it rises (Wang 2009; Zhao 2008).

In the short term, of course, full Chinese membership in the IEA might be too ambitious a goal. The difficulty of reforming the IEA to admit China, combined with China's hesitation about joining the organisation, is a significant obstacle that will not be overcome overnight. Nonetheless, China and the IEA need to develop a closer relationship if they are to cooperate effectively in the future. One possibility is that China could deepen its consultation with the IEA—sharing more information and developing communication mechanisms to be used in emergencies—without formally joining the organisation (Colgan 2009:12). This would be a positive step, and it would help to reduce confusion in a supply crisis. Yet it would not give China a voice inside the institution, and it would be less reassuring to the world about China's trajectory and intentions in the energy sphere than full membership would be. For these reasons, China's long-term goal ought to be full membership in the IEA.

Conclusion

China's policies to address its 'petroleum predicament' in recent years range from the largely ineffective to the insufficiently developed. Beijing's support for the international expansion of China's NOCs is arguably the least productive of its policies; it might be good for the companies themselves, but it does little to enhance national energy security. China's attempts to diversify the regional sources of its oil imports represent a more effective means of pursuing energy security, and Beijing has had some success in this regard. Even so, the country will remain highly dependent on imports from the Middle East and Africa—and on transportation through the Malacca Strait—for years to come. This raises the question of how these shipments will be protected. China's efforts to develop blue-water naval capabilities could enable it to protect its oil shipments against such threats as piracy and terrorism more effectively, particularly in collaboration with other countries. For the moment, however, it remains unclear whether Beijing is interested mainly in these types of missions or in the more dubious proposition of competing with the United States and its allies for sea control. Lastly, China's development of its own SPR system is an important and necessary step, one that will give it new options in the event of future supply crises. Yet Beijing will need to coordinate more effectively with other major oil importers in the future if it is to use its reserve system effectively.

This last point raises a broader issue concerning how China pursues energy security. As argued in the preceding pages, China has thus far emphasised unilateral and bilateral measures to reduce its vulnerability to oil-supply shocks. Pursuing greater coordination with other oil importers—and, in particular, with the IEA—would allow China to develop the multilateral side of its approach to energy security. In the short term, China could deepen its level of consultation with the IEA and make its energy sector more transparent. In the longer term, China could seek membership in the organisation. Such multilateral engagement would provide Beijing with more information and greater influence in the event

of future supply shocks—a danger that appears all too real in light of recent events. More broadly, greater multilateral engagement would demonstrate that Beijing is looking for ways to cooperate with the international community as the story of China's rise continues to unfold.

Bibliography

Bradsher, K. 2010, 'Security tops the environment in China's energy plan', *The New York Times*, 17 June, <http://www.nytimes.com/2010/06/18/business/global/18yuan.html>

British Petroleum (BP) 2010, *BP Statistical Review of World Energy 2010*, British Petroleum, <http://www.bp.com/productlanding.do?categoryId=6929&contentId=7044622>

Chase, M. and Erickson, A. 2009, 'Changes in Beijing's approach to overseas basing?', *China Brief*, vol. 9, no. 19 (24 September), pp. 8–11.

Colgan, J. 2009, *The International Energy Agency: challenges for the 21st century*, GPPi Policy Paper Series No. 6, Global Public Policy Institute, Berlin.

Collins, G. and Erickson, A. 2011, 'Grading China's military plans', *The Diplomat*, 9 April, <http://the-diplomat.com/flashpoints-blog/2011/04/09/grading-chinas-military-plans/>

Collins, G. and Murray, W. 2008, 'No oil for the lamps of China?', in G. Collins, L. J. Goldstein and A. S. Erickson (eds), *China's Energy Strategy: The impact of Beijing's maritime policies,* Naval Institute Press, Annapolis, Md, pp. 387–407.

Downs, E. 2006, *China*, Foreign Policy Studies Energy Security Series, December, Brookings Institution, Washington, DC, <http://www.brookings.edu/experts/downse.aspx>

Downs, E. 2010, 'China's energy rise', in B. Womack (ed.), *China's Rise in Historical Perspective*, Rowman and Littlefield, Lanham, Md.

Downs, E. 2011, *Inside China, Inc.: China Development Bank's cross-border energy deals*, John L. Thornton China Center Monograph Series No. 3, The Brookings Institution, Washington, DC.

Downs, E. and Maloney, S. 2011, 'Getting China to sanction Iran: the Chinese–Iranian oil connection', *Foreign Affairs*, vol. 90, no. 2, pp. 15–21.

Economy, E. and Segal, A. 2008, 'China's Olympic nightmare: what the Games mean for Beijing's future', *Foreign Affairs*, vol. 87, no. 4, pp. 47–56.

Erickson, A. 2010, 'Still a pipedream: a Pakistan-to-China rail corridor is not a substitute for maritime transport', *China Signpost*, no. 13 (22 December), <www.andrewerickson.com/2010/12/still-a-pipedream-a-pakistan-to-china-rail-corridor-is-not-a-substitute-for-maritime-transport/>

Erickson, A. and Collins, G. 2010, 'China's oil security pipe dream: the reality, and strategic consequences, of seaborne imports', *Naval War College Review*, vol. 63, no. 2, pp. 89–112.

Fang, Y. and Wong, J. 2010, 'China electric vehicles to hit 1 million by 2020: report', *Reuters*, 16 October, <http://www.reuters.com/article/2010/10/16/retire-us-autos-china-idUSTRE69F0J820101016>

Harrison, S. 2010, 'China's discreet hold on Pakistan's northern borderlands', *International Herald Tribune*, 26 August, <http://www.nytimes.com/2010/08/27/opinion/27iht-edharrison.html>

International Energy Agency (IEA) 2007, *World Energy Outlook 2007*, Organisation for Economic Cooperation and Development, Paris.

International Energy Agency (IEA) 2010a, *IEA Response System for Oil Supply Emergencies 2010*, International Energy Agency, Paris, <http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=1912>

International Energy Agency (IEA) 2010b, *World Energy Outlook 2010*, Organisation for Economic Cooperation and Development, Paris.

Jiang, J. and Sinton, J. 2011, *Overseas investments by Chinese national oil companies: assessing the drivers and impacts*, Information Paper Prepared for the Standing Group for Global Energy Dialogue of the International Energy Agency, February, Paris, <www.iea.org/papers/2011/overseas_china.pdf>

Kennedy, A. 2010, 'China's new energy-security debate', *Survival: Global Politics and Strategy*, vol. 52, no. 3, pp. 137–58.

Keohane, R. 1984, *After Hegemony: Cooperation and discord in the world political economy*, Princeton University Press, Princeton, NJ.

Kong, B. 2010, *China's International Petroleum Policy*, Praeger Security International, Santa Barbara, Calif.

Liang, D., Lu, Y. and Zhang, T. 2010, 'What's clogging China's air traffic pipeline?', *Caixin Online*, 13 October, <http://english.caing.com/2010-10-13/100188152.html>

Lin F. 2011,'China's 2010 Petroleum Net Imports Up 16 pct to 254 mln t,' *Xinhua China Oil, Gas & Petrochemicals*, 21 February.

McKinsey and Company 2009, *China's Green Revolution: Prioritizing technologies to achieve environmental and energy sustainability*, February, McKinsey and Company, New York, <http://www.mckinsey.com/locations/greaterchina/mckonchina/reports/china_green_revolution.aspx>

Oliver, H. H., Gallagher, K. S., Tian, D. and Zhang, J. 2009, 'China's fuel economy standards for passenger vehicles: rationale, policy process, and impacts', *Energy Policy*, vol. 37, pp. 4720–9.

Scott, R. 1994, *The History of the International Energy Agency. Volume 1: Origins and Structure*, Organisation for Economic Cooperation and Development, Paris.

Wang, L. 2009, 'Zhongguo yu Guoji Nengyuan Jigou—Yi Xiang Guifan Yanjiu [China and the International Energy Agency—a normative analysis]', *Guoji Guancha* [*International Survey*], no. 4, pp. 11–17.

Yergin, D. 2006, 'Ensuring energy security', *Foreign Affairs*, vol. 85, no. 2, pp. 69–82.

Zhao, H. 2007, 'Maliujia Kunju yu Zhongguo Nengyuan Anquan Zai Sikao [Rethinking the Malacca dilemma and China's energy security]', *Xiandai Guoji Guanxi* [*Contemporary International Relations*], no. 6, pp. 36–42.

Zhao, H. 2008, 'Guoji Nengyuan Zuzhiyu Duobian Nengyuan Waijiao [International energy organisations and multilateral energy diplomacy]', *Guoji Shiyou Jingji* [*International Petroleum Economics*], no. 10, pp. 12–17.

Zhou, Y. and Shen, J. 2011, 'Tianjin oil storage facility in train', *China Daily*, 5 March, <http://europe.chinadaily.com.cn/business/2011-03/05/content_12121641.htm>

Endnotes

1. *Renmin Ribao Electronic Database*, accessed through The Australian National University Library's electronic resource system.
2. Note this total refers to the investments themselves; it does not include related transactions concluded to facilitate the investments, such as some of the loans made by Chinese banks to oil-producing countries in recent years. The 'loan for oil' deals are discussed in the next section.
3. Note that some Chinese analysts appreciate the difficulties that the United States would have. See Zhao (2007:36–8).
4. The IEA also allows for the coordination of fuel-switching and surge production in the event of a crisis, but these mechanisms are less viable now than in the past.
5. Note that Chinese officials subsequently disputed Tanaka's estimate as too high. See 'Chinese official denies 86 days oil reserve claim by IEA', *Asia Pulse*, 6 July 2009.
6. This point is based on the author's interviews with energy specialists at Chinese state-owned think tanks in Beijing, March 2009.

9 Promoting Global Carbon Equity and Low-Carbon Growth:

China's role in combating global climate change

Yongsheng Zhang

Introduction

Climate change has emerged as one of the greatest crises of the world today, and calls for global efforts to reduce greenhouse gas emissions and the dependence on traditional fossil fuels. The final solution to global climate change will require a greater reliance on a pattern of low-carbon growth based on renewable energy, which will represent the most profound transformation of the development model since the Industrial Revolution.

Two severe obstacles, however, stand in the way. First, effective international governance is absent, as the existing international order most reflects the interest of industrialised countries, yet handling the issue of climate change has a direct bearing on the future emission space (or development potential) of developing countries. If global climate negotiation is based on the arm-twisting of various countries, not on the principle of equity, this could give rise to unfair results (Garnaut 2008). Even though such unfair results might also contain climate change to some extent, this might well be achieved at the cost of underdevelopment in the world's developing countries. Second, the ideal of low-carbon growth has not become a common reality. Emissions reduction is deemed a burden and all countries have the incentive to be free riders in combating global climate change. In addition, the limitations of existing analyses fail to fully recognise the benefits of mitigation for economic growth. According to the existing analysis, global emission reduction conflicts with economic growth, such that fighting climate change becomes an issue of balancing its benefits and costs (for instance, Nordhaus 1993; Stern 2007). As a result, those involved in global negotiations on climate change focus more on how to share the burden, instead of on how to blaze out a low-carbon growth model via concerted and coordinated global efforts.

This focus on the burden of carbon reductions overlooks the fact that climate change negotiations could, through collaboration between industrialised and developing countries, be redirected from a zero-sum game to a win-win situation. This could be achieved through the simultaneous pursuit of global carbon equity and low-carbon growth. In both of these pursuits, China has an active role to play. In shaping the international climate change regime, China plays a key role in ensuring balance in the negotiations between industrialised and developing countries. On low-carbon growth, China is already making great efforts to transform its development pattern and promote low-carbon growth by robustly mitigating its emissions, adjusting its economic structure, and developing new energy sources. The objective of this chapter is to investigate China's role in combating global climate change, and the economic opportunities that fighting climate change represents.

Global carbon equity and low-carbon growth

Due to the limited space for carbon emissions in the future, there are two possible scenarios for combating global climate change. The first is to control the emissions of global greenhouse gases (GHGs) while maintaining the existing pattern of world development. Under this scenario, industrialised countries would not need to drastically change their existing development and consumption patterns, but would need only to cut their current emissions by a certain margin. The majority of developing countries would, however, then likely be subject to long-term poverty due to the lack of enough emission space in the future. The second scenario is to establish a new low-carbon growth pattern in which industrialised countries dramatically alter their development and consumption pattern and developing countries shake off poverty by adopting a low-carbon growth pattern.

Obviously, the second scenario is optimal for the world as it can achieve two targets simultaneously—namely, the control of global GHG emissions and the boosting of global economic development for shared prosperity. Without great external pressure for further emission reduction, however, industrialised countries will not be motivated to shift to low-carbon growth. Should the most innovative industrialised countries lose the motive for transformation, the possibility of realising a global low-carbon growth pattern will become very slim. Hence, without carbon equity, the optimal second scenario cannot be achieved either. Carbon equity is therefore in the best interest not just of developing countries, but of the world as a whole.

According to the initiatives of the industrialised countries at the Copenhagen Climate Change Conference, global carbon emissions will be reduced by 50 per cent of those of 1990 by 2050, with an 80 per cent cut in GHGs by industrialised countries. Seemingly, industrialised countries have made a great commitment. Yet this is not true. Given the equation 'GHG emissions space for developing countries = global emission space in the future – emission space for industrialised countries', when the global emission space in the future and the emission space for the industrialised countries are given then GHG emissions space for developing countries is fixed. Setting the long-term goal of global temperature control at 2ºC means that global emissions of carbon dioxide during 2010–50 need to be limited to 750 Gt (WBGU 2009). In accordance with this initiative, developing countries will suffer from insufficient emission space, despite the reductions pledged by industrialised countries (Khor 2009).

Global carbon equity and China's role

The principle of common but differentiated responsibilities (CBDR) is fundamental to dealing with global climate change. Due to the absence of a clear definition for such responsibilities, however, industrialised countries often stress 'common responsibility' while developing countries place greater emphasis on 'differentiated responsibilities'. In particular, some industrialised countries regard it as unfair that China and the other largest developing countries do not undertake any compulsory emission reduction obligations as the major emitters in the world. So what is global carbon equity in the real sense? This can be addressed as long as 'differentiated responsibilities' are clearly defined.

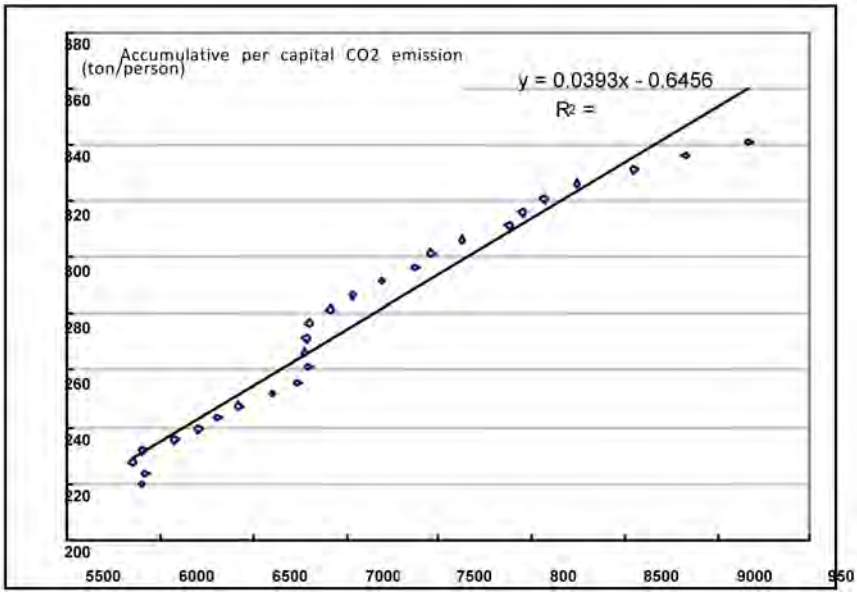
The meaning of global carbon equity

The project team of the Development Research Centre of the State Council (DRC 2009) proposed a solution of carbon budget accounts (CBA) for global GHG emissions reduction. Due to the mobility and inertia of GHGs, about 70 per cent of the GHGs currently in the atmosphere have been discharged by industrialised countries since the Industrial Revolution. Therefore, a global carbon budget should include both historical and future emissions. If a country's per capita emissions exceed the world average, it not only imposes a net negative externality on other countries, it also squeezes out their emission or development space, which should therefore be compensated. The initial emissions entitlements of each country should be allocated based on the per capita principle of accumulative emission entitlements. This is what we mean by global carbon equity.

In the first place, the aggregate global carbon budget including historical and future emissions should be set up in line with global long-term temperature control goals. Second, the budget should be allocated fairly among all countries in accordance with the per capita principle, and carbon budget accounts should be set up according to their initial emission entitlements and 'real' emissions. Third, an open and compatible mechanism for international cooperation and domestic emission reduction should be established on the basis of such accounts, by virtue of which all countries need to clear their account at the targeted time. In addition, relevant mechanisms for reporting, registration, verification and agreement compliance should be set up.

In accordance with this approach, the DRC project team gauges the differentiated responsibilities of each country through direct and indirect measurement (DRC 2010a). Direct measurement refers to the initial emission entitlements for each country based on a global carbon budget and per capita principle, while the real emissions are calculated directly in its historical accumulative real emissions. In light of the high lineal correlation between per capita gross domestic product (GDP) and per capita accumulative carbon dioxide emissions (Figure 9.1), an 'indirect' measurement is also adopted to gauge the differentiated responsibilities using current per capita GDP purchasing power parity (PPP) as a substitute indicator of accumulative real emissions (DRC 2010b). Both direct and indirect measurements have their own merits and demerits, but both show that industrialised countries register massive emission account deficits while developing countries enjoy a great account surplus. In this sense, the emission reduction commitment by industrialised countries lags far behind their responsibilities. The key results of the above two measurements are presented as follows.

Figure 9.1 World average per capita GDP and per capita accumulative carbon dioxide emissions



Source: DRC (2010b).

Differentiated responsibilities of various countries by direct measurement

According to Meinshausen et al. (2009), when the probability of the temperature exceeding 2ºC is set at 25 per cent, the aggregate global carbon dioxide emission budget during 1850–2050 will stand at 2040 Gt of carbon dioxide (CO_2). For a 50 per cent probability, the figure is 2477 Gt CO_2 (Table 9.1). As can be seen from Table 9.2, under the second scenario, the deficit of Annex I countries (that is, industrialised countries) amounts to 384 Gt CO_2 and the surplus of non-Annex I countries is 1598 Gt CO_2. This means that the industrialised countries would have no emission quota at all and would have to purchase emission rights from developing countries in order to maintain their current levels of production and consumption. Hence, the emission reduction commitment by the industrialised countries falls far behind their responsibilities.

Table 9.1 Aggregate global carbon dioxide emission budget during 1850–2050 with different probabilities of temperature rise exceeding 2ºC

	Temperature exceeding probability	
	25%	50%
Global emission budget during 1850–1999		1040
Plus: global emission budget during 2000–49	1000	1437
Equals: aggregate global emission budget during 1850–2049	2040	2477

Note: All values in the table are Gt CO_2.

Sources: Meinshausen et al. (2009); and calculation of CAIT 7.0.

Table 9.2 Balance of carbon budget account in 2006 with 50 per cent probability of temperature rise exceeding 2°C (Mt CO_2): direct measure

	Initial emission entitlements (1850–2050)	Real emissions (1850–2006)	Balance of carbon budget account (2006)
World	2 477 032	1 258 612	1 218 420
Annex I	482 593	867 044	–384 451
Non-Annex I	1 967 720	369 177	1 598 543

Notes: Figures for Annex I and non-Annex I do not add up to the World total due largely to calculation errors. All values in the table are Gt CO_2.

Source: DRC (2010a).

Differentiated responsibilities of various countries by indirect measurement

For the indirect measurement, we apply per capita GDP to the Annex 1 countries and non-Annex 1 countries (Table 9.3). In general, the balance of carbon budget accounts in most countries through indirect measurement is close to the results of direct measurement with discrepancies for just a few countries.

Table 9.3 Balance of carbon budget account in 2006 with 50 per cent probability of temperature rise exceeding 2°C (Mt CO_2): indirect measure

	Emission entitlements (1850–2050)	Balance of carbon budget account (2006)
World	2 477 032	1 218 420
Annex I	482 593	–314 918
Non-Annex I	1 967 720	1 533 338

Source: DRC (2010a).

Both the direct and indirect measurements indicate that industrialised countries experience great emission deficits while developing countries generally have great emission surpluses. Such results genuinely speak for the differentiated responsibilities between industrialised and developing countries, which will not be changed by single-track or dual-track global climate change negotiations. With clearly defined differentiated responsibilities, industrialised countries will receive emissions quotas from developing countries through various collaborations or an international emission trading scheme to maintain their development, which will provide crucial financing for developing countries to gain access to new green technologies and to adapt to climate change.

On the starting point of historical responsibilities

On this issue, a popular argument holds that the year 1990 should be the starting point for measuring the historical responsibilities of all countries as the assessment report of the Intergovernmental Panel on Climate Change (IPCC) was first published in 1990. Yet such an argument is unconvincing.

First, the concept of 'common but differentiated responsibilities' was put forward as early as 1992, according to which differentiated responsibilities reflected the historical responsibilities of each country based on the impact of accumulative emissions on the environment by various countries from the Industrial Revolution through to 1992, not the carbon emissions of various countries from 1990 to the present. This point is reflected in the following two quotes.

- *Rio Declaration* (1992) (Principle 7): 'In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.'
- *UN Framework Convention on Climate Change*: 'Parties should act to protect the climate system "on the basis of equality and in accordance with their common but differentiated responsibilities and respective capabilities".'

Second, GHGs discharged by industrialised countries since the Industrial Revolution still harm developing countries today. Theoretically speaking, the historical responsibility of each country should therefore begin from the Industrial Revolution. In practice, given the lack of available historical data, balanced negotiations between industrialised and developing countries should establish a starting point that is acceptable to both parties.

Typical arguments from industrialised countries on global carbon equity

Since the differentiated responsibilities in the principle of CBDR have not been clearly defined, some industrialised countries fail to fully recognise their responsibilities in global emission reduction. Some people argue that industrialised countries have made a greater contribution to global emission reduction, while the developing countries—in particular, the major developing countries such as China—are the main obstacles in combating climate change (for example, see Miliband's comments on China in Coates and Macartney 2009). This argument seems to be supported by the fact that industrialised countries took the initiative to undertake compulsory emission reduction obligations in the Kyoto Protocol while developing countries did not. Also, with China emerging as one of the largest emitters in the world, with rapidly growing emissions, some people conclude that it is China rather than the historical emissions that underpins the current predicament for global emission reduction. The above calculations demonstrate that the emission reduction efforts by the industrialised countries fall far behind their responsibilities once differentiated responsibilities are clearly defined.

The following typical views of industrialised countries help to explain the disagreements between industrialised and developing countries on the issue of carbon equity.

'Our ancestors were not aware of the hazards of GHG emissions. Therefore, we are not responsible for the emission by our ancestors.'

Such an argument is understandable but not convincing. In line with the legal principle of 'objective responsibility' (such as in the United States), polluters should not be exempted from responsibility by claiming an unawareness of the hazards to the environment.

'It is unfair to ask this generation to take responsibility for the emissions generated by their forefathers.'

First, the current high levels of economic and social development in industrialised countries could not have been achieved without the emissions generated by their forefathers. In this sense, people in the present industrialised world are the beneficiaries of the emissions generated by their forefathers. Given that these historical emissions still linger in the atmosphere, someone has to take responsibility for them and surely this should be the (richer) people in industrialised countries, rather than the (poorer) people in developing ones.

'Developing countries should not focus on the issue of history. Instead, they should try to avoid the mistakes we have made by actively reducing their own emissions.'

Historical responsibility and future emissions are two different issues. The former relates to the rights of each country and the latter is the issue of choosing the path to industrialisation. No matter which path developing countries take (that is, high or low carbon growth), it should not affect their emission entitlements subject to the global budget. Also, given historical emissions and the impact they have had on current global temperatures, there will not be sufficient room for the economic development of developing countries unless the industrialised countries accept their responsibilities.

Besides, it is a false proposition to urge the developing countries to avoid making the mistakes made by the industrialised countries. If there were a better road towards industrialisation, developing countries would follow it spontaneously without requiring persuasion by industrialised countries. The problem is, however, that until now, low-carbon growth has not become a reality even in industrialised countries. Industrialised countries need to conduct more pilot projects based on new low-carbon patterns of growth for developing countries to follow. Before such patterns mature, they will be too risky for relatively poor countries to adopt.

'Being democratic means that our political processes will not allow us to take on so much historical responsibility or to have deep emissions cuts.'

This argument reflects reality, yet lacks legitimacy. A country's emission reduction responsibility has nothing to do with its democracy. Yet such reality speaks for the necessity of more effective global governance. How to establish more democratic and effective global governance remains a daunting challenge for solving global public issues such as climate change.

Low-carbon growth and China's contribution

To reduce GHG emissions and combat global climate change, we ultimately need to shift to a low-carbon pattern of development. This is a major thread in China's Twelfth Five-Year Plan (2011–15). China is committed to reducing its carbon emission intensity (that is, emissions per unit of GDP) by 40–45 per cent by 2020 compared with 2005, and to raising the proportion of renewable energy in total primary energy consumption to 15 per cent. China has also formulated ambitious development plans for emerging industries of strategic importance, covering next-generation information technology, industries on energy saving and environmental protection, new energy, biology, high-end manufacturing equipment, new materials, and new-energy vehicles. As a result, China has recently become the world's largest investor in renewable energy, followed by the United States and Germany. These efforts are likely to have a significant positive impact on the world's future pattern of development.

How emission mitigation promotes economic development

According to mainstream neoclassical marginal analysis, there is a trade-off between emissions reduction and economic growth. In particular, given the current (or any previous) level of technology and economic structure, economic growth necessarily generates emissions. Holding both the level of technology and the economic structure fixed therefore implies that emission reduction, to a large extent, can come only at the expense of economic development. Therefore, the cost of emission reduction consists of two parts: 1) the direct cost of emission reduction; and 2) the output decrease due to emission reduction. The benefit of emission reduction is mainly the decrease in the damage caused by climate change. Since the cost of emission reduction is local while the benefit is global, each country has an incentive to be a free rider in emission reduction. In the framework of neoclassical marginal analysis, the optimal global emission reduction is to achieve an efficient trade-off between the (global) benefits of emission reduction and the (local) costs of reduction—that is, the standard marginal analysis.

If, however, emission reduction leads to a more efficient low-carbon division-of-labour model, the result will be very different. In this case, emission reduction might promote instead of hamper economic development. This line of thinking follows Smith (1776) and Young (1928) and is formalised by Yang (2001) with 'infra-marginal analysis', which argues that the technical level, industrial structure and hence economic growth will undergo non-continuous change along with the evolution of the division of labour. This process is closely related to the Schumpeterian process of creative destruction.

Building on Smith and Young's ideas, Zhang and Shi (2010) develop an infra-marginal general equilibrium model that demonstrates how unilateral mitigation policy could actually stimulate the emergence and development of new industries associated with low-carbon technologies, analogous with the unilateral tariff cutting in the United Kingdom that stimulated economic growth 200 years ago. In particular, the earlier adopter of stringent mitigation policy can enjoy first-mover advantages in specialisation and higher productivity, and, consequently, international competitiveness. Other countries will then adopt similar stringent mitigation policies so as to maintain and improve their competitiveness, leading

to multilateral carbon reduction policy changes. Within this context, there is even the probability that developing countries could leapfrog to a more competitive low-carbon economic structure, since they have lower transition costs than industrialised countries, which have been already locked into high-carbon technologies.

Driven by national emission reduction policies and market competition, new final products will emerge one after another, coupled with the enlargement of industrial chains and the phasing out of old (especially emission-intensive) industries. Such changes can occur one by one or simultaneously. For example, motors can replace traditional petrol internal combustion engines and be built into electric vehicles, while at the same time the utilisation of wind power, nuclear power and/or carbon capture and storage technology can reduce the emissions per unit of electricity generated. In addition, the application of new technology can bring about changes to the whole industrial chain.

This means that the continuous development and expansion of low-carbon industries can become strong drivers of economic growth, resulting in fundamental changes in the development model, which would rely more heavily on the following

- low-carbon energy sectors: 1) new and renewable energy including wind, solar, hydropower, biomass, nuclear energy, ocean energy; 2) low-carbon fossil fuels such as shale-gas and liquefied natural gas (LNG); 3) and the 'cleaning' of high-carbon fossil fuels, such as 'dirty' coal
- upstream industries and services of low-carbon energy sectors, such as low-carbon energy generation equipment and services
- downstream industries and services of low-carbon energy sectors, including renewable energy-based industries (such as electric vehicles and their industrial chains)
- de-carbonisation of traditional high-carbon industries and the modernisation of agriculture, by using new technologies and business models (such as carbon asset management)
- low-carbon urban planning, infrastructure, and transportation systems
- low-carbon consumption patterns and lifestyles, which will further expand the markets for low-carbon products, as long as consumers are willing to pay a relatively higher price for low-carbon products.

China's potential advantages in promoting low-carbon growth

Industrialised countries have already fully developed their traditional fossil fuel capacities and related industries, so the development of low-carbon industries would be largely at the cost of the elimination of traditional capacity. For developing countries, however, low-carbon industries can develop without needing to eliminate traditional high-carbon industries. As China is still relatively less developed, it should be able to enjoy a relatively low cost of transformation, given the potential for developing its low-carbon industries by leapfrogging.

China's massive domestic market creates an additional favourable condition for the development of low-carbon industries. Based on Adam Smith's (1776) fundamental argument that the extent of the market determines the extent of the division of labour, this gives China a unique advantage. In combination with the ongoing challenges facing Chinese leaders as they grapple with ways to cope with the country's almost insatiable demand for energy, it seems that both the potential and the incentives for low-carbon development are there.

Nonetheless, this does not necessarily make the task easy. The ability to take full advantage of potential latecomer advantages not only depends on strict emissions mitigation policy and the establishment of a market-based mechanism for emission reduction, but also depends on a solid market economic system. Ultimately, global competition for low-carbon growth is a competition among each country's institutions. These constitute the sufficient conditions for a country to get on a competitive low-carbon development path in the first place.

The future of global climate change

Zhang and Shi (2010) use their model to analyse the prospects for global climate change negotiations to solve the climate change problem. According to the analysis, the prospects for successful negotiations are rather thin. Despite these findings, we are in fact rather optimistic about finding solutions to the global climate change issue, and particularly about the unique role that China can play.

According to the goal of the Copenhagen Accord, global emissions during 2010–50 should be confined within 750 Gt CO_2 (Meinshausen et al. 2009). Such emission space would be used up in 25 years given annual global emissions of more than 30 Gt CO_2 in 2008 (WBGU 2009). Hence, under the current technology level and economic growth pattern, unless either the industrialised or the developing countries make a great concession for the sake of reaching a global agreement on emission reduction, the goal is simply not achievable. For this reason, no major breakthroughs are likely to be achieved in global climate change negotiations in the foreseeable future.

The ongoing climate change negotiations rely on a top-down approach, in which a global temperature control target is set in the first place and then the corresponding global emission space or emission reduction quota is allocated among countries. Due to the absence of effective global governance, this top-down approach has confronted enormous difficulties. Some people have lost confidence in any kind of top-down solution and instead place their hope on a 'bottom-up' solution—that is, one in which each country sets its own emission reduction goals and promotes low-carbon growth (see Howes 2010).

Despite the dim prospects for global climate change negotiations, the prospect for addressing the issue of global climate change is still relatively promising. According to Zhang and Shi (2010), countries that take the initiative to adopt strict emission reduction policies will take the lead in shifting to a more competitive low-carbon growth pattern. Other countries then will have to follow to avoid being left behind in international competition. Hence, the global climate change issue will eventually be solved by such a bottom-up approach. Nonetheless, it does not mean that the top-down approach should be abandoned

in international negotiations. Without such pressure, many countries are unlikely to consciously adopt the strictest emission reduction policies at home since the pursuit of a low-carbon pattern of growth through emission reduction is regarded as risky before such a pattern is proved to be more competitive and feasible. Therefore, without emission reduction pressure exerted by top-down negotiation, industrialised countries are extremely unlikely to adopt rigid emission reduction measures. In this regard, the bottom-up solution to global climate change deeply relies on top-down negotiation, creating a serious dilemma for global climate change negotiations and comprehensive emission reduction.

Conclusions

Global carbon equity is a prerequisite for the solution to global climate change and low-carbon growth is the fundamental way out. In both regards, China has an indispensable role to play. Without the efforts of China, together with other rising powers, to defend the right of developing countries in global climate change negotiations, global carbon equity is not likely to be realised and future development in the developing part of the world will be confined by limited emission space. Meanwhile, without global carbon equity, industrialised countries will lack sufficient incentives to explore low-carbon development patterns. As a result, the global shift to low-carbon growth in the future will remain a mirage.

To date, emission reduction has been deemed as more a burden than an opportunity, with global negotiations focusing more on how to share that burden than on seriously exploring avenues for shifting to low-carbon growth. Both industrialised and developing countries need to rethink their respective roles in addressing global climate change as well as their positions in global climate change negotiations. First, all parties need to consider more deeply the perspective and concerns of the other. But more importantly, the traditional mentality of treating emission reduction as burden sharing needs to be changed. The world is being presented with a great opportunity to explore low-carbon modes of growth, which, if successful, will provide a positive-sum game globally, with both economic and environmental benefits worldwide.

Bibliography

Coates, S. and Macartney, J. 2009, 'China to blame for failure of Copenhagen climate deal, says Ed Miliband', *The Times*, 21 December.

Garnaut, R. 2008, *The Garnaut Climate Change Review*, Cambridge University Press, UK.

Howes, S. 2010, The international effort on climate change: unravelling or shifting gear?, ANU East Asia Forum, 24 October 2010, Canberra.

Khor, M. 2009, 'Blame Denmark, not China, for Copenhagen failure', *The Guardian*, 28 December 2009.

Meinshausen, M., Meinshausen, N., Hare, W., Raper, S. C., Frieler, K., Knutti, R., Frame, D. J. and Allen, M. R. 2009, 'Greenhouse-gas emission targets for limiting global warming to 2 degrees centigrade', *Nature*, vol. 435, p. 1158.

Nordhaus, W. D. 1993, 'Reflections on the economics of climate change', *The Journal of Economic Perspectives*, vol. 7, no. 4 (Autumn), pp. 11–25.

Project Team of the Development Research Centre of the State Council (DRC) 2009, 'Global greenhouse gas emissions reduction: an analytical framework and solution', in R. Garnaut, L. Song and W. T. Woo (eds) 2009, *China's New Place in a World in Crisis: Economic, geopolitical and environmental dimensions*, ANU E Press, Canberra, and Brookings Institution Press, Washington, DC.

Project Team of the Development Research Centre of the State Council (DRC) 2010a, *Carbon budget account approach: measurement results and implications*, [in Chinese], A report of Fighting Climate Change Project, Beijing.

Project Team of the Development Research Centre of the State Council (DRC) 2010b, *Carbon budget account scheme: a new measurement*, [in Chinese], A report of the project Fighting Climate Change Project, Beijing.

Rio Declaration on Environment and Development, <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>

Smith, A. 1776, *An Inquiry into the Nature and Causes of the Wealth of Nations*, [reprinted 1976], University of Chicago Press, Ill.

Stern, N. 2007, *The Economics of Climate Change: The Stern review*, Cambridge University Press, UK.

UN Framework Convention on Climate Change, http://unfccc.int/essential_background/convention/background/items/2853.php

WBGU 2009, *Solving the climate dilemma: carbon budget approach*, A Report of the German Advisory Council for Global Change (WBGU), Berlin.

Yang, X. 2001, *Economics: New classical versus neoclassical framework*, Blackwell, Boston.

Young, A. 1928, 'Increasing returns and economic progress', *The Economic Journal*, vol. 38, pp. 527–42.

Zhang, Y. and Shi, H.-L. 2010, *How emission reduction promotes economic development*, [in Chinese], A report of the Fighting Climate Change Project of the Development Research Centre of the State Council, Beijing.

10 Chinese–US Economic Relations After the Global Financial Crisis

Geoffrey Garrett

Introduction

The global financial crisis has had three profound effects on Sino–American relations. First, China and the United States have become a *de facto* Group of Two (G2), largely by default, as Europe and Japan have fallen on even harder times than the United States and because India's development path is at least 15 years behind China's. Second, the speed with which China is catching up to the United States has increased, with the mid-2020s projected as when China will pass the United States to become the world's largest economy—though it will then still be a much poorer and less powerful country than the United States. Third, the global financial crisis (GFC) did not—as some projected—reduce the enormous economic imbalances between China and the United States even as both countries reduced their imbalances with the rest of the world.

The first half of the Asia-Pacific century will thus likely be dominated by a waxing China and a waning United States, both standing head and shoulders above the other major powers, with profound differences in values and interests between the two countries, and tied together in a profoundly imbalanced but deeply co-dependent economic relationship. What China and the United States do—alone, together, in regional and multilateral forums or in conflict with each other—will increasingly define the global bounds of the possible not only in economic and security terms but also for new challenges such as sustainability.

What is the likely course of Sino–American relations: geopolitical conflict, economic competition or uneasy coexistence? Contra the heated punditry surrounding Chinese–US relations, uneasy coexistence built on economic co-dependence seems the most likely outcome.

There is one clear similarity and one important difference between Chinese–US relations today and USSR–US relations in the second half of the past century. The similarity is that there is a likely enduring gulf in core principles and world views between China and the United States—certainly making possible another intense and lasting geopolitical rivalry. The difference, however, is that China is deeply integrated into the global economy and joined at the economic hip with the United States, whereas the USSR was not part of the global capitalist economy and its economic ties with the United States were close to nonexistent. The smart money today says that this economic difference with the Cold War is likely to remain more important than the political similarity with the second half of the twentieth century.

There is a long tradition suggesting that Sino–American economic integration will be a powerful force for stability in Chinese–US relations. From Kant and Cobden on, liberals have believed that economic entanglements reduce the probability of armed conflict. This was a guiding principle of the open-economy vision of the United States after World War II, notwithstanding the absence of the communist world from it. Bill Clinton and George H. W. Bush seemed also to believe in the geopolitical power of economic entanglements, strongly supporting the integration of China into the global economy after the collapse of the Soviet Union.

Nonetheless, many today believe that Chinese–US economic relations are so imbalanced that, rather than acting as an inhibitor of geopolitical conflict, they will be a source of such conflict between the world's two most powerful countries. This is why Niall Ferguson (2009) argues that we are today living in a time that bears strong parallels with the years immediately before World War I.

Until now, the nearly constant flare-ups and ongoing aggravations in Chinese–US economic relations have acted more as a pressure-release valve to ease tensions than as wildfires threatening to rage out of control—at worst into another world war. There seems every reason to suspect that after more than two decades of savvy management of their difficult relationship, the leaders of both China and the United States will be up to the task of continuing to keep a lid on their frictions simply because the stakes are so transparently high.

There is no denying that the post-GFC challenges facing Sino–American relations are large. But they are dwarfed by the potential costs of conflict. As Henry Kissinger (2011) argued, the China–United States relationship will never look like a second Cold War because 'the overriding reality is that neither country will ever be able to dominate the other and that conflict between them would exhaust their societies'. Ultimately, the massive stakes in Chinese–US relations—the upside to their economic ties and the downside to armed conflict—are what should make us confident that both countries will continue to be able to manage their relations.

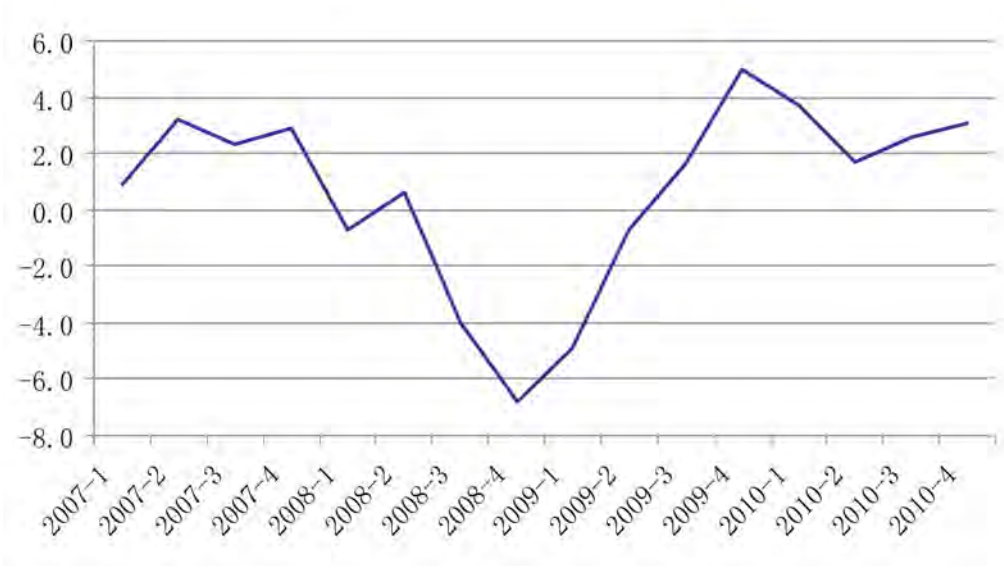
The remainder of this chapter unfolds as follows. The next section assesses the economic trajectories of China and the United States before and after the GFC, pointing both to the dramatic successes of China's massive crisis-fighting measures and to the spottier record of the United States despite comparable fiscal and monetary stimuli. The third section analyses the enduring economic imbalances between the two countries even in the post-GFC period when they have begun to unwind their imbalances with the rest of the world. The fourth section argues that these imbalances are less important to Sino–American economic relations than is commonly thought because they mask profound private sector interdependencies between the two countries. The final section examines the strong record of managing economic tensions by both sides, particularly in the immediate post-GFC period, which should give us confidence that stability rather than conflict will continue to be the watchword in relations between the world's two most powerful countries.

The *de facto* G2, by default

The GFC was born in the United States of too loose money and too lax regulation, aided and abetted by Asia's willingness to provide credit to America apparently without limit, and instantly transmitted to Europe through integrated global capital markets and then the rest of the world through plummeting global trade. Post GFC, buccaneering capitalism has lost it sheen, debt and deficits haunt the Western world, and emerging economies are rethinking their reliance on exports and funding Western debt to pay for them.

But *plus ça change, plus c'est la même chose*. The fundamental big-picture trajectory of the post–financial crisis era is the same as it was before—towards a world dominated by interactions between the United States, which is still the most powerful country, and China, which is the biggest and fastest-growing rising power. A *de facto* G2 is emerging, almost by default, even though neither China nor the United States will give their relationship this grandiose title.

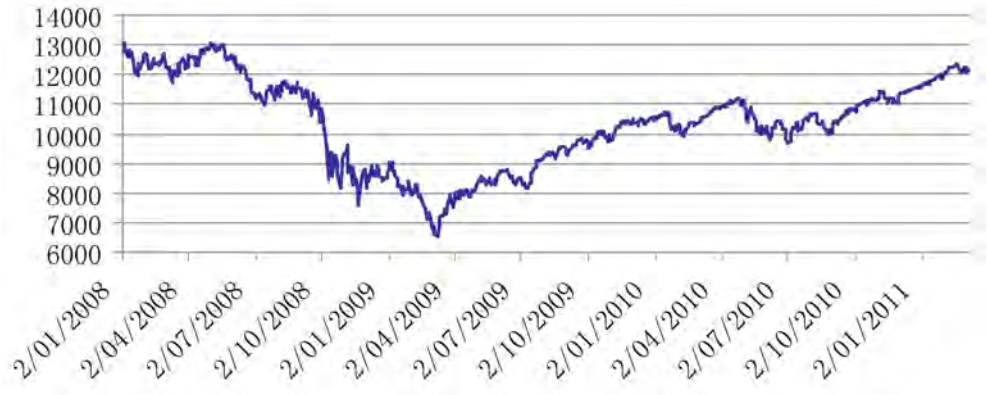
Figure 10.1 US GDP Growth 2007-2010



Source: US Bureau of Economic Analysis

There are two faces to the United States' economic recovery from the GFC. On the one hand, the real economy is doing quite well. From the depths of a precipitous 6 per cent decline in the fourth quarter of 2008, US gross domestic product (GDP) growth has returned to its historical norm of about 3 per cent (Figure 10.1). Similarly, the share market has recovered most of the value it lost during the crisis (Figure 10.2). Indeed, both recoveries, and especially growth, have the basic V-shape that has characterised previous American bounce-backs from recession.

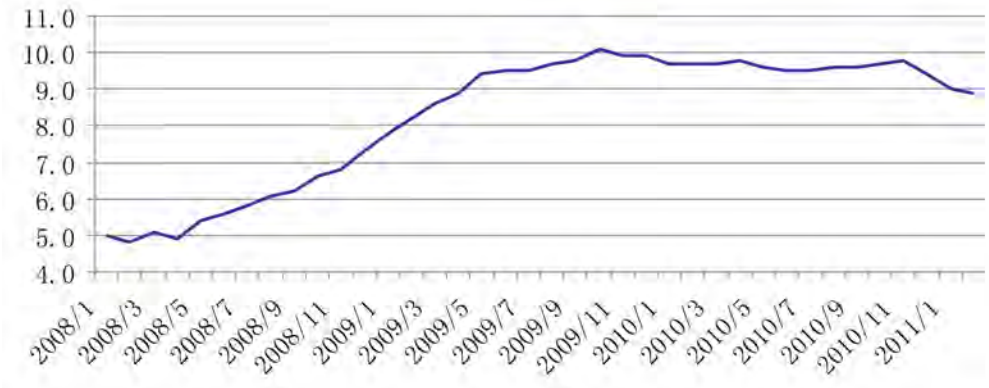
Figure 10.2 US Stock Market (DJIA)



Source: Dow Jones

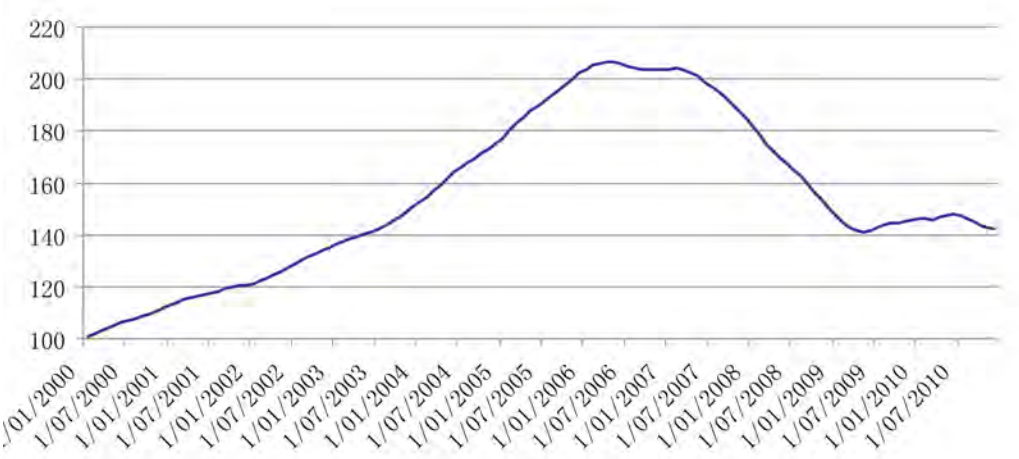
The US rebound, however, has been anaemic on the two most politically salient economic statistics: unemployment and housing prices. Wall Street might have recovered; Main Street is still reeling. The unemployment rate doubled to 10 per cent from the beginning of 2008 to the end of 2009 and has subsequently come down only slowly to slightly less than 9 per cent (Figure 10.3). After doubling between 2000 and 2006, US house prices fell by 30 per cent over the next two and a half years. Housing has essentially flat-lined since (Figure 10.4).

Figure 10.3 US Unemployment Rate



Source: US Bureau of Labor Statistics

Figure 10.4 US Housing Prices (Case Shiller Index)



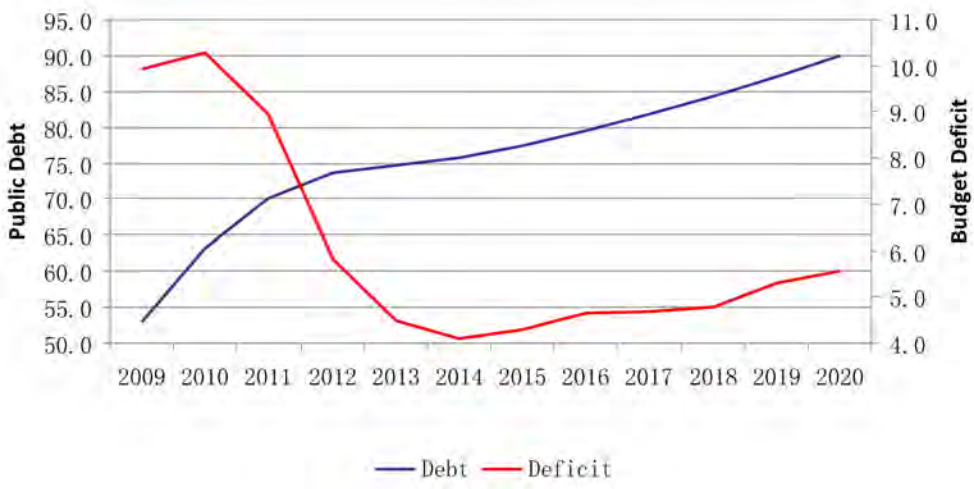
Source: S&P Case Shiller Home Price Index (20 city)

There are at least two ways to interpret these data. Optimists say that housing prices and unemployment were always going to be lagging indicators in America's recovery, and hence that they too will soon start to bounce back—even if not in any way approximating a V-shaped recovery. Pessimists instead say that the trajectory for jobs and housing prices is more likely L-shaped, with the poor outcomes of the recent past continuing for an extended period. The reality is likely to be somewhere in between.

The rising post-GFC debt and deficit mountain is more worrying to the United States' economic future (Figure 10.5). The massive US fiscal stimulus during the crisis resulted in a budget deficit of more than 10 per cent for the 2009–10 financial year. But short-term stimulus only adds to the fiscal unsustainability of the two biggest parts of the American welfare state—social security pension benefits for retirees and Medicare health care for the aged—which are under siege from the demographic time bomb of ageing, post–World War II baby boomers.

The Obama administration's budget projections will reduce the annual deficit to 4 per cent by 2014 (according to the independent Congressional Budget Office), with deficits rising back above 5 per cent by the end of the decade. Barack Obama, like other presidents before him, is unwilling to think the unthinkable of performing radical surgery on Medicare and social security—and the voting public remains squarely behind this inaction. But the consequence of massive GFC fighting and do-little on the welfare state is that US public debt is projected to nearly double from a little more than 50 per cent of GDP in 2009 to 90 per cent of GDP in 2020.

Figure 10.5 US Budget Deficits and Public Debt (%GDP), 2009-2020



Source: Congressional Budget Office estimates of Obama 2011 budget

The global financial markets can see the United States' fiscal future all too clearly. Before, during and after the financial crisis, the markets thought that the path of least resistance for the United States would be to inflate its way out of its fiscal obligations. The decade-long descent of the greenback is their reaction. The US dollar actually appreciated in trade-weighted terms from 2000 to 2002—first when Y2K problems did not materialise and then in a flight to safety after the 9/11 terrorist attacks (Figure 10.6).

But over the next six years, the dollar lost 30 per cent of its value. There was another flight into the dollar during the financial crisis—perhaps as much because assets were repatriated into the United States as because the dollar is the global currency. But since then the dollar has gone back onto what looks like another extended slide. The US dollar today is only two-thirds the currency it was a decade ago.

In sum, the US economic picture is very much a mixed bag. Growth has rebounded since the depths of the financial crisis and there are literally trillions of dollars on corporate balance sheets waiting for the right time to invest. But the United States' fiscal problems are very real and some worry that the innovation and flexible labour markets that have helped the United States grow out of its debts in the past are no longer up to the job. Nonetheless, it would be highly imprudent to predict that the US economy will soon fall off the global cliff. An extended period of relative decline—caused as much by emerging Asia's rise as by America's slowing down—seems much more likely. Couple this with the United States' military hegemony and the fact that its cultural and political reach will continue to dwarf that of other countries, and the old Mark Twain saying seems apposite: talk of America's demise has been grossly exaggerated.

Figure 10.6 Trade Weighted US dollar

Source: Federal Reserve Bank of St Louis

The arc of the Chinese economy is obviously very different. The 30 years of average double-digit growth from the late 1970s are an economic miracle without precedent. China is surely plagued by great challenges, such as mass urbanisation, interior development, pollution, energy security, rapid ageing, and a mushrooming middle class that will inevitably seek political change. But the immense capacity of the Chinese state, coupled with the insatiable drive among its people for a better life and their innate business acumen, has proved time and again a sufficiently powerful combination to overcome these challenges.

Many worried, however, that the GFC would finally put paid to the Chinese miracle. The country had long lived by the sword of export-led growth, a sword that hung menacingly over its head when world trade plummeted during the crisis. But the history books will say that the GFC was not the death knell of the Chinese economic miracle. In fact, China's ability to ward off the potentially devastating effects of the slump in world trade is one of the more stunning features of a crisis replete with the extraordinary.

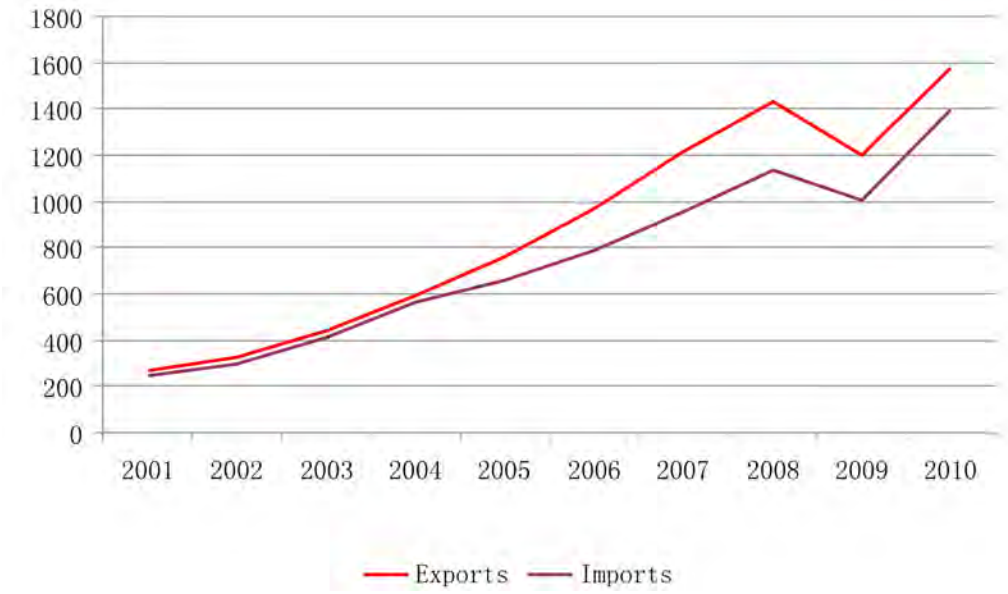
As the global economy came under real stress in 2008, Chinese economic growth dropped precipitously from a heady and no doubt unsustainable 13 per cent in early 2007 to reach a low point of just more than 6 per cent in the first quarter of 2009 (Figure 10.7). But only 12 months later, growth was back up to 12 per cent, before dropping back to a more sustainable 10 per cent.

China was not immune to the collapse of global trade, but the effects were muted in China: a drop of 15 per cent from 2008 to 2009 rather than the 30 per cent for the world as a whole (Figure 10.8). At least as impressive, the effect of the global downturn lasted only 12 months, with trade in 2010 returning to the same rapid growth trajectory of earlier in the decade.

Figure 10.7 China GDP growth rates, 2007-2011

Source: Trading Economics

Figure 10.8 China Trade (Billions of $US), 2001-2010



Source: PRC National Bureau of Statistics

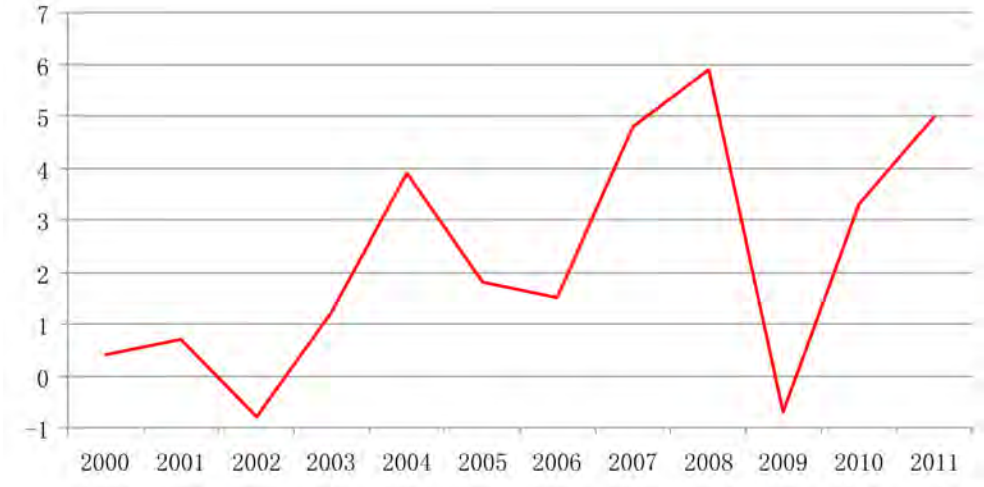
The secret to China's success in warding off the crisis was the one-two punch of a massive fiscal stimulus coupled with a dramatic increase in bank lending. According to the best estimates of the International Monetary Fund (IMF) for the crisis-fighting year of 2009, China's discretionary fiscal stimulus made up a bigger portion of GDP than the United States' stimulus: 5.8 per cent of GDP for China compared with 3.8 per cent for the United States (IMF 2009). Even more improbably, China also injected as much money into the financial

system as did the United States (both 21 per cent of their respective GDPs), even though none of China's banks failed or even threatened to fail. If one sums the two statistics to measure the size of a country's GFC fight (relative to its economic size), China came third among the major Group of Twenty (G20) economies, behind only two countries ravaged by the crisis—Japan and the United Kingdom—and ahead of the United States, its epicentre.

Perhaps not surprisingly, China's principal economic challenge in the wake of the financial crisis has been inflation (Figure 10.9). China's inflation rate rose from zero to 6 per cent from 2002 to 2008, before dropping below zero in 2009 as the full force of the GFC hit. But one negative consequence of all the money injected into the Chinese economy was that inflation turned quickly positive—above 3 per cent in 2010 and projected at 5 per cent for 2011.

Nonetheless, the best Chinese epitaph for the GFC is that the country came through the greatest challenge to its post-1978 economic miracle with flying colours—and it did so largely because of domestic policy responses, not the help of the international community.

Figure 10.9 China Inflation Rate (% growth in CPI), 2000-2011



Source: IMF

As a result, China is continuing its heady climb up the global economic rankings. In 2010, it passed Japan to take second place in total economic size measured in terms of GDP at market exchange rates. The best estimate of Goldman Sachs' BRICS (Brazil, Russia, India, China and South Africa) country team is that China will finally overtake the United States on this measure in the middle of the 2020s. The IMF now predicts China's economy will pass the United States when GDP is measured in purchasing power parity (PPP) terms in 2016 (IMF 2011). Goldman Sachs is unwilling as yet to say when or if the United States will fall into third place; but it will presumably be overtaken by India, though not until well into the second half of this century.

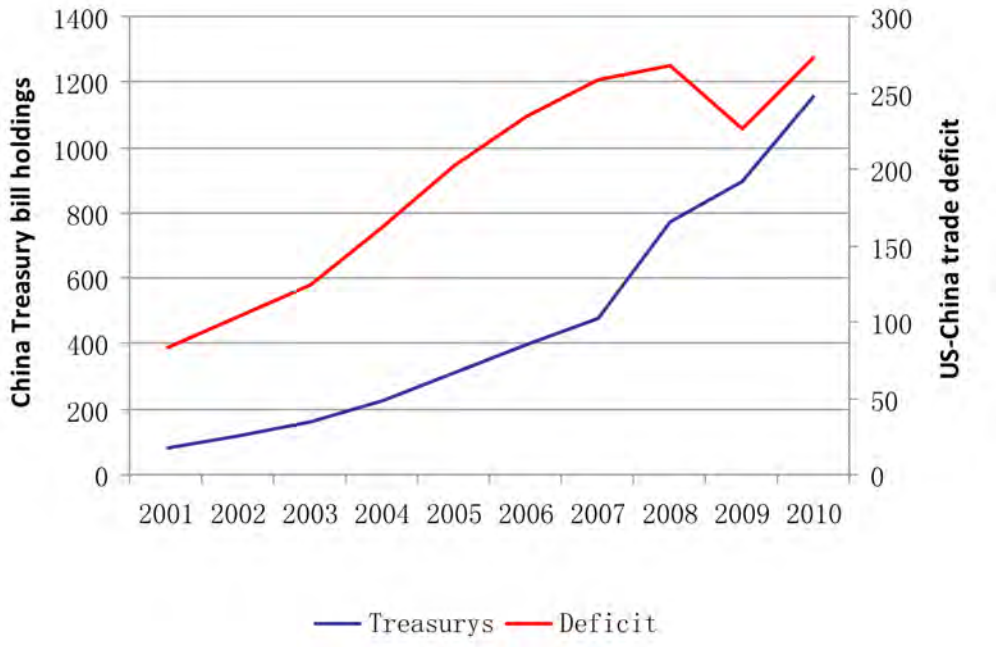
Since the GFC, China and the United States are clearly the world's two most important powers and the gap between them has narrowed. The global ramifications of Sino–American relations have long been extensive. Today, they are greater than ever before.

Chinese–US economic imbalances

Putting together all we know about the economics of the crisis, the world does appear to be moving towards a *de facto* G2, almost by default. The Chinese–US economic relationship is very big. But it is also very imbalanced.

The headline statistics concerning the two key indicators of Sino–American imbalances pre-GFC are by now well known: the mushrooming of Chinese Government purchases of American Treasury bonds (T-bills) and American consumption of Chinese goods. China increased its holding of T-bills more than fivefold to well more than US$500 billion from 2000 to 2008. Over the same period, America's trade deficit with China more than trebled to more than US$250 billion (Figure 10.10).

Figure 10.10 China-US Trade and Treasurys ($US billions), 2001-2010



Sources: US Trade Statistics, US Federal Reserve

The co-dependence inherent in these imbalances is equally well understood. China kept its currency from appreciating rapidly against the dollar by buying dollars and dollar-denominated paper, keeping US interest rates low and American debt-financed consumption booming. This kept Chinese goods flying off American shelves and made possible year after year double-digit growth in China.

Economists long decried these imbalances as 'unsustainable'. But neither China nor the United States wanted to stop the party while the music was still playing—their economies benefited too much from them, in the short term at least. Then the music stopped with the onset of the GFC, and leading commentators such as the *Financial Times*' Martin Wolf (2008) pointed to Chinese–US imbalances as one of the major causal factors behind the crisis.

There was, however, supposed to be a silver lining to the financial crisis: it would naturally reduce Sino–American imbalances by forcing China to rely more on domestic growth and less on export-led growth and by reining in the voracious appetite of the American consumer. China would become more American in behaviour by consuming more and saving and investing less. The United States would become more Chinese by saving and investing more and consuming less. American imports from China would shrink and American exports to China would grow. China would buy fewer US dollars and Treasury securities. The renminbi (RMB) would appreciate against the dollar. The Chinese–US economic relationship would go from unsustainable co-dependence to more balanced and sustainable interdependence.

The initial evidence gave some reason to think that this rosy scenario might play out. In particular, America's trade deficit with China dropped for the first time in a decade in 2009, and by more than US$40 billion. But despite worrying out loud about the long-run viability of the greenback as the global currency, the Chinese Government increased it purchases of T-bills in 2009, overtaking Japan as the largest foreign holder of US Government debt.

Then in 2010, notions of a rapid and substantial unwinding of Chinese–US imbalances came back to reality with a thud. The bilateral trade deficit between the two countries increased by more than US$50 billion while China's holdings of T-bills increased by more than US$100 billion. Today, the Sino–American economic relationship is both bigger and more imbalanced than ever.

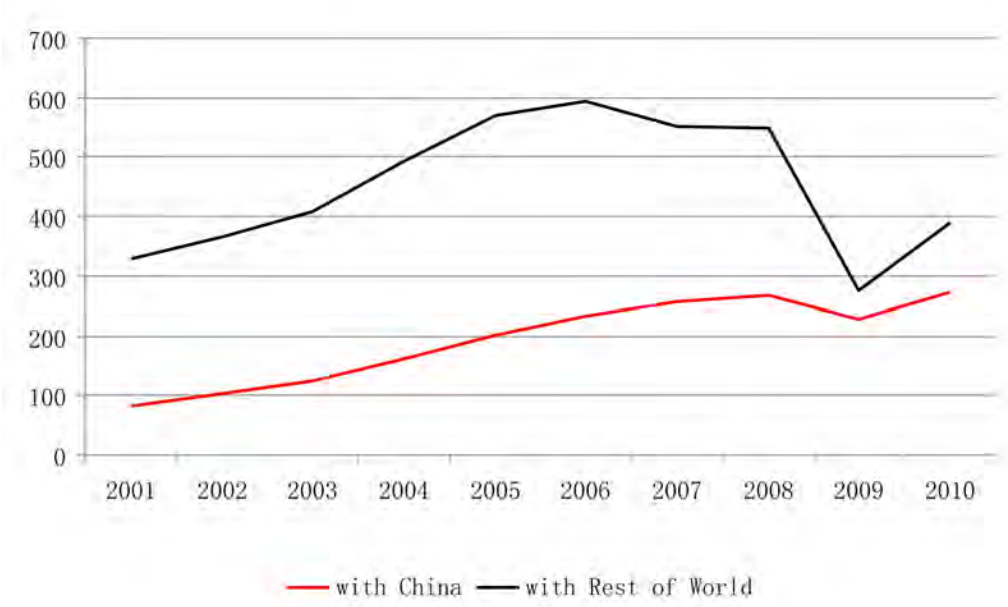
One key question concerning these bilateral imbalances is whether their trajectory mirrors or departs from China's and the United States' relationships with the rest of the world—that is, is there something different about the China–United States relationship, or is it a bilateral manifestation of the broader trajectories of each economy? If the latter were true, there would be less reason to concentrate on Sino–American imbalances, *per se*, and more reason to focus on each national economy writ large.

While the evidence is somewhat mixed, the data are certainly open to the interpretation that there is something unique about Sino–American economic relations.

The United States' trade deficit with the rest of the world (that is, excluding China) peaked in 2006 at US$600 billion—almost three times the United States' China deficit that year (Figure 10.11). By the depths of the GFC in 2009, the United States' deficit with the rest of the world had halved, whereas its deficit with China was more or less where it had been in 2006. The result was that in 2009, the United States' trade deficit with China, at US$266 billion, was only $50 billion less than its deficit with the rest of the world combined.

Put differently, in 2009 almost half of the United States' trade deficit with the world was with China. In 2010, the United States' trade deficit grew by more than US$150 billion as the American economy began to recover. But despite the fact that about two-thirds of this increased deficit was outside the relationship with China, the United States' bilateral deficit with China was still about three-quarters as large as its deficit with the rest of the world.

Figure 10.11 US Trade Deficits ($US billions), 2000-2010

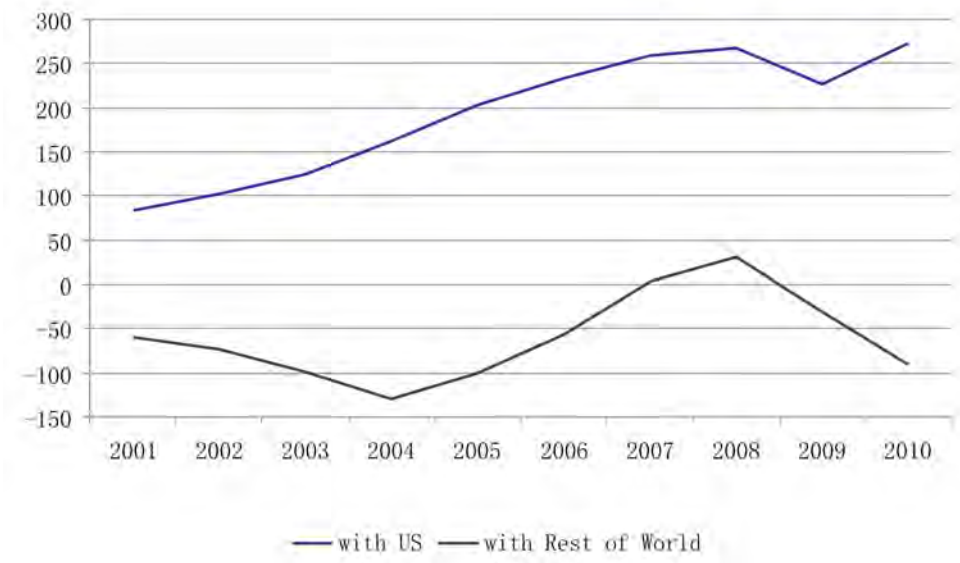


Source: US Census Bureau – Foreign Trade

The United States stands out even more clearly in the Chinese trade statistics (Figure 10.12). China actually ran trade deficits with the world excluding the United States from 2001 to 2006 and again in 2009 and 2010. China's trade deficit with the rest of the world in 2010 was US$90 billion—up from US$61 billion in 2001. Taking the decade as a whole, China's trade stance with the rest of the world has been to run relatively small deficits—far from the common perception of China as a country amassing ever-greater surpluses with the world.

But over the same period, China always ran a trade surplus with the United States—more than trebling from US$83 billion in 2001 to US$273 billion in 2010. It is only when the United States is included that the conventional view of China as a big-surplus nation is born out in the statistics.

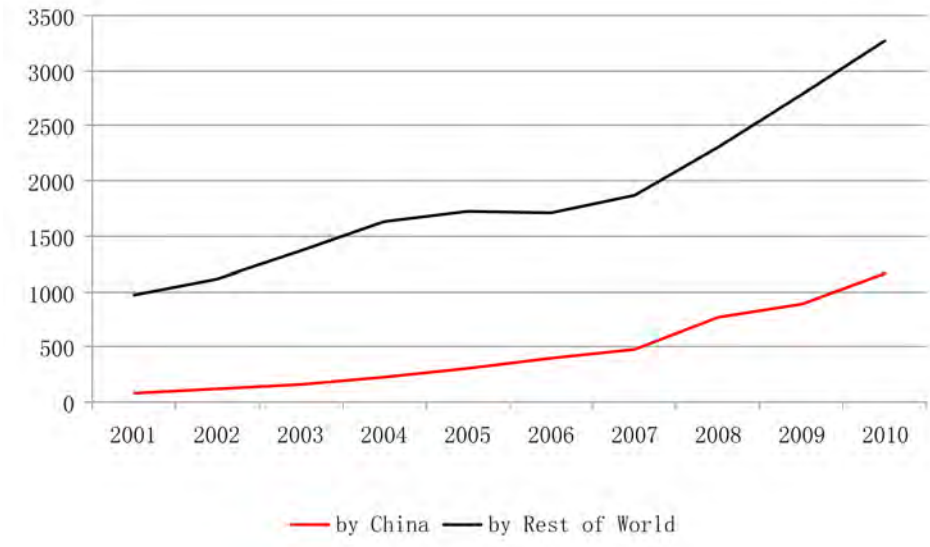
Figure 10.12 China Trade Surplus ($US billions), 2001-2010



Source: US-China Business Council

Over the past decade, foreign holdings of US T-bills more than quadrupled to almost US$4.5 trillion dollars—equivalent to about 30 per cent of US GDP (Figure 10.13). In 2001, Chinese T-bill holdings of US$78 billion were less than one-tenth the holdings of other countries around the world. By 2007, China's holdings had grown considerably to almost US$500 billion, then roughly one-quarter as large as the holdings of all other countries.

Figure 10.13 Foreign Holdings of US Treasury Bills ($US billions, 2001-2010)



Source: US Treasury

Foreign holdings of T-bills skyrocketed as the US Government pumped close to US$2 trillion dollars into the staggering domestic economy during the financial crisis. Despite near-zero interest rates and a dollar under siege in global markets in the United States, foreign countries were willing to underwrite US public debt to an unprecedented extent.

China's holdings of T-bills more than doubled between 2007 and 2010, reaching US$1.16 trillion by the end of last year. Over the same three-year period, holdings by all the other countries in the world grew by 75 per cent to almost US$3.3 trillion. Today, China holds a little more than one-quarter of all the T-bills held outside the United States—a smaller portion than the media hype would suggest, but very large given the enormous gap in development between America and the largest foreign holder of its debt. And China is now by far the foreign country with the largest US T-bill holdings.

Putting together the data in Figures 11–13 suggests three things about the United States and China. First, as everyone knows, the United States runs large trade deficits with and borrows a lot of money from the world. Second, China's overall trade position is more balanced than many people might think.

But third, the imbalances between China and the United States have increased greatly in the past decade, both in absolute terms and compared with each country's relations with the rest of the world. The scale of and imbalance in Sino–American economic relations are something the world has never before seen. As a result, it is important to analyse the Chinese and American economies as such and to then focus on what is unique about their bilateral relationship.

Private domestic demand in the United States has cooled markedly since the onset of the GFC. But this has been offset by the enormous public sector one-two punch of fiscal stimulus and bank bailouts. The fiscal challenges facing the United States are well understood. It remains unclear if the country has the political will to meet these challenges, both because average Americans are clinging desperately to their welfare-state programs in the wake of the crisis and because the partisan divides in Washington have made the political system close to ungovernable. How and whether the United States rises to these challenges will have enormous implications for the United States' global economic position—its trade balances, foreign borrowing and the strength of the dollar.

China has gone to great lengths to focus more of its economic attention on the domestic economy—in particular, with its own enormous fiscal stimulus and bank lending boom to inoculate the country from the GFC. Despite the strength of its own banks during the crisis, the Chinese Government led a lending spree by state-controlled banks, with new loans in the first quarter of 2009 alone in excess of the entire government fiscal stimulus plan for three years and greater than total bank loans for all of 2008, which were already the largest in Chinese history (Leow 2009).

Chinese domestic consumption has been rising rapidly in recent years, but not as quickly as investment, which now sits at 45 per cent of GDP—an extraordinarily high number by global standards. Chinese investment during the GFC was even more concentrated in infrastructure development and state-owned enterprises than ever before.

The Chinese Government continues to say it wants to rebalance the domestic economy away from investment and towards consumption. But as its response to the GFC showed, the Government will always look to investment to keep growth humming and employment full. And the kinds of reforms needed to promote consumption by average Chinese—including a more open and useful retail financial system and a stronger system of welfare-state supports for the sick and the old—seem to remain far off. Whether China can pass the baton on economic growth from exports to domestic demand will have a major impact on its position in the global economy over the next several decades.

Private sector interdependencies

How well China and the United States tackle their own problems will affect their economic relations with the rest of the global economy, not just with each other. But the unique features of Sino–American imbalances are what stand out as much as the overall trajectories of the two national economies. The trade statistics are particularly troublesome. The United States has already been able to reduce its trade deficit with the rest of the world considerably, but not with China. China continues to run a small trade deficit with the rest of the world, but the growth in its large surplus with the United States seems to have no upper bound.

Why is the China–United States relationship so different? The conventional view is to blame China—and in particular its management of the RMB exchange rate against the dollar—for unfair competition with the United States, and therefore for taking jobs away from Americans. This view was already common in Middle America before the GFC and has become even more pronounced since as the unemployment rate has stayed stubbornly close to double digits.

The United States shed about four million manufacturing jobs over the past decade—the same decade in which the US trade deficit with China mushroomed and vaulted into the news headlines. The temptation to draw a causal connection is clear. Here is how US Senator Sherrod Brown painted the picture for his part of Middle America in March 2009:

> The Ohio manufacturer has a minimum wage to pay his workers. He has clean air and workplace and product safety standards by which to abide, helping to keep his workers healthy and productive and his customers safe. The Chinese manufacturer has no minimum wage to maintain and is allowed to pollute the local water sources and let workers use dangerous and faulty machinery. The Ohio manufacturer pays taxes, health benefits, and social security. He typically allows family leave and gives WARN notices when there is a plant closing. The Chinese manufacturer often allows child labor. The Ohio manufacturer receives no government subsidies, and the Chinese manufacturer often receives subsidies for the development of new technologies, or for export assistance. The Chinese manufacturer benefits from China's manipulation of its currency, which gives up to a 40 per cent cost advantage. (<http://brown.senate.gov/newsroom/press_releases/release/?id=83a8362f-5b7f-4901-9659-37957ac77798>)

There is more than an element of truth to the 'unfair competition' critique of China, certainly with respect to Chinese restrictions on foreign access to its domestic market and to Chinese infringement on American intellectual property rights. But the notion of a fixed and undervalued Chinese exchange rate cannot be the whole story behind Sino–American imbalances.

Since 2005, the RMB has appreciated more than 25 per cent in nominal terms, and about 50 per cent in real terms, according to *The Economist* ('Nominally cheap or really dear?', *The Economist*, 4 November 2010), due to higher inflation in tradables in China than in the United States (Figure 10.14). In response to the growing imbalances between the two countries in the first half of the 2000s, Chinese authorities allowed the RMB to appreciate steadily against the dollar from the middle of 2005 until mid-2008. Amid the chaos and pervasive uncertainty of the crisis, China then decided to re-peg the RMB to the dollar. But when the Government was confident the worst of the crisis was over, it again started a gradual appreciation against the dollar that has added another 5 per cent to the value of the Chinese currency.

Figure 10.14 Chinese–US exchange rates, 2005–10

The fact that the US–Chinese trade imbalance has continued to grow despite the strong appreciation of the RMB says that exchange rate manipulation is not the whole story, and may not even be much of the story, in Chinese–US trade. So what is behind the gaping trade imbalance? One answer that not only many in China but also many American businesspeople believe, but rarely say in public, is that the headline trade statistics are grossly misleading and undervalue how the United States benefits—for two reasons.

First, the bulk of Chinese exports involve multinational firms operating in China. According to a recent systematic study based on 2005 data, foreign affiliates of multinationals send half of the exports out of China, with joint ventures between multinational corporations

(MNCs) and Chinese companies accounting for another 25 per cent of all Chinese exports (Manova 2011). Put differently, only one-quarter of what are booked as exports from China are wholly 'Chinese'.

Second, most of the MNCs operating in China are engaged in global supply chains in which parts made in other countries, particularly throughout Asia, are assembled into final products in China. In 2010, for example, China ran trade deficits of well more than US$50 billion with both Japan and South Korea, and even more with Taiwan—all producers of high value-added goods that are then assembled into finished products in China for export to the rest of the world (US–China Business Council 2011).

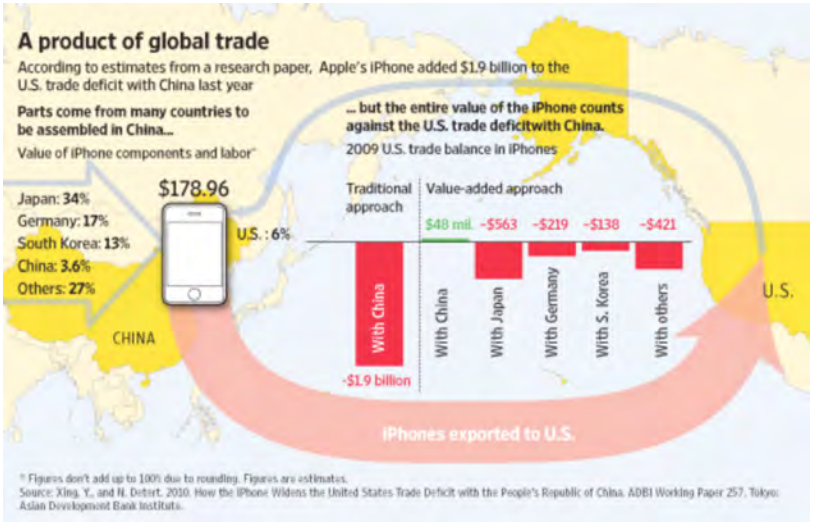
This notion that goods are 'assembled in China' for foreign firms rather than 'made in China' by China is nowhere clearer than in the iconic Apple iPhone. In 2009, the official trade statistics show that more than 11 million iPhones were shipped from China to the United States at a total value of just more than US$2 billion. There were only about US$100 million in American parts in these iPhones. So iPhones added about US$1.9 billion to the official US trade deficit with China.

But a new study by researchers from the Asian Development Bank uncovers the economic reality written on the back of every iPhone: 'Designed in California, assembled in China' from parts made elsewhere, and with all the profits going back to Apple headquarters and Silicon Valley and its mostly American shareholders (Xing and Detert 2010). According to this study, components from Germany, Japan and Korea made up about two-thirds of the US$200 wholesale price of an iPhone. Chinese assembly of them—by a Taiwanese firm, Foxconn, operating on the mainland—was worth about only US$6 per iPhone, which was less than half the cost of the American parts shipped to China to make the phone (Figure 10.15).

As a result, iPhones were actually a net export of about US$50 million from the United States to China, not the US$2 billion deficit in the trade statistics. Germany, Japan and Korea were net exporters to China. And none of this takes into account the massive 50 per cent or so profit Apple made on all its iPhone retail sales, driving its spectacular performance on the Nasdaq.

Americans should be celebrating the iPhone not only because of the value they get from it personally but also because of the value they generate for the US economy through the Apple powerhouse. If Americans want to complain about the evils of iPhone globalisation, they should be worrying more about why the disk drives, memory and screens come from Germany, Japan and Korea rather than the United States. In the most important economic sense, the fact that iPhones are assembled in China is only a small part of the story—even though it is the only thing the US–Chinese trade statistics pick up.

Figure 10.15 The iPhone supply and distribution chain



The first two responses to the normal critique of Chinese–US trade imbalances are thus that the Chinese currency has appreciated significantly against the US dollar in recent years and that multinational firms such as Apple are the principle beneficiaries of China as an assembly platform. The final rejoinder to the conventional imbalances critique is American multinational firms are benefiting enormously from China's rise not only by using China as an export platform, but also by making products in China to sell directly into the Chinese market.

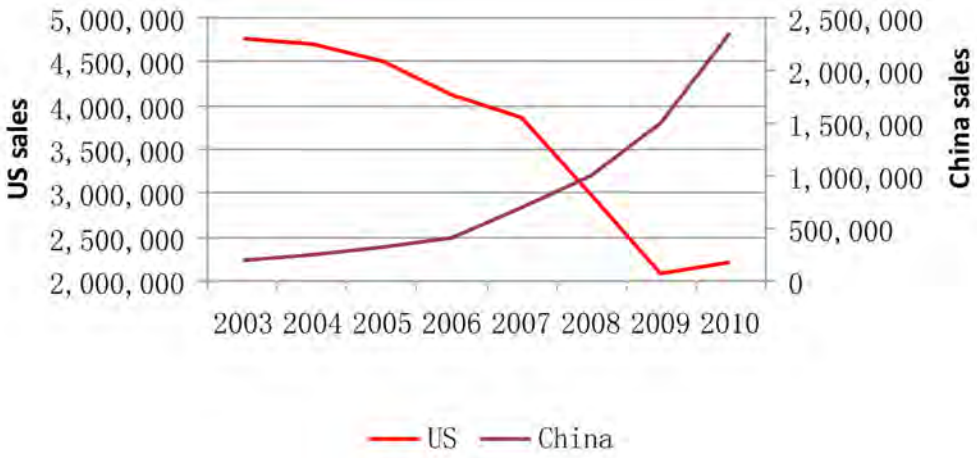
Here the General Motors (GM) story is exemplary. Venerable GM—the icon of American manufacturing in the twentieth century—was bailed out by the Obama administration in the dark days of the financial crisis. Now it has returned to profitability and repaid the Government for its bailout. But the backslapping between Detroit and Washington does not tell the real story behind GM's recovery: its joint venture with SAIC to build and sell cars and trucks in China.

When the GM–SAIC plant started producing its first cars in Pudong in 2003, its initial sales in China were about 200 000 units. In the same year, GM's sales in the United States were almost 5 million units (Figure 10.16). Over the next seven years, GM's American sales plummeted while its Chinese sales skyrocketed. In 2010, GM sold more cars and trucks—2.5 million—in China than it did in the United States. And, according to most estimates, the profit margin on GM's Chinese operations was much higher than that in the United States given the much lower labour costs and much newer production facilities and an upper middle-class market big enough to support global automobile prices.

There are, of course, limits to what GM can do in China. It cannot have a majority stake in its Chinese operations. It knows that by building cars in China it is affording indigenous Chinese firms the chance to learn from its technology and know-how. It also knows that the

Chinese Government is looking to create its own global champion auto-maker. But the size and likely growth of the Chinese market are nonetheless irresistible to GM and will remain that way unless and until home-grown Chinese companies push it out of the way.

Figure 10.16 General Motors sales, 2003-2010



Source: General Motors

Apple and GM arguably are closer to the reality of Chinese–US economic relations than the official trade statistics. But neither firm nor the US Government has much incentive to tell their story—because it would only lead to a loud 'where are the jobs?' critique from inside America. The Chinese Government has more incentive to tell Americans of the new realities of the global economy. But publicising the successes of American firms on Chinese soil is unlikely to persuade Chinese citizens that the Government is pursuing a development strategy that is in their interests—in contrast with the Government's indigenous innovation push.

To be sure, there are real problems for American firms trying to do business in China—most importantly, concerning limited market access and weak enforcement of intellectual property rights. The Chinese Government's desire to create literally hundreds of world-beating firms has led to an emerging pattern of industrial policies that favours domestic companies at the expense of their foreign counterparts. Foreign companies remain partly or completely barred from participating in major industries such as banking, securities, telecommunications, legal services, and insurance (Ahrens 2010).

But American multinationals know they cannot stay out of China, with its rapidly growing consuming middle class as well as its highly cost-competitive production processes. They are trying to make it easier for themselves to do business in China, but not in ways that push their hosts too hard (American Chamber of Commerce in China 2011).

The US Government is listening, and its high-level economic diplomacy with China is today focused at least as much on increasing market access for American MNCs as it is on prosecuting the case for Americans at home adversely affected by Sino–American economic imbalances.

Managing Sino–American relations

The biggest challenges facing the American and Chinese economies are more domestic than they are concerned with relations between the two. Hillary Clinton and Tim Geithner made this clear on the eve of the first Strategic and Economic Dialogue meeting with their Chinese counterparts in July 2009 as both countries turned from crisis management to recovery:

> As we move toward recovery, we must take additional steps to lay the foundation for balanced and sustainable growth in the years to come. That will involve Americans rebuilding our savings, strengthening our financial system and investing in energy, education and health care to make our nation more productive and prosperous. For China it involves continuing financial sector reform and development. It also involves spurring domestic demand growth and making the Chinese economy less reliant on exports. Raising personal incomes and strengthening the social safety net to address the reasons why Chinese feel compelled to save so much would provide a powerful boost to Chinese domestic demand and global growth. (Clinton and Geithner 2009)

But the challenges laid out by Clinton and Geithner amount to nothing less than changing the economic DNA of both countries. For the foreseeable future, the biggest domestic economic problem facing the United States will be what President Obama calls 'fiscal sustainability'. But just stabilising US public debt after the full effects of the Obama administration's crisis-fighting measures are felt will require tax cuts or spending increases of nearly one-third of central government spending, or 7–9 per cent of US GDP (Auerbach and Gale 2009).

President Obama's 2011 budget projects deficits of roughly 5 per cent of GDP until 2020—increasing public debt from about 50 per cent to 90 per cent of GDP by the end of the decade. The most important fiscal reform he has proposed is ending the Bush tax cuts for the wealthiest Americans—not enough substantially to bend the curve on fiscal unsustainability. The newly empowered Republicans in Congress have come up with a plan that would come closer to balancing the budget without ending the tax cuts based on massive spending cuts. But they found out that mainstream America is in no mood for the kind of radical surgery that would be required to balance the budget the Republican way—most notably, the *de facto* privatisation of the Medicare program of health care for the aged. The path of least resistance in the United States—perhaps best reflected in the dollar's slide—is on more red-ink bleeding from the American budget into the foreseeable future.

China's challenge is the mirror image of that facing the United States. Unlike spendthrift Americans, Chinese citizens save for a rainy day. Members of close-knit extended families save because family rather than the state will look after them when they get sick, old or lose their jobs. Even if Chinese citizens wanted to spend and borrow more, the retail financial sector needed to service a consumer society is at best rudimentary in China.

The Chinese Government has the capacity to build an effective social safety net and to change the regulatory environment to favour the growth of retail banks, credit cards and insurance targeted at consumers. But the Government has preferred to invest in infrastructure, state-owned enterprises (SOEs) and state-controlled companies, with state-owned banks a preferred intermediary.

This strategy makes political as well as economic sense for the Chinese Government. Focusing on driving productive capacity ever higher allows the Chinese Government to deliver on its implicit guarantees of full employment and higher living standards for all its citizens. The Government also knows that the history of democracy runs through the development of a large consumerist middle class. Chinese leaders learned well the lessons of Mikhail Gorbachev's *glasnost* and *perestroika*, and they will not lightly walk down what might be considered the former Soviet Union's naive path to openness.

Given these difficulties in fundamentally restructuring the Chinese and American economies, the temptations are great for each side to blame its imbalances with the other as the cause of its economic challenges. This certainly seemed to be the case in the immediate aftermath of the GFC once the initial panic of the post-Lehman collapse somewhat abated.

It is not surprising that after the first half of 2009 witnessed a rising tide of public mud-slinging between China and the United States, America took the lead, but China was quick to follow.

On the US side, Geithner let slip in his confirmation hearings in early 2009 that China indeed 'manipulates' its currency. Understanding that this could trigger a legislative process requiring US retaliation against China, President Obama quickly sought to recover the situation by saying his Treasury Secretary had misspoken.

Chinese reaction to Geithner's diplomatic *faux pas* was sharp and swift. Premier, Wen Jiabao, worried out loud about China's dollar-based holdings, saying that in light of the GFC 'of course we are concerned about the safety of our assets'. A week later, the Governor of the Bank of China, Zhou Xiaochuan, proposed a new global reserve currency 'that is disconnected from individual nations and is able to remain stable in the long run, thus removing the inherent deficiencies caused by using credit-based national currencies' (Anderlini 2009). He did not mention the US dollar by name, but the focus of his worries was clear to all.

The public duelling over the dollar's weakness and control of the RMB soon died down because both sides knew they were playing with fire. But sniping over protectionism soon replaced jibes over currencies.

The United States fired the first shot when Obama chose to do what George W. Bush had been unwilling to do—use Section 421 of US trade law and an obscure element of China's World Trade Organisation (WTO) accession agreement to impose heavy tariffs on Chinese imports into the United States for the mere reason that they were adversely affecting American production and American jobs. In this case, the product was tyres, the tariffs were up to 35 per cent, and the lobby pushing the action was the United Auto Workers' union.

But more important was the precedent the action set. China and the world had been anxiously waiting to see if Obama in office would resist the protectionist temptations and back down from his sometimes quite protectionist rhetoric on the campaign trail. In the tyres case, Obama blinked. This apparently has emboldened American textile and steel producers and workers to consider similar appeals to Obama.

China's retaliation was again swift. The Chinese Government took the United States to the WTO, claiming that it was dumping chicken and auto parts on the Chinese market—taking aim at two sectors of the American economy benefiting from US Government subsidies in the wake of the financial crisis. A month later, they added nylon to American products potentially dumped on the Chinese market.

But what is most interesting about these 2009 skirmishes over currencies and protectionism is that they did not flare out of control into the trade and currency wars many expected. Instead, cooler heads prevailed in both China and the United States, returning to the behind-closed-doors, softly-softly economic diplomacy that characterised most of the decade before the GFC.

In 2010, the arena for Sino–American tensions in fact moved from economics to geopolitics as China—emboldened by its remarkable escape from the GFC compared with the United States' navel-gazing swoon—became much more confident about asserting its interests in East Asia, engaging partly in head-bumping and partly in chest-thumping in its relations with Japan, Korea and Taiwan. The United States responded with more military exercises in the Western Pacific and by emphasising the values and interests it shares with a wide range of market-oriented democracies in the region—not only Australia, Japan and Korea, but also India and Indonesia—but pointedly not China.

But again predictions that geopolitical tensions between China and the United States would boil over proved unfounded—just as they have in the past.

Looking into the future, it would seem reasonable to expect that Sino–American economic frictions over time will move away from trade and towards investment issues between the two countries.

China's sovereign wealth funds and its large para-statal companies wanted to buy American firms before the crisis. But the backlash in America was intense—most vividly in the congressional firestorm in the summer of 2005 that led CNOOC to withdraw its bid for the small American oil and gas company Unocal. Since then, China has kept a low profile in the market for corporate control in the United States, opting for minority stakes in shadow banks such as the private equity firm Blackstone over more visible acquisitions of manufacturing firms and their quintessentially American middle-class jobs.

With American asset prices battered by the GFC, China worried about the security of its T-bill holdings because of American public debt, and, with the Chinese currency likely to continue appreciating against the dollar, the economic incentives are high for China to go on a foreign direct investment buying spree in the United States. But it is hard to imagine that the reception in the United States would be favourable.

In China, tight governmental control of its domestic market has always created high hurdles for American firms wanting to establish footholds in China—with the ability to void potential foreign investments if they threaten what the Chinese Government calls 'national economic security'. American firms salivate at the prospect of satisfying the needs of China's growing middle class, and they have been willing to go to great lengths to get inside the Chinese market. Wal-Mart is now China's biggest retailer, but the infamously anti-organised-labour firm was willing not only to let its Chinese workers unionise but also to hold meetings of the Chinese Communist Party on Wal-Mart premises. GM is China's biggest car maker, but its joint venture is still controlled by its Chinese partner, SAIC. American banks continue to expend immense effort trying to open branches in China, but getting anything more than a small minority stake has proved impossible.

The geopolitical rivalry between China and the United States is also bound to intensify in the future. The good news, however, is that potential flash points that could trigger military confrontation between the United States and China are apparently receding. Taiwan's economic integration with China continues to build stronger linkages between the island and the mainland. Japan and China might lock horns on disputed islands, but everyone knows how tightly Japan's economic future is tied to China. The United States and China have cooperated more closely over curtailing North Korea's nuclear ambitions in recent years than many predicted. Tibet seems unlikely to assume the significance of Taiwan. China might not always cooperate with the United States in the struggle against Islamic extremism, including the vexed issue of sanctioning Iran, but this is about diplomatic cooperation rather than a head-to-head security struggle.

Conclusion

There seem to be two bottom lines in relations between China and the United States. On the one hand, frictions are inevitable between the two countries. China is a rapidly rising power; the United States is a waning one, even if much more slowly than is often suggested. The differences in values and interests between the two countries are deep and enduring. The economic imbalances between them are enormous and likely long lasting. The fact that Chinese defence spending is growing even more rapidly than its world-beating economy will always leave American hawks unwilling to trust Chinese protestations that their military intentions are solely defensive.

On the other hand, time and again, both countries have managed tensions in their relationship that threatened to spiral out of control—and this has been at no time more the case than following the GFC. There seems to be a shared understanding on both sides that signalling their real differences in values and interests—often with an eye to domestic audiences—is to be tolerated as a necessary cost of doing business with each other. As a result, it seems reasonable to interpret the inevitable and frequent spats between the two countries more as pressure-release valves than as brushfires that could ignite into a bushfire.

Both sides understand that the benefits from their economic relationship are immense. For the United States, China is not only a cheap assembler of American innovations. It is also the world's fastest-growing middle-class consumer market. For China, the United States

is not only its consumer of last resort but also the repository of technology and know-how that can help China's economy remain productive and efficient even as its labour-cost advantages are eroded by its prosperity. Both sides also know that the costs of real conflict and ultimately war between them would be catastrophic.

This highly pragmatic approach to Sino–American relations requires real leadership on both sides. Both sides—under a variety of leaders over recent decades—have been up to the challenge. The GFC raised the stakes higher than ever before and increased the points of potential friction between China and the United States. But cool heads in both countries have been able to keep their eyes firmly on the bigger prize of the benefits of economic integration and on avoiding the cataclysmic costs of military conflict.

Bibliography

Ahrens, N. 2010, *Innovation and the Visible Hand*, July, Carnegie Endowment for International Peace, Washington, DC.

American Chamber of Commerce in China 2011, *2011 American Business in China White Paper*, American Chamber of Commerce in China, Beijing.

Anderlini, J. 2009, 'China calls for new reserve currency', *Financial Times*, 23 March.

Auerbach, A. and Gale, W. 2009, *The Economic Crisis and the Fiscal Crisis: 2009 and beyond*, 19 February, Brookings Institution, Washington, DC.

Clinton, H. and Geithner, T. 2009, 'A new strategic and economic dialogue with China', *Wall Street Journal*, 27 July.

Ferguson, N. 2009, 'What "Chimerica" hath wrought', *The American Interest*, January–February.

International Monetary Fund (IMF) 2009, *The State of Public Finances*, July, International Monetary Fund, Washington, DC.

International Monetary Fund (IMF) 2011, *World Economic Outlook*, January, International Monetary Fund, Washington, DC.

Kissinger, H. 2011, 'Avoiding a US–China cold war', *Washington Post*, 14 January.

Leow, J. 2009, 'Fitch sounds alarm on Chinese lenders', *Wall Street Journal*, 22 May.

Manova, K. 2011, Firm exports and multinational activity under credit constraints, Ms., Stanford University, Calif.

US–China Business Council 2011, *US–China Trade Statistics and China's World Trade Statistics*, US–China Business Council, Washington, DC, and Beijing, <http://www.uschina.org/statistics/tradetable.html>

Wolf, M. 2008, 'How imbalances led to credit crunch and inflation', *Financial Times*, 17 June.

Xing, Y. and Detert, N. 2010, *How the iPhone Widens the United States Trade Deficit with the People's Republic of China*, Asian Development Bank Institute, Tokyo.

11 The Importance of Being Earnest in Defusing US–China Trade Tensions

Wing Thye Woo

Introduction

It was no April Fool's joke when the *Wall Street Journal* of 1 April 2011 carried the headline 'China meeting highlights currency conflict'. The list of crimes against the US economy caused by the large US–China bilateral imbalances has now expanded from the loss of US jobs (Scott 2007) to the destabilisation of the US financial market (Guha 2009). The 'bad China' feeling is so strong that even *The New York Times* (17 March 2010) stooped to oxymoronic rhetoric, calling the *fixed* RMB–US dollar exchange rate 'a textbook example of the beggar-thy-neighbor competitive *devaluation*' (emphasis added).

The English language is not the only casualty in the discussion of the US–China economic relationship; history has also been given the wrong twist. According to Nicholas Lardy: 'The United States is the addict. We are addicted to consumption…China is the dealer. They're supplying the credit that makes it possible for us to over-consume' ('Winter institute: China and US joined at the hip', St Cloud State University News Release, 2 March 2009, <http://www.stcloudstate.edu/news/newsrelease/default.asp?storyID=28126>).

It is hard not to see this reference to the Opium War of the nineteenth century, with the identities of the aggressor and the victim reversed, as a transmogrification of history that is quite over the top. To continue the practice of historical analogies started by Nicholas Lardy, I will paraphrase the opening paragraph of the most famous work by Karl Marx—China's leading intellectual light—to describe the state of the world in April 2011 and my opinion of it as follows:

> A spectre is haunting the World—the spectre of a currency war. All the powers of the Group of 20 (G20) are meeting in Cannes on 3–4 November 2011 to attempt a holy alliance to exorcise this spectre: the President of the United States and the General Secretary of the Chinese Communist Party, Timothy Geithner, Christine Lagarde, Japanese technocrats and German sherpas. This spectre is sustained by the prolonged swingeing trade imbalances of the United States and China. Will the G20 degenerate into a G2 with China defending its exchange rate against the protests of the rest? Can't the G20 show some statesmanship instead by putting global economic recovery on a new, environmentally sustainable path? If China can work out such an outcome with the other members of the G20, this will be China's and the G20's greatest contribution to global economic recovery—nay, global economic renaissance.

Beyond exchange rate monotheism

The large US trade deficit and the large Chinese trade surplus do not reflect Chinese economic conditions alone. Rather, each of them reflects the economic conditions in both countries (and in the rest of the world) (Woo 2008). It is indisputable from the constant intervention in the foreign exchange market by the Chinese central bank that the renminbi (RMB) is undervalued, but it is also indisputable that the low US savings rate predisposes the United States to borrow from abroad to finance its investment and its large government budget deficit, and that the US Government does not have a credible plan to reduce its budget deficit upon the recovery of the economy. The straightforward implication is that a fair solution to any desired reduction in the trade imbalance would require corrective measures to be implemented by both China and the United States.

Given that the trade imbalances are produced by a host of factors, another straightforward implication is that the efficient solution will employ more than only one policy instrument for the task. There would not just be an appreciation of the RMB against the US dollar, but also equally large changes in policy measures such as the lowering of Chinese trade barriers, the adoption of a budget deficit reduction by the United States, and expansion of the trade credit facilities of the Export–Import Bank of the United States.

It is instructive to remember that the now much-praised Plaza Accord of September 1985, which engineered a sharp appreciation of the Japanese yen, caused so much instability in global financial markets that it became a museum piece after only 17 months (!), with the hurried signing of the Louvre Accord in February 1987. As the world is only beginning to get over the trauma of the global financial crisis of 2008–09, it verges on irresponsibility to now impart a Plaza Accord-type of shock to the financial markets.

Table 11.1 US and Japanese trade balance during the 1985–88 period of yen appreciation

	Yen/US$ (average)	Overall US trade balance (% of US GDP)	Overall Japanese trade balance	Bilateral Japan–US trade balance
			(% of Japanese GDP)	
1984	237.52	–3.13	2.64	2.63
1985	238.54	–3.51	3.43	2.98
1986	168.52	–3.80	4.12	2.60
1987	144.64	–3.61	3.29	2.17
1988	128.15	–2.75	2.61	1.61

Sources: Trade data are from Direction of Trade, the United Nations, New York City and GDP data from International Financial Statistics, the International Monetary Fund (IMF), Washington DC. Various years.

More importantly, the effectiveness of a large appreciation of the RMB–US dollar exchange rate in reducing the US trade deficit is suspect outside the textbook situation of a two-country world. When the Yen–US dollar exchange rate went from ¥238.5/US$1 in 1985 to ¥128.2/US$1 in 1988 (an appreciation of 86 per cent by the International Monetary Fund definition), the overall US and Japanese trade imbalances saw only small improvements (Table 11.1). The US trade deficit declined from 3.5 per cent of gross domestic product (GDP) to 2.8 per cent (a 0.7 percentage-point drop), and the Japanese trade surplus fell from 3.4

per cent of GDP to 2.6 per cent (a 0.8 percentage-point drop). The biggest change was in the bilateral Japan–US trade imbalance, which went from 3 per cent of Japanese GDP to 1.6 per cent (a 1.4 percentage-point drop).

The US trade deficit improved very little when direct Japanese exports became drastically more expensive in the US market after 1985 because, first, US customers reacted by switching their purchases to similar imports from third countries; and, second, Japanese businesses relocated their production to other Asian countries in order to service the US market from there. The Japanese trade surplus also did not change substantially because its new overseas production bases imported large amounts of capital equipment and intermediate inputs from Japan.

Since more than 60 per cent of Chinese exports are produced in factories with foreign investment, many of these foreign investors would relocate their operations to other parts of the world if the RMB were to duplicate the dramatic 1985–88 appreciation of the yen. Unless accompanied by US actions to raise its low private savings rate and to cut its budget deficit, a second Plaza Accord would not diminish the US trade deficit adequately and its primary consequences would be a reconfiguration of the sources of US borrowing from abroad, and a new round of global financial market instability.

The only economically meaningful definition of the equilibrium exchange rate is the market-clearing exchange rate produced in the absence of intervention by any central bank. This market-clearing exchange rate is characterised by the balance-of-payments position being zero and not by the trade account balance (or the current account balance) being zero or being at some *a priori* value. This means that the notion of exchange rate misalignment that is based on the proposed concept of the fundamental equilibrium exchange rate (FEER) is analytically vacuous because the FEER is not identical to the market-clearing exchange rate.

The proposal by US Treasury Secretary, Tim Geithner, at the G20 meeting in Seoul in November 2010 that every G20 country should prevent its current account imbalance from exceeding 4 per cent of GDP for sustained periods is an appropriately practical way to reduce the high trade tensions in an economic setting marked by severe under-utilisation of production capacity and high unemployment worldwide. The Geithner proposal makes good economic and political sense for the present global circumstances because it: 1) avoids the pseudo-science of FEER-based misalignment of the RMB and the inexact science about by how much the US trade deficit would be improved by a sharp RMB appreciation; 2) gives each country the freedom to choose its preferred combination of policy instruments to keep its trade imbalance under control; and 3) explicitly prevents beggar-thy-neighbour policies from appearing to torpedo the slowly recovering international economy.

What China should do

It is shockingly unusual for a developing economy such as China's to be lending its savings to the industrialised world, especially since all estimates suggest that the rate of return to capital in China is much higher than in the United States. This anomalous situation is the (perhaps mostly unintentional) outcome of: 1) the overriding economic and political

priority in China to create jobs for its vast labour force; and 2) the widespread belief in the efficacy of infant industry protection (ambiguously labelled as the 'promotion of indigenous innovation') in accelerating China's movement up the value-added ladder. An undervalued exchange rate was useful in quickening the simultaneous growth of export firms and import-competing firms enabled by the movement of surplus labour from the countryside.

China's simultaneous promotion of exports and suppression of imports is the basic reason behind the trade surplus. In the short run, the Government should reduce trade barriers to allow more imports, which would also raise the standard of living of the Chinese people. China should also increase imports by enabling new types of imports—for example, educational services and tourism. With its humongous foreign exchange reserves, China should have expanded its scholarship and student-loan programs tremendously to enable the large number of qualified Chinese to go abroad to receive better university-level training. It has been a failure of the imagination that China has failed to increase this type of import prodigiously for productive purposes.

Furthermore, China should recognise that its large indigenous innovation program to incubate high-tech industries has, in fact, been an inequitable mechanism that transfers income from the customers to the makers of the products covered in the program. The global experience with indigenous innovation programs has mostly been a negative one. Most of the industries they spawned never became internationally competitive, showing that most indigenous innovation programs are based either on a misguided sense about the possibilities of 'learning by doing' or on rent-seeking motives. Another unfortunate outcome of such misguided indigenous innovation programs is that they accentuate foreign dissatisfaction with China's import barriers and violations of intellectual property, and hence raise the probability of a protectionist backlash against Chinese exports. Given that most protected industries would not grow up into competitive world-class industries, and are mostly rent-seeking operations enabled by protection from foreign competition, China could drastically reduce the size of its extensive indigenous innovation program without hurting its capability in technological upgrading.

For the long run, the basic task for China is to reform its monopoly state banking system so that most of China's savings could be intermediated into domestic investment. China is also anomalous in that foreign private banks actually face fewer legal restrictions and far fewer informal prohibitions on their activities than domestic private banks. Without the proliferation of domestic private banks, it will continue to be hard to meet the financing needs of small and medium enterprises, which are more labour intensive in their operations than large enterprises. A modern, diversified financial sector is a key part of the solution to ending the spill-over of Chinese savings to foreign countries, and to the continued fast creation of new jobs.

The too often made recommendation that China should now switch to consumption-led growth by cutting investment and raising consumption is nonsensical.[1] This type of consumption-led growth means a lower growth rate for China because, with lower investment, there would be slower expansion of production capacity. This particular advice to China is in effect a recommendation that China delays its catch up to the level of the industrialised countries. This flawed recommendation of rebalancing is based on the uncritical use of the GDP accounting identity where GDP equals the sum of the different

components of demand. The proponents do not realise that when more of GDP is consumed and less of it is invested, only the full utilisation of existing capacity is guaranteed, and not the growth rate of production capacity. The level of GDP in the next period is determined by how much investment is undertaken in this period to increase the capital stock that is used in the next period.

The only type of economic rebalancing that makes sense for China has two components. The first is to increase consumption at the expense of the trade surplus and not at the expense of domestic capital accumulation. For the situation in April 2011, the implication is that the Chinese Government should stop relying on the reduction of investment as the primary instrument to curb inflation, and begin appreciating the RMB much faster instead. Using RMB appreciation as the primary tool to fight inflation means, however, accepting a temporarily higher unemployment rate now in exchange for a permanently lower unemployment rate in the future. This is because manufactured exports are typically more labour intensive than investment projects. As a result, a RMB1 billion reduction in exports would create more unemployment than a RMB1 billion reduction in investment spending. Tomorrow's capacity expansion from today's investment would, however, mean a permanent increase in the number of jobs created from tomorrow onward. China should also lower import barriers because cheaper imports will stimulate consumption and help keep inflation in check.

The second component of an economically sensible method of rebalancing is to help switch the composition of investment away from the export sector towards investments that aid human capital formation and accelerate urbanisation of the rural population. Urbanisation can become as important and as durable a driver of growth as the export sector has been (Woo and Zhang 2010). China should base its urbanisation on the principle of affordable future homeownership. The fast growth of the real estate sector—not only recently but also over the past decade—reflects not just speculative demand but also genuine pent-up demand for housing and genuine accommodation of the high rate of the joint industrialisation–urbanisation process.[2] The bulk of the new arrivals from the countryside cannot qualify for bank mortgages, so many investors have been buying multiple housing units to rent to new arrivals with the intention of raising the rents over time in line with the income growth of the renters. In this sense, much of the recent housing demand has been speculative.

We propose that China studies the low-cost public housing schemes in Hong Kong and Singapore and establishes a national housing program in which the new arrivals would rent homes for seven years and then have the first right to buy these units at a price based on construction costs. This 'future ownership' form of urbanisation would prevent the problem of empty housing held for speculative reasons from escalating into non-performing loans. China can afford a massive public housing program because the expensive part of such programs in other countries is the cost of land and not the cost of the structures—and land in China is mostly owned by the state.[3]

The required sense and sensibility for common prosperity

It cannot be overstressed that important reforms are also required in the United States in order to keep protectionist sentiments under control. It is well known that the inflation-adjusted take-home wage of blue-collar workers has shown little or no growth in the past 20 years, and this stagnation has fuelled protectionism because many have identified increased competition from globalisation to be the cause. The reality is that US firms have been paying more and more for the services of their blue-collar workers, but this has not been translated into higher take-home wages for the workers because the increases in labour compensation have been mostly absorbed by the rapidly rising medical insurance premium! If not for medical insurance inflation, the take-home pay of the working class would have been pulled up significantly by the rapid labour productivity growth created by the transformational technological innovations of the past two decades. US President, Barack Obama, has extended healthcare coverage to more workers but he has not introduced any potent cost-containment measures on health care. Until the next phase of healthcare reform brings cost under control, it will be hard to cut the budget deficit, and hence the trade deficit.

Besides what the United States and China can each do independently to reduce international tensions over the trade imbalance, they should also work together to prevent the World Trade Organisation (WTO) free-trade regime from weakening. Specifically, China has benefited immensely from the WTO system, and yet it has, up to this point, played a very passive role in pushing the Doha Round negotiations forward to completion. By default, Brazil and India have assumed the leadership of the developing-economies camp in the trade negotiations. At the Group of Four (G4: the United States, the European Union, Brazil and India) meeting in Potsdam in June 2007, Brazil and India retreated from their earlier offers to reduce their manufacturing tariffs in return for cuts in agricultural subsides by the industrialised economies because of their concern for increasing Chinese imports.

With the United States now seemingly weaker in its resolve to protect the multilateral free-trade system, China should now become more active in the Doha Round negotiations to further deregulate world trade. Such a role will be very much in China's interest because Brazil is now bypassing multilateral trade liberalisation by entering into free-trade agreement (FTA) negotiations with the European Union. The fact is that a growing number of nations such as Brazil are increasingly cautious about a multilateral deal that would lower tariffs to all and hence benefit low-cost producers such as China disproportionably and are seeking bilateral trade agreements with rich countries that are tailored to both their conditions. It is definitely time for China to show that it has the sensibility of a responsible stakeholder by joining in the stewardship of the multilateral free-trade system.

What the world economy especially needs now is an invisible handshake between the United States and China to start economic policy coordination on a number of fronts (such as exchange rate policy, budget deficits, bilateral and global trade deregulation, intellectual piracy, and social safety nets) to keep their current account imbalances below 4 per cent of GDP. It is not naive to predict that if the two countries are unable to arrive at an invisible handshake on the solution of the trade imbalances then we are unlikely to see at any time soon visible handshakes (multilaterally) on an accord on global climate change, a strengthened

treaty on nuclear non-proliferation or a compact to end absolute poverty globally. In short, if statesmanship is lacking on the less contentious issue of trade then progress on these even more important objectives will not occur. And, if progress is made on any one of these other problems, it might be only after a highly confrontational process.

The outcome of a highly confrontational process need not be progress, however. Mutual paralysis or open conflicts have also been common outcomes of confrontations. After all, many pundits have pointed out that the rise of new powers in the twentieth century (Germany and Japan in the first half, and the Soviet Union in the second half) led to disastrous wars with the existing powers. This pessimistic presumption about the emergence of China as a world power in the twenty-first century overlooks the fact that the strongest power to rise in the twentieth century was the United States (not Germany, Japan or the Soviet Union), and that the United States was generally a force for global stability. There is, in short, ground to expect that if the existing powers could accommodate the concerns of an emerging China adroitly (without appeasement), China could become a responsible stakeholder in the global system. We should therefore not give up the reasonable hope that enlightened self-interests (when repeatedly pointed out by analysts such as the *ANU China Update* participants) could guide the United States and China to be earnest in defusing their bilateral tensions and ensure that the picture of the future is not grey.

Bibliography

Guha, K. 2009, 'Paulson says crisis sown by imbalance', *Financial Times*, 1 January 2009, <http://www.ft.com/cms/s/0/ff671f66-d838-11dd-bcc0-000077b07658.html>

Lardy, N. 2007, 'China: rebalancing economic growth', in F. Bergsten, B. Gill, N. Lardy and D. Mitchell (eds), *The China Balance Sheet in 2007 and Beyond*, Center for Strategic and International Studies and the Peterson Institute for International Economics, Washington, DC.

Scott, R. E. 2007, *Costly trade with China: millions of U.S. jobs displaced with net job loss in every state*, EPI Briefing Paper No. 188, Economic Policy Institute, Washington, DC.

Woo, W. T. 2008, 'Understanding the sources of friction in US–China trade relations: the exchange rate debate diverts attention away from optimum adjustment', *Asian Economic Papers*, vol. 7, no. 3, pp. 65–99.

Woo, W. T. and Zhang, W. 2010, 'Time for China to move from macro-stability to macro-sustainability: making macro-stimulus work and maintaining its effects', *Journal of Asia Pacific Economy*, vol. 15, no. 4 (November 2010), pp. 349–68.

Endnotes

1. For example, Lardy (2007:10) wrote that the more desired growth path is one marked by 'a reduction in China's national savings rate', and by a reduction in 'China's excessive rate of investment'. The latter 'is a prerequisite to a successful transition to a more consumption-driven growth path'.

2. If speculative demand had been the overwhelmingly dominant cause for the property boom then house rents would not have risen substantially (because the speculative investors would tend to rent out their extra units). Instead, rent in Beijing in March 2010 was 19.6 per cent above that in March 2009. See 'Survey shows house prices still too high', *China Daily*, 12 May 2010, <http://www.chinadaily.com.cn/metro/2010-05/12/content_9839054.htm>

3. It should be noted that housing construction is relatively labour intensive and that home decoration is highly labour intensive.

12 Australia–China Economic Relations

Christopher Findlay[1]

Introduction

China's growth and change are driving dramatic structural change in Australia. Despite the fact that Australia's per capita income is much higher than China's, the continuation of rapid growth in China is exposing a series of policy challenges for Australia, particularly matters of regulatory reform. Many of these are directly related to key areas of interest in the relationship with China, and the manner in which Australia responds will affect the evolution of this relationship. There is also a risk that the boom conditions will not last and the opportunities created by growth in China will be wasted.

That China will continue to grow at high rates is a widely held expectation.[2] But China faces a series of structural challenges and its response to these challenges will also affect the evolution of the relationship with Australia.

Growth in the movements of capital and people is a part of the change in the relationship. China has become a big investor in Australia, and there are now significant movements of people in both directions. The aim here is to document some aspects of these developments. The next section reviews recent changes in the trade and investment flows and then some features of the resources boom in Australia. Following this is a discussion of foreign direct investment (FDI) flows and people movement. The chapter concludes with a review of Australia's three challenges: the 'now' challenge, the 'end of the boom' challenge, and the challenge of grasping new opportunities.

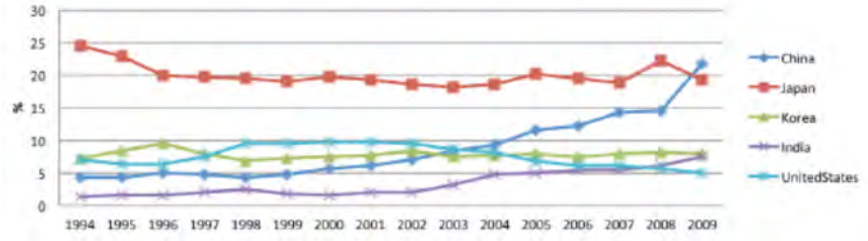
Trade and investment flows

There is a high level of complementarity between Australia and China, and China is increasingly important in world trade. Not surprisingly, China has become Australia's top-ranked merchandise trade partner, taking over from Japan as an export destination and from the United States as a source of imports.

Merchandise exports to China in 2010 were A$58.4 billion (25 per cent of the total) and imports from China were A$39.3 billion (19 per cent). The shares of the top-five partners in exports and imports are shown in Figures 12.1 and 12.2. China took over the number-one position in 2009 as an export destination. The growth in the importance of India is also noteworthy. In import transactions, while China's share is rising, the share of Japan and of the United States has been falling. The rising share of Association of South-East Asian Nations (ASEAN) economies in imports is also of interest.

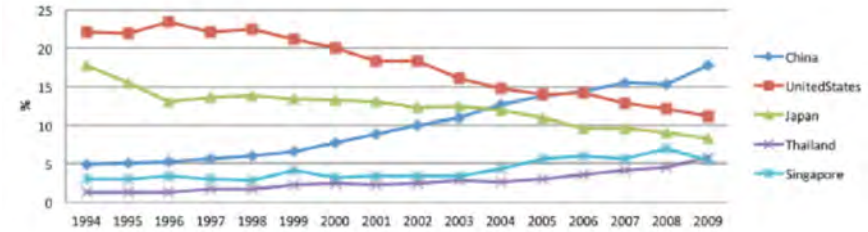
In 2009, China was the world's largest exporter with a share of 9.6 per cent, and the second-largest importer with a share of 7.9 per cent (WTO 2010). China's share of Australian exports was more than three times its world import share, which provides a further illustration of the intensity of the relationship.

Figure 12.1 Shares of Australian exports to the top–five destinations, 1994–2009



Source: CEIC Data Company Ltd, New York.

Figure 12.2 Shares of Australian imports from the top-five origins, 1994–2009



Source: CEIC Data Company Ltd, New York.

The main Australian export items to China in 2009–10 were iron ore (A$25 billion), coal (A$5 billion), copper (A$1.7 billion) and wool (A$1.5 billion). Clothing, computers, telecommunications equipment and toys make up the bulk of the import transactions (DFAT n.d., 2010b). Chinese exports to Australia are, however, diversifying—for example, while constituting a small share of exports to Australia (less than 1 per cent), fresh food products became important in the Australian summer, and certainly more noticeable. There was a vigorous debate about the threat to apple growers in Australia early in 2011 following the arrival of Chinese apples into Australian shops 'for the first time since 1921' (AAP 2011; Murphy 2011).

Australia's resources trade has been reoriented to China. By 2009, China accounted for more than one-quarter of Australia's total resources exports (metal ores, minerals, fuels and metals—including gold), followed by Japan (20 per cent), India (10 per cent) and Korea (9 per cent). In 1999, China accounted for less than 5 per cent of total resources exports and Japan accounted for 23 per cent (DFAT 2010a).

Australia on the other hand is of lesser importance as a trading partner to China, although the relationship is intense. It is the eleventh-ranked export destination, accounting for less than 2 per cent of China's exports (Australia's share of world merchandise imports is 1.3 per cent and it is ranked number 19 in the world). Australia ranks higher as a source of imports—at number seven, with a share of 4 per cent (1.2 per cent of world merchandise exports and ranked twenty-third in the world).

The services relationship with China is also deepening. China is now Australia's number-one export destination. Australia's 'services exports' to China were valued at A$5.8 billion, or 11 per cent of the total, in 2009–10. Imports were A$1.6 billion, or 3 per cent of the total. The main export items were education-related travel (expenditure in Australia by overseas students) and other personal travel—or tourism. The main import items were tourism (Australians travelling to China) and transport (shipping, for example). China is the eighth-most important source of services imports. Sales of services to China are likely to be significantly understated. The data reported in this paragraph are cross-border transactions and not sales from services affiliates offshore.

Foreign investment flows from China have surged in recent years. By 2009, the stock of Chinese investment (of direct and portfolio flows) in Australia was A$16.6 billion and the FDI stock was A$9.2 billion. China is outside the list of leading foreign investors in Australia in terms of the size of the stock (a total of nearly A$2000 billion in 2009, in which the United States and the United Kingdom together account for half and Japan for another 5 per cent), but in 2009 it was ranked fifth in terms of the inflow, after the United States, the United Kingdom, Netherlands and Japan. Table 12.1 shows the value of the inflows, according to Australian Bureau of Statistics (ABS) data, rising to nearly A$5 billion in 2009. Australian investment in China has fluctuated but remains small: by 2009, the stock of all flows was A$6.3 billion with the FDI stock valued at A$2.4 billion.

Table 12.1 Foreign investment flows from China to Australia, 2005–09 (A$ million)

Investment from China to Australia	2005	2006	2007	2008	2009
Foreign investment	30	1281	2681	2489	7845
Direct investment	–58	244	23	3187	4991

Source: ABS (2009).

The resources boom

Global demand growth for resources as well as food is reflected in the change in the composition and direction of Australian trade. The resources share of exports is now 57 per cent, compared with 41 per cent in 2005 (Christie et al. 2011). This shift reflects both price and volume changes.

Australian terms of trade have never been higher since Federation (Stevens 2011). The price of iron ore has increased at an average annual rate of 23 per cent since 2005 and the price of coal at 8 per cent (in Australian dollars).[3] Australia's terms of trade are 65 per cent

above the average twentieth-century level and 85 per cent above the trend of the twentieth century had that continued (Stevens 2011). As a result, Australian gross domestic product (GDP) in nominal terms is about 13 per cent higher than it would have been (Stevens 2011).

The volume of exports of iron ore has grown at 10 per cent a year and of coal at 5 per cent a year since 2005. The major structural changes in trade have been the surge in iron-ore exports to China (a fivefold increase since 2005 to more than 250 mt), the growth in coking-coal exports to China in 2007 (on top of steady growth in exports to India) to between 20 and 30 mt, and a more recent rise in thermal-coal exports to China in 2010. China has become the second-largest destination for liquefied natural gas (LNG) exports.

Growth in China, and to a lesser extent India, has been a driver of higher resources prices (Orsmond 2011). Growth in China involves not only industrialisation but also the employment of rural labour and therefore a rapid rate of urbanisation (Song 2010). China has now entered what Song calls the mid-phase of industrialisation, which is more energy and minerals intensive than the more labour-intensive early phase. This has contributed to the 'sudden surge in China's demand [for] energy and resources since 2002', which has contributed to the higher price level than otherwise, with the low short-run supply elasticities in minerals and resources. While well endowed with resources in absolute terms, China's endowment is poor in per capita terms and has led to its rising demand being reflected in purchases from offshore. China, Song reports, shifted to become a net importer of oil in 2003 and coal in 2009.

At the same time as contributing to higher minerals and energy prices, China's industrialisation has increased the supply of manufactured goods and prices have remained lower than otherwise. These shifts of higher resource prices and flat or even lower manufactured product prices have been especially beneficial to Australia, given its endowment of the factors of production and its patterns of trade. They are reflected in the composition of Australia's trade with China summarised above.

Song asks how long this boom will last. Assuming continuing high GDP growth, Song refers to work on the Kuznets curve for steel, according to which China will not reach peak steel consumption per capita until 2024, and possibly longer if its follows a trajectory similar to that of Japan. Steel output in 2024 would be about 1 billion tonnes or more, compared with 600 mt now, which indicates strong growth in demand for steel and suggests continuing growth in demand for other minerals and energy. The question for Australia, however, is the supply response in world markets. This question and issues around the sequence of structural adjustments occurring in Australia are discussed in more detail below.

A theme of this chapter is that changes in the relationship with China are driving not only structural changes but also debate about policy in Australia. An example is the taxation of resource rents. A consequence of higher prices was higher profits in the resource sector, which led to debate over the distribution of resource rents and to a significant change in taxation policy. The concern is that the new arrangements might not have solved problems in the previous taxation arrangements and at the same time created new ones.

Previously, Australia levied taxes on resource projects in place in the form of company income tax as well as royalties, linked to sales. State governments managed the royalties, and firms in the resources industry were concerned that higher prices and profits would trigger higher royalty rates, which would be difficult to reverse later if prices were to fall. Royalties are inefficient since they induce mines to close earlier than otherwise. In May 2010, the Government proposed a profit-based tax, the initial version of which was highly controversial. Following the change in government, the industry negotiated a new form of this tax, which applied only to coal and iron ore (Government of Australia n.d.).[4] The States continue to collect royalties that are to be paid immediately, while losses, including credits for royalties paid, are carried forward at a specified rate of interest. When profits are low and there are insufficient profit tax payments against which to credit the royalties, the mines will continue to close too soon. Other criticisms of the new tax are that it discourages cost reductions by miners, induces higher levels of capital intensity, flattens out production over time and penalises high-risk projects (Pincus 2011). The tax is also argued to fall less heavily on some types of companies than others.

Capital flows: investment in minerals

Data on capital flows are available not only from the ABS but also from reports of approvals and announcements. The approvals data come from the Foreign Investment Review Board (FIRB) and, as usual, they exceed the data on actual flows reported by the ABS (see Table 12.2).

Foreign Investment Review Board-approved Chinese FDI projects surged to more than A$7 billion in 2005–06 and remained high the following year compared with previous history. In 2007–08, the value of approved projects returned to levels similar to 2005–06 and then in 2008–09 quadrupled. This occurred in the face of the global financial crisis; total approvals from China numbered only 57 in 2008–09, but the value of approved projects in the minerals sector increased dramatically. Total approvals for projects from all countries fell following the financial crisis—from 8354 in 2007–08 to 604 in 2008–09. Despite the effects of the financial crisis on overall investment approvals, the value of approved projects from China remained more than A$16 billion in 2009–10. Total approved Chinese-investor projects since 2005–06 were valued at just more than A$60 billion, of which A$53 billion (or nearly 90 per cent) was in minerals or resources processing.

While China did account for the largest value of project approvals in the minerals sector in 2008–09, China generally ranks number three after the United States and the United Kingdom. For example, over the same period, total approved projects from the United States were valued at A$197 billion but the minerals sector accounted for only A$67 billion or 34 per cent. Even so, this planned investment from the United States exceeded that from China.

Other data on FDI projects in which China is involved are available from information on announcements of projects contained in the Zehpyr database.[5] There were 89 merger and acquisition (M&A) 'deals' completed in the resources sector over the period 2007–10, the total value of which was reported to be about A$36 billion. This amount is far greater than the ABS reported capital flows, but less than the value of approved deals in the FIRB

data. One reason for the difference, apart from valuation methods, is the location of the foreign investor—investments might be managed by Chinese firms based in other countries. According to the reporting dates in Zephyr, the focus of deals by Chinese investors is shifting: iron ore dominated deals in 2007 and 2008, then oil became more important in 2009, and deals in 2010 were dominated by gold projects.

The ownership of Chinese companies involved in the deals was also reviewed. Another policy debate in Australia has been about investments from China by consumers of the output of the projects and by state-owned enterprises. By inspection of the web sites of each company involved in the deals and using other sources, it is estimated that over the period 2007–10 the lower bound estimate of public ownership is 73 per cent, although it could be as high as 84 per cent. As Drysdale and Findlay (2009:374) point out:

> State-owned firms in China are increasingly subject to the disciplines of the market at home. They have preferred access to domestic credit through the state-owned banking system but on terms that are, given that distortion, increasingly commercially based…Chinese companies in which the state has a stake are publicly listed at home and increasingly in Hong Kong and abroad. Corporate organisation and corporate governance in China is in a state of transition and is evolving towards a system increasingly governed by market institutions.

Indeed, the latest (Twelfth) Five-Year Plan (2011–15) calls for further listing.

According to the Zephyr database, investments in 2010 were much lower than in previous years, since the value of deals completed in that year was only about one-quarter of that in 2009; this figure is difficult to check, since, for example, FIRB data now available refer only to the first half of 2010. Overall outflows from China, however, continued to grow in 2010, including in M&A activity.[6] A fall in investment in Australia, if correct, points to a dramatic shift in investment strategy by Chinese investors. Any such shift would most likely be linked to the uncertainty in the application of Australian policy. Drysdale and Findlay (2009) argued that 'additional requirements' on resources projects, which were originally introduced in 2008 and which led to the rejection of some projects, created greater 'uncertainty about the treatment of Chinese FDI in the resources sector [which] is, at the margin, likely to damage the potential growth of the sector and Australia's full and effective participation in the benefits from Chinese economic growth through the growth of its market for industrial materials' (p. 378). They argued that these additional considerations were not required; however, these considerations have been retained in a new format in the latest version of the policy, dated January 2011. Government-to-government arrangements for routine consultation between Australian and Chinese authorities to deal with competition policy questions and with issues of corporate governance and financial transparency are preferred (Drysdale and Findlay 2009).

Table 12.2 Chinese investment in Australia by industry, as approved by the Foreign Investment Review Board, 1993–2010 (A$ million)

Year	Number	Agriculture, forestry and fisheries	Manufacturing	Mineral exploration and resource processing	Real estate	Services and tourism	Total*
1993–94	0	0	0	0	0	0	0
1994–95	927	0	1	42	426	52	522
1995–96	267	0	6	52	137	31	225
1996–97	102	10	3	5	176	17	210
1997–98	0	0	0	0	0	0	0
1998–99	0	0	0	0	0	0	0
1999–2000	259	35	5	450	212	10	720
2000–01	0	0	0	0	0	0	0
2001–02	237	0	47	20	234	10	311
2002–03	0	0	0	0	0	0	0
2003–04	170	0	2	971	121	5	1100
2004–05	206	2	0	39	181	42	264
2005–06	437	0	223	6758	279	0	7259
2006–07	874	15	700	1203	712	11	2640
2007–08	1761	0	0	5448	1491	121	7479
2008–09	57	0	82	26 416	n.a.	59	26 599
2009–10	1766	0	198	12 946	2421	717	16 282

n.a. not applicable * includes financial sector projects

Source: Updated from Drysdale and Findlay (2009) from Department of Treasury (Various years).

People movement

An important feature of the bilateral relationship is the movement of people. In the late nineteenth century, the Chinese were the dominant Asia-born group in Australia, but their share then fell to a low point in the early 1980s (Hugo 2008). By 2006, however, the Chinese once again became the largest Asia-born group, accounting for 1 per cent of the population. Settler arrivals from China since 1950 show a small movement in the 1950s then two decades of virtually no settlement, and then 'spectacular gains' in the mid-1990s following the treatment of students who were granted temporary protection visas in 1989 following the Tiananmen Square protests, which were then converted to permanent residency (Hugo 2008).

In more recent years, there has been another surge in the number of settlers, so that China-born immigrants have risen from a rank of tenth among settlers in the early 1990s to third in 2005–06 (Hugo 2008). Table 12.3 shows Chinese arrivals 'from offshore' have risen from nearly 7000 in 2001–02 to nearly 17 000 in 2009–10 and to nearly 12 per cent of the total of such arrivals.

Settlers arriving from offshore do not provide the only channel for additions to the population. In 2009–10, 33 per cent of permanent additions to the population came from 'onshore' migrants—those who initially come as temporary residents then apply for permanent migration. Table 12.3 also shows onshore arrivals since 2001–02. Arrivals from China via this route have risen from more than 3000 in 2001–02 to nearly 9000 in 2009–10. Their share in total additions from China has fluctuated from 32 to 45 per cent. China accounts for nearly 13 per cent of the total onshore arrivals.

Considering both sources, more than 25 000 people were added to the China-born population in 2009–10, or about 12 per cent of the total. China in that year matched the United Kingdom for the first time as a birthplace of additions to the population; other significant countries of birth were India (more than 23 000) and New Zealand (more than 18 000). Previously, and since 2007–08, arrivals of India-born had exceeded those from China.

In 2009–10, of the total arrivals of 140 610 people in Australia from offshore, nearly 75 per cent came in the migration program, the balance being the humanitarian program and New Zealand citizens. Of those in the migration program, 59 per cent were in the skilled-migrant category and the balance in the family category. The orientation of Australian migration policy has shifted significantly since the skilled migrant share was less than one-quarter in 1995–96 (Hugo 2008). Recent published data are not available for China but Hugo (2008) reports that 60 per cent of migrant arrivals of China-born people in 2003–04 were in the skilled category (not including onshore additions to the population). Hugo also refers to data that show migrants from China are found in the top-three occupational categories in terms of skills (managers and professionals), and notes the extent to which students from China in Australia transfer to permanent residence.

Table 12.3 Permanent additions to Australian population of China-born, 2001–10

Year	Onshore		Offshore arrivals		Total		
	Number	Percentage of total onshore additions	Number	Percentage of total offshore arrivals	Number	Percentage of total additions	Onshore as a percentage of total additions
2001–02	3180	13.4	6708	6.2	9888	7.5	32.2
2002–03	3369	10.5	6664	7.1	10 033	8.0	33.6
2003–04	4532	11.8	8784	7.9	13 316	8.9	34.0
2004–05	4903	11.2	11 095	9.0	15 997	9.6	30.7
2005–06	7403	15.4	10 581	8.0	18 084	10.1	40.9
2006–07	9811	18.9	12 009	8.5	21 820	11.4	44.9
2007–08	8249	14.5	12 959	8.7	21 208	10.3	38.9
2008–09	7889	11.8	15 803	10.0	23 692	10.6	33.3
2009–10	8722	12.8	16 644	11.8	25 366	12.1	34.4

Source: Updated from Hugo (2008) from DIAC (Various years).

Movements to Australia that are not permanent are also significant and of interest. Temporary arrivals could be visitors (tourists, short-stay business visitors and those visiting friends and relatives), temporary residents (including long-stay business visitors, managers, specialists, technical workers, and so on, with length of stay at least three months and up to four years) and students (which presumably includes returning students). Data on these temporary arrivals are shown in Table 12.4.

Table 12.4 Temporary arrivals from China and in total, 2005–10

Year	Origin	Visitors	Temporary residents	Students
2005–06	China	263 811 (7.1)	9105 (2.8)	63 415 (20.5)
	Total	3 730 555	321 631	309 780
2006–07	China	300 235 (7.9)	11 381 (3.1)	73 191 (20.9)
	Total	3 804 735	368 546	350 097
2007–08	China	320 796 (8.7)	13 300 (3.2)	90 908 (22.2)
	Total	3 702 370	420 045	409 136
2008–09	China	290 876 (8.2)	13 174 (2.8)	107 294 (22.1)
	Total	3 534 280	474 827	485 342
2009–10	China	303 920 (8.4)	14 578 (3.1)	128 685 (26.3)
	Total	3 612 606	466 971	489 766

Note: Percentage of the total in parentheses.

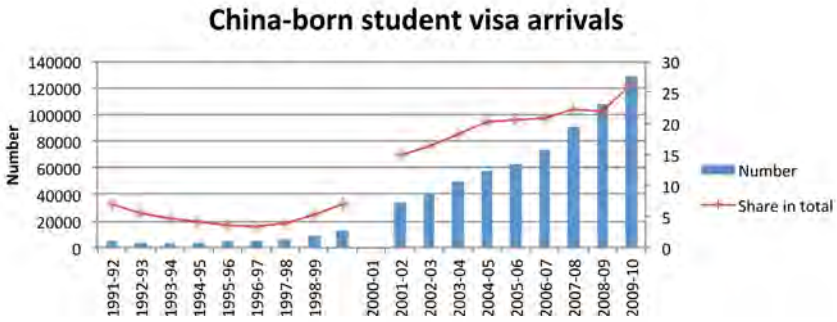
Source: DIAC (Various years).

In the five years since 2005, visitor numbers from China have fluctuated by about 300 000, or 8 per cent of the total. In the first part of the decade, however, short-term arrivals from China more than doubled (Hugo 2008:Table 9). The number of temporary residents (which includes longer-stay business visitors) has grown but remained at about 3 per cent of the total; China was ranked at number 11 in this category in 2009–10. China ranks more highly as a country of origin of short-stay business visitors (Hugo 2008).

Students

The arrival of students from China in Australia has doubled in the past five years, and China's share of student arrivals has risen to more than one-quarter. Figure 12.3 shows a longer time series of student arrivals.

Figure 12.3 China-born student arrivals in Australia, 1991–2010



Note: Figures for 2000–01 not available.

Sources: DIAC (Various years); Hugo (2008).

The total number of international students in Australia has increased more than thirteen-fold in this decade (Table 12.5). The China share rose from less than 6 per cent at the start of the decade to 20 per cent by 2005, and China has since retained that share. Hugo (2008) stresses the 'nexus between Chinese non-permanent migration, especially that of students, and eventual permanent settlement in Australia'. He argues in favour of that route to residency—in the context of the shift in Australian migration policy to a focus on skills—because of the value of the experience of having lived in Australia, the contribution of local education to language skills and the value of the Australian qualification to employers.

Estimates from China show that at the end of 2010 there were 1.27 million students from China living overseas.[7] Of these, 284 700 'new students began their overseas studies' in 2010, which was a 24 per cent increase from 2009 ('China: more than 1.2 million Chinese studying abroad', *University World News*, no. 168, 24 April 2011, <http://www.universityworldnews.com/article.php?story=20110421200341899>; Jia 2011; 'Market data snapshots: People's Republic of China', *Australian Education International*, vol. 16, May 2007, <http://www.aei.gov.au/AEI/PublicationsAndResearch/MarketDataSnapshots/MDS_No16_China_pdf.htm>. In 2007, the three leading destinations were the United States (16 per cent), followed closely by the United Kingdom (14 per cent) and Australia (13 per cent).

Table 12.5 Stock of Chinese and international students in Australia, 2000–10 (as of 31 March)

Year	China	Total	Percentage China
2000	7415	130 801	5.7
2001	7420	102 331	8.4
2002	13 565	110 572	12.3
2003	23 991	186 102	12.9
2004	35 576	204 794	17.8
2005	43 367	213 892	20.3
2006	49 831	234 844	21.2
2007	55 550	265 999	20.9
2008	70 106	327 188	21.4
2009	81 567	400 656	20.4
2010	94 310	425 861	22.1

Sources: DIAC (Various years); Hugo (2008).

Factors that might have contributed to the rise in the importance of Chinese students in Australia include the attractiveness of and promotion of Australia compared with competitor countries (particularly the United States after 2001), the scope for onshore migration (since reforms in 1999), the incentives for students to study at 'regional' universities since 2005, and the overall increase in outbound student movement from China (Hugo 2008).

A current critical domestic policy issue in Australia is the treatment of international student visas. Migration risk—that is, the risk that people arriving in Australia will not abide by the conditions of their visa—appears to be an important determinant of policy on visas. The concern is that people apparently arriving for one purpose, such as study, might actually have in mind another goal, such as work or settlement. To manage this risk, students are allocated to different risk categories, which are associated with different requirements with respect to visa applications. There are five levels: 'Assessment Level 1 represents the lowest immigration risk and Assessment Level 5 the highest. The higher the Assessment Level, the greater the evidence an applicant is required to demonstrate to support their claims for the grant of a student visa' (DIAC n.d.).

Recently some risk levels for Chinese students were reduced from Level 4 to 3; currently the categories for China are English language intensive courses for overseas students (ELICOS), 3; schools—4; vocational education and training (VET)—4; higher education—3; postgraduate research—2; and non-award—3. Research students are regarded as lower risk, which contributes to the scope for research cooperation with Australia. Visas for school students are assessed more stringently, despite some reports that Chinese families are deciding to send their children for international study at an earlier age (Ning 2011).

Further tests are applied to check whether applicants for student visas are 'genuine' students, including proof of access to funds for living costs (raised from A$12 000 to A$18 000 from January 2010). Also since 2010, there have been changes in the list of preferred occupations for migration and changes in the points test for migration.

While there might be some risks associated with issuing particular visa categories, assessing that risk requires consideration of both the consequence of the occurrence of the events of concern and the consequences of the risk-screening systems put in place. People who come to Australia for training or education might seek to work or settle in Australia. This 'problem' has to be weighed against the cost of the implementation of the risk-control measures, which dissuade the movement of all students.

The Knight Review (Government of Australia 2011) is examining student visas. The discussion paper for the review asks questions about the risk-assessment process and also about features of the process that add to the burdens on students applying to Australia, including the length of the application process, demonstrated access to funds and the application charges. In other aspects, Australia appears relatively less restrictive, such as with respect to caps on hours of work.

Dee (2010) has demonstrated how sensitive student flows are to these conditions. Dee finds a significant statistical relationship between the policy regime applying to arriving students and the movement of students. She considers an economy with barriers to the inward movement of students who were at the average of the sample she examines. She finds that if that economy were to liberalise completely, it would attract about two and a half times more students. Dee also finds that the policies affecting commercial presence in the home countries of students who study abroad have significant effects on student movements. She reports that barriers to the inward movement of foreign campuses boost the number of students from the source economy seeking overseas enrolment. Conversely, a source country that is confronted with barriers to the movement of its students could consider reform of its own policy on commercial presence.

There is another link to the distribution of rents in this set of policies. Dee conjectures whether some of the barriers (that act like quantitative restrictions) imposed by exporting countries (those that host international students) also assist the institutions providing these services to charge higher fees. In this way, they can capture any rents available and use that income to cross-subsidise their other activities, including research. A more efficient arrangement is to finance research directly, rather than through cross-subsidies funded by the imposition of an export tax.

Tourists

Tourism is also growing in both directions. Tourism Minister, Nick Sherry, is expecting China to become number one in terms of the number of arrivals and their expenditure within a few years (Sainsbury 2011). China has recently declared itself to be Australia's most valuable 'visitor' market (visitors stay less than one year), with estimated expenditure in 2010 of A$2.5 billion, growing by 21 per cent in 2010 compared with 2009. The total number in 2010 was 453 800 (24 per cent higher than in 2009), with China accounting for 13 per cent of total spending by visitors.[8] Chinese 'visitors' now also spend more nights in Australia than arrivals from any other country. The United Kingdom is second on the list in terms of visitor nights. The number of individual visitors is, however, higher from New Zealand, the United States and the United Kingdom.

Outbound movements from China have increased nearly three times in the past decade—from 9.2 million in 2000 to 25.8 million in 2009 (Tourism Australia 2010).[9] Australia's share of this total is about 1.4 per cent, according to Tourism Australia (compared with Australia's share of world arrivals of 0.6 per cent). Australia's share of travel to a defined set of competitors (including Western Europe, the United States, Canada, New Zealand and South Africa) was 11.5 per cent (of total departures of 3.2 million).

A critical policy issue for Australia in this sector is the treatment of air transport services between Australia and China. Australia has committed itself to the 'ultimate objective' of an open-capacity arrangement with China but currently capacity levels are capped. These have increased from 14 500 seats a week in 2010 to 18 500 in March 2011, and 22 500 in February 2012.

A recent agreement on air transport with China allows airlines to offer an extra 2500 seats a week to the major destinations if they also provide stopovers at regional airports. Sandilands (2011) points out that foreign carriers that provide such a service would not be able to pick up local traffic under the restrictive regime in Australia, so the opportunity for an injection of competition into the domestic market is lost. At the same time, this provision also has the effect of taking international-origin passengers away from airlines operating on domestic routes who would otherwise have carried those passengers.

By February 2012, there will be about 1.2 million seats a year in each direction on direct services. It is difficult to estimate the true origin–destination traffic on the Australia–China routes accurately and therefore to compare this with the seats available on direct services, since there are many routes to destinations in China, including via Singapore and Hong Kong. In 2010, however, an estimate based on ABS data of people with Chinese residence arriving in Australia plus Australian residents departing for China was 790 400. This number, compared with the 1.2 million seats available, indicates that there is space for the direct traffic within this capacity. Even so, an open-capacity arrangement remains preferable for two reasons. One is to allow for growth without further requirements for negotiation and the other is because there is the prospect of passengers travelling via China to and from other destinations, which adds to the competition with the regional and global networks.

Sandilands (2011) points out, for example, that China is an important intermediate point and is well positioned for flights to Europe from Australia, or as part of a longer route for traffic from Eastern Europe and Russia into Australia. The latest memorandum of understanding with China allows Australian carriers to serve additional points beyond those in China, making this track to Europe possible. The problem is that the Europeans have to agree to this as well as China, and in the latest negotiations on a European Union–Australia open-skies agreement, the European Union has reportedly asked that restrictions on foreign ownership of Qantas be lifted as part of the deal (Creedy 2011). These issues in the air transport market provide further interesting illustrations of the way that China's growth and Australia's response have exposed flaws in Australian regulatory systems.

Challenges for Australia

Previous sections have identified some specific policy issues that have become more important in Australia as its relationship with China evolves, in relation to taxation, student visas, aviation policy and resource-rent taxation. There is also a series of broader challenges over time, related to the structure of the economy. These are the 'now' challenge, the 'end of the boom' challenge and the 'new opportunities' challenge.

The 'now' challenge relates to the response to increases in the price of minerals and energy in world markets, which have translated into higher prices for those items in Australia and hence in incomes, also creating strong pressure for resource reallocation. With a flexible exchange rate, the response is a real appreciation of the Australian dollar. Other traded goods sectors shrink while the non-traded goods sector expands in response to higher demand following the rise in income.

This adjustment occurs at relatively low cost because of the use of the exchange rate mechanism (an alternative would have been inflation). That cost would, however, be even lower if factor markets were more flexible—for example, if relative wages were allowed to change across occupations and if mobility was higher. Continuing reform in Australia can make an important contribution to labour-market flexibility. This is the first part of the 'now' challenge. Included in this portfolio is the management of migration, including from China, and its links to students enrolments.

Some (but not all) of the effects of higher prices for resources could be quarantined if some of the rise in income was captured through taxation and consolidation into a sovereign wealth fund—a portion of which might be invested offshore. So far that is not happening, although households and governments seem to be saving a bit more now than in the previous decade. As Stevens (2011) points out, allowing 'a good deal of the income growth to flow into saving' already seems to be happening at the household and firm levels.

Meanwhile, tradable sectors open to world markets are forced to adjust, and the costs of that adjustment are significant. Those open sectors will incur fewer adjustment costs if they can raise their productivity growth; they could continue to release factors of production to the sectors where output is growing but still have the chance to continue in business in the long run. This requires new technology and new ways of doing things. These responses at the firm level are the second part of the 'now' challenge.

The debate in Australia on finding new sources of productivity growth has recently been much more vigorous—this is especially important to sectors under pressure to adjust to the boom, including other export but non-resource sectors such as education and tourism. The recently released Gillard Government *Trade Policy Statement* has a large section on the 'patchwork economy' and a discussion of why an economic reform program to restart economic growth is 'essential'. Making the adjustments that contribute to productivity growth will also be easier now in the time of boom conditions than otherwise.

Policy and institutional reforms are therefore important responses in Australia to the Chinese resources boom even in the short term.

In the longer term, the question is on the supply side, and the response of producers of the resources that China demands. According to newspaper reports (FitzGerald 2011), Goldman Sachs recently predicted price falls in iron ore from US$170 a tonne to US$80 tonne by 2015. This presumably relates to the fact that, over time, higher world prices have led to the entry of new firms into those booming industries. There are, in the case of many minerals, alternative suppliers. Their entry causes world prices to fall again—maybe even back to their original level. Australian firms might continue to supply, as many would remain competitive at the lower prices—that is, they are not the marginal suppliers. But the sector will stop growing and will stop pulling in factors from other sectors.

Income will also drop back a bit, since the rent component is lower. The adjustment in spending patterns is associated with a real (and nominal) depreciation with a flexible exchange rate. There is subsequently a reallocation of resources from non-traded sectors back to traded sectors (other than minerals and energy).

In this second-round adjustment, the sectors previously squeezed might recover somewhat. But the initial squeeze and its reversal could be very costly unless: 1) it is anticipated; and 2) the costs of adjustment in both directions can be reduced. This is the 'end of the boom' challenge. Stevens (2011) comments further on this longer-run story. He points out that lowering the cost of responding to the possibility of a reversal of the current patterns of structural change requires the maintenance of flexibility and the ability to adapt in the economy. This perspective reinforces the value of adopting a productivity-growth promoting reform agenda in the short term.

The third challenge is that of taking advantage of the new opportunities. Their origin is in structural changes in China, which are discussed by Zhang (2011) in his review of the Twelfth Five-Year Plan. Zhang argues that the new plan implies a new development model for China. He observes that for some time there have been calls for China to shift from a GDP and export-oriented model of development to one that is more focused on wellbeing at home and with less environmental impact. He argues that these calls now have greater urgency because of the risks and imbalances that are emerging. The Twelfth Plan calls for a higher consumption share of output, a higher services share of output,[10] reductions in consumption of water and energy per unit of output, reductions in carbon emissions and greater non-fossil fuel consumption, better management of social services, regulation of monopolies and 'improved government efficiency and credibility'. Changes in these directions are not likely to retard the urbanisation process, or the industrialisation in western regions that is driving much of the resources demand. But they do offer new opportunities for Australian business, particularly in the services sector, where Zhang reports opportunities in medicine, education, finance and banking, but also with respect to government institution building—their design, implementation and operation. Australian business will benefit from an understanding of the forces for change in China and also the policy environment in which these new business opportunities arise, particularly the regulatory systems applying in the services sector.

The rules of the international trading and investment systems provide a framework in which these opportunities might be grasped. An element of that framework is the free-trade agreement (FTA) that has been negotiated with China since 2005. The report on the fifteenth round of negotiations is dated July 2010 and the published summary of those

discussions indicates the work that remains to be done. The focus of the negotiations is not clearly connected with the likely changes in the structures of the Chinese economy and the opportunities they might create. Nor is it clear that the negotiations are responding to the regulatory issues identified here and highlighted in the new dimensions in the economic relationship with China—namely, the regulation of FDI, visas for students and capacity on air transport routes.

In the recent trade policy statement, the remark on the FTA with China was that there was an impasse. Proposals to 'unlock the negotiations' were to be discussed when the two trade ministers met for the annual Joint Ministerial Economic Commission in mid-April 2011.

Explanations of the lack of progress are many and they include the difficulty of dealing with sensitive sectors in a bilateral agreement. An alternative approach is suggested by the following perspective on international commitments. Hoekman has argued,[11] in commentary on the World Trade Organisation (WTO) rather than FTAs in particular, that what matters is trade costs—lowering trade costs helps firms enter new markets and create new products: '[e]xpansion along the so-called extensive margin is an important mechanism through which trade supports higher economic growth.'

Hoekman argues that rules and trade policy bindings that reduce uncertainty and thus expected costs might be 'more important to the investment decisions of firms and the welfare effects of trade agreements than a marginal reduction in the applied tariff affecting an existing trade flow'. He argues for action that squeezes out 'water', or the gap to actual policy, from existing commitments, extends services commitments, and lowers trade costs.

These arguments point to the value of a new focus in discussion with China on the trading system; the results of that discussion might be documented in a bilateral arrangement but it would be one that, by the nature of the commitments, could be applied to all trading partners and that could provide some groundbreaking material for WTO processes at the same time.

Conclusions

Australia has benefited substantially from the growth of the Chinese economy at this stage of China's development. China has become Australia's most important trading partner and has been an important driver of the growth of Australian resources exports. Its own competitiveness in manufactured products has provided low-cost imported goods for Australia and contributed further to the improvement in Australia's terms of trade.

These shifts are associated with three significant challenges for Australia. They have also exposed flaws in Australia's regulatory arrangements. Australia has so far responded in a slow and clumsy way to this situation.

The 'now' challenge for Australia is to manage the adjustment to the shift in minerals prices in the short term at lower cost. Contributors include reforms to add flexibility in the economy and to contribute to productivity growth in the sectors being squeezed. The more immediate policy response was not focused so much on these questions—although the

intensity of that debate has recently increased—but on taxation. There was a reconsideration of the ways in which the resources sectors were taxed. This led to a series of policy changes and, eventually, after considerable political turmoil, to a new system in which it is still not clear whether the fundamental problems of the preceding royalty arrangements have been resolved.

At the same time, the scope of the Australia–China relationship is shifting, including larger volumes of movements of both people and capital. This evolution has highlighted further areas for reform in the Australian economy, which relate to impediments to those movements. Foreign direct investment policy, policy on visas for visitors and especially for students, and policy on the allocation of capacity on air transport routes should be on the agenda for attention. To some extent, like the taxation debate, these too are related to the efforts to capture and redistribute the rents that Chinese growth has offered.

While minerals prices are currently relatively high, there is in the longer term the prospect of lower resources prices and the reversal of the current directions of pressure for adjustment. Accommodating this shift is the second challenge—that of the end of the boom. Responding to this challenge reinforces the case for economic reform in the short term.

At the same time, the structure of the Chinese economy is shifting and offers the scope for a series of new business opportunities for Australia. The extent to which they can be captured, in services, for example, depends in part of the features of the trading system that links the two economies. Negotiations on an FTA are attempting to shift that system but so far with little progress. A new focus—on likely structural changes in China and the prospects they offer and on current issues in regulatory systems in Australia—might provide new avenues of discussion. This could not only create mutual benefit but also lead to valuable contributions to the design of global arrangements.

Bibliography

Australian Associated Press (AAP) 2011, 'Protests as Chinese apples arrive', *ninemsn.com.au*, 17 January 2011, <http://news.ninemsn.com.au/national/8197616/protests-as-chinese-apples-arrive>

Australian Bureau of Statistics (ABS) 2009, *International Investment Position, Australia: Supplementary statistics*, Cat. no. 5352.0, Australian Bureau of Statistics, Canberra.

Christie, V., Mitchell, B., Orsmond, D. and van Zyl, M. 2011, 'The iron ore, coal and gas sectors', *RBA Bulletin*, (March Quarter), pp. 1–8.

Creedy, S. 2011, 'Europe puts brakes on Qantas China expansion plan', *The Australian*, 21 April 2011.

Dee, P. 2010, 'International student movements and the effects of barriers to trade in higher education services', in C. Findlay and W. Tierney (eds), *Globalisation and Tertiary Education in the Asia-Pacific*, World Scientific Publishing, Singapore and London.

Department of Foreign Affairs and Trade (DFAT) n.d., *China Fact Sheet*, Department of Foreign Affairs and Trade, Commonwealth of Australia, Canberra, <http://www.dfat.gov.au/geo/fs/chin.pdf>

Department of Foreign Affairs and Trade (DFAT) 2010a, *Australia's Resources Exports, 1999–2009*, Department of Foreign Affairs and Trade, Commonwealth of Australia, Canberra.

Department of Foreign Affairs and Trade (DFAT) 2010b, *Trade in Services Australia 2009–10*, Department of Foreign Affairs and Trade, Commonwealth of Australia, Canberra.

Department of Immigration and Citizenship (DIAC) n.d., *Student Visa Assessment Levels*, Department of Immigration and Citizenship, Commonwealth of Australia, Canberra, <http://www.immi.gov.au/students/student-visa-assessment-levels.htm>

Department of Immigration and Citizenship (DIAC) (Various years), *Immigration Update*, Department of Immigration and Citizenship, Commonwealth of Australia, Canberra.

Department of Treasury (Various years), *Foreign Investment Review Board Annual Report*, Department of Treasury, Commonwealth of Australia, Canberra, <http://www.firb.gov.au/content/publications.asp?NavID=5>

Drysdale, P. and Findlay, C. 2009, 'Chinese foreign direct investment in Australia: policy issues for the resource sector', *China Economic Journal*, vol. 2, no. 2, pp. 133–58.

Ergas, H., Harrison, M. and Pincus, J. 2010, 'Some economics of mining taxation', *Economic Papers*, vol. 29, no. 4 (December), pp. 369–83.

FitzGerald, B. 2011, 'Iron ore price train is coming to a stop', *Sydney Morning Herald*, 14 March, <http://www.smh.com.au/business/iron-ore-price-train-is-coming-to-a-stop-20110313-1bsxn.html>

Government of Australia n.d., *A new resource tax regime*, Fact sheet, Commonwealth of Australia, Canberra, <http://www.futuretax.gov.au/documents/attachments/factsheet_resource_taxation.pdf>

Government of Australia 2011, *Strategic review of the Student Visa Program*, Discussion Paper, Commonwealth of Australia, Canberra, <http://www.immi.gov.au/students/student-submissions/_pdf/student-discuss.pdf>

Hugo, G. 2008, 'A changing diaspora: recent trends in migration between China and Australia', *Chinese Southern Diaspora Studies. Volume Two*, pp. 82–103.

Jia, C. 2011, 'Students go overseas in record numbers', *China Daily USA*, 18 April, <http://usa.chinadaily.com.cn/china/2011-04/18/content_12342187.htm>

Murphy, S. 2011, 'China nibbles Australian apple market', *Landline*, ABC TV, 11 March 2011, <http://www.abc.net.au/news/stories/2011/03/11/3161289.htm>

Ning, Y. 2011, 'More students choose to study abroad', *China Daily*, 25 April, <http://www.chinadaily.com.cn/bizchina/2011-04/25/content_12384782.htm>

Orsmond, D. 2011, 'Domestic demand growth in emerging Asia', *RBA Bulletin*, (March Quarter), pp. 31–4.

Pacific Economic Cooperation Council (PECC) 2010, *State of the Region 2010–11*, Pacific Economic Cooperation Council, Singapore.

Pincus, J. 2011, 'Taxing issues surrounding the economics of mining', *The Conversation*, 1 April, <http://theconversation.edu.au/articles/taxing-issues-surround-the-economics-of-mining-626>

Sainsbury, M. 2011, 'China tourists to bring in $6bn', *The Australian*, 13 April, <http://www.theaustralian.com.au/news/nation/china-tourists-to-bring-in-6bn/story-e6frg6nf-1226038117189>

Sandilands, B. 2011, 'Qantas, Shanghai–Paris, China eastern, Cairns–Sydney?', Plane Talking Blog, *blogs.crikey.com.au*, 8 March.

Song, L. 2010, China's rapid growth and development: an historical and international context, Paper presented at the 2010 Paftad Conference, Peking University, December.

Stevens, G. 2011, 'The resources boom', *RBA Bulletin*, (March Quarter), pp. 67–71.

Tourism Australia 2010, *Outbound Market Share Analysis—China*, April, Tourism Australia, Sydney.

Tourism Research Australia 2010, *International Visitors in Australia, Quarterly Results of the International Visitor Survey*, Tourism Research Australia, Department of Resources, Energy and Tourism, Commonwealth of Australia, Canberra.

United Nations Conference on Trade and Development (UNCTAD) 2011, *Global Investment Trends Monitor*, No. 6, 27 April, United Nations Conference on Trade and Development, Geneva, <http://www.unctad.org/templates/Page.asp?intItemID=5516&lang=1>

United Nations Educational, Scientific and Cultural Organisation (UNESCO) 2010, *Global Education Digest 2010*, UNESCO Institute of Statistics, Montreal.

World Trade Organisation (WTO) 2010, *International Trade Statistics 2010: World trade developments in 2009*, World Trade Organisation, Geneva, <http://www.wto.org/english/res_e/statis_e/its2010_e/its10_world_trade_dev_e.htm>

Zhang, Y. 2011, 'The impact of China's 12th Five Year Plan', *East Asia Forum*, 24 April, <http://www.eastasiaforum.org/2011/04/24/the-impact-of-china-s-12th-five-year-plan>

Endnotes

1. Thanks to David Kai Du for help with the data for this chapter and to Kym Anderson for discussion of some of the contents. Any errors are the author's.

2. The Pacific Economic Cooperation Council (PECC) report on the State of the Region 2010–11 expects China to grow at 9.5 per cent in 2011 and 2012 compared with 10.5 per cent in 2010 (PECC 2010). Respondents, in an opinion leader survey in that report, to the question of growth in China over the next 12 months compared with the past 12 were 46 per cent expecting stronger to much stronger growth and only 19 per cent expecting weaker to much weaker growth.

3. Food prices have also been rising since the early part of this century. This increase is a reversal of the trend of falling prices that was observed since the 1970s.

4. See Ergas et al. (2010) for an assessment of the new tax and Pincus (2011) for a summary.

5. See <https://zephyr2.bvdep.com/version-201138/Home.serv?product=zephyrneo> Another data source is the *Mayne Report*: see 'Every project that has Chinese investment', *Mayne Report*, 23 June 2010, <http://www.maynereport.com/articles/2009/09/09-1244-6609.html> Work was done to cross-check the *Mayne* list with the *Zephyr* list, which found two deals on each list not on the other.

6. According to UNCTAD data, FDI outflows from China rose to US$68 billion in 2010 from US$56.5 billion in 2009, and M&A activity increased from US$21.5 billion to US$29.2 billion.

7. UNESCO estimates the ratio of students abroad to total tertiary enrolments in China as 1.7 per cent.

8. Sometimes these visitor data are referred to as tourism data; however, this definition of visitors includes those in Australia for education and for business.

9. The World Bank indicators show a much higher number for outbound travel but the Tourism Australia data include only trips in which at least one night is spent outside China. Day trips to Hong Kong, for example, are excluded.

10. Official data on the output of services might understate its size, since many informal activities might not be counted.

11. See Hoekman's statement at: <cuts-tradeforum@googlegroups.com> (5 April).

13 Chinese Development Aid in Africa

What, where, why, and how much?

Deborah Brautigam

Introduction

China's development aid to Africa has increased rapidly, yet this might be the only fact on which we have widespread agreement when it comes to Chinese aid.[1] Analysts disagree about the nature of China's official development aid, the countries that are its main recipients, the reasons for providing aid, the quantity of official aid, and its impact. Why does this matter? Knowing more about Chinese development aid is important for understanding Chinese foreign policy and economic statecraft: how and to what ends does China use its government policy tools? It is also important for more accurate comparisons between Chinese practices and those of other donors and providers of finance. Finally, for those who are interested in the question of whether, as it rises, China will transform, reform or maintain the existing system of norms and rules (Kim 1999), development aid provides a particularly interesting case study. The rules and norms about foreign aid have been forged not by a global institution, but primarily by the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development (OECD)—a group of countries of which China is not a part. To answer questions about China's impact on these rules and norms, we need to have a sound idea of what China is actually doing as a donor.

This chapter is organised as follows: the first section begins by briefly explaining the various categories of official finance used by the OECD in order to establish a common language for discussing Chinese finance in Africa. It then introduces the variety of instruments used by the Chinese for official finance, and explains why only a small proportion of Chinese finance in Africa is equivalent to official development aid. Next is a comparison of the quantity of official development aid from China and from some of the 24 members of the OECD's DAC, and a discussion of two recent cases to illustrate the difference between development aid and other official tools of economic diplomacy. Finally, the chapter argues that several recent efforts to estimate Chinese 'aid' and to analyse it using proxy figures are misguided and have produced misleading results.

What aid is (and is not)

As Figure 13.1 illustrates, the international financial architecture is made up of many different kinds of flows. The two that are relevant for our purposes are 'official development assistance' and 'other official flows'. This chapter uses the standardised definition of official development assistance (ODA) agreed upon in 1972 by the members of the DAC: concessional funding given to developing countries (those with a per capita income below

a regularly adjusted threshold) and to multilateral institutions primarily for the purpose of promoting welfare and economic development in the recipient country (OECD 2008). Funding must be 'concessional in character' (that is, it must involve some genuine subsidy from the government) and loans must have a grant element of at least 25 per cent using a 10 per cent discount rate. While only concessional loans and grants may qualify as ODA, governments also offer other official flows: funds for firms from the donor country to subsidise or guarantee their firms' private investment in recipient countries, military aid, and export credits (OECD 2008a, 2010). These funds are reported as 'other official flows' or OOF. The OOF category includes loans that are not concessional in character, or those with a grant element of less than 25 per cent, and 'official bilateral transactions, *whatever their grant element*, that are primarily export facilitating in purpose. *This category includes by definition export credits*' (OECD n.d., emphasis added).

Figure 13.1 Global development finance

China provides the equivalent of ODA through three instruments: grants, zero-interest loans, and concessional (fixed-rate, low-interest) loans. These instruments finance Chinese Government scholarships for African students (about 5500 students per annum); Chinese medical teams; 'turn-key' construction of stadiums, government buildings, telecommunications networks and other infrastructure; technical assistance teams in agriculture and other sectors; short-term training programs; youth volunteers; and material aid (export of Chinese goods).

Although China's Ministry of Commerce is responsible for China's grants and zero-interest loans, China Eximbank and China Development Bank provide the bulk of Chinese overseas finance. These two policy banks, established in 1994, operate as part of Beijing's portfolio of instruments to support China's own development goals. While China Eximbank manages one of China's aid instruments (concessional loans), this is a very small part of the bank's portfolio. In its 2006 review of China Eximbank, a credit rating agency pointed out

that concessional loans at the end of 2005 made up only 3 per cent of China Eximbank's assets (Standard & Poor's 2006). China Development Bank does not offer concessional loans, and their interest rates tend to be higher than those offered by China Eximbank.

For Africa, the category of 'other official flows' provided by OECD members has normally been well below the level of funds provided on ODA terms. This is not the case, however, for China. China's government-provided finance to Africa falls *primarily* into the category of other official flows, not ODA. This is particularly true of funds coming from China's policy banks. We turn now to a closer look at Chinese official finance in Africa.

China's official finance in Africa: what instruments?

As noted above, China's official finance in Africa consists of grants, zero-interest loans, debt relief, and concessional loans (which would all qualify as ODA) as well as preferential export credits, market-rate export buyers' credits, and commercial loans from Chinese banks, none of which would qualify as ODA. China also provides equity funds that assist Chinese companies investing in Africa through the China–Africa Development Fund, and has established a fund to on-lend up to US$1 billion to African small and medium enterprises (SMEs) through local African banks. While the China–Africa Development Fund, as support for China's own companies, does not qualify as ODA, the finance for SMEs could qualify if it was provided on the appropriate concessional terms.

ODA: grants, zero-interest loans and debt relief

Grants and zero-interest loans were the primary instruments of China's official development aid until 1995 when concessional loans were introduced. In April 2011, the Chinese State Council released its first white paper on foreign aid (State Council 2011). According to this report, approximately 40 per cent of China's aid has been financed through grants. (These grants are, however, rarely given as budget support.) Zero-interest loans are also a mainstay of China's aid. The debt relief program launched by Beijing in 2000 targeted overdue zero-interest loans for cancellation, with RMB25.58 billion (US$3.76 billion) having been cancelled, and of this, RMB18.96 billion (US$2.79 billion) was cancelled in Africa (State Council 2011). While debt relief does qualify as ODA, if the cancelled debt was originally given as a foreign aid loan (as opposed to an export credit or other non-ODA debt) it cannot be double-counted as new ODA.

ODA: concessional loans

Only larger projects (minimum size of RMB20 million, or about US$2.4 million) that involve considerable use of Chinese goods (at least 50 per cent) and services (that is, Chinese construction firms as contractors) may be funded with concessional loans. As of the end of 2009, China had 'provided' (almost certainly, committed) approximately US$10.8 billion in concessional loans since the inception of that program in 1995—'to 76 foreign countries, supporting 325 projects, of which 142 had been completed' (State Council 2011:5). This number reflects the sharp increase in concessional loan-supported projects, with 56 per cent still being implemented or in the planning stage. (It also shows why the figures for commitment of concessional loans are far higher than those for actual disbursement.)

The percentage for Africa was not given, but the report supplied information on sectors: 61 per cent went for economic infrastructure, industry secured 16 per cent, and energy and resource development accounted for 9 per cent (State Council 2011:6).

China's concessional loan program in Africa has grown rapidly. At the end of 2005, China Eximbank had cumulatively funded only about US$800 million in concessional loans in Africa, for 55 projects (Broadman 2006). Two years later, the number of African projects had risen to 87, and the cumulative value was about US$1.5 billion. At the end of 2006, Chinese leaders announced that China Eximbank would make US$2 billion in concessional loans and US$3 billion in preferential export credits available in Africa between 2007 and 2009. Three years later, after announcing that this target had been met, a new pledge of US$10 billion in concessional/preferential credits was announced for Africa, to be committed over the next three years—that is, by 2012.

China also supplies other official funds that do not meet the requirements for ODA. Three categories of loans are relevant here: export buyers' credits (including preferential buyers' credits), official loans at commercial rates, and strategic lines of credit to Chinese companies. Both China Eximbank and China Development Bank offer official loans at commercial rates, and both allow export financing.

OOF: export buyers' credits

China Eximbank offers short-term credits to Chinese exporters (export sellers' credits) to help them finance foreign sales, and it offers longer-term credits to foreign buyers to assist in the export of Chinese goods and services. A small proportion of the export buyers' credits are offered at preferential rates, usually with a fixed interest rate of 2 or 3 per cent. As export credits, these loans do not qualify as ODA, although in structure they are very similar to the concessional loan instrument offered by Eximbank. Most long-term credits are, however, issued at London Interbank offered rate (LIBOR)-plus rates. The lowest rate of credit for which information is publicly available was issued at LIBOR plus 1 per cent (100 basis points). In 2007, Li Ruogu, the President of China Eximbank, announced that his bank expected to commit approximately US$20 billion in loans within Africa over the next three years. This appears to have been done.

OOF: official loans at commercial rates

China Development Bank (CDB) also offers policy loans at competitive rates. Traditionally, CDB operated primarily inside China, but in recent years it has begun to expand overseas. As of March 2007, CDB reported that it had financed 30 projects in Africa, for a total of about US$1 billion (*Xinhua*, 14 May 2007). Three and a half years later, a bank official interviewed by *Xinhua* announced that as of September 2010, it had committed more than US$10 billion to projects in Africa and disbursed 'USD5.6 billion in financing to 35 projects across over 30 African nations' (*People's Daily*, 17 November 2010). This also reflects rapid expansion (and, given the number of projects in 2010, suggests that the 2007 figures refer to commitments rather than disbursements). According to the 2010 interview, the largest

proportion of the loans issued so far has gone to South Africa, Angola and Botswana. China Development Bank does not provide official development aid; it issues commercial loans based on LIBOR plus a margin—usually at least 200 basis points.

Strategic lines of credit and suppliers' credits

China's policy banks have another tool in their portfolio: strategic lines of credit offered to China's 'dragon-head' companies—firms the Government believes have the potential to become competitive multinationals. In March 2009, for example, CDB extended a US$15 billion financing package to support the telecommunications firm ZTE in its overseas business, while two months later Eximbank concluded a line of credit for ZTE worth US$10 billion. ZTE's rival Huawei benefited from a US$30 billion strategic package from CDB.

These strategic lines of credit create a financing platform that combines export sellers' credits, export buyers' credits, import credits (allowing the company to finance imports of foreign technologies), and preferential foreign loans, all of which allow the company to secure foreign business—often through direct offers of vendor finance to the purchaser. In Ethiopia, for example, ZTE was able to offer finance for the Ethiopian Government's Millennium Telecoms project, securing a US$1.5 billion deal for which the interest rate was LIBOR plus 150 basis points (Personal communication, 2011). Huawei offered a Brazilian firm financing at LIBOR plus 200 basis points, with a two-year grace period (Bloomberg 2011). As with the other forms of non-concessional official finance, these strategic lines of credit are clearly not ODA.

Chinese aid in Africa: where and how much?

China's first official white paper on foreign aid discussed only those Chinese aid instruments that most closely resemble official development assistance. 'By the end of 2009', the paper stated, 'China had provided a total of 256.29 billion yuan [US$37.7 billion] in aid to foreign countries, including 106.2 billion yuan [US$15.6 billion] in grants, 76.54 billion yuan [US$11.3 billion] in interest-free loans and 73.55 billion yuan [US$10.8 billion] in concessional loans'. It also revealed that aid had grown by 29.4 per cent annually between 2004 and 2009 (State Council 2011:3).[2] Although the information appears thin, this was the first time the Chinese Government had been this transparent about its aid figures and the first time figures had been included on loans, grants and concessional loans. For the fiscal year 2009 alone, nearly half (46.7 per cent) of Chinese aid was committed to Africa (State Council 2011:12). These figures follow other announcements made in earlier years by Chinese leaders (Table 13.1).

Table 13.1 Announcements of aid by Chinese leaders

Date	Leader	Type of aid	Amounts	
			RMB	US$
2008	Premier Wen Jiabao	Africa grants in 2007	2.377 billion	313 million
		Africa zero-interest loans in 2007	700 million	92 million
		Africa concessional loans	n.a.	n.a.
		Total Africa aid, 1950–2006	44 billion	5.8 billion
		Total aid, 1950–2006	206.5 billion	27 billion
		Of which grants	90.8 billion	12 billion
		Of which 'loans'	115.7 billion	15.2 billion
		[African aid 22% of total]		
2011	State Council	Total aid, 1950–2009	256.29 billion	37.7 billion
		Of which grants	106.2 billion	15.6 billion
		Of which zero-interest loans	76.54 billion	11.25 billion
		Of which concessional loans	73.55 billion	10.8 billion
		[Loans total	150.09 billion]	

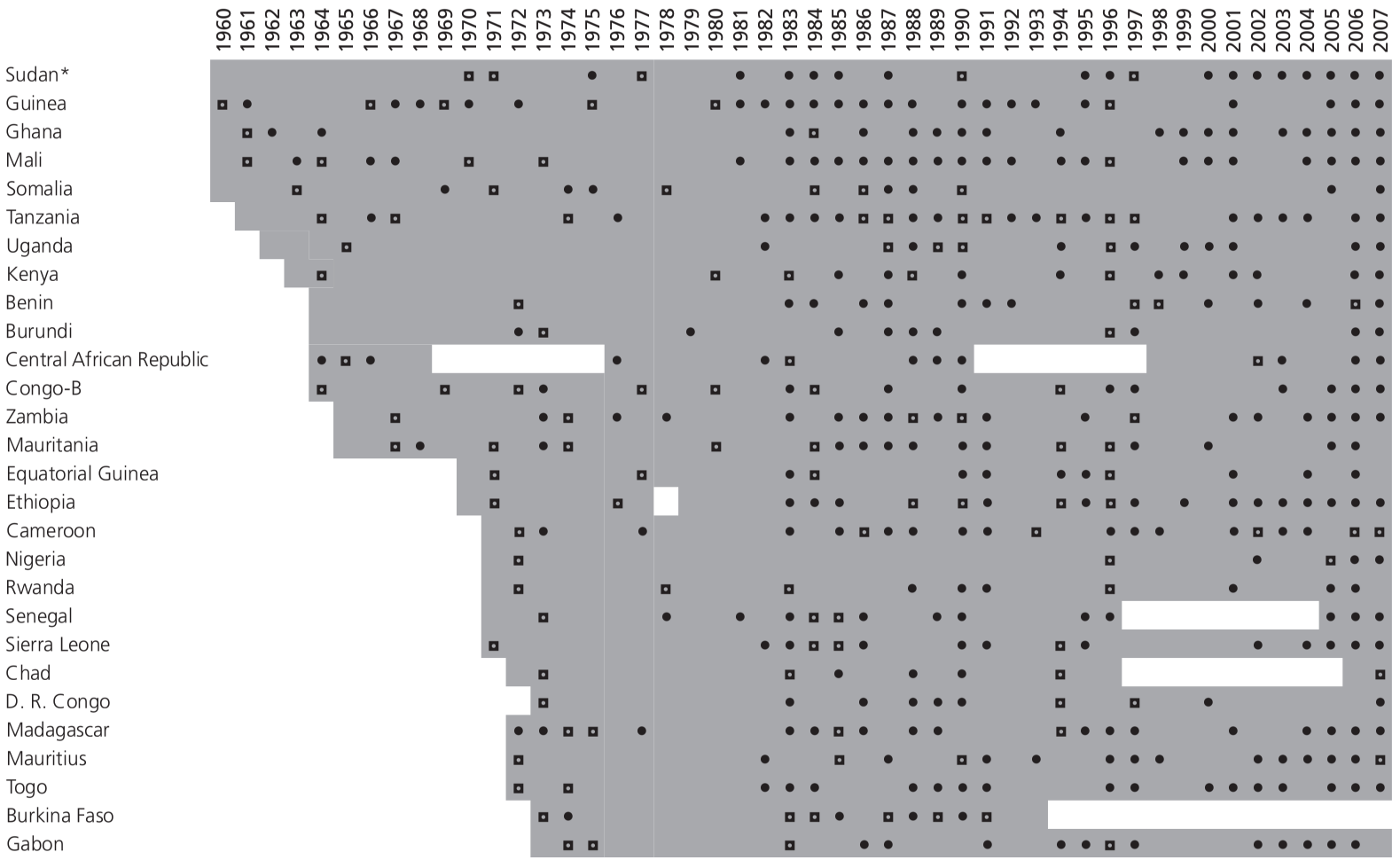
n.a. not applicable

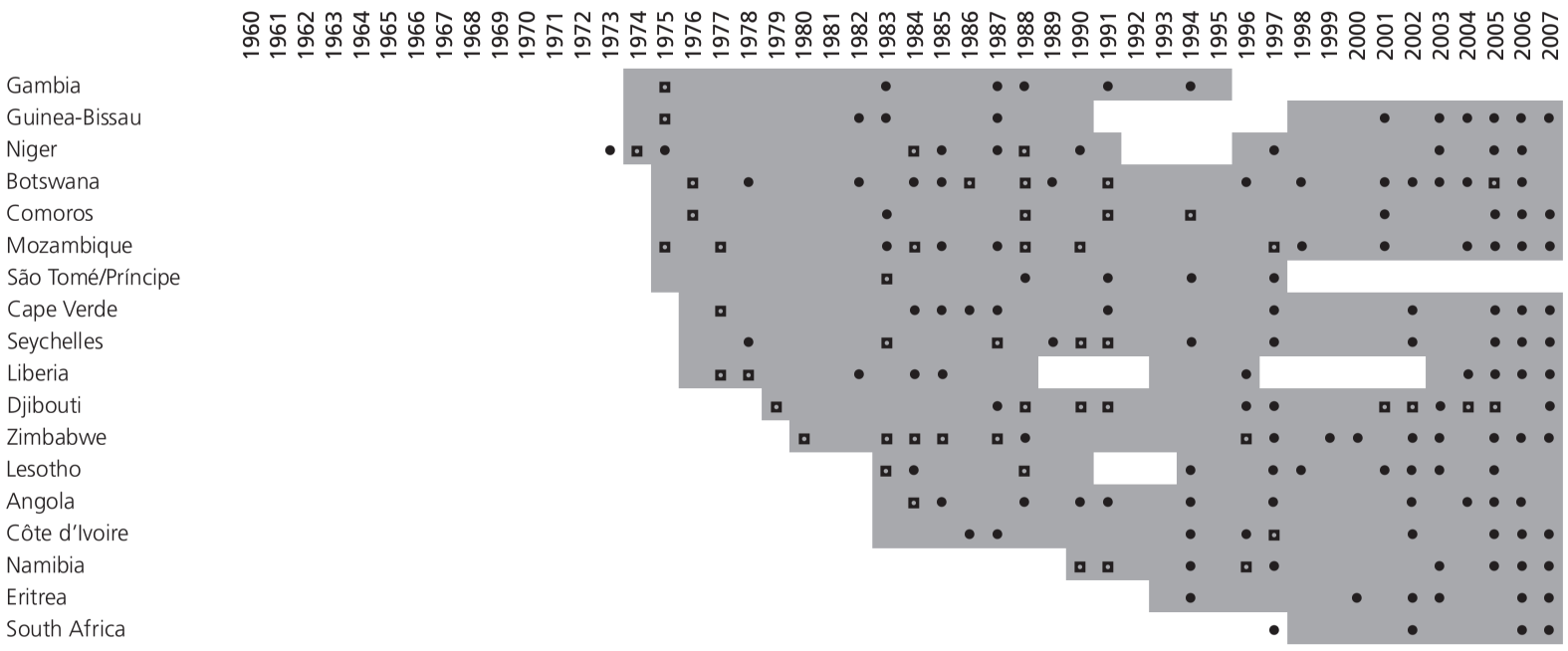
Note: Conversions made from RMB to US dollars at a rate of RMB7.6 = US$1 for 2006 and 2007 figures, and RMB6.8 = US$1 for 2009 figures. Figures are gross commitments and do not include debt relief.

Sources: Brautigam (2011); State Council (2011).

Within Africa, where does this aid go? Figure 13.2 provides part of the story. The white squares are years in which an African country had diplomatic ties with Taiwan, while the grey squares represent years of diplomatic ties with Beijing. As we can see here, Chinese aid agreements follow diplomatic ties. All countries in sub-Saharan Africa with which Beijing has diplomatic ties receive foreign aid from China, even if (as in South Africa) it is symbolic, such as the building of a pair of primary schools. Furthermore, ODA does not appear to be given in larger amounts to resource-rich countries, as we will see with Nigeria and the Democratic Republic of Congo (DRC) below. Grants and zero-interest loans are distributed fairly evenly around the continent, while concessional loans fit a country's ability to pay, either because it is middle income (Mauritius, Namibia, Botswana) or because it will finance an income-generating project.

Figure 13.2 Years of new aid commitments, China to Africa, 1960–2007





▫ Economic and technical cooperation agreements

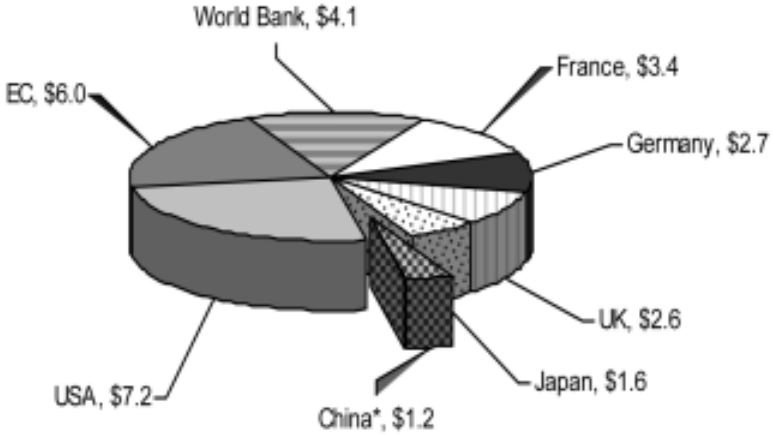
● Loan agreements

* Recognised in 1959

Notes: Data are from open sources and might be incomplete. Shaded area represents years country had diplomatic ties with China.

How much aid does China provide to Africa? Close analysis of Chinese budget expenditures, reports and media announcements, supplemented with interviews with Chinese officials, allows us to develop estimates for Chinese aid to Africa (for details, see Brautigam 2011).[3] Figure 13.3 compares China's official African development aid in 2008 with ODA as reported by some of the major donors.

Figure 13.3 Official development assistance to Africa, 2008



Note: Figures are disbursements. Figures for OECD countries are from the OECD's DAC Statistics. Figures for China are the author's estimates.

Source: Brautigam (2011).

In 2008, China probably disbursed about US$1.2 billion in ODA in Africa, compared with the World Bank (US$4.1 billion), the United States (US$7.2 billion) and France (US$3.4 billion). China's aid disbursement probably rose to US$1.4 billion in 2009. These figures, while closer to reality, are far smaller than those estimated by some researchers, or the figures used by other researchers to proxy Chinese aid. What of the fact that in some African countries, the Chinese Government facilitates its companies getting contracts through the provision of large lines of export credit at competitive (but still commercial) rates, much as Japan did in China in an earlier era (Brautigam 2011)? What should we make of these other instruments of Chinese engagement and why do they not qualify as ODA?

The next section discusses two of these package deals, illustrating how Chinese finance works, and why it is essential to know the terms of this finance instead of assuming that it all should be considered as 'Chinese aid'. Some of China's large package deals—thought to be financed as ODA—are in fact more complicated.

Case studies: Ghana and the Democratic Republic of the Congo

Ghana's Bui Dam

In 2007, Sinohydro began construction on the Bui Dam, one of the Ghanaian Government's priority projects. The environmentally controversial 400 MW dam was financed by two separately negotiated China Eximbank loans. One was a commercial export buyers' credit of US$292 million with 12 years' maturity, a grace period of five years and an interest rate set at a margin of 1.075 per cent over the prevailing Commercial Interest Reference Rates (CIRR). The other, with a fixed interest rate of 2 per cent, appeared to be either a concessional loan or a preferential export credit, for about US$270 million (Government of Ghana 2008; Habia 2009). Development Assistance Committee rules recommend that a mixed credit like this be reported separately: 'one for the ''soft'' loan [ODA] and one for the commercial loan [OOF]' (Ahmad 2008). 'Tied aid' like this is allowed under OECD rules for projects that cannot attract commercial financing, although OECD members would be required to report the offer and its terms so that other OECD members could compete on the same terms if they were so inclined (Brautigam 2010).

Just like some of China Eximbank's larger credits in countries such as Angola, the Bui Dam project finance was a resource-secured loan. In this case, it was guaranteed not through oil or minerals, but through export sales of cocoa beans (Brautigam 2011). Research by James Habia has uncovered further details (Habia 2009). Genertec Corporation of China has a cocoa sales agreement with the Ghana Cocoa Board for up to 40 000 Mt of cocoa beans (30 000 main crop; 10 000 light crop) annually over the life of the loan—that is, 20 years. In 2008–09, Ghana produced 703 000 Mt of cocoa beans. Assuming this was all exported, loan repayment would absorb about 6 per cent. If there was negotiation about the price at which the cocoa will be sold, this has not been made public. In other cases of commodity-secured loans, only the amount was specified in the agreement, not the price. China Eximbank President, Li Ruogu, has stated that his bank uses market prices in repayment arrangements for its commodity-secured lines of credit (Brautigam 2011).

China Eximbank also required Bui Hydropower to have a power purchase agreement with the Electricity Company of Ghana. The net revenue from this will be deposited into an escrow account to help repay the loan. The price for the future electricity was tentatively negotiated to be in a range between US$0.035 and US$0.055 cents kW/h (Habia 2009). According to the World Bank, the average electricity tariff in Africa is much higher—at US$0.13 per kW/h (World Bank 2011). Although the price appears reasonable now, the details of how the price will be changed over the course of the life of the dam are not transparent (Habia 2009).

This case study illustrates several things. First, it shows how Chinese officials can combine different financial instruments to allow a large project to be financed. Part of the finance might qualify as ODA, but not the entire package. It also gives some insight into the way in which Chinese banks can secure their loans—something that allows them to provide more debt finance than might otherwise be the case. Of course, Ghana will now be using its cocoa bean exports to China in future years to repay its debt. These resources will not be

available for other needs. Whether this is a good deal or not for the Ghanaians will become clear only when the dam is finished, its social and environmental costs mitigated, and its electricity is generated at a reasonable cost.

Democratic Republic of the Congo: mining and reconstruction

In 2007, two Chinese engineering firms—China Railway Engineering Corporation and Sinohydro—signed an agreement with the DRC for a massive development package. In the original agreement, Chinese banks were slated to finance two separate lines of credit—US$3 billion each—which would be used for the repair and reconstruction of the war-torn country. The credits would be repaid out of the profits of an associated joint venture—a cobalt–copper mine—which would also be financed by Chinese capital. The infrastructure package was later reduced to a single line of credit for US$3 billion, under pressure from the DRC's other development partners who were concerned about debt sustainability.

Infrastructure to be financed out of the two lines of credit originally included 3402 km of paved roads, including an auto-route and bridges connecting the main cities of the DRC (Lubumbashi, Bukavu, Goma, Kisangani) and construction and repair of 450 km of roads within the capital district of Kinshasa; 3213 km of railway construction or rehabilitation; construction and equipping of 145 health centres, 31 hospitals, 5000 units of low-cost housing, and two universities.[4] A later list included rehabilitation of two airports and two electricity distribution systems, and the construction of two hydroelectric dams.[5]

What were the terms of this package? A joint venture, Sicomines, would be set up, held 32 per cent by the Congolese—primarily the state-owned natural resource firm Gécomines—and 68 per cent by a Chinese consortium dominated by the two Chinese engineering firms. Profits from Sicomines' mining investment would be used to repay loans financing the costs of developing the mine and the unrelated infrastructure projects.

The cost of the infrastructure line of credit was set at LIBOR plus 100 basis points. The associated copper–cobalt mining joint venture was to be developed at a cost estimated to be about US$3.2 billion, and financed by a separate package combining a zero-interest shareholder loan (*prêt d'actionnaire*) extended by the Chinese consortium (US$1.1 billion), and other finance, from an unspecified source, of US$2.1 billion at a fixed interest rate of 6.1 per cent.[6]

The donor community was deeply concerned about this venture, and particularly by the initial promise of a sovereign guarantee for all the financing, including the mining venture. As the Congolese Government was asking for cancellation of much of its official debt through the Highly Indebted Poor Countries (HIPC) initiative, this appeared to be a case where a new lender would 'free ride' on the backs of old creditors. In a speech to the National Assembly of the DRC, which had to give its approval to the venture, the Minister of Infrastructure, Public Works and Reconstruction pointed out that the loans 'are not concessional' but that the projects had been appraised with an internal rate of return (IRR) of more than 19 per cent, which provided 'the best possible conditions of sustainability of the debt' (DRC 2008). It later became clear that the contract stipulated that the feasibility

study—which at that point had not yet been done—would need to demonstrate that the Chinese investors would have an IRR of at least 19 per cent; if not, the deal would need to be adjusted.[7]

After a yearlong stand off, the Chinese and the DRC agreed to remove the sovereign guarantee from the debt associated with the mining project. The DRC's creditors, led by the International Monetary Fund (IMF), agreed that the sovereign guarantee could remain for the US$3 billion infrastructure component of the package, but not the mining venture, while the DRC agreed to drop any mention of the second tranche of infrastructure credits for US$3 billion.

A second problem was the non-concessional financing terms. The DRC was not allowed to accept non-concessional financing under the IMF and World Bank's Debt Sustainability Framework (DSF) imposed as a condition of HIPC debt relief. The Chinese consortium agreed that if the bank interest rate on the loan (LIBOR plus 100 basis points) rose higher than the rate of 22 April 2008 (about 4.4 per cent), the Chinese consortium would be responsible for the difference.[8] With these changes, the IMF announced that the grant element of the US$3 billion infrastructure financing was in the range of 42–46 per cent (IMF 2010). The IMF's definition of concessional under the DSF requires that any loan to a post-HIPC country have at least a 35 per cent grant element. According to the IMF, the Chinese infrastructure loan would now qualify as 'concessional' by their standard, allowing the HIPC debt to be cancelled.

This calculation of concessionality, however, rested on several assumptions. Most significantly, the IMF assumed a worst-case scenario: the mining venture would not generate any net income for 25 years, interest would be compounded during that time, and then the loan would be repaid by the Government, which had given a sovereign guarantee.[9] The grant element of 42–46 per cent, which looks a lot like 'aid', even if not technically ODA, depends on this assumption. In other words, this assumption created a 25-year grace period. There is nothing incorrect about this, as the Government's sovereign guarantee would not be put at risk except in the situation where the mining venture was unable to generate any profits, thus not repaying a penny of the infrastructure loan for 25 years. Yet this clearly extraordinary assumption, together with the grant element calculation, creates an impression that the loan is financed under terms so generous that they look like aid. This is simply not the case.

Furthermore, the Congolese had already proposed that the signing bonus of US$250 million the Chinese consortium agreed to pay the Government for the mining venture be considered as finance '*au titre d'appui budgétaire*' or budget support—analogous to the budget support grants offered by donors (DRC 2008). The IMF agreed to consider the entire signing bonus as part of the calculation of the grant element of the infrastructure package, separating it from the mining venture (IMF 2010). Signing bonuses are a common feature of natural resource extraction projects, but not public works infrastructure projects. Thus, the DRC and its traditional creditors squeezed the complicated Chinese package into categories that were more familiar and acceptable to them.

Would this loan qualify as ODA under the DAC? Clearly, not, according to the OECD, if we apply the test of concessional intent this is clearly not concessional, since the loan from the Chinese government is based on LIBOR, a commercial interest rate. The grant element for the infrastructure loan comes to 33.8 per cent (assuming 4.4 per cent in interest, 25 years' maturity, no grace period and not including the signing bonus), according to the OECD's Development Cooperation Directorate's grant element calculator (2011). Even this calculation, however, would rest on another heroic assumption: that the 'capped' interest rate of 4.4 per cent should be used rather than the rate of LIBOR plus 100 basis points. The Eximbank rate itself is not capped; it may rise above 4.4 per cent, but the Chinese consortium will absorb the extra cost. This is a business decision, not foreign aid.

Finally, it is clear that in the DRC the Chinese themselves do not regard the commodity-secured loans as 'development aid'. In July 2009, the Chinese embassy in the Congolese capitol, Kinshasa, posted a document listing all of the development aid loans provided by China since 2007: two concessional loans, worth RMB250 million (US$37 million) and RMB245 million (US$36 million), for telecommunications projects undertaken by Huawei and CITCC; and RMB120 million (US$18 million) in three zero-interest loans (Embassy of China 2009).

Why do we sometimes get it so wrong?

Although there has been an increase in transparency by the Chinese in recent years, official announcements on foreign aid are still few and far between. The Chinese Government does not report its aid or other flows to the DAC—a practice adopted by OECD donors (and even many countries outside the OECD). This has led to several attempts by researchers to estimate Chinese aid through media reports, or to use other, published figures as proxies for aid. Two recent examples illustrate why these efforts can produce misleading results.

Estimating 'aid' through media reports

A group of researchers at the Congressional Research Service (CRS), the research arm of the US Congress, tried to estimate China's aid through collecting media reports (Lum et al. 2009). First, the researchers assumed that China's aid was disorganised. China 'appears to administer foreign aid in an ad hoc fashion, without a centralised system, foreign aid agency and mission, or regularized funding schedule'. In fact, all of these assumptions are incorrect. As might be expected from a government still enmeshed in five-year plans, China's aid is highly centralised, disbursed according to an annual budget, organised primarily by the Department of Aid to Foreign Countries in the Ministry of Commerce, and committed not in an *ad-hoc* fashion but according to annual plans and budgets (Brautigam 2011).

Having decided that China's development aid did not fit the model of ODA developed by the OECD, the CRS researchers developed their own broad (and questionable) definition of 'aid' for China: 'Many PRC economic investments abroad can be counted as aid rather than foreign direct investment because they are secured by official bilateral agreements, do not impose real financial risks upon the PRC companies involved, or do not result in Chinese ownership of foreign assets'. The researchers then commissioned a group of students at New York University to scour media reports of all Chinese 'pledges of aid or loans and

government-sponsored investment projects' and put together a database. This produced a Chinese 'aid' figure of US$17.96 billion for Africa in 2007. The researchers then produced a series of tables that compared these very large estimates of 'aid' with ODA from the OECD countries.

The CRS approach had two obvious problems. First, given that many of the Chinese companies investing abroad—including its oil companies—are state owned, and that its main banks are also state owned, lumping all of their activities together as 'aid' primarily because of the association with the Government (or because they occur in the developing world) defies both logic and convention. Organisation for Economic Cooperation and Development members have never considered export credits, commercial loans or investment by their own state-owned companies as ODA. As noted above, official flows such as these from governments that do not meet the definition of ODA are reported as 'other official flows' (or OOF).[10] If the same definition of 'official development assistance' is used for China and for the West, in 2007, China disbursed only about US$850 million in official development assistance to Africa (Brautigam 2011).

This approach also leads to misleading analysis of the purposes of Chinese aid. For example, having defined 'state-sponsored investment' as 'foreign aid', the researchers then conclude that 'China's foreign aid is driven primarily by the need for natural resources' (2009:5). While it is true that natural resources are a primary driver of Chinese *investment* in Africa, Chinese *development aid* is allocated to every country in Africa with whom Beijing has diplomatic ties (Brautigam 2008, 2009). China's aid follows the needs of diplomacy, not natural resources. Second, counting up figures based on media stories requires very careful investigation into their veracity. As Remi Bello, CEO of a political-risk consulting firm focused on Africa, noted: 'Keep in mind that only 2 to 4 per cent of MOUs [memorandums of understanding] lead to projects in Africa' (Zoninsein 2010).

Defining economic cooperation as 'aid'

Other scholars have fallen into a different trap by using 'foreign economic cooperation' data as a proxy for Chinese aid (Biggeri and Sanfilippo 2009; Sanfilippo 2010). The idea that 'economic cooperation' figures are equivalent to aid can be traced back to as early as 2005 when *The Economist* stated that China had provided a figure of US$1.8 billion as its 'development aid' for Africa in 2002 ('Forget Mao, let's do business: China and Africa', *The Economist*, February 7 2005). This report of an 'official aid figure' was picked up and repeated in several World Bank and IMF publications (Broadman et al. 2006; Wang 2007). Yet the Chinese actually published no official figures for aid in 2002. What they did publish was the figure for foreign economic cooperation in Africa: US$1.8 billion (Brautigam 2011:179).

What is 'foreign economic cooperation'? The Chinese Government publishes data on foreign economic cooperation annually in several yearbooks, including the *China Statistical Yearbook*.[11] According to the official definition, these figures refer to turnover (revenues) for 'projects undertaken by Chinese contractors (project contracting companies)' including '(1) overseas civil engineering construction projects financed by foreign investors;

(2) overseas projects financed by the Chinese government through its foreign aid programs; (3) construction projects of Chinese diplomatic missions, trade offices and other institutions stationed abroad' (NBS 2009). In other words, as I have noted elsewhere, these figures include

> all the work done by Chinese contractors in Africa, whether the contract is paid by the World Bank, the Africa Development Bank (ADB), an African government, other companies that hire Chinese engineering firms, or the Chinese government itself. Chinese companies win about a quarter of all major World Bank construction contracts in Africa, and a half of those funded by the ADB. It would be like reporting US aid to Africa as the revenues earned across the continent by the giant US contracting firms—Bechtel Corporation, Fluor, or Kellogg, Brown and Root (KBR)—or Swedish aid as the turnover of the Swedish company Skanska. (Brautigam 2011)

Chinese companies began carrying out construction projects in Africa for non-Chinese clients in the late 1970s as part of China's turn towards the market. For example, in 1991, China's news agency, *Xinhua*, reported that 'African nations receive about USD14 billion in assistance from foreign countries. Chinese companies hope that they can make profits through contracting more projects involving this foreign aid' (*Xinhua*, 26 February 1991).

In Nigeria, Chinese contractors began winning projects in 1979 (Brautigam 2011:64). Between 2000 and 2008, Chinese engineering companies reported earning a total of US$6.1 billion in revenues from several hundred projects implemented in Nigeria.[12] One well-known Chinese contractor had carried out more than two dozen projects for various branches of the Nigerian Government over the past decade. In comparison, China's ODA commitments to Nigeria are relatively small—estimated to total less than US$220 million between 2000 and 2008 (or US$440 million if a preferential US$200 million credit for a communications satellite is counted as development assistance).[13]

In further evidence that economic cooperation data should not be seen as 'aid', Chinese companies report economic cooperation contracts in countries where China does not have diplomatic ties and thus does not provide official aid or other finance. In 2007, this included Swaziland, Gambia, Burkina Faso, Central African Republic, and Malawi, with a total of 25 contracts (Ministry of Commerce 2008:218). They also report economic cooperation contracts in wealthy countries. In 2009, Chinese companies earned US$1.15 billion from economic cooperation in Australia, and US$520.4 million in Germany (NBS 2010). Chinese companies have implemented billions of dollars worth of economic cooperation projects in resource-rich Algeria, Libya, Saudi Arabia and the United Arab Emirates. Chinese companies work in all of these countries because they are competitive in winning construction contracts, not because they are carrying out aid projects.

Nevertheless, several researchers have begun to use these data on 'foreign economic cooperation' as a substitute for figures on 'aid' (Berthélemy 2009; Bhaumik and Yap Co 2009; Sanfilippo 2010:602). Take a recent paper that purports to examine 'possible synergies' between Chinese FDI and 'the aid strategies of the Chinese government' in Africa (Sanfillipo 2010). This paper uses 'economic cooperation' data as a proxy for aid, and posits that the Chinese Government 'might use provision of international economic cooperation…to foster recipients to use the funds to attract Chinese investors' (Sanfillipo 2010:602). But as noted above, the 'economic cooperation' data refer not to something *provided by the Chinese*

Government, but to turnover or revenues earned by Chinese contractors. Although they include revenues from aid-financed contracts, these totals cannot simply be assumed to be equivalent to aid. As the Nigeria case shows, in some countries this could lead to a vast overestimation of the size of China's 'aid'.

It is understandable that researchers would like to understand many things about Chinese aid and that only a cross-national database can enable econometric analysis. But using economic cooperation data as a substitute for 'aid' simply means that the analysis will track where Chinese companies are getting contracts.

Conclusions

This chapter asked: what is aid, where does China give aid, why does it give aid, and how much aid does it give in Africa? After defining aid as 'official development assistance', the chapter discussed the various economic instruments used by the Chinese Government to foster its national economic interests abroad and to conduct its economic diplomacy. The amount of ODA provided to Africa by China in recent years has grown sharply, but it is still not large. A comparison of this amount with that provided by other donors shows that China is a modest, mid-sized donor, although we can expect that its official aid will continue to increase.

China's economic push to 'go global' is coordinated by many policy instruments, some of which were described above. In this way, China resembles Japan's outward march more than it resembles the experience of the other OECD countries. Chinese banks have developed instruments that they believe can link Africa's riches—its natural resources (agricultural and mineral)—to its development. Because they regard these resources as a source of wealth, they do not offer resource-secured loans at concessional rates. To the Chinese, even resource-poor countries whose balance sheets might not look good sometimes have untapped capacity to service a future debt, if borrowing goes for productive projects. It remains to be seen whether fears about the sustainability of this debt are borne out. The challenges presented by China's engagement in Africa are large—for African countries, who need to learn how to manage this eager new development partner strategically, and for Africa's traditional partners, who feel as though their efforts to reform governance and economic policy might be losing ground. But all the stakeholders will benefit from a more accurate description of the dimensions of this engagement, and a more realistic and grounded idea of the realities of Chinese development assistance and economic cooperation on the continent.

Bibliography

Alesina, A. and Dollar, D. 2000, *'Who gives foreign aid to whom and why?', Journal of Economic Growth*, vol. 5 (March), pp. 33–63.

Berthélemy, J.-C. 2009, Impact of China's engagement on the sectoral allocation of resources and aid effectiveness in Africa, Paper prepared for African Economic Conference 2009: Fostering Development in an Era of Financial and Economic Crises, United

Nations Economic Commission for Africa (UNECA), 11–13 November 2009, Addis Ababa, Ethiopia, viewed 19 August 2010, <http://www.uneca.org/aec2009/papers/AEC2009BackgroundPaper.pdf>

Bhaumik, S. K. and Yap Co, C. 2009, *Chinese state's economic cooperation-related investment: an investigation of its direction and some implications for outward investment*, William Davidson Institute Working Paper No. 966 (August), University of Michigan, Ann Arbor.

Bloomberg 2011, 'Huawei's 30-billion credit line opens doors in Brazil, Mexico', Businessweek, 24 April 2011, viewed 30 April 2011, <http://www.businessweek.com/news/2011-04-24/huawei-s-30-billion-china-credit-opens-doors-in-brazil-mexico.html>

Brautigam, D. 2008, *China's African Aid: Transatlantic challenges*, April, German Marshall Fund of the United States, Washington, DC.

Brautigam, D. 2010, *China, Africa, and the international aid architecture*, Working Paper No. 107 (April), African Development Bank, Tunis.

Brautigam, D. 2011, *The Dragon's Gift: The real story of China in Africa*, Oxford University Press, UK.

Broadman, H. with Isik, G., Plaza, S., Ye, X. and Yoshino, Y. 2006, *Africa's Silk Road: China and India's new economic frontier*, 1 November, The World Bank, Washington, DC.

Democratic Republic of the Congo (DRC) 2008, *Contribution of the Minister on the Occasion of the Presentation of the Accords Signed Between the Government of the Democratic Republic of the Congo and the People's Republic of China*, 9 May, Ministry of Infrastructures, Public Works, and Reconstruction, Kinshasa.

Embassy of China 2009, *Aides au Developpement Chine-RDC*, 9 July, Embassy of China in the Democratic Republic of the Congo, Kinshasa.

International Monetary Fund (IMF) n.d., *Concessionality Calculator*, International Monetary Fund, Washington, DC, viewed March 2010, <http://www.imf.org/external/np/pdr/conc/calculator/default.aspx>

International Monetary Fund (IMF) 2010, *Democratic Republic of the Congo: Staff report for the 2009 Article IV Consultation, request for a three-year arrangement under the Poverty Reduction and Growth Facility, and request for additional interim assistance under the Enhanced Initiative for Heavily Indebted Poor Countries*, March 2010, International Monetary Fund, Washington, DC, viewed October 2010, <http://www.imf.org/external/pubs/ft/scr/2010/cr1088.pdf>

Kim, S. S. 1999, 'China and the United Nations', in E. Economy and M. Oksenberg (eds), *China Joins the World: Progress and prospects*, Council on Foreign Relations Press, New York.

Kuziemko, I. and Werker, E. 2006, *'How much is a seat on the Security Council worth? Foreign aid and bribery at the United Nations', Journal of Political Economy*, vol. 114, no. 5.

Lum, T., Fischer, H., Gomez-Granger, J. and Leland, A. 2009, *China's foreign aid activities in Africa, Latin America, and Southeast Asia*, 25 February, CRS Report for Congress, Congressional Research Service, Washington, DC.

Manuela, A. 2010, 'Nigeria secures agreement for refineries', *Engineering News-Record*, 16 June 2010.

Ministry of Commerce various years, *China Commerce Yearbook*, Ministry of Commerce, Beijing.

Ministry of Commerce 2008, *China Commerce Yearbook 2008*, Ministry of Commerce, Beijing.

National Bureau of Statistics (NBS) 2009, *China Statistical Yearbook 2009*, China Statistics Press, Beijing.

National Bureau of Statistics (NBS) 2010, *China Statistical Yearbook 2010*, China Statistics Press, Beijing.

Organisation for Economic Cooperation and Development (OECD), n.d., *Glossary*, Organisation for Economic Cooperation and Development, Paris, viewed 22 May 2009, <www.oecd.org/document/19/0,3343,en_21571361_39494699_39503763_1_1_1_1_,00.html>

Organisation for Economic Cooperation and Development (OECD) 2008a, *Is it ODA?*, Fact Sheet, November, Organisation for Economic Cooperation and Development, Paris, viewed 6 March 2011, <http://www.oecd.org/dataoecd/21/21/34086975.pdf>

Organisation for Economic Cooperation and Development (OECD) 2008b, Personal email communication with a senior official regarding Ghana credits, 17 November, Data Collections Unit, Statistics and Monitoring Division, Development Cooperation Directorate, Organisation for Economic Cooperation and Development, Paris.

Organisation for Economic Cooperation and Development (OECD) 2010, *International Development Statistics: Other official flows*, 13 April, Organisation for Economic Cooperation and Development, Paris, viewed 6 March 2011, <http://www.oecd-ilibrary.org/development/data/oecd-international-development-statistics/other-official-flows-oof_data-00075-en;jsessionid=1f4rgdb5f6jo3.delta>

Standard & Poor's 2006. 'Bank Credit Report: Export-Import Bank of China', August 2006.

State Council 2011, *China's Foreign Aid*, April, Information Office of the State Council, People's Republic of China, Beijing.

Vines, A., Wong, L., Weimer, M. and Campos, I. 2009, *Thirst for African Oil: Asian national oil companies in Nigeria and Angola*, August, Chatham House, London.

Wang, J.-Y. 2007, *What drives China's growing role in Africa?*, IMF Working Paper No. 07/211 (August), International Monetary Fund, Washington, DC.

World Bank 2011, *Energy in Africa: Overview*, The World Bank, Washington, DC, viewed 2 April 2010, <http://go.worldbank.org/ZD42IOATZ0>

Zoninsein, M. 2010, 'Nigeria secures agreement for refineries, *Engineering News-Record*, 16 June.

Endnotes

1. Unless otherwise stated, 'Africa' refers to the entire continent, including North Africa.

2. According to a Ministry of Commerce official (Personal email communication, Ministry of Commerce, Beijing, 3 May 2011), these figures all refer to commitments, not disbursements.

3. Given the rapid increase in Chinese aid on an annual basis, the figures for commitments and disbursements are likely to differ far more for Chinese aid than would be the case for the OECD donors. A Chinese official estimated that, in recent years, China Eximbank's commitments for concessional loans are nearly double the disbursements, while grants and zero-interest loans tend to be disbursed much more rapidly. Annual figures for disbursements and commitments are far closer for the aid controlled by the Ministry of Commerce. For more detail on these estimates and additional figures, see Brautigam (2011).

4. *Convention de Collaboration entre la République Démocratique du Congo et le Groupement d'Entreprises Chinoises: China Railway Group Limited, Sinohydro Corporation relative au Developpement d'un Projet Minier et d'un Projet d'infrastructures en République Démocratique du Congo, April 22, 2008*.

5. Ibid.

6. Ibid.

7. Ibid.

8. *Avenant No. 3 à la Convention de Collaboration Relative au Developpement d'un Projet Minier et d'un Projet d'Infrastructures en République Démocratique du Congo du 22 Avril 2008 – 2009, October*.

9. Former IMF Senior Official, Personal email and phone communication, 7 and 11 April 2011. The IMF explained that its calculations assumed: '(i) the mining project does not generate any net income and the government guarantee is invoked after 25 years as provided for under the amended Agreement; (ii) accrued interest is compounded' (IMF 2010). The assumption that the mining project would not generate any net income seemed unrealistic. Assuming the project would generate income as predicted, and using the IMF's concessionality calculator (IMF n.d.), the assumption of a US$250 million 'grant', no grace period, an interest rate of 4.4 per cent and a 25-year maturity, the author found a grant element of just more than 20 per cent compared with the commercial rates prevailing for the US dollar in March 2011.

10. To elaborate: none of these (curious) qualifiers would make an OECD state-sponsored investment qualify as ODA. For example, official bilateral agreements may provide a pledge that an investment will not be expropriated, but this does not make it into 'aid'. Leaving aside the questionable assumption that state-sponsored investment is risk free for Chinese companies, the degree to which a government ameliorates the risks faced by its firms abroad has nothing to do with whether the investment qualifies as ODA. No OECD country counts assistance to its companies for their foreign investment as part of its ODA. Finally, it is true that an 'investment' (a government loan, for example) that does not result in ownership of assets abroad does not qualify as foreign direct investment (FDI), but that does not mean that by default it thus qualifies as 'aid' (unless it meets the strict criteria for ODA). It would simply be counted in 'other official flows'.

11. These data are found in the section on foreign economic cooperation under the subheading 'Total amount of contracts and turnover of China's foreign economic cooperation in 2008 by country/region'. The section on foreign economic cooperation also includes a subsection on overseas foreign direct investment (FDI) by Chinese companies. Several researchers who have referred to or used these data stated that they believed the economic cooperation figures also included the FDI data (World Bank 2008:xiii, 7). It is not clear how that would be the case, given that the figures refer to turnover from contracts. The Yearbook definition does not include FDI as part of these figures, and they are listed separately from the contracts and turnover data under the broad heading of 'Foreign economic cooperation'.

12. This is a simple sum of the turnover reported annually in the *China Commerce Yearbooks* (1998–2009) (Ministry of Commerce various years) and has not been adjusted for inflation.

13. Official aid financed two rural telephony projects, a borehole project, anti-malaria program training, bird flu prevention, construction of a hospital, a malaria treatment centre, four primary schools, and 500 volunteers in the South–South Cooperation Program operated by the Food and Agriculture Organisation. Not included in this estimate are the costs of at least 50 Nigerian students studying in China and short-term training programs and study tours for 300 Nigerians in China. Nigeria also received non-concessionary export credits of US$230 million for two 335 MW gas power plants in 2002 (Nigerian Government Official, Personal email and phone communication, May 2009). In 2007, China Eximbank offered a US$500 million preferential export credit, which was not taken up during this period, and thus resulted in no turnover for Chinese companies. Although a large line of resource-backed credit such as we have seen in some other African countries was offered to Nigeria, it was not taken up (Vines et al. 2009).

14 Clash of the Titans

Chinese and Indian growth compared

Peter E. Robertson[1]

Introduction

Both China and India emerged from World War II as shattered giants embroiled in civil conflict. By 1962 they were at war with each other over their shared Himalayan border. Upon these shaky foundations, both countries took different paths through the hostile Cold War environment—India with its market-based socialism and China with communism and collectivism.

The aim of this chapter is to ask what growth theory can tell us about the similarities and differences in India's and China's respective growth experiences and future prospects. This is important for several reasons. First, despite many popular explanations for China's success, or India's emergence, we simply do not have a good theory of all the necessary conditions for how a country can effect the transition from a developing to a developed economy. Understanding the process is likely to be important for understanding what bottlenecks or hurdles lie ahead, as well as for developing appropriate policies for other countries to follow.

Moreover, since China and India are, respectively, the world's largest and second-largest countries in terms of population, their continued economic growth will substantially change the world economic and geopolitical landscape in ways that have not been seen since the emergence of the United States at the end of the nineteenth century. The political dominance of the current Western world arguably, therefore, depends a lot on whether or not India, with its British colonial heritage and Westminster-style democracy, can match China in terms of economic might.

To think about past and future growth prospects, we need a framework for organising ideas. The benchmark model for thinking about both long-run growth and short-run transition is the neoclassical growth model. In what follows, a careful application of this model is used to shed substantial new insights on to the comparative performance of these two countries. In particular, the chapter demonstrates that: 1) increases in China's investment rate have had little impact on its growth, especially since the 1980s; 2) the difference in the investment rate between China and India does not explain their differing growth performances; and 3) there is some new evidence that human capital accumulation has been a critical source of growth in China, being not only a source of rising labour productivity but also through inducing capital accumulation.

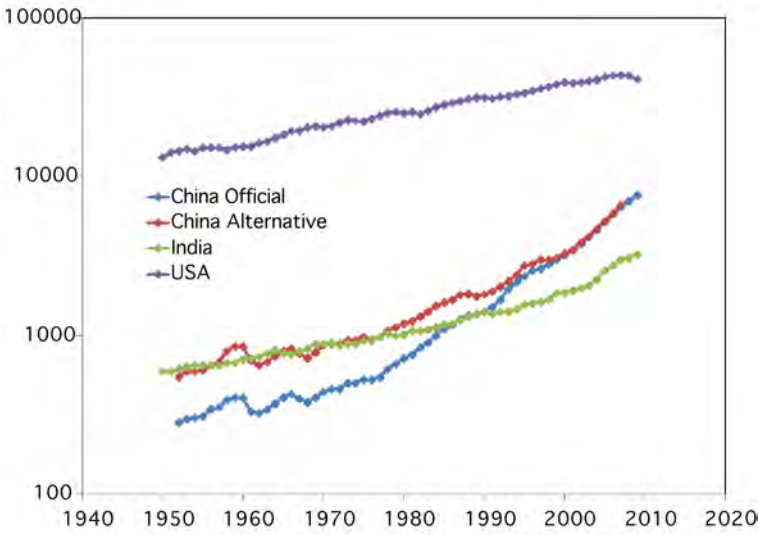
The results are not inconsistent with existing growth accounting studies that tend to emphasise capital accumulation and the residual productivity growth. Rather, they offer a different way of thinking about causes and effects and hence also fresh insight into the way different policies have influenced the growth of these two titanic economies.

China's and India's stylised growth facts

Long-run growth of GDP per capita

The growth records of both countries are shown in Figure 14.1, which plots gross domestic product (GDP) per capita for China, India and, for reference, the United States, in dollars of purchasing power parity (PPP$) since 1952. For China, two series are reported—both from the Penn World tables (Heston et al. 2011). The first series is based on China's official price indices and the 2005 ICP benchmark. The second is an alternative series based on corrections to these official data following Madison and Wu (2008) and Wu (2010), among others.

Figure 14.1 GDP per capita (PPP$)



Source: Heston et al. (2010).

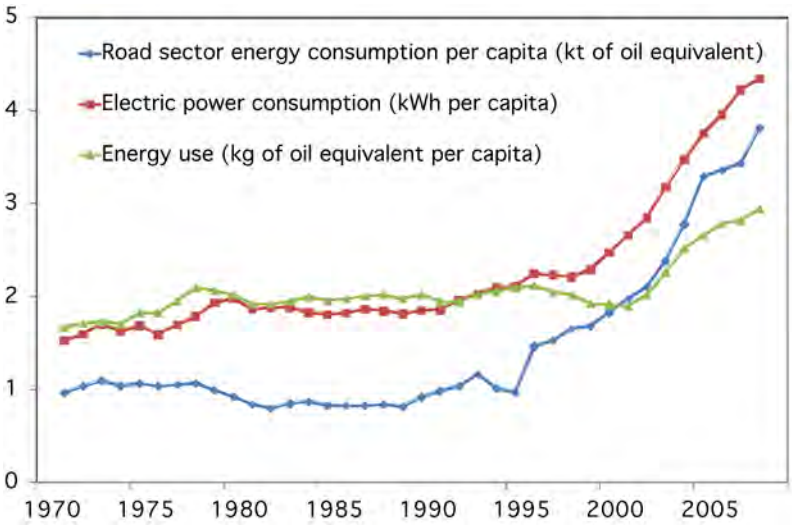
The adjustment mainly concerns the growth rates of China prior to the 1980s. According to the official data, it can be seen that China's GDP per capita in 1952 was only half that of India's. From 1952 to 1978, China grew at 3 per cent per annum whereas India grew at 2 per cent per annum—the same as the United States. But from 1978 to 2010, China grew at 8.5 per cent per annum and caught up with India in 1986—less than a decade after the end of the Cultural Revolution.

The adjusted series, however, shows a remarkably different story. According to these data, China's GDP per capita in 1952 was the same as India's. This higher income level for China in 1952 implies a substantially lower growth rate from 1978 to 2010. Specifically, the revised series suggests that China's growth rate was 6.5 per cent per annum, instead of the official rate of 8.5 per cent per annum, for the post-reform era, 1978–2010.

Madison and Wu (2008) and Wang and Meng (2001) argue that their lower growth rates are much more reasonable than the official rates, since the lower level of GDP per capita in 1952 implies an income level of PPP$282 per annum, which is far below subsistence. In comparison, India—itself a very poor country—had an income of PPP$612 per annum. Heston (2008) also agrees that an implication of the official growth rates is that India was much wealthier than China in 1952, and that is implausible.[2] He supports this by citing earlier studies such as Kravis (1984) and Ruoen and Kai (1995), both of which found that China was wealthier than India in 1952. In particular, Kravis (1981) found that China has 12 per cent of the United States' GDP per capita and India only 6 per cent.[3]

Figure 14.2 provides some more evidence of this by comparing energy use in China and India. It shows the ratio of China's to India's per capita energy use. Although these data date back only to the 1970s, they show that China's demand for road transport energy was the same as India's in the 1970s when China was substantially poorer according to the official Chinese data. Moreover, at this time China's total consumption of energy was approximately double that of India. Taking these data at face value suggests that, at least by the 1970s, China was at least as industrialised as India was. Hence it seems plausible that the official data dramatically understate China's wealth and overstate its post-reform growth rate.

Figure 14.2 China's energy use relative to India



Source: World Bank (Various years).

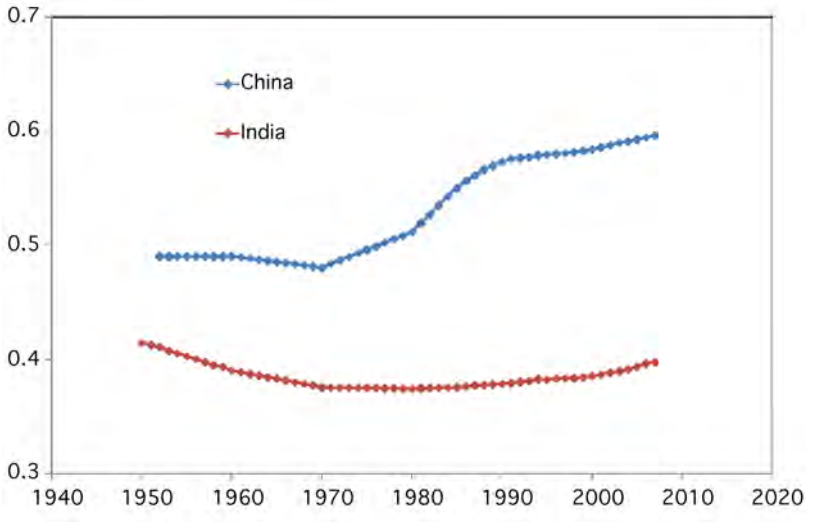
From the adjusted GDP series for China it can be seen that, initially, China's and India's growth performances were very similar, but China's was much more unstable, with booms and busts. The first severe economic downturns in China were associated with the Great Leap

Forward and the Three-Year Famine, which has been linked to about 15–20 million deaths. The second downturn was during the Cultural Revolution. In comparing India and China, considerable attention has been given to the costs of the failed collectivist experiments.[4]

Growth of GDP per worker

Another way to compare their growth rates is by looking at GDP per worker, rather than GDP per capita. This is more of a productivity measure and is also more closely tied to the concepts used in growth theory. Figure 14.3 reports the ratio of 'working-age persons per capita' in China and India from Heston et al. (2010). In India, approximately 41 per cent of the population in 1952 was working whereas in China, 50 per cent was working. But whereas China's ratio of workers per person has risen—from 50 per cent in 1952 to 60 per cent now—India's ratio of workers per person has remained relatively constant.

Figure 14.3 Working-age population per person



Source: Heston et al. (2010).

As discussed by Golley and Tyers (2011), the fall in dependency ratios in China is a result of China's demographic transition, with falling fertility rates. This also has potential implications for China's and India's future prospects, with increasing age dependency in China in the future but falling youth dependency for India.

With respect to comparing past growth rates, however, it means that China's growth of GDP per worker has not been as fast as its growth of GDP per capita. Nevertheless, even in terms of GDP per worker, with a faster growing denominator, China's growth has still doubled India's—with a tenfold increase in GDP per worker from 1952 to 2007—versus India's fivefold increase.

Relative achievements

In comparing the two countries in the longer term, commentators also point to the role of poor economic management in contributing to China's mass famine, China's poor record on human rights and China's lack of democracy as significant costs of China's development policy. The reign of Mao has been estimated as contributing to the deaths of about 40 million people—double the human cost of Stalin's collectivist policies and one of the largest episodes of human life loss in modern history, second only to World War II as a whole. So the costs of these politically motivated policies cannot be understated.

Nevertheless, it remains the case that, since the Cultural Revolution, China's experience has been vastly superior to that of India's. Even when we adjust for systematic errors in China's national income reporting and look at GDP per worker, rather than GDP per capita, China's economic growth has been approximately double that of India's.[5]

Moreover, this superior economic growth has delivered equally superior reductions in mortality, malnutrition and poverty. For example, Ravillion (2009) finds that between 1981 and 2005 the poverty headcount index fell by a factor of five in China, compared with a factor of 1.4 in India over the same period.[6] According to Ravillion (2009), this difference in poverty reduction is almost entirely explained by the difference in each country's growth rate.[7]

Sources growth

Growth accounting

Given the dramatic difference in growth performance, the next question is whether there are any notable differences in the characteristics of that growth that might point to key policy differences. The main tool for country growth studies is growth accounting. Bosworth and Collins' (2008) study is a useful starting point as they construct growth accounts for both countries over the period 1978–2004.

Specifically, they assume that real output per worker in both countries can be represented by a Cobb-Douglas production function (Equation 14.1).

Equation 14.1

$$y = k^{a} (Ah)^{1-a}$$

In Equation 14.1, k is physical capital per worker, y is output per worker, h is human capital per worker and A is a measure of productivity expressed in terms of equivalent units of labour. Taking the ratio of per capita GDP at two dates, and denoting these as y and y' respectively, we can compare the income level at these two dates as the product of the components (Equation 14.2).

Equation 14.2

$$y'/y = (k'/k)^{a} (h'/h)^{1-a} B'/B$$

In Equation 14.2, $B \equiv A^{1-\alpha}$ is total factor productivity (TFP), which is productivity expressed in equivalent units of output.[8] Alternatively, log differentiation gives the usual growth accounting equation (Equation 14.3).

Equation 14.3

$$\hat{y} = \alpha \hat{k} + (1 - \alpha)\hat{h} + \hat{B}$$

In Equation 14.3, $\hat{B}$ is the 'Solow Residual'.

Using Equation 14.3, Bosworth and Collins (2008) find that, in proportional terms, the contributions of growth of physical capital and other inputs in China and India are similar. For China, assuming $\alpha = 0.4$, the contribution of capital, $\alpha \hat{k}$, accounts for approximately 44 per cent of its growth. Human capital, $(1-\alpha)\hat{h}$, accounts for 4 per cent of GDP per capita growth and the Solow Residual, $\hat{B}$, makes up the remaining 49 per cent. For India, the proportional contributions of capital, human capital and TFP are 39, 12 and 48 per cent, respectively.

Thus, human capital makes a slightly larger contribution for India, physical capital is moderately larger for China and in both countries the Solow Residual accounts for about half of their respective growth rates. Bosworth and Collins (2008) also note, however, that in absolute terms India's record on capital accumulation is well below that of the East Asian economies during their rapid growth era whereas China's capital accumulation experience has matched, and more recently exceeded, that of East Asia during the 'East Asian Miracle'.

The emphasis on capital accumulation for China fits the perception that China has benefited from its high investment levels. Comparisons of India and China often point to the differences in investment rates across the two countries as evidence of why India has done relatively poorly compared with China (for example, Bardhan 2006; Basu 2009). Certainly, the results seem to suggest that capital accumulation has been vastly more important than human capital accumulation, and more so in China than in India.

Understanding the sources of capital accumulation

Recall that in the neoclassical growth model, capital accumulation is endogenous. The rate of capital accumulation is not something that is directly influenced by policy variables. In the simplest neoclassical model, the Solow–Swan model, the rate of capital accumulation is determined by changes in the rate of investment, the current value of capital per worker relative to the steady-state value, which determines the convergence rate, and all factors that affect productivity, including human capital. Thus, although growth accounting tells us that approximately 40 per cent of both India's and China's growth is due to physical capital accumulation, the neoclassical model says that this capital accumulation can in turn be attributed to (i) changes in the investment rate, *s*, changes in productivity, *A*, changes in human capital, *h*, and convergence to a steady state.

Note also that since some of the capital growth can be attributed to human capital accumulation, this means that the total contribution of human capital exceeds its growth accounting contribution.[9] In this way, using the neoclassical growth model rearranges the

contribution of different factors and provides a different perspective on the growth process. As we shall see, this exercise will highlight the important role that human capital has played, not only in India but also in China.

The role of investment

Levels versus changes

To disentangle the effects of this rise in investment rates from other factors that have affected capital accumulation, we can again refer to the Solow–Swan model. In this model, the steady-state equilibrium condition is as shown in Equation 14.4.

Equation 14.4

$$sy/k = (1 + n)(1 + g) - (1 - \delta)$$

In Equation 14.4, s is the investment rate, and δ denotes the depreciation rate on capital, $1 + n = \mathrm{L}_{t+1}/\mathrm{L}_t$ is the annual increase in labour inputs, $1 + g = \mathrm{A}_{t+1}/\mathrm{A}_t$ denotes the annual increase in productivity.[10] Given the Cobb-Douglas production function assumed above for the growth accounting exercise, $y = k^{\alpha}(Ah)^{1-\alpha}$, we can use these expressions to obtain Equation 14.5.

Equation 14.5

$$y = (\mathrm{s}/\chi)^{\alpha/(1-\alpha)}Ah$$

In Equation 14.5, $\chi \equiv (1 + n)(1 + g) - (1 - \delta)$.[11] This shows a steady-state relationship between the investment rate, human capital, productivity and output. Thus, an economy that moves from an initial steady state to a new steady state due to a change in the investment rate from s to the new level of investment, s', a new level of human capital, h', and a new productivity level, A, will have an increase in per capita income as shown in Equation 14.6.

Equation 14.6

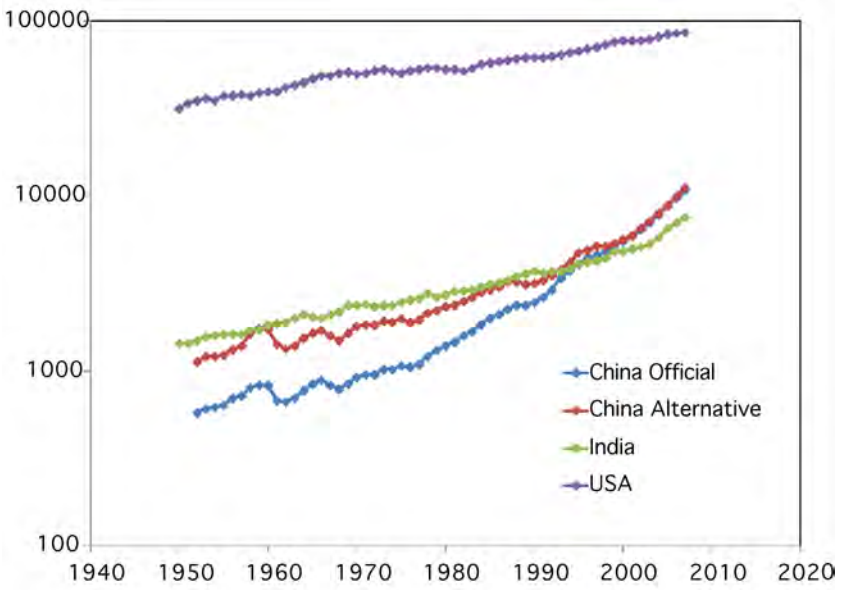
$$y'/y = (s'/s)^{\alpha/(1-\alpha)}(A'/A)(h'/h)$$

We can use this expression to compare the long-run changes in GDP in China and India across time.[12] First note that on a steady-state path, s is constant so the first term becomes $(s'/s)^{\alpha/(1-\alpha)} = 1$. Thus, on a steady-state growth path, per capita income growth depends only on the growth rate of productivity $y'/y = (A'/A)(h'/h)$. The long-run growth rate, though not the income level, is independent of the level of investment. This is a well-known result in this model. Thus, according to this standard model—and contrary to many informal discussions of China's high growth rates—China's higher level of investment relative to India's is not relevant for explaining its higher rate of growth.

What might explain China's higher growth rate is the change in the investment rate. The neoclassical growth model shows that if a country is experiencing an increase in its investment rate, other things being equal, the rate of capital accumulation will exceed the growth rate. As shown in Figure 14.4, which illustrates the basic Solow–Swan diagram,

a higher investment rate, s, increases the steady-state ratio of capital per effective worker. Since sy/k is constant, the shift from s to s' must imply that y/k falls, so that y does not grow as fast as k. Thus, an increase in the investment rate, s—other factors held constant—increases capital accumulation and raises the growth accounting capital contribution. The question remains, to what extent were rising investment rates in China and India responsible for the large capital contributions found by Bosworth and Collins (2008)?

Figure 14.4 GDP per worker (PPP$)

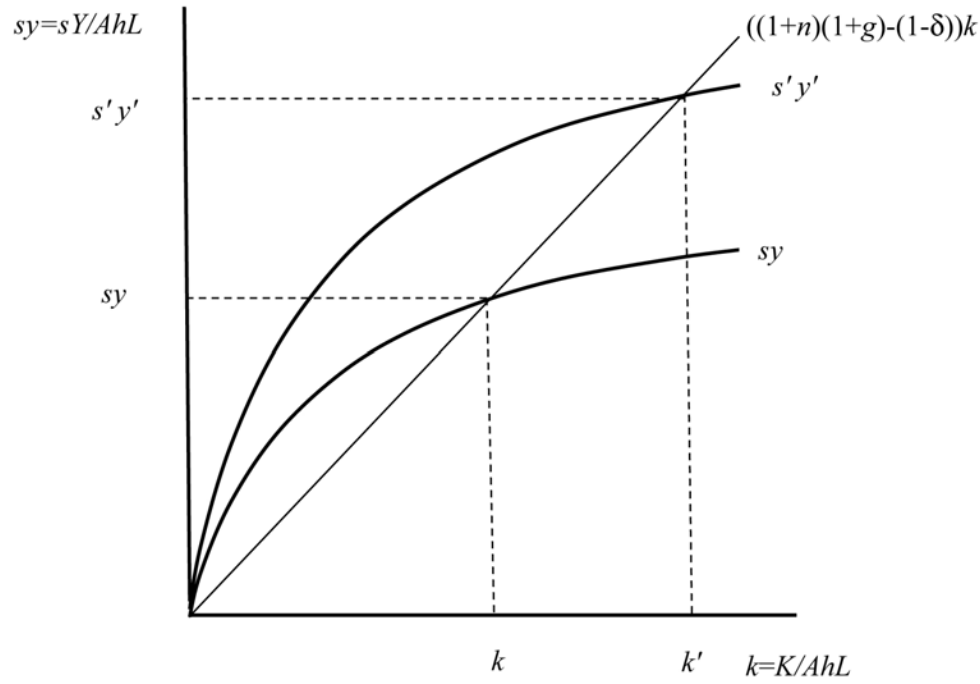


Source: Heston et al. (2010).

Investment data

To look at the relative role of capital accumulation in each country more carefully, Figure 14.5 compares Chinese and Indian investment rates, or, more specifically, gross fixed capital formation as a fraction of GDP, both measured in real PPP$. Figure 14.5 shows that using the official statistics, China's investment rate rose from 17 per cent of GDP in 1952 to 33 per cent of GDP in 1978. The investment rate remained at this level until the 1990s, but then stepped up again—by another 10 percentage points, eventually rising to more than 40 per cent of GDP.

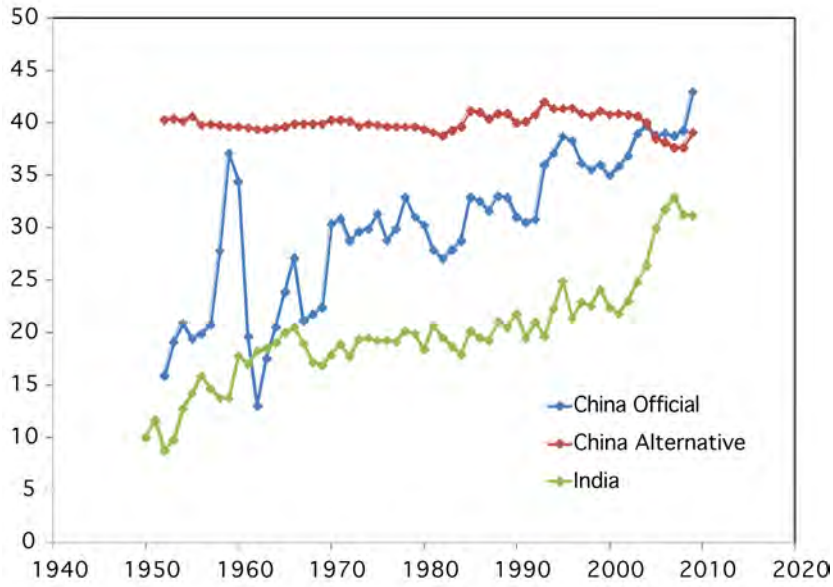
Figure 14.5 Capital accumulation in the Solow–Swan model



In contrast, India's investment rate was only 10 per cent of GDP in 1952, despite its higher income level, and by 2003 it doubled to 20 per cent of GDP. The significant rise in India's investment rate occurs only after 2003, with the investment rate then reaching 32 per cent of GDP. Thus, a simple comparison shows the much higher investment levels in China, although India has caught up considerably in recent years. Overall, the Indian investment rate has increased approximately 3.2-fold whereas China's has increased 2.7-fold. Viewed in these terms, India appears to have outperformed China in terms of investment rate increases.

The comparison is even more dramatic if we use the unofficial Chinese data where adjustments have been made to the price of consumption goods. As shown in Figure 14.6, the adjusted data show that the real quantity of investment as a fraction of output has been about 40 per cent since 1952—much higher than India's *level* but with very little *increase* over time.

Figure 14.6 Gross fixed investment as a fraction of GDP (per cent)



Source: Heston et al. (2010).

Quantifying the impact of investment

So how much growth can be explained by the rising investment rate in each country? Suppose we assume that $\alpha = 1/3$, which is a widely used value in the cross-country growth accounting literature. The total growth from one steady state to the next comparative steady state with productivity and human capital is constant and is $y'/y = (s'/s)^{1/2}$. As we have seen above, the investment rate in China since 1952, using the official data, is $s'/s = 2.7$. This accounts, at best, for a $\sqrt{2.7} = 1.64$-fold increase in per capita GDP between 1952 and 2009. This confirms that the increase in the investment rate has made only a very small contribution to China's growth, given that GDP has increased at least twelvefold.[13] In India, the slightly more substantial increase in the investment rate of 3.2-fold would increase GDP per capita by a factor of 1.8. Relative to India's 5.3-fold increase in per capita income, this is a more substantial contribution to India's overall growth. Thus, the contribution of increases in the investment rate to growth has been greater in India than in China, both in absolute and in proportional terms. This suggests that, for example, policies that have encouraged investment and perhaps savings, such as bank reforms in India, have contributed to growth in India to a greater extent than in China.

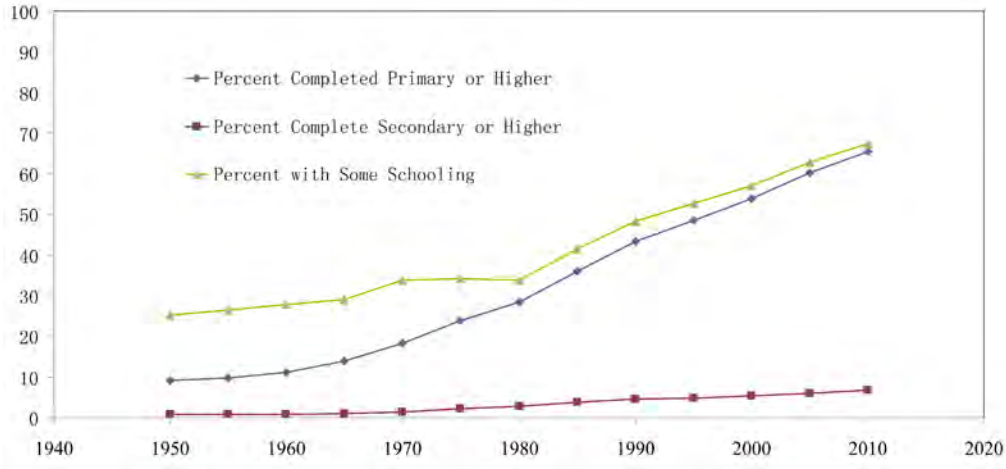
So we can conclude that the different increases in investment rates do not help much in explaining the different growth experiences of the two countries. In proportional and absolute terms, investment rate increases have been more important to India than China. In addition, if capital income shares are close to $\alpha = 1/3$, we can also conclude that the increases in the investment rate have in fact been a relatively minor contributing factor to growth, especially in China.

Human capital

Since increases in the investment rate do not appear to explain much of China's or India's growth, we now consider human capital. Human capital incorporates the skills and attributes of workers that have been accumulated though schooling, as well as health, experience and training. It is thus an asset and is valued as the present value of the higher income stream that an individual attains from undertaking such investments, above what they would have otherwise earned.

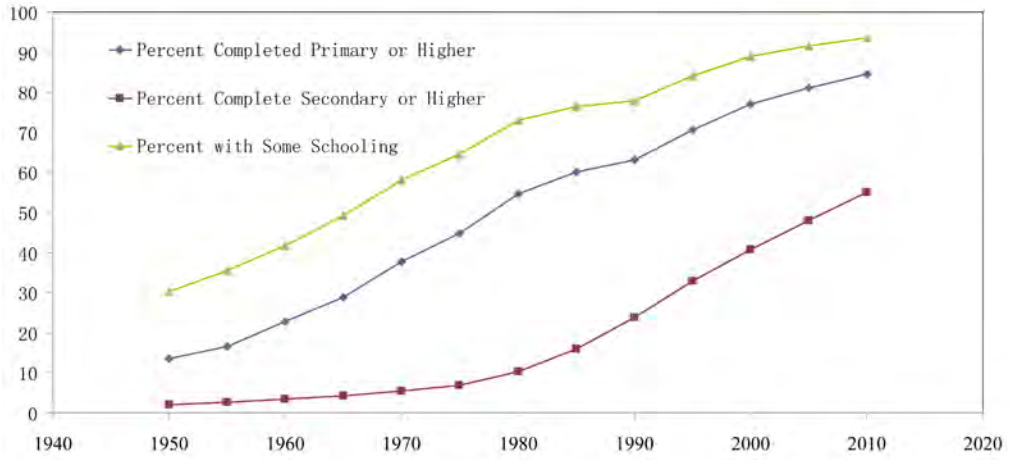
Figure 14.7 shows primary and secondary schooling attainment rates for China and India. It shows that even in 1950 China had higher schooling rates than India and the gap has tended to widen, with China's population reaching 85 per cent who had 'completed primary school' and 93 per cent with 'some schooling' by 2010. In comparison, India achieved 65 per cent who had 'completed primary school' and 67 per cent with 'some schooling'.

Figure 14.7a School completion rates in India



Source: Barro and Lee (2010)

Figure 14.7b School completion rates in China



Source: Barro and Lee (2010).

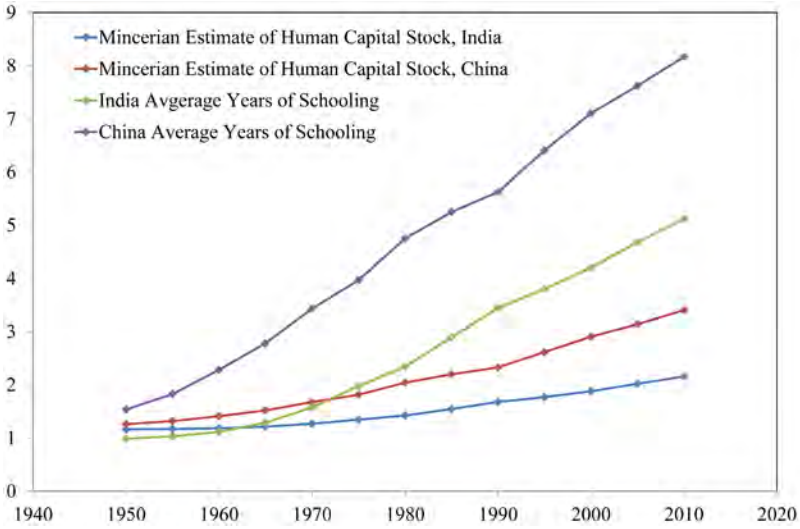
The figures also show the proportion of the population that commenced secondary education in each country and the percentage that completed secondary education or higher. This shows an enormous difference, with China's secondary completion rate reaching 55 per cent of the population, compared with India at only 6.7 per cent.

Although India has lower levels of education attainment, it experienced slightly larger increases than China in the fraction of its population with primary schooling—increasing 7.2-fold versus China's 6.2-fold. So in terms of increases in primary attainment, India has experienced higher growth than China.

There are, however, far more dramatic differences in the growth of secondary schooling rates in the two countries. For India, the secondary schooling rate increase was quite large—from 0.7 per cent of the workforce to 6.7 per cent of the workforce—which is a 9.6-fold increase. Nevertheless this is dwarfed by China's increase from 2 per cent of the labour force to 55 per cent—a 28-fold increase!

Attainment rates, however, are a flow variable, which gives us an idea about the rate of investment in education in each country, but not the total stock of the accumulated education. To obtain a measure of human capital stocks, Barro and Lee (2010) convert these attainment rates into a measure of average years of schooling in the labour force. These are shown in Figure 14.8. Over the period 1950–2005, India's average years of schooling increased from 0.98 to 4.7—a 4.8-fold increase. In comparison, China's average years of schooling in the labour force increased from 1.5 to 7.6—a fivefold increase. In these terms, then, the rate of increase in the human capital stock appears to be fairly similar for the two countries over this period.

Figure 14.8 Human capital indicators



Source: Barro and Lee (2010).

For these measures to be meaningful, however, we need to convert years of schooling into a quantity of human capital that is proportional to labour productivity. We follow previous studies such as Bosworth and Collins (2008) and Klenow and Rodriguez-Clare (1997), who employ evidence from Mincerian earnings regressions. These studies establish a relationship between human capital stock, h, and years of schooling, t, given by $h = e^{\theta t}$, where θ is estimated to be approximately 0.15.[14]

Figure 14.8 shows the implied level of human capital, h, for China and India based on this simple transformation. By this measure, India's human capital rate increased 1.7-fold and China's increased 2.5-fold.[15] China's figure here is larger because, with this method, additional years of higher schooling are recognised as adding more to the human capital stock than additional years of lower schooling levels.

The long-run impact of human capital

Although these values are relatively modest, recall that according to the Solow–Swan growth model, an increase in human capital not only has a direct impact on output through the production function but also has an indirect effect on capital accumulation. As shown by Equation 14.6, across steady states this total contribution is linear in the increase in human capital. That is, holding productivity, A, and the investment rate, s, constant, from Equation 14.6, we have Equation 14.7.

Equation 14.7

$$y'/y = h'/h$$

Thus, the doubling of human capital per person will double steady-state income per capita in the long run.

India's GDP per capita over the 55-year period 1950–2005 increased 4.3-fold, which implies a growth rate of approximately $4.2^{1/55} - 1 = 2.7$ per cent per annum. We have a total contribution of human capital to growth of $1.7^{1/55} - 1 = 1$ per cent per annum. So the maximum impact of human capital on growth, allowing for full realisation of transitional growth to the new steady state, is 1 per cent relative to 2.7 per cent. This represents 38 per cent of India's growth. Similar calculations for China give a total human capital contribution of 41 per cent of its adjusted growth rate.

It is therefore possible that human capital can explain a very large fraction of growth in both India and China. Again, this overturns the received view from growth accounting studies. The difference is simply due to: 1) adjusting China's GDP growth according to the Heston et al. (2010) and Madison and Wu (2008) figures; and 2) allowing for the indirect effects of human capital on physical capital accumulation.

The analysis here is only exploratory, but these back-of-the-envelope calculations suggest that the role of human capital in China's growth might have been understated by conventional growth accounting studies. Even so, based on the years of schooling data, a concern is that there does not appear to be any acceleration in the rate of growth of human capital between China's first phase, 1950–80, and the post-reform phase from 1980 onwards. A natural question, then, is whether any other studies of human capital have suggested a faster rate of growth in the post-reform era?

Re-examining China's growth and human capital post-1980

Several recent studies have suggested that the impact of human capital in China might be even larger than the rates implied by the increase in average years of schooling. In particular, Li et al. (2009) estimate that the rate of return to schooling in China has increased dramatically from just 1 per cent in 1985 to 11 per cent in 2007.[16] As a result, they find that human capital levels in China increased by a factor of 3.8 over the period 1985–2007 compared with the estimates used above of just 1.5 over a similar period.

Using the adjusted Penn World tables data, the increase in China's GDP per worker over this period is $y'/y = 3.8$. Li et al.'s (2009) measured increase in human capital is also $h'/h = 3.8$. Thus, Li et al.'s measured increase in human capital is potentially capable of accounting for 100 per cent of China's adjusted growth of GDP per worker.

Human capital transitional dynamics

Of course these back-of-the-envelope calculations assume, unrealistically, that a full transition to a steady state has already occurred. Much of the increase in human capital is very recent and hence might in fact take many years to be realised in terms of its effects on capital accumulation.

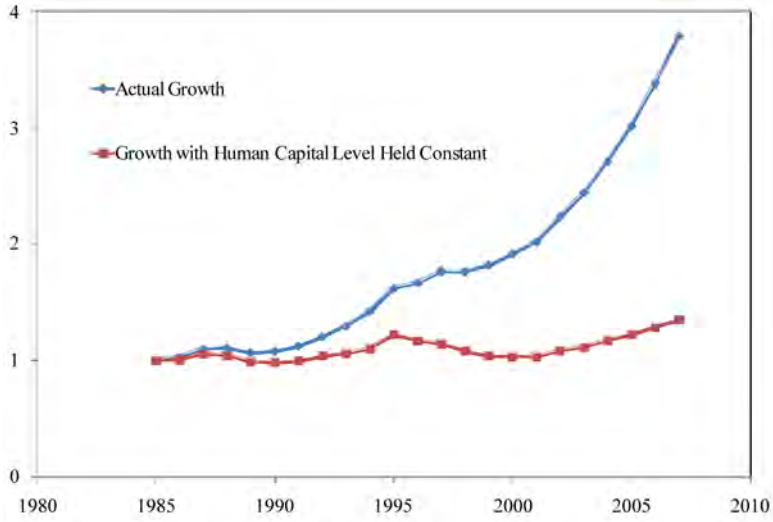
Fortunately, it is straightforward to quantify these impacts while also allowing for only partial convergence in the transitional dynamics, using simple simulation methods. Specifically, I simulate the Solow–Swan model using the method described in Robertson (2000), and using the

Penn World tables' (adjusted) data for Chinese GDP, labour and investment and Li et al.'s (2009) human capital data. Given these data, and assuming an initial steady-state capital stock in 1952, a capital stock series can be calculated. The residual productivity level for each year, A, can then also be calculated so that the calibrated model exactly reproduces the actual GDP data for each year, consistent with observed investment rates and human capital levels for each year.

Given this benchmark calibration, we can then consider counterfactual simulations holding human capital growth constant at its 1985 value, letting the other exogenous variables, s and A, take their actual values, and letting capital update using the standard Solow–Swan equation. This quantifies the contribution of the increase in human capital, h, given the Solow–Swan dynamics and holding other factors constant.

Figure 14.9 shows the actual GDP growth, which provides the benchmark and also the counterfactual path of growth of GDP per worker that would have occurred if human capital levels were held constant at their 1985 values, given the Solow–Swan model. For the benchmark, GDP per worker in 1985 is indexed to unity and it rises to a value of 3.8, which represents an average growth rate of 6.25 per cent per annum. The counterfactual, with h held constant at the 1985 level, implies that the economy grows very slowly. Gross domestic product per worker increases only to a value of 1.35, which represents a growth rate of 1.3 per cent per annum.

Figure 14.9 Simulation results



Thus, Li et al.'s (2009) measure of human capital can account for 4.9 percentage points out of 6.25 percentage points of growth per annum, or 78 per cent of China's growth since 1985! Thus, even after allowing for transitional dynamics, the impact of allowing human capital to grow at the rate suggested by Li et al. (2009) is enormous.

Caveats

Li et al. (2009) suggest that their finding of a high growth rate of human capital is due primarily to the rising rate of return to education in China. Taken at face value, their estimates imply that a year of schooling in later years in China generates more units of human capital, or skills, than the same years of schooling in earlier years. Thus, their results imply that the relationship between schooling and human capital investment has changed over time, which is a type of technical change in education. This is an interesting conclusion as recent cross-studies, such as Manuelli and Seshadri (2007), have suggested that differences in the quality of schooling across countries can explain a large fraction of the variance in income across countries.

But there are alternative explanations for Li et al.'s (2009) results. One might be that skills were undervalued by the Chinese command economy in earlier years, relative to later years, as emphasised by Liu et al. (2010) and Zhang et al. (2005). In this case, the market return to human capital might have increased even though the marginal product of human capital might not have changed very much at all. So changes in the organisation of labour markets might affect the effectiveness of human capital employment, and it might be difficult to disentangle this effect, which represents a technical change, from an increase in human capital *per se*. Second, the estimated increasing return to schooling might in fact reflect technical change or complementary factors of production that might have been omitted from the earnings regression estimates.

Thus, the argument would appear to rest on whether we can obtain independent evidence of increases in the quality of schooling in China. If the quality of schooling accelerated in China, but not in India, at a rate suggested by Li et al. (2009), the preceding results suggest that this would provide a simple and elegant proximate explanation for China's remarkable success and also its performance relative to India.

If evidence of increases in schooling quality cannot be found, the results nevertheless point to the reorganisation of labour markets as part of China's reforms, and subsequent improved allocation of human capital, as a major source of productivity growth that affects the effective units of human capital. This is perhaps an alternative interpretation of the Li et al. (2009) results and the preceding simulations.

One aspect of this conclusion suggests that China's current strategy of heavy investment in tertiary education and liberalisation of the education sector is appropriate. It likewise indicates that for India there might be severe institutional or structural barriers to growth due to the barrier in educational attainment. Basu (2009) and Yao (2008), for example, emphasise the role of the Chinese state prior to 1978 in providing 'social priming' for rapid economic growth. This priming most notably includes a high degree of social and economic equality including literacy.

In contrast, as noted by Bardhan (2010), India is the largest single-country contributor to world illiteracy, and also has a very high degree of education inequality. Clearly such unequal access to education makes it much more difficult to increase the average skill level of the labour force. Moreover given India's relatively younger population, investment in

education is imperative, since failure to do so could mean a lost opportunity to rapidly increase the average years of schooling as an extremely large cohort of children enter their schooling and hence formative years.

These final remarks are of course speculative. But if human capital accumulation has been as important as the results in this chapter suggest, it does have important implications for investments in access to education in both countries, but particularly in India with its younger population, lower levels of urbanisation and higher levels of inequality.

Conclusions

This chapter aimed to explain China's and India's economic growth in the context of the neoclassical growth model, which has long provided the theoretical benchmark for understanding of the growth process. The neoclassical model places strict discipline on the way we understand and interpret the data. It reminds us, for example, that we cannot simply point to China's high levels of investment and conclude that this explains China's growth, since growth in that model depends on the changes in the investment rate, not the level.

Thus, as we have seen, in the context of this model, changes in the Chinese and Indian investment rates during the past three decades or so do not adequately explain the differences in their growth rates. India has had larger increases in investment, and yet experienced only a fraction of China's growth. Moreover, it was shown that increases in the investment rate contributed to only a very small fraction of the observed growth in the capital stock in both countries. Of course, an analyst might simply take this as a rejection of the model. It is, however, no small task to replace the neoclassical model. It is easy to speculate, for example, as to how institutions, externalities and various exotic theories can explain China's growth. But such theories are necessarily complex, and have not been particularly successful in systematic empirical tests. Occam's razor suggests that we should not reject the neoclassical model in favour of more exotic models as long as the former can explain the facts.

To this end, the neoclassical model shows clearly that an increase in labour productivity—as might arise from an increase in human capital per worker—can have a magnified impact on growth. This is because it increases output directly and also induces capital accumulation by raising the average product of capital. Hence some of the large share of growth that is usually attributed to capital accumulation for China and India can be seen to be associated with increases in human capital instead. Indeed, according to our estimates of these direct and indirect effects, human capital accumulation might in fact explain a very large fraction of growth in India and an even higher fraction of growth in China since 1950.

Finally, although conventional estimates of human capital based on average years of schooling do not show an acceleration of average years of schooling after the Chinese reforms, Li et al.'s (2009) estimates suggest a very rapid growth rate for China's human capital after 1985. A simple numerical simulation, moreover, showed that the direct and indirect effects of human capital accumulation might account for as much as 78 per cent of China's growth in GDP per worker between 1985 and 2007.

These results raise the possibility that human capital accumulation in China and India might have been a very significant part of both their growth success and also the differences in their respective growth performances. It points, moreover, to human capital investments and improvements in the quality of education as critical ingredients of China's recent success.

The emphasis on human capital also points to potential barriers for both China's and India's future growth ambitions. Commentators have emphasised that India's 'ace card' is its democracy and ability to manage conflict (Bardhan 2010; Basu 2009). But India's investment in democratic institutions might be wasted unless it is backed up with greater and more equitable investment in education. Conversely, for China, a lack of democracy is argued to be its greatest hurdle to future growth. But China's past and ongoing investment in human capital must surely also smooth its path to a more inclusive form of government. Fundamentally, for both China and India to realise their full potential on the world geopolitical and economic stage, the citizens of these countries must also realise their full potential as educated and informed citizens participating and sharing in the gains from economic growth. This can be achieved only with access to education and labour markets that will deliver returns to people's human capital investments.

Bibliography

Bardhan, P. 2010, *Awakening Giants, Feet of Clay: Assessing the economic rise of China and India*, Princeton University Press, Princeton, NJ.

Barro, R. J. and Lee, J.-W. 2010, *A new data set of educational attainment in the world, 1950–2010*, NBER Working Paper No. 15902, National Bureau of Economic Research, Cambridge, Mass.

Basu, K. 2009, *Asian century: a comparative analysis of growth in China, India and other Asian economies*, Working Paper No. 209, Bureau for Research and Economic Analysis of Development, Duke University, Durham, NC.

Bosworth, B. and Collins, S. M. 2008, 'Accounting for growth: comparing China and India', *Journal of Economic Perspectives*, vol. 22, no. 1, pp. 45–66.

Caselli, F. 2005, 'Accounting for cross-country income differences', in P. Aghion and S. Durlauf (eds), *Handbook of Economic Growth*, North Holland, New York.

Clements, K. W. and D. Chen 2010, 'Affluence and food: a simple way to infer incomes', *American Journal of Agricultural Economics*, vol. 94, no. 2, pp. 909–26.

Garnaut, R. and Ma, G. 1993, 'How rich is China?: evidence from the food economy', *The Australian Journal of Chinese Affairs*, vol. 30, pp. 121–46.

Gilley, B. 2005, 'Two passages to modernity', in E. Friedman and B. Gilley, (eds) *Asia's Giants, Comparing China and India*, Palgrave Macmillan, New York.

Golley, J. and Tyers, R. 2011, *Contrasting giants: demographic change and economic performance in China and India*, CAMA Working Paper, Centre for Applied Macroeconomic Analysis, The Australian National University, Canberra.

Hall, R. E. and Jones, C. I. 1999, 'Why do some countries produce so much more output per worker than others?', *The Quarterly Journal of Economics*, vol. 14, no. 1, pp. 83–116.

Heston, A. 2008, *What can be learned about the economies of China and India from purchasing power comparisons?*, Working Paper No. 229, Indian Council for Research on International Economic Relations, New Delhi.

Heston, A., Summers, R. and Aten, B. 2011, *Penn World Table Version 7.0*, March, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, Philadelphia.

Hsieh, C.-T. and Klenow, P. J. 2010, 'Development accounting', *American Economic Journal: Macroeconomics*, vol. 2, no. 1, pp. 207–23.

Klenow, P. J. and Rodriguez-Clare, A. 1997, 'The neoclassical revival in growth economics: has it gone too far?', *NBER Macroeconomics Annual 1997*, MIT Press, Cambridge, Mass., pp. 73–103.

Kravis, I. B. 1981, 'An approximation of the relative real per capita GDP of the People's Republic of China', *Journal of Comparative Economics*, No. 5.

Kravis Irving B. 1984, 'Comparative Studies of National Income and Prices', *Journal of Economic Literature*, 22, 1, pp. 1-39.

Li, H., Fraumeni, B. M., Liu, Z. and Wang, X. 2009, *Human capital in China*, NBER Working Paper 15500, National Bureau of Economic Research, Cambridge, Mass.

Liu, X., Park, A. and Zhao, Y. 2010, *Explaining rising returns to education in urban China in the 1990s*, IZA Discussion Paper No. 4872, Institute for the Study of Labor, Bonn.

Madison, A. and Wu, H. 2008, 'Measuring China's economic performance', *World Economics*, no. 2 (9 June), pp. 13–44.

Manuelli, R. E. and Seshadri, A. 2007, *Human capital and the wealth of nations*, Department of Economics Working Paper, University of Wisconsin, Madison.

Ravallion, M. 2009, *A comparative perspective on poverty reduction in Brazil, China and India*, World Bank Policy Research Working Paper 5080, The World Bank, Washington, DC.

Robertson, P. E. 2000, 'Diminished returns? Investment and East Asia's miracle', *Economic Record*, vol. 76, no. 235, pp. 343–54.

Rodrik, D. and Subramanian, A. 2004, *From Hindu growth to productivity surge: the myth of the Indian growth transition*, IMF Staff Papers 52(2), International Monetary Fund, Washington, DC.

Ruoen, R. and Kai, C. 1995, *An Expenditure-Based Bilateral Comparison of Gross Domestic Product Between China and the United States*, The World Bank, Washington, DC.

Swamy, S. 2005, 'Chasing China: can India bridge the gap?', in E. Friedman and B. Gilley (eds), *Asia's Giants, Comparing China and India*, Palgrave Macmillan, New York.

Wang, X. and Meng, L. 2001, 'A revaluation of China's economic growth', *China Economic Review*, vol. 12, pp. 338–46.

Whalley, J. and Zhao, X. 2010 'The Contribution of Human Capital to China's Economic Growth', NBER Working Paper 16592.

World Bank various years, *World Development Indicators*, The World Bank, Washington, DC.

Wu, H. X. 2010, *Accounting for China's growth in 1952–2008—China's growth performance debate revisited with a newly constructed data set*, Hitotsubashi University Discussion Series, Institute of Economic Research, Tokyo.

Yao, Y. 2008, The disinterested government: an interpretation of China's economic success in the reform era, Mimeo., China Center for Economic Research, Peking University, Beijing.

Zhang, J., Zhao, Y., Park, A. and Song, X. 2005, 'Economic returns to schooling in urban China, 1988 to 2001', *Journal of Comparative Economics*, vol. 33, pp. 730–52.

Endnotes

1. I am grateful for comments from and insightful discussions with Rod Tyers and Jane Golley.
2. Heston (2008) notes that the GDP growth figures for India are much more reliable than those for China due to the more detailed price-survey data available.
3. Garnaut and Ma (1993) argued that whereas China's GDP in US dollars, as reported by the World Bank, was similar to India's in 1990, food consumption patterns suggest it should be approximately three times higher in real terms. See also Clements and Chen (2010), who argue that food consumption share data also suggest that official data understate China's current per capita GDP.
4. Gilley (2005) and Swamey (2005), for example, argue for many downward adjustments to China's growth rate and emphasise the social costs of China's economic policies, which provide a basis for more favourable evaluations for India relative to China.
5. In terms of the official data, China's GDP has increased 27-fold—more than five times that of India.
6. Ravillion (2009) has the poverty headcount in China in 1981 at about 80 per cent versus approximately 60 per cent for India in 1980. This appears to be based on the World Bank's International Comparison Program (ICP) data, which in turn are based on the official Chinese GDP growth estimates, rather than the adjusted data. Hence in 1981, Ravillion (2009) estimates China's GDP at PPP$543, compared with a figure for India of PPP$901, so that India's income is 60 per cent higher than China's. The adjusted data from the Penn World Table v.7, however, have China 17 per cent wealthier than India in 1981. If poverty rates are based on the official GDP per capita series for China and the implied PPP price levels then Ravillion's estimates potentially overstate the level of poverty in China and therefore the reduction in poverty.
7. Specifically, he finds elasticities of poverty reduction with respect to per capita income growth of approximately –0.7 in India and up to –0.8 in China.
8. This comparison of income levels when y and y′ represent outputs across countries is known as the 'development accounting equation' (Hsieh and Klenow 2010).
9. For example, in the neoclassical model, the contribution of human capital to growth can be characterised as a direct effect, $(1-\alpha)\hat{h}$, and an indirect effect that measures its impact on capital accumulation. This is because an increase in h raises the average product of capital and induces capital. Thus, a fraction of the term $\alpha\hat{k}$ will be attributed to human capital.

10. Note that productivity here is measured in Harrod-neutral units, A, as opposed to Hicks-neutral units, B, where $B = A^{1-\alpha}$. I switch between the two because the use of Harrod-neutral units is more common, and useful, in growth theory whereas the use of Hicks-neutral units is the convention in growth accounting. Since we have assumed a Cobb-Douglas production function, however, it makes no difference as to whether productivity is in fact Hicks or Harrod-neutral or indeed some combination of both.

11. To obtain this expression, divide both sides of the production function by y^{α}, solve for y and then substitute for the steady-state value of $k/y = s/\chi$.

12. A similar steady-state decomposition has also been used by Hall and Jones (1999) in a cross-country context. They do not explicitly use the Solow–Swan relationship to analyse changes in s, but rather just look at changes in Y/K.

13. Though most studies assume a capital income share between 0.3 and 0.4, occasionally studies have suggested that the capital share of income is much larger. For example, if we assumed $\alpha = 0.5$, the Solow–Swan model says that a 3.2-fold increase in the investment rate—to use the example of India—would cause a 3.2-fold increase in the level of per capita GDP. This would make the increase in the investment rate very important for India explaining the bulk of its fivefold increase in GDP per capita. The 2.7-fold increase in China's investment rate would, however, still be a relatively minor factor in China's twelvefold increase in GDP per capita.

14. The Mincer model is $w = \beta e^{\varphi t}$ in which t is the years of schooling and w is the wage rate. The empirical literature based on wage regressions suggests that the return to an additional year of education is approximately $\varphi =$ 10 per cent (Barro and Lee 2010). Using the preceding Cobb-Douglas production function, the wage rate in a market economy is $w = k^{1-\alpha}h^{1-\alpha}$ in which k and h are physical and human capital per worker, respectively. These equations suggest that $h = e^{\varphi t/(1-\alpha)}$, so if $\alpha = 1/3$ then $\varphi/(1\text{-}\alpha) = 0.15$ and so $h = e^{0.15t}$. As we shall see below, however, there is reason to believe that China's returns to schooling have increased over time.

15. These values are not too dissimilar from Bosworth and Collins' (2008) estimates. Using the traditional growth accounting approach, convert these changes to annual growth rates and then, as in Equation 14.3, weigh the growth rate of human capital by the labour share $(1 - \alpha)$. As noted above, this gives a relatively modest contribution to growth, especially for China.

16. Also see Whalley and Zhao (2010).

15 The Effects of Institutions on Migrant Wages in China and Indonesia

Paul Frijters, Xin Meng and Budy Resosudarmo

Introduction

According to Bell and Muhidin (2009) of the UN Development Programme (UNDP), '[i]nternal migration is the most significant process driving changes in the pattern of human settlement across much of the world, yet remarkably few attempts have been made to compare internal migration between countries'. They estimate that nearly 800 million individuals are internal migrants who live in a different region than the one in which they were born, compared with 'merely' 200 million migrants who have moved countries. The World Bank *Development Report 2009* calls this internal migration one of the key drivers of world economic prosperity.

One important aspect of migration is that of the labour-market outcomes of migrants versus their urban incumbents. The literature on migration has always argued that migrants are a selected group. On average, migrants are more motivated, and hence, other things being equal, should do better than locals in the receiving labour market. Most studies comparing labour-market outcomes for migrants and natives often find, however, that migrant outcomes are worse than those of their native counterparts. The explanations for this puzzle include the lack of local labour-market knowledge and communication skills on the migrants' part (see, for example, Borjas 2003; Card 2009; Card et al. 2009; Ottaviano and Peri 2006) and discrimination on the employers' part (Becker 1971).

Most studies have analysed outcomes for people moving from one country to another—a situation under which the lack of local language, local information and discrimination should matter a great deal and might be expected to more than offset the impact of selection. The positive effect of selection should be more evident when analysing internal migration, as migrants and locals share a common language and culture, though levels of education and experience are still likely to differ. Similarly, we might expect discrimination to play a lesser role unless the internal migrants come from a particular (different) ethnic group or when there are particular institutional restrictions that disadvantage migrants.

In this chapter, we study large internal migrant movements in China and Indonesia, using a unique data set on migrants with consistent questionnaires for both countries. In each country, we compare labour-market outcomes of rural-to-urban migrants with those of their city incumbents. In China, rural–urban migrants face very strong legal labour-market discrimination: they are restricted by the type of jobs they may obtain and do not have access to the social welfare available to urban incumbents. In Indonesia, there is almost no legal distinction between migrants and incumbents.

The key statistical difficulty in comparing labour-market outcomes lies in overcoming the issue of migrant selectivity. We lack clear natural experiments in our data, but we are able to map the migration history of the migrants' region of origin into our data sets. This allows us to use the proportion of previous migrants from a particular region to the cities as an instrument. It is often found in developing countries that the lack of formal information channels makes migration flows heavily dependent upon informal information or, in other words, personal contacts (see, for example, Banerjee 1984; Meng 2000). We believe that the lagged information flow will have a trended impact on the probability of migration mainly via non-wage factors, such as whether migrants can find a home, whether their children feel comfortable and whether someone can help them find a job. Such advantages of prior migration from one's own region make migration more likely without a direct effect on wages.

Although in both countries migrants earn more in the cities than the average rural worker, we find that migrants in China receive significantly lower hourly earnings than their urban incumbents (50 per cent) while migrants in Indonesia receive significantly higher earnings (30 per cent). Selection in both countries is strongly positive while occupational selectivity is negative in China (where migrants are not allowed to work in some of the more high-earning sectors) and positive in Indonesia. As a result, the unexplained portion of differences in hourly wages between migrants and city incumbents is close to zero in Indonesia while it is close to 50 per cent in China. We attribute the latter to the discriminatory legislation in place in most Chinese cities during the survey period.

Background

During the past 20 years or so, the unprecedented economic growth in China and Indonesia has been accompanied by a large population movement from the countryside to the cities. Between 1995 and 2007, the number of rural-to-urban migrants in China increased from 40 million to about 150 million, accounting for 20 per cent of the rural labour force and one-third of the total urban labour force. Since independence in 1949, the official urban population in Indonesia grew by about 4–5 per cent per annum—two to three times the growth in total population. In 2005 migrants accounted for about 20 per cent of the total urban population in Indonesia (Meng and Manning 2009).

One explanation for this large-scale internal migration is the large rural–urban income gap; urban Chinese per capita income and per capita expenditure were 2.6 and 2.1 times that of their rural counterparts in 2007. In Indonesia, the ratio for household expenditure was 1.8 in 2008. Qualitatively, these differences in both countries seem large enough to entice the more talented rural workers to move to cities for financial gain, which is indeed borne out by the data that show that the young and more educated rural workers go to the cities (see below).

While both China and Indonesia face similar challenges in terms of transitioning away from a predominantly agricultural economy to one dominated by city-based services and industry, the institutions surrounding internal migration are very different. China, for its part, has established tight controls on the migration process, preventing overly rapid migration as well as forcing migrants to keep ties with their home villages. The most

important restriction has been that migrants moving to cities are, in general, not allowed to have a city 'citizenship' (*hukou*). Such intra-country 'citizenship' matters for work and everyday life: migrants are restricted in the type of jobs they may take and, in most cities, are only permitted to take jobs that urban incumbents are unwilling to take. Even if they do the same job as someone with urban citizenship, migrants are not entitled to employer contributions to health insurance, unemployment insurance, housing subsidies or pension coverage. The disadvantages of lacking urban citizenship also extend to the families of migrants: children of migrant workers are not allowed to enroll in normal city schools without paying extra fees (Du et al. 2006; Meng 2000; Meng and Manning 2009; Meng and Zhang 2001; West and Zhao 2000). As a consequence, rural–urban migration in China follows a 'guest worker' system where children remain in the countryside and migrants remain only temporarily in the cities.

Rural–urban migration in Indonesia follows quite different patterns. In contrast with China, in Indonesia, the various governments in the past 40 years have placed very few restrictions on rural–urban migration, with rural and urban citizens treated more or less equally. The only important restriction on migration is that citizens are not permitted to have dual residential cards (*kartu tanda penduduk* or KTP)—that is, one may not be a resident in two different places. Residency status, however, has no significant labour-market consequences in Indonesia.[1] Not having a city residential card does not restrict one from obtaining particular jobs in the city, nor does it restrict one's access to public facilities such as health centres and schools. Even the restrictions on residential ownership are easy to bypass. It is not costly to bribe the local authority at the place of origin to provide a fake letter stating that one has relinquished one's rural residential status or to bribe the local authority in the city to obtain a city residential card without showing proof of the release of one's rural residential status. Thus even the few restrictions that exist turn out not to be binding.

To sum up, both China and Indonesia have had large-scale rural-to-urban migration in the past 20 or so years, but migrants face very different institutional settings in the two countries. As a result of the *laissez-faire* institutions in Indonesia compared with China, we expect that the labour-market outcomes of migrants vis-a-vis urban incumbents are better in Indonesia.

A statistical model of migration

Individual *i*'s hourly log-wages, $\ln(y_i)$, are assumed to be generated by an endowment of observable productivity characteristics, x_i (such as education), migration status and an unobserved productivity characteristic, u_i (which does not depend on x_i or on initial location) (Equation 15.1).

Equation 15.1

$$\ln(y_i) = x_i\beta + Migrant_i * f + v_i$$

In Equation 15.1, $Migrant_i$ is a dummy variable equal to 1 if the person is a migrant and equal to 0 if the person in the wage regression was born in the city. Hence, in this regression, the sample base is the city. Here, β denotes the return to observable characteristics in the city. The parameter $f < 0$ denotes the degree of discrimination (exploitation) arising from actual restrictions on migrants in the cities. *Ex ante*, we expect f to be close to zero in a *laissez-faire* country such as Indonesia and to be significantly negative in a country with legal discrimination such as China. We assume that the decision to migrate is generated by a latent variable process (Equation 15.2).

Equation 15.2

$$Migrantrural_i = 1 \Leftrightarrow x_i\delta_0 + z_i\delta_1 + e_i > 0, \quad e_i \sim N(0,1)$$

In Equation 15.2, z_i contains an appropriate instrument related to the decision to migrate but not directly effecting wages. In this regression, $Migrantrural_i$ is a dummy variable equal to 1 if the person is a migrant living in the city and it is 0 if the person still lives in the countryside. The selectivity problem in Equation 15.1 stems from the likelihood that v_i and e_i are positively related in that the more able potential migrants will actually migrate.

Given estimates for and δ_0 and δ_1, we can then overcome the selection issue in a wage equation by running the regression (Equation 15.3).

Equation 15.3

$$\ln(y_i) = x_i\beta + Migrant_i * f + Migrant_i * \hat{\lambda}_i + v_i$$

The variable is the inverse-Mills ratio of the selection equation and is equal to $\frac{\phi(x_i\hat{\delta}_0 + z_i\hat{\delta}_1)}{\Phi(x_i\hat{\delta}_0 + z_i\hat{\delta}_1)}$. The identifying assumption that yields the effect of migration is that the innate characteristics, e_i, have the same distribution at birth in any region in the countryside as they do in the cities, implying that $Ee_i = 0$ for individuals who were born in the city.[2]

Data

The data used in this study are drawn mainly from the Rural–Urban Migration in China and Indonesia (RUMiCI) survey, which was conducted between March and July 2008. Detailed information on the sampling process of the survey in both countries can be found in Meng and Manning (2009).

The China survey comprises three independent samples: a Rural Household Survey (RHS) with 8000 households, an Urban Household Survey (UHS) with 5000 households, and an Urban Migrant Survey (UMS) with 5000 households. The RHS was conducted in 11 provinces while the UHS and UMS were conducted in 15 cities of nine different provinces.[3] While households from the rural sample cannot be linked to households in the migrant sample, both the rural and the migrant surveys contained similar information regarding individual and village characteristics. What this means is that the selection in Equation 15.2 uses a different sample of migrants to the eventual wage Equation 15.3; the selection equation will use information on migrants collected in the rural villages, where the questionnaire was

filled in either by the migrants (when they were visiting home) or by their family members. In order to ascertain whether this brings in any bias, we will compare the characteristics of these proxy migrants with the characteristics of the migrants interviewed in the cities (the UMS). Nevertheless, since more than 70 per cent of the migrants surveyed in the 15 cities came from the nine provinces where we conducted the rural survey, we can use the information collected in the RHS to obtain predicted migration probabilities for more than 70 per cent of the migrants in the UMS sample.

The RUMiCI survey in Indonesia was conducted only in urban areas. Approximately 2500 households in total from four cities (Medan, Tangerang, Samarinda and Makassar) were surveyed, including 921 urban households, 922 lifetime migrant households, and 594 recent migrant households. A migrant is defined as someone who spent at least five years in a rural area before completing primary school. Those who moved to cities in the past five years are defined as recent migrants and the rest are termed lifetime migrants. This distinction is important in Indonesia since one can expect the characteristics of the earlier migrants (in terms of house ownership and job status) to be closer to their urban counterparts. It is the recent migration that is comparable with migration in China and that we will mainly focus on. The sampling frame started with a mini-census conducted in early 2008 consisting of all households in the listing of the 2007 National Socio-Economic Survey (*Survei Sosial Ekonomi Nasional*, or *Susenas*) for the cities of Medan, Tangerang, Samarinda and Makassar. This mini-census provides information on the size of each type of migrant household in all cities as well as their regions of origin. We then mapped household information in rural areas corresponding with the rural origins of migrant households in the RUMiCI survey from the 2007 National Socio-Economic Survey, which was taken in July–August 2007. The mapped rural sample consists of 28 805 households. Hence, in the Indonesian case we directly compare the migrants in the city with the remaining rural population in the region of origin.

The summary statistics for the matched rural samples for China and Indonesia are reported in Tables 15.1a and 15.1b, respectively. Table 15.1a shows that for the China sample, 28 per cent were migrants in 2007. Relative to those who did not migrate, migrants are about 10 years younger, 10 per cent more likely to be male and have about one additional year of schooling. Although migrants are more educated, on average, their self-assessed school performance does not differ much. We also find that migrants are healthier, about 1 cm taller than non-migrants, are less likely to be married and, on average, have fewer children. We also present some village-level information and find that migrants are more likely to come from villages where the daily wage for unskilled labour is lower and where more people migrated three years ago. The daily wage for unskilled labour will be used as a control in the selection equation, while the percentage of prior migration is our main instrument.

The sample statistics for Indonesia are in Table 15.1b. In the unweighted combined sample, only 3 per cent are migrants, but these migrants are younger with almost two more years of education on average than their rural counterparts (although this is somewhat offset by the fact that 30 per cent of the rural sample are 'students' and therefore still in school).

Table 15.1a Summary statistics for rural sample with migrants and non-migrants: China

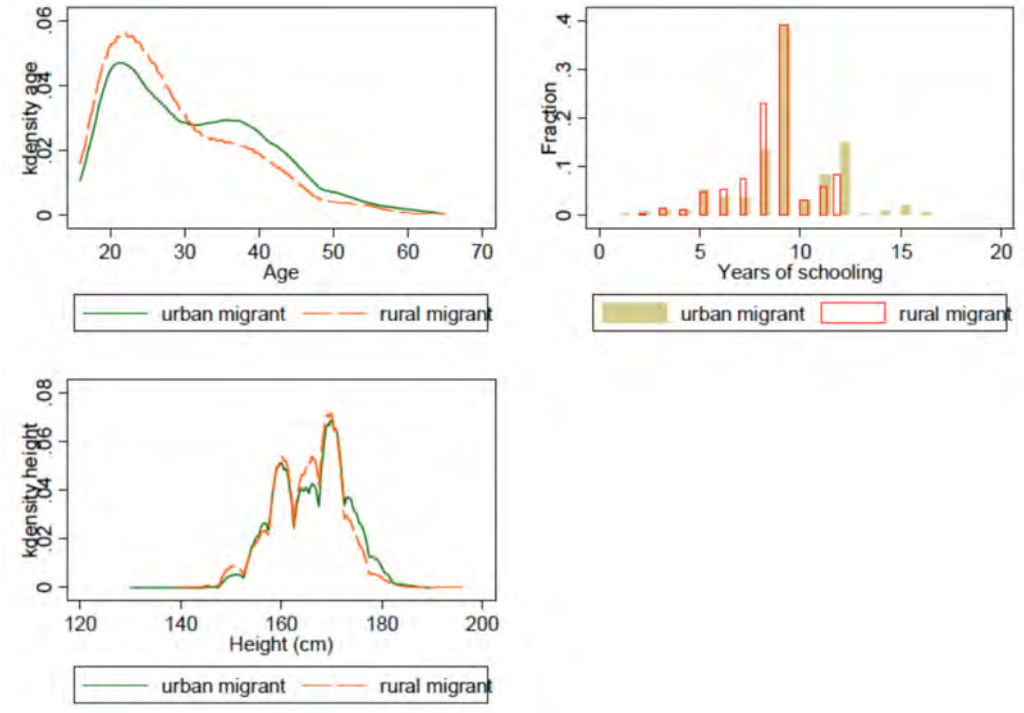
	Total sample		Migrants		Non-migrants	
	Mean	Std dev.	Mean	Std dev.	Mean	Std dev.
Currently migrated (%)	0.28	0.45				
Age	36.37	11.16	28.48	8.70	39.48	10.47
Males (proportion)	0.55		0.63		0.52	
Years of schooling	7.94	2.22	8.51	1.88	7.72	2.31
School performance (good/very good) (proportion)	0.31		0.30		0.31	
Being healthy/very healthy (proportion)	0.83		0.90		0.81	
Height (cm)	164.68	6.69	165.30	6.84	164.43	6.62
Birth order	2.27	1.38	2.05	1.19	2.36	1.44
Married (proportion)	0.78		0.56		0.87	
Number of children ever given birth to	1.33	1.06	0.77	0.91	1.56	1.03
Daily wage for unskilled labour (yuan)	42.66	12.86	41.20	11.75	43.23	13.22
Village is in a hilly area (proportion)	0.04		0.04		0.04	
Village is in a mountainous area (proportion)	0.02		0.02		0.01	
Percentage of village labour force migrated in 2005	0.30	0.20	0.36	0.19	0.27	0.20
Number of observations	16 499		4662		11 837	

Table 15.1b Summary statistics for rural sample with migrants and non-migrants: Indonesia

	Total sample		Migrants		Non-migrants	
	Mean	Std dev.	Mean	Std dev.	Mean	Std dev.
Currently migrated (proportion)	0.032					
Females (proportion)	0.508		0.472		0.509	
Age	0.393	0.165	0.364	0.143	0.394	0.166
Student	0.304	0.460	0.106	0.308	0.311	0.463
Years of schooling	7.822	3.469	10.084	4.000	7.738	3.419
Married	0.719	0.450	0.785	0.411	0.716	0.451
Proportion of those in the same rural district migrated to Medan	0.005	0.030	0.008	0.026	0.005	0.030
Proportion of those in the same rural district migrated to Tangerang	0.002	0.004	0.002	0.004	0.002	0.004
Proportion of those in the same rural district migrated to Samarinda	0.002	0.006	0.003	0.009	0.002	0.006
Proportion of those in the same rural district migrated to Makassar	0.003	0.010	0.010	0.019	0.003	0.009
Number of observations	82 589		2615		79 974	

Before we launch into a comparison of migrants and urban incumbents, we present some graphs to show that the migrants observed in the RHS are similar in characteristics to the migrants observed in the UMS. Figure 15.1 plots the age, years of schooling, and height distributions for the two migrant samples for China and it shows that migrants in both samples have similar age and height distributions, but migrants observed in cities are more educated than those observed in the rural areas. On average, the difference in years of schooling is about 0.9 of a year. Since we have only one survey of migrants in Indonesia (there is no implied set of migrants from the countryside, only the migrants found in the cities) there is no concomitant figure for Indonesia.

Figure 15.1 Comparison between migrants in rural and urban surveys: China



Tables 15.2a and 15.2b summarise the unconditional means of important variables for migrants and locals in the cities for the two countries. The China sample shown in Table 15.2a includes individuals who are in the labour force between the ages of sixteen and fifty-five and have positive earnings. On average, migrants in our sample are 11 years younger than their urban incumbents, 5 per cent more likely to be males, with one year less schooling, 10 per cent more likely to be healthy, and almost equal in height. With regard to labour-market outcomes, migrants on average earn about 65 per cent of urban incumbents' earnings, and the two groups have very different occupational distributions. Figure 15.2a exhibits the occupational distribution for the migrant and urban samples in China, whilst Figure 15.2b shows the distribution for Indonesia. Figure 15.2a clearly shows that most migrants in China are concentrated in the sales–services and production workers categories, while most of the urban incumbents are in the professional, managerial and clerical groups.

In Indonesia, the occupational groupings of migrants and urban incumbents look far more similar, with services and skilled workers dominating the distribution. The percentage of professionals is exactly the same in Indonesia for migrants and non-migrants.

Figure 15.2a Occupational distribution of migrants and urban incumbents: China

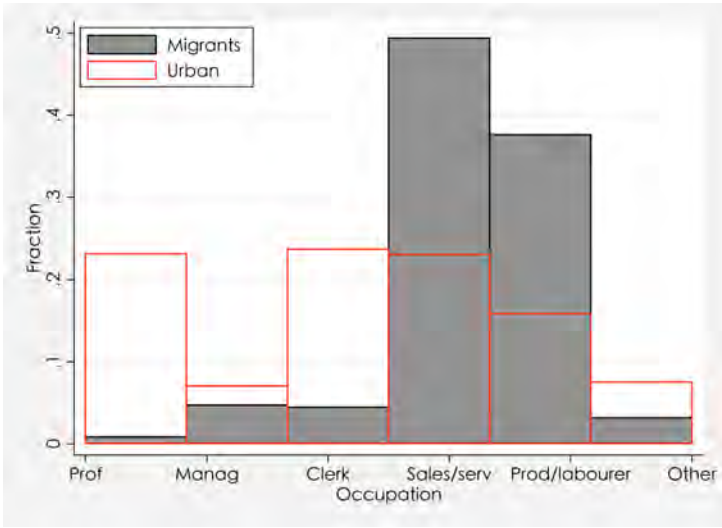


Figure 15.2b Occupational distribution of migrants and urban incumbents: Indonesia

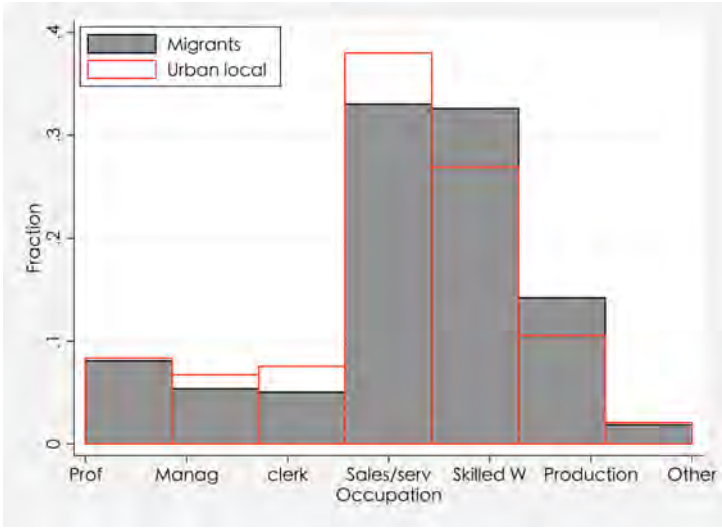


Table 15.2b shows the averages for migrants and urban incumbents in Indonesian cities. The Indonesian data cover individuals who are in the labour force between the ages of sixteen and eighty-six with positive earnings. In general, there is no clear difference between the characteristics of migrants and those of locals in the cities, with the only significant differences being that migrants in our sample are 8 per cent more likely to be males than their urban incumbents and 5 per cent more likely to be smokers. Differences in education or health are otherwise small.

Table 15.2a Summary statistics for urban incumbents and urban migrant samples: China

	Total urban		Migrants		Urban incumbents	
	Mean	Std dev.	Mean	Std dev.	Mean	Std dev.
Individual characteristics:						
Age	34.51	10.17	29.21	9.12	40.31	7.83
Males (proportion)	0.58		0.60		0.55	
Years of schooling	9.93	2.16	9.42	2.35	10.49	1.77
School performance (good/very good) (proportion)	0.40		0.25		0.56	
Exam score	78.50	174.98	36.08	121.13	125.00	209.69
Being healthy/very healthy (proportion)	0.81		0.86		0.76	
Height (cm)	166.48	7.23	166.37	7.06	166.61	7.41
Birth order	2.11	1.00	2.12	1.32	2.09	0.44
Married (proportion)	0.74		0.52		0.97	
Number of children ever given birth to	0.82	0.65	0.67	0.80	0.98	0.38
Labour market variables:						
Log hourly earnings	1.98	0.72	1.67	0.51	2.32	0.75
Professional (proportion)	0.12		0.01		0.24	
Managerial (proportion)	0.04		0.02		0.07	
Sales and service workers (proportion)	0.38		0.56		0.19	
Production workers (proportion)	0.26		0.35		0.17	
Other occupation (proportion)	0.04		0.00		0.08	
Dummy for migrants	0.52					
Migrants' hometown and migration variables:						
Daily wage for unskilled labour (yuan)			37.89	12.20		
Village is in a hilly area (proportion)			0.23			
Village is in a mountainous area (proportion)			0.24			
Age left village			22.50	7.53		
Year since first migrated			7.03	5.98		
Number of observations	8950		4680		4270	

Table 15.2b Summary statistics for urban incumbents and urban migrant samples: Indonesia

	Total urban		Migrants		Urban incumbents	
	Mean	Std dev.	Mean	Std dev.	Mean	Std dev.
Individual characteristics:						
Age	35.97	12.34	36.81	12.51	35.26	12.14
Females (proportion)	0.34		0.30		0.36	
Married (proportion)	0.83		0.82		0.85	
Student (proportion)	0.00		0.00		0.00	
Disabled (proportion)	0.00		0.00		0.00	
Being healthy/very healthy (proportion)	0.95		0.95		0.96	
Height (m)	1.61	0.08	1.61	0.09	1.62	0.08
Smoking (proportion)	0.49		0.52		0.47	
Years of schooling	10.19	3.97	10.01	3.84	10.34	4.07
School performance (good/very good) (proportion)	0.29		0.30		0.28	
Years of repeating school	0.20	1.44	0.21	1.54	0.19	1.34
Labour market variables:						
Log total monthly earnings from all jobs	13.80	0.87	13.89	0.82	13.73	0.90
Log hourly earnings from main job	8.74	1.15	8.76	1.12	8.72	1.17
Managerial (proportion)	0.06		0.05		0.06	
Professional (proportion)	0.09		0.09		0.09	
Clerical worker (proportion)	0.07		0.05		0.08	
Sales worker (proportion)	0.21		0.20		0.21	
Service worker (proportion)	0.14		0.12		0.16	
Technician (proportion)	0.10		0.12		0.09	
Machine operator (proportion)	0.04		0.05		0.02	
Transportation operator (proportion)	0.06		0.07		0.06	
Armed forces (proportion)	0.02		0.02		0.02	
Other skilled worker (proportion)	0.20		0.21		0.18	
Agricultural worker (proportion)	0.02		0.02		0.02	
Dummy for migrants	0.46					
Migration variables:						
Age left village	9.40	12.08	20.34	9.66		
Year since first migrated	4.96	10.09	10.73	12.59		
Number of observations	3433		1586		1847	

Analyses

The selection model

Tables 15.3a and 15.3b show the estimates for Equation 15.2 using the RUMiCI rural sample for China and the combined RUMiCI and *Susenas* rural sample for Indonesia. As tends to be the case, the relatively young and highly educated are the ones more likely to migrate, as witnessed by the positive coefficient on education and the negative coefficient on age. The results on gender and marital status, however, differ significantly between the two countries. In China, men are 10 per cent more likely to move to cities, while gender plays no role in explaining migration probabilities for Indonesia. In addition, singles are more likely to migrate in China but the opposite is true for the Indonesian case. These differences fit the difference in institutional settings in that in China it is hard to bring children and families into the cities whereas this is not a particular problem in Indonesia.

Tables 15.3c and 15.3d show the selection equations for Indonesia separating recent and lifelong migration. This is mainly to see if it makes much of a difference to the determinants of migration and hence the sensitivity of the later analyses to the definition of migration. If we focus on two key characteristics, years of schooling and the network size (where the network is the eventual instrument), then we see that there is not much difference between the findings of Tables 15.3b to 15.3d. The marginal effect of years of schooling changes from 0.121 in Table 15.3b to 0.118 in Table 15.3c and 0.135 in Table 15.3d, well within each other's confidence intervals. The effects of the network size is always of the same sign and similar magnitude in each of these three tables, with the effects of the network size in Medan, Tangerang and Samarinda within each other's confidence interval. Only for Makassar is it the case that for more recent migrants, the effect of the network size is significantly smaller (16.8 in Table 15.3c as compared to 20.2 in Table 15.3b and 21.0 IN Table 15.3d) but these effects are still within 20 per cent of each other.

Table 15.3a Marginal effect from migration selection equation: China

	Probit estimates			OLS estimates		
	Total	Males	Females	Total	Males	Females
Proportion of village labour force migrated in 2005	0.340	0.387	0.269	0.310	0.338	0.274
	[0.042]***	[0.051]***	[0.036]***	[0.038]***	[0.044]***	[0.038]***
Age	0.009	0.018	0.009	–0.015	–0.005	–0.027
	[0.004]**	[0.005]***	[0.004]**	[0.003]***	[0.004]	[0.004]***
Age^2	–0.035	–0.049	–0.034	0.001	–0.013	0.019
	[0.005]***	[0.007]***	[0.006]***	[0.004]	[0.005]**	[0.005]***
Dummy for males	0.109			0.096		
	[0.010]***			[0.009]***		
Years of schooling	0.026	0.007	0.025	0.015	0.010	0.020
	[0.010]**	[0.015]	[0.011]**	[0.007]**	[0.011]	[0.008]**
Years of $schooling^2$	–0.001	0.000	–0.001	–0.001	–0.001	–0.001
	[0.001]**	[0.001]	[0.001]*	[0.000]*	[0.001]	[0.001]*
School performance (good/very good)	–0.017	–0.021	–0.017	–0.017	–0.016	–0.020
	[0.011]	[0.013]	[0.011]	[0.010]*	[0.011]	[0.012]*
Healthy and very healthy	0.032	0.040	0.018	0.026	0.032	0.018
	[0.014]**	[0.018]**	[0.015]	[0.011]**	[0.014]**	[0.012]
Height	0.001	0.002	–0.001	0.001	0.002	–0.001
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Married	–0.060	–0.044	–0.094	–0.057	–0.028	–0.091
	[0.016]***	[0.021]**	[0.020]***	[0.017]***	[0.020]	[0.021]***
Number of children ever given birth to	–0.017	–0.022	–0.008	–0.020	–0.021	–0.018
	[0.007]**	[0.009]**	[0.008]	[0.006]***	[0.007]***	[0.007]***
Birth order	–0.004	–0.009	0.000	–0.004	–0.008	0.001
	[0.003]	[0.004]**	[0.004]	[0.002]	[0.003]**	[0.003]
Daily wage for unskilled workers in the village	–0.001	–0.001	–0.001	–0.001	–0.001	–0.001
	[0.001]	[0.001]	[0.001]	[0.001]*	[0.001]*	[0.001]
Hilly area	–0.004	–0.018	0.012	–0.006	–0.019	0.010
	[0.020]	[0.025]	[0.022]	[0.018]	[0.022]	[0.022]
Mountainous area	0.127	0.140	0.119	0.104	0.113	0.100
	[0.040]***	[0.047]***	[0.045]***	[0.029]***	[0.035]***	[0.034]***
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-test of the instrument	68.63	57.84	56.99	68.17	59.05	52.73
Observations	16 499	9061	7438	16 499	9061	7438
Adjusted R^2				0.27	0.25	0.29

* significant at 10 per cent

** significant at 5 per cent

*** significant at 1 per cent

Note: Robust standard errors in square brackets.

Table 15.3b Marginal effect from migration selection equation: Indonesia

	Probit estimates			OLS estimates		
	Total	Males	Females	Total	Males	Females
Dummy for females	0.062			0.002		
	(0.048)			(0.002)		
Age	–1.901***	–0.013	–3.935***	–0.045**	0.002	–0.077***
	(0.706)	(1.115)	(0.824)	(0.022)	(0.036)	(0.023)
Age^2	0.000***	0.000	0.000***	0.000**	0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Dummy for students	–0.764***	–0.427***	–1.005***	–0.014***	–0.011***	–0.017***
	(0.059)	(0.085)	(0.082)	(0.001)	(0.003)	(0.002)
Years of schooling	0.121***	0.151***	0.094***	0.001	0.001	0.001
	(0.026)	(0.040)	(0.033)	(0.001)	(0.001)	(0.001)
Years of $schooling^2$	–0.002*	–0.003*	–0.001	0.000**	0.000*	0.000
	(0.001)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)
Married	0.218***	0.118	0.353***	0.008***	0.003	0.011***
	(0.068)	(0.114)	(0.066)	(0.002)	(0.005)	(0.002)
Size of network in Medan	5.943***	6.077***	5.909***	0.835***	0.958***	0.712**
	(0.597)	(0.745)	(0.956)	(0.219)	(0.295)	(0.322)
Size of network in Tangerang	27.195***	23.186***	32.654***	0.920***	0.813**	1.038***
	(5.000)	(7.006)	(6.995)	(0.271)	(0.371)	(0.394)
Size of network in Samarinda	19.131***	17.858***	21.247***	0.898***	0.879***	0.921***
	(1.875)	(2.812)	(2.248)	(0.157)	(0.224)	(0.215)
Size of network in Makassar	20.167***	20.797***	20.128***	1.170***	1.310***	1.025***
	(1.715)	(2.874)	(1.555)	(0.143)	(0.245)	(0.135)
Dummies for island of origin	Yes	Yes	Yes	Yes	Yes	Yes
Constant	–3.458***	–4.012***	–2.874***	–0.009	–0.022**	0.002
	(0.229)	(0.347)	(0.283)	(0.006)	(0.009)	(0.007)
F-test of the instrument	392.11	185.45	285.1	42.48	20.21	29.33
Observations	70 968	36 622	34 346	70 968	36 622	34 346
Adjusted R^2				0.090	0.100	0.082

* significant at 10 per cent

** significant at 5 per cent

*** significant at 1 per cent

Note: Standard errors in parentheses.

Table 15.3c Marginal effect from recent migration selection equation: Indonesia

	Probit estimates			OLS estimates		
	Total	Males	Females	Total	Males	Females
Dummy for females	0.029			0.003		
	(0.080)			(0.002)		
Age	–8.502***	–9.086***	–8.238***	–0.067***	–0.090***	–0.049**
	(1.239)	(1.369)	(1.891)	(0.014)	(0.024)	(0.024)
Age^2	0.001***	0.001***	0.001***	0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Dummy for students	–0.402***	–0.040	–0.649***	–0.005**	–0.000	–0.007**
	(0.077)	(0.076)	(0.110)	(0.002)	(0.001)	(0.003)
Years of schooling	0.118*	0.068	0.152	-0.000	-0.001	0.001
	(0.060)	(0.056)	(0.093)	(0.001)	(0.001)	(0.001)
Years of schooling^2	-0.002	0.001	-0.003	0.000*	0.000*	0.000
	(0.003)	(0.002)	(0.004)	(0.000)	(0.000)	(0.000)
Married	0.653***	0.842***	0.511***	0.007***	0.008***	0.007**
	(0.078)	(0.110)	(0.113)	(0.002)	(0.002)	(0.004)
Size of network in Medan	5.177***	1.587***	6.329***	0.459	0.007	0.766
	(1.392)	(0.487)	(1.550)	(0.374)	(0.015)	(0.541)
Size of network in Tangerang	29.816***	21.026***	37.696***	0.259**	0.109	0.371**
	(4.923)	(5.339)	(7.367)	(0.106)	(0.086)	(0.148)
Size of network in Samarinda	19.809***	19.142***	22.352***	0.104***	0.112**	0.101
	(2.041)	(2.674)	(3.252)	(0.040)	(0.044)	(0.065)
Size of network in Makassar	16.822***	14.731***	19.572***	0.228***	0.284***	0.209*
	(1.262)	(1.700)	(1.938)	(0.089)	(0.085)	(0.123)
Dummies for island of origin	Yes	Yes	Yes	Yes	Yes	Yes
Constant	–2.403***	–2.106***	–2.534***	0.008	0.016***	0.003
	(0.503)	(0.410)	(0.734)	(0.007)	(0.005)	(0.010)
F-test of the instrument	315.6	176.45	170.25	15.12	10.1	8.89
Observations	69 475	35 831	33 644	69 401	35 793	33 608
Adjusted R^2				0.065	0.010	0.156

* significant at 10 per cent
** significant at 5 per cent
*** significant at 1 per cent
Note: Standard errors in parentheses.

Table 15.3d Marginal effect from lifetime migration selection equation: Indonesia

	Probit estimates			OLS estimates		
	Total	Males	Females	Total	Males	Females
Dummy for females	0.090			0.002		
	(0.059)			(0.011)		
Age	3.787***	7.201***	0.572	0.005	0.046	0.004
	(1.009)	(1.753)	(1.099)	(0.246)	(0.491)	(0.203)
Age^2	–0.000**	–0.001***	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Dummy for students	–1.480***	–1.112***	–1.705***	–0.040***	–0.037**	–0.040***
	(0.147)	(0.177)	(0.230)	(0.008)	(0.017)	(0.008)
Years of schooling	0.135***	0.177***	0.095***	0.003	0.002	0.003
	(0.030)	(0.048)	(0.035)	(0.006)	(0.010)	(0.005)
Years of $schooling^2$	–0.003**	–0.004**	–0.002	0.000	0.000	0.000
	(0.001)	(0.002)	(0.002)	(0.000)	(0.001)	(0.000)
Married	0.007	–0.270**	0.306***	0.010	0.004	0.014
	(0.082)	(0.132)	(0.084)	(0.016)	(0.036)	(0.017)
Proportion of those in the same rural district migrated to Medan	6.188***	6.397***	5.830***	0.271*	0.436**	0.097
	(0.673)	(0.756)	(1.277)	(0.148)	(0.222)	(0.187)
Proportion of those in the same rural district migrated to Tangerang	24.768***	21.914**	28.637***	1.137	–0.060	2.452***
	(6.807)	(9.194)	(9.966)	(1.141)	(2.027)	(0.672)
Proportion of those in the same rural district migrated to Samarinda	16.548***	15.552***	17.940***	–0.197	0.370	–0.776
	(2.556)	(4.068)	(2.633)	(0.595)	(0.729)	(0.924)
Proportion of those in the same rural district migrated to Makassar	21.001***	23.617***	18.988***	–1.297**	–1.855*	–0.715
	(2.432)	(4.160)	(1.943)	(0.652)	(0.964)	(0.850)
Dummies for island of origin	Yes	Yes	Yes	Yes	Yes	Yes
Constant	–4.959***	–5.848***	–4.107***	–0.036	–0.038	–0.039
	(0.300)	(0.481)	(0.363)	(0.061)	(0.115)	(0.042)
F-test of the instrument	228.69	128.6	168.08	2.46	1.76	4.87
Observations	70 164	36 204	33 960	70 177	36 210	33 967
Adjusted R^2				0.046	0.034	0.076

* significant at 10 per cent

** significant at 5 per cent

*** significant at 1 per cent

Note: Standard errors in parentheses.

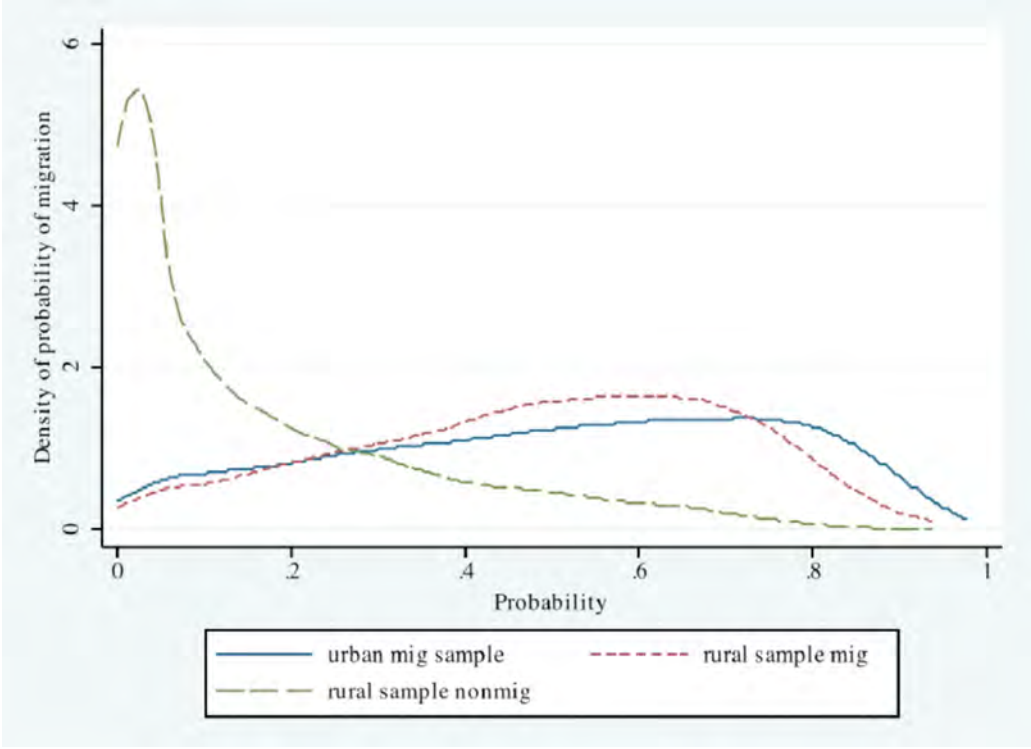
For the Chinese case, we show the extended selection estimations, which control for health, height, birth order and village-level information. Individuals who are healthier, with fewer children, and from mountainous areas (which tend to be poorer) are more likely to migrate. This information is not available in the Indonesian rural data, but, as a robustness check, we redid all the Chinese estimations using the same selection specification as we used in the Indonesian estimations, which did not significantly change the main results.[4]

The instrument used to identify the migration selection equation in the case of China is the proportion of the labour force migrated from the migrant's village in 2005. For Indonesia, we use the proportion of the labour force in each migrant's rural district migrating to the cities included in the survey—that is, Medan, Tangerang, Samarinda or Makassar—in 2007–08. In both countries, we find that the instrument is highly significant and of the expected sign: the higher the proportion who previously migrated to a particular destination, the more likely someone from that region is to migrate in 2008. The F-test presented at the bottom of each table signals that there is no weak instrument problem.

The superior fit of the estimation results in China is probably related to the greater wage differential between the cities and the rural countryside, as well as to the fact that migration is mainly temporary; everyone who can profitably migrate in China does so, at least for a few years, and our controls seem to pick up the factors that predict this profitability of migration. In Indonesia, other unmeasured factors presumably prevent individuals from migrating (which is a more permanent choice in Indonesia).

Using the estimated results from Tables 15.3a and 15.3b, we predict the probability of migration for the RUMiCI urban migrant samples; we calculate λ_i for each individual, which we include in the earnings equation as a Heckman correction term. The predicted migration probability is plotted for migrants and the rural samples (see Figure 15.3). The figures show that the predicted probability and λ_i for the sample of migrants observed in cities (out-of-sample predictions) exhibit almost the same pattern as those observed for the migrants in the rural household sample (in-sample predictions), indicating the similarity of the migrants observed from the two samples.

Figure 15.3 Predicted probability of migration: China



The earnings model

The main wage regression results are reported in Tables 15.4a and 15.4b. The two columns of each table show the progression from not correcting for selectivity (simple OLS) to the inclusion of a selection correction term. For both countries, we provide results for hourly earnings from the main job. We see in column 1 of Table 15.4a that the effect of being a migrant in China—comparable with being a recent migrant in Indonesia—is to have nearly 56 per cent lower hourly wages than their urban incumbents. This does not yet allow for selection. The equivalent result in Table 15.4b for Indonesia is that a recent migrant earns nearly 17.5 per cent more than their urban incumbents. Given that migrants work more hours, total monthly earnings of recent migrants are about 30 per cent higher than the earnings of corresponding urban workers (Table 15.4c).

Table 15.4a Results from the earnings equations (without occupation)

	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit
Dummy for migrants	–0.560	–0.914	–0.646	–0.463
	[0.086]***	[0.119]***	[0.081]***	[0.067]***
Lambda		0.965		
		[0.225]***		
Age	0.038	0.039	0.041	0.052
	[0.007]***	[0.007]***	[0.006]***	[0.006]***
Age^2	–0.000	–0.001	–0.001	–0.001
	[0.000]***	[0.000]***	[0.000]***	[0.000]***
Males	0.112	0.139	0.148	0.145
	[0.018]***	[0.019]***	[0.019]***	[0.019]***
Years of schooling	0.058	0.065	0.067	0.069
	[0.014]***	[0.014]***	[0.014]***	[0.014]***
Years of $schooling^2$	–0.001	–0.002	–0.002	–0.002
	[0.001]*	[0.001]**	[0.001]**	[0.001]**
Good school performance	0.130	0.125	0.124	0.126
	[0.013]***	[0.013]***	[0.013]***	[0.013]***
National college examination score	0.001	0.001	0.001	0.001
	[0.000]***	[0.000]***	[0.000]***	[0.000]***
Healthy	0.050	0.056	0.058	0.060
	[0.015]***	[0.015]***	[0.015]***	[0.015]***
Height	0.008	0.008	0.008	0.008
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Married	0.116	0.090	0.084	0.101
	[0.023]***	[0.024]***	[0.024]***	[0.024]***
Number of children	–0.081	–0.088	–0.088	–0.085
	[0.014]***	[0.014]***	[0.014]***	[0.014]***
Birth order	–0.015	–0.016	–0.017	–0.016
	[0.006]**	[0.006]***	[0.006]***	[0.006]***
City dummies	Yes	Yes	Yes	Yes
Migrant specific information				
Age left home village	–0.005	–0.013	–0.016	–0.018
	[0.002]***	[0.003]***	[0.001]***	[0.001]***
Years since migration	0.017	0.011	0.007	0.005
	[0.005]***	[0.005]**	[0.004]	[0.004]
Years since $migration^2$	–0.001	–0.001	–0.000	–0.001
	[0.000]***	[0.000]***	[0.000]***	[0.000]***

	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit
Village information				
Daily wage for unskilled in home village	0.002	0.002	0.001	0.001
	[0.001]***	[0.001]**	[0.001]**	[0.001]*
Home village in hilly area	–0.007	–0.006	–0.006	–0.005
	[0.022]	[0.022]	[0.022]	[0.022]
Home village in mountainous area	–0.037	0.017	0.033	0.018
	[0.022]*	[0.025]	[0.024]	[0.024]
Home town province	Yes	Yes	Yes	Yes
Observations	8950	8950	8950	8950
R-squared	0.41	0.41	0.41	0.41

* significant at 10 per cent

** significant at 5 per cent

*** significant at 1 per cent

Note: Standard errors in square brackets.

Table 15.4b Results from the hourly earnings equations (without occupation)

	Result for all migrants				Results for recent and lifetime migrants			
	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit
Dummy for migrants	0.111	0.109	0.097	0.247				
	(0.101)	(0.100)	(1.370)	(0.702)				
Dummy for recent migrants					0.175*	0.165	–1.507	1.544
					(0.106)	(0.105)	(2.821)	(1.972)
Dummy for lifetime migrants					0.138*	0.130*	–1.464	–0.801
					(0.078)	(0.078)	(1.856)	(1.040)
Lambda		0.302**				0.342**		
		(0.133)				(0.138)		
Dummy for females	–0.127*	–0.125*	–0.120*	–0.120*	–0.133**	–0.132**	–0.125*	–0.140**
	(0.069)	(0.069)	(0.069)	(0.069)	(0.065)	(0.065)	(0.067)	(0.066)
Age	0.024*	0.024*	0.025*	0.026**	0.024*	0.024*	0.024*	0.027**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Age^2	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000	–0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	–0.092	–0.097	–0.097	–0.100	–0.092	–0.095	–0.073	–0.097
	(0.061)	(0.061)	(0.065)	(0.064)	(0.061)	(0.061)	(0.068)	(0.071)
Dummy for students	–0.302	–0.262	–1.007***	–1.004***	–0.296	–0.260	–1.086***	–1.034***
	(0.652)	(0.689)	(0.255)	(0.255)	(0.658)	(0.700)	(0.266)	(0.262)
Disability	0.018	0.012	–0.005	–0.007	0.012	0.003	–0.016	–0.027
	(0.283)	(0.282)	(0.286)	(0.286)	(0.287)	(0.287)	(0.293)	(0.292)
Healthy	0.110	0.111	0.070	0.070	0.108	0.110	0.062	0.069
	(0.139)	(0.138)	(0.140)	(0.140)	(0.139)	(0.138)	(0.140)	(0.140)
Height	0.848**	0.849**	0.866**	0.867**	0.843**	0.843**	0.833**	0.847**
	(0.360)	(0.359)	(0.371)	(0.371)	(0.356)	(0.355)	(0.364)	(0.366)
Smoking	0.028	0.028	0.032	0.033	0.025	0.027	0.030	0.030
	(0.054)	(0.054)	(0.055)	(0.055)	(0.054)	(0.054)	(0.055)	(0.055)

	Result for all migrants				Results for recent and lifetime migrants			
	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit
Years of schooling	0.024	0.025	0.022	0.022	0.025	0.027	0.029	0.028
	(0.024)	(0.024)	(0.025)	(0.025)	(0.024)	(0.024)	(0.026)	(0.025)
Years of schooling^2	0.003**	0.003**	0.003**	0.003**	0.003**	0.003**	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Good school performance	0.158***	0.157***	0.167***	0.167***	0.156***	0.155***	0.166***	0.166***
	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.051)	(0.052)	(0.052)
Years of repeating school	0.010	0.010	0.010	0.009	0.010	0.010	0.010	0.010
	(0.020)	(0.020)	(0.021)	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)
City dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Migrant specific information								
Age left home village	–0.005	–0.005	–0.002	–0.002	–0.006*	–0.006*	–0.001	–0.002
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Year since migration	–0.001	–0.001	0.000	0.000				
	(0.008)	(0.008)	(0.008)	(0.008)				
Year since migration^2	0.000	0.000	0.000	0.000				
	(0.000)	(0.000)	(0.000)	(0.000)				
Village information								
Dummies for island of origin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	5.901***	5.654***	5.919***	5.918***	5.868***	5.580***	5.898***	5.801***
	(0.608)	(0.615)	(0.626)	(0.626)	(0.611)	(0.621)	(0.623)	(0.630)
Observations	2559	2559	2485	2485	2559	2559	2485	2485
R-squared	0.104	0.105	0.105	0.105	0.104	0.105	0.105	0.105

* significant at 10 per cent

** significant at 5 per cent

*** significant at 1 per cent

Note: Standard errors in parentheses.

Table 15.4c Results from the total monthly earnings equations (without occupation)

	Result for all migrants				Results for recent and lifetime migrants			
	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit
Dummy for migrants	0.206***	0.205***	–0.635	–0.284				
	(0.069)	(0.069)	(0.951)	(0.427)				
Dummy for recent migrants					0.307***	0.300***	–2.006	–0.941
					(0.072)	(0.072)	(2.144)	(0.853)
Dummy for lifetime migrants					0.203***	0.198***	–1.399	–0.777
					(0.059)	(0.059)	(1.098)	(0.683)
Lambda		0.219**				0.217**		
		(0.097)				(0.101)		
Dummy for females	–0.230***	–0.228***	–0.216***	–0.217***	–0.236***	–0.235***	–0.229***	–0.236***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.046)	(0.046)	(0.047)	(0.048)
Age	0.081***	0.081***	0.080***	0.080***	0.087***	0.087***	0.084***	0.082***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Age^2	–0.001***	–0.001***	–0.001***	–0.001***	–0.001***	–0.001***	–0.001***	–0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	–0.119***	–0.123***	–0.122***	–0.124***	–0.121***	–0.122***	–0.103**	–0.104**
	(0.041)	(0.041)	(0.044)	(0.043)	(0.041)	(0.041)	(0.046)	(0.045)
Dummy for students	–1.906***	–1.878***	–2.218***	–2.212***	–1.886***	–1.864***	–2.276***	–2.262***
	(0.319)	(0.343)	(0.250)	(0.248)	(0.321)	(0.346)	(0.255)	(0.252)
Disability	–0.461**	–0.466**	–0.473**	–0.469**	–0.456**	–0.462**	–0.474**	–0.468**
	(0.214)	(0.215)	(0.214)	(0.214)	(0.212)	(0.213)	(0.216)	(0.216)
Healthy	0.127	0.126	0.126	0.127	0.130	0.129	0.122	0.122
	(0.091)	(0.091)	(0.092)	(0.092)	(0.091)	(0.091)	(0.092)	(0.092)
Height	0.711***	0.712***	0.725**	0.726**	0.721***	0.722***	0.703**	0.710**
	(0.273)	(0.272)	(0.283)	(0.283)	(0.273)	(0.272)	(0.281)	(0.282)
Smoking	0.028	0.028	0.022	0.021	0.026	0.027	0.021	0.021
	(0.037)	(0.037)	(0.038)	(0.038)	(0.037)	(0.037)	(0.038)	(0.038)

	Result for all migrants				Results for recent and lifetime migrants			
	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using OLS	IV with predicted probability using probit
Years of schooling	0.057***	0.058***	0.056***	0.055***	0.056***	0.057***	0.061***	0.057***
	(0.017)	(0.017)	(0.018)	(0.018)	(0.017)	(0.017)	(0.018)	(0.018)
Years of schooling^2	0.001	0.001*	0.002*	0.002*	0.001*	0.001*	0.002*	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Good school performance	0.160***	0.159***	0.168***	0.168***	0.157***	0.156***	0.169***	0.169***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.035)	(0.034)
Years of repeating school	0.016	0.016	0.015	0.015	0.016	0.016	0.015	0.015
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)
City dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Migrant specific information								
Age left home village	–0.006**	–0.006**	0.000	0.000	–0.006***	–0.006***	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Year since migration	0.005	0.005	0.010*	0.010*				
	(0.006)	(0.006)	(0.005)	(0.005)				
Year since migration^2	–0.000	–0.000	–0.000	–0.000				
	(0.000)	(0.000)	(0.000)	(0.000)				
Village information								
Dummies for island of origin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	10.070***	9.891***	10.118***	10.119***	9.932***	9.749***	10.050***	10.062***
	(0.480)	(0.483)	(0.496)	(0.496)	(0.482)	(0.486)	(0.495)	(0.498)
Observations	2565	2565	2490	2490	2565	2565	2490	2490
R-squared	0.293	0.294	0.290	0.290	0.294	0.295	0.289	0.289

* significant at 10 per cent

** significant at 5 per cent

*** significant at 1 per cent

Note: Standard errors in parentheses.

When we then add selection effects (column 2 in each table), we find that in both countries the point estimate of λ_1 is positive, indicating positive self-selection of migrants. This selection effect is highly significant in China but insignificant in Indonesia, which reiterates the poorer fit in terms of explaining migration in Indonesia. The inclusion of selection decreases the effect of being a migrant in both countries; migrants in China are now predicted to earn 0.914 log-points less than their urban counterparts whilst in Indonesia the point estimate has become insignificantly negative. For the Chinese case, λ_1 (the unobservable selection effect) contributes to a 35 per cent increase in earnings for migrants (which is the change in the migrant dummy when not allowing for selection). In Indonesia, this is approximately 1 per cent.

The effect of the other variables on wages is as expected for both countries. For China, the age–earnings profile is inverse-U shaped; the more educated earn more, as do those whose high-school performance was self-rated as being good or very good. To better control for observed ability, we also include the self-reported National College Entrance Examination (NCEE) score variable, which is set to zero if the individual did not take the NCEE. We find that the test score is positively and highly significantly related to one's earnings. In addition, healthy and taller people earn more, which is consistent with findings from other countries. Men earn more, as do individuals who are married, whereas individuals who have more children and are of higher birth order earn less.

Consistent with the international migration literature, we find that individuals who left their village at younger ages earn more, as do individuals who migrated longer ago. One interpretation is that this positive affect of having been somewhere for a long time is an indication of migrants 'catching up' with the locals because of familiarising themselves with local labour-market knowledge and language and eventually reaching similar levels of local human-capital variables.

The regressions also include each migrant's home village characteristics, including the daily wage for unskilled workers and geographic location. We find that individuals who come from villages where wages are higher earn more. Whether or not the hometown is in a mountainous area does not appear to matter.

In the case of Indonesia, we find similar results as in China regarding the effect of individual characteristics: the age–earnings profile is inverse-U shaped; the more educated earn more, as do those whose high-school performance is self-rated as being good or very good. Healthier and taller people earn more, men earn more, those still in school earn less, and those who left their village at a younger age earn more.

The earnings equations estimated above for the two countries suggest that migrants in China are paid extremely low earnings relative to their urban incumbent counterparts, whereas in Indonesia migrants are paid equal earnings.

Next we examine the channels through which migrants in China are discriminated against. As discussed in the background section, discrimination in China is believed to function partially via work restrictions on migrants in particular jobs. In Indonesia, such restrictions do not generally exist. This is almost self-evident from the proportion of workers in the major categories—while in China the proportions of migrants and urban locals working as professionals are 1 and 24 per cent, respectively; the same comparison in

Indonesia is 8 per cent for both migrants and locals. Hence while in China professional jobs (such as those in the civil service) are reserved for urban residents, in Indonesia, they are not.

When adding broad occupational structure in Tables 15.5a and 15.5b in order to absorb this channel for discrimination, we find that in China (Table 15.5a) the effect of migration on wages increases by 12 percentage points from –0.56 to –0.44 (see column 2 of Tables 15.4a and 15.5a). Hence occupational barriers are able to explain about 20 per cent of the wage differences between migrants and city incumbents. In Indonesia (Table 15.5b), the inclusion of the occupational variables makes the selection effect all but disappear and reduces the effect of being a recent migrant to an insignificant 14 per cent. This means that the slightly higher hourly wages of migrants are explained mainly by their over-representation in higher-paying occupations, which can be due either to some unmeasured greater degree of effort or to a compensating wage differential for working in less pleasant occupations. Table 15.1 supports the idea of higher work effort in the sense that migrants also work significantly longer hours. Table 15.5c, which shows the effects of migration when looking at total monthly earnings, show that recent migrants earn a significant 27 per cent more than urban residents, mainly because of the longer hours worked. Again, selection effects are unimportant in Indonesia for recent migrants.

Table 15.5a Results from earnings equations with occupation and school quality controls (China)

	Results with occupational controls				Results with occupation and school quality controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
Migrant dummy	-0.438	-0.756	-0.535	-0.369	-0.387	-0.740	-0.526	-0.363
	[0.083]***	[0.114]***	[0.078]***	[0.064]***	[0.083]***	[0.114]***	[0.078]***	[0.064]***
lambda		0.864				0.973		
		[0.216]***				[0.217]***		
Age	0.035	0.036	0.036	0.046	0.036	0.037	0.034	0.044
	[0.007]***	[0.007]***	[0.006]***	[0.006]***	[0.007]***	[0.007]***	[0.006]***	[0.006]***
Age^2	0.000	0.000	0.000	-0.001	0.000	0.000	0.000	-0.001
	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***
Males	0.091	0.115	0.120	0.117	0.090	0.117	0.119	0.116
	[0.018]***	[0.019]***	[0.018]***	[0.018]***	[0.018]***	[0.019]***	[0.018]***	[0.018]***
Years of schooling	0.063	0.069	0.070	0.071	0.060	0.065	0.066	0.067
	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***
Years of schooling squared	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]**	[0.001]***	[0.001]***	[0.001]***
good school performance	0.087	0.083	0.082	0.084	0.143	0.143	0.143	0.145
	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.017]***	[0.017]***	[0.017]***	[0.017]***
good school performance* migrant dummy					-0.120	-0.131	-0.131	-0.132
					[0.025]***	[0.025]***	[0.025]***	[0.025]***
National college examination score	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***
healthy	0.045	0.051	0.052	0.053	0.045	0.051	0.051	0.052
	[0.015]***	[0.015]***	[0.015]***	[0.015]***	[0.015]***	[0.015]***	[0.015]***	[0.015]***
height	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
married	0.100	0.077	0.072	0.087	0.097	0.071	0.067	0.082
	[0.022]***	[0.023]***	[0.023]***	[0.023]***	[0.022]***	[0.023]***	[0.023]***	[0.023]***

	Results with occupational controls				Results with occupation and school quality controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
nchildren	-0.072	-0.079	-0.079	-0.075	-0.072	-0.080	-0.080	-0.076
	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***
Birth order	-0.016	-0.017	-0.017	-0.017	-0.016	-0.017	-0.017	-0.017
	[0.006]***	[0.006]***	[0.006]***	[0.006]***	[0.006]***	[0.006]***	[0.006]***	[0.006]***
professional	0.211	0.211	0.211	0.212	0.205	0.205	0.205	0.205
	[0.022]***	[0.022]***	[0.022]***	[0.022]***	[0.022]***	[0.022]***	[0.022]***	[0.022]***
Managerial	0.332	0.331	0.331	0.329	0.327	0.326	0.326	0.324
	[0.031]***	[0.031]***	[0.031]***	[0.031]***	[0.031]***	[0.031]***	[0.031]***	[0.031]***
Sales and services workers	-0.267	-0.266	-0.266	-0.267	-0.263	-0.262	-0.261	-0.262
	[0.019]***	[0.019]***	[0.019]***	[0.019]***	[0.019]***	[0.019]***	[0.019]***	[0.019]***
Production workers	-0.103	-0.101	-0.101	-0.103	-0.098	-0.095	-0.095	-0.097
	[0.020]***	[0.020]***	[0.020]***	[0.020]***	[0.020]***	[0.020]***	[0.020]***	[0.020]***
Others	-0.207	-0.207	-0.206	-0.207	-0.203	-0.202	-0.202	-0.202
	[0.033]***	[0.033]***	[0.033]***	[0.033]***	[0.033]***	[0.033]***	[0.033]***	[0.033]***
Selfemployed managers	-0.083	-0.080	-0.080	-0.086	-0.074	-0.070	-0.068	-0.074
	[0.202]	[0.202]	[0.202]	[0.202]	[0.202]	[0.202]	[0.202]	[0.202]
City dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Migrant specific variables								
ageleft	-0.005	-0.011	-0.013	-0.014	-0.005	-0.013	-0.012	-0.013
	[0.002]**	[0.003]***	[0.001]***	[0.001]***	[0.002]***	[0.003]***	[0.001]***	[0.001]***
Year since migration	0.016	0.010	0.008	0.007	0.015	0.009	0.009	0.008
	[0.005]***	[0.005]**	[0.004]**	[0.004]*	[0.005]***	[0.005]*	[0.004]**	[0.004]**
Year since migration^2	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]**	[0.000]***	[0.000]***	[0.000]***

	Results with occupational controls				Results with occupation and school quality controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
Rural variables								
daily wage for unskilled in home village	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.001
	[0.001]***	[0.001]**	[0.001]*	[0.001]*	[0.001]***	[0.001]**	[0.001]**	[0.001]**
home village in hilly area	-0.009	-0.008	-0.008	-0.007	-0.007	-0.006	-0.006	-0.005
	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]
home village in mountainary	-0.031	0.017	0.027	0.013	-0.030	0.024	0.029	0.015
	[0.021]	[0.024]	[0.023]	[0.023]	[0.021]	[0.024]	[0.023]	[0.023]
Provinces migrant came from	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8950	8950	8950	8950	8950	8950	8950	8950
R-squared	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46

Standard errors in brackets
* significant at 10%
** significant at 5%
*** significant at 1%

Table 15.5b Results from hourly earnings equations with occupational controls (Indonesia)

	Results with occupational controls				Results for recent and lifetime migrants with occupational controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
Dummy for migrants	0.071	0.070	0.468	0.351				
	(0.100)	(0.100)	(1.362)	(0.702)				
Dummy for recent migrants					0.148	0.143	-0.412	2.955
					(0.106)	(0.106)	(2.854)	(2.026)
Dummy for lifetime migrants					0.111	0.110	-1.521	-0.594
					(0.079)	(0.078)	(1.853)	(0.807)
lambda		0.284**				0.289**		
		(0.129)				(0.128)		
Dummy for females	-0.103	-0.102	-0.103	-0.102	-0.113*	-0.113*	-0.109	-0.119*
	(0.070)	(0.070)	(0.070)	(0.070)	(0.066)	(0.066)	(0.068)	(0.067)
Age	0.025**	0.025**	0.027**	0.027**	0.025**	0.026**	0.027**	0.033***
	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)
Age^2	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
married	-0.077	-0.081	-0.085	-0.086	-0.078	-0.084	-0.065	-0.117*
	(0.060)	(0.060)	(0.063)	(0.063)	(0.060)	(0.060)	(0.067)	(0.065)
Dummy for students	-0.406	-0.370	-1.094***	-1.096***	-0.399	-0.361	-1.174***	-1.067***
	(0.638)	(0.672)	(0.246)	(0.247)	(0.645)	(0.679)	(0.257)	(0.246)
disable	-0.049	-0.056	-0.069	-0.073	-0.056	-0.065	-0.080	-0.108
	(0.283)	(0.282)	(0.284)	(0.285)	(0.288)	(0.287)	(0.290)	(0.293)
healthy	0.091	0.092	0.051	0.051	0.089	0.090	0.043	0.059
	(0.137)	(0.137)	(0.139)	(0.139)	(0.137)	(0.137)	(0.139)	(0.139)
height	0.889**	0.891**	0.922**	0.922**	0.882**	0.884**	0.891**	0.894**
	(0.357)	(0.356)	(0.369)	(0.369)	(0.352)	(0.351)	(0.362)	(0.362)
smoking	0.039	0.040	0.044	0.045	0.037	0.038	0.042	0.041
	(0.053)	(0.053)	(0.054)	(0.054)	(0.053)	(0.053)	(0.054)	(0.054)

	Results with occupational controls				Results for recent and lifetime migrants with occupational controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
Years of schooling	0.032	0.033	0.030	0.031	0.033	0.034	0.038	0.037
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.026)	(0.025)
Years of schooling squared	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
good school performance	0.127**	0.126**	0.137***	0.137***	0.126**	0.125**	0.137***	0.138***
	(0.051)	(0.051)	(0.052)	(0.052)	(0.051)	(0.051)	(0.052)	(0.052)
years of repeating school	0.010	0.010	0.009	0.009	0.010	0.011	0.010	0.011
	(0.019)	(0.019)	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)	(0.020)
managerial	0.504***	0.500***	0.445***	0.446***	0.485***	0.482***	0.422**	0.423**
	(0.162)	(0.161)	(0.164)	(0.164)	(0.164)	(0.163)	(0.165)	(0.164)
professional	0.388**	0.389***	0.349**	0.348**	0.379**	0.380**	0.334**	0.339**
	(0.151)	(0.150)	(0.151)	(0.151)	(0.152)	(0.151)	(0.153)	(0.152)
clerical worker	0.433***	0.431***	0.380***	0.380***	0.425***	0.423***	0.368**	0.375**
	(0.146)	(0.145)	(0.147)	(0.147)	(0.147)	(0.146)	(0.149)	(0.148)
sales worker	0.074	0.069	0.029	0.030	0.061	0.056	0.012	0.014
	(0.143)	(0.142)	(0.143)	(0.143)	(0.144)	(0.143)	(0.145)	(0.144)
service worker	0.082	0.085	0.058	0.057	0.075	0.077	0.042	0.044
	(0.153)	(0.152)	(0.154)	(0.154)	(0.153)	(0.152)	(0.155)	(0.154)
technician	0.325**	0.318**	0.272*	0.272*	0.312**	0.305**	0.256*	0.263*
	(0.150)	(0.149)	(0.151)	(0.151)	(0.152)	(0.151)	(0.153)	(0.152)
machine operator	0.332**	0.323**	0.272*	0.272*	0.315**	0.306**	0.253*	0.259*
	(0.149)	(0.148)	(0.149)	(0.149)	(0.150)	(0.149)	(0.151)	(0.150)
transportation operator	0.063	0.058	0.002	0.002	0.051	0.046	-0.009	-0.012
	(0.153)	(0.152)	(0.152)	(0.153)	(0.154)	(0.154)	(0.155)	(0.154)
armed force	0.138	0.132	0.071	0.071	0.135	0.129	0.065	0.056
	(0.170)	(0.169)	(0.171)	(0.171)	(0.170)	(0.169)	(0.171)	(0.171)

	Results with occupational controls				Results for recent and lifetime migrants with occupational controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
other skilled worker	0.314**	0.309**	0.274*	0.274*	0.303**	0.298**	0.258*	0.259*
	(0.142)	(0.141)	(0.142)	(0.142)	(0.143)	(0.142)	(0.144)	(0.143)
City dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Migrant specific info.								
Age left home village	-0.004	-0.004	-0.002	-0.002	-0.005	-0.005	-0.001	-0.001
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Year since migration	-0.000	-0.000	0.000	0.000				
	(0.008)	(0.008)	(0.008)	(0.007)				
Year since migration squared	0.000	0.000	0.000	0.000				
	(0.000)	(0.000)	(0.000)	(0.000)				
Village info.								
Dummies for island of origin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	5.606***	5.375***	5.618***	5.619***	5.576***	5.338***	5.600***	5.475***
	(0.623)	(0.631)	(0.641)	(0.642)	(0.624)	(0.632)	(0.638)	(0.638)
Observations	2,559	2,559	2,485	2,485	2,559	2,559	2,485	2,485
R-squared	0.120	0.121	0.120	0.120	0.119	0.120	0.120	0.121

Standard errors in brackets

* significant at 10%

** significant at 5%

*** significant at 1%

Table 15.5c Results from total monthly earnings equations with occupational controls (Indonesia)

	Results with occupational controls				Results for recent and lifetime migrants with occupational controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
Dummy for migrants	0.168**	0.167**	-0.464	-0.150				
	(0.069)	(0.068)	(0.959)	(0.430)				
Dummy for recent migrants					0.272***	0.270***	-1.466	-0.628
					(0.072)	(0.072)	(2.173)	(0.847)
Dummy for lifetime migrants					0.188***	0.187***	-1.682	0.335
					(0.059)	(0.059)	(1.076)	(0.598)
lambda		0.169*				0.159*		
		(0.093)				(0.093)		
Dummy for females	-0.197***	-0.197***	-0.187***	-0.188***	-0.210***	-0.210***	-0.204***	-0.210***
	(0.047)	(0.047)	(0.048)	(0.048)	(0.046)	(0.046)	(0.047)	(0.047)
Age	0.081***	0.081***	0.080***	0.080***	0.086***	0.086***	0.083***	0.082***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Age^2	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
married	-0.110***	-0.112***	-0.113***	-0.115***	-0.112***	-0.115***	-0.095**	-0.115***
	(0.040)	(0.040)	(0.042)	(0.042)	(0.040)	(0.040)	(0.045)	(0.042)
Dummy for students	-1.894***	-1.873***	-2.216***	-2.211***	-1.875***	-1.855***	-2.285***	-2.209***
	(0.335)	(0.352)	(0.264)	(0.262)	(0.337)	(0.354)	(0.269)	(0.264)
disable	-0.458*	-0.463*	-0.468*	-0.466*	-0.456*	-0.461*	-0.471*	-0.466*
	(0.247)	(0.247)	(0.247)	(0.248)	(0.247)	(0.247)	(0.251)	(0.250)
healthy	0.115	0.114	0.114	0.114	0.116	0.115	0.109	0.107
	(0.090)	(0.090)	(0.091)	(0.091)	(0.090)	(0.090)	(0.091)	(0.091)
height	0.654**	0.656**	0.673**	0.675**	0.661**	0.662**	0.647**	0.669**
	(0.264)	(0.262)	(0.274)	(0.274)	(0.262)	(0.261)	(0.271)	(0.274)
smoking	0.030	0.030	0.022	0.022	0.028	0.028	0.021	0.023
	(0.036)	(0.036)	(0.037)	(0.037)	(0.036)	(0.036)	(0.037)	(0.037)

	Results with occupational controls				Results for recent and lifetime migrants with occupational controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
Years of schooling	0.052***	0.052***	0.050***	0.050***	0.052***	0.052***	0.057***	0.050***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)	(0.017)	(0.018)	(0.018)
Years of schooling squared	0.001	0.001	0.002*	0.002*	0.001*	0.001*	0.002*	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
good school performance	0.146***	0.145***	0.156***	0.156***	0.144***	0.143***	0.157***	0.159***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
years of repeating school	0.014	0.015	0.013	0.013	0.015	0.015	0.013	0.013
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)	(0.010)
managerial	0.516***	0.514***	0.506***	0.505***	0.513***	0.511***	0.490***	0.491***
	(0.138)	(0.138)	(0.142)	(0.142)	(0.138)	(0.138)	(0.144)	(0.143)
professional	0.007	0.008	-0.002	-0.002	0.009	0.009	-0.012	-0.010
	(0.130)	(0.130)	(0.133)	(0.133)	(0.131)	(0.130)	(0.136)	(0.135)
clerical worker	0.238*	0.237*	0.210*	0.210	0.241*	0.239*	0.204	0.204
	(0.124)	(0.124)	(0.128)	(0.128)	(0.125)	(0.124)	(0.130)	(0.129)
sales worker	0.026	0.023	0.009	0.008	0.024	0.021	-0.001	-0.003
	(0.124)	(0.123)	(0.127)	(0.127)	(0.124)	(0.124)	(0.129)	(0.129)
service worker	-0.125	-0.124	-0.141	-0.142	-0.121	-0.119	-0.151	-0.148
	(0.125)	(0.124)	(0.128)	(0.128)	(0.125)	(0.125)	(0.130)	(0.130)
technician	0.186	0.182	0.171	0.171	0.185	0.182	0.164	0.163
	(0.124)	(0.124)	(0.128)	(0.127)	(0.125)	(0.125)	(0.130)	(0.130)
machine operator	0.218*	0.212*	0.202	0.201	0.210	0.206	0.189	0.190
	(0.128)	(0.128)	(0.131)	(0.131)	(0.128)	(0.128)	(0.133)	(0.133)
transportation opertor	0.050	0.047	0.039	0.037	0.052	0.049	0.033	0.031
	(0.130)	(0.130)	(0.133)	(0.133)	(0.130)	(0.130)	(0.134)	(0.134)
armed force	0.075	0.071	0.051	0.049	0.075	0.071	0.038	0.033
	(0.137)	(0.136)	(0.140)	(0.140)	(0.137)	(0.137)	(0.141)	(0.141)

	Results with occupational controls				Results for recent and lifetime migrants with occupational controls			
	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit	OLS	OLS with lambda	IV with predicted probability using ols	IV with predicted probability using probit
other skilled worker	0.101	0.098	0.085	0.084	0.102	0.099	0.075	0.076
	(0.122)	(0.121)	(0.125)	(0.125)	(0.122)	(0.122)	(0.127)	(0.127)
City dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Migrant specific info.								
Age left home village	-0.004*	-0.004*	0.000	0.000	-0.005**	-0.005**	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Year since migration	0.006	0.006	0.010*	0.010*				
	(0.006)	(0.006)	(0.005)	(0.005)				
Year sicne migration squared	-0.000	-0.000	-0.000	-0.000				
	(0.000)	(0.000)	(0.000)	(0.000)				
Village info.								
Dummies for island of origin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	10.152***	10.015***	10.203***	10.203***	10.022***	9.892***	10.129***	10.200***
	(0.477)	(0.481)	(0.494)	(0.495)	(0.479)	(0.483)	(0.493)	(0.497)
Observations	2,565	2,565	2,490	2,490	2,565	2,565	2,490	2,490
R-squared	0.322	0.322	0.318	0.318	0.322	0.323	0.318	0.317

Standard errors in brackets

* significant at 10%

** significant at 5%

*** significant at 1%

Conclusions

This chapter examined wage differentials between migrants and urban individuals in China and Indonesia, with particular interest in the role of occupational restrictions. Migrants in China were found to receive nearly 50 per cent lower hourly wages than their urban counterparts, of which close to 20 per cent could be explained by differential access to high-wage occupations. Almost the opposite held in Indonesia, which has a *laissez-faire* policy towards migrants within cities. In Indonesia, recent migrants earn about 6 per cent more than those born in the city, but the majority of this small difference is captured by the fact that they are over-represented in high-paying occupations, which one can interpret either as a sign of compensating differentials (migrants willingly trade-off wages for less pleasant types of jobs) or as a greater willingness to work hard (which is also witnessed by their higher hours of work). In both countries, migrants tend to be relatively young and better educated. Also, in both countries there is evidence of the positive selectivity of migrants in that some 12–13 per cent of the earnings of migrants in both countries come from positive characteristics (higher ability) that migrants possess but that non-migrants in the countryside do not possess.

The overall message for policy makers is that the internal tensions in the Chinese system are far greater than they are in Indonesia. Indeed, there is no evidence of systematic discrimination or even of a relative backwardness of migrants in Indonesian cities, in which very similar wages and occupational distributions are observed for migrants and non-migrants. From a labour-market point of view, there are hence no clear migrant-specific issues to address in the Indonesian case. In principle, the Indonesian cities can try to mimic the Chinese example of restricting access to the more desirable jobs to current urban residents, but this would need a level of organisation and political cohesion that seems unlikely to occur soon.

The opposite is true in China. A very large degree of outright discrimination is observed that does not seem sustainable in the long run given the ethos of the Chinese state bureaucracy as being the custodian of the welfare of all Chinese. The implicit current taxation of the migrants by urban incumbents, via entry restrictions for migrants into higher wage occupations such as the civil service and managerial positions, might benefit urban incumbents and might even keep export prices down, but this comes at the expense of the earnings levels of migrants and thereby also of those who depend on those migrants in the countryside. As China's urbanisation process is an unstoppable trend in line with the development experience in other countries, it seems unworkable to have an explicit two-class residency system inside the cities in the long run. The policy question then becomes how to make the playing field more level over time. One way is for the urban insiders to change the rules within the cities as to how to become an official resident.

By changing the access to urban *hukou*, urban insiders may explicitly sell off the right to be urban—something that already occurs at the moment because the most successful migrants manage to buy themselves into the club of urban *hukou* holders (and via marriage) but at a price that is simply too high for the majority of migrants. The *laissez-faire* solution is to wait for that price to drop as urban incumbents cash in on their current position of power in deciding who can be urban, by selling off these rights in larger chunks (for short-–term

gain but with longer-term equality as the outcome). Competition between cities, which will intensify when the migrant streams run dry, will speed up the price reductions in urban residency. Given that there are still some 800 million people living in the countryside, this market solution might take a few decades still. The centralised policy solution would be to try to legislate towards more equal treatment, in the form of centralised education and health programs (such that individual cities do not control access to urban education or health) and centralised inspectorates to enforce equal opportunity legislation. Either way, the centralised solution essentially entails a power struggle between the centre and the cities, and will continue to challenge policy makers across China for some time to come.

Bibliography

AFX NEWS 2005, 'China's Hu says political stability helps maintain high economic growth', *AFX NEWS*, 15 October 2005, <http://www.forbes.com/markets/feeds/afx/2005/10/15/afx2278991.html>

Anderson, J. 2005, *How to Think About China*, UBS Securities Asia Limited, Hong Kong.

Banerjee, B. 1984, 'Information flow, expectations and job search', *Journal of Development Economics*, vol. 15, pp. 239–57.

Baum, R. 1992, 'Political stability in post-Deng China: problems and prospects', *Asian Survey*, vol. 32, no. 6, pp. 491–505.

Becker, G. 1971, *The Economics of Discrimination*, [Second edition], University of Chicago Press, Chicago.

Bell, M. and Muhidin, S. 2009, *Cross-national comparison of internal migration*, UNDP Research Paper 2009/30, United Nations Development Programme, New York.

Borjas, G. J. 2003, 'The labor demand curve is downward sloping: re-examining the impact of immigration on the labor market', *Quarterly Journal of Economics*, vol. 118, no. 4, pp. 1335–74.

Brunnermeier, M. and Parker, J. 2004, *Optimal expectations*, NBER Working Paper 10707, National Bureau of Economic Research, Cambridge, Mass., <www.nber.org/papers/w10707>

Cannon, W. B. 1914, 'Recent studies of bodily effects of fear, rage, and pain', *Journal of Philosophy, Psychology and Scientific Methods*, vol. 11, no. 6, pp. 162–5.

Card, D. 2009, *Immigration and inequality*, NBER Working Paper No. 14683, National Bureau of Economic Research, Cambridge, Mass.

Card, D. E., Dustmann, C. and Preston, I. 2009, *Immigration, wages, and compositional amenities*, NBER Working Paper No. w15521, (November 2009), National Bureau of Economic Research, Cambridge, Mass.

Clark, A., Frijters, P. and Shields, M. A. 2008, 'A survey of the income happiness gradient', *Journal of Economic Literature*, vol. 46, no. 1 (March), pp. 95–144.

Das, M. and van Soest, A. 1999, 'A panel data model for subjective information on household income growth', *Journal of Economic Behavior and Organization*, vol. 40, no. 4, pp. 409–26.

Du, Y., Gregory, R.G., and Meng, X. 2006, 'Impact of the guest worker system on poverty and wellbeing of migrant workers in urban China' in Ross Gaunaut and Ligang Song (eds), *The Turning Point in China's Economic Development*, Asia Pacific Press, Canberra.

Easterlin, R. A. 2001, 'Income and happiness: towards a unified theory', *Economic Journal*, vol. 111, pp. 465–84.

Ferrer-i-Carbonel, A. and Frijters, P. 2004, 'The effect of methodology on the determinants of happiness', *Economic Journal*, vol. 114, pp. 641–59.

Frijters, P., Shields, M. A. and Haisken-DeNew, J. P. 2006, 'How rational were expectations in East Germany after the falling of the wall?', *Canadian Journal of Economics*, IZA working paper.

Giessmann, H. J. 2007, *ChIndian and ASEAN: about national interests, regional legitimacies, and global challenges*, FES Briefing Paper 7, Friedrich Ebert Stiftung, Berlin.

Hagerty, M. 2003, 'Was life better in the ''good old days''? Intertemporal judgments of life satisfaction', *Journal of Happiness Studies*, vol. 4, pp. 115–39.

Hamermesh, D. S. 2004, *Subjective outcomes in economics*, NBER Working Paper No. W10361, National Bureau of Economic Research, Cambridge, Mass.

Harwood, K., MacLean, N. and Durkin, K. 2007, 'First-time mothers' expectations of parenthood: what happens when optimistic expectations are not matched by later experiences?', *Developmental Psychology*, vol. 43, no. 1, pp. 1–12.

Holbig, H. 2006, 'Ideological reform and political legitimacy in China: challenges in the post-Jiang era', *German Institute of Global and Area Studies*, no. 18.

Lu, X. 2003, 'Corruption and regime legitimacy in China', in F. Godement (ed.), *China's New Politics*, La Documentation Francais, Paris.

Mankiw, N. G., Reis, R. and Wolfers, J. 2003, *Disagreement about inflation expectations*, NBER Working Papers 9796, National Bureau of Economic Research, Cambridge, Mass..

Meng, X. 2000, 'Regional wage gap, information flow, and rural–urban migration', in Y. Zhao and L. West (eds), *Rural Labor Flows in China*, University of California Press, Berkeley, pp. 251–77.

Meng, X. and Manning, C. 2010, 'The Great Migration in China and Indonesia—trend and institutions' in X. Meng and C. Manning, with S. Li, and T.Effendi (eds). *The Great Migration: Rural-Urban Migration in China and Indonesia*, Edward Elgar Publishing Ltd.

Meng, X. and Zhang, J. 2001, 'The two-tier labour market in urban China: occupational segregation and wage differentials between urban residents and rural migrants in Shanghai', *Journal of Comparative Economics*, vol. 29, pp. 485-504.

Ottaviano, G. and Peri, G. 2006, *Rethinking the effects of immigration on wages*, NBER Working Paper No. 12497, National Bureau of Economic Research, Cambridge, Mass.

Perry, E. and Selden, M. 2000, *Chinese Society: Change, conflict and resistance*, Routledge, London.

Rabin, M. 1998, 'Psychology and economics', *Journal of Economic Literature*, vol. 36, pp. 11–46.

Senik, C. 2004, 'When information dominates comparison: a panel data analysis using Russian subjective data', *Journal of Public Economics*, vol. 88, pp. 2099–123.

Song, L. and Appleton, S. 2008, *Life satisfaction in urban China: components and determinants*, IZA Discussion Papers 3443, Institute for the Study of Labor, Bonn.

Souleles, N. 2004, 'Expectations, heterogeneous forecast errors, and consumption: micro evidence from the Michigan Consumer Sentiment Surveys', *Journal of Money, Credit, and Banking*, vol. 36, pp. 39–72.

Stutzer, A. 2004, 'The role of income aspirations in individual happiness', *Journal of Economic Behavior and Organization*, vol. 54, no. 1, pp. 89–109.

Veenhoven, R. 2004, 'Average happiness in 90 nations 1990–2000', *World Database of Happiness*, RankReport 2004/1c, <worlddatabaseofhappiness.eur.nl>

West, L. and Zhao, Y. (eds). 2000, **Rural Labor Flows in China**, University of California Press, Berkeley.

World Bank 2009, *Development Report 2009*, The World Bank, Washington, DC.

Younis, M., Lin, X. X., Sharahili, Y. and Selvarathinam, S. 2008, 'Political stability and economic growth in Asia', *American Journal of Applied Sciences*, vol. 5, no. 3, pp. 203–8.

Zeng, S. 2003, 'Leadership change, legitimacy, and party transition in China', *Journal of Chinese Political Science*, vol. 8, nos 1–2 (September), pp. 47–63.

Endnotes

1. The few consequences of residential rights are that one may own a vehicle with a local number plate, and one may own a property in the area of the residency right. Given the large market for rented accommodation, these benefits are small compared with those in China. A restriction of access to residential cards in a few large cities, such as Jakarta, is that to obtain a residential card in these cities one needs to show proof of being employed in a formal private or government institution located in those cities or of being a student in those cities.

2. This identifying assumption also means that in the selection estimation, we need (after weighting) representative proportions of migrants and non-migrants in each region.

3. The nine provinces where the rural survey was conducted are: Guangdong, Jiangsu, Hangzhou, Ningbo, Hefei, Bangbu, Zhengzhou, Luoyang, Chongqing, Chengdu and Wuhan.

4. Available on request from the authors.

16 China's Demographic Challenges from a Global Perspective

Zhongwei Zhao

Introduction

One of the most significant events in recent history has been the worldwide demographic transition. The role of this transition 'in the creation of the modern world' has been so important that some scholars have argued that unless the demographic transition is put at centre-stage, the modern process of development cannot be understood (Dyson 2010:viii). Population changes taking place in China have also been closely related to its historical development and will greatly influence the country's future. This chapter describes China's demographic transition in a global perspective, and examines the major demographic trends and challenges that it will face in the next few decades.

Demographic transition in China and the world

Demographic changes before the mid-twentieth century

Europe was the leader of the demographic transition, with long-term mortality decline already beginning in a number of countries in the early nineteenth century. In the United Kingdom, France and Sweden, for example, life expectancies at birth increased from 37.3, 33.9 and 36.5 years in 1800–09 to 69.2, 66.5 and 71.3 years in 1950, respectively. While it started slightly later, fertility decline was also on the way about the mid-nineteenth century. Complete family size remained large for those born about 1800, with close to five children per woman; but lifetime fertility fell to about two children for those born about a century later in England and Wales, France and Sweden (Livi-Bacci 2007). According to the United Nations, Europe, North America, Australia, New Zealand and Japan had largely completed the classic demographic transition by the early 1950s, with life expectancy at birth reaching 66 years and the total fertility rate (TFR) declining to about three children per woman (UN 2009). In the early stage of demographic transition, the decrease of both mortality and fertility was relatively slow and took a long time to accomplish. This gave enough time for both society and government to respond to these changes and to prepare for their consequences.

In contrast, in other parts of the world, demographic transition started later. Mortality and fertility remained high in many countries in Africa, Asia and Latin America until the end of World War II. According to the United Nations, life expectancy for these countries (excluding China) was about 41 years and their TFR was more than six children per woman in the early 1950s (UN 2009).

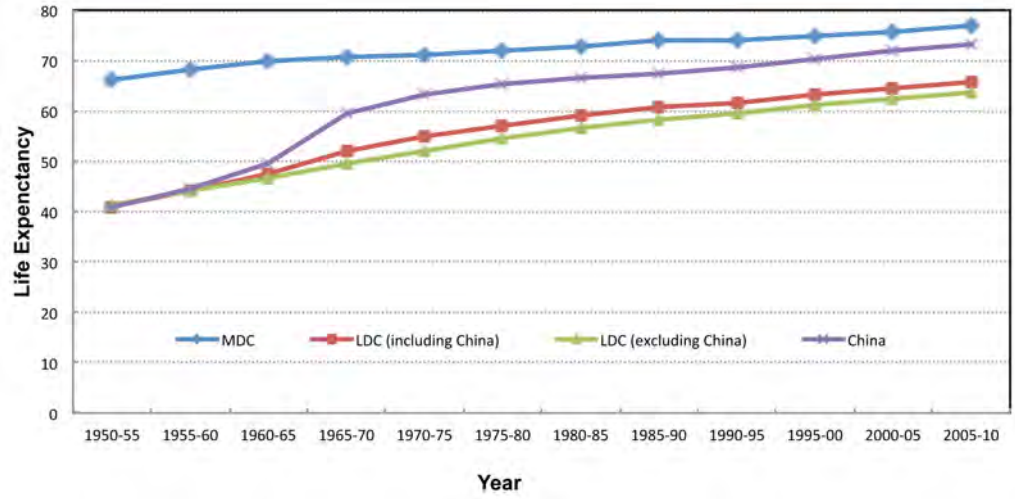
China was a typical country of this kind. According to a survey conducted among Chinese peasants in around 1930, their life expectancy at birth was about only 25 years and the TFR was about 5.5 (Barclay et al. 1976). Despite the improvement in lowering mortality in some Chinese cities during the first half of the twentieth century, the life expectancy for China's national population was likely to have been lower than 35 years and TFR was between five and six children in the late 1940s (Campbell 2001; Zhao 1997).

One of the most significant impacts of the pre-transitional demographic regime on the society and economic development was the great waste of human resources, which contributed directly to the slow economic growth of the time. Under the high mortality recorded among the Chinese peasant population about 1930, for example, to ensure that one son would survive to a marriageable age and continue the family line, each couple would need to have an average of at least five births, because more than 40 per cent of children did not survive to age fifteen. Accordingly, women had to spend most of their reproductive years in pregnancy, giving birth and taking care of children. But a large part of such effort and investment would bring about no return or be wasted completely because of high mortality. It is, therefore, not a surprise that low economic growth was often found in the pre-transitional society.

Worldwide demographic transition in the second half of the twentieth century

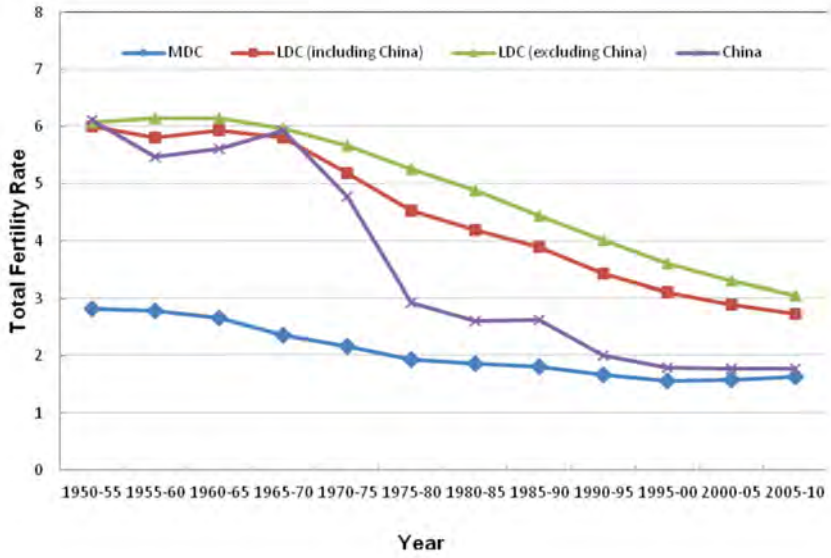
As shown in Figures 16.1–4, mortality and fertility have continued to decline in the industrialised world since the end of World War II. By the end of the twentieth century, life expectancy at birth rose from about 66 to about 75 years, and the TFR fell from nearly 3 to 1.6 children. As a result of these changes and the impact of international migration, the population size of the world's more industrialised countries increased from 812 million in 1950 to 1.195 billion in 2000. The age structure became older, with the proportion of people aged 65 and over growing from about 8 per cent to more than 14 per cent of the total population. Because of the fertility decline, however, the total dependency ratio, which is measured by the sum of the population aged 0–14 and that aged 65 and over (or dependents) to the population aged 15–64 (or working-age population) and presented as the number of dependents per 100 persons of working age, was maintained at a comparatively low level in these countries. After fluctuating about 55 for a quarter of a century (1950–75), it fell steadily to 49 in the year 2000 (UN 2009).

Figure 16.1 Changes in life expectancy at birth, 1950–2010



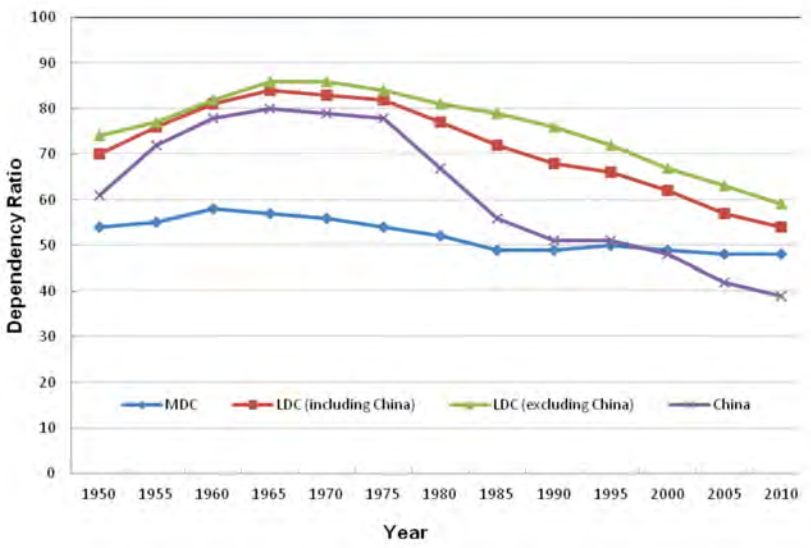
Source: UN (2009).

Figure 16.2 Changes in the total fertility rate, 1950–2010



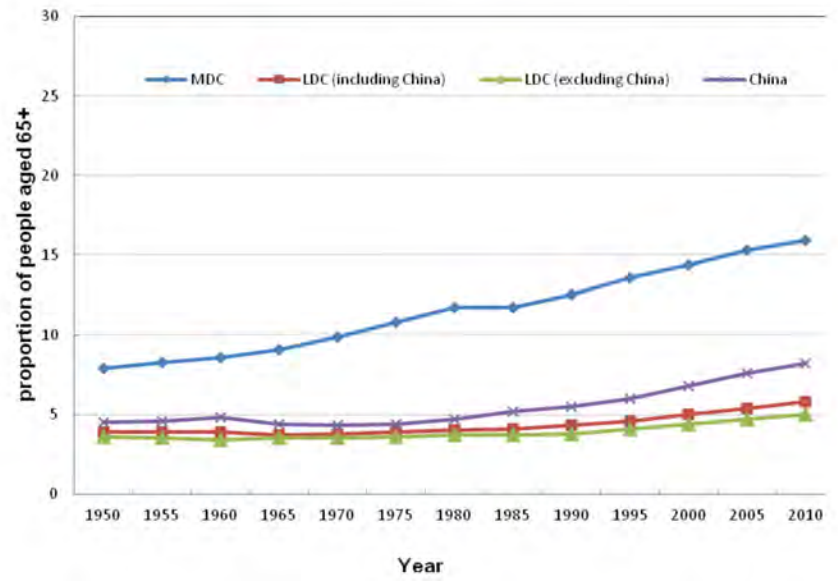
Source: UN (2009).

Figure 16.3 Changes in the dependency ratio, 1950–2010



Source: UN (2009).

Figure 16.4 Changes in the proportion of people over age sixty-five, 1950–2010



Source: UN (2009).

In less developed countries (excluding China), demographic transition began, or started to accelerate, after World War II. In the next half-century, life expectancy rose from 41 to 61 years and the TFR fell from 6.1 to 3.6 children per woman. There were, of course, great variations in the speed and magnitude of such transitions among these countries.

The most rapid mortality and fertility declines took place in East Asia, while the least developed countries fell far behind, with a life expectancy of 52 years and a TFR of about 5 children per woman at the end of the twentieth century. From 1950 to 2000, the population size of less developed countries (excluding China) increased from 1.2 to 3.6 billion (from 1.7 to 4.9 billion, if China is included). Because of their rapid population growth, these countries also had a markedly higher dependency ratio than more industrialised countries—greater than 70 in most of the years. This was caused primarily by their high fertility, which contributes directly to increases in the child dependency ratio. For the same reason, age structures in many less developed countries either remained young or became younger in the second half of the twentieth century (UN 2009). The comparatively high dependency ratio has been a major demographic contributor to the slow development in many less developed countries.

China's demographic transition and its recent economic growth

Demographic changes taking place in China in the second half of the twentieth century were broadly similar to those observed in other less developed countries, but with greater speed and magnitude.

China witnessed a rapid improvement in mortality in the 1950s and 1960s except during the great famine. According to estimates made by Banister, life expectancy at birth reached about 50 years in 1957, 61 in 1970, and 65 in 1981, which are reasonably close to those calculated by the United Nations and displayed in Figure 16.1. China's official data suggest that mortality decline was even faster during this period (Banister 1987; Huang and Liu 1995).[1] These experiences, along with those observed in Sri Lanka, Costa Rica and some other populations, have been widely seen as a great success in lowering mortality in poor countries (Caldwell 1986:171). Since the early 1980s, China's mortality has declined further. Life expectancy at birth for the national population has now reached 74 years (Ren et al. 2004; UN 2009; Zhao and Guo 2007). While the speed of recent mortality decline has been slower than that recorded earlier, it is still remarkable in comparison with the experience of some former Soviet republics and Eastern European countries where mortality stopped declining or even increased during their recent reconstruction (Meslé 2004).

China's national fertility level remained high in the 1950s and 1960s, although a non-trivial fertility decline was already observed in some urban populations at the time (Lavely and Freedman 1990). This and the falling mortality led to rapid population growth. Facing increasing population pressure, the Chinese Government launched an unprecedented family-planning campaign in the early 1970s, which played an important part in bringing the fertility rate down to the level of below replacement. While China's TFR was still about six children at the beginning of the 1970s, it fell rapidly to about 2.5 in 1980. In the 1980s, China's fertility decline seemed to have stopped and the TFR fluctuated between 2.3 and 2.9 (Yao 1995). This, however, was followed by further fertility reduction in the 1990s. China's TFR had fallen to below replacement in 1991 and further declined to less than 1.6 in 2000. Many studies have suggested that China's fertility has remained that low or has fallen even lower since, which has been supported by recently published 2010 census preliminary results (Cai 2008, 2010; Guo and Chen 2007; Retherford et al. 2005; Scharping 2005; Zhang and Zhao 2006; Zhao and Guo 2010; Zhao and Zhang 2010; Zheng et al. 2009). They differ notably from those estimated by the United Nations in recent years, as shown in Figure 16.2.[2]

China's mortality and fertility decline opened a 'demographic window'—like other countries experiencing similar demographic changes. According to the United Nations' 2008 medium variant population projection, China's total dependency ratio was close to 80 in the early 1970s, but it has been falling since and has now reached 39, as indicated by Figure 16.3 (UN 2009).[3] This favourable age structure, which provides auspicious demographic conditions for economic development, has been widely seen as the first demographic dividend. From a demographic point of view, it seems rather natural that China's spectacular economic development has taken place during this period.

China's major demographic challenges in a global perspective in the early twenty-first century

The demographic map of the world at the beginning of the twenty-first century

Worldwide mortality and fertility decline in recent decades has brought about many significant changes. If we use the United Nations' classification of more developed and less developed countries, it is evident that the demographic map of the world now differs greatly from half a century ago.

In the early 1950s, nearly one-third of the world population lived in more developed countries and the other two-thirds in less developed countries. In 2010, the population of more developed countries declined to less than one-fifth of the world total. The population of less developed countries accounted for more than four-fifths, which itself was more than twice the world population of 1950. These trends will continue in the next 40 years.

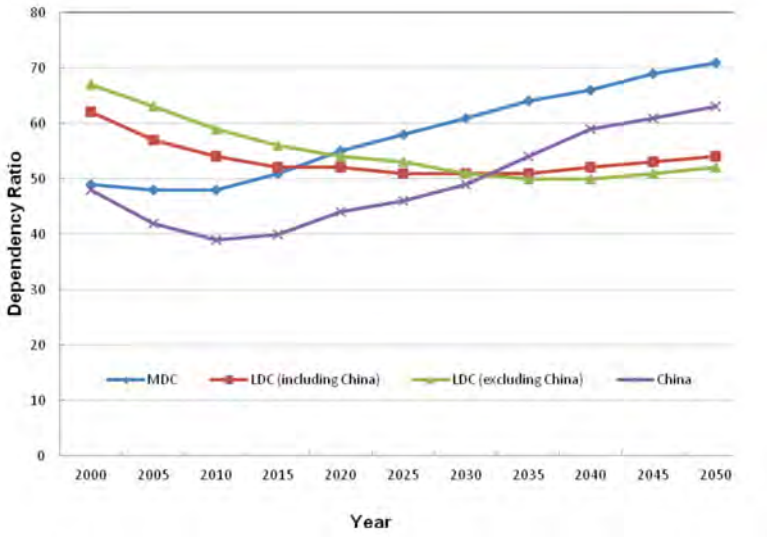
Comparing with half a century ago, the gap between more developed and less developed countries in their mortality and fertility has narrowed in general, as shown in Figures 16.1 and 16.2. In 2005–10, life expectancy at birth in less developed countries reached 66 years. This was about 85 per cent of that achieved in more developed countries—a marked increase from the 62 per cent recorded in 1950–55. Also in 2005–10, the TFR was 3.3 in less developed countries and 1.6 in more developed countries; this gap was also smaller than that in 1950–55. Although there are some uncertainties, further convergences in mortality and fertility are likely to take place in the two groups of countries in the next four decades.

During the past half-century, total dependency ratios declined in both more developed and less developed countries. As Figures 16.3 and 16.4 show, although the magnitude of such reduction is more noticeable in less developed countries, their dependency ratio is still higher than that in more developed countries. This is attributed mainly to their high child dependency ratios. In both more developed and less developed countries, the age structure has become older. The median age of the population has increased from 29 years in 1950 to the current 40 years in more developed countries and from 22 to 27 years in less developed countries (UN 2009).

In the next 40 years, more developed countries are likely to experience the following demographic changes. Their mortality will continue to fall and fertility could fluctuate at a relatively low level. As a result, their total population will be relatively stable and

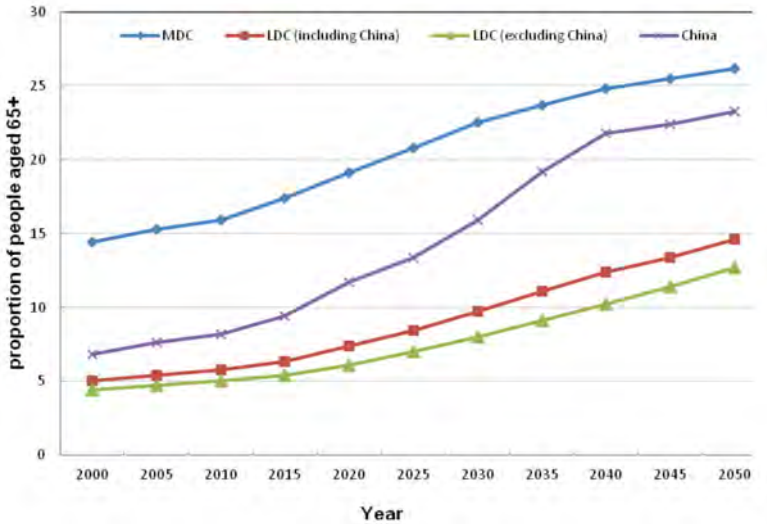
close to 1.3 billion. But their share in the world population will further shrink—to less than 14 per cent. Demographically, the influence of countries currently regarded as 'more developed' will be greatly reduced. Moreover, as shown in Figures 16.5 and 16.6, the age structure of their populations will become much older, with the proportion of those aged 65 and over increasing from the current 15.9 per cent to 26.2 per cent. Driven by this change, their total dependency ratios will rise markedly—from 48 currently to 71 in 2050. Because of that and labour shortages, which are partly a result of low fertility, immigration is likely to further increase in some countries.

Figure 16.5 Changes in the dependency ratio, 2000–50



Source: UN (2009).

Figure 16.6 Changes in the proportion of people over age sixty-five, 2000–50



Source: UN (2009).

In contrast, future demographic changes will differ significantly in less developed countries. Their mortality and fertility will decline further. Because of the relatively high fertility and young age structure, their population will continue to grow; it will be close to 8 billion and account for 86 per cent of the world total by 2050. While the increase in the proportion of old people will accelerate, their dependency ratio will stay at or be slightly lower than the current level owing to the decrease in the child dependency ratio, as indicated by Figures 16.5 and 16.6. Many less developed countries will benefit from this change. Furthermore, many of these countries will experience rapid urbanisation. Large-scale rural-to-urban migration is likely to accompany their future economic growth.

Of course, countries regarded as 'less developed' according to the UN classification are very different both in their levels of economic development and in their stages of demographic transition. Such variations are likely to remain in the foreseeable future. While some of these countries are now in many ways closer to more developed countries than to other less developed countries, the above discussion and major conclusions drawn from it are still useful in providing a brief summary of world demographic changes over the past half-century and their major trends in the near future.

The major characteristics of China's future demographic changes

What are China's current demographic situation and future population trends, and how do they differ in comparison with those in other parts of the world? Before answering these questions, it is useful to briefly comment on a number of characteristics of demographic change that are likely to take place in China in the next few decades. In comparison with socioeconomic developments that are affected by many factors and thus often difficult to predict, China's future demographic changes have the following notable differences.

Population changes are determined by a few demographic factors and China's future population changes are no exception. If we consider only changes in population size and structure, they are determined exclusively by fertility, mortality and migration. Since China is a large country, the influence of international migration on population growth is rather small. Although internal migration could greatly change its spatial distribution, it has no impact on the size and structure of the national population.

China's future mortality and fertility changes are likely to be relatively slow and steady rather than dramatic. China had a rapid mortality decline in the 1950s and 1960s, and a great fertility reduction in the 1970s. But changes of this kind are unlikely in the next one or two decades. Unless catastrophic infectious diseases, natural disasters or wars strike, China's mortality will decline steadily or stay at a low level. Similarly, there might be some small fluctuations in fertility, but a drastic increase or decrease is unlikely in the near future.

It is also expected that China's future mortality and fertility changes are likely to lack 'elasticity'. Future mortality and fertility trends—which differ from certain economic phenomena or activities that can be stimulated or altered relatively easily by government financial, monetary or taxation policies—are less likely to change drastically as a response to government policies or interventions of other kinds. China's nationwide family-planning campaign did contribute to its rapid fertility reduction in the 1970s. But now the major

demographic challenge is no longer to control birth. Until now, there has been no evidence suggesting that moderate incentive policies have brought back sustained replacement fertility in countries where it had fallen to a very low level.

Population momentum will also affect future demographic changes. Although China's fertility has been below replacement since the early 1990s, China's population has grown for the past 20 years, and this trend will continue for at least another decade, because of the influence of the population age structure. Similarly, when China's population size starts falling, the trend might not stop quickly, even if fertility could be raised to a level that is moderately higher than that of replacement. Furthermore, even if effective policies or interventions were available to increase fertility, the fertility adjustment might not contribute positively to economic development until some 20 years later.

For the reasons summarised above, China's future demographic changes are more predictable than its socioeconomic development. Regardless of what we think about their importance and consequences, China's major population trends have already formed a demographic backdrop for, and will exert a significant impact on, its socioeconomic development in the next quarter of a century.

China's future demographic trends

So what kind of demographic changes will take place in China in the next few decades? First is the change in the national population. According to the United Nations' 2008 medium variant population projection, China's national population was about 1.35 billion in 2010.[4] It will reach 1.46 billion in 2030 and then start to decline. By 2050, the Chinese population will fall to 1.42 billion (UN 2009).[5] While China's population will continue to grow for another 15 to 20 years, it will lose the title of the most-populous country in the world to India in the mid to late 2020s. Moreover, the magnitude of China's future population increase will be much smaller than that recorded in the past half a century. The nature and major characteristics of the increase will also differ greatly from those observed in the 1960s and 1970s. Current population growth is the result of the population momentum created by past demographic changes. Under the surface of such an increase, a negative intrinsic growth rate has already been recorded.[6] Accordingly, despite the fact that continuing population growth can still put some pressure on various kinds of resources and economic development, it is no longer a major demographic concern for future long-term development.

Second, similar changes will take place in the working-age population (those aged 15–64). According to the United Nations' 2008 medium variant population projection, China's working-age population will reach its peak during the period 2010–15, at approximately 1 billion. After that it will begin to fall and decrease by 130 million by 2050. The decline in the proportion of the working-age population will start earlier—falling from the current 72 per cent to 61 per cent in 2050. Since most Chinese, and those in urban areas in particular, will retire at or before age 60, changes in the number of those aged 15–59 might be more relevant to many policy issues. According to the United Nations' 2008 projection, the proportion of people aged 15–59 reached 68 per cent in 2010, and it will now start to fall.[7] By 2050, its size

will decrease by 160 million. The decline of the younger working-age population (15–24) is particularly notable—by more than 80 million or 36 per cent in the next 40 years. As a result, China's working-age population will become older (UN 2009).

The third major demographic trend is that China's fertility is very likely to stay below or far below replacement in the near future, which will have a profound impact on long-term demographic and socioeconomic development. Rising fertility can prevent the Chinese population from decline, and indeed some scholars have recently argued that the Chinese Government should change its fertility policy. It is important, however, to be aware of the fact that China's current low fertility is no longer a result of, or caused mainly by, the restrictive family-planning policies, although they are still in place. Evidence shows that major changes in people's fertility desires and reproductive culture have already taken place in China. Young couples increasingly want to have a small family or have no children at all (Cai 2010; Gu and Wang 2009). These changes have largely conformed to the fertility trends observed in many countries and are similar to those recorded in several East Asian populations in recent decades. It is also important to note that in comparison with many other countries, in China, age at marriage is relatively low, the proportion of never-married people is still high, and the proportion of those never having children remains at a very low level. All of these are, however, likely to change in the near future. Increasing celibacy, postponing marriage to a later age and a rising proportion of childless people could soon become non-trivial factors contributing to China's low fertility. China's intrinsic population growth rate had already become negative in the early 1990s because of its below-replacement fertility. Under the conditions used in the United Nations' 2008 population projection, China's population is expected to experience a long-term decline from the mid or late 2020s. The decline will continue in the rest of this century and could well last into the next century.

China's fourth major demographic trend is rapid population ageing. Figure 16.5 shows that China's current dependency ratio is only 39—perhaps the lowest level ever recorded. It will increase slightly thereafter, but its level will remain lower than that before 1985 and also lower than that in more developed countries. China can continue to benefit from its demographic dividend in the next quarter of a century. China's aged population and old-age dependency ratio will, however, increase rapidly. According to the United Nations' 2008 population projection, the number of people aged 65 and older was 111 million in 2010.[8] In the next 40 years, that number will further increase, and reach 331 million by 2050. Their proportion will rise from 8 per cent to 23 per cent, as shown in Figure 16.6. The number of people aged 80 and over will grow even faster. By 2050, the number of people in this age group will increase from the current less than 20 million to more than 100 million. As a result of these changes, the median age of the Chinese population will increase from 34 years in 2010 to 45 years in 2050 (UN 2009). As far as population ageing is concerned, China will become very similar to the industrialised countries.

The fifth major demographic trend is the increase in population movement and urbanisation. Differing from many other countries, in China, those who have left their homes and work in other cities or areas are often referred to as the 'floating population'. Many of these migrants, including their family members, are not given the same rights as the local

people. Largely for these reasons, they tend to be less stable in terms of residence and employment, and thus often travel between the place where their permanent registration is held and the place where they work. Because of the difficulties in defining the urban and migrant populations and the difficulties in registering the floating population and monitoring its movements, there have been considerable uncertainties in determining the size of China's urban and rural populations and their future changes. There is, however, a general consensus among Chinese authorities and academics that China's internal migration has now reached an unprecedented scale and the speed of urbanisation will increase. According to the preliminary results of the 2010 census, China's floating population has reached 221 million and almost half of the population has lived in cities and towns (NBS 2011). Even according to UN projections, which give a lower figure, China's urban population was more than 600 million or 47 per cent of the national population in 2010, and it is likely to rise to more than 1 billion or 73 per cent of the total population by 2050 (UN 2010).

China's future sustainable development and major demographic challenges

Most of the demographic changes discussed above will take place in the next few decades, which will significantly affect Chinese society. From a demographic viewpoint, to create and maintain sustainable, generally favourable and relatively stable demographic conditions is one of the most important strategies for promoting future development.

A key step for the Government to facilitate and maintain such a development-friendly demographic environment is to closely monitor demographic changes and reduce preventable negative demographic impacts (such as great fluctuations in population size and structure and extremely low fertility) in a timely fashion through effective guidance and interventions. While future demographic changes are relatively easy to project, reliable projection results cannot be produced without accurate data about the current state of the population. One urgent issue in this respect is to resolve the puzzle surrounding China's recent fertility level and population size.

The Chinese Government reports that the country's TFR has been about 1.8 since the mid-1990s. It also insists that this level will be maintained in the next three decades (National Strategy on Population Development Research Group 2007). Most demographers, however, believe that China's TFR was lower than 1.8 in 1995 and probably about 1.6 in 2000. It has been even lower and perhaps about 1.5 since then. They also suggest that China's TFR might stay at a level lower than 1.8 in the near future (Cai 2008, 2010; Gu and Wang 2009; Guo and Chen 2007; Retherford et al. 2005; Scharping 2005; Zhang and Zhao 2006; Zhao and Guo 2010; Zhao and Zhang 2010). Because of that, there are notable differences among various estimates of China's current and future population sizes. For example, according to *The General Report on China's National Strategy on Population Development*, China's national population, which is currently close to 1.35 billion, will grow to 1.43 billion by 2020 and reach a peak of about 1.5 billion in 2033 (National Strategy on Population Development Research Group 2007:36). These results are largely similar to those produced by the United Nations' 2008 medium variant population projection. They differ significantly, however, from the preliminary results of the United Nations' 2010 population projection and those projected recently by the US Census Bureau, which were based on lower but more reliable

fertility estimates (UN 2009, 2011; US Census Bureau 2011). According to the United Nations' latest population projection, China's current population is about 1.34 billion and will reach the peak of approximately 1.4 billion in 2025. In 2033, China's population size will be about 1.39 billion, or nearly 100 million smaller than that suggested by the Chinese Government. For the year 2050, the preliminary result of the United Nations' 2010 population projection is also 120 million smaller than that obtained from the 2008 projection (UN 2009, 2011). Differences of nearly 20 per cent in estimated fertility levels and of about 100 million people in projected population size are by no means negligible. They will have significant impacts on the formation of China's future development plans and strategies. To clear up the confusion created by these uncertainties, great effort must be made to improve China's demographic data collection and data quality.

It is a pity that the figures reported in this chapter could not be based on the final results of the United Nations' 2010 population projection because they are still not available.[9] If these results were used, the decline in China's national population and working-age population would be earlier and of greater magnitude, the increase in the proportion of old people and the old-age dependency ratio would be faster and larger, and the momentum of population decline would last longer than that suggested by the United Nations' 2008 population projection results. Their consequences would therefore be more severe. For these reasons, China needs to carefully consider the negative and long-term impact of very low fertility and prepare for effective policy intervention accordingly.

In the twenty-first century—at least the first half of the century—one of China's most significant demographic changes is the increasing population ageing. It is important to recognise that population ageing, in China and elsewhere, is largely the product of two demographic successes: first, effectively eradicating premature deaths and improving longevity; and second, effectively controlling reproduction or avoiding unwanted pregnancies. Because mortality will continue to decline and fertility will probably stay at a relatively low level, population ageing is likely to be an irreversible trend of long-term development rather than a historical event occurring at a particular time. Hence, it is more meaningful to think about how to prepare ourselves to live in this new demographic environment than to talk about preventing or delaying population ageing, although the latter might not be completely meaningless within a short period or for a small population. As demographic successes, improving longevity and population ageing have brought considerable benefits to humankind and our society. In addition to the demographic dividend that has been addressed by many scholars (Mason and Tomoko 2004; Wang and Mason 2007), these changes provide an opportunity for people to increase the number of years that they live in a healthy state. Although the findings are not conclusive, many studies have shown that along with improving longevity, the proportion of healthy life expectancy out of the total life expectancy has increased. People can now spend a greater proportion of their life in production or other types of creative activities. This in turn can help to overcome the difficulty caused by rapid population ageing. In the long run, difficulties brought about by this change cannot be dealt with by promoting high (above replacement) fertility or migration. They can be overcome only by rapidly developing the economy, adjusting related social and economic policies, and establishing the facilities and social institutions that will be required by the increasingly ageing society.

Another major challenge facing China is the significant increase in urbanisation and migration. By international standards, China's current level of urbanisation is not high, but the scale of its rural-to-urban migration (though it might be less permanent) and urbanisation is gigantic. Whether China can successfully manage its future urbanisation is a serious challenge in maintaining its development momentum and in building a truly harmonious society. For a very long time, China's development policies have been urban centred and rural surplus workers have been used as a reservoir to adjust the labour supply for urban development. Rural-to-urban migrants have rarely been given rights equal to those their urban counterparts have, but often have been blamed for many problems that have occurred in the process of urbanisation. This not only prevents China from smoothly advancing its urbanisation, it could potentially become a major source of social disturbance and instability. Largely due to the floating nature of China's current migrant population and the impact of China's long-established two-tier urban and rural development and social policies, China's future urbanisation and rural-to-urban migration are not only a demographic or economic process. They are, in many ways, a profound demographic, social, economic and political transformation.

Conclusions

The worldwide demographic transition has been one of the most significant events in recent history and has played a crucial part in the creation of the modern world. While China's demographic transition started later in comparison with more developed countries, it has been faster. As a result of the rapid mortality and fertility decline, China's life expectancy at birth has now reached 74 years, its TFR has fallen well below replacement, and the dependency ratio has decreased to a very low level. China's recent economic development has benefited greatly from such favourable demographic conditions. China's demographic changes will not stop here, however. After its unprecedented growth in the second half of the twentieth century, China's national population—driven by its fertility reduction, especially the below-replacement fertility level in the past two decades—will soon begin a long-term decline. The decline in its working-age population will start earlier. Because of that and the rapid population ageing, China's dependency ratio will rise. In comparison with recent years, in the future China's demographic conditions will become less favourable to its economic growth. In addition, China will face the great challenge of large-scale rural-to-urban migration and rapid urbanisation. To meet these challenges, China needs to form more realistic strategies to create and maintain sustainable, generally favourable and relatively stable demographic conditions, which are of great importance to the country's future prosperity and long-term development.

Acknowledgment

The author would like to thank Jiaying Zhao for her assistance in drawing all the graphs used in this chapter. The author also acknowledges the partial support provided by an Australian Research Council Research Grant (DP1096696).

Bibliography

Banister, J. 1987, *China's Changing Population*, Stanford University Press, California.

Barclay, G. W., Coale, A. J., Stoto, M. A. and Trussell, T. J. 1976, 'A reassessment of the demography of traditional rural China', *Population Index*, vol. 42, no. 4, pp. 606–35.

Cai, Y. 2008, 'An assessment of China's fertility level using the variable-*r* method', *Demography*, vol. 45, no. 2, pp. 271–81.

Cai, Y. 2010, 'Social forces behind China's below replacement fertility: government policy or socioeconomic development', *Population and Development Review*, vol. 36, no. 3, pp. 419–40.

Caldwell, J. 1986, 'Routes to low mortality in poor countries', *Population and Development Review*, vol. 12, no. 2, pp. 171–219.

Campbell, C. 2001, 'Mortality change and the epidemiological transition in Beijing, 1644–1990', in T. Liu, J. Lee, D. S. Reher, O. Saito and F. Wang (eds), *Asian Population History*, Oxford University Press, Oxford.

Dyson, T. 2010, *Population and Development: The demographic transition*, Zed Books, London.

Gu, B. and Wang, F. (eds) 2009, *An Experiment of Eight Million People*, [in Chinese], Social Sciences Academic Press, Beijing.

Guo, Z. and Chen W. 2007, 'Below replacement fertility in Mainland China', in Z. Zhao and F. Guo (eds), *Transition and Challenge: China's population at the beginning of the 21st century*, Oxford University Press, New York.

Huang, R. and Liu, Y. 1995, *Mortality Data of China Population*, [in Chinese], Data User Service, China Population Information and Research Center, Beijing.

Lavely, W. and Freedman, R. 1990, 'The origins of the Chinese fertility decline', *Demography*, vol. 27, pp. 357–67.

Livi-Bacci, M. 2007, *A Concise History of World Population*, (Fourth edition), Blackwell Publishing, Oxford.

Mason, A. and Tomoko, K. 2004, *East Asian economic development: two demographic dividends*, Economics Series Working Papers No. 83, East–West Center, Honolulu.

Meslé, F. 2004, 'Mortality in Central and Eastern Europe: long-term trends and recent upturns', *Demographic Research (Special Collection 2)*, pp. 45–70.

National Bureau of Statistics (NBS) 2011, *The Sixth National Census*, Bulletin No. 1, China Statistics Press, Beijing, viewed April 2011, <http://www.stats.gov.cn/tjfx/jdfx/t20110428_402722253.htm>

National Strategy on Population Development Research Group 2007, *The General Report on China's National Strategy on Population Development*, [in Chinese], China Population Publishing House, Beijing.

Ren, Q., You, Y., Zheng, X., Song, X. and Chen, G. 2004, 'The levels, patterns and regional variations in mortality of China since the 1980s', [in Chinese], *Chinese Journal of Population Science*, no. 3, pp. 19–29.

Retherford, R. D, Choe, M. K., Chen, J., Li, X. and Cui, H. 2005, 'Fertility in China: how much has it really declined?', *Population and Development Review*, vol. 19, no. 1, pp. 57–84.

Scharping, T. 2005, 'Chinese fertility trends 1979–2000: a comparative analysis of birth numbers and school data', [in Chinese], *Population Research*, no. 4, pp. 1–15.

United Nations (UN) 2009, *World Population Prospects: The 2008 revision*, United Nations, New York.

United Nations (UN) 2010, *World Urbanization Prospects: The 2009 revision*, United Nations, New York.

United Nations (UN) 2011, *World Population Prospects: The 2010 Revision*, United Nations, New York.

US Census Bureau 2011, *Preliminary Results for World Population Prospects 2010*, Population Division, US Census Bureau, Washington, DC, viewed March 2011, <http://www.census.gov/ipc/www/idb/country.php>

Wang, F. and Mason, A. 2007, 'Population ageing: challenges, opportunities, and institutions', in Z. Zhao and F. Guo (eds), *Transition and Challenge*, Oxford University Press, Oxford.

Yao, X. 1995, *Fertility Data of China*, [in Chinese], China Population Publishing House, Beijing.

Zhang, G. and Zhao, Z. 2006, 'Re-examining China's fertility puzzle: data collection and quality over the last two decades', *Population and Development Review*, vol. 32, no. 2, pp. 293–321.

Zhao, Z. 1997, 'Demographic systems in historic China: some new findings from recent research', *Journal of the Australian Population Association*, vol. 14, no. 2, pp. 201–32.

Zhao, Z. and Guo, F. 2007, 'Introduction', in Z. Zhao and F. Guo (eds), *Transition and Challenge: China's population at the beginning of the 21st century*, Oxford University Press, New York.

Zhao, Z. and Guo, Z. 2010, 'China's below replacement fertility: a further exploration', *Canadian Studies in Population*, vol. 37, pp. 525–62.

Zhao, Z. and Zhang, X. 2010, 'China's recent fertility decline: evidence from reconstructed fertility statistics', *Population*, vol. 65, no. 3, pp. 451–78.

Zheng, Z., Cai, Y., Wang, F. and Gu, B. 2009, 'Below-replacement fertility and childbearing intention in Jiangsu Province, China', *Asian Population Studies*, vol. 5, no. 3, pp. 329–47.

Endnotes

1. According to the Population Information and Research Centre of China, life expectancy at birth for the Chinese population increased to 56 in 1957, 64 in the early 1970s, and 68 in 1981 (Huang and Liu 1995).
2. As shown by the preliminary results of the United Nations' 2010 projection, lower fertility estimates have been used in this round of population projection, which will be further discussed later.
3. Since the final results of the United Nations' 2010 population projection are not available, a large part of the discussion has been based on the United Nations' 2008 medium variant population projection results. Because the UN Population Division is very likely to base its 2010 final projection on lower fertility estimates, the results will be different from those obtained from the 2008 projection.
4. According to China's 2010 census, its national population (excluding the population of Hong Kong, Macau and Taiwan) was 1.34 billion (NBS 2011).
5. These results are most likely to have overestimated China's future population growth and this will be further discussed in the next section.
6. Changes in a population can be examined in two ways. First, the increase or decrease of the total population can be examined. Second, whether a generation can reproduce itself—which is often measured by whether a group of women can produce enough daughters to replace themselves—can be examined. Because of the impact of age structure, changes in the second type of population growth—which is called intrinsic population growth—might not be the same as those in the first type of population growth.
7. According to China's recent census, the proportion of people aged 15–59 was slightly higher—at 70 per cent—in 2010 (NBS 2011).
8. This figure is about 7 million lower than that obtained from China's 2010 census (NBS 2011).
9. An alternative is to base the study on China's 2010 census data, but the detailed results are still not available. The choice of using the United Nations' 2008 medium variant population projection results rather than making a new projection also arises from the consideration of ensuring the consistency in comparing demographic changes between China, more developed countries and less developed countries.

17 Population Ageing, Domestic Consumption and Future Economic Growth in China

Yang Du and Meiyan Wang

Introduction

In the newly released Twelfth Five-Year Plan (2011–15), increasing the role of domestic demand as a driver of economic growth is identified as one of China's major priorities in the years ahead. According to the most recent statistics from the National Bureau of Statistics (NBS), final consumption accounted for 48 per cent of gross domestic product (GDP) in 2009, which included 35 percentage points from household consumption. In most industrialised countries, consumption accounts for more than two-thirds of GDP, and the share of government consumption in final consumption is not as high as in China either. Given that the Chinese Government has already had in place for many years the specific goal of raising household consumption, it seems clear that this is neither an easy task nor one that can be accomplished in the short term.

More seriously, as a middle-income country, China has already entered a period of population ageing. According to the Sixth Population Census, conducted in 2010 (NBS 2011), people aged sixty and above accounted for 13 per cent of the total population, while the share of people aged sixty-five and above was 9 per cent. Compared with the Fifth Census, the above two shares increased 3 and 2 percentage points, respectively. This has placed China in a uniquely challenging position—with the process of ageing occurring far earlier in its development than has been the experience in the industrialised world.

In addition to the insufficient resources for supporting the elderly and a pension system that is still under construction, one of the major concerns about the impact of ageing on development is that elderly people tend to consume less, which is of particular relevance in China—a country eagerly seeking to rebalance its economy towards domestic consumption.

The spending habits of people at different ages during the life cycle have been a topic of great interest in analyses of macroeconomic stability and economic policy for a long time. Dating back to Modigliani and Brumberg's (1954) life-cycle model, the consumption–saving choice by households is a key element in determining inter-temporal consumption patterns so as to smooth consumption over the life cycle (Browning and Lusardi 1996).

Many recent studies have been motivated by the observed reduction in consumption following retirement, giving rise to the so-called retirement consumption puzzle that has been empirically observed in many industrialised economies (Banks et al. 1998; Bernheim et al. 1997). In his review paper, Hurst (2008) summarises five stylised facts that have emerged from the recent literature on consumption behaviour during retirement, including declines in spending on food and work-related expenses, constant or increased spending

on non-durables, and substantial heterogeneity across households. Overall, he thinks that the life-cycle model does well in explaining the consumption pattern of most households, including the pattern of aged consumption.

The determination of consumption choices over the life cycle is more complicated in a developing and transitioning country such as China—compared with industrialised countries—even without taking into account the question of ageing. For example, to a large extent, the consumption behaviour of the elderly is determined by how the pension system is arranged—wherever those elderly are. Yet the Chinese case is complicated by the significant changes in the elderly support system. Prior to the reform initiated at the end of the 1970s, urban residents enjoyed comprehensive welfare treatments attached to their employers. The urban economic restructuring in the 1990s, however, has brought about challenges to the elderly support system. To deal with massive labour-market dislocations, the Chinese Government adopted a combination of individual accounts and social pooling as the uniform pension system in 1997. In spite of the shortage of funds in the pension system, the individuals who are eligible in the system are well protected since pension social provisions were implemented in 1998. Those elderly who are not supported by current programs, however, will find it difficult to deal with poverty and negative shocks. These two mixed groups of elderly people are likely to have substantial heterogeneity in expenditure when facing ageing simultaneously.

Other types of social security and public services also affect consumption patterns. For example, when encountering health shocks, people who are outside the healthcare system or can get only limited benefits from the healthcare system have to bear high out-of-pocket medical costs and in turn reduce their spending on other items. Huge burdens in education expenditure might cause intergenerational transfers from older to younger generations. For these and other reasons, the determinants of age-specific consumption patterns in an ageing society are of policy importance. While these problems are not entirely unique to China, they are perhaps more prominent there than elsewhere, particularly in an era of transitioning health and educational systems.

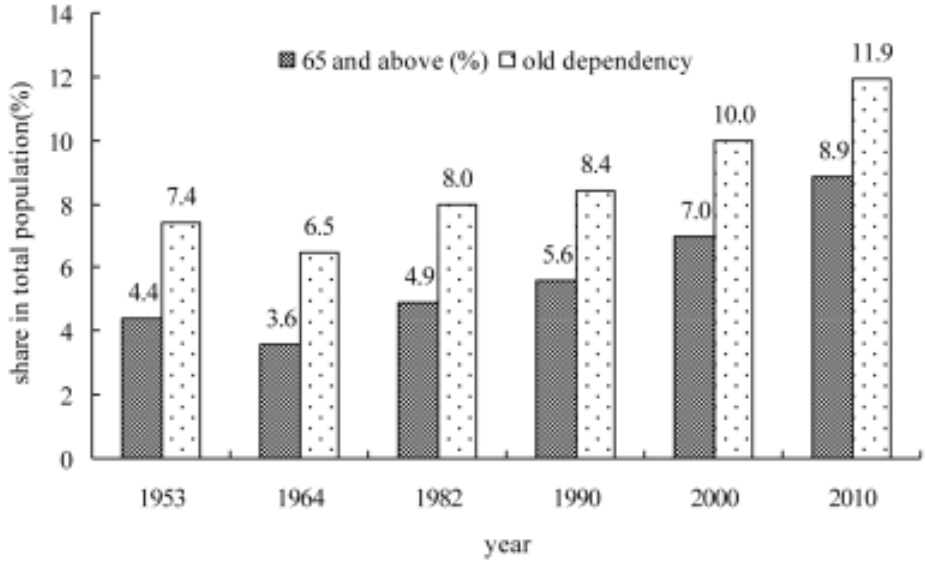
In spite of the policy relevance to long-term economic growth and macroeconomic fluctuations of the consumption patterns of elderly households, the empirical work on this is scant in China. This chapter employs data from an urban household survey conducted by the Institute of Population and Labour Economics at the Chinese Academy of Social Sciences in 2010. The China Urban Labour Survey (CULS) was implemented in five cities: Shanghai, Wuhan, Shenyang, Xian and Fuzhou. The first two rounds were conducted in 2001 and 2005 respectively. In each city, 700 local-resident households and 600 migrant households were surveyed. For the purpose of this study, only the local-resident sample is used. The survey provides information at both the household and the individual level.

This chapter is organised as follows. The next section briefly introduces the features of demographic transition in China and the process of population ageing. Then we employ the survey data to describe the pattern of consumption in China. This is followed by a presentation of the results from an empirical model that seeks to explain the relationship between population ageing and consumption. The final section concludes with some relevant policy recommendations.

Population Ageing in China

China completed the process of demographic transition in the past century. In fact, the total fertility rate in China has been declining since the 1970s. This process was driven first by the decline in mortality rates before the 1970s, and then by strict population policies in the 1980s and fast economic development since the country's period of opening up. With a low fertility level for decades, China has long been a country facing an ageing society. As Figure 17.1 depicts, in 2010, people aged sixty-five and above accounted for 8.9 per cent of the total population and the old-age dependency ratio reached 11.9 per cent in the same year. According to the widely accepted definition, China has already become an ageing society. The features of ageing are rooted in the process of demographic transition. The following aspects of demographic transition and ageing in China are of relevance to this chapter.

Figure 17.1 Share of the elderly and old-age dependency in years with a census



Sources: Data for 2010 are from NBS (2011); data for the other years are from NBS (various years).

First, China has experienced a relatively rapid process of population ageing compared with many other economies. As seen in Figure 17.1, between 1982 and 1990, the share of elderly people (aged sixty-five and above) increased by 0.7 percentage points, compared with an increase of 3.3 percentage points during the two decades since then. In the big cities we surveyed, the situation is even more serious. For example, in Shanghai, people aged sixty and above accounted for 23.4 per cent of its population in 2011, with people aged sixty-five and above accounting for 16 per cent of the total population.

To compare this process across economies, demographers use the duration and the multiplier of transition. The former refers to the time interval from the start of the first stage of transition to the end of the third stage of transition and the latter refers to the ratio of the population at the end of the transition to the start of the transition, which

essentially indicates transition speed. China is exceptional in both of these terms, as shown in Table 17.1, due to the combination of strict population policies and rapid economic development, both of which accelerated the transition.

Table 17.1 The features of demographic transition in selected economies

	Start and end of transition	Duration (years)	Transition multipliers
Sweden	1810–1960	150	3.83
Germany	1876–1965	90	2.11
Italy	1876–1965	90	2.26
Former Soviet Union	1896–1965	70	2.05
France	1785–1970	185	1.62
China	1930–2000	70	2.46
Taiwan, China	1920–1990	70	4.35
Mexico	1920–2000	80	7.02

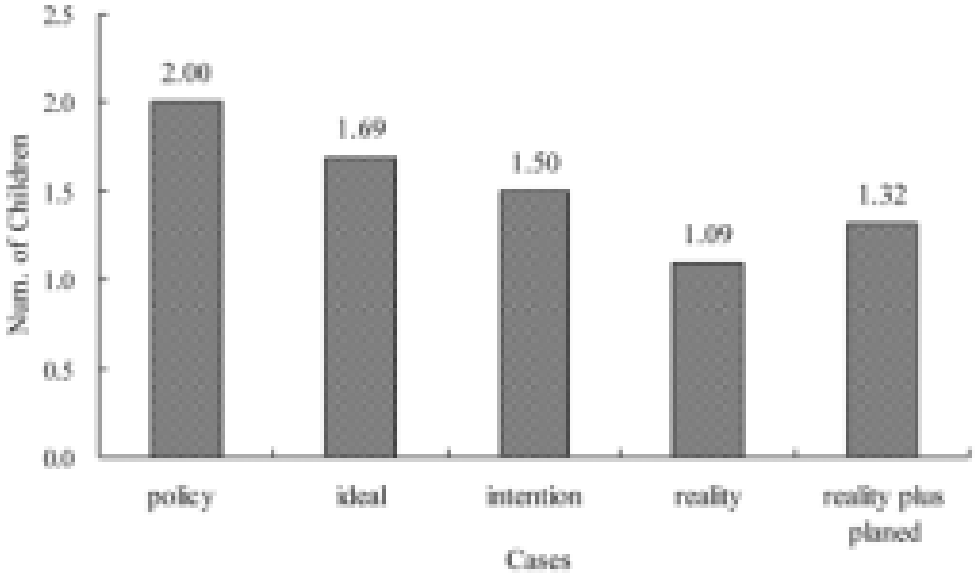
Source: Peking University Press (n.d.).

Second, the trend of fertility decline and ageing is not reversible. Some expectations of easing the pressure of ageing in China assume that fertility levels will bounce back if the strict population policy is relaxed. Although the strict population policy played a dominant role in fertility declines in the 1980s, empirical studies find that the fertility decline since the 1990s has been dominated mostly by economic development rather than by population policy (Du 2005). If this is the case, the role of population policy in the determination of fertility has already been weak. In other words, changes in the population policy will not change the trend of ageing in the future.

A recent empirical study of fertility intentions supports this argument. In Jiangsu, Zheng (2011) investigates 5295 women of childbearing age who are allowed to have two children as per local population policy. She finds that, although on average women claim that they intend to have 1.5 children, the number in reality is only 1.09 on average. Figure 17.2 displays the results at various levels of fertility, ranging from 1.09 to 2, as per different definitions. If the results of this study were to be applied to the rest of China, one cannot expect that the country will change the trend of ageing by abolishing population policy.[1]

Finally, population ageing has taken place before China has become a rich country. As noted, 8.9 per cent of the total population in China was sixty-five or more years old in 2010. On average, the ratio for other developing countries is about 5 per cent. Considering that the process is not reversible, the only choice for China is to keep economic growth sustainable. According to Fogel (2007) and the Japan Centre for Economic Research (JECR 2007), the possibility that China will become a high-income country by 2020 is pretty high. If this prediction is true, China's ageing problem will not be significantly worse than in industrialised countries. According to the United Nations, people aged sixty-five or more years old will account for 12 per cent and 16 per cent of the total population in China by 2020 and 2030, respectively, compared with average shares for industrialised countries of 19 per cent and 23 per cent.

Figure 17.2 Various fertility levels for women of childbearing age



Source: Cited from Zheng (2011).

Therefore, the key strategy for China to cope with ageing is to maintain its pace of economic growth in the next decade—a period that is recognised as the 'Strategic Opportunity Period' by the Chinese Government. Responding to the effects of ageing on economic growth and its drivers (such as consumption) is of policy relevance now.

Consumption patterns over the life cycle in urban China

Due to the transitional features noted earlier, the determinants of household consumption are complicated in urban China. Naturally, the first factor that affects consumption patterns is income. Studies of industrialised countries that find declining consumption around retirement are based on the assumption that income at retirement is significantly less than work income, which encourages rational people to save in order to smooth their consumption over the life cycle. When observing the Chinese labour market, this assumption on income needs to be modified. As long as retired people are eligible for the urban pension system, their income in retirement—compared with many industrialised economies—is not significantly lower than their working income. According to the CULS, in 2010 average monthly earnings for male retirees with pensions were RMB1904—accounting for about 70 per cent of the population of working males. For females, the average retirement income was RMB1484—accounting also for about 70 per cent of the population of working females. Furthermore, retired people have different education distributions to working people, with the latter having a higher educational attainment, on average. So, if we look at income

comparisons by education group, it can be easily seen that retirees actually receive very generous pay, especially those in low-education groups. Table 17.2 gives the details of the comparison.

Table 17.2 Income comparison by education group: retired versus working

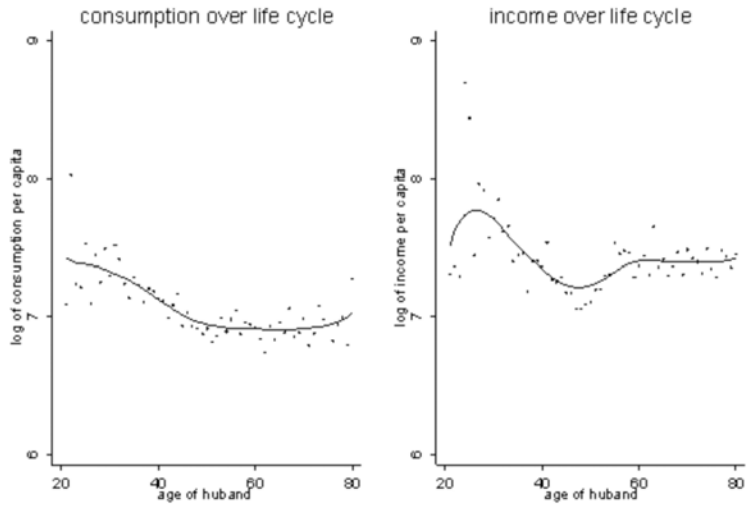
	Primary school	Junior high school	Senior high school	College and above
Male				
Work income (RMB, a)	1538	2049	2437	3486
Pension (RMB, b)	1508	1751	1727	2687
b/a	0.98	0.85	0.71	0.77
Female				
Work income (RMB, a)	1405	1315	1848	2824
Pension (RMB, b)	1211	1431	1524	2334
b/a	0.86	1.09	0.82	0.83

Source: Authors' calculation using the survey data from CULS (CASS 2010).

Thanks to the generous pay for retirees, Chinese urban income and consumption patterns over the life cycle are thus different from those in industrialised economies. For example, Browning and Crossly (2001) find an inverted-U shape for consumption and income within the working life for a sample of UK couples. Limited as we are by data sources, it is not possible to observe the life-cycle effect in income and consumption strictly by cohort. We can, however, still see how the pattern of income and consumption changes with age in our data. The two panels of Figure 17.3 depict the changes of consumption and income with age, respectively. It seems that consumption declines as age increases through the working-age period, while it is stable after retirement. The pattern of income change over the life cycle is more complicated. In addition to an inverted-U shape within the working life, a slight increase is found around retirement. There are two possible explanations here. First, the official retirement age varies across groups of people—for example, males and females, and workers in different occupations. Second, early retirees might receive an increase in income when they qualify to withdraw benefits from their pension account.

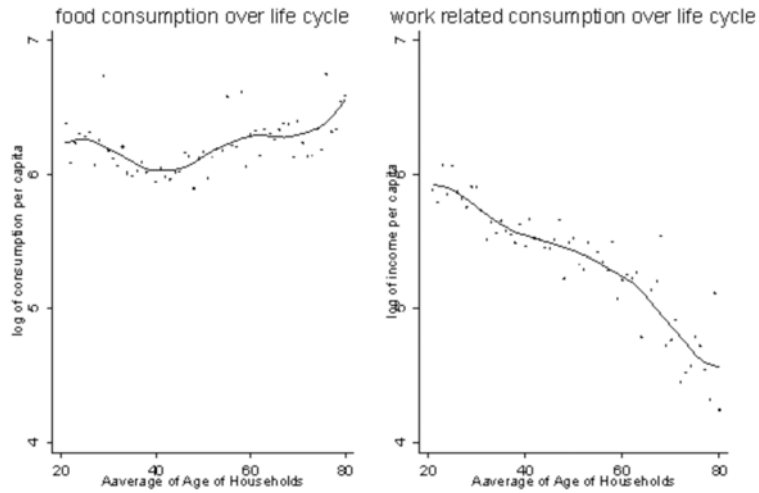
As for the components of total consumption, the case in China differs from the findings in industrialised economies, too. According to the stylised facts summarised by Hurst (2008), the declines in expenditure around retirement are limited mostly to two types of consumption categories: work-related items (such as clothing and transportation expenditure) and food (both at home and away from home). When applied to the situation in urban China, we find a dissimilar pattern in food consumption although a justifiable explanation is still expected. As shown in the left-hand panel of Figure 17.4, food consumption displays a U-shape within working life and is slightly increased after retirement.

Figure 17.3 Consumption and income with age increase



Source: Authors' calculations based on the survey data from CULS (CASS 2010).

Figure 17.4 Food and work-related consumption over the life cycle

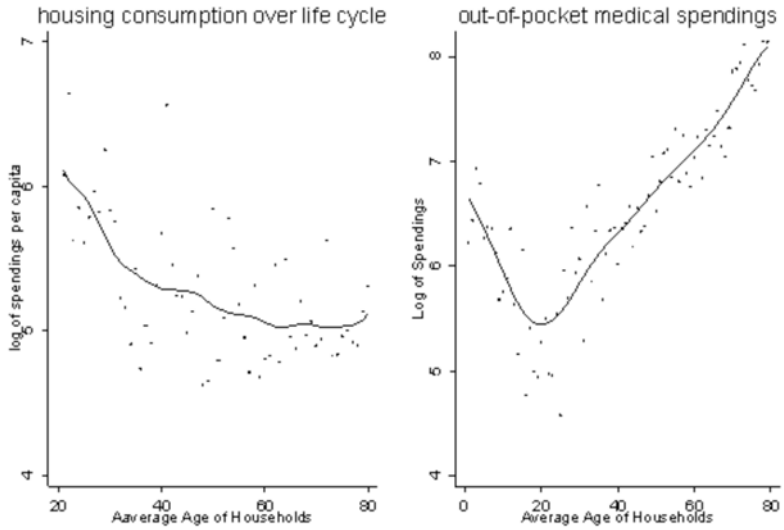


Source: Authors' calculations based on the survey data from CULS (CASS 2010).

The change in work-related consumption is quite obvious, as evidenced by the right-hand panel of Figure 17.4, where a very negative slope of the curve is found. In particular, the slope is steeper after retirement.

The last two categories of household consumption worth mentioning here are expenditure on housing and out-of-pocket medical spending. As shown in the left-hand panel of Figure 17.5, although the dots are quite diversified, a general declining trend is found as age increases. The pattern of out-of-pocket health expenditure is not surprising because the elderly are in general not sufficiently covered by the social health insurance system. In addition, the magnitude of medical expenditure in some households is quite large.

Figure 17.5 Housing and out-of-pocket medical spending



Source: Authors' calculations based on the survey data from CULS (CASS 2010).

To summarise the consumption pattern, Table 17.3 presents the composition of household consumption by age group. The table expresses the following features regarding the structure of consumption over the life cycle in urban China. First, compared with households of working age, aged households tend to reduce their expenditure on work-related items. Second, food consumption accounts for a large share in elderly households. Third, there is almost no difference in consumption shares on housing between the two groups. Finally, elderly households (defined as households with an average age of sixty-five or above) spend far more resources on medical care under the current healthcare system.

Table 17.3 Composition of household consumption in urban China (per cent)

Age group	Food	Work related	Housing	Service	Education	Health	Total
Working-age average	45.0	23.0	13.9	5.6	7.1	5.4	100.0
20–	42.7	20.9	22.0	9.5	0.7	4.2	100.0
20~29	41.2	25.6	18.2	5.8	6.4	2.9	100.0
30~39	42.0	23.1	12.5	5.2	13.0	4.4	100.0
40~49	45.3	24.2	13.2	5.3	5.7	6.2	100.0
50~59	51.6	19.2	13.8	6.1	1.7	7.5	100.0
Old-age average	54.8	12.6	13.7	7.9	0.0	10.9	100.0
60~69	51.6	19.2	13.8	6.1	1.7	7.5	100.0
70~79	55.6	10.0	14.1	7.8	0.0	12.5	100.0
80+	49.4	9.0	13.9	11.3	0.0	16.4	100.0
All	47.0	20.9	13.9	6.1	5.7	6.6	100.0

Note: Work-related consumption is defined as expenditure on transportation, clothing, communications, culture and entertainment.

Source: Authors' calculations based on the survey data from CULS (CASS 2010).

Empirical model and estimation results

The impact of ageing on consumption has been widely considered by academics in China. Very few empirical studies based on micro-level data have been conducted, however, due to data limitations. In this section, we take advantage of the CULS data to examine empirically the effect of ageing on household consumption.

Measuring income and consumption

To a large extent, consumption patterns are determined by individual behaviour. When measuring income and consumption, some items are measured at the individual level. Some, however, are not separable among household members. We have information about expenditure on education and out-of-pocket health care by individuals, but the remaining expenditure is at the household level. For this reason, we aggregate individual consumption to the household level and observe the effect of relatively aged households on consumption rather than of individuals.

According to the CULS data, household incomes consist of working income, pension income, asset income, private transferred income, public transferred income, and other income. The survey also carefully investigates household consumption. The items of expenditure are regrouped as in Table 17.3, and Table 17.4 gives the descriptive statistics on income and expenditure.

Table 17.4 Descriptive statistics on income and expenditure

	Mean	Std dev.	Min.	Max.
Income per capita	1753.9	1451.6	–3263	22 033
Working income	1010.4	1228.4	0	18 250
Pension income	633.1	807.3	0	10 000
Asset income	96.5	607.0	0	12 708
Private transfer	–4.3	397.8	–4583	18 333
Public transfer	8.7	55.7	0	1389
Other income	9.4	347.2	0	20 833
Expenditure per capita	1184	1283	0	70 992
Food	490.2	399.0	0	15 000
Work-related items	252.7	281.0	0	3150
Housing	220.0	1002.8	0	68 300
Service	82.5	236.7	0	7572
Education	65.6	161.8	0	3767
Health	72.9	200.6	0	4167
Number of observations	3573			

Source: Authors' calculations based on the survey data from CULS (CASS 2010).

Measuring population ageing

As discussed earlier in this chapter, most expenditure and some income are inseparable among household members. Although at the aggregate level population ageing is measured by the share of elderly people in the total population, this is not a good measurement

at the household level. In particular, we need to look at the effect of population ageing on household consumption rather than the consumption of individuals. Here, we measure the effect of population ageing by looking at the average ages of the households and define the households with average ages more than sixty-five as elderly households. Considering that elderly households could include some young members in this definition, we include some variables reflecting household compositions in the regression.

Based on the above definition, 15 per cent of sampled households are defined as elderly households in our sample.

Model and estimation results

The purpose of the empirical model is to look at the effects of population ageing on household consumption, including the effect on overall household consumption and its components. To capture the effect of ageing precisely, the core of the empirical strategy is to control the other factors that might also affect the consumption of urban households. Several types of household variables are included in the regression. The regression model is specified as follows: **Y** refers to the vector of income variables, **H** is a vector of household characteristic variables, and **S** stands for social insurance coverage (Equation 17.1).

Equation 17.1

$$C = Y\alpha + H\beta + S\gamma + \varepsilon$$

First, income is the fundamental determinant of consumption. Not only a control variable, it is also used to capture the effect of income on consumption *per se* at different income levels. If the majority of income in a given household comes from the pension of an elderly family member, this member might have more power than others in making decisions on what will be consumed in the household. Therefore, we also add variables reflecting the structure of household incomes into the regression—for example, the share of pension income in total income, the share of work income in total income, and the share of asset income in total income.

Second, other household composition variables could affect the pattern of household consumption, too. The following variables are included in the regression: household size is to capture the scale economy of household consumption. The fraction of children of different age groups (zero~six, seven~five, and sixteen~twenty-two) is also used to control their impacts on some types of expenditure, such as on education.

Finally, by adding the individual participation of social insurance, a household variable measuring access to social insurance is added. The impact of social insurance participation on current consumption could, however, be mixed. On the one hand, people with social insurance might have stable expectations of the future, which could encourage current consumption. On the other hand, expenditure on social insurance reduces income, which could have negative impacts on current consumption. City dummies in the regression are used to capture the regional factors that might affect household consumption.

To observe the consumption pattern of households at different levels of consumption, simultaneous quantile regression is applied. Two variables are of interest here: household income per capita and the variable measurement of population ageing. We look at their effects on per capita household expenditure, work-related consumption, and healthcare expenditure. Only the two variables are presented in Table 17.5 for simplicity.

Table 17.5 Simultaneous quantile regression results

	20th	40th	60th	80th
Log of household expenditure per capita				
Log of household income per capita	0.346	0.333	0.354	0.382
	(12.33)	(14.58)	(18.39)	(15.39)
Old household	–0.031	0.004	0.055	0.092
	(–0.58)	(0.11)	(1.55)	(2.11)
Pseudo R2	0.239	0.236	0.220	0.196
Number of observations				3518
Log of work-related expenditure per capita				
Log of household income per capita	0.623	0.578	0.582	0.567
	(9.89)	(15.44)	(11.48)	(12.79)
Old household	–0.600	–0.605	–0.558	–0.435
	(–4.76)	(–6.30)	(–7.66)	(–4.86)
Pseudo R2	0.246	0.240	0.222	0.196
Number of observations				3518
Log of out-of-pocket heath expenditure per capita				
Log of household income per capita	0.018	0.067	0.044	–0.038
	(0.77)	(1.03)	(0.71)	(–0.51)
Old household	0.087	1.222	0.938	0.964
	(0.25)	(6.15)	(6.45)	(7.17)
Pseudo R2	0.134	0.061	0.072	0.082
Number of observations	3518			

Note: t-statistics are in parentheses. The other regressors include the share of working income in total income, the share of pension income in total income, the share of asset income in total income, household size, percentage of household members aged between zero and six, percentage of household members aged between seven and fifteen, percentage of household members aged between sixteen and twenty-two, average years of schooling of household members, average coverage of social insurance among household members, and city dummies.

Source: Authors' estimations based on the survey data from CULS (CASS 2010).

Discussion of estimation results

It seems that population ageing has not affected the total expenditure of urban households. After controlling for the other factors, the ageing variable is statistically significant only in the case of the wealthiest households, and the sign of the coefficient is positive. In the same equation, we found that the wealthier households tend to have a slightly higher elasticity of consumption with respect to income, as evidenced by the coefficients of the income variable in the regression. The magnitude of the elasticity is about 0.33~0.38, which means that income growth in all urban households is supposed to have some kind of effect on increasing consumption.

The results on total expenditure do not, however, capture the effects of changing consumption patterns that are driven by population ageing. Due to ageing, household expenditure on some items increases and declines on some others. That is why we see insignificant effects on total expenditure. In the second regression, at each percentile, the elderly households consume significantly less than the young households in work-related items. The marginal effect is bigger in poor households than rich in households.

Although the income variable is statistically insignificant in the regression on healthcare expenditure, ageing affects this expenditure significantly except in the poorest households. This implies that the households have to bear the healthcare costs under the current health insurance system and this item of expenditure could crowd out the other household consumption.

Conclusions

Taking advantage of recent urban household data, this chapter has analysed the changing consumption pattern in urban households with respect to population ageing. The empirical results indicate that aged households significantly reduce their expenditure on work-related items although the effect of this on overall expenditure seems limited. Meanwhile, aged households spend far more resources on health care compared with their young counterparts.

Two implications lie in the pattern of expenditure on health. First, due to population ageing, it is expected that overall expenditure on health care will increase, which could negatively affect economic growth. Second, the empirical results also imply that healthcare expenditure could crowd out household consumption on the other items. Although the coverage of social health insurance in urban China has improved in recent years, in some cases the actual benefit to the households reimbursed by the healthcare system is not enough to deal with the health shock they encounter.

In China—a middle-income country—the marginal propensity of consumption in urban households is still high. Given this, policies to promote household income growth might have a positive impact on consumption growth, too. Strengthening reforms relating to income distribution will be a useful tool to rebalance the economy to a consumption-led growth pattern. For example, policies aiming to enhance the share of labour income in GDP will have the effect of increasing individual incomes.

The ongoing process of population ageing in China will definitely increase expenditure on health care. Our empirical results indicate that, if the current healthcare system is not reformed effectively, in terms of coverage and efficiency, the out-of-pocket expenditure on health care will further crowd out other forms of household consumption, which might become an unfavourable factor for determining future economic growth in China.

Bibliography

Banks, J., Blundell, R. and Tanner, S. 1998, 'Is there a retirement-savings puzzle?', *American Economic Review*, vol. 88, no. 4, pp. 769–88.

Bernheim, B., Skinner, J. and Weinberg, S. 1997, *What accounts for the variation in retirement wealth among US households?*, NBER Working Paper 6227, National Bureau of Economic Research, Cambridge, Mass.

Browning, M. and Crossley, T. F. 2001, 'The life-cycle model of consumption and saving', *Journal of Economic Perspectives*, vol. 15, no. 3 (Summer), pp. 3–22.

Browning, M. and Lusardi, A. 1996, 'Household saving: micro theories and micro facts', *Journal of Economic Literature*, vol. 34, no. 4, pp. 1797–855.

Chinese Academy of Social Sciences (CASS) 2010, *The China Urban Labour Survey*, Institute of Population and Labour Economics, Chinese Academy of Social Sciences, Beijing.

Du, Y. 2005, 'The formation of low fertility levels and its impacts on long run economic growth in China', *World Economy*, p. 12.

Fogel, R. W. 2007, *Capitalism and democracy in 2040: forecasts and speculations*, NBER Working Paper No. 13184, National Bureau of Economic Research, Cambridge, Mass.

Hurst, E. 2008, *The retirement of a consumption puzzle*, NBER Working Paper 13789 (February), National Bureau of Economic Research, Cambridge, Mass.

Japan Centre for Economic Research (JCER) 2007, *Demographic Change and the Asian Economy*, Long-term Forecast Team, Economic Research Department, Japan Centre for Economic Research, Tokyo.

Modigliani, F. and Brumberg, R. 1954, 'Utility analysis and the consumption function: an interpretation of the cross section data', in K. Kurihara (ed.), *Post-Keynesian Economics*, Rutgers University Press, New Brunswick, NJ, pp. 388–436.

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

National Bureau of Statistics (NBS) 2011, *The Statistical Communiqué on the Sixth Population Census in 2010 (No. 1)*, National Bureau of Statistics, Beijing, <www.stats.gov.cn>

Peking University Press n.d., *Brief History of World Population*, [In Chinese], Peking University Press, Beijing.

Zheng, Z. 2011, 'Childbearing intention and childbearing behavior: evidence from Jiangsu survey', *Population Research*, no. 2.

Endnotes

1. Of course, this is not a reason for keeping the current population policy unchanged.

18 The Route of Urbanisation in China from an International Perspective

Xiaolu Wang[1]

Introduction

This chapter examines China's urban development strategy from an international perspective. There are ongoing debates as to whether the Government's plan for urbanisation should focus on the development of small and medium size cities and towns, or whether instead China should allow, and encourage, more large cities to emerge to accommodate the large scale of urbanisation. This has been a highly controversial issue in China and raises the more general issue of whether, and to what extent, the Chinese Government should intervene in the process of urbanisation, which has hitherto been driven largely by market forces. A cross-country econometric analysis shows that the concentration ratio of the population (defined as the percentage of the population living in mega-cities—that is, cities with a population of 1 million and above) is determined by the level of economic development, the urbanisation ratio, population density, transport conditions, and the geographic location of the country. From this perspective, the concentration ratio in China is shown to be far below the international convention. To follow international common practice, China's concentration ratio should be lifted up by 17 percentage points (from the 2007 level) by 2030. This means that an additional 273 million people will transfer to mega-cities in China between now and then.

The next section provides some background information on the past route of China's urbanisation, and reviews the relevant literature. This is followed by an empirical study using cross-country data to examine the rationality of China's population concentration ratio, and a prediction for China's concentration ratio in the future, on the basis of international experience. Policy implications are discussed in the concluding section.

Background

During the 60 years since the 1949 revolution, the urbanisation process in China can be divided into three phases. In the first phase of central planning, urbanisation in China was extremely slow, especially compared with its rapid industrialisation. During the 26 years from 1952 to 1978, the industrial share in gross domestic product (GDP) increased by 27 percentage points—from 17.6 per cent to 44.4 per cent. During the same period, however, the urbanisation ratio (urban population as a proportion of the total) increased by only 5 percentage points—from 12.5 per cent to 17.9 per cent. This was abnormal

compared with urbanisation in other industrialising countries, resulting mainly from the government policy of sacrificing urbanisation in order to maximise industrial investment for its industrialisation strategy.

This policy significantly accelerated the process of industrialisation in the early years of this period. Its negative impacts, however, gradually dominated. Efficiency in the industrial sector became very low and there were many failures in investment programs in industry; service sectors remained underdeveloped; the urban–rural income gap became larger and larger; and there was serious underemployment in the rural sector. These were due largely to the underdevelopment of the urban economy. Things went to the extreme in the 1960s and 1970s when many factories were built in mountain areas, far away from cities, and suffered from the difficulties of procuring inputs and subsequently transporting production to distant markets.

The second phase of urbanisation was from 1979 to the late 1990s—that is, the early economic reform period. During this period, the old policy of restricting urban development was partially abandoned and replaced with a policy that aimed to 'strictly restrict the scale expansion of large cities, reasonably develop medium and small cities, and actively develop small towns'. This policy freed limitations on the development of medium and small cities and towns, and gradually loosened restrictions on rural–urban labour migration. Together with the systematic transition from a centrally planned economy to a market economy, this led to rapid urbanisation as well as rapid economic growth. During the 20 years from 1979 to 1998, the urbanisation ratio increased by 15 percentage points—from 17.9 per cent to 33.3 per cent. Compared with the earlier period, in the second phase, the speed of urbanisation was several times higher.

During this period, the total number of cities in China expanded dramatically from 193 to 668, of which the number of medium and small cities (medium cities are defined as those having an urban population between 200 000 and 500 000) increased from 153 to 583—that is, a 281 per cent increase. In contrast, the number of large cities increased by 89 per cent—from 45 to 85. In this period, the average city population decreased from roughly 400 000 to 300 000.

During this period, the number of small towns increased even more rapidly than the number of medium and small cities—from some 2000 to 18 000. This was a result pushed by government administrative power. The total population living in towns, however, increased by 60 per cent—from roughly 100 million to 160 million—implying a dramatic drop in the average population size of towns. This indicates that, despite the policy bias in their direction, small towns lacked the attractiveness for population concentration and the capital investment for further developing themselves.

The third phase of urbanisation commenced in the late 1990s, when the policy restriction on the development of large cities was abandoned and replaced with a new policy called 'harmonising the development of large, medium and small cities and small towns'. Rural–urban labour migration, instead of being merely allowed, was encouraged in some senses (although still restricted in certain aspects such as through the household registration system). During this phase, the process of urbanisation further accelerated, with the urbanisation ratio increasing by 13 percentage points—from 33.3 per cent in 1998

to 46.6 per cent in 2009. In particular, the number of mega-cities increased from 81 to 124, whereas the number of smaller cities decreased from 587 to 530. This suggests that, in contrast with the Government's preference for smaller cities in the earlier periods, market forces prefer mega-cities to smaller ones.

Despite these changes, some recent studies indicate that the average size of Chinese cities is still too small (for example, Gill and Kharas 2007; Henderson 2007). This is at least partially due to continuing restrictions within the urban household registration system and the exclusion of migrant workers from urban social security and public service systems.

The problem also comes from frequent policy vacillations. For instance, an official document of the Central Committee of the Chinese Communist Party on the Twelfth Five-Year Plan, published in October 2010, called for 'taking medium and small cities and towns as a priority' in urban development, and asked local governments to loosen the limitations of household registration in these smaller cities and towns. While this made some progress in terms of urbanisation, it appears to be a partial copy of the earlier restrictive policy against large cities.

Attempts to avoid the development of large cities have a few possible explanations. One of these comes from the fear of 'large city disease'. This relates to assessments of the negative externalities of large cities, as discussed further below. Another comes from a misunderstanding on land use in different cities. It is often seen in official statements that, with consideration of land scarcity in China, priority should be given to the development of small cities and towns. Chinese statistics show, however, that per capita land use in small cities and towns is actually far larger than in large cities.

Table 18.1 shows that, in 2007, urban built areas had only 73 sq m per person in larger cities, 94 sq m per person in smaller cities, 121 sq m per person in county towns, and 183 sq m per person in ordinary towns. The last column of Table 18.1 shows the ratios of per capita urban areas, taking that area in cities with a population size of 4 million or above as 1, showing that per capita urban land areas in smaller cities decrease rapidly with city size.

Table 18.1 Per capita land use in different sized cities and towns

City size (million persons)	Per capita urban built area (sq m)	Per capita urban area (sq m)	Ratio in per capita urban area (≥ 4 million cities = 1)
≥ 4	76	888	1.0
≥ 2	83	1061	1.2
1–2	62	1499	1.7
0.5–1	75	2280	2.6
< 0.5	94	5596	6.3
County town	121	..	..
Ordinary town	183	..	..

.. not available

Source: Calculated from NBS (2008) data.

According to urban economics theories, cities—especially large ones—have positive externalities stemming from agglomeration effects, which come from more efficient trade and lower transport costs led by population concentration and larger sized markets for goods, inputs and production factors; more efficient use of land and infrastructure; industrial cluster effects; stronger spill-overs of information, knowledge and technology; and higher productivity resulting from better developed service sectors.

Large cities also have negative externalities due to transport congestion, environmental pollution, higher living costs and the deterioration of living conditions of residents, which all result from high population density and industrial concentration. Therefore, a key issue is how to optimise city scale taking these positive and negative externalities into account.

In an earlier study, Wang and Xia (1999) set up an econometric model, using panel data for more than 600 Chinese cities for the period between 1989 and 1996, to estimate the positive and negative externalities of cities. They derived a positive and marginally diminishing externality function and a negative and marginally increasing externality function. Between these two externality curves, they find an inverted-U shaped net return to scale of cities within a large range of city sizes. Of different scaled cities, those with an urban population between 1 and 4 million are found to be optimal, with net returns to city scale at 17–19 per cent of the total value added of these cities. For cities below the population size of 100 000 people, no net return was found.

Based on this result and Chinese city statistics, the authors argued that there were too few large cities in China, and that the Government's policy of restricting the development of large cities and encouraging the development of small towns had led to efficiency losses, and should be replaced. They suggested an active policy for the Government to improve the provision of public services and to extend the social security system to cover rural–urban migrant workers and enable them to settle in cities. They also suggested that the Government improve infrastructure conditions in a limited number of medium-sized cities with better market environments and natural endowments, to enable them to grow into larger cities, rather than spending government resources investing in too many small cities and towns.

Au and Henderson (2006) also use Chinese city-level data and econometric models to find an inverted-U shaped agglomeration effect of cities along with changing city scales. They estimate that, given an output ratio between the manufacturing and service sectors of 1, the optimal employment size of cities (where value added per worker is maximised) is 1.17 million (implying a total population of about 2.3 million). Where the manufacturing–service ratio is 0.6, the optimal employment size is 1.44 million (implying a total population of 2.8 million). Thus, the findings from the two studies—that is, Au and Henderson (2006) and Wang and Xia (1999)—are basically consistent.[2]

Henderson (2007) also suggests that if the sizes of Chinese prefecture-level cities doubled, their labour productivity could increase by 20–35 per cent. His calculations, however, seem to be based on gross returns and do not deduct the negative externalities.

Both these studies were based on data for individual cities, and were thus unable to investigate the issue of spatial interactions among different Chinese cities.[3] With consideration of these interactions, I assume that different-sized cities (and towns) in an economy form a

system, and therefore there is no single solution for optimal city size. While questions of optimal city size remain interesting and important, we shift our attention here to study the role of large cities in a country, and what are the influential factors on this issue—rather than focusing on optimal size per se.

An empirical analysis from an international perspective: the role of mega-cities

Urbanisation has been a non-exceptional phenomenon experienced by all industrialised countries during their development process. Different countries have shared many common features in their urbanisation process, including an increasing concentration of the population in large cities that is driven by the agglomeration effects.

Meanwhile, there have also been differences in urbanisation patterns, in terms of pace and extent, city scale and the spatial distribution of cities. These differences will be determined by a range of country-specific economic, demographic, geographic and social conditions, including the level of economic development, population density, the geographic location and natural endowments of a country, transport conditions, and government policies.

This section draws on cross-country data to examine the range of factors that influence national-level concentration ratios, which provide an indication of how city scale changes. The concentration ratio is measured as the proportion of the population in a nation living in cities with a population size of 1 million and above (mega-cities), and is used as an indicator of city scale. Data are from the World Bank (2008, 2009). The hypotheses to be tested include the following.

1. To benefit from city-level agglomeration effects, a larger part of the population in a nation gradually gathers in mega-cities during the process of economic development; therefore the level of economic development has a positive effect on the concentration ratio.
2. Without achieving a certain level of urbanisation, mega-cities can hardly develop themselves; thus, the urbanisation ratio (population share in urban areas) also has a positive effect on the concentration ratio.[4]
3. Higher population density means land resources are more scarce and therefore more costly; therefore the market mechanism will naturally lead to a higher concentration of the population (that is, in mega-cities) to save land resources. A lower population density (and thus a broader population distribution) will, however, have greater transport needs, which might also result in a higher concentration of the population in order to reduce transport costs. These two effects work in opposite directions, so this study tests which effect dominates.
4. Given the same population density, better transport conditions can reduce the necessity for population concentration. This is because, as travelling becomes easier, people can live in smaller cities near large central cities, so that they can enjoy lower living costs, an easier life in smaller cities, and better services provided in central cities at the same time. Thus, transport conditions should have a negative effect on the concentration ratio.

5. Greater income inequality leads to a higher concentration ratio. This is because the greater the income inequality, the larger will be the income gap between mega-cities and small cities and towns, and this makes mega-cities more attractive.
6. Different geographic locations, which reflect different natural environmental and human ecological conditions, can have positive or negative effects on the concentration ratio.

Finally, government policies—that is, whether governments prefer large or small cities and how they use various policy measures to affect the urbanisation process—can also affect the concentration ratio. Country-specific information is, however, not available for this hypothesis, and is therefore not tested here.

To test the above hypotheses 1–6, a linear model is set as follows[5] (Equation 18.1).

Equation 18.1

$$m = c + a_1 y + a_2 u + a_3 d + a_4 r + a_5 g + a_6 aon + a_7 eu + \varepsilon$$

In Equation 18.1, m is the concentration ratio; y is per capita gross national income (GNI) in a purchasing power parity (PPP) measure, indicating the level of economic development; u is the urbanisation ratio—that is, the proportion of urban population in the country; d is the population density, measured by the number of persons per square kilometre of the territory; r is a road density variable to present the transport conditions—that is, kilometres of highway and railway length per 100 sq km of the territory, where railway length is converted into highway equivalent by multiplying by a conversion factor of 14.7, which was derived from Chinese empirical data; g is the Gini coefficient for income inequality (or consumption inequality where income data are unavailable); aon is a regional dummy for North and South America, Oceania and North-East Asia; and eu is a regional dummy for European countries. African and the remaining Asian countries are taken as reference countries. Countries were grouped according to similarities that were found in preliminary regressions using more specific dummy variables.

Cross-country data for 2007 from the World Bank (2008, 2009) are used (where 2007 data are unavailable, 2005 or 2006 data are used instead). Lower-income countries (below US$2500 per person, PPP) are considered to be not representative enough in terms of urban development, and small countries (with populations below 4 million, or with an area less than 20 000 sq km) are considered to be naturally restricted in their city-scale options. These two types of countries are therefore excluded from the data set. Countries with incomplete data are also dropped. There are 56 countries in the remaining sample.

Table 18.2 shows the robust regression results. Most estimates are statistically significant. Due to the low significance of the Gini coefficient in a preliminary regression, it is omitted from the model. Further investigations find that the fitted concentration ratios and the actual ones are close, with an average error of 2 percentage points. This indicates the satisfactory fitness of Equation 18.1.

Table 18.2 Determinants of the concentration ratio: regression results

	Coefficient	t-ratio (robust)
y	5.03E-06	5.21**
u	0.1561	2.12*
d	2.67E-04	2.31*
r	–4.39E-04	–3.16**
aon	0.1221	3.51**
eu	–0.03525	–0.87
Constant	0.04194	0.94
Samples	56	
R^2	0.6824	

* significant at the 5 per cent level

** significant at the 1 per cent level

Source: Author's own estimation

As expected, per capita GNI, the urbanisation ratio and population density all have positive and significant impacts on the concentration ratio, while road density has a negative and significant effect. The regional dummies imply that the concentration ratios of American, Oceanian and North-East Asian countries are 12 percentage points higher than in African and other Asian countries, all other conditions being equal. The European dummy variable has a negative but insignificant coefficient.

Based on the coefficients obtained from the regression based on Equation 18.1, we can predict China's current and future concentration ratio assuming that international convention is followed—that is, given China's level of development and other relevant factors, the concentration ratio China would have according to the international average when other conditions are equal. Other assumptions for the prediction are as follows.

a. Per capita GNI (PPP$ in 2009 prices) in China will grow at an annual rate of 7 per cent between 2010 and 2020 to achieve $13 682 in 2020, and then by 6.5 per cent between 2021 and 2030, to achieve $25 682 in 2030.[6]
b. The urbanisation ratio will continue to increase by 1 percentage point per annum during the period 2010–20, to achieve 59.7 per cent by 2020, and then by 0.8 percentage points during the period 2021–30, to achieve 67.7 per cent by 2030 (during the period 2001–10, the urbanisation ratio was lifted by 1.35 percentage points per annum).
c. China's population will grow at 0.5 per cent per annum during the 2010–20 period to achieve 1.41 billion, and then by 0.3 per cent per annum during the 2021–30 period to achieve 1.45 billion, to increase the population density from 139 (2009 figure) to 147 persons/sq km by 2020, and then to 151 persons/sq km by 2030.[7] As a reference, from 2000 to 2010, the actual annual population growth rate was 0.6 per cent.
d. Road density will double during the 2007–20 period to achieve 99 km/100 sq km, and further increase by 50 per cent during the second period to achieve 148 km/100 sq km. By way of comparison, road density in 2007 in the United States

was 107 km/100 sq km, and it was 417 km/100 sq km in Japan (World Bank 2009). Road density in China doubled between 1999 and 2007.

The result of the prediction for China's concentration ratio is shown in Table 18.3. The values for each determinant in the first three columns are their true values (for 2009) and assumed values (for 2020 and 2030), and the data in the last three columns are the predicted effects on the concentration ratio, in percentage points. The bottom row presents the sum of these effects—that is, the predicted concentration ratios for the corresponding years.

As shown in Table 18.3, the actual concentration ratio in China in 2007 was 20.4 per cent[8] (that is, 20.4 per cent of the total population in China lived in mega-cities), which is below the world average (24.6 per cent in 2005). The predicted ratio for China in 2009, based on the international average given the level of development and other conditions, is 28.8 per cent. This indicates that the proportion of the Chinese population living in mega-cities is significantly below international common practice, implying a serious underdevelopment of mega-cities in China from an international perspective. This result is consistent with some comparative studies using international data (for example, Gill and Kharas 2007) and the empirical studies based on the Chinese city-level data (Au and Henderson 2006; Wang and Xia 1999)—which all indicates that average city size in China is too small. While the empirical model does not test for it, these results suggest that this might well be the result of restrictive government policies on the development of large cities or on rural–urban migration.

Based on the prediction shown in Table 18.3, to follow international common practice, 32 per cent of the Chinese population will live in mega-cities by 2020, and this proportion will reach 37 per cent by 2030. These concentration ratios are significantly higher than the present level in China, although they are still below present levels in the United States and Japan (at 43 per cent and 48 per cent, respectively). Dividing the 17 percentage point increases in the concentration ratio—from 2007 to 2030—into contributions from each different factor reveals that economic growth, urbanisation and population growth in China will contribute 9.6, 3 and 0.3 percentage points, respectively, to the increasing concentration ratio, while the improvement in transport conditions will reduce the concentration ratio by 4.3 percentage points. These four factors will together contribute 8.6 percentage points. The remaining unexplained 8.4 percentage point increase in the concentration ratio will, very likely, be attributed to policy adjustments that abandon restrictions on large-city development and rural–urban migration.

Based on these predictions, to achieve the concentration ratios of 32.2 per cent in 2020 and 37.5 per cent in 2030, the population living in Chinese mega-cities will need to reach 454 million people by 2020, and 543 million by 2030. This means an increase of 273 million people in mega-cities by 2030 from the 2007 level.

Table 18.3 Predicted future concentration ratios in China

	Influential factors			Effect on concentration ratio (percentage point)		
	2009	2020	2030	2009	2020	2030
Per capita GNI (PPP$)	6500	13 682	25 682	3.27	6.88	12.92
Urbanisation ratio (per cent)	48.7	59.7	67.7	7.60	9.32	10.57
Population density (persons/sq km)	139.0	146.9	151.3	3.72	3.92	4.04
Road density (km/100 sq km)	49.3*	98.6	147.9	–2.16*	–4.33	–6.49
Regional dummy (aon)				12.21	12.21	12.21
Constant				4.19	4.19	4.19
Predicted concentration ratio (per cent)				28.83 (20.4*)	32.20	37.45

Notes: Data with * are for year 2007, and the number in parentheses is the actual value.

Sources: NBS (2010); World Bank (2010); and calculation results.

An often-seen argument in China is that further increases in the population living in mega-cities will make these cities overcrowded. This will not necessarily be true, however, because the average population size of mega-cities could remain unchanged as long as the number of mega-cities grows rapidly enough. For this to be the case, the number of mega-cities would need to double—from the current number of 124 to 250. More realistically, both the average population of current mega-cities and the number of mega-cities will need to increase over time.

Most of these new mega-cities will develop from the current medium-sized cities, or even small cities. Over time, a few new super economic and population centres might emerge, besides the current Yangtze River Delta, Pearl River Delta and Beijing–Tianjin–Hebei areas—for instance, the Chongqing–Chengdu area and the Wuhan–Changsha area.

Considering that the current concentration ratio is too low, even a positive policy adjustment might not lead to the predicted concentration ratio of 32 per cent by 2020. Assuming that by 2020 it can reach 30 per cent, this still implies a large population increase in mega-cities of 154 million people. For this to materialise, future policy adjustment will need to remove remaining restrictions that have hindered the urbanisation process to a certain extent, and the expansion of mega-city populations in particular. With consideration of the effects of both aggregate demand growth and efficiency increases, the development of mega-cities will continue to be a major engine of economic growth in the coming decades (Au and Henderson 2006; Wang and Xia 1999).

Conclusions

This chapter analysed the determinants of China's national-level concentration ratio—that is, the ratio of the population living in mega-cities—from an international perspective. The cross-country analysis indicated that this ratio is positively affected by each country's level of economic development, degree of urbanisation and population density, while being negatively affected by transport infrastructure. Geographic location was shown to have either a positive or a negative effect on the concentration ratio.

Based on these results, drawn from international experience, the author suggests that a more rational concentration ratio in China should be close to 29 per cent in 2009—about 8 percentage points higher than its actual level. This indicates an underdevelopment of mega-cities in China—likely due to policy restrictions in the earlier period, the unreformed urban household registration system and the incompletion of social security systems in urban areas, which exclude the majority of rural–urban migrant workers from coverage.

Assuming that future policy adjustment will continue to lead China's urbanisation process to follow international convention in the coming decades, it is predicted that China's concentration ratio will reach 37 per cent in 2030. This means that the population living in mega-cities will grow from the current 270 million to 543 million—a 273 million increase. In other words, the urbanising population in the coming two decades will concentrate mainly in mega-cities. This does not, however, necessarily imply a further expansion of the size of current mega-cities, but rather suggests the need for more mega-cities in China. Because of the positive agglomeration effect of mega-cities, this development in the coming

two decades will become a strong engine for China's economic growth, and might bring China into the high-income-country group. To achieve this, however, numerous policy adjustments will be necessary.

First, government policy preferences towards the development of small cities and towns should be replaced with a more neutral urbanisation policy. Some of the preferential policies enjoyed by a small number of selected large cities (especially provincial and capital cities) should also be removed. Population and resources flowing into large cities, led by market forces, are usually indicators of improvement in resource allocation, and should not be redirected by government restrictions.

Second, the urban household registration system, which hinders rural–urban migrant workers from receiving coverage under the urban social security and public services systems, should be reformed. The provision of public services should be equalised among migrants and original urban residents.

Third, the role of government in urban development should be, in general, complementary with market forces. Meanwhile, because of the positive and negative externalities of urban economies, the Government still has an important role to play. For instance, further development of large cities relies heavily on urban planning and infrastructure improvements. In these areas, governments should continue to play active roles.

Fourth, due to city-based negative externalities, some mega-cities might become oversized, and this is unlikely to be automatically corrected by market forces. International experience shows that, once a city becomes oversized, its transport conditions and living environment deteriorate, and both living costs and production costs become high. Cities such as Shanghai and Beijing are approaching a population size of 20 million, and the trend of their expansion is continuing. To prevent the unlimited expansion of these super mega-cities, it might be useful to promote the development of second-tier cities and small cities in the surrounding areas, so that the migration pressure towards these super mega-cities can be alleviated.

For instance, there is only one mega-city within 120 km of Beijing, and there are only two mega-cities within 130 km of Shanghai. In contrast, there are six mega-cities in the Pearl River Delta region, within an 80 km radius. This could explain why no city in this area exceeds a population of 10 million. Therefore, more mega-cities might be a better solution for the problem of oversized super mega-cities, particularly compared with administrative measures that simply restrict migration towards those super mega-cities.

Fifth, as indicated by the results of empirical analysis in this chapter, a better road network—especially better intercity transport systems—might be another effective measure to alleviate the migration pressure towards oversized, or soon-to-be oversized, super mega-cities. This is because better transport conditions can enable people to live in nearby smaller cities and, at the same time, to enjoy the better services provided in the super cities.

In general, a market-friendly urbanisation policy framework, together with carefully designed government measures to deal with the positive and negative externalities of the urban economies, will accelerate the urbanisation process in China and improve the efficiency of the urban economies at the same time, thereby playing a critical role in sustaining China's long-run development.

Bibliography

Au, C. and Henderson, V. 2006, 'Are Chinese cities too small?', *Review of Economic Studies*, vol. 73, no. 2, pp. 549–76.

Dobkins, L. H. and Ioannides, Y. M. 2001, 'Spatial interactions among US cities: 1900–1990', *Regional Science and Urban Economics*, vol. 31, pp. 701–31.

Gill, I. and Kharas, H. 2007, *An East Asian Renaissance: Ideas for economic growth*, The World Bank, Washington, DC.

Henderson, J. V. 1987, 'General equilibrium modeling of systems of cities', in E. S. Mills (ed.), *Handbook of Regional and Urban Economics. Volume 2*, Elsevier, Amsterdam, pp. 927–56.

Henderson, J. V. 2007, *Urbanization in China: Policy issues and options*, China Economic Research and Advisory Programme.

Maddison, A. 2007, *Chinese Economic Performance in the Long Run*, (Second edition), Development Centre of the Organisation for Economic Cooperation and Development, Paris.

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

National Bureau of Statistics (NBS) 2008, *China City Statistical Yearbook*, China Statistics Press, Beijing.

National Bureau of Statistics (NBS) 2010, *China Statistical Yearbook 2010*, China Statistics Press, Beijing.

National Bureau of Statistics (NBS) 2011, Press release on major figures of the 2010 National Population Census, National Bureau of Statistics, Beijing, <http://www.stats.gov.cn/tjfx/jdfx/t20110428_402722521.htm>

O'Sullivan, A. 2000, *Urban Economics*, (Fourth edition), McGraw-Hill, New York.

United Nations Population Division (UNPD) 2008, *World Population Prospects: The 2008 revision*, United Nations Population Division, New York, <http://data.un.org/Data.aspx?q=China&d=PopDiv&f=variableID%3a12%3bcrID%3a156%2c948>

Wang, X. and Xia, X. 1999, 'Promoting economic growth by optimizing urban size', [In Chinese], *Economic Research Journal*, no. 9 (September).

World Bank various years, *World Development Report*, The World Bank, Washington, DC.

World Bank 2008, *World Development Indicators*, The World Bank, Washington, DC.

World Bank 2009, *World Development Report*, The World Bank, Washington, DC.

World Bank 2010, *World Development Report*, The World Bank, Washington, DC.

Endnotes

1. The author thanks Jane Golley for her very helpful comments and language revisions.

2. Au and Henderson suggest that their study is the first one to use econometrical tools to estimate the agglomeration effect of cities. This seems to be a result of information insufficiency due to language barriers (Wang and Xia's 1999 paper is published in Chinese).

3. For references, see Dobkins and Ioannides (2001); for the case of US cities, see also Henderson (1987); and O'Sullivan (2000).

4. One could argue that the concentration ratio can also affect both the level of economic development and the urbanisation ratio—thus, there exists a reverse-causality problem. These effects work, however, basically in the long run—for example, changes in the concentration ratio in the short run might affect economic growth and efficiency marginally, but will have little impact on the *current level* of development of a country. Thus, in the current cross-section regression, the author treats both the level of economic development and the urbanisation ratio as exogenous variables for simplicity.

5. An alternative equation with inclusion of the square term of the explanatory variables was tested for possible non-linearity, but estimates of all the square terms were insignificant, and calculation shows better fitness of the original equation than the alternative one. The results of the latter are therefore not reported.

6. Angus Maddison (2007) estimated that GDP growth in China in a PPP measure was 6.6 per cent per annum from 1978 to 2003. Economic growth further accelerated in China, however, during the post-2003 period. In addition, the 2005 economic censuses in China found serious underreporting in services sector output in previous official statistics, and this indicates underreporting of the economic growth rate in that period.

7. These assumptions are based on the United Nations' population forecast—slightly modified by the author with reference to the results of the recent Chinese population census (see UNPD 2008; and NBS 2011).

8. This number excludes the population in county-level cities (smaller cities) with a population above 1 million, because they usually include a large number of rural people, and therefore their urban population size in statistics is overstated.

Index