

China in Focus: Lessons and Challenges

2012



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FOREWORD

The OECD's mission is to help governments develop, adopt and implement "better policies for better lives". To do so, the Organisation brings together the collective expertise and accumulated experience of a range of policy communities from all around the world. The main challenges faced by our economies are indeed global and addressing them requires the OECD to work ever more closely with its partners to design better policy options and truly global solutions. China's experience and development path are thus of critical interest to the OECD.

The collaboration between China and the OECD is a two-way process. The OECD is increasingly incorporating China's perspectives into its policy analysis and recommendations in order to provide its Members with smarter, innovative policy choices. In turn, as China becomes a more prosperous country, the challenges it faces in its economic development are also increasingly similar to those of many OECD countries, in particular regarding how to foster and sustain more inclusive and greener growth. The experiences of OECD countries are thus more and more relevant for China's own policy choices. This is evidenced by the fact that the OECD works on many policy issues identified as priorities in the Chinese 12th Five Year Plan, including energy efficiency, public service delivery, social protection, education and health care, just to cite a few.

This publication "China in Focus: Lessons and Challenges" has a two-fold objective. First, it provides a snapshot of the current cooperation between China and the OECD by gathering analyses conducted by the OECD on China in 2011, including in the areas of poverty reduction, inequality, health care and foreign trade. Second, it shares with China the policy experience of OECD Members on issues of particular relevance for China, such as green growth and skills.

Our intention is to make this publication a regular feature of the OECD-China policy dialogue to help shape and deepen our cooperation further. This cooperation dates back to the mid-90s and has since then been intensified and extended to new policy areas. We consider this policy dialogue as strategic for the future of the OECD and to build together a stronger, cleaner and fairer world economy.



Angel Gurría
OECD Secretary-General

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Introduction

China's economic rise has drawn growing attention across OECD countries and beyond, while many of its key policy challenges are increasingly in alignment with OECD priorities. *China in Focus: Lessons and Challenges* gathers analyses conducted by the OECD on China in 2011, together with a selection of more general pieces of work of particular pertinence to China. The objective is twofold: first, to facilitate access for Chinese policy makers and experts to relevant OECD reports, which provide an international perspective on China's situation and challenges; and second, to enhance the understanding of China's experience in the broader policy community, in developed as well as developing countries.

Today, China and OECD countries face a number of common challenges. Some, like improving international trade and investment regimes, or curbing climate change, have a global dimension and require co-ordinated action, which in turns requires a mutual understanding through policy dialogue. Others reflect China's progress towards its goal of becoming a well-off society in an all-around way. China now ranks as an upper middle income country with a GDP per-capita closing in on some OECD member countries. The experience of advanced countries, their failures and successes, has thus become even more relevant for China.

Following a macroeconomic overview (Chapter 1), the report provides an international perspective on two key challenges addressed in the 12th Five-Year Plan for National Economic and Social Development (Chapters 2 and 3): how to ensure development is people-centred, and how to tackle the adverse environmental consequences of rapid economic development. These objectives echo two OECD priorities: how to make growth more inclusive and greener. Chapters 4 and 5 consider how further structural reforms can boost competitiveness, thereby sustaining continued strong growth. Reflecting the importance the Chinese government attaches to education and skills, Chapter 6 discusses ways to strengthen skills to support China's long-term growth and ongoing transformation, including in rural areas. Chapter 7 then examines another dimension of human capital and wellbeing, documenting China's progress in improving health and, looking ahead, discusses how, like many OECD and other emerging countries, it must address the rise of non-communicable diseases. Chapter 8 reviews China's strategy for the use of nuclear energy and discusses the possible gains from increased co-operation with the OECD's sister organisation, the Nuclear Energy Agency. Finally, Chapter 9 takes a step back on the Chinese economic transformation and experience with poverty reduction and draws conclusions for aid policies.

The OECD's Economics Department China Desk closely monitors economic developments in China, and forecasts of China are included in the twice yearly OECD Economic Outlook. The macroeconomic overview contained in this volume notes the continued strong performance of the economy against the backdrop of continued weakness in many other parts of the global

economy. Rebalancing of the economy is underway, as demonstrated by the substantial reduction in the current account surplus. It discusses the government's responses to the global economic slowdown and identifies the property sector as a considerable source of risk. It also discusses how reforms towards a more market-oriented monetary policy, and a more flexible exchange rate regime could help the economy better absorb shocks, thereby promoting greater macroeconomic and financial stability. This overview chapter also points to the importance of fiscal policy reform to support the ambitious social objectives of the 12th Five-Year Plan.

China and OECD countries are similarly concerned by inequality and the need for the benefits of economic development to be widely shared by the population. How to respond to the problem of inequality is an important theme of the 12th Five-Year Plan, and the recently issued Plan for the Development of Human Resources and Social Security poses the objective of reaching a "reasonable income distribution". Inequality has been rising in many countries and remains a key concern to governments. Moreover, there appears to be little relation between the level of economic development and the extent of inequality. How to address inequality and promote inclusive growth has become a priority for the OECD. Chapter 2 analyses inequality trends in China and discusses how an effective tax and transfer system, appropriate labour and product market regulations as well as sound education and financial sector policies, can all help reduce inequality. It shows the strong complementarities between a number of policies that can directly reduce inequality and strengthen growth.

Another shared priority among China and OECD countries is to shift towards greener modes of consumption and production. Across the OECD awareness of the need to tackle a variety of environmental challenges is rising while the recent economic crisis provided many countries with the opportunity to consider reforms to promote a different economic growth model. Many governments are therefore putting in place measures aimed at a green recovery, focussing on innovation and investing in renewable energy and improved efficiency in the use of energy and materials. Chapter 3 draws on the OECD's work on green growth, and discusses how countries can design a green growth strategy adapted to the local context. In China, as in many other developing countries, environmental pollution has been sometimes seen by local actors as the price to pay for development. But the rising pollution is generating mounting costs, not least for human health, and social tensions. The government has taken a number of important steps to improve the environment. The green growth path provides an opportunity for China to leapfrog unsustainable and wasteful production and consumption patterns. Moreover, as argued in Chapter 1, there are complementarities to be exploited between reforms that will aid environmental and broader economic rebalancing, notably through the shift away from construction and manufacturing towards the service sector.

Chapters 4 and 5 focus on China's integration in the world economy, and analyses how the government's commitment to pursue an opening up strategy and further liberalise trade and investment barriers can help sustain high growth. Chapter 4 looks back at the wide-ranging structural reforms implemented since China's accession to the WTO 10 years ago, and recalls how the participation in global trade networks and global value chains (GVCs) has been pivotal to China's economic success. It shows that China could gain further additional benefits from further opening up by removing remaining pockets of border and behind-the-border protection, continued reforms of the state-owned enterprises sector and of the agriculture sector, as well as rethinking its approach to trade of raw materials. Regulatory reform and increased competition in services sectors can also contribute to the development of the services sector and help lift overall productivity.

Chapter 5 takes a closer look at China's role within GVCs as the "World's Factory", examining the importance of "processing trade", and exploring the role played by imported intermediate inputs in China's relatively sophisticated exports. It pays special attention to China's value-added GVC activity by presenting some of the latest findings by the OECD on the mapping of GVCs. The chapter also emphasises the necessity of strong technological capabilities in developing high quality, innovative products, and the accumulation of other strengths such as intellectual property, human capital and organisational assets, often summarised as intangible assets. It finds that, as with physical assets, China's intangible assets are disproportionately concentrated in state controlled enterprises. Considering the highly dynamic and entrepreneurial nature of innovation, China's upgrading within GVCs will increasingly need to be led by profit-oriented enterprises. The internationalization of private firms in particular could be a way to strengthen their innovation capabilities and foster their role in GVC upgrading.

Shanghai has been the first Chinese province to take part in the Programme for International Student Assessment (PISA) and its results have stunned policy makers around the world. Fifteen-year-olds in Shanghai reached the highest performance standards in every subject assessed, outperforming students from the 73 other participating economies. While the Shanghai results illustrate what China can achieve in terms of educational performance, skills-related challenges elsewhere remain, in particular in rural areas. Chapter 6 presents the results from OECD work to support countries in their effort to formulate sound skills policies. It provides guidelines not only regarding which kind of information is needed to evaluate current supply and demand of skills, skills match and outcomes in investment in skills, but also discusses how to design policies that will make the most of existing skills to foster development.

Chapter 7 recalls the considerable progress in improving health outcomes and health care coverage and access, with the life expectancy today being similar to the one observed for several OECD countries. Today, China is setting the bases for tomorrow's healthcare and insurance systems, and can, in this process, benefit from the dialogue with OECD countries and OECD's systematic data collection and analysis of health systems. With the decline in infectious diseases, chronic diseases have become the major health challenge in China. The experience of OECD countries, which have been confronted with this challenge for a longer period of time, shows the importance of prevention, screening and treatment in primary care. Better aligning China's health and insurance systems towards interventions in primary care settings, such as screening for hypertension and diabetes and effective treatment, would improve cost-effectiveness, and provide more flexible treatment options. In addition, while China has been successful in expanding hard infrastructure in the health system, many aspects of soft infrastructure, such as hospital management and financing as well as training of medical staff, need further reform.

Reflecting its strong economic growth, China's demand for energy has increased rapidly over the years. Both to limit the environmental impact of its energy consumption, and to develop domestic alternatives to coal, China has adopted a very ambitious plan for the development of its nuclear energy capacity. As in other countries, the Fukushima-Daiichi accident has raised concerns regarding the safety of nuclear plants, leading to a revision of safety regulations and a focus on deploying advanced technology reactors, which offer improved safety features. Chapter 8 provides a description of China's nuclear energy program and outlines the possible benefits China could gain from increased co-operation with the Nuclear Energy Agency. Across a variety of issues, including nuclear safety and regulation, radioactive waste management and decommissioning, radiological protection and emergency preparedness as well as the economic, scientific and legal aspects of nuclear energy, participation in this agency can provide access to

international best practices to help support the safe and sustainable development of China's nuclear energy.

Finally, Chapter 9 looks at China's exceptional record in addressing poverty, through a rapid economic transformation from a poor, rural-based country to a middle income one. It summarises the work conducted by the China-DAC Study Group, established by the Development Assistance Committee (DAC), OECD's network of donors, and by the International Poverty Reduction Centre in China (IPRCC), and with the active participation of several African countries. It highlights the important role played by the Chinese government in guiding economic and social development, through planning and budgeting, performance-based public management, policy research and innovative experiments. It also emphasises how China was able to make the most of foreign investment and aid, by incorporating these with its own development strategies. China's experience is an important reference for other developing and emerging countries, and its active participation in the recently signed Busan Partnership for Effective Development Co-operation is an important asset both for other donors and developing countries.

Chapter 1:

Macroeconomic Overview

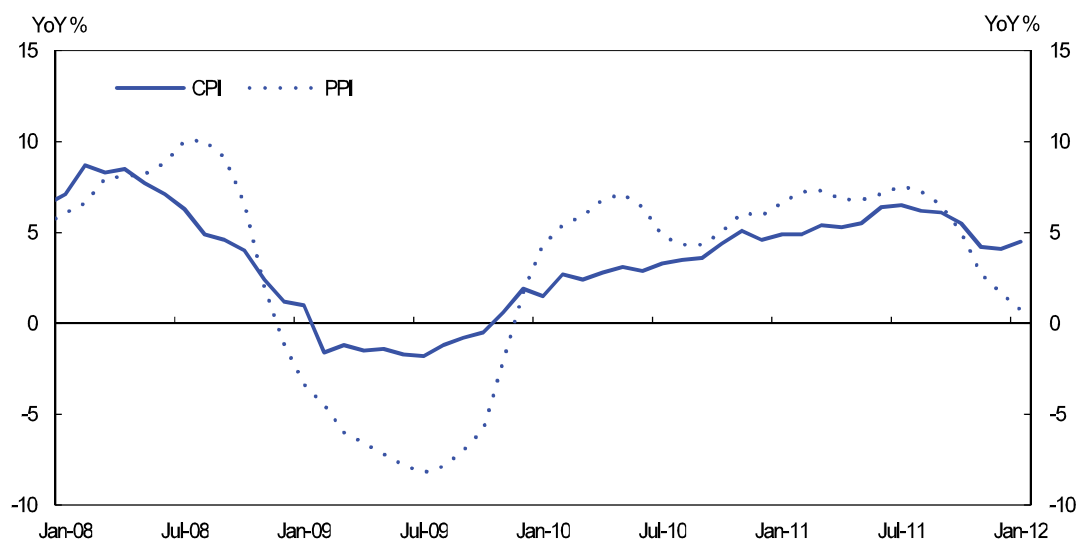
Recent performance and near-term prospects

The economy has slowed and price pressures receded...

In 2011, the Chinese economy slowed markedly and it recorded one of its slowest expansions in a decade. Nonetheless, by world standards, the growth rate of 9.2% was exceptional and was achieved against the backdrop of a weak and uncertain global economic environment. This marked the tenth consecutive year the economy has notched up annual growth above 9%, almost tripling the size of Chinese GDP in a decade. It marked another step towards China's goal of becoming a well-off society in an all-around way and consolidating its position as a key engine of the global economy. Indeed, while the major advanced economies continued to post anaemic and uneven growth, and grapple with other serious economic challenges – notably stubbornly high unemployment, a heavy public debt burden and falling asset prices – China is estimated to have contributed around one third of global growth in PPP terms. The economy's momentum weakened over the course of 2011 and by end-year it was growing at only just over 8%, well below its trend pace.

The slowing reflected a concerted effort to cool the economy and reduce inflation, which began to rise steadily from the end of 2010 with consumer prices up over 6% in year-on-year terms by mid-2011 (Figure 1.1). Pricing pressures were widespread, reflecting broader capacity constraints which emerged following an earlier, very strong, growth rebound that in turn help push up many international commodity prices. For much of the year producer prices rose at over 6% year-on-year, more than double the long-term average. Decisions to raise support prices for cereals and longer-term supply constraints plus bad weather, resulted in food prices rising at close to 15% year-on-year at the peak of the cycle. By the end of 2011, inflation had declined to around 4% year-on-year, aided by slowing activity and an easing of capacity constraints, as well as a moderation in food and raw material prices.

Figure 1.1 Consumer and producer prices, year-on-year change



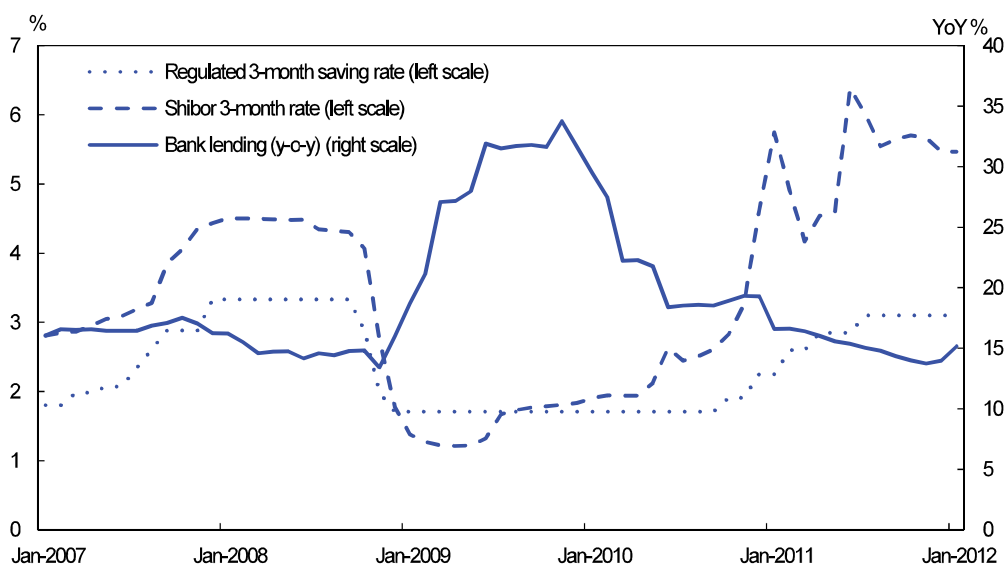
Source: CEIC.

... As the policy stance tightened

In response to inflationary pressures, monetary policy was tightened and both regulated interest rates and the reserve ratios for commercial banks were raised. Though the increase in benchmark interest rates was relatively modest, the reduction in liquidity ensured that borrowing costs for the banks moved up substantially more. By mid-2011 the 3-month interbank rate had risen to over 6%, more than 400 basis points higher than early 2010 (Figure 1.2). Lending to local government investment vehicles, some of which had borrowed heavily during 2009, was also reined in as signs of mounting bad debts began to emerge. The banking regulator ordered a halt to new lending for some new local government infrastructure projects, required significant loans to be transferred back on to the balance sheets of the banks and intensified the monitoring of their existing loan portfolios.

As a result of these measures, as well as the general monetary policy tightening, the growth of money and bank lending slowed appreciably and for 2011 as a whole the authorities were successful in hitting their target for money growth of 16%, a marked slowdown from the more than 20% expansion in the previous year. With clear signs that inflationary pressures were abating, growth moderating and the outlook in some advanced economies deteriorating, the authorities commenced monetary policy easing towards the end of the year, reducing the required reserve ratio by 50 basis points. This move helped to ease pressure in money markets somewhat, thereby marginally lowering financing costs for the banks. The reserve ratio was cut a further 50 basis points in February 2012 though benchmark interest rates were left unchanged, at relatively high levels.

The authorities implemented measures to cool the property market, which continued to post strong price rises early in the year, especially in the largest cities. These measures built on earlier initiatives and included a further rise in the minimum deposit for purchases of a second property, from 50% to 60%, as well as an extension of the list of cities imposing other restrictions on the purchase of real estate. In addition, property taxes were introduced for the first time, in Shanghai and Chongqing.

Figure 1.2 **Bank lending growth and interest rates**

Source: CEIC.

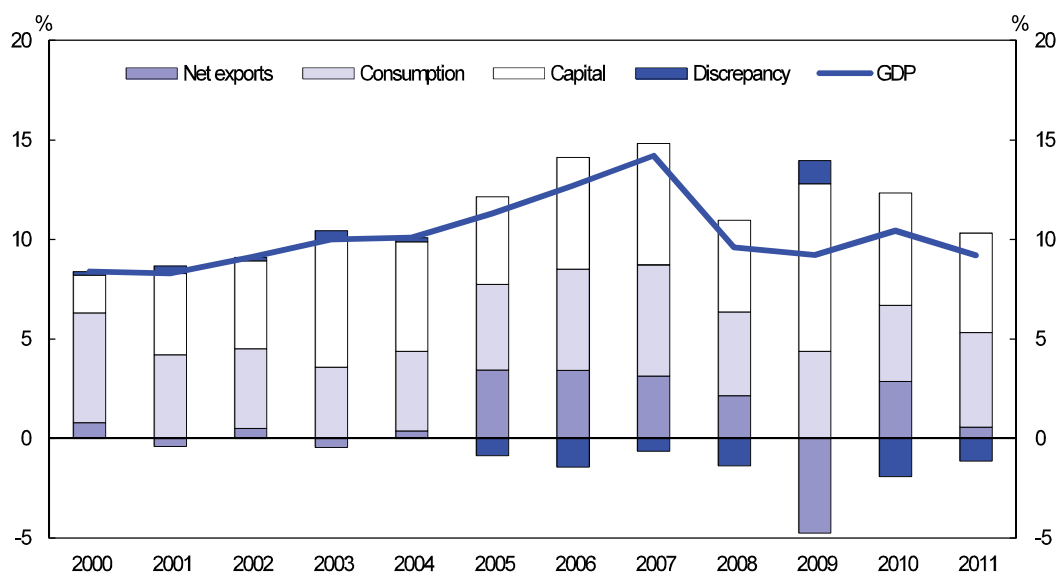
Fiscal policy also added to the headwinds for the economy. Tax revenues were extremely buoyant during 2011. The national government deficit (the sum of central and local governments) decreased significantly, almost reaching balance. At the same time, the social security system (whose budget is separate from the government and is managed locally) ran a surplus sufficiently large to ensure that the combined accounts of the national government and social security moved into a surplus of around 0.5% of GDP, despite below-par growth. With nominal GDP rising rapidly and a small deficit, national government debt declined to 15% of GDP by end-2011. Moreover, government cash balances rose significantly, leaving the government with little net debt.

However, there are a range of off-budget borrowings that could eventually add to government debt. At end-2010, these fell into four components: the debt of the Ministry of Railways; the debt of asset management companies and, most importantly the debt of local government financing platforms and unauthorised borrowing by local government. According to the National Audit Office the total of these debts amounted to 35% of GDP at end-2010. This figure is the maximum amount for which the government might eventually be liable in the event that all the investment projects financed by the debt failed to produce sufficient revenues to repay the borrowing. A significant proportion of the investment projects, especially those located in richer provinces is likely to generate sufficient funds for repayment or are backed by adequate collateral.

The rebalancing of the economy has started

Despite the tightening in monetary and fiscal policy, domestic demand held up in 2011 thanks to a marked rebalancing in favour of consumption, which accelerated (Figure 1.3). For the first time in a decade, the share of overall consumption in real GDP rose, albeit very modestly. Retail sales rose nearly 12% in real terms, bolstered by strong increases in household income. For the year, real household incomes rose by an estimated average of slightly above 10%, with even larger gains in rural areas. Labour incomes rose strongly, especially for rural migrants whose income was boosted by large minimum wage hikes, including in key export provinces such as Guangdong and Jiangsu, which saw nominal increases of around 19% and 15% respectively.

Figure 1.3 Contributions to GDP growth



Source: CEIC.

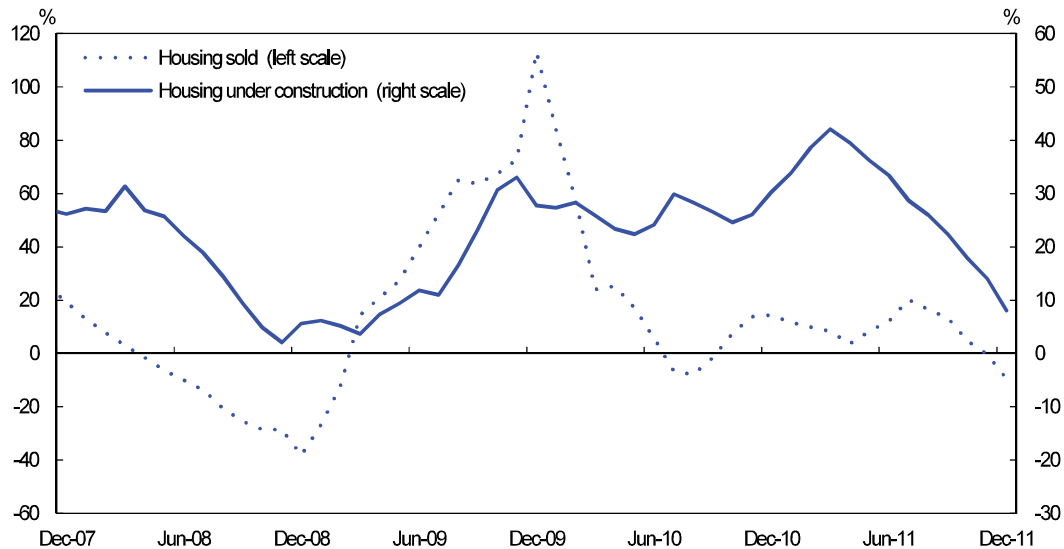
The tightening in monetary policy did have a significant impact on capital formation whose growth slackened to 10½ per cent. The property sector was a weak spot, reflecting the measures undertaken to cool prices. Sales were stagnant for much of the year before declining sharply in December. The supply of properties on the market continued to accelerate though and as a result the stock of unsold properties rose through the year. Developers reacted by cutting the growth of new construction (Figure 1.4). Property prices levelled off around mid-year though while sharp falls were seen in some market segments, nationally prices did not decline markedly. The weakness of the commercial market was, however, partially offset by the rollout of a government social housing scheme involving the construction of 36 million new dwellings over five years which, at the time of the announcement, amounted to around 20% of the country's urban stock of housing. The government aimed to commence around 10 million dwellings in 2011 and a further 7 million in 2012.

Chinese exports grew well below their trend rate in 2011, registering a gain of under 10% for the year as a whole. In part this stemmed from domestic inflationary pressures which pushed up export prices substantially faster than prices of other countries' exports. It also reflected weak demand from abroad. In Europe, a tentative recovery stalled, as renewed concerns surrounding sovereign debt sustainability and broader financial sector instability hit confidence, while fiscal consolidation sapped demand and imports fell at an annual rate of nearly 10% in the six months to November 2011. In the United States, growth was stronger but labour markets remained relatively weak, with unemployment moderating only gradually from high levels. In Japan, the economy suffered a major setback on account of disruptions associated with the March earthquake and the ensuing nuclear accident.

Exports also slowed in other large emerging economies, notably in India and Brazil, where growth slipped below trend rates in the second half of the year. As the global slowdown intensified in the second half of the year, Chinese exports were hit hard, barely showing any increase. Indeed, by the fourth quarter of 2011, the level of exports was lower than in the second quarter.

Figure 1.4 **Housing sales and property under construction**

12 month change of a three-month moving average

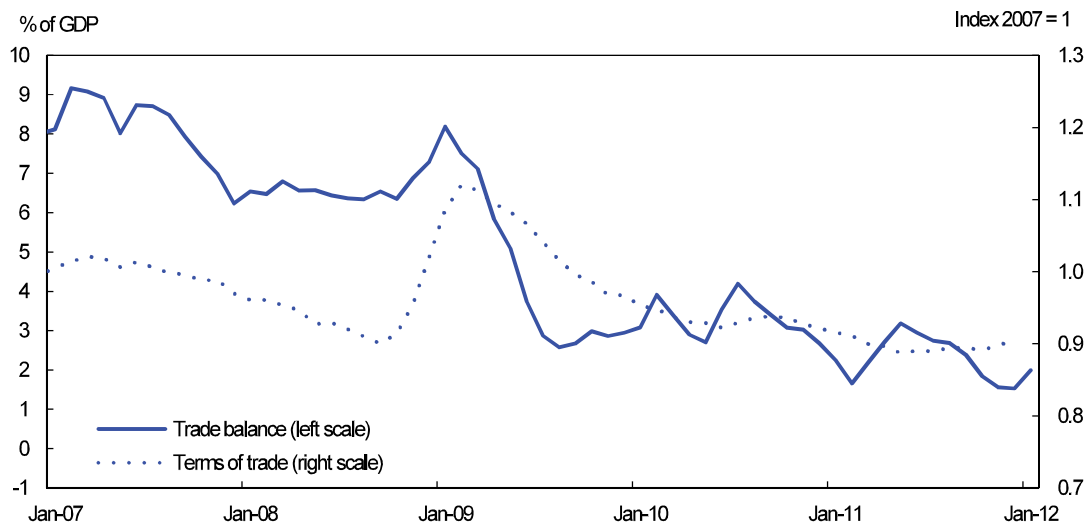


Source: CEIC.

Overall, the foreign sector contributed little to growth in 2011. The growth of imports was slightly faster than that of exports. Moreover, with the terms of trade worsening, the trade surplus fell to 2.2% of GDP (Figure 1.5). Accordingly, the current account surplus shrank, to 2¾ per cent of GDP in 2011 and in absolute terms is estimated to have fallen by one quarter from its 2010 level. In the final quarter of the year, the diminishing surplus, together with an appreciation of the euro, led to a small decline in the dollar value of the foreign exchange reserves, the first quarterly decline in over a decade.

Figure 1.5 **The trade balance and terms of trade**

Three-month moving average



Source: CEIC and OECD estimates.

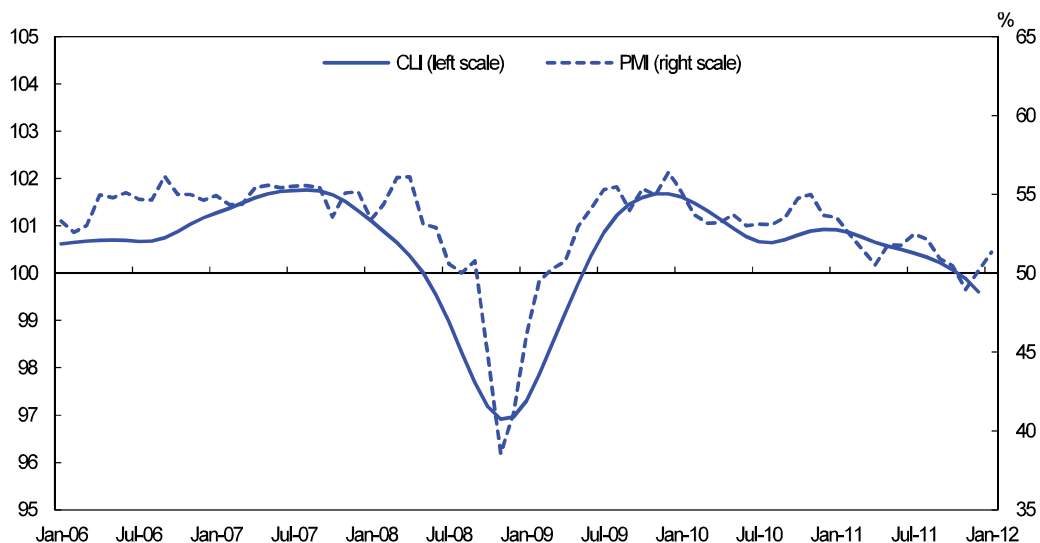
Growth will remain sub-par

Real GDP growth is expected to remain below 9% in 2012, but to pick up later in the year and into 2013 as conditions in the global economy gradually improve. There are some indications that the production cycle may have bottomed out, with the purchasing managers' index and industrial production recently posting modest improvements. However, the OECD's Composite Leading Indicator is still suggesting that growth will remain sub-par in the first half of 2012 (Figure 1.6 and Box 1.1). Indeed, prospects for external demand are poor. As detailed in the OECD's latest *Economic Outlook* (OECD, 2011), the weakness in the global economy is likely to persist, particularly in Europe. This will continue to weigh on Chinese growth, which is expected to remain below trend through the first half of this year. The loss in momentum in the property sector will hold back construction, as well as key supply sectors such as cement and steel. Property sector weakness will also impact on demand through weaker revenues to local governments, which rely heavily on the proceeds of land sales. With less demand from developers, local authorities have reduced sales of land development rights and, rather than reduce prices, have often cancelled auctions when offers have failed to reach their reserve price. Lower revenues are likely to feed through into a mix of reduced public sector infrastructure investment and increased borrowing in 2012.

The government has already announced a number of measures to stimulate the economy. It raised tax thresholds and tax brackets in September 2011, lowering the number of taxpayers to 24 million from 84 million previously, at a cost of 0.3% of GDP. In January 2012, it also announced a 10% increase in all social security and government pensions at a cost of 0.4% of GDP. If fully spent, these measures could raise private consumption by over 2%. In addition, construction work on the affordable housing scheme will rise, following the start of a 10 million apartments in 2011. In order to finance this construction, the government is urging banks to lend to local authorities on concessional terms. It is also considering using some of the dividends from state-owned companies to support social housing.

With demand in China remaining strong compared to other major economies, and with competitiveness expected to deteriorate mildly on account of relatively high inflation, the current account surplus should remain low.

Figure 1.6 **Cyclical developments: the OECD leading indicator and the national PMI**



Source: OECD Main Economic Indicators Database and CEIC.

The near-term priority for the authorities will be to ensure growth starts to recover during 2012. This will require macroeconomic policies that counter heightened external uncertainty and weakness. Monetary policy should be eased by lowering reserve ratios and reducing regulated interest rates which would help bolster demand later this year. The stance of fiscal policy also needs to be reversed. The apparent objective of returning the national government budget to balance, and running a general government surplus, should be changed. Indeed, given the medium-term trajectory for continued rapid economic growth, and the low cost of public borrowing, the national government could run a deficit of 2% of GDP with little, if any, increase in the debt-to-GDP ratio.

Box 1.1. **The OECD Composite Leading Indicator for China**

The OECD Composite Leading Indicators (CLIs) are designed to provide early signals of turning points in the fluctuations of economic activity around its long term trend, commonly referred to as the “business cycle”. The approach, which focuses on turning points (peaks and troughs), results in CLIs that provide qualitative rather than quantitative information on short-term economic movements. They measure early stages of production, respond rapidly to changes in economic activity, are sensitive to expectations of future activity or are control variables that measure policy stance.

The CLI for China has performed well in providing early signals of turning points in the fluctuations of economic activity as measured by the Index of Industrial Production (see Figure 1.6).

The CLI for China is constructed from a small number of economic time series that display similar cyclical fluctuations to those of the business cycle, yet have a tendency to turn earlier. Seven are used for China: the production of chemical fertilizer; a monetary aggregate (M2); the production of crude steel; the overseas orders as captured in a business tendency survey; the construction of buildings; the production of motor vehicles; and the Shanghai Stock Exchange turnover. All are from the National Bureau of Statistics (NBS), except for the overseas orders (People’s Bank of China data) and the stock exchange turnover (Shanghai Stock Exchange data).

In the area of macro-economic data, the OECD has cooperated with the NBS since 1996. Workshops have been held to assist China in using accepted international standards and definitions as defined by the System of National Accounts. The NBS now publishes internationally-comparable, annual national accounts data, including some historical series dating from 1970. The NBS has also worked with the OECD to develop Quarterly National Accounts. Initial estimates are under review and should be publicly released in the near future, thus providing China with more timely indicators for reliable measurement of its economic progress.

The economy faces risks from the property sector and the external environment

The economy faces considerable risks stemming from the property sector. The moderation in property prices is to be welcomed. However, buyers are continuing to hold back from making purchases and an overhang of unsold stock is creating pressures for developers. In turn, rising losses could lead to financial sector stress. Although the exit of small developers is unlikely to pose a problem, the failure of larger operators would put some bank lending at risk, which could trigger negative spillovers. These would be accentuated by the popularity of advance purchases amongst buyers who could be exposed to significant paper losses in the event of price falls and might find buildings were not completed in the event of a developer failing. In addition, although rapid urbanisation and rising incomes should ensure a prompt return to market equilibrium, a

persistent excess stock would lead construction activity to continue to slow, further weakening demand. So far the balance sheets of the major commercial banks remain strong, with the stock of non-performing loans low. However, as unprofitable investments are exposed this may change. At the recent National Financial Work Conference, the authorities emphasised the need to step up financial sector reforms while minimising systemic risks, including addressing bad debts accumulated by local authorities and strengthening financial sector regulation.

A significant additional risk facing the Chinese economy is that external demand would weaken further if growth prospects elsewhere continue to deteriorate. Across advanced economies the situation in Europe remains a key concern, with the euro area likely to have entered a mild recession. If measures to contain sovereign debt and broader financial sector problems fail to succeed, the feedback to the real economy could result in severely impaired growth. In the United States, fiscal policy remains highly uncertain, as are the effects on the broader economy as stimulus is withdrawn. In Japan, the risk of a rise in long-term borrowing costs for the government is being compounded by delayed fiscal consolidation. In addition, delays in re-opening power plants could constrain growth.

The framework for monetary and exchange rate policy needs improvement

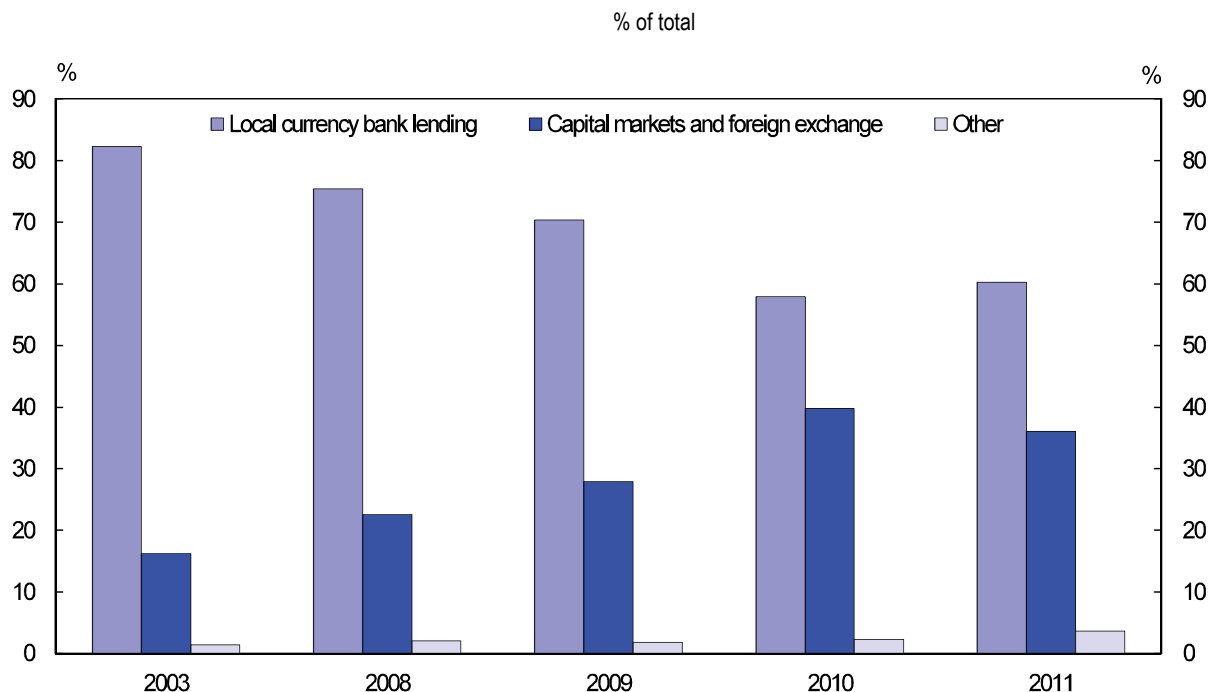
Monetary policy would be more effective if the government took further steps to promote a more market-oriented monetary policy framework (OECD, 2010). The current quantity-based approach that targets money growth and imposes loan quotas has several disadvantages, notably higher volatility in interbank interest rates and a reduction in competition. Greater reliance on market mechanisms would promote smoother and improved monetary policy transmission. The ability of the central bank to rely on quantitative methods of controlling the growth of money and credit is becoming progressively weaker because capital markets are an increasing source of finance.

Regulatory decisions by the central bank and securities regulators have widened the ability of companies to use short and medium-term borrowing instruments that carry market-determined interest rates. As a result, the share of bank lending in the total non-equity financing of non-financial companies has declined significantly (Figure 1.7). The movement towards capital markets has not been in one direction. The banking regulator has become increasingly concerned that banks have been moving their loans off-balance sheet and encouraging depositors to purchase these assets through special purpose vehicles in order to raise the rate of return paid to customers. This concern culminated, in January 2012, with the banking regulator ordering banks to stop this practice and also to no longer create products based on the payment of inter-bank interest rates. It remains to be seen how the financial sector will react to this re-regulation of markets. Such moves are likely to create pressure for non-bank financial intermediaries, such as money market funds, to allow a wider range of investors to receive market-determined interest rates rather than the regulated interest rates offered by banks.

Decisions to move towards a more market-oriented monetary policy cannot be taken without considering the need to liberalise the foreign exchange market and how to synchronise the process of liberalisation in these markets. The policy of the government is to gradually allow greater capital account convertibility, choosing the categories of transactions where renminbi can be freely bought and sold. This process is being driven by a desire to see greater use of the local currency in the invoicing and settlement of trade transactions and an eventual creation of a multi-polar international financial system. Significant steps have been taken in this area,

notably by the greater willingness of the authorities to allow an active market for the renminbi in Hong Kong, China. From the second half of 2010 onwards, a series of measures were taken by the People's Bank of China and Hong Kong Monetary Authority to facilitate the growth in this market.

Figure 1.7 **Borrowing by non-financial companies by source**



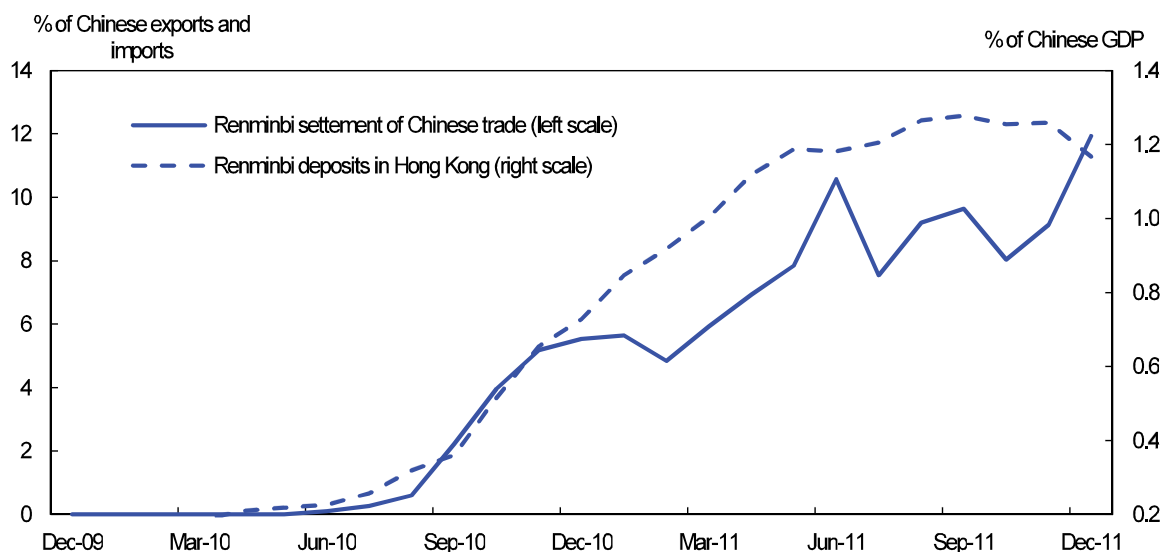
Source: CEIC.

The size of the offshore market rose very rapidly following these joint moves. By December 2011, 18 months after the liberalisation, almost one-eighth of Chinese foreign trade was settled in renminbi (Figure 1.8). This generated strong growth in outstanding renminbi deposits in Hong Kong, China, though they still amount to less than 1¼ per cent of Chinese GDP. Recently, the growth of the offshore banking system moderated perhaps due to the levelling-off of the share of trade settled in renminbi and the difficulty in finding assets in which to invest the deposits. It is effectively constrained to place most of its funds with the Chinese central bank at a penalty rate. China has maintained strict inward investment controls, despite easing outward controls. However, in order to develop the offshore market, the Chinese authorities allowed mainland borrowers to issue a greater amount of renminbi-denominated bonds and, in principle, permitted the financing of inward FDI with offshore renminbi loans. The authorities are unlikely to allow unconstrained lending to mainland enterprises by offshore banks as this would put downward pressure on regulated lending rates on the mainland. Such conflicts suggest that an integrated approach to capital account and interest rate liberalisation is needed. Instead, the government is leaving interest rate deregulation to the end of the process. An incremental approach to reform could focus first on deregulating bank interest rates at a one-year maturity and longer, which would also allow higher returns for savers.

The need to reform exchange rate arrangements also remains. The authorities have stated that their exchange rate policy is guided by the value of the currency against a basket of currencies. Nevertheless, it moves much more smoothly against the dollar than in effective

terms (Figure 1.9). Tying the value of the currency to the dollar means that fluctuations in that currency's value directly impact the Chinese economy, even though the cyclical positions of the US and Chinese economies may differ substantially. By linking the renminbi strongly to the dollar, the authorities lose the ability to control the overall value of their own currency. This may lead to policy conflicts. A period of dollar weakness (and hence renminbi weakness) may coincide with the need to tighten monetary policy due to rising inflation. In this situation, a policy to linking to the dollar would run against domestic needs, cutting off a powerful instrument for reducing inflation.

Figure 1.8 **Offshore renminbi deposits and trade settlement in renminbi**



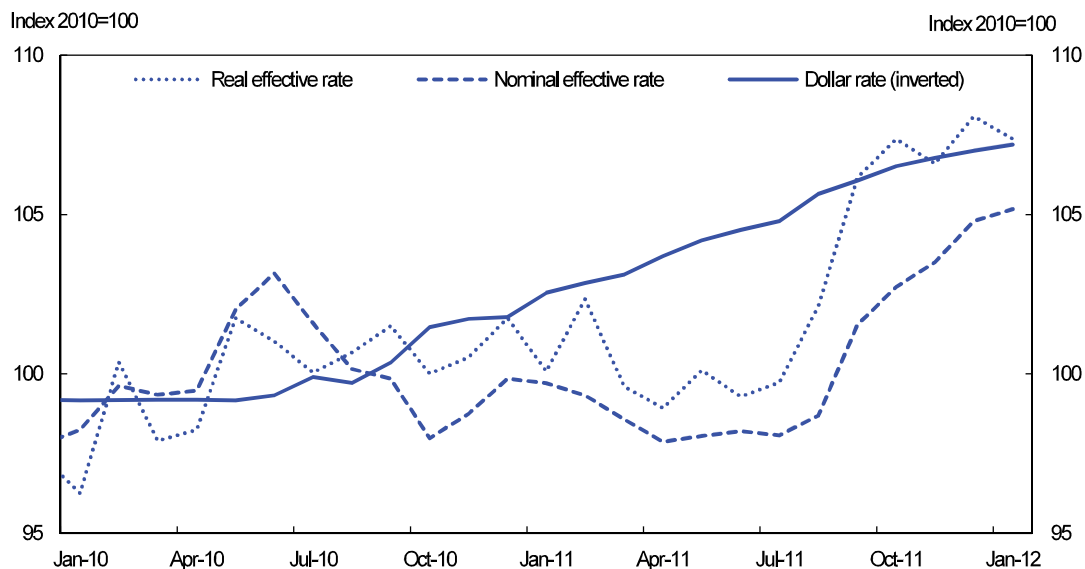
Source: Hong Kong Monetary Authority and CEIC.

The shortcomings of the existing policy approach were highlighted during the past 18 months. The renminbi appreciated steadily against the US dollar from mid-2010 to mid-2011. However, its effective exchange rate declined, which added to domestic inflationary pressures. The authorities appear to have responded by reducing the pace at which the renminbi was allowed to appreciate against the dollar, from an annual rate of around 5% to just 2% by the beginning of 2012. Indeed, at one point, the offshore market was pricing a future depreciation of the renminbi against the dollar. As a result, from the mid-2011 onwards, though, the effective exchange started to appreciate, rising by nearly 9% in the six months to December 2011. The apparent greater attention to the movement of the effective exchange rate is a step in the right direction of greater flexibility. However, it needs to be applied symmetrically and not just when the effective rate is appreciating.

Going forward, improved exchange rate flexibility will help the economy better absorb shocks, thereby promoting greater macroeconomic and financial stability. Until recently, greater flexibility of the exchange rate would have been synonymous with a sharp rise in the exchange rate which would have been disruptive in the short term. However, the upward pressure on the exchange is easing to some extent. The current account surplus is declining and Chinese state-controlled enterprises are increasingly investing abroad, offsetting FDI inflows, while earnings on accumulated foreign investments are being limited by low interest rates worldwide. The

easing of upward pressures gives the authorities the chance to pursue an integrated policy of capital account liberalisation, reduced intervention in exchange rate markets and interest rate deregulation. Such a policy would be line with the goals of the 12th Five-Year Plan (FYP).

Figure 1.9 **Nominal and effective exchange rate of the renminbi**



Source: CEIC, Bank for International Settlements.

The fiscal framework needs to be strengthened to meet economic and social objectives

Over the past few years the role of fiscal policy has come under the spotlight. There is however little information in the public domain as to how fiscal policy is implemented. The budget is presented to the National People's Congress three months into the fiscal year, in marked contrast to many OECD countries where the budget is discussed in advance of the fiscal year. There is no line-by-line disclosure of spending, with only broad expenditure headings being made public and even less information being disclosed at the local level. The budget for the social security system is not made public at the same time as the national budget, despite its revenues representing one-sixth of total government receipts. Finally, the existence of over 10,000 local corporations, often largely financed by off-budget transfer of land-use rights and subsidies, is not acknowledged in the government accounts as occurs in some OECD countries.

Improving the fiscal policy framework would strengthen credibility and effectiveness. As a first step, the scope of the budget presented to the National People's Congress should be widened to cover all areas, including social security and outlays by local government infrastructure companies. For off-budget borrowing at the local level, a clear strategy needs to be implemented setting out how this debt will be financed and which institutions will bear the cost of any eventual default. The challenge of managing this burden, while financing much of the affordable housing scheme and having limited avenues for boosting revenue, will restrict the ability of local governments to provide additional fiscal stimulus.

Local governments are responsible for funding many essential services but face limited avenues for raising revenue and have recently experienced financial pressures owing to the

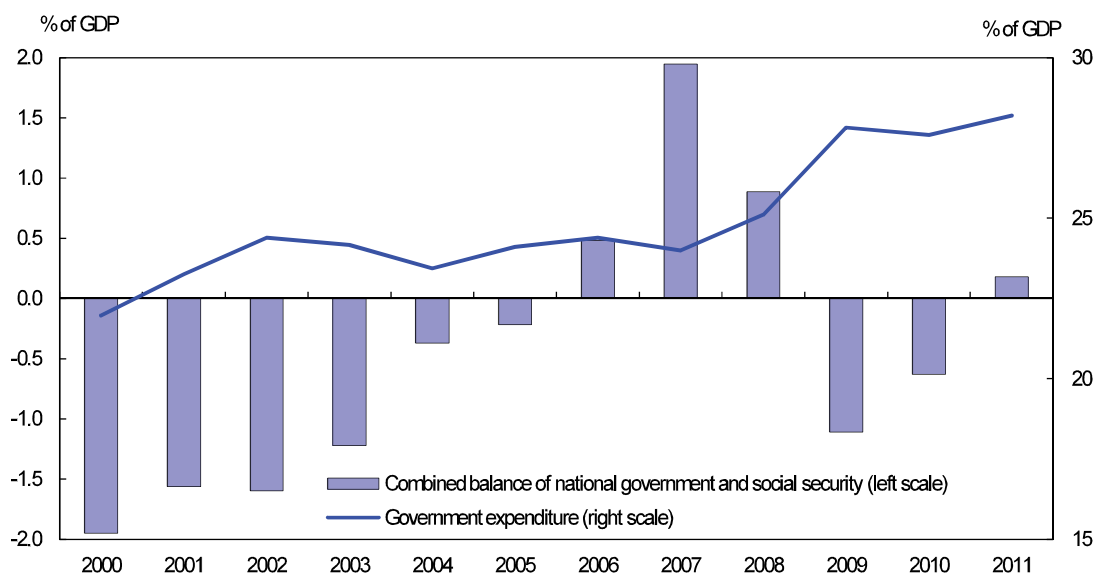
downturn in the property market. At the same time, the central government has a relatively light debt burden and enjoys buoyant tax revenues, suggesting that reforms in revenue-sharing between central and local governments are needed. Looking ahead, reforms need to be implemented to ensure that fiscal policy can more effectively serve the twin objectives of aiding macroeconomic stabilisation and providing adequate resources to fund a wide range of social expenditures. As underscored in the 12th FYP there is a vast demand for increased spending on education, health and retirement incomes as well as on further upgrading and expansion of physical infrastructure.

Medium-term challenges

Rebalancing is occurring gradually

Considerable progress has been made in rebalancing the economy in the past five years. The current account surplus has shrunk from a peak of over 10% of GDP in 2007 to around 3% in 2011, and growth has become less dependent on external demand. Indeed, over the past five years, net exports have made a negligible contribution to growth, which has been driven by domestic demand. Thus far, the adjustment towards domestic demand has almost entirely reflected strong public infrastructure investment that has been financed off-budget and has not been reined back once the recovery was in place. Since the start of the world financial crisis, the share of investment in GDP has risen by over five percentage points, while the share of consumption has fallen by two percentage points. On budget public expenditure has been increased also, notably in social areas since 2008 but this contribution to rebalancing has been partially offset by a marked reduction in the budget balance that has been reduced and turned to a surplus in 2011 (Figure 1.10).

Figure 1.10 **Government expenditure and the budget balance**



Source: CEIC.

As noted above, there are signs that the fall in the share of consumption in demand has been stopped. Its marginal increase in 2011 can be partly attributed to improvements in social safety nets reducing the need for household precautionary savings. In particular, the widening coverage of public medical insurance has reduced the private share of spending on healthcare,

while pension schemes have been boosted and broadened, notably in rural areas (see Chapter 7 in this volume). Going forward, reforms to further expand the provision of social services will continue to promote rebalancing towards domestic demand and consumption, as well as other government objectives including lowering inequality (Kerdrain *et al.*, 2010). Continued strong gains in labour earnings will also help to boost consumption growth. So would improved access to consumer credit. Financial sector reform also has a key role to play in reducing high corporate savings. As access to bank lending can be uncertain, firms often choose to retain earnings in order to finance their investments directly.

In the 12th FYP the government is aiming to expand the share in the economy of a number of priority sectors. Many of these focus on high-end, technologically advanced manufacturing. In addition, the FYP aims to encourage the growth of business services and to boost the overall share of the tertiary sector in GDP by four percentage points. The growth of a number of service sectors, particularly retail and finance, can play an important role in aiding rebalancing by supporting consumption. To support the growth of these sectors the government should focus on further building human capital, as well as implementing structural reforms to encourage the emergence of dynamic new firms.

Growth needs to become greener

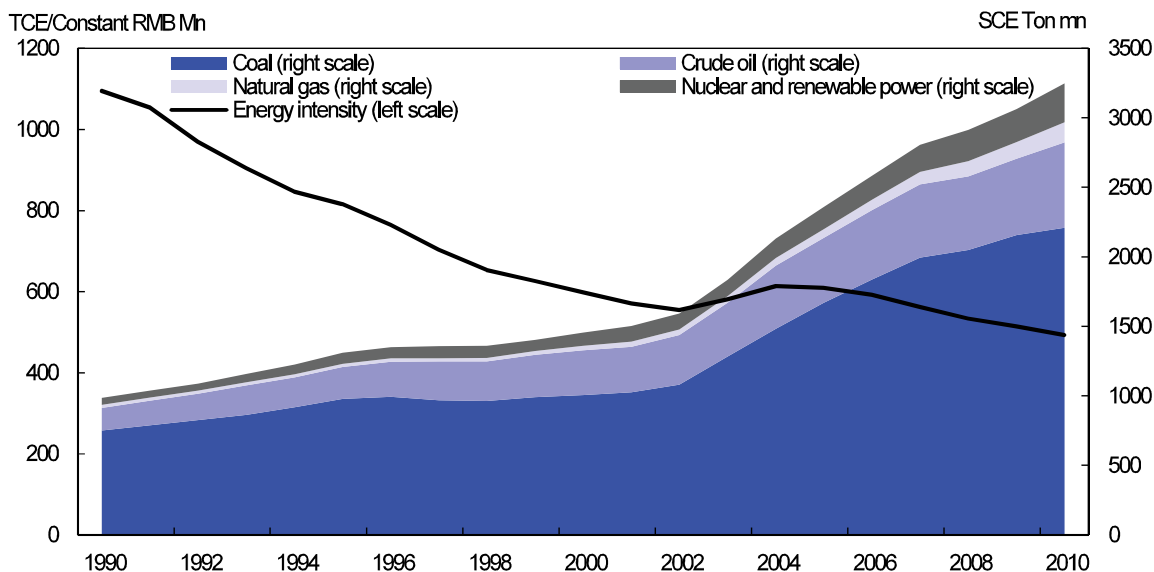
An additional priority is to rebalance the economy towards greener modes of consumption and production. As in other fast-growing emerging economies, China is experiencing rising pollution and environmental degradation, which is generating mounting costs, not least for human health. Large sections of major river systems suffer from high levels of pollution, as does the air in many of China's largest cities. Given the tendency for many types of pollution to spill across national boundaries, tackling environmental issues also has important global ramifications, particularly with respect to climate change as China has been the leading producer of greenhouse gases since 2005, emitting 40% more than the United States in 2008 (IEA, 2011). The challenge for the authorities is to decouple environmental degradation from economic development, allowing continued economic progress and a drive towards greater prosperity while reducing the environmental impact. In this regard, the work undertaken at the OECD to develop green growth strategies may prove of help to the Chinese authorities (see Chapter 3 of this volume).

Recognising this challenge, the government has taken a number of important steps to tackle pollution and promote a more environmentally sustainable development path. New laws have been introduced to encourage cleaner production, strengthen the role of environmental impact assessments and promote the circular economy, including recycling (McElwee, 2011). Key environmental protection legislation has also been modernised and amended, and new regulations implemented to reflect evolving needs. Governments at all levels have invested vast sums in key environmental related infrastructure to reduce immediate sources of pollution, notably the expansion of water and waste treatment facilities, as well as public transport systems. As a result of these efforts, during the 11th FYP, from 2005 to 2010, significant progress was made in reducing emissions of key pollutants, including sulphur dioxide and chemical oxygen demand (CCICED, 2011).

China relies heavily on fossil fuels for its energy needs, especially coal which accounts for around three quarters of total energy production (Figure 1.11). China is expanding its nuclear energy capacity (see Chapter 8) and the government has taken a number of steps to promote

renewable energy, especially solar and wind power. Fossil fuel prices have also been deregulated so that they now reflect prevailing international oil prices, and hence provide better signals to end users. A number of command-and-control initiatives were also launched in the second half of the 2000s to curb energy consumption growth focussing on promoting improved energy conservation amongst the leading industrial energy consuming firms, closing down outdated and inefficient industrial production capacity and lifting energy standards for buildings and consumer durables (Yuan et al., 2011). These measures ensured that after a slight rise during the 10th FYP period, energy intensity resumed a downward trend in the second half of the 2000s.

Figure 1.11 **Energy production and energy intensity, 1990-2010**



Note: Energy intensity defined as total energy consumption divided by real GDP.

Source: China Statistical Yearbook and CEIC.

However, significant challenges remain, and the government has committed to a variety of environmental targets in the 12th FYP which will require broad-based reforms. Though per-capita carbon emissions in China remain below the levels of advanced economies, the Chinese economy is relatively carbon and energy intensive. The government is implementing pilot CO₂ emissions trading schemes in selected provinces that could eventually be used as the basis of a nationwide scheme that would have the potential to control emissions in a cost-effective manner. Better price signals could also be used to conserve resources. Electricity prices remain tightly regulated and have been kept low despite rising generation costs, while water charges also need to be reformed. Efforts to better regulate key pollutants, including through better enforcement, also need to be stepped up. Finally, over the medium and longer run there are complementarities to be exploited between reforms that will aid environmental and broader economic rebalancing. Most notably, a shift away from construction and manufacturing towards less energy intensive and polluting service sectors will help meet environmental goals.

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Chapter 2:

Inequality: Recent Trends in China and Experience in the OECD Area

Introduction

Over the past two decades, China has moved towards a market-oriented economy. Such a transformation initially entailed a marked rise in inequality, which was an inevitable consequence of the transformation of the economy that has delivered a higher and more sustained growth in incomes than observed in any other major economy. Since around 2005, the government has increasingly focused on the creation of a more harmonious society. The new emphasis in government policy was implemented during the 11th Five Year Plan (2006-10) and has resulted in a reduction in inequality across a number of dimensions. By 2010, the number of people below the poverty line of \$1.25 per day (converted at purchasing power parities) had fallen by more than 150 million from ten years previously, leaving just 6% of the rural population with incomes below this level. In addition during the period of the Plan, income inequality in the urban and rural population has fallen, the urban-rural income gap has narrowed and the lower-income provinces have started to grow more rapidly than higher-income regions. At the same time, the coverage of social protection systems has been widened and total spending on social protection has soared.

As Chinese incomes rise, the emphasis on social policy may shift towards reducing inequality by redistributing income. Indeed, by 2010, income levels in major Chinese cities, which house around one-quarter of the population, approached \$12,000 per person when evaluated at purchasing power parities – an income level not far from that in a number of OECD member countries. Consequently, the experiences of policies designed to reduce inequality in the OECD area could become increasingly relevant for designing policies in China. Given that the level of inequality may not fall automatically as the economy grows, policymakers may thus be interested in the approaches to reducing inequality that have been adopted within the OECD area and the consequences that these policies may have had on inequality and overall economic growth.

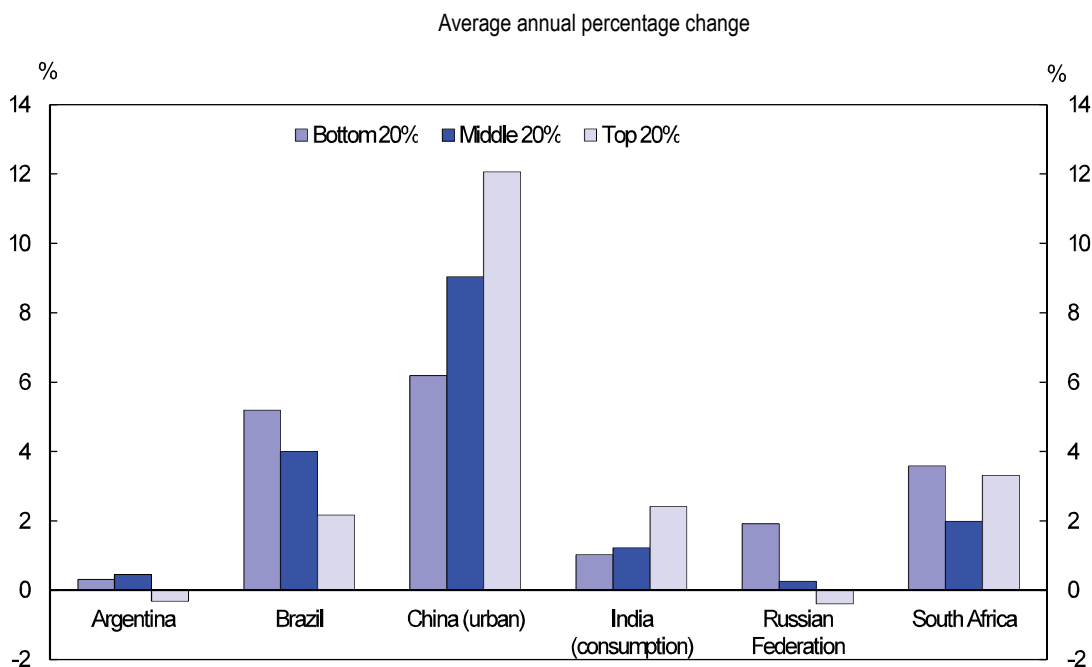
The remainder of this chapter first documents the movement in inequality in China over the period since reform and opening up gained momentum, focusing on developments since 2005. It then compares the extent of social protection and the social expenditure in relation to other emerging economies. Finally, the chapter considers the lessons with respect to growth and inequality that can be drawn from the experience of OECD members, focussing on the areas

where it is possible to both reduce inequality and improve growth. This chapter draws on the results in two recent OECD publications *Going for Growth* and *Divided We Stand* and the related background papers.

Trends in inequality

As a result of the pace of transformation of the economy, the distribution of incomes changed much more rapidly in China than in other emerging economies. The extent to which the incomes of the higher quintile grew faster than the lower quintile was particularly marked in the urban areas of China, where they grew twice as fast (Figure 2.1). Nonetheless, the growth in the real incomes of the lowest quintile in China was more rapid than that of any quintile in the other emerging economies considered here, generating a very rapid decline in poverty.

Figure 2.1 **Change in real household income by quintile between the early 1990s and the late 2000s¹**

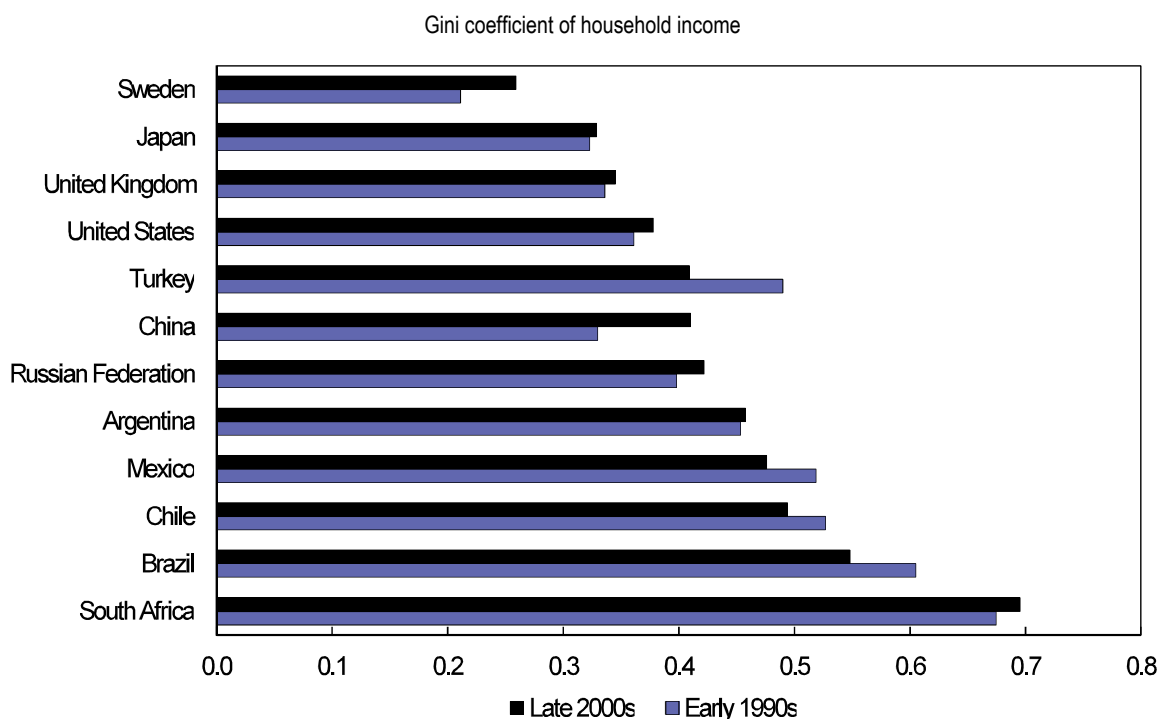


1. Figures for the early 1990s generally refer to either 1992 or 1993, while figures for the late 2000s refer to the period around 2008.

Source: OECD (2011a) -EU Database on EEs and World Bank Development Indicators Database.

In the early 1990s, China's income distribution was much more equal than that of other emerging economies. Although income disparities rose rapidly in China, by the end of the past decade the overall level of inequality in China was still lower than in nearly all the emerging countries, with only Turkey showing a marginally lower level. Inequality was higher, however, than that in the more advanced OECD countries (Figure 2.2).

In China, as the move towards a market economy became more complete, the rise in inequality eased. In fact, it appears to have stopped around 2005 and may have even been reversed in recent years, not least thanks to tax reform and improvements in the social safety net (Herd, 2010).

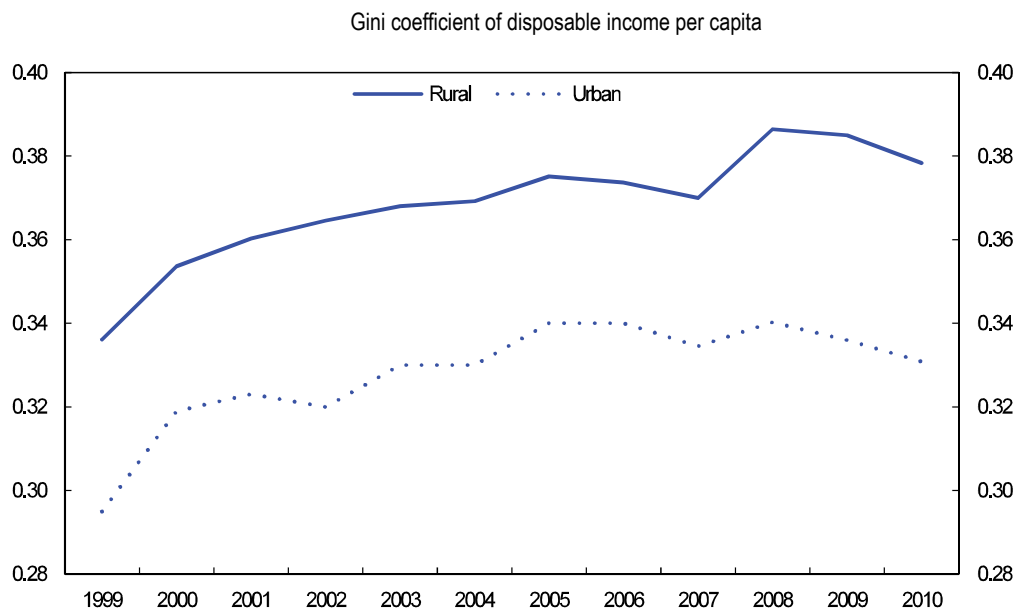
Figure 2.2 **Change in inequality levels, early 1990s versus late 2000s¹**

1. Figures for the early 1990s generally refer to 1993, whereas figures for the late 2000s generally refer to 2008.

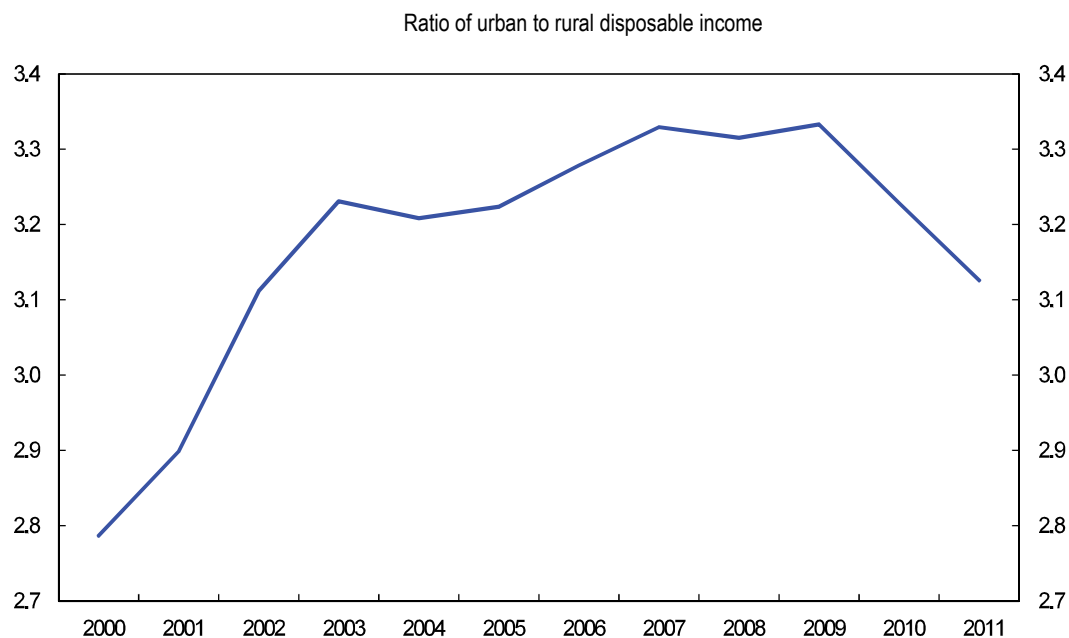
Source: OECD-EU Database on Emerging Economies, World Bank Development Indicators Database.

In the period of the 11th Plan, the poorer groups in the urban areas experienced more rapid growth in income than the better-off groups, with the real incomes of the lowest decile rising by 10.6% annually against an increase of 9.3% for the highest decile. Such movements have resulted in a fall in the Gini coefficient in urban areas (Figure 2.3), though this movement may have been overstated by the increasing difficulty in sampling high-income households and obtaining accurate data about their disposable income. Inequalities in rural areas have also diminished, thanks to a number of government policies such as the removal of agricultural taxes and fees in 2006. More recently in 2010, government cash transfers to the lowest income quintile rose 30% from the previous year.

The difference between average incomes in rural and urban areas is an important determinant of overall national inequality in China and has fallen recently. The extent of this difference is particularly high in China and had been rising steadily until recently. By 2009, the ratio had reached 3.3, which is much higher than in other emerging economies such as India, where the ratio of consumption between urban and rural households was just under 2 in 2009. Since then, however, the rural-urban income gap in China has started to fall and by 2011 had dropped back to its level of 2003. The fall has been helped by a rapid increase in the number of migrants whose income is counted as being rural income, even if they are working in urban areas provided that their families remain in the countryside. There has also been a major increase in the extent of government transfers to the less well-off in rural areas. In addition to income discrepancies, there are great disparities in access to basic services, such as education, between rural and urban populations (OECD, 2010b).

Figure 2.3 **Inequality drops in urban and rural areas**

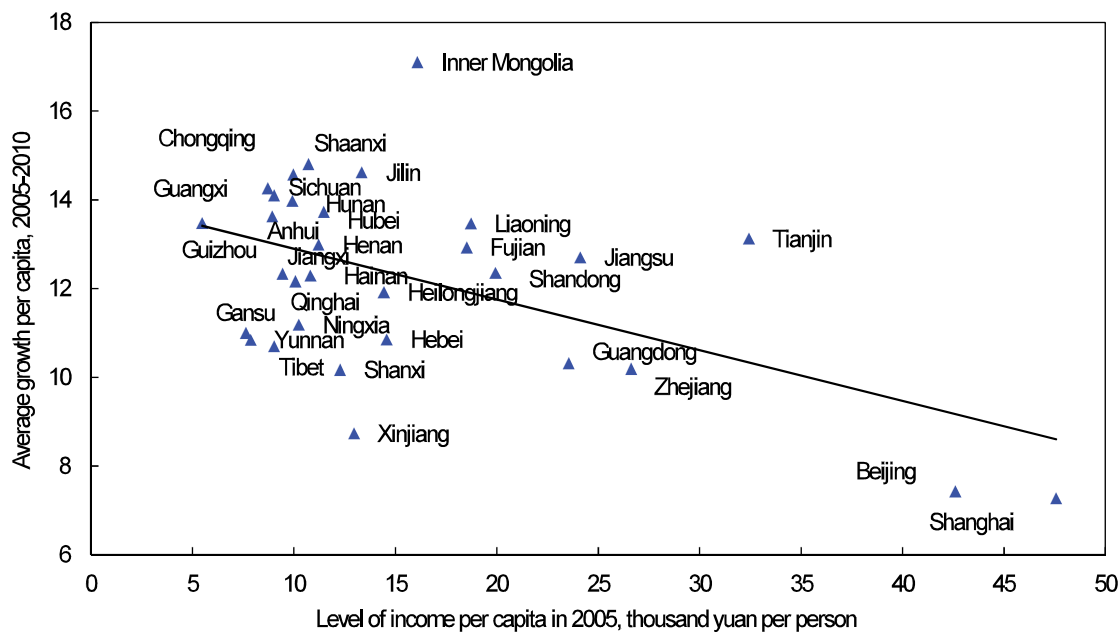
Source: National Bureau of Statistics and National Development and Reform Commission, except for urban incomes from 2008 to 2010 which have been estimated by the OECD.

Figure 2.4 **The gap between rural and urban incomes narrows**

Source: ChinaDataOnline from National Bureau of Statistics.

Regional inequality has been declining in the past five years. The forces underlying regional inequality are difficult to disentangle and often overlap. They typically involve the interplay of geographic, historical and institutional factors such as weak resource endowments and distance from markets, which

Figure 2.5 **Low-income provinces have grown faster than high-income provinces between 2005 and 2010**



Source: GDP: CEIC; provincial population: National Bureau of Statistics.

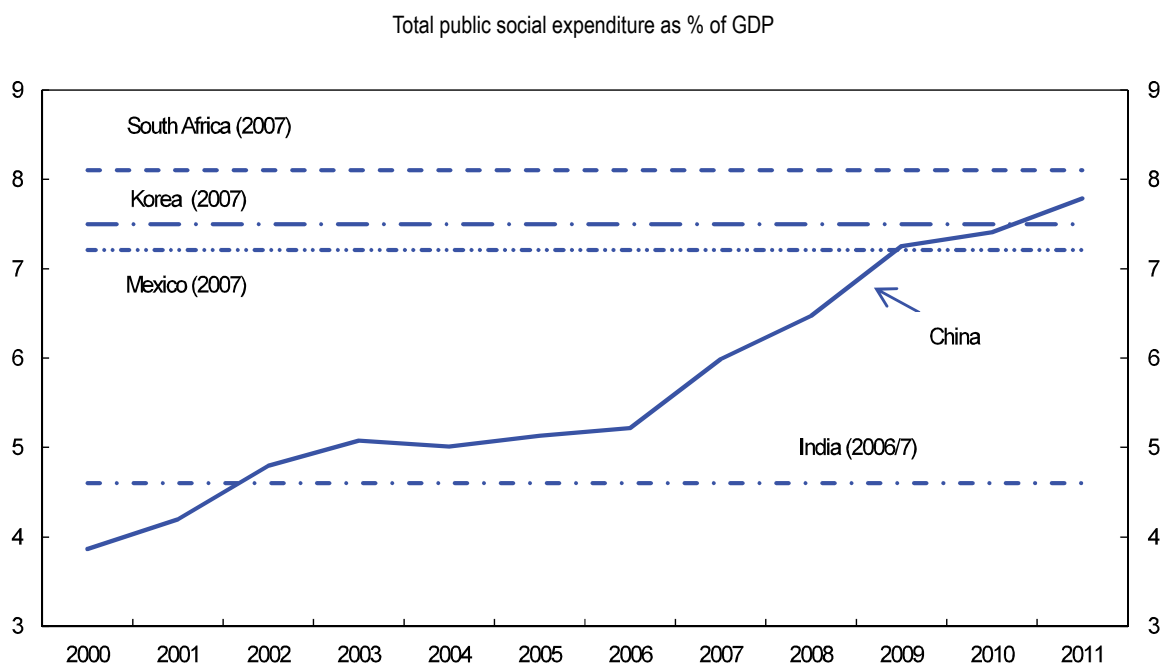
constrain development in lagging regions. Nonetheless, in the five years to 2010, the extent of regional inequality has been declining in China. In part this development reflects rapidly increasing wages in coastal provinces which has incited companies to relocate factories away from coastal areas, as well as the emphasis on infrastructure spending in inland areas during the past five years (OECD, 2010c).

The causes of inequality in China

The key sources of inequality in China, as in other emerging economies, include geographical factors, a large and persistent informal sector, gaps in access to education, and barriers to employment and career progression for specific groups, particularly rural migrants. The inequality between rural and urban areas are linked with disparities in access to basic services – such as medical insurance and education (Herd, 2010) – and institutional factors – notably, the hukou system which prevents rural and urban migrants from acquiring the same rights as people with the local urban registration status in the area in which they live (Herd et al., 2010). The incidence of informal employment is also an important parameter of inequality and is related to the segmentation of labour markets.

The social protection system has been widened but is far from universal

Social policy has helped raise the incomes of the poorest groups in society during the past five years. Government social expenditure spending in China has been rising rapidly since 2006 reflecting the change in emphasis that started during the period of the 11th Plan. In the five years to 2011, social outlays have almost tripled in real terms, rising to nearly 8% of GDP. Such growth has pushed outlays above those in many emerging economies (Figure 2.6).

Figure 2.6 **Public social expenditure in China and selected emerging economies¹**

1. Policy areas covered include old-age and survivors pensions, incapacity-related benefits, family, health, active labour market policies, unemployment and in some cases (but not China) housing.

Source: OECD countries the SOCX database; for non-OECD countries other than China see Chapter 2 of OECD (2011a) and <http://www.oecd.org/dataoecd/45/62/48654927.pdf>; for China: China Statistical Yearbook and CEIC.

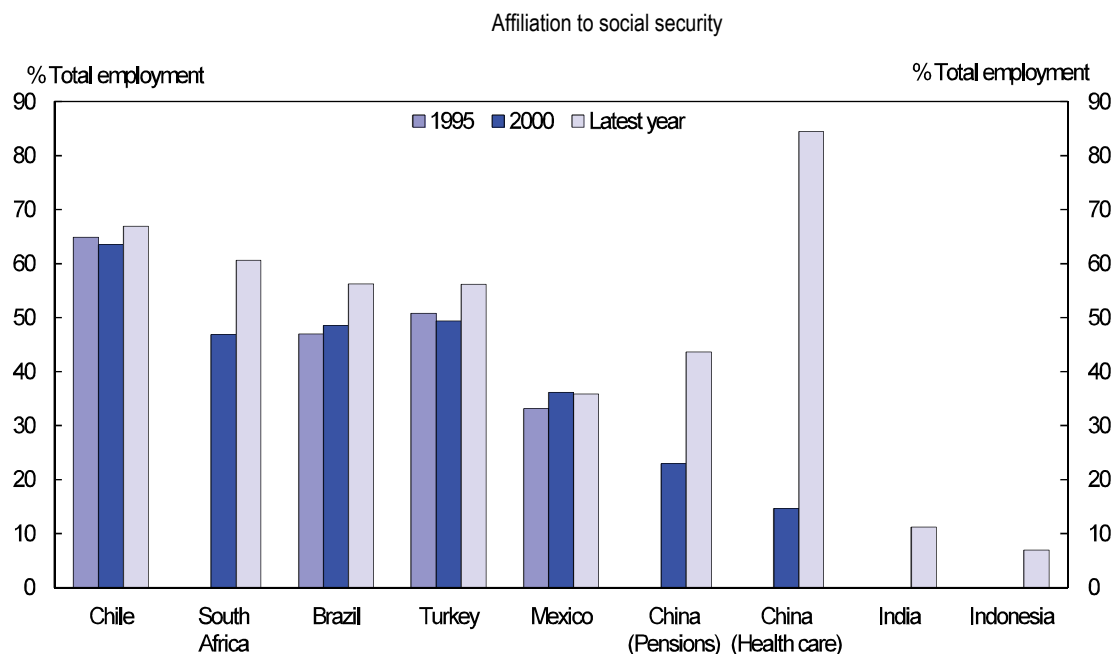
On the other hand, social expenditure is much lower than in Brazil and Russia, where outlays on social programmes reach levels typical of countries with much higher incomes.

The bulk of the increase in expenditure in this period has gone towards extending the coverage of social programmes. Notable reforms include the generalisation of the minimum subsistence allowance to the countryside; new medical insurance schemes for people with rural registration status, for dependants of registered urban employees and students; the introduction of a new pension system for people living in the countryside and one for migrant workers. The result of the new policies has been a marked rise in coverage for the principal forms of social protection (Figure 2.7). During the 12th Plan period (2011-2015), the government expects to complete the roll-out of the pension system for people living in the countryside and to further extend social protection. The first actions during the 12th Plan included the introduction of a pension system for people in urban areas who are economically inactive and a 10% increase in benefit levels for those already retired at a cost of around 0.4% of GDP. Key challenges remain to be overcome. The average level of benefits under many of the rural social protection schemes is low and within urban areas many firms do not pay contributions for their staff as enforcement is poor and penalties for non-compliance are almost non-existent, so employees of these firms are not eligible for social benefits.

The system of unemployment insurance in China rests to a very large extent on severance payments determined by the labour contract of the employee. For those workers with labour contracts the severance payments are quite high. Indeed, if the severance pay for a worker with four years seniority is added to the total unemployment benefits payable in the first 12 months of unemployment, the total unemployment package is above the average of the OECD areas

(Figure 2.8). However, in 2010, only 4% of migrant workers were affiliated to the unemployment insurance system and less than half had a labour contract despite the new labour law. As a result, the proportion of the unemployed receiving benefits is under 10%, slightly below the average in emerging economies. The extent of informal or semi-informal employment limits the ability of unemployment insurance systems to prevent unemployment-related poverty and inequality and increases the importance of informal insurance mechanisms. It may also impose higher adjustment costs on people who return to work and may represent an inefficient use of resources when individuals are credit-constrained.

Figure 2.7 **The coverage of contributory social schemes has risen substantially**

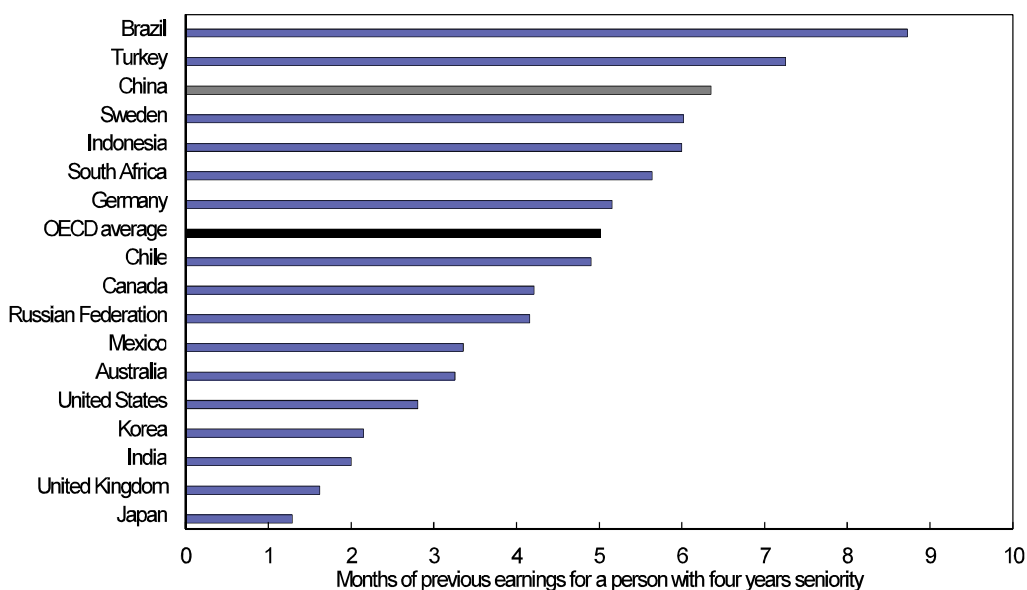


The year of reference varies slightly from country to country.

Source: OECD calculations based on various sources for non-member countries (same as Figure 2.6) and National Bureau of Statistics (2011) for China.

There is evidence that persistent informal economic relations lead to greater income inequality (Jütting and de Laiglesia, 2009). In China, this outcome reflects the interplay of several forces. First, informal jobs typically carry a wage penalty. Migrants' pay was two-thirds that of registered urban employees in 2010, though half of all migrant workers had free accommodation. The gap in hourly earnings was even larger as migrants worked far more hours, though part is accounted for by the lower human capital of migrants. Second, informal jobs are much less stable than formal ones. Third, employers do not register migrants for social security. Fourth, informal jobs considerably limit opportunities for human capital accumulation and career progression. Furthermore, employment in the informal sector can also be detrimental to a worker's subsequent prospects for formal employment, thereby entrapping the low-skilled and contributing to the persistence of income inequality.

Figure 2.8 **Unemployment and severance pay benefits**

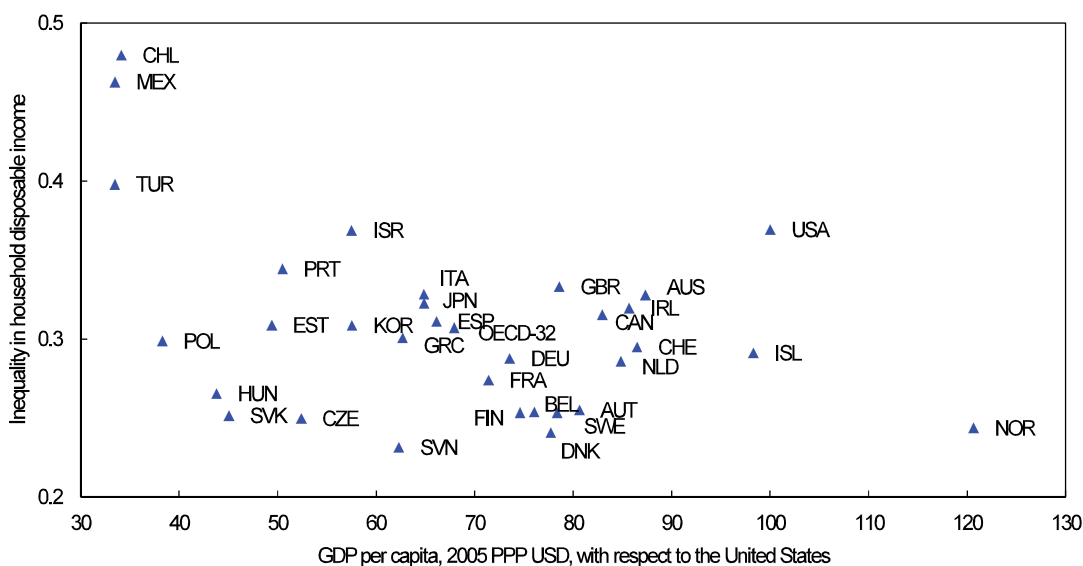


Source: OECD (2011b).

The impact of taxes and cash transfers policies on inequality in the OECD area

Across the OECD area, there appears to be little relation between the level of economic development and the extent of inequality. Countries with as diverse levels of economic development as Poland and Switzerland have similar levels of inequality. Such a result has also been found across countries with lower income levels than China (Deiningger and Squire, 1998).

Figure 2.9 **Inequality and income levels across OECD countries**

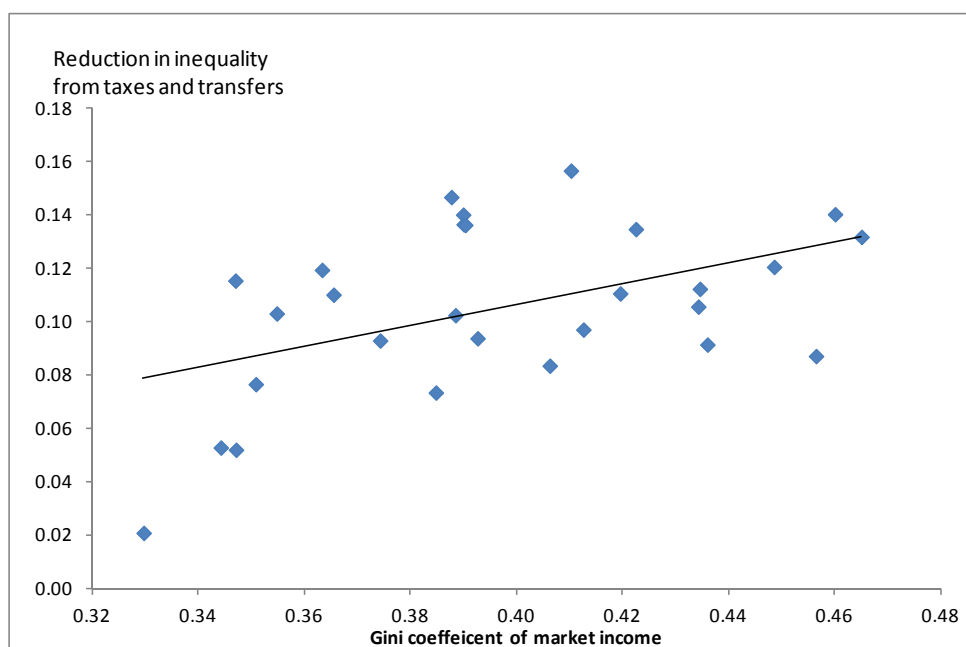


Source: Hoeller et al., (2012)

These results suggest that policymakers should not rely on any automatic tendency for inequality to decline as their economy develops. Rather specific policies to boost the incomes of poorer households may be needed.

Within the OECD area, the redistributive impact of taxes and transfers varies: countries with a more unequal distribution of market income tend to redistribute more, though there are exceptions (Joumard et al., 2012). Cash transfers reduce income dispersion more than taxes in most OECD countries. On average, three quarters of the reduction in inequality is due to transfers, the rest to taxes.

Figure 2.10 **Redistribution tends to be higher when incomes are more unequal**



Note: The best fit line is given $y = -0.032 + 0.342x$. The t statistic on the x variable is 3.0

Source: OECD Income and Poverty database

There is no single redistributive strategy favoured by OECD member governments. Countries have adopted a wide range of policies. In some, cash transfers redistribute income mainly over the life-cycle rather than across individuals and often account for a large share of household disposable income. Old-age pensions often fall into this category – and their progressivity is low in many countries, as the distribution of pensions reflects the initial distribution of incomes. Countries with lower outlays on cash transfers tend to rely more on targeted benefits. A few rely to a very limited extent on cash transfers to reduce income inequality. In most countries, the most progressive benefits are family and housing benefits, though their redistributive impact is limited as they are often small in size. Disability and unemployment benefits reduce income inequality although their progressivity largely depends on their design.

The cross-country variation in the redistributive impact of household taxes is more limited than that of transfers, despite large differences in tax-to-GDP ratios. High-tax countries tend to have less progressive household taxes. The progressivity of labour taxes (including social security contributions) has increased in the majority of OECD countries but mainly at lower income levels.

Personal income rate schedules have often become flatter reflecting the steep decline in top marginal tax rates, but working against this social security contributions for low-income earners have been cut and earned income tax relief has been introduced in attempts to reduce the adverse impact of high labour taxation and dual labour markets on young workers. On the other hand, the redistributive impact of tax systems has been reduced by the reduction of the taxation of capital income and wealth. The most progressive tax is that on personal income, though there are significant cross-country variations. The most regressive taxes are social security contributions, consumption taxes and real estate taxes.

Complementarities between policies to reduce inequality and boost growth

In a number of areas, there is clear evidence that policies designed to reduce inequality can also boost growth. The clearest example is education policy. Human capital formation should be facilitated in order to boost growth but the key for reducing inequality is to ensure that the educational potential of an individual should be made less dependent on her/his personal, social and geographic background. There is clear evidence in OECD countries that the completion of secondary and tertiary education boosts income and this holds in China too (OECD, 2010c). Equally, all forms of discrimination should be avoided so that the labour market participation of women and elderly people is raised, as gender differences in working hours and choice of occupation and sector account for a sizable part of the earnings gap. Policies to reduce these differences (*e.g.* improvements in the access to childcare) could thus lead to more equal labour market outcomes among men and women while boosting long-run growth. Addressing inequalities in both access to, and quality of, education can be expected to help lower inequality in labour income. This is especially the case in China, where education is seen to play a major role in shaping household income differences between urban and rural areas, mainly because the education levels are different but also because the related returns are higher in cities with education helping rural people to move to cities. In addition, education needs to be complemented by policies to ensure a smooth transition from school to work especially for disadvantaged youth (mainly from poor households) so as to ultimately achieve a more equal distribution of income for the future generations.

Chinese policymakers should also note that there is evidence from OECD countries that long-run growth can be boosted and inequality reduced by integrating migrants into the labour force and avoiding labour market dualism. This is particularly important for China. While international migration is not sizeable, there is a need to integrate internal migrant workers into the local population, both with respect to eligibility to existing social safety nets and with respect to education, where OECD experience is that inequality can be reduced by ensuring that access to all levels of education is independent of the family background of individuals.

Policymakers in China also need to guard against entrenched labour market dualism, which places much of the adjustment burden on those in the informal part of the economy. In part this already occurs in China, where employment protection legislation of permanent workers is particularly stringent compared with other emerging economies and many OECD countries, but has a limited reach among vulnerable groups such as workers in the informal sector and rural migrants because of weak enforcement (Herd *et al.*, 2010), so that employment protection legislation may possibly worsen the income distribution. Reducing labour market dualism by narrowing the gap between the protection of permanent and temporary employees should help reduce income inequality through both a lower wage dispersion and lower unemployment. Evidence from the OECD area suggests that lowering the protection of permanent employees

reduces inequality. In China, there are also regulations that limit the use of temporary and fixed-term contracts. Relaxing restrictions on the use of such contracts and reducing firing costs for young or inexperienced workers may improve incentives for firms to hire workers on a formal basis. In some cases in the OECD area, partial reforms of employment protection laws may have resulted in “two-tier” systems with high unemployment turnover for certain categories of workers but still high overall unemployment. In the Chinese context, the dual labour market is evidenced both by the exclusion of many workers from the social security system and by the markedly higher wages paid by the state-owned enterprises where they are operating non-competitively.

Given that strict employment protection legislation reduces outflows from unemployment, OECD experience suggests that there is a case for easing strict regulation on regular contracts, especially where unemployment benefits are high and extended, or where unemployment persistence is a problem. Furthermore, a dual labour market amplifies shocks. Hence, narrowing the differences in the degree of employment protection between different types of workers, for instance by unifying contract types with protection rising with seniority, could boost hiring during the recovery while at the same time improving labour market resilience to future shocks and lowering the unemployment rate in the longer term.

Taxing in a way that allows equitable and inclusive growth

OECD experience suggests that there are a number of areas where there is a tension between the desire to reduce inequality and the objective to promote economic growth.

The clearest example from within the OECD area is that inequality can be reduced by policies that set high marginal tax rates on top incomes, wealth, inheritance and transfers of capital between living individuals. However, there is evidence from within the OECD area that high marginal tax rates could undermine incentives to work, save and invest, which can adversely impact long-run growth (OECD, 2012). So far, tax policy is oriented to raising growth rather than reducing inequality by keeping marginal income tax rates low. For example, the highest marginal tax rate (45%) only applies to incomes more than 34 times the average wage, with the marginal income tax rate for the bulk of the population is zero since September 2011 when marginal income tax rates were reduced to zero for 60 million taxpayers, leaving only 24 million people (3% of the working population) paying income tax on labour income. Income from investment in bank deposits and many bonds is not taxed at all while other forms of property income, including capital gains, are taxed at 20%. A low income tax burden also has positive effects on economic growth as it enhances entrepreneurship and encourages foreign direct investment and education.

However, OECD experience also suggests that there are policy options that could yield a double dividend by promoting growth and reducing inequality at the same time (Table 2.1). Cutting back tax expenditures that benefit mainly high-income groups (e.g. tax relief on mortgage interest) is likely to be beneficial both for long-term growth, allowing a reduction in marginal taxes, and for a more equitable distribution of income. Other possible options are aligning the taxation of owner-occupied residential property more closely with actual values and returns and a closer alignment between the tax treatment of capital gains and ordinary income.

Equally, OECD experience suggests that growth can be boosted by shifting the tax mix to less-distorting taxes – in particular away from labour and corporate taxes to consumption taxes (OECD, 2011d). Model simulations in Table 2.1 suggest that shifting the tax burden away from direct taxes towards consumption taxes reduces unemployment relatively quickly, particularly so for youth and women (Ahrend *et al.*, 2011). After a few years, such reforms also appear to trigger stronger

female and youth participation. This indicates that improving the tax structure can have positive labour supply and labour demand effects (OECD, 2011e). Moreover, empirical results suggest that such reforms also boost private investment. The Chinese tax system is already based on indirect taxation, with only one-third of total tax revenues coming from income tax and social contributions. At the same time, taxes on consumption are associated with a widening gap between the rich and poor. However, other changes in the tax or benefit system could be used to offset some of these effects on inequality such as applying a reduced VAT to necessities and providing targeted benefits to those most in need. All in all, under current conditions, the role of taxes in income redistribution remains limited. Changing this situation is likely to take time. In China then, for the time being, reducing inequality is better addressed through well-targeted social welfare programmes. In-work tax credits that targeted the low-income groups, for instance, can narrow the income distribution and raise incentives to work.

Table 2.1 **The impact of tax reforms on growth and equality**

+ means more and - means less equality or GDP per capita; ~ denotes an ambiguous effect

Tax policies	Income equality	GDP per capita	Comments
<i>Increasing total tax revenues</i>	+ (in general)	-	<ul style="list-style-type: none"> The impact of taxes on income distribution depends on the level of taxation, the tax mix and the use of tax revenues, but if tax systems are progressive overall, equality is enhanced. Taxes dampen incentives to work, save and invest and are thus detrimental to growth. But some taxes have a less adverse effect than others.
<i>Changing the tax mix while keeping total tax revenues constant</i>			
Moving from personal income tax to consumption taxes	-	+	<ul style="list-style-type: none"> Personal income tax tends to be progressive while consumption tax is regressive. Personal income tax reduces work and saving incentives. A shift from direct to indirect taxes would raise GDP per capita.
Moving from labour income to property and capital taxes:			
<ul style="list-style-type: none"> to wealth, inheritance and capital income taxes, such as capital gains taxes 	~	+	<ul style="list-style-type: none"> Wealth and inheritance taxes tend to be progressive. The distributive impact depends on the relative progressivity of income versus wealth and inheritance taxes. Real estate taxes are often less progressive than the personal income tax and can even be regressive.
<ul style="list-style-type: none"> to real estate taxes 	-	+	<ul style="list-style-type: none"> Property taxes are among the least harmful for growth. Moving from income to property taxes tends to improve incentives to work and invest, and thus to raise output, at least in the short and medium term.
Cutting tax expenditures and marginal rates	+ (in most cases) - (for in-work tax credits)	+	<ul style="list-style-type: none"> Most tax expenditures benefit high-income groups (in-work tax credits and other tax expenditures targeted at low-income groups are the exception). Cutting tax expenditure would narrow the distribution of disposable income. Cutting marginal rates improves incentives to work, save and invest, and thus lifts GDP per capita.
<i>Increasing the progressivity of taxes (revenue-neutral)</i>			
Personal income tax:	+	~	<ul style="list-style-type: none"> In-work tax credits narrow the income distribution and raise incentives to work. On the other hand, higher top rates may reduce working hours and productivity by undermining incentives to learn, invest and innovate. The GDP per capita impact is thus ambiguous.
<ul style="list-style-type: none"> increase in top rates above measure combined with expanded EITC schemes or tax free allowances 			

Source: Joumard et al. (2012).

Dealing with the distributional consequences of short-term output fluctuations

While long-run movements in inequality are of concern, OECD policymakers have also been concerned with the short-term consequences of output fluctuations for income distribution. In general, individuals on lower incomes are found to have been more strongly affected by fluctuations in economic activity than other income groups, suffering more from adverse shocks, but at the same time often benefiting more from positive ones (Table 2.2).

Table 2.2 **Synthesis of empirical findings on the distributional impact of macroeconomic shocks**

Financial crises	<ul style="list-style-type: none"> increase the income share of the 3rd and 4th quintile reduce the income share of the 5th quintile increase poverty worsen the relative labour market outcomes for <ul style="list-style-type: none"> youths (unemployment , employment), seniors (unemployment) women (employment) improve the relative employment performance of those with tertiary education
Fiscal consolidations	<ul style="list-style-type: none"> reduce the income share of the first 1st and 2nd quintile increase inequality (Gini coefficient) increase poverty worsen relative labour market outcomes for <ul style="list-style-type: none"> youths (unemployment, employment) seniors (employment)
Fiscal expansions	<ul style="list-style-type: none"> increase the income share of the 1st and 2nd quintiles reduce the income share of the 5th quintile reduce inequality reduce poverty increase income share of youth increase income share of pensioners enhance relative labour market performance of <ul style="list-style-type: none"> youths (unemployment) seniors (unemployment, employment)

Source: Ahrend et al. (2011).

As China has become more open and interlinked with the economies of the rest of the world, it has become more vulnerable to external shocks in addition to the disturbances that can arise from within its own economy. The labour market in China has proved quite resilient to external shocks, especially those stemming from the 2008 financial crisis when there was neither an increase in the unemployment rate nor a increase in the extent to which people withdrew from the labour force and became economically inactive. Within the OECD area, countries rely on

different types of institutions to cope with shocks:

- Some provide income risk sharing mainly via social-protection institutions: most continental-European and (possibly to a lesser degree) eastern-European countries are likely to offer a higher degree of income protection to lower-income households in the wake of negative shocks, at the risk of generating poor labour-market performance of youth and labour market outsiders.
- Some rely mainly on reallocation-facilitating institutions: English-speaking and Asian OECD countries would typically fall in this second group and provide less redistribution.
- Some rely strongly on both of them: these are mainly Nordic countries, which typically combine strong reallocation-facilitating institutions, including active labour market policies, with well-developed social insurance. However, there are efficiency losses associated with the high marginal tax rates necessary to finance this model.

The institutional structure in China corresponds most to that seen in the second group of OECD countries. Unemployment benefits are relatively low and the response of the authorities to the labour market problems of 2009 was mostly through measures to facilitate the re-insertion of workers that had lost their jobs (OECD / ILO, 2011).

The influence of institutions on the distributional implications of shocks

Analysis of the above sets of policies suggests that there is no one best set of policies designed to reduce the distributional impact of a downturn in the economy. Some policies that work in the short term may have undesirable consequences in the long term while other policies may have differing impacts on efficiency. Nearly always, it is a case of balancing equity and efficiency and the short and long term. The weights that different countries attach to these elements differ. However, an analysis of the policies in place in the OECD area may be of interest to Chinese policymakers as they continue to reform their social safety net.

The balance between a short-term gain in equity against longer-term loss in efficiency can be seen clearly in the experience of countries with high levels of unemployment benefit. The negative impact of macroeconomic shocks on poorer segments of society can be dampened by generous unemployment benefits, especially for the initial period of unemployment, but such transfer payments generate a risk of adverse employment effects for certain groups, raising both the level and duration of unemployment, unless effective activation strategies for the unemployed are also in place.

A common finding across countries is that other policies designed to dampen the impact of the macro-economic fluctuations have an adverse impact on youths. Stricter job protection is found to have provided some income protection for lower and middle-income classes in the wake of negative shocks but at the expense of youth employment. Equally minimum wages are found to have beneficial effects on inequality in the wake of certain shocks, but again often with the opposite effect on youths.

On the other hand, a number of policies can help mitigate the impact of downturns on youths. China already has one of the best-performing youth labour markets amongst G20 countries in terms of integrating young people into the labour market, with their unemployment rate being twice that of the adult population (OECD / ILO, 2011). In the OECD area, lower tax wedges on labour income are one example of a policy that can help youth employment. In China, many young workers effectively face a tax wedge of zero. There is a range of evidence

suggesting that high-quality vocational education pathways in upper secondary education can help engage youth who have become disaffected with academic education and thereby improve graduation rates and ensure smoother transitions from school to work. Countries with a long tradition of apprenticeship systems, such as Germany, have a good performance in terms of low youth unemployment. Indeed Germany is one of only two other countries in the G20 that match the performance of the Chinese youth labour market. Important steps have been made in China to enhance the employment prospects of youth and migrants through vocational training and incentives provided to employers to retain or hire among vulnerable groups. In addition, complementary career guidance can help youth make better informed decisions during their school-to-work transitions and about their future, provided that it is effectively designed and implemented. Notably it requires: i) early action in lower secondary education; ii) highly qualified guidance personnel; and iii) timely and high-quality data on local labour market needs and employment prospects by occupation (OECD, 2010a; and OECD, 2011b). Such programmes are urgently needed in higher-education institutions where there is evidence that many graduates are unable to find jobs that match their expectations, following the massive expansion of higher education in the past five years.

The orientation that Chinese policymakers would want to give to policies designed to improve the social safety net will depend on the balance that is struck between equity and efficiency. One key aspect of improving the social safety net will be widening the coverage of unemployment benefits and the minimum living allowance to all people who have lived and worked in a given area. Currently unemployment benefit levels are set locally. They vary between the level of the minimum wage and the guaranteed minimum living income, which is also set locally. Although its coverage increased substantially in recent years, a majority of poor households remained uncovered. Fiscal constraints enter into the determination of local poverty lines by local governments, with the implication that entitlements cover only part of the poverty gap. In 2011, the government announced an 80% hike in the poverty line and set a goal of meeting the food, clothing, education, basic health and housing requirements of the poorest people by 2020. Extension of benefits to the migrant population could have a significant impact on equity and increase the share of the lower incomes in the value of output. OECD experience shows that such an extension should be accompanied by strategies for ensuring a swift return to work through improving information flows in the labour market. The experiences of Brazil with *Bolsa Familia* and Mexico with *Oportunidades* may offer useful insights to the Chinese authorities, including on the introduction of conditionalities. By combining income support to those mostly in need with investments in health and education they can play a major role in reducing poverty and enhance the future (labour market) opportunities of poor households.

To ensure social stability, policies designed to protect one group in the labour market should not have a marked adverse impact on other groups. In China, this would point to careful evaluation of policies designed to increase minimum wages. Minimum wages can improve inequality outcomes in downturns but can also result in fewer employment opportunities for the marginal workers, which in China would be the poorer migrant workers from the central and western provinces.

Reforms in product markets can also improve the income distribution

The extent of regulation of product markets has been found to be a driver of long-term growth. This has been confirmed by analysis of the changes in the regulation in network industries. Such structural reform has also lowered inequality. Cross-country time-series evidence

on product market reforms in transport, energy and communication industries in the OECD area suggests that they increase employment (Fiori *et al.*, 2012). Inequality is reduced by this type of structural reform through the boost given to labour force participation and employment.

While it is difficult to document that structural reform in network industries raises labour force participation in China, there is clear evidence that reducing the extent of regulation in non-manufacturing network industries brings productivity gains, even in the short term (Bas and Causa, 2012). It also appears that trade liberalisation spurs manufacturing productivity growth, especially for domestically-owned firms. Within the OECD area, better product-market regulation is found to have a particularly positive effect for youths and the poorer segments of society in the wake of macroeconomic shocks.

In the Chinese context, this work suggests that there is scope for increasing productivity and employment by introducing more competition into network, energy and transport industries that are largely controlled by state-owned monopolies or oligopolies. If the effects on labour force participation are similar to those observed in the OECD area, then reform of these sectors where competition is restricted would have beneficial impacts on labour force participation, though the impact on inequality is ambiguous. In addition, while lifetime employment has been ended in state-owned enterprises, there appears to be a significant discrimination against migrant workers in the employment policies of these companies.

Financial reforms as well can have redistributive effects

Financial market reforms that make it easier for firms to rely on external finance are also tentatively found to bring productivity gains relatively quickly in catching-up economies. Firm-level evidence for China also shows that such reforms are more beneficial to firms that are relatively far from the technological frontier, implying that they help speed up the catch-up process within industries (Bas and Causa, 2012).

However, financial reforms may amplify the redistributive effects of various shocks insofar as financial market sophistication makes for more pronounced credit cycles. Financial crises have tended to affect the incomes of the low and high-income households most strongly, while the middle class has tended to improve its relative income position. The effect of macroeconomic shocks varies also across age groups. Labour-market performance of youths has been particularly poor in the wake of almost any negative macroeconomic shock. Older households have been disproportionately affected by large changes in the fiscal stance. Financial crises have often been associated with house price declines. Highly-leveraged households and those whose asset portfolios primarily consist of housing assets, *i.e.* households in the 26-35 year old group, are most vulnerable in such cases. Such consequences flowing from financial reform strengthen the case for strong macro-prudential regulation which should amongst other factors limit excessive leverage - including for house purchases.

Conclusions

The extensive analysis of inequality and inclusive growth, dealing with both the economic ramifications and the social effects produced in publications and seminars by the OECD over the past year points to the strong complementarities between a number of policies that can serve to improve growth over the longer term and which at the same time can reduce inequalities. Improving access to education and removing barriers that give rise to discrimination between people of similar qualifications and abilities in the labour market are examples. Reducing

such constraints boosts the average level of incomes but also tends to draw more people into employment and can reduce the extent of rent-sharing between employees and employers in the protected sectors. In the context of China, such analysis confirms to the urgency of reducing discrimination against the quarter of a billion of migrant workers and their families. It also shows that introducing more competition into sectors where a few state-owned enterprises hold dominant market shares would both contribute to reduce inequalities and boost long term growth.

The analysis produced over the past year has also suggested that there are policies that can promote growth and reduce inequality. Improving tax compliance and abolishing tax breaks that benefit high-income recipients, for instance, are efficient ways to achieve both. Tax systems based on indirect taxation are more growth-friendly than those based on direct taxation. At the same time, to contain inequality, China should continue to improve its social safety nets, but in doing so it needs to guard against potential work disincentives. The efforts and successes of China will become increasingly relevant to informing the continuing work of the OECD in its work on inequality and inclusive growth.

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Chapter 3:

Key Lessons from OECD Work on Greening Growth

With a population of 7 billion, the world in 2012 faces highly complex economic and social challenges. While protecting the environment and conserving natural resources remain key policy priorities, many countries are also struggling with slow economic growth, stretched public finances and high levels of unemployment. Tackling these pressing challenges requires a deep cultural shift towards “greener” and more innovative sources of growth, and more sustainable consumption patterns.

By 2050, the world economy will look rather different than today (OECD, 2012). The OECD's share is projected to decline from 54% in 2010 to less than 32%, while the share of Brazil, Russia, India, Indonesia, China and South Africa (the BRIICS) is expected to grow to more than 40%. The Chinese economy in terms of GDP in purchasing power parity exchange rates (PPPs) is projected to overtake the US economy around 2012. India's GDP is projected to surpass that of the US before 2040. Today's global “engines of growth” – China and India – could see their average GDP growth rates slow down to 2050. Meanwhile, Africa will experience high economic growth rates between 2030 and 2050, but will remain the poorest continent. Overall, by 2050 the world GDP is projected to nearly quadruple, raising living standards around the world.

Without green growth policies, this new world will demand 80% more energy and the global energy mix in 2050 will still rely 85% on fossil energy, leading to a further 50% increase in greenhouse gas (GHG) emissions. Global water demand is projected to increase by some 55% to 2050, due to rapid increase from manufacturing (+400%), electricity (+140%) and domestic use (+130%). Competition for water would intensify, threatening supply for irrigated agriculture and leading to 2.3 billion more people than today – or over 40% of world population – living in severely water-stressed river basins (OECD, 2012).

By 2050 global terrestrial biodiversity is projected to decline by a further 10% and mature forests to shrink in area by 13%. The main pressures driving biodiversity loss include land-use change (e.g. agriculture), the expansion of commercial forestry, infrastructure development, human encroachment and fragmentation of natural habitats, as well as pollution and climate change. Urban air pollution is set to become the top environmental cause of premature mortality globally by 2050. The total number of premature deaths from exposure to particulate matter (PM)¹

¹ The Outlook modelled a composite of PM10 and PM2.5, based on assumed relationships between PM10 and PM2.5.

could double from current levels to 3.6 million per year, with most deaths occurring in China and India. China is projected to have by far the highest rate of PM-related premature deaths at over 900 per million inhabitants in 2050 (OECD, 2012).

The costs and consequences of inaction on these environmental challenges are colossal, both in economic and human terms. These projections highlight the urgent need for new thinking, an urgent call for green growth policy reforms.

What are the benefits of green growth?

Green growth is about fostering economic growth and development while ensuring that natural assets continue to provide the ecosystem services on which our well-being relies. It is also about fostering investment, competition and innovation which will underpin sustained growth and give rise to new economic opportunities.

The overarching challenge of addressing pressing environmental risks while ensuring continued improvements in the living standards of a rapidly growing population is equally applicable to advanced, emerging and developing economies. In fact, green growth presents opportunities for emerging and developing countries to leapfrog unsustainable production and consumption patterns. Where developed economies are constrained by the path dependency of sunk capital, developing economies have, given access to adequate financing and capacity, the opportunity to lay down infrastructure and networks that can reduce costs and increase productivity, while easing environmental pressure.

There are two broad reasons why a green growth strategy (GGS) will contribute to sustainable growth. First, it could open up new sources of growth through several channels:

- Better management of natural assets can generate improvements in the use of resources and enhance productivity throughout the economy, for instance by eliminating waste.
- Innovation, spurred by improved policies and framework conditions aimed at addressing environmental problems, can promote growth.
- A clear strategy provides certainty about how governments are going to deal with major environmental issues. This would boost confidence to invest in green technologies, goods, and services, and encourage environmentally-friendly consumption and the creation of new “green markets”.
- Increased revenues from the pricing of pollution can be used to fund goods and services to support long-term growth.

Second, green growth can prevent downward bends in growth trajectories caused by unresolved tensions between economic activity and the environment:

1. In the absence of a GGS, the value of natural capital eroded by economic activity can exceed the economic value that such erosion generates, undermining the ability to sustain future growth. This can occur due to increasingly costly substitution between natural capital and other inputs into production. For example, more costly investment in irrigation and drinking water supply has been necessary in the face of increasingly scarce water resources. The absence of a GGS may also lead to growth-choking bottlenecks, or to the failure to adequately measure the benefits of natural capital, for instance on human health.
2. A GGS can also help minimise the risk that further environmental deterioration affects

growth negatively due to the crossing of critical thresholds. Change in environmental systems doesn't necessarily follow a smooth, foreseeable trajectory. Things can shift suddenly and catastrophically (as has happened to some fish stocks and as could happen with climate change or damage to biodiversity), leading to potentially highly damaging and irreversible effects on growth.

An issue that policy makers need to address is that these different dimensions are closely related. For example, uncertainty which delays investment in greener growth will raise the cost of avoiding environmental thresholds.

A framework for green growth

Over the last few years, national efforts to foster greener growth have been gaining momentum in both OECD and emerging economies, albeit to varying degrees. Most countries have introduced discrete policy measures that, if extended could form part of the green growth policy mix. In these cases, there is scope to build on ongoing initiatives and to scale-up and join policy action under well-defined strategies. Some countries such as Korea, Germany, Norway, and the United Kingdom, have gone further and introduced comprehensive strategies that mainstream green growth objectives in broader government policies, including the budgetary process. In China, the National 12th Five-Year Plan for Environmental Protection (2011-2015), promulgated by the State Council in December 2011, testifies the government commitment to building a more “resources-efficient and environment-friendly society” (Box 3.1).

But there is no ‘one-size-fits-all’ green growth strategy. The optimal path to a greener economy depends on policies and institutional settings, levels of development, resource endowments and particular environmental pressures. There are, however, common considerations that need to be applied in all settings and an effective strategy requires looking across a very wide range of policies, not just traditionally ‘green’ policies.

A GGS should be centred on mutually reinforcing aspects of economic and environmental policy, recognising natural capital as a factor of production and its role in growth. It should focus on cost-effective ways of attenuating environmental pressures to affect a transition towards new patterns of growth that will avoid crossing critical environmental thresholds. The strategy should also recognise that minor policy adjustments can only produce positive outcomes up to a point. Beyond this, trade-offs between environmental and economic outcomes become binding, with negative consequences for longterm growth and development. Innovation can break path dependence and help to reconcile growth and environmental objectives. Innovation, therefore, is an essential element of an effective GGS.

A GGS also recognises that focusing on GDP as a measure of economic progress generally overlooks the contribution of natural assets to well-being. Policy makers will therefore have to target a range of measures of progress, encompassing the quality and composition of growth, and how this affects the environment and people's welfare. They will also need to promote policies that require more efficient use of resources to minimise environmental pressures. Efficient resource use is a core goal of economic policy and a GGS, and many fiscal and regulatory interventions that aren't normally associated with a ‘green’ agenda will be involved. A flexible, dynamic economy promotes high growth, as well as the transition to greener production and consumption.

Box 3.1 The National 12th Five-Year Plan for Environmental Protection (2011-2015)

The Plan presents seven major targets that the government aims to achieve by 2015: “(1) significant reduction of major pollutants emission; (2) improved environmental safety of urban and rural drinking water source areas, with major improvement in water quality; (3) effective control in the pollution caused by heavy metals, Persistent Organic Pollutants, hazardous chemicals and dangerous wastes; (4) improved urban environmental infrastructure operations; (5) reversal of ecological deterioration; (6) improved regulatory ability in nuclear safety; (7) enhanced environmental regulatory institution”.

The Plan elaborates concrete and detailed actions that primarily concentrate on four areas: (1) improve quality of water environment (this includes protection of the drinking water source areas, treatment of water pollution in major rivers, prevention and control of marine environment pollution); (2) implement comprehensive control of air pollutants; (3) enhance protection of soil environment; (4) strengthen ecological protection and supervision.

A notable feature about the Plan is that the government has, for the first time, announced its intention to “strengthen prevention and control of environmental risks in key areas” and “improve the system of environmental public services” as strategic tasks for environment protection. In order to ensure an equalization of environment public services, the Plan states clearly that the government should “appropriately define the scope and standard of basic environmental public services, with attention to the integration of urban and rural areas in service access (...) The central government will provide increased financial support, through measures as general fiscal transfers and ecological compensation, to improve environmental public services in western regions, areas prohibited or restricted for development and other disadvantaged areas. Local governments at all levels should guarantee expenditure on environmental public services...”

With regard to economic policies to support environmental protection, the Plan calls for advancement of environmental tax reform and improvement in waste disposal fee system. Besides, the Plan states that the government will establish a credit rating system for enterprises’ environmental behaviours and will step up credit support for those enterprises and projects that operate in line with environmental requirements and credit principles. The government will also build a green rating system in banks, linking green credit performance with other elements including work evaluation of banking staff, admission of institutions and business development. Meanwhile, the government will explore mechanisms for earmarked funds for national ecological compensation.

According to the Plan, China is calling for around RMB 3.4 trillion of investments for environmental protection.

Finally, the Plan requires that local governments should integrate the objectives, tasks, measures and key environmental protection projects outlined in the Plan into local plan of economic and social development and that the performance in implementation will serve as a key indicator in the overall evaluation of local government officials. “By the end of 2013 and end of 2015, mid-term evaluation report and final evaluation report on implementation shall be submitted to the State Council, with evaluation results open to the public”.

Beyond that, specific environmental interventions are likely to deliver economic benefits. The economic costs arising from the emission of some pollutants and the over-exploitation of some resources are relatively well-known, and clear benefits will arise once corrective policies are implemented. In such cases, positive environmental and economic results can be obtained in a relatively short time horizon. However, where ecosystem services – and their relationship to

natural assets and the economy are less defined, as with climate change or global biodiversity, the size and timing of payoffs are subject to considerable complexity and uncertainty. In these cases, economic policy decisions taken today need to incorporate a longer time horizon. Growth and technological change tend to create path dependency and technological lock-in. Environmental impacts are also cumulative and often irreversible. Action taken now to insure against unfavourable or even catastrophic outcomes can avoid very significant economic costs in the future.

What are the essentials of green growth policies?

Green growth policies need to (i) encourage greener behaviour by firms and consumers, (ii) facilitate smooth reallocation of jobs, capital and technology towards greener activities and (iii) provide adequate incentives and support to green innovation. Policies should focus on ways to close the gap between private returns and overall social benefits of economic activities, due to misguided government policies or constraints and distortions arising from failure of markets to resolve tensions between the economy and the environment. Policies should also take into account any distributional effects that may result, and include ways to mitigate them.

Two broad sets of policies are essential elements of any GGS: (i) framework policies that mutually reinforce economic growth and the conservation of natural capital, and (ii) policies specifically aimed at greening growth. Among the first are:

- Sound innovation policies (such as those expounded in the *OECD Innovation Strategy*).
- Policies that ensure the smooth functioning of labour and product markets (which are periodically reviewed in the *OECD Going for Growth* exercise).
- Fiscal structures which encourage both economic growth and environmental protection.

The second set includes a mix of pricebased and nonmarket instruments. Ultimately, it is not the precise choice of these instruments that matters for the success of a GGS but the need to stick to a well-defined set of economic and policy criteria. These crucially include cost effectiveness and the ability to spur innovation, but also to what extent policies are likely to be adopted and enforced (De Serres et al, 2010).

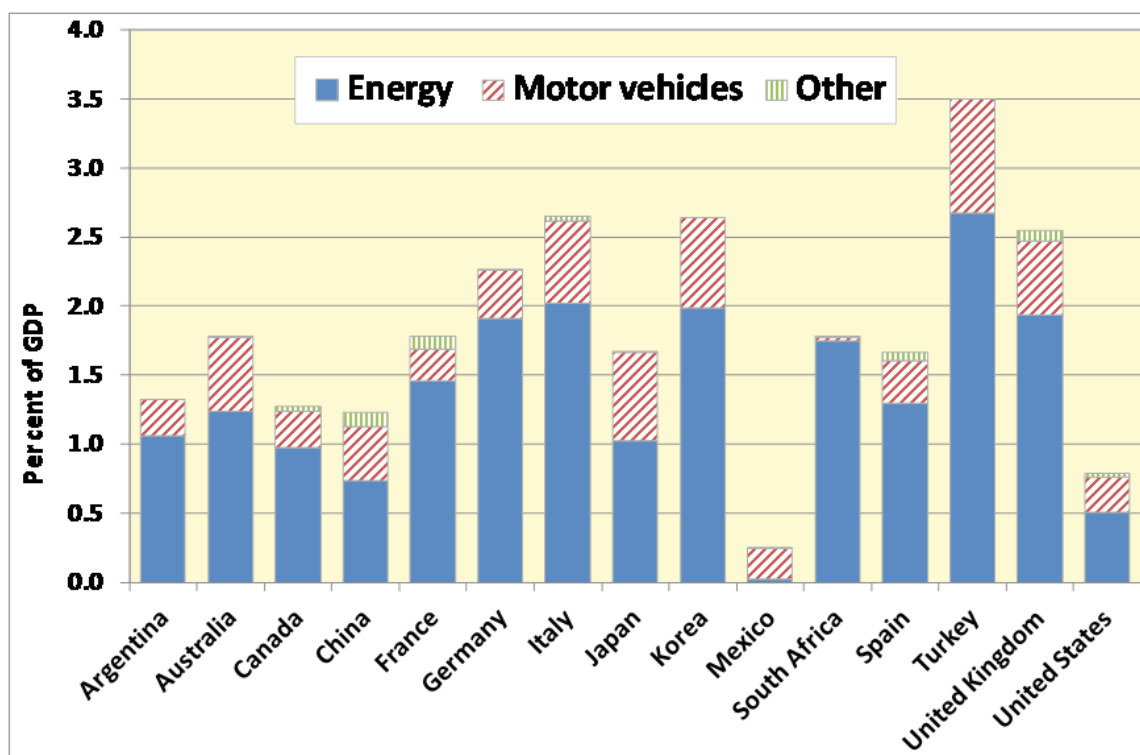
The balance between market and non-market instruments

Putting a price on a pollution source or on the over-exploitation of a scarce resource through mechanisms such as taxes or tradable permit systems should be a central element of a policy mix. Pricing mechanisms tend to minimise the costs of achieving a given objective and provide incentives for further efficiency gains and innovation. Importantly, increased use of environmentally related taxes can play a role in growth-oriented tax reform; by helping to shifting (part of) the tax burden away from more distortive corporate and personal income taxes and social contributions.

The use of environmentally related taxes and emission trading systems has widened over recent decades with a growing number of countries using taxes and charges in areas like waste disposal and on specific pollutants, such as emissions to air of NO_x and SO_x. Meanwhile, the revenue from taxes on energy, which are the most widespread form of environmentally-related tax (Figure 3.1), has tended to decline as a share of GDP, partly because growing global energy demand has pushed up pretax prices and encouraged increased fuel efficiency – an illustration of the impact of economic incentives.

Figure 3.1 **Composition of environmentally related tax revenues in selected G-20 countries**

As a percentage of GDP in 2009



Source: OECD/EEA database on instruments for environmental policy.

Not every situation lends itself to market instruments. In certain cases, well-designed regulation, active technology-support policies and voluntary approaches may be more appropriate or an important complement to market instruments. In addition, the responsiveness of businesses and consumers to price signals can, in many situations, be strengthened through information-based measures that highlight the consequences of environmental damage caused by specific activities and the availability of cleaner alternatives.

The use of non-market instruments such as command-and-control regulation, active technology-support policies and voluntary approaches is appropriate when pollution emissions cannot be adequately monitored at source and that there are no obvious input or output that could serve as a proxy and be subjected to taxation. They may also work best when insufficient information or misaligned incentives results in a weak response of agents to price signals.

In assessing the best policy strategy to foster greener growth, the environmental side-effects of existing sectoral policies should also be examined, notably in the areas of energy, agriculture and trade, to establish whether regulation and/or subsidies result in both economic inefficiency and environmental damage.

Seizing the opportunities for green innovation

A GGS should address the specificities of innovation in the environmental area. The problems for innovators in this area are fourfold:

1. The environmental externalities are not priced – for example a carbon price can address this, but current levels of carbon prices still leave a considerable gap.
2. Path dependency and dominance of existing technologies and systems can make it very difficult for some new technologies to compete and scale up, which is why temporary support may be needed in certain cases. Innovation support instruments must be carefully designed to foster the emergence and uptake of efficient technologies while minimising the risk of technology lockin.
3. Reducing barriers to trade and investment is important to diffuse green technologies globally. The effective protection and enforcement of intellectual property rights (IPRs) provides a key framework for the diffusion of technologies, including by facilitating foreign direct investment and licensing.
4. To accelerate the diffusion of green innovation, new mechanisms that enhance technology transfer to developing countries, e.g. voluntary patent pools and other collaborative mechanisms, need to be scaled up. Multilateral action is also needed to reduce the cost of green technologies for the least developed countries, e.g. by covering licensing fees. Such approaches need to ensure strong incentives to invest in follow-up innovation.

While developed countries still lead in green innovations at the frontier (OECD, 2011a; Dutz and Sharma, 2011), emerging and developing countries have their own green innovations and business models, reflecting their own needs and building on their own strengths.

Innovation provides opportunities for developing and emerging economies to avoid the growth path of developed economies and leapfrog to a greener economy. For example, as many developing and emerging economies are still in the process of developing their infrastructure, there are opportunities to integrate greener and smarter solutions from the outset, e.g. by integrating ICT in energy systems (e.g. smart grids) and transport systems, or by building green cities. However, if such solutions are to be viable in the context of developing countries, they need to be cheap.

There are also market opportunities from green innovation for emerging and developing economies. Brazil, China and India have all become important drivers of green innovation in recent years and the technologies from such countries may be more suited to the needs and conditions of developing countries than those from advanced economies. South-South flows of technology are therefore increasing, although from low levels. The United States is collaborating with China and Russia in a number of energy fields, as are Belgium and South Africa.

Key areas for a green innovation policy

Business is the driver of innovation, including green innovation. However, government action is essential to shape the environment for green innovation. Several well-known market failures provide the rationale for policy actions to foster green innovation. The first are the negative externalities associated with environmental challenges. If firms and households do not have to pay for the environmental damage they inflict, there will be little incentive to invest in green innovation. These externalities need to be removed. Second, there are important market failures specific to the market for innovation, notably the difficulty for firms to fully appropriate the returns from their investments, which typically results in under-investment in innovation. Third, the market for green innovation is affected by specific barriers, notably the prevalence of dominant designs, technologies and systems in energy and transport markets. This can create

entry barriers for new technologies and competitors due to, for example, the high fixed costs of developing new infrastructures.

Key elements of a policy framework for green innovation include:

- Providing predictable policy signals to ensure that potential innovators and adopters of climatefriendly technologies are not dissuaded from undertaking the necessary longterm investments. Increasing policy stability is good for innovation and growth and also for the environment.
- Improving the overall climate for business and innovation, as this is equally important for green innovation as for innovation more generally. A good environment for innovation will allow entrepreneurship to flourish and innovative firms to grow and provide new green solutions.
- Wider application of price signals to reflect the true value of natural resources and the costs of pollution. This will enhance efficiency in allocating resources by strengthening markets for green innovation, and will lower the costs of addressing environmental challenges. Price signals are also important as they indicate the commitment of governments to move towards greener growth.

Governments can also implement policies that strengthen the innovation effort itself and target it more directly towards supporting green growth. The scope for such policies will differ across countries, depending heavily on local capabilities.

A *first area* for policy action involves focusing the national innovation effort more on fostering green research, notably on addressing local needs, e.g. water scarcity, biodiversity loss, support for ecosystems. Investment in such public research will only help if that it is translated into innovation, which requires good links between science and business.

A *second area* of possible policy action is to foster green innovation more broadly, e.g. by encouraging firms and households to adopt green technologies and products. Four areas of policy are particularly important:

- *Support for private investment in green innovation*, including the commercialisation and diffusion of green innovations. Such support may be required as green innovation faces additional barriers in some markets, e.g. barriers to entry in the electricity sector. Provision of targeted support by government can be risky because of the lack of information. Good policy designs need to ensure competitive selection processes, focus on performance rather than specific technologies, avoid favouring incumbents or providing opportunities for lobbying, ensure a rigorous evaluation of policy impact, and contain costs. Support for commercialisation should be temporary and accompanied by clear sunset clauses and transparent phase-out schedules.
- *Strengthening the market for green innovation*. In many cases, the main problem for the commercialisation of green innovations is the immaturity of the market. This makes it difficult for innovators to obtain finance and to scale them up to a commercial size, and it makes it difficult for firms to invest in technologies that have uncertain returns. In specific market segments, demand-side policies, such as public procurement, standards and regulation can also help to strengthen and improve the markets for green products, fostering innovation in the process.

- *Change consumer behaviour.* Consumers also have an important role to play in fostering and taking up green innovation. Consumers often focus on short-term costs, without fully considering longer-term factors. This suggests that efforts should be made to highlight cost implications of consumer choices over the life of a consumer durable through consumer education, as well as green labelling and certification.
- *Fostering the greening of SMEs:* A specific challenge for innovation involves small and medium-sized enterprises (SMEs). These firms face additional problems in adopting green innovations, as they often have weak innovation capabilities. Policy can help to improve access to finance, enable small and medium-sized enterprises to participate in knowledge networks, support the formation of the skills that can lead to innovation.

Drawing on global knowledge

Governments can do much at the national level to strengthen green innovation but should also look to benefit from knowledge and technologies being developed abroad. Openness to trade and investment is important and numerous barriers to trade in green technologies remain in place which inhibit their free flow. In some economies, high import tariffs on energy-consuming goods combine with subsidised electricity prices to encourage consumers to favour appliances that are cheap to buy but inefficient to operate.

Lowering barriers to trade in services is also important. Deployment of climate-change mitigation and adaptation technologies often depends on the availability of specialised services. Moreover, free movement of people is important. Indeed the growth of China's photovoltaic industry owes much to skilled executives returning from the Chinese diaspora (de la Tour, et al., 2011).

Tension can arise between technology diffusion and maintaining appropriate incentives for investment in innovation. Intellectual property rights provide an important incentive to invest in innovation by allowing firms to recover their investment costs but they may make adoption of the technology too expensive. To accelerate the diffusion of innovation, new mechanisms that enhance international technology transfer are currently being developed, including voluntary patent pools and other collaborative mechanisms.

Institutions and multi-level governance

Institutional and governance capacity to implement wide-ranging policy reform is an essential condition for greening growth. Governments need to be able to integrate green growth objectives into broader economic policymaking and development planning (Box 3.2). Developing such capacity is a key structural issue and applies as much to many OECD countries as it does to developing countries. This issue is not restricted to formal national level planning processes, but extends to public financial management (especially the budget process), developing strategies for key economic sectors as well as how these feed through into sub-national development. It concerns not only policy priorities but also the choice and design of programmes, public investments and regulation of economic activity.

Box 3.2 Green growth objectives and national development planning

The National Strategy for Green Growth and the Five-year Plan (2009-2013) of Korea provide a comprehensive policy framework for green growth. The Strategy aims to: (1) promote eco-friendly new growth engines, (2) enhance peoples' quality of life, and (3) contribute to the international efforts to fight climate change. To facilitate the realisation of the new vision, the Presidential Commission on Green Growth was established in 2009 and 'the Framework Act on Low Carbon Green Growth' was enacted in January 2010. Drawing on the planning practice that was discontinued in the early 1990s, the Five-Year Plan (2009-2013) provides a blueprint for government actions for implementation of the Strategy; containing specific budget earmarks and detailed tasks for line ministries and local governing entities. Under the plan, the government will spend about 2% of the annual GDP on green growth programs and projects (e.g. on green infrastructures and R&D of green technologies).

The National Development Plan of Ireland (2007-2013) sets out indicative financial allocations for the investment priorities aimed at enhancing economic competitiveness and at providing a better quality of life. It brings together different sectoral investment policies into one overall framework, in order to promote co-ordination and alignment between sectoral policies, providing a financial framework within which government departments and agencies can plan and deliver the implementation of public investment. The Plan emphasises the importance attached to several horizontal themes, including environmental sustainability. The environment chapter covers transport, waste management, climate change, environmental research, and sustainable energy. The NDP set out a strong financial framework to enable Ireland to tackle environmental challenges over the period 2007-2013. In 2007, investment programmes with a direct impact on promoting environmental sustainability exceeded EUR 1.3 billion.

Source: Government of Ireland (2008), "Ireland National Development Plan 2007-2013. Transforming Ireland A Better Quality of Life for All".

The implementation of green growth reforms will require ongoing coordination across ministries, public agencies but also between levels of government involved in policymaking. Urban initiatives both affect and are affected by economy-wide fiscal policies and national sectoral policies (particularly transportation, building, labour, innovation and education policy). There are cases in which national-level policies can undermine regional level green growth policies due to the lack of information on conflicting rules or practices. Similarly, regional initiatives that focus on stand-alone or "flagship" projects without regard to where these projects fit within national policy frameworks risk falling short of their promise. Multi-level governance is of considerable practical importance for guiding investment and innovation in a number of key areas such as water and sanitation systems. At the same time, addressing issues of uneven stringency of enforcement of environmental policies and laws at the provincial and local levels will be important for achieving more effective and equitable implementation (Box 3.3).

Employment and distributional aspects

In the transition to green growth new jobs will be created, including skilled jobs in emerging green innovative activities. But some jobs will be at risk and others would have to be reallocated from grey to green sectors that either replace polluting activities with cleaner alternatives or provide environmental services. This turnover will create challenges for some and opportunities for others. While many of the existing skills will remain appropriate, skill mismatches may emerge, especially in relation to innovation activities, as the experience in some countries already suggests. New skills will be needed and this will require appropriate education policies, while training and retraining programmes will be needed for workers with existing skills.

Box 3.3 Promoting National Coherence of Environmental Enforcement in China

Ensuring compliance with environmental standards poses a particular challenge to the promotion of green growth in China. Local environmental quality is mainly the responsibility of local governments, whose environmental protection bureaus (EPBs) only receive guidance from the Ministry of Environmental Protection (MEP). Due to the limited number of inspectors and the lack of enforcement capacity, local EPBs can usually inspect key large polluting facilities only, while the majority of smaller enterprises, especially in rural areas, are not inspected systematically or only when there are complaints about pollution incidents. The MEP, in co operation with local EPBs, conducts country-wide inspection campaigns to follow-up on specific environmental problems but many polluting facilities reopen after. Furthermore, fines imposed due to non-compliance are often too low to provide an effective deterrent. Parties directly responsible for significant pollution incidents face criminal charges. However, this avenue has not been used very often due to the difficulty in establishing causal relationships between pollution and harm, uncertainty over the legal responsibilities, and long judicial procedures.

EPBs often rely on developing mutual understanding with polluters, providing technical and financial assistance, and negotiating reasonable compliance deadlines, softening their approach to key local industries, especially at the municipal level and in poorer areas. The Ministry of Environmental Protection set up in 2008 six regional environmental protection supervision centres, to oversee local EPBs. But concerns remain about the lack of national consistency of enforcement due to unbalanced economic development levels and enforcement capacity, leading to an uneven playing field and compromising the achievement of China's ambitious environmental goals.

The government hopes to improve compliance through performance reviews of local governments and officials. In 2011, the State Council stressed the need to improve the enforcement of environmental policies and develop new indicators to monitor the performance of local government officials.

Companies are also incentivised to improve their environmental performance through the linkage of the interest rate on bank loans to compliance records and the refusal of bank credit to serious environmental violators. In addition, companies issuing new shares on the stock market can only do so if their environmental performance is cleared by the MEP and may be banned from exporting for up to three years if their environmental performance is poor.

Public disclosure is being used to complement traditional compliance assurance instruments. Since 2008, EPBs are required to disclose lists of enterprises violating discharge standards, causing major pollution accidents, or refusing to comply with compliance orders. A number of awards are in place but seem to have had a limited impact. The government offers subsidies to encourage companies to obtain certification of their environmental management systems (EMS) based on the ISO 14000 standards.

Source: OECD (2010), National Consistency of Environmental Enforcement in OECD Countries and China: Principal Issues, Issues Paper prepared for the stakeholder workshop "Promoting National Coherence of Environmental Enforcement in China", Beijing, 9-10 December 2010

Labour market and skill policies can play an important role in facilitating the structural adjustments associated with green growth, while at the same time minimising any associated costs. Labour market policies should focus on preserving employment, not jobs. They need to ensure that workers and firms are able to adjust quickly to changes brought about by the greening of the economy, including by seizing new opportunities. By helping workers to move from jobs in contracting sectors to jobs in expanding sectors, they can also help to assure a just sharing of adjustment costs occasioned by the transition.

Green growth may also entail distributional impacts that need to be taken into account. There is a widespread perception that distributional effects may be regressive but this may not necessarily be the case in China. Indeed some policies, such as carbon taxes, raise public revenue which can be used to strengthen social protection systems and compensate those negatively affected. Similarly, phasing out energy subsidies would have positive impacts on the environment and free up additional government resources.

Governments also need to find satisfactory compromises not only among the conflicting objectives of different strands of society, but also within government itself. GGS cannot be implemented through a single type of policy, but getting the mix right requires a high degree of coordination among ministries and levels of government.

The international dimension

Global challenges require cooperation on a global scale in order to deliver public goods (climate change mitigation, biodiversity) or protect the global commons (the environment, fisheries). International co-operation is necessary because: a) no single country can successfully address the problems alone; b) the costs and benefits of action may accrue to different countries, and individual countries may not be willing to bear the costs of addressing global challenges if they cannot appropriate the benefits; and c) uncoordinated efforts of many countries to address global challenges are likely to be more costly and less successful than coordinated, cooperative efforts.

Creating a global architecture which is conducive to green growth will require further strengthening of arrangements for managing access to the global commons, increased co-operation in the field of science and technology, provision of finance to support action by developing countries, and facilitating the diffusion of clean technologies. Increased effort to boost global trade and investment flows would also help to underpin sustained growth and access to clean technologies. At the same time, there is a need for increasing vigilance around the potential spill-over effects of domestic policy measures on trade and investment and the potential for incoherent policy which undermines development prospects in low income countries.

A stronger international collective effort related to the environment has been seen recently. The Cancun agreements in particular have renewed confidence in multilateral action to address climate change. International coordinated action will be needed to facilitate transfer of green technologies and to deal with competitiveness concerns as firms in countries pricing externalities feel more pressure. International technology collaboration is an important vehicle through which countries can share costs, increase knowledge spillovers and realise the benefits of greener energy systems. This requires more concerted approaches to accelerate technology development and diffusion. The use of new innovative financing mechanisms (*e.g.* securitisation, risk sharing and forward commitments) is particularly important.

Establishing global coalitions to deal with global issues will be difficult as preferences and priorities may differ across countries. Side-payments, for example in the form of development or adaptation assistance, will have a role to play in helping align incentives across countries with different initial conditions.

Many countries have expressed concern that the green-growth policy agenda could be captured by protectionist interests. The OECD-hosted Freedom of Investment Roundtable has addressed this concern and recently issued a communication on “Harnessing Freedom of Investment for Green Growth” which aims at making governments’ environmental and investment policy goals mutually supportive. However, none of the 42 countries that report

regularly to the Roundtable about investment measures have reported overt discrimination against non-resident or foreign investors in relation to environmental policy. Neither have participating countries reported serious concerns about such measures by other countries. Nonetheless, continued vigilance is encouraged, and the Roundtable will continue to monitor investment measures to ensure that they are not used as disguised protectionism. Environmental policy measures that appear to be neutral may potentially involve de facto discrimination or create barriers to trade which constrain development. Some environment-related state aids (such as grants, loan guarantees or capital injections for individual firms), may potentially pose risks to competition. Global dialogue can play a major role to increase transparency, foster cooperation and prevent these negative outcomes.

Measuring progress towards green growth

A key issue for policy makers is that the integration of economic and environmental policies requires a matching framework of comparable data to measure progress towards green growth. The diagnosis of key constraints will require country-specific information, encompassing a range of environmental and economic indicators compatible with assessing global economic and environmental trends. The preliminary set of indicators developed in the context of OECD's work *Towards Green Growth: Measuring Progress – OECD Indicators* (OECD, 2011b) provides measures which can be used to inform a diagnosis of constraints to green growth (Table 3.1).

The measurement framework explores four inter-related groups of indicators:

1. Indicators reflecting the productivity of environmental assets and natural resources.
2. Indicators of the natural asset base.
3. Indicators monitoring the environmental quality of life.
4. Indicators describing policy responses and economic opportunities.

Table 3.1 **Overview of proposed OECD green growth indicator groups and topics covered**

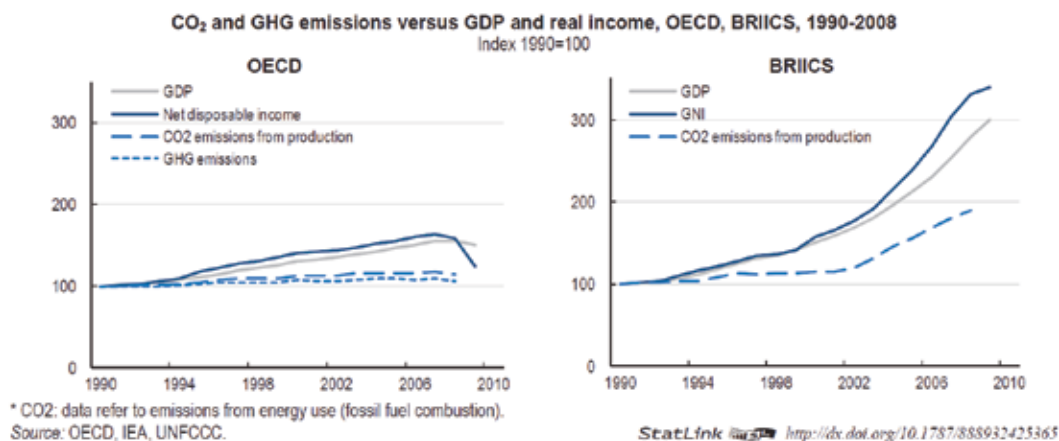
Main indicator groups	Topics covered
The socio-economic context and characteristics of growth	
Economic growth, productivity and competitiveness	Economic growth and structure Productivity and trade Inflation and commodity prices
Labour markets, education and income	Labour markets (employment / unemployment) Socio-demographic patterns Income and education
Environmental and resource productivity	
Carbon and energy productivity	1. CO ₂ productivity (demand-based, production-based)
Resource productivity	2. Energy productivity 3. Material productivity (demand-based, production-based) Non-energy materials, waste materials, nutrients)
Multi-factor productivity	4. Water productivity 5. Multi-factor productivity including environmental services

Main indicator groups	Topics covered
Natural asset base	
Renewable stocks	6. Freshwater resources 7. Forest resources 8. Fish resources
Non-renewable stocks	9. Mineral resources
Biodiversity and ecosystems	10. Land resources 11. Soil resources 12. Wildlife resources
Environmental quality of life	
Environmental health and risks	13. Environmentally induced health problems and related costs 14. Exposure to natural or industrial risks and related economic losses
Environmental services and amenities	15. Access to sewage treatment and drinking water
Economic opportunities and policy responses	
Technology and innovation	16. R&D of importance to GG 17. Patents of importance to GG 18. Environment related innovation
Environmental goods and services	19. Production of environmental goods and services
International financial flows	20. International financial flows of importance to GG
Prices and transfers	21. Environmentally related taxation 22. Energy pricing 23. Water pricing and cost recovery
Training & skill development	<i>Indicators to be developed:</i>
Regulations & management approaches	

The data gathered for the preliminary set of indicators suggests that across most countries the growth rates of GDP and other measures of output tend to outstrip the growth rates of environmental inputs into the production system. This has been reflected in falling energy and carbon intensity of production in China and other countries but not in an absolute decrease in emissions or energy use (Figure 3.2). This exercise also showed that the sectors directly producing environmental goods and services accounted for less than 0.9% of total employment. However, green activities also occur in other industries, so it is not possible to measure the full size of the green economy.

Figure 3.2 **Decoupling trends: production based CO2 and GHG emissions - CO2 and GHG emissions versus GDP and real income, OECD, BRIICS, 1990-2008**

DECOUPLING TRENDS: PRODUCTION BASED CO₂ AND GHG EMISSIONS



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Chapter 4:

China's 10 Years in the WTO: Sustaining Openness-based Growth into the Future¹

Introduction

China's WTO accession led to deep structural changes that are at the core of its transformation towards a modern market-based economy. In order to sustain high growth and its position in the global economy, China needs to continue with—and in some areas accelerate—structural reforms. This includes removing remaining pockets of border and behind-the-border protection, progressive reforms of the state-owned enterprise sector and agriculture, as well as rethinking of its strategy with respect to raw materials markets. Reforms of services sectors, in particular, will be key to avoid the pitfalls of middle-income transition. If China is to achieve in services trade what it has accomplished in manufacturing then it needs to reform its services sector in the same spirit as it has done with its manufacturing sector. Liberalised business services will facilitate and accelerate the process of moving up the value chain; reforms of telecommunications will foster the information economy; and, access to better and more efficient financial services will support the development process in general.

China's accession to the WTO as the cornerstone of its re-emergence as an economic power

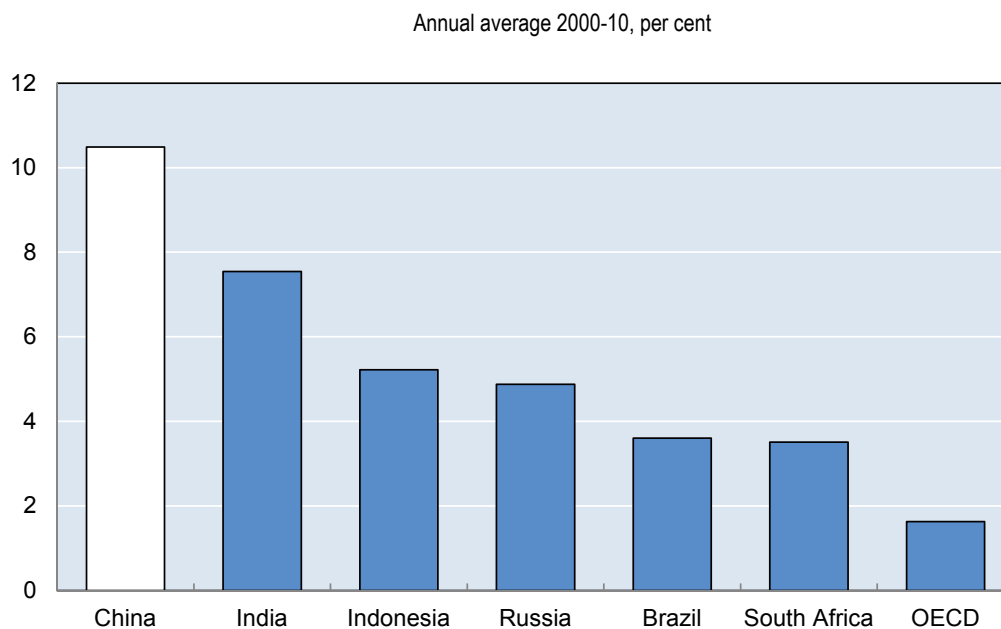
The performance of the Chinese economy since its entry into the WTO in 2001 has been spectacular, with GDP growth averaging double-digit rates, the fastest of any large economy and well above the average growth rates of OECD countries (Figure 4.1). This achievement follows sustained high growth through the 1980s and 1990s, making for one of the most rapid and profound economic transformations in history. Indeed, in just three decades, measured on a purchasing power parity (PPP) basis, China has increased its share in world output from a mere 2% to over 13% by 2010, and now ranks as the second largest economy behind the United States.

Sustained growth has been underpinned by deep structural reforms. They have helped pave the way for the rise of a vibrant export sector which now accounts for around a tenth of global

1 The chapter is a result of cross-directorate team effort co-ordinated by Przemyslaw Kowalski and Hildegunn Nordås under the supervision of Michael Plummer and Raed Safadi. Other OECD contributors in alphabetical order are: Max Buge, Koen De Backer, Andrea Goldstein, Richard Herd, Samuel Hill, Robert T. Klein, Vincent Koen, Andrzej Kwiecinski, Dirk Pilat, Susan F. Stone, Frank Van Tongeren and Naomitsu Yashiro. Statistical assistance of Clarisse Legendre is gratefully acknowledged.

exports. This increased international integration together with sustained vigorous growth has made China an important engine of growth for the world economy. Between 2009 and 2011, the absolute increase in Chinese GDP constituted almost 40% of the absolute increase in output in the rest of the world. The dynamism of Chinese domestic demand has been particularly important during the recent period of severe and protracted weakness in many advanced economies, with the increase in world exports to China accounting for 10% of the increase in GDP in the rest of the world in 2011.

Figure 4.1 **Real GDP growth in China, other large emerging economies and the OECD**



Source: OECD.

China's extraordinary growth performance, and the broader transformation of the economy, has been underpinned by a commitment to steady, incremental reforms (OECD, 2005; OECD, 2010). The main liberalisation thrust was domestic (Sally, 2009), though in part it reflected China's response to meet the requirements of major parties in the WTO accession negotiations (OECD, 2005). In short, the WTO accession negotiations served as a strategic lever to consolidate, accelerate and, finally, lock in the reforms that had started already in the late 1970s and accelerated markedly after 1994 (Sally, 2009).

Simultaneously, China has signed more than 300 regional trade agreements (RTAs) (Mattoo and Subramanian, 2011). These agreements can lead to trade diversion from non-participating countries. China has concluded agreements with ASEAN, Peru, Chile and New Zealand, Costa Rica, Singapore, Pakistan, and with the separate customs areas of Hong Kong, China, Macau, China and Chinese Taipei. It is also party to the Asia-Pacific Trade Agreement, which includes a number of states not covered in its other agreements, including Bangladesh, Brunei, India, Korea, and Sri Lanka. RTA negotiations are currently underway with Australia, the Gulf Cooperation Council, Iceland, Norway and the Southern African Customs Union. More recently, China has engaged in negotiating a trilateral deal with Korea and Japan.²

² MOFCOM FTA website: http://fta.mofcom.gov.cn/english/fta_qianshu.shtml

China's outstanding growth and poverty reduction record (see Chapter 9) is commensurate with the ambition of trade and FDI liberalisation reforms undertaken both before and after its WTO accession. Its WTO commitments are more ambitious and comprehensive than those of other developing countries. As part of the WTO accession process, China undertook a set of sweeping reforms that required it to lower trade barriers in almost all sectors of its economy, provide national treatment and improved market access for goods and services and increase protection of intellectual property rights (IPRs), improve transparency and eliminate non-tariff barriers. China also agreed to special rules regarding subsidies and the operation of state-owned enterprises (SOEs), in light of the state's large role in the Chinese economy (Greene *et al.*, 2006). On the other hand, China is not part of the Agreement on Government Procurement but is currently negotiating accession.

While tariffs on imports of goods had already been approximately halved in the decade preceding China's WTO accession, the implementation of accession commitments resulted in a further approximate halving of tariffs during 2001-10 (Table 4.1). Importantly, upon accession to the WTO China bound all its import tariffs in goods, giving businesses, both in China and abroad, a clearer view of their future opportunities. China also committed to a further phased reduction and removal of non-tariff barriers by 2010. Today Chinese tariffs on most products are just below or at the level of bindings which are, on average, at 15.9% for agricultural products and 9.1% for non-agricultural products (Table 4.1). In agriculture, the highest tariffs are charged on imports of grains, sugar, tobacco and beverages, while in manufacturing this is the case for transport equipment, textiles and clothing and leather products. The maximum MFN tariff in agriculture in 2010 was 65% and in manufacturing 50%.³

Upon accession, China also committed to convert planned quotas on sensitive agricultural products to less distortive tariff rate quotas (TRQs) and to allocating parts of the quotas to non-state trading enterprises. In addition, it agreed to eliminate export subsidies, to phase out licence controls on traded commodities, to abide by the WTO rules governing technical barriers to trade and to limit its subsidies for agricultural production to 8.5% of the value of farm output. It is estimated that implementation of these reforms has resulted in significant improvement in market access for imported farm products (OECD, 2005; OECD, 2011b).⁴

Trade in services was a key area in the negotiations and China committed to open a broad range of services sectors through the elimination of many existing limitations on market access. This was particularly important since at the time of accession reforms in the goods sector were much more advanced than those in services. For instance, as a result of WTO accession, foreign services suppliers were to be allowed to engage in the retailing of all products and all firms would have the right to import and export all goods except those subject to state trading monopolies. Gradually, depending on specifically agreed implementation dates extending to 2008, foreign financial institutions were to be permitted to provide services without client restrictions for foreign currency business, local currency services to Chinese companies and, finally, services to all Chinese clients. Critical sectors such as telecoms, banking and insurance were to be opened up through the elimination of most restrictions on foreign entry and ownership, as well as removal of a number of discriminatory practices against foreign firms. It has been estimated that the full implementation of China's GATS commitments would mean significant reforms and

³ These maximum rates refer to HS 6-digit classification.

⁴ Albeit to a lesser extent, China's access to export markets improved as well, as evidenced by a significant increase in agro-food exports.

liberalisation measures with important gains for China and its trading partners (*e.g.* Greene *et al.*, 2006).

WTO membership also helped to sustain reform momentum; even after the tariff reductions consequent on joining the WTO, trade barriers were reduced further, a large number of regulations were standardised and constitutional changes in 2004 reinforced the importance of the private sector. The following year regulations that had prevented private sector participation in a wide range of areas including financial services, infrastructure and utilities, were abolished, paving the way for a further expansion of private investment into new and important sectors. The introduction of a new Anti-Monopoly Law in 2008 represented another important milestone in strengthening the role of markets (OECD, 2009). This legislation aligned China's competition framework with international best practice and replaced an earlier competition law that suffered from a number of gaps and other weaknesses that limited its effectiveness. It provided a comprehensive legal basis for combating a wide range of anticompetitive practices, including abuses by dominant firms, and corporate mergers. Until recently anti-competitive measures had only been undertaken with respect to mergers involving foreign firms, but in 2011 investigations into whether state-owned telecom companies were restricting competition were initiated.

Table 4.1 **China's tariffs on agricultural and industrial products**

Simple average

	MFN tariff				Bound tariff 2001
	1992	2001	2009	2010	
Animals and products thereof	47.2	19.8	15.1	15.1	15.0
Beverages & spirits	102.0	46.5	21.0	20.3	21.0
Chemicals and photographic supplies	28.4	10.4	6.3	6.3	6.8
Coffee, tea, mate, & cocoa	55.0	23.9	14.7	14.7	14.9
Dairy products	53.9	35.9	12.0	12.0	12.2
Electric machinery	35.4	15.6	8.1	8.4	9.0
Fish and fish products	41.4	19.5	10.9	11.0	11.0
Flowers, plants, vegetable materials, etc.	37.6	10.9	9.6	9.6	9.2
Fruit & vegetables	52.3	21.5	15.8	15.8	16.0
Grains	1.5	54.3	30.5	30.5	27.1
Leather, rubber, footwear & travel goods	50.5	18.8	13.3	13.3	13.7
Manufactured articles n.e.s.	51.3	16.8	12.0	12.0	12.5
Metals	24.7	9.0	6.7	6.7	7.0
Minerals products and precious stones and metals	35.7	11.5	8.8	8.9	9.7
Non-electric machinery	27.5	13.8	7.9	8.0	8.4
Oilseeds, fats and oils	36.3	29.6	10.9	10.9	11.3
Other agricultural products	34.6	13.1	11.5	11.4	12.0
Petroleum	7.7	8.8	4.4	4.8	5.2
Spices, cereal and other food preparations	44.6	30.4	20.4	20.5	20.6
Sugars	49.3	41.9	27.4	27.4	27.4
Textiles & clothing	74.8	21.0	11.4	11.4	11.5
Tobacco	116.7	49.3	30.7	30.7	33.3
Transport equipment	44.7	21.1	11.7	11.7	11.8
Wood, pulp, paper & furniture	34.7	13.2	4.4	4.4	5.0
Agricultural Products (WTO definition)	46.6	24.5	15.8	15.7	15.9
Non-Agricultural Products (WTO definition)	41.4	14.5	8.7	8.7	9.1

Source: UN Trains accessed through the World Integrated Trade Solution.

Global trade networks, global value chains and FDI

China's economic take-off since the late 1970s owes much to its integration in global trade networks and global value chains (GVCs). The extent of the former has been recently quantified by Reyes *et al.* (2009), using a centrality index. The index, measuring the likelihood that a given country is involved in a randomly selected trade chain in the network of 217 countries, demonstrates a truly impressive trade performance that has moved China from an isolationist position to the core of the trade network in the space of 25 years. China is thus at the core of many GVCs, on a par with the G3 countries (US, Japan, Germany).

China's involvement in GVCs reflects its increasing dependence on imported raw materials, parts and components and services to meet the export demand for a wide range of final capital and consumer goods. China has developed strong (manufacturing) links with East Asian countries, particularly for the sourcing of intermediate inputs. Almost 80% of China's processing imports⁵ originate from other East Asian economies, including high technology intermediates like parts and components (Ma *et al.*, 2009). On the export side, the picture is more diversified with 45% of the final products assembled in processing zones exported to Europe and the United States. This has given rise to a triangular pattern of trade in Asia, where intermediates are largely exported from more developed countries (*e.g.* Korea and Japan) to China for assembly into final products, which are then exported back to developed countries.

Multinational companies (mainly from OECD countries), as the main actors in processing trade, played a major role in integrating China into GVCs and thereby contributing to China's strong trade performance (OECD, 2012). In 2010, foreign-invested enterprises (FIEs, not including firms originating from Hong Kong, China, Macau, China and Chinese Taipei) were responsible for 55% of China's exports and 53% of imports.⁶ This reflects the impressive progress China has made in developing a regulatory framework to attract and promote FDI over the past three decades. Such progress has been rewarded: despite increasing competition from other investment destinations in recent years, China continues to be cited as a favourite FDI destination in surveys of investor sentiment.⁷ As well, China's accumulated FDI stock of USD 473 billion dwarfs that of other large developing and transition economies. From 2000 to 2009, China received larger FDI inflows than any other developing or transition economy. During the recent global economic crisis, the fall in FDI to China was small compared to the global FDI contraction,⁸ suggesting that as risks in the global economy mount China is seen as a safe destination.

While FDI inflows remain strong in absolute terms, other indicators suggest that the contribution of FDI to China's economy reached a plateau in the second half of the 2000s. While still important, FDI is no longer an increasing contributor to China's industrial output, fixed investment and tax revenues. The share of FIEs in China's foreign trade, having soared from nothing at the beginning of the reform period to a peak of 58.5% in 2005, eased back to 53.8% by 2010 and continued to decline in early 2011 (Figure 4.2). This may be a cause for concern for the government, given FIEs' importance in China's export-led growth so far. Up to 1997, FIE imports exceeded their exports each year. From 1998 FIEs produced a trade surplus which rose from USD 14 billion in 2004 to a peak of USD 171 billion in 2008 before falling to USD 127 billion in 2009 and USD 124 billion in 2010.

5 This refers to imports classified as processing trade by the Chinese customs authorities.

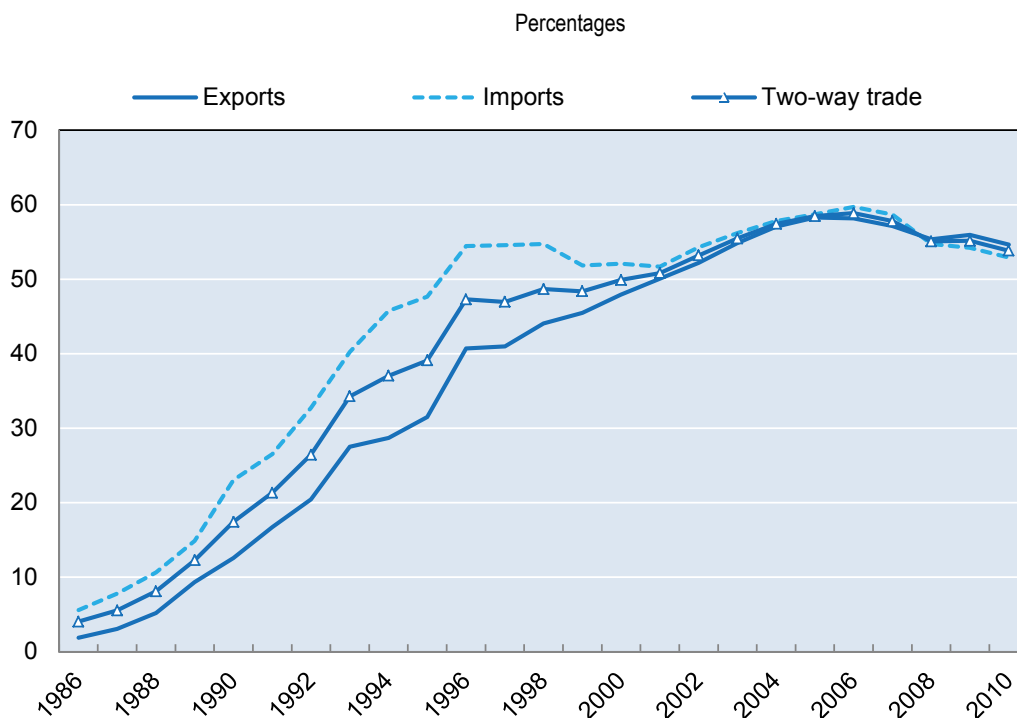
6 Based on Chinese customs data. This share has dropped slightly during the economic crisis.

7 For example, China has been in first position from 2002 to 2011 in the A.T. Kearney FDI Confidence Index (A.T. Kearney, 2011).

8 According to UNCTAD FDI to China fell by only 2.6%, from USD 92.4 billion to USD 90 billion, while global FDI flows contracted by around 40% at the same time.

There have also been important changes in sectoral composition (OECD, 2012). In 2000, the year before China committed to opening services sectors to FDI over a five-year period under the terms of WTO accession, FDI in manufacturing accounted for 63.5% of realised FDI inflows (OECD, 2003); by 2008, the share of manufacturing had fallen to 46.1%. From 2000 to 2008, the share of tertiary-sector FDI grew from 30.5% to 52.3% (Davies, 2010). During that time, financial-sector FDI rose from 0.2% (banking and insurance) to 15.2% (finance), while FDI in real estate increased from 11.4% to 17.2% (OECD, 2003; and OECD, 2012).

Figure 4.2 **Share of FIE exports and imports in total exports and imports**



Source: MOFCOM website: www.fdi.gov.cn.

China is not only an increasingly important destination of FDI flows, but also a source. China (including Hong Kong, China) ranks as the fourth largest source of international mergers and acquisitions (M&A) in 2011, with 7% of the world total (OECD 2011e).⁹ In just two years China has emerged as one of the main sources of international investment in Latin America and the Caribbean (LAC). Its share of LAC cross-border M&A jumped from only 1% in 2001-09 to 15% in 2010. In Sub-Saharan Africa, Chinese outward FDI flows totalled only USD 64 million between 1979 and 2000. By contrast, in 2007 alone FDI flows exceeded USD 1 billion, representing more than 10% of total inflows and contributing to half a percentage point or above of GDP growth in some of these countries (Weisbrod and Whalley, 2011).

Trade specialisation patterns

As shown in OECD (2011a), China is a prominent example of a country that has allowed structural change and trade in response to the forces of comparative advantage. Despite its

⁹ In 2010 it ranked second with 10%. The 2011 figures are based on linear projection based on data through 21 October 2011.

fast growth and rapid accumulation of physical and human capital, China's endowments are still dominated by unskilled labour, as reflected in its trade patterns. An analysis of these trade patterns by Stone *et al.* (2011) using relative values for factor abundance for 1997, 2001 and 2004, showed that unskilled labour was the factor used most intensively in China's net trade. Accounting for the factors embodied in its imported intermediate inputs, Stone *et al.* (2011) confirmed that China's factor content of trade reflects its relative abundance in unskilled labour along with the gradual emergence of a capital-intensive export sector.

Indeed, in recent decades China has been expanding revealed comparative advantage (RCA) in unskilled labour-intensive, but also in human capital-intensive and technology-intensive products (Kowalski and Bottini, 2011). Many OECD countries such as the United States and Germany, for example, have been expanding RCA in human capital-intensive and technology-intensive products but progressively losing it in unskilled-labour intensive products. This suggests that most of the structural adjustment associated with the integration of selected emerging market (SEM) economies, including China, with the world economy may have been borne by unskilled labour-intensive sectors. Moreover, data suggests that these trends are not easing. China had a RCA in over 70% of unskilled labour-intensive products in the early 1990s and this share has been climbing steadily over 1988-2008, while in Germany for instance, this share has been gradually declining (Figure 4.3).

That China's integration in world markets has been predominantly based on exports of labour-intensive products is also reflected in the importance of processing trade which has shaped China's trade performance. Such trade allows firms to import intermediate inputs without paying custom duties, provided that these inputs are solely used for the production of final goods destined for third markets. This trade regime prompted multinationals to move some of their manufacturing to China's SEZs and elsewhere after WTO accession, enabling them to benefit from China's comparative advantage in labour intensive assembly processes. The success of this approach and the export processing zones is reflected in the increasing share of processing trade in China's total exports (see Chapter 5).

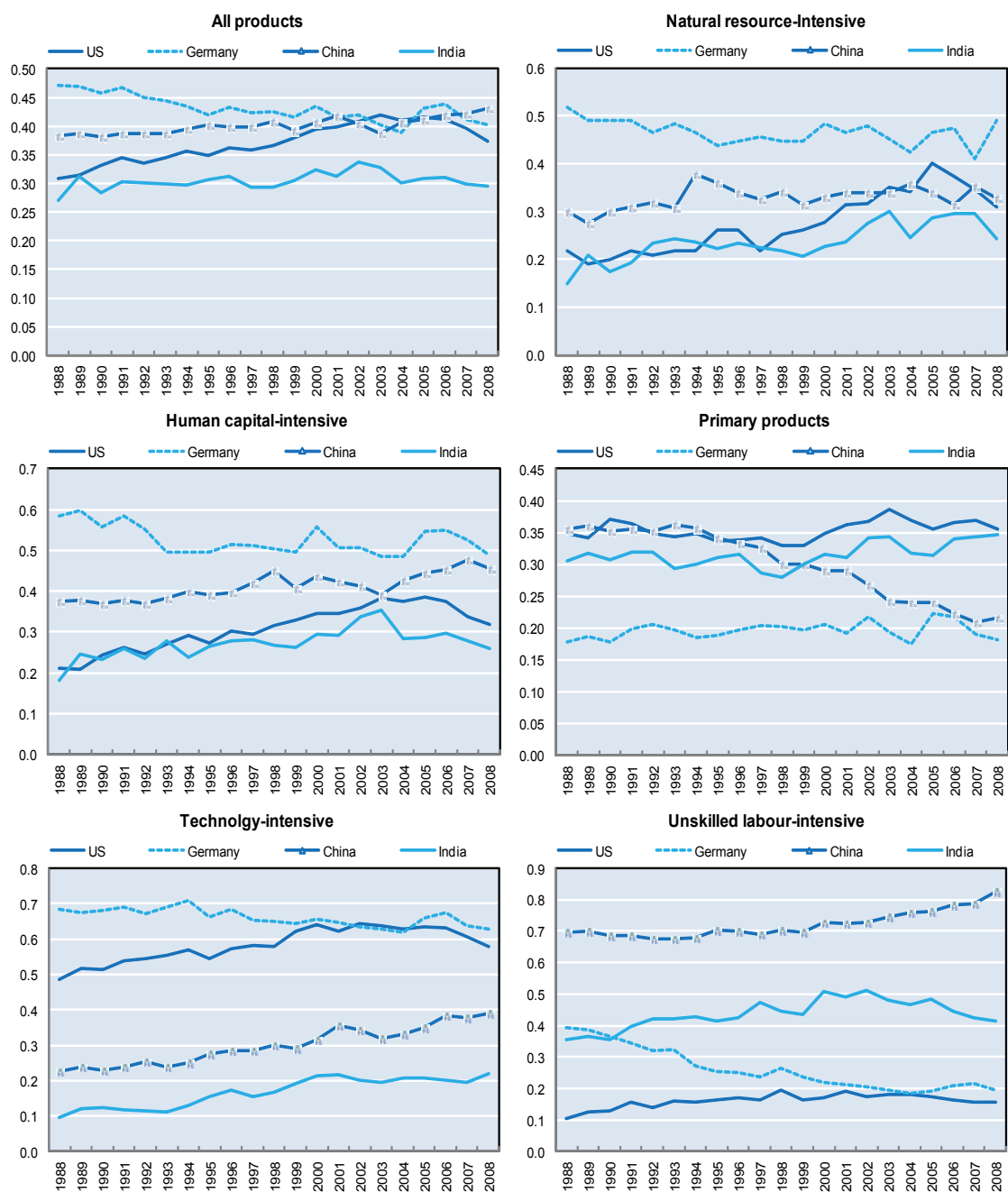
Overall, China's trade patterns have not been changing as rapidly as in other emerging economies. Mobility of export specialisation patterns is generally higher in SEMs as compared to some more advanced OECD economies suggesting that their export structures evolved more (Kowalski and Bottini, 2011). This mobility correlates with the extent of expansion of world market shares. Yet, China stands out as one of the exceptions to this finding, with a relatively low mobility of export specialisation compared to some more advanced OECD economies and much lower mobility than other SEMs (*e.g.* Indonesia, India or Brazil); at the same time, China recorded the largest increase in world market share (600% in the period 1990-2007) in the whole 56-country sample used in the study.

Accordingly, China's record trade expansion has likely been driven less by changes in specialisation patterns than by a general increase in exported volumes across many products. This might reflect the size effect, whereby structural changes triggered by opening up by a very large country are not as profound as would be the case for a small country, but it does suggest relatively modest relative price changes. Gilbert (2012) arrived at a similar conclusion by studying trade performance of a number of Asian countries with the use of constant market shares analysis which decomposes changes in world trade flows into: (i) world growth effects; (ii) commodity effects; (iii) market effects; and (iv) competitiveness effects. The study found that China's trade expansion has been driven predominantly by the competitiveness effect. These results may illustrate the effects of broad factors underpinning trade competitiveness in China.

Advanced technology products and increasing sophistication of exports

Recently, China's exports have begun to shift away from labour-intensive manufacturing to more human capital and technology-intensive products, thanks to the accumulation of physical and human capital as well as policies targeted at the adoption of advanced technologies (Deason and Ferrantino, 2011; Kowalski and Bottini, 2011; Stone *et al.*, 2011).

Figure 4.3 Share of products with RCA index above 1 by factor intensity



Source: Kowalski and Bottini (2011).

While the OECD countries continue to hold larger stocks of capital and skilled labour, their rates of accumulation of these factors fall well behind the SEMs, indicating significant changes in relative factor abundance over time. This is especially true for China and India. For example, while the capital-to-labour ratio is estimated to have increased by respectively 84% in the United States and 61% and Germany in 1990-2005, in China it shot up by 314%. Still, in 2005 the Chinese ratio was only about one tenth of the United States (Stone *et al.*, 2011). Kowalski (2011) showed the importance of capital-to-labour ratios and human capital indicators in explaining volumes and patterns of trade, noting the still relatively low ranking of the BRIIC (Brazil, Russia, India, Indonesia, China and South Africa) countries with respect to these indicators. The high rates of income growth and investment in physical and human capital in recent decades suggests that important changes in trade structures, such as an expansion of these countries' shares in exports of capital-intensive and human capital-intensive products, are likely to continue.

Deason and Ferrantino (2011) argue that China's rapid growth featuring above-average accumulation of both physical and human capital by global standards was a precondition for the attraction of certain kinds of goods and the movement of comparative advantage on Heckscher-Ohlin grounds. However, China's recent exports of advanced technology (ATP) products have been associated with the encouragement of FDI and processing trade, and the development of a variety of government policy zones associated with further incentives. Each of these factors is associated with a high share of ATP exports. However, Deason and Ferrantino (2011) argue that it would not have been possible to predict which goods would be subject to rapid product cycles in advance of the adoption of such policies. They argue that "when the personal computer came, it would eventually come to China, as well as to other countries with similar patterns of factor accumulation that adopted policies designed to attract final assembly. China's size, along with the encouragement of regional agglomerations by policy, may also have led to nation-specific, sector-specific economies of scale and learning-by-doing, making it more likely that once having moved to China, the products would be likely to stay there."

Yet, the increasing sophistication of China's exports has also been helped by high levels and growth rates of R&D investment making China one of the major players in the global R&D landscape. In 2010, China became the largest R&D investor in purchasing power parity terms, ahead of Japan (OECD, 2011f). While all R&D performing sectors have contributed to this growing R&D investment, it was especially the enterprise sector that has increased its R&D efforts, accounting for 73% of total R&D expenditure in 2009. Foreign firms played an important role in this process, as China has become an attractive location for R&D investment due to the size of its domestic market, the availability of high-quality human resources, and a growing domestic capability for science and innovation (OECD, 2008; 2011d; see also Chapter 5).

Moving up the income ladder and sustaining openness-based growth

Since 1960 many countries have successfully climbed the development ladder from low to middle-income status, while only few have made the second leap to high-income status. Japan and Korea are two notable examples of countries that have previously been poor and have managed to join the ranks of high-income countries. In contrast, for decades now, many countries in Latin America and the Middle East have failed to move from middle to high-income status, though this situation is now changing as growth in Latin America accelerates. As recently pointed out by Eichengreen *et al.* (2011), there is a possibility that China's growth may start to slow when the country's per capita income reaches around USD 17,000 in year-2005 constant international

prices.¹⁰ If indeed China's growth were to be maintained until incomes reached this level, it would still be a very positive outcome. GDP per capita would then be 40% above the average income levels in Chile, Mexico and Turkey in 2011 and on a par with those in Hungary and Poland. The point at which this slowdown might occur is far from certain as there is little consensus on the current level of GDP measured in purchasing-power parity terms, but it seems likely to occur between 2015 and 2020. Even using nominal incomes and market exchange rates, China is rapidly reaching the high-income threshold as defined by the World Bank. For example, in 2013 Gross National Income per capita is projected by the OECD to reach over half the high-income boundary and may reach two-thirds of that level by the end of the 12th Five Year Plan.

After that point, China may be entering a phase where opportunities for catch-up growth are beginning to diminish and growth may gradually slow. The 12th Five Year plan recognises the need to adapt policies in order to minimise the scale of this slowdown. The 2010 OECD Economic Survey of China (OECD, 2010) gives recommendations for reform in the areas of the product, labour and financial markets, as well as highlighting the reforms necessary to achieve socially-inclusive growth. The remainder of this paper showcases other recent and current OECD work focusing on trade and investment-related growth bottlenecks, those related to structural change and accumulation of resources, as well as those related to productivity enhancement.

Reforms of the agriculture sector

Despite being the world's largest exporter of manufacturing products, China still relies to a large extent on its agricultural sector both economically and socially. The sector accounts for 38.1% of total employment but only 10.3% of GDP (as of 2009); agriculture labour productivity is less than one sixth of that in manufacturing and less than one fourth of that in services. Interestingly, these productivity gaps have increased over the period 1990-2008 when China's share of agriculture in GDP has been falling more rapidly than the sector's share in total employment (OECD, 2011b). Hence, there remains a considerable potential for productivity gains associated with shifting employment from agriculture to other sectors. Such an adjustment is already being underway and is estimated to have contributed significantly to China's overall productivity growth in recent decades (OECD, 2010). Yet, the high share of agriculture in employment also points to major labour market adjustment challenges that China needs to overcome as it seeks to transit towards a high-income economy status.

Raising incomes in the countryside remains a policy priority (see also Chapter 2). The major objectives are: doubling rural household incomes by 2020; increasing grain production capacity by 50 million tonnes by 2020 to sustain 95% self-sufficiency in grain production; improving food safety; environmental protection; agricultural competitiveness; and improving social and technical infrastructure in rural areas (OECD, 2011b). To meet this first goal China has been making commendable efforts to improve rural infrastructure and to improve access to basic public services such as education, health care and social security for the rural population (OECD, 2010). A recent OECD evaluation of agricultural policy developments (OECD, 2011b) suggests that overall China has been making good progress in this area. In particular, support to agricultural producers – as measured by the OECD Producer Support Estimate (PSE) – has increasingly been taking the form of direct income support payments, which are less distortive for production and more efficient at enhancing farmers' incomes. However, a significant part of budgetary transfers is still allocated to lower prices of agricultural inputs such as *e.g.* chemical fertilisers, distorting production and harming the environment (OECD, 2011b).

10 The income definition used by Eichengreen *et al.* (2011) is GDP per capita, PPP (constant 2005 international \$).

China is likely to continue to face important policy questions with respect to the role of international agro-food markets in the pursuit of its objectives of supporting farmers' incomes, ensuring food security, as well as facilitating broader structural changes that will take place with economic development. In recent years China has become a large net importer of agro-food products which is one of the basic signs that the country's productive factors are more efficiently employed in other sectors of the economy.¹¹ Still, the agricultural sector is much less integrated with global markets than the rest of the economy, as shown by its 2.4% share in China's total exports and 4.7% share in imports. In part this reflects the tiny size of Chinese farms (0.6 hectare on average), but also reflects the trade distortions related to the market price support provided through tariffs, tariff rate quotas (TRQ) and state trading, combined with minimum guaranteed prices for rice and wheat, ad hoc interventions on a growing number of agricultural commodity markets, as well as distortions related to the use of export taxes and export quotas. While China's support to agriculture as measured by the percentage PSE is just above half of the OECD average, the level of support between 1995-97 and 2008-10 quadrupled, mainly due to a significantly larger gap between domestic and border prices, and this likely had an impact on China's competitiveness in agro-food markets.

Raw materials

It is also clear that China's future growth will depend on its access to raw materials. The rise of the BRICs in general, and China in particular, has been associated with large shifts on both the demand and the supply side of global markets for raw materials. For example, during 2000-08, the BRICs' consumption of iron ore increased threefold while their production doubled. While world imports of iron ore rose 83%, the imports by the BRICs increased almost six times faster during the same period (OECD, 2011c). This has led to increasing prices (*e.g.* Humphreys, 2009) and efforts to ensure a stable supply of raw materials through increased FDI. Indeed, during 2007-10 vertical investment by steel and other raw material processing companies accounted for 37.5% of global outward FDI and in China 63% of its outward FDI transactions concentrated on iron ore, of which the country is a net importer since 2003.

The challenge of access to foreign raw materials has been made more difficult by the Chinese decision to apply export quotas on sales of a number of raw materials. China chose to apply export restrictions on some rare earths as well as on coking coal. These restrictions are part of a diverse set of policies whose declared aim is to protect the environment (OECD, 2011c), restructuring fragmented and inefficient mining firms in order to increase the domestic absorption of those raw materials (Price and Nance, 2010) and improving mining safety (OECD, 2011c). Export restrictions are not the most effective instrument as they are incapable of targeting the specific market failures and have widespread negative side effects. They divert exports to domestic markets, raise prices for foreign consumers and importers while increasing global uncertainty and negatively affecting investment in extraction and production (Van Tongeren, 2011). Additionally, a policy-driven diversion of raw materials to domestic downstream industries goes against the economy's comparative advantage. Such a diversion will be difficult to sustain in the long run as it reduces (increases) the profitability of the domestic (foreign) raw materials sector and hence has long-run effects on investment and production capacity.

A recent OECD study of export restrictions and domestic policies on steel-related raw materials discusses the role of selected emerging economies, including China, as major consumers and major producers of steel and steel-related raw materials, and main users of

¹¹ However, China is deemed to have comparative advantage in several fruits and vegetables (OECD, 2011b).

export restrictions (OECD, 2011c). In particular, it examines mine safety performance-linked export licenses and export taxes in the coke coal sector. It concludes that, although in general export licensing can be applied as a supplementary border-monitoring method, the effectiveness of export restrictions as a measure to improve mine safety is questionable since exports of coke accounted for only 7.3% of domestic production in 2004 and export taxes have not been related to the management of the licensing scheme for monitoring purposes.

The impact associated with export restrictions is global in nature and can generate retaliation, increasing the extent of global market distortions and uncertainty for prospective investors. Timely and accurate information about various government policies affecting exports of raw materials is a necessary condition for predictability of supply and risk management in production. An ongoing OECD initiative attempts to contribute to improved transparency by constructing an inventory of export restrictions on critical raw materials.¹²

Remaining border and behind-the-border protection

As discussed, China is already relatively open to international trade in goods. Remaining import tariffs are not exorbitant (see Table 4.1), but in some sectors they are significantly higher than in the OECD countries. For example, *ad valorem* tariffs rates on motor vehicles exceed 20%. Other sectors with high tariffs are grains, sugar, tobacco, beverages, oil, coal and petrochemicals, and chemicals (e.g. Kowalski and Leshner, 2011; OECD, 2011b). This suggests that a reduction of the remaining tariff barriers would further benefit China by reducing trade-related distortions, which hurt households by driving up prices and lead to inefficient production and consumption choices.

Also, such reforms may facilitate the process of rebalancing and indeed increase the credibility of China — one of the economies with the largest trade surpluses in the world— in the global rebalancing debate (Kowalski and Leshner, 2011). The study finds that tariff liberalisation by China and ASEAN countries could deliver an increase in these regions' GDP of approximately 0.2% while reducing these regions' trade surpluses by up to 1 percentage point of GDP, relative to the baseline. A scenario combining unilateral tariff reductions with a decrease in the cost of delivering services to these markets further magnifies the scale of rebalancing. Thus, overall, China could alone make a significant contribution to rebalancing and, as illustrated by the positive role openness played in these regions' recent economic growth, this would also benefit firms and consumers in these economies.

On the FDI front, major challenges remain.¹³ As noted earlier, FIEs account for a declining share of economic activity. While this is largely due to the internal dynamism of China's domestic economy, in particular the development of successful large enterprises whose own contribution to the economy is growing faster than that of FIEs, it may be accentuated by the more selective FDI policy regime that appears to have been developing in China in

12 See http://www.oecd.org/document/4/0,3746,en_2649_37431_47021508_1_1_1_37431,00.html

13 OECD (2003, 2006 and 2008). For instance, in the 2008 OECD Investment Policy Review of China, it was suggested to reconsider the discriminatory merger notification procedures in the 2003 *Interim Provisions on the Acquisition of Domestic Enterprises by Foreign Investors* that had been retained in the 2006 *Regulations on the Acquisition of Domestic Enterprises by Foreign Investors*. The Ministry of Commerce has since replaced the original Chapter 5 on anti-monopoly review in the 2006 Regulations with a new article (Article 51 in the Supplementary Provisions) which states that "According to the provisions of the Anti-Monopoly Law, where M&A of a domestic enterprise by a foreign investor meets the thresholds for declaration of the Provisions of the State Council on Thresholds for Declaration of Concentrations of Undertakings, the foreign investor shall make a declaration with MOFCOM and shall not carry out the transaction without a declaration."

recent years.¹⁴ Besides, concerns about intellectual property rights (IPR) protection and WTO accession commitments have been raised recently. The 2011 Japanese White Paper, in particular, reiterates demands for stronger enforcement and points out that the risk of “leaking technology and know-how from a business partner” may inhibit Japanese companies from promoting R&D activities or transferring technologies to China (Japanese Chamber of Commerce and Industry in China, 2011).

The OECD FDI Regulatory Restrictiveness Index (which does not include State ownership) captures statutory restrictions on both the establishment and operations of firms that discriminate against foreign investors. While China has been the biggest reformer since 1997, based on a sample of 42 countries, it still maintains more restrictions than any other G20 country. FDI inflows are continuing to increase, yet it appears that the above-mentioned perceptions are beginning to have a discouraging effect, initially at the margin but potentially much larger.

Reform of the state-owned sector

Outward international investment and trade by large Chinese firms, most of which remain subject to government ownership, adds a new dimension to the challenge of sustained growth. Recent estimates point to a reduction in the share of state ownership in the Chinese economy from approximately 70% of total industrial assets in the late 1990s to roughly half in 2008 (Gao, 2010), still a high share of state-ownership compared to China’s trading partners. SOE reforms in the late 1990s resulted in privatisation, bankruptcy and consolidation of smaller SOEs, leaving remaining firms in a strong market position relative to their private counterparts. The average SOE was three times larger than an average non-state sector firm in late 1990s, but 15 times as large in 2008 (Gao, 2010). Despite these reforms, there were still large numbers of loss-making state-owned enterprises and their productivity was well below that of private sector firms (OECD, 2010).

In 2010, the State-owned Assets Supervision and Administration Commission (SASAC) owned some 120 state-owned firms, with assets equalling over 60% of the country’s GDP, and the sectors dominated by SOEs accounted for 80% of the capitalisation of domestic stock exchanges by the end of the same year (Scissor, 2011; Szamosszegi and Kyle, 2011). Each of these 120 holding companies has a myriad of subsidiaries. In addition, every province and city has its own SASAC supervising locally-owned SOEs. Moreover, there are many companies where state authorities are important shareholders such as the technology company Lenovo and the appliance multinational Haier, a legacy of their emergence as major players before China’s private-sector reforms (Woetzel, 2008).

Although SOEs represent a small share of the country’s firms that engage in outward activities, they carried out 81% of China’s overseas investment in 2006. However, SOEs play a much smaller role in foreign trade, accounting for less than 10% of exports in 2007 (OECD, 2010). The importance of state ownership for China’s role in international markets is reflected in its WTO Accession Protocol which contains several strong “WTO-plus” commitments, with direct implications for SOEs in the context of subsidies, including: non-discrimination with respect to downstream customers and upstream suppliers, non-discriminatory pricing based on market forces, and avoidance of conflict of interest between regulatory agencies and firms under their purview. These commitments provide an ambitious framework for the reform of the Chinese

¹⁴ The share of EU investors surveyed who thought policies discriminate against FIEs increased from 33% to 43% since a similar survey was conducted in 2010, while similar perceptions regarding the outlook for the next two years also increased from 36% to 46%. The five most significant regulatory obstacles cited by European investors were discretionary enforcement of broadly drafted laws and regulations (42%); lack of co-ordination of different regulators (40%); lack of harmonisation with global standards (39%); registration procedures for companies or for products (38%); and local implementation of Chinese standards (35%). See European Chamber of Commerce in China (2011).

state-owned sector, with significant potential benefits to both Chinese economic welfare and that of China's trading partners by limiting uncompetitive, market-distorting behaviour.

While these reform obligations are binding and failure to implement them is subject to challenge at the Dispute Settlement Body (DSB), there are challenges associated with this potential discipline, including concerns of reprisals in the fast-growing Chinese market and of the DSB's ability to handle structural reform issues, even those with significant trade effects. Other major problems include a relative lack of transparency about the management of SOEs, their regulators and their upstream suppliers, most notably the financial services which are key to SOE operations and the economy overall, such as banking and insurance. For instance, recent analysis suggests that SOEs benefit from preferential access to financing at below-market costs, without which existing profits would be significantly reduced (Ferri and Liu, 2010).

The sustainability of China's growth and its commercial relationships will, therefore, depend on its ability to develop a stronger and more transparent rules-based framework regardless of ownership structure, particularly in key upstream sectors to the economy as a whole, such as network industries and banking and insurance where implementation of China's strong WTO commitments would bring efficiency gains in these sectors and the economy as a whole.

Ensuring such competitive neutrality and extending it to the operations of Chinese SOEs involved in international goods and services markets are also key to China's ambitions in the "going outward" policy. Such initiative will help to address concerns that large Chinese companies benefit from preferential treatment, both through favourable market access and regulatory treatment in the home market, concessionary financing and subsidies. It may also alleviate concerns that Chinese outbound investment could be prejudicial to recipient country national security and operate on non-market principles. The latter could be a major barrier to outward investment by Chinese SOEs given that market-oriented actors are key to the regulatory apparatus in OECD countries, particularly in services. Such concerns limit the potential benefits from increased international investment and trade, while also hindering the unwinding of global imbalances.

OECD initiatives, including the Freedom of Investment Roundtable (and its *Guidelines for Recipient Country Investment Policies Relating to National Security*), Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, and ongoing work on competitive neutrality (Capobianco and Christiansen, OECD, 2011) are particularly relevant areas where China could benefit from deeper participation.

Services sectors reforms

The services share of GDP tends to increase over time for all countries and to rise with per capita income. Demand for services rises as societies and individuals become richer, typically outpacing demand for manufacturing or agricultural products. However, there are exceptions to this rule and China is one of them. While the services share of GDP in middle-income countries was about 56% on average in 2008, the latest year for which comparable data is available, the share was only 42% in China. This is also below the average for low-income countries, which stood at 50% in 2008 (based on the World Development Indicators database). Finally, while the share of services in world trade is around 20% on average, services account for only 12% of China's foreign trade.

The low services share in GDP and trade in China is mirrored by a high share of goods-producing sectors. China's 12th Five Year Plan aims at raising the services share of GDP to 47% by

2015. In fact, improving the performance of the services sectors is important because services play an essential role in relation to many of the objectives set out in the Plan.

As discussed, after a long period of export-led growth based on comparative advantage in labour-intensive industries, China has started to diversify production as well as exports towards more capital and skills-intensive industries. The role of services during such a development is multi-faceted. First, moving up the value chain is associated with rising labour productivity and thus slower job creation in goods-producing sectors. The services sectors therefore need to take over as the major engine of job creation in order for manufacturing to move into higher-end products in a socially harmonious manner.

Second, although services are increasingly tradable, domestic demand is the main driver of job creation in services. Furthermore there is a two-way relationship between services sector developments and expansion of domestic demand. Not only do the services sectors depend on domestic demand, but growth in private consumption also requires better developed services. Consumer credit is for example needed to stimulate demand for big-ticket items, and access to competitive insurance services as well as a social security network would reduce the need for precautionary savings. Finally, a competitive retail sector offering a broad variety of consumer goods would help further boost consumer demand.

Third, services play a crucial role for industrial upgrading to higher value added products. While investment in physical and human capital has taken centre stage hitherto with China already boasting one of the highest investment-share of GDP in the world, there is limited scope for profitably raising the rate of investment further. Thus, the attention now needs to shift towards organisational innovations and there is ample room for them both within firms and across production networks and value chains. By allocating activities to where they contribute the most to the competitiveness of the supply chain and trimming slack and waste, organisational innovations can create leaner and more effective (and energy-efficient) supply chains. They can also help improve timeliness, reliability, quality and low fault-rates, which take on increasing importance as products become more sophisticated or time-sensitive (Geloso-Grosso *et al.*, 2007).

Reforms of services sectors will thus be key to avoid the pitfalls of middle-income transition given their documented positive impact on organisational innovation and overall productivity, including in manufacturing. Liberalisation of business services and retail services could be a first step towards a more efficient and competitive services sector. More competitive business services would be an important source of growth and job creation in their own right and would foster competition in higher value added manufacturing industries. More competitive retail services would also help stimulate domestic consumer demand. Liberalisation of network services and financial services on the other hand requires a strong institutional framework. In these sectors foreign suppliers face relatively high barriers to entry and there is ample scope for liberalisation to go hand in hand with institutional development such as establishing independent regulators and a transparent regulatory framework.

Influence of services on export performance in manufacturing

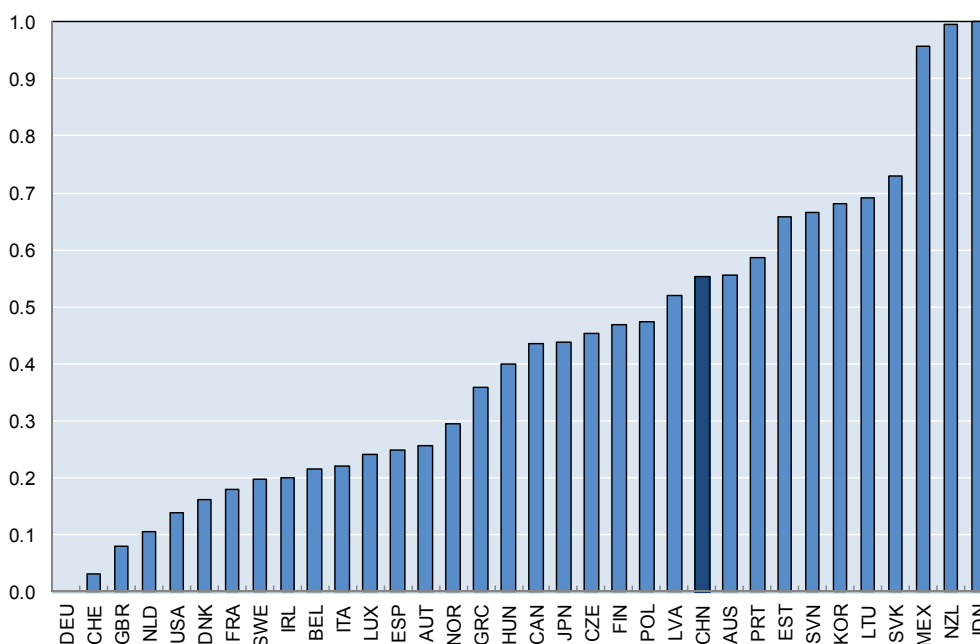
Internal and external connectivity is key to advancing towards the technology frontier as far as organisational innovations are concerned. Open and competitive markets in transport, logistics and finance would facilitate international trade in manufactured goods. Business services including computer services, consultancy, professional services and advertising also play a role for export performance in manufacturing. Such services contribute to matching products to consumer tastes

and to complying with local standards and regulations in the export markets. Local services suppliers in the export markets as well as global firms with a local presence are often best placed to provide such services. Multinational companies typically have their own in-house or global services suppliers that support their trade and production activities. Local firms would benefit from having access to a similar services supplier base, and would be the major beneficiaries of service trade and investment liberalisation. If China's openness towards FDI in financial services and business services approached the OECD average, the export share of manufacturing output of local firms could go up by 10.5 and 7.5 percentage points respectively (Nordås, 2008).

The role of business services in moving up the value chain

China is the world's largest exporter of clothing and apparel, and hitherto its trade has been dominated by exports with intra-industry trade way below the global average for the industry.¹⁵ China's global market share has, however, peaked as the most labour-intensive segments of the industry have moved on to some of the fastest growing exporters of clothing such as Bangladesh and Vietnam. In order to remain competitive in the textiles and clothing industry, while supporting earnings that attract young people with middle class aspirations, China needs to move up-market. A more developed business services sector would facilitate such a process.

Figure 4.4 **Average services trade costs relative to domestic transaction costs, total services 2005**



Note: The services trade costs are calculated as suggested by Jacks et al. (2011): bilateral trade cost are calculated on the basis of information of exports, imports, output and local sales of services. The calculated trade costs have been normalised using min-max. The country with the lowest trade costs is thereby assigned a value of zero and the country with the highest trade costs a value of unity.

The Chinese motor vehicle industry has grown rapidly from mainly supplying parts and

¹⁵ In 2008 the Grubel-Lloyd intra-industry trade index was estimated to 0.05 for HS category 61 and 0.06 for HS category 62, compared to international average of about 0.25 for both sectors. These are averages estimated for 6-digit categories. For motor vehicles the index was 0.32, as compared to an international average of 0.20.

components to FIEs to developing local brands that are taking an increasing share of the local low-end market. So far, exports of final products in this sector are low, but intra-industry trade is relatively high, though dominated by FIEs. In the same way as the presence of the major car manufacturers helped local car manufacturers enter the market, the presence of supporting business services may help local producers develop their brands, distribution and after sales services in export markets.

As discussed, many countries before China have faced the middle-income transition problem. This can be attributed *inter alia* to the difficulty of transition to the services economy after the manufacturing share of employment has peaked. OECD work shows that regulatory reform as well as openness to trade and investment improves performance both in the liberalised services sector and their downstream customers not least in manufacturing. In sum, competitive services industries are essential for achieving China's objectives of moving up the value chain, a larger role for domestic consumption as a driver of future growth, improved energy efficiency, the creation of jobs attractive for the growing number of young, skilled people who aspire to the middle class, and, of course, raising the share of services in GDP.

The importance of telecommunications in fostering the information economy

Telecommunications play an important role in economic development. Telecoms infrastructure provides the information highway in the information economy, and early evidence found a causal link between investment in telecommunications and economic growth in OECD countries where telecommunications accounted for about a third of observed growth during 1970-90 (Röller and Waverman, 2001). In the past, telecommunications were provided by state-owned monopolies in virtually all countries. During that period the sector was static with similar market structure and features as utilities. However, the technical revolution in the sector in the past three decades both facilitated and was driven by reforms such as commercialisation, privatisation and eventually trade liberalisation. At the same time, due to significant economies of scale and network effects, the sector remains regulated whenever a supplier with significant market power is identified. Best practice includes a regulator independent both of the major telecoms providers and the state.

In China the state still owns virtually all telecoms providers. Furthermore, regulation is scattered around several institutions where the Ministry of Industry and Information Technology (MIIT) is the lead agency for the industry responsible for licensing and other regulations. Price regulation is carried out in concert with the National Development and Reform Commission (NDRC) and the Ministry of Finance (MOF). NDRC's price supervision and anti-monopoly department also is charged with enforcing China's anti-monopoly law, while SASAC administers the state's ownership in the sector and its decisions also have the force of regulation. For issues involving internet video and music, the State Administration of Radio, Film, and Television (SARFT) also has regulatory authority, in cooperation with MIIT.

China's draft telecommunications law has been 12 years in the making. The last draft was made available to the public in 2009. To date, the law has yet to be promulgated and the telecom regulation first issued in 2000 by the State Council, last updated in 2009, remains in force.

The 2011 NDRC-MOFCOM Catalogue for the Guidance of Foreign Investment in Industry notes that telecommunications services are a "restricted" sector for foreign investment (in contrast to "prohibited" or "encouraged"). Value-added telecom services are limited to a 50% foreign equity share, while domestic and international basic telecommunications services, including mobile

voice and data services, as well as domestic and international services, are limited to a 49% foreign equity share. These limits are also reflected in China's GATS schedule. However, foreign firms' access to the Chinese market may be further restricted by the licensing regime, where there appears to be uncertainty regarding the extent to which foreign firms may obtain a license to operate, particularly in basic telecommunications (Voon and Mitchell, 2010).

The telecommunications sector has developed rapidly in China and infrastructure development has outpaced middle income countries as well as other developing countries in East Asia and Pacific. In addition, broadband penetration has picked up relatively more quickly than mobile. Thus, it appears so far that the policy regime has served China well. However, as the technology becomes more complex and the market matures, both local companies and consumer access to state of the art telecommunications services may be limited by concerns over the uncertainty facing foreign investors.

The role of financial services in the development process

Financial development is not only a robust determinant of economic growth, it is also a good predictor of future growth (Levine, 1998; Sala-i-Martin, 1997). Financial development, in turn is determined by institutional factors such as creditors' rights, the rule of law in enforcing contracts (Levine et al., 2000) and openness to trade and investment in financial services (Claessens et al., 2001). Using standard measures of financial development such as interest rate spreads, credit to the private sector as share of GDP and the ratio of commercial banks assets to central bank assets, credit appears to be readily available in China. The interest rate spread, however, is much lower than in other middle income countries or the regional average, and it has been fairly constant over time, reflecting government regulation. China has, nevertheless, committed to move towards market-driven interest rates in its financial industry following the entry into the WTO.

In accordance with China WTO commitments in financial services including banking, insurance, financial leasing, finance corporations, trusts and investment corporations, currency and insurance brokers, foreign investment is limited to a 49% share in investment fund management companies, and 33% for firms that underwrite and trade government and corporate bonds, domestic shares and Hong Kong-listed mainland companies. Chinese investors must hold a controlling stake of futures companies (NDRC-MOFCOM guidelines). In order to establish a wholly-owned foreign bank or a branch of a foreign bank it must have established a representative office in China for at least two years. Furthermore, wholly-owned foreign banks must have assets of at least USD 10 billion, while USD 20 billion is required to establish a branch of a foreign bank. Banks that seek to establish a joint-venture with a Chinese bank are not subject to the two-year wait, however. Finally, foreign-invested banks must have operated for three years, with two consecutive years of profit before they may provide services in local currency. After receiving a permit for local currency, branches of foreign banks must have a minimum of 300 million yuan in registered capital, and are still not permitted to issue bank cards, and can only take yuan deposits of at least 1 million from Chinese citizens.

Additional restrictions apply to foreign equity investment in existing financial institutions. These include regulatory approval by the China Banking Regulatory Commission (CBRC). Inbound investment by a single foreign financial institution is limited to a 20% minority stake, and only the Chinese-invested financial institution that would receive the investment can request approval from CBRC. If the total number of foreign investors exceeds 25% in a non-listed financial institution, it

becomes subject to rules applied to foreign-invested financial institutions. In addition to the ceiling on foreign investment in existing financial institutions, investors in Chinese commercial banks must have assets of at least USD 10 billion, while investors in urban and rural credit unions or non-bank financial institutions must have assets of at least USD 1 billion.

According to China's WTO commitments, the foreign suppliers are also subject to certain regulations. All foreign investment in the insurance sector is subject to regulations that include 30 years of business history, a minimum of USD 5 billion in assets, a representative office in China for at least two years before applying, and a minimum registered/operating capital of 200 million yuan or foreign currency equivalent. Foreign investment is limited to a 50% share of life insurance joint-ventures.

Summary and conclusions

The performance of the Chinese economy since its entry into the WTO has been spectacular and has been underpinned by a commitment to steady incremental reforms since the beginning of reforms in late 1970s. China's WTO commitments were ambitious and comprehensive and led to deep structural changes that are at the core of China's transformation towards a modern market-based economy.

Participation in global trade networks and global value chains has been pivotal to China's economic success, as was FDI. Overall, China's opening, specialisation and growth were built very much on the principles of comparative advantage, as indicated by its relative abundance in labour, its factor content of trade, the importance of processing trade and positioning of China in global value chains. As a result of accumulation of physical and human capital, encouragement of FDI and processing trade, and development of a variety of government SEZs, China has gradually begun to develop strengths in human capital and technology-intensive products.

Yet, there are signs that China may be entering the difficult middle-income transition period. Recent OECD research indicates that sustained growth, and China's position in the global economy, depends on continuation of structural reforms. This includes removing remaining pockets of border and behind-the-border protection, continued reforms of the SOE sector and agriculture, as well as rethinking of strategy with respect to raw materials markets.

Reforms of services sectors will be key to escaping the middle-income trap given their documented positive impact on organisational innovation and overall productivity, including in the manufacturing sector. This is evidenced by the important role that business services play in moving up the value chain, the role of telecommunications services in fostering the information economy, and the role financial services in the development process in general. The current level of state involvement in both planning and production is likely to get in the way of innovation-led growth, particularly in the services sector where process and organisational innovations are relatively more important. Competition in the services sectors is therefore important for continued growth and trade liberalisation and domestic reforms go hand in hand in creating more competitive and innovative services markets supporting growth and the creation of good jobs.

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Chapter 5:

Moving up the Value Chain: China's Experience and Future Prospects

Introduction

The past decades have witnessed a trend towards the international dispersion of value chain activities such as design, production, marketing, and distribution. Different stages in the production process are increasingly located across different economies according to their comparative advantage. This chapter discusses China's role in the rise of Global Value Chains (GVCs) and some key issues for China in upgrading its role in GVCs.

Multinational enterprises (MNEs) are major actors in GVCs as they seek to optimise their task allocation to maximize value added and cost competitiveness. With an abundant labour force as its main asset, China has attracted large inflows of FDI to establish manufacturing facilities engaging in labour intensive processes such as final assembly.

This chapter first discusses China's role within GVCs as the "World's Factory" by describing the large volume of so called "processing trade" and MNEs' contribution to it, and explores the role played by imported intermediate inputs in China's relatively sophisticated exports. It pays special attention to the value-added that China earns from its current GVC activity by presenting some of the latest findings by the OECD on the mapping of GVCs.

The section that follows describes the strategy for China's upgrading within GVCs.¹ It emphasizes the necessity of strong technological capabilities in developing high quality, innovative products, and the accumulation of other strengths such as intellectual property, human capital and organisational assets, often summarized as intangible assets. It finds that China's intangible assets, in line with distribution of physical assets, are disproportionately concentrated in state controlled enterprises. Considering the highly dynamic and entrepreneurial nature of innovation, China's upgrading within GVC will increasingly need to be led by enterprises that have a strong business and profit orientation. The internationalization of private firms in particular could be a way to strengthen their innovation capabilities and foster their role in GVC upgrading.

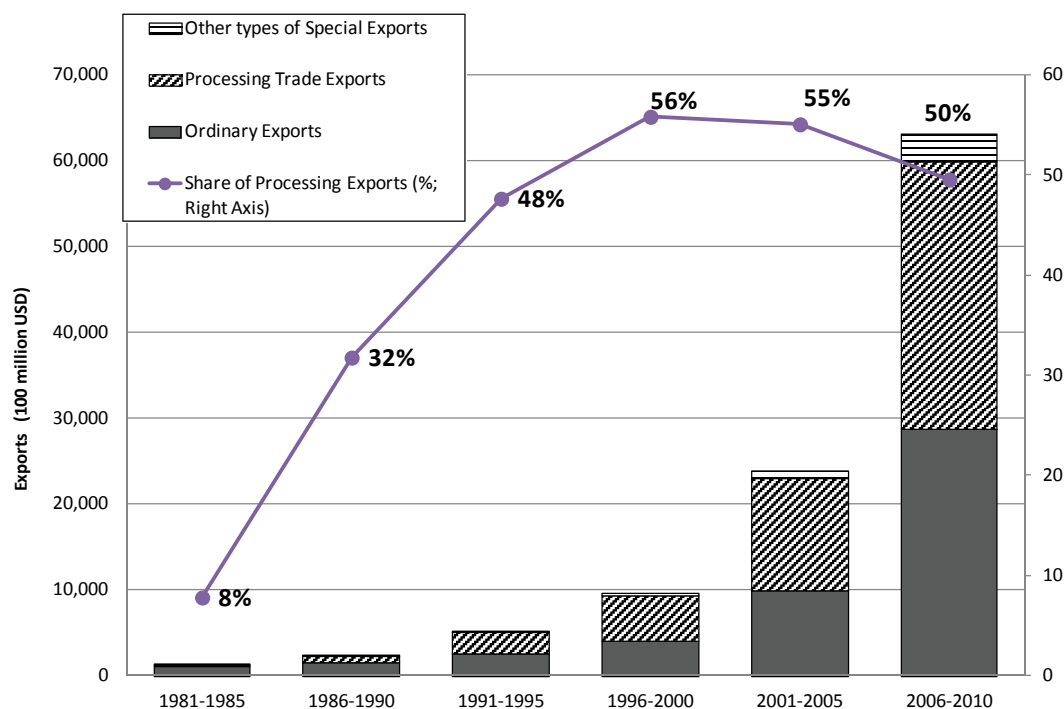
¹ The term "Upgrading" refers to the increased creation of value added in a GVC, not necessarily to whether a firm is engaged in upstream or downstream activities in the production process. For example, activities with high value added might also be found downstream in the value chain, *e.g.* in distribution, marketing or after-sales service.

A final section concludes by offering a perspective on China's new role in GVC as global demand shifts to emerging economies, China being the most prominent.

China's involvement in global value chains

In the past thirty years the share of China in world exports has risen from less than one percent to 10% (see also Chapter 4). China's rapid integration into GVCs has been most apparent in processing trade which contributed heavily to the rapid growth of China's exports. The share of processing trade in China's exports increased rapidly in the late 1980s to mid 1990s and has remained near to 50% while its volume grew by an average annual rate of 17% between 1991 and 2010 (Figure 5.1). The processing trade regime allows firms to import intermediate inputs free of custom duties, provided that these inputs are solely used for the production of final goods destined for third markets. This trade regime has been extremely successful in attracting the assembly activities of MNEs that seek to apply China's comparative advantage in labour-intensive activities to enhance their cost competitiveness.

Figure 5.1 **China's processing trade and ordinary exports**



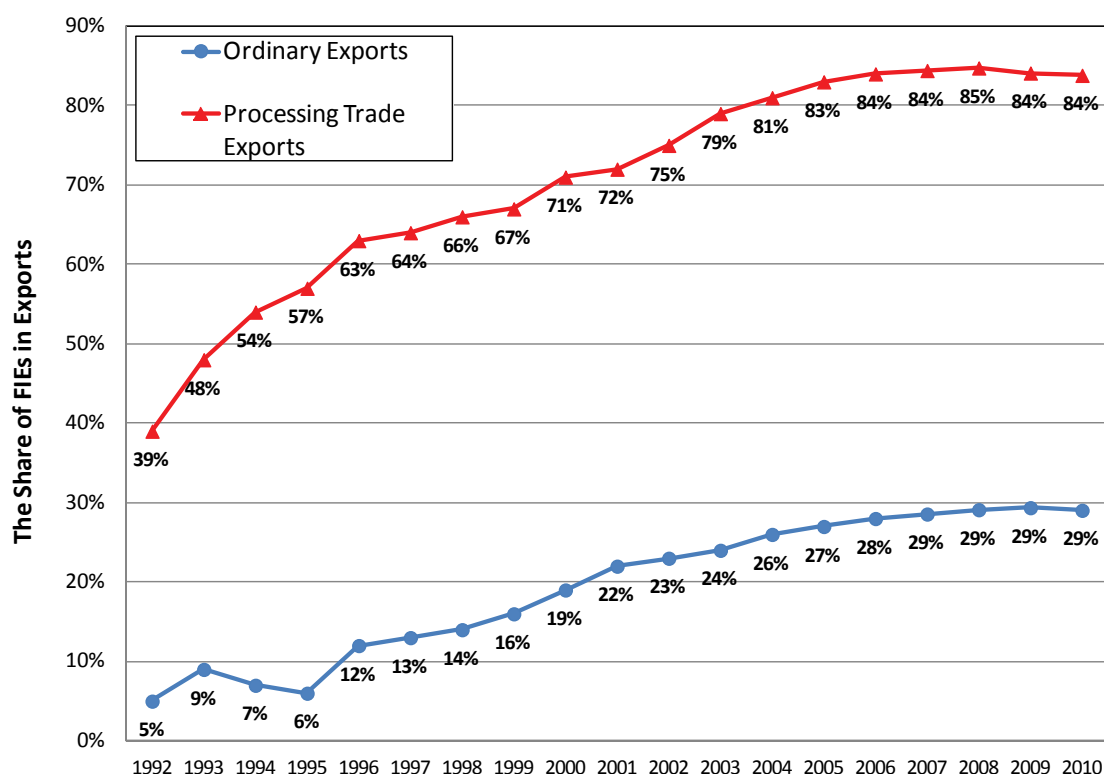
Source: 2010 China Statistical Yearbook, China Custom.

Processing trade constitutes an important part of the “triangle trade” in which parts and components are produced by more developed Asian countries, as well as other advanced countries, and then exported to China where the assembly of the different intermediates into finished products takes place. The assembled final products are either exported back those Asian countries or exported to other developed countries/regions such as the United States and Europe where they may undergo some additional processing (packaging, marketing, etc.).

The share of foreign invested enterprises (FIEs; mostly affiliates of OECD MNEs) in processing

trade rose rapidly during the expansion of processing trade as a share of China's exports, indicating that FIEs are the main driver of processing trade (Figure 5.2). While FIEs conducted only 39% of processing trade in 1992 their weight has increased over time, to nearly 70% at the end of 1990s, and to 85% in 2008. The scope of FIEs involvement in GVCs is not limited to processing trade. Their share in ordinary exports has also risen, from only 5% in 1992 to 29% in 2008 (Figure 5.3). This suggests that the activities of FIEs in China, as well as China's involvement in GVCs, are increasingly not just assembly of imported inputs but also include local procurement and other interactions with Chinese industries that go beyond the processing trade regime.

Figure 5.2 **The share of FIEs in ordinary exports and exports based on the processing trade regime**



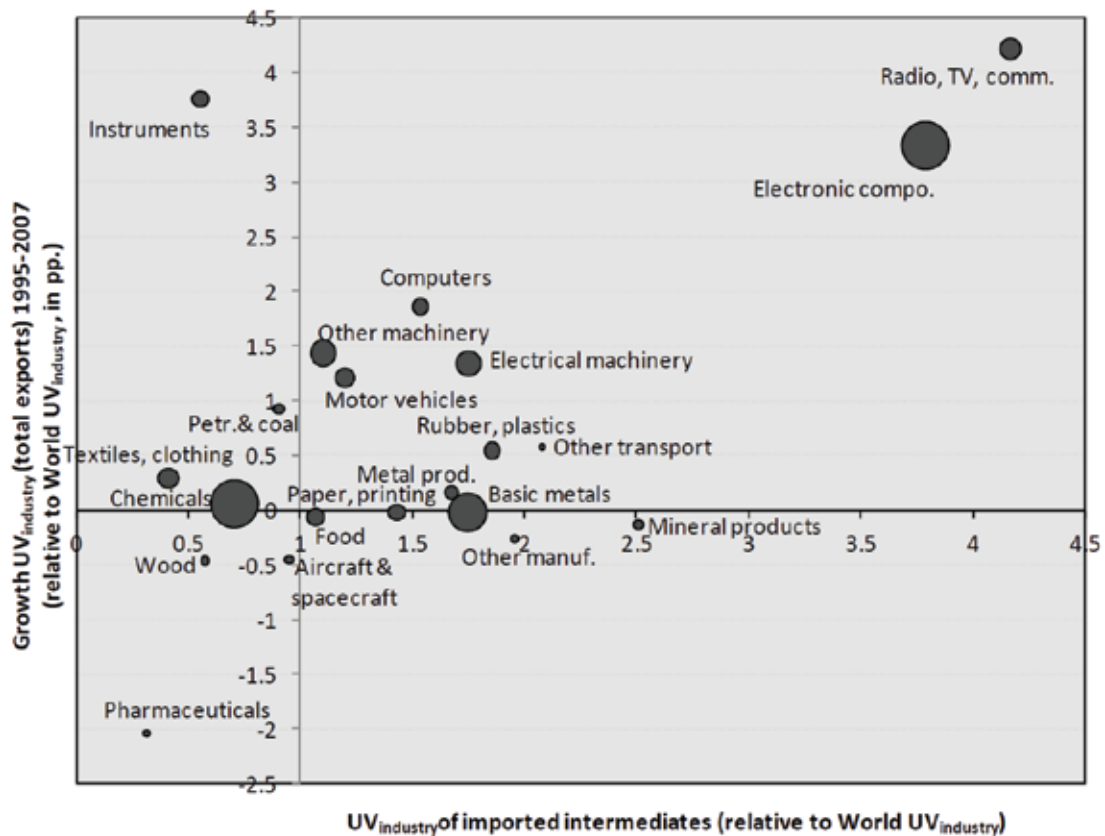
Source: Feenstra and Wei (2010), China Custom.

Integration into GVC has played an essential role in China's industrial development. China hosts the assembly of goods embodying sophisticated technology and high quality intermediate goods, which allows it to tap into the cutting edge technology that was not available in the domestic market (Breznitz and Murphree, 2011). Processing trade has not only contributed to China's export-led growth, but also to improvements in quality. China's exports are considerably more sophisticated than those of other emerging economies (Rodrik, 2006). Empirical studies report that processing trade has been the major factor driving the high skill-intensity of China's exports and also explain its similarity to exports of OECD countries (Amiti and Freund, 2010; Xu and Lu, 2009). Participation in GVCs enabled China to upgrade its industrial production and exports through the use of sophisticated imported intermediate goods.

Over the past decades, China has increased its share of world exports in high technology industries such as computer equipment as well as mid to low technology industries like textiles.

Furthermore, within high-technology industries, China has increased its share in high quality products (products with a high unit value – or average price – of exports) although its expansion was most pronounced in low to medium quality products (OECD, 2011b). The unit values of China's exported products have grown strongest in industries importing intermediate goods with high unit values. Figure 5.3 plots the growth of the unit values of China's exports relative to growth of world average unit values between 1995-2007 (vertical axis) against the unit values of China's imported intermediate goods compared to the world average (horizontal axis). The size of the circle corresponds to the import value of intermediate inputs. The positive relation suggests that imports of higher quality intermediate goods played a significant role in enabling China to upgrade the quality of its export goods, especially in industries like Radio, TV and Communication equipment or Electronic Components.

Figure 5.3 **Growth in the unit value of China's exports and the role of imported intermediates**



Source: OECD (2011c) "Export Competition: Price or Quality?" STI Working Paper, forthcoming.

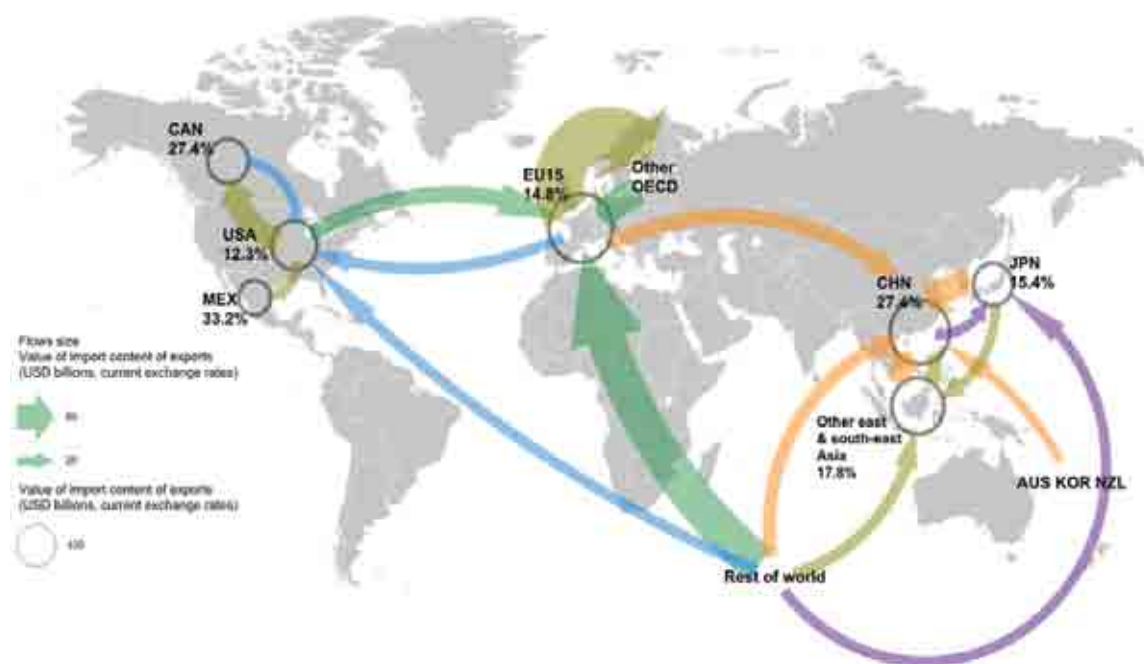
However, the large role of imported inputs in China's sophisticated exports raises a question on how much of China's exports are actually made in China? What does China's dependency on imported intermediate inputs imply about China's indigenous technological capabilities and the nature of its contribution to GVCs?

The extent of a country's specialization within GVC can be inferred by observing the share of imported inputs in the total inputs used to produce its exports (Hummels et al, 2001). The OECD STAN Input-Output Database describes the sale and purchase relationships between

producers and consumers within an economy in an international harmonized format, and is a useful empirical tool for computing such indicators. Furthermore, linking this Input-Output database with bilateral trade data provides insights on the origin and destination of imported intermediates as well as on the specific linkages between individual countries. Such an exercise illustrates the global interdependencies in production and exports within GVCs, as well as China's position (Figure 5.4).

The share of imported intermediate inputs in China's exports is 27.4%, substantially higher than that of large manufacturing exporters like the U.S. (12.3%) or Japan (15.4%), but comparable to that of Germany (27.2%) and lower than that of Korea (38.8%). The import content of exports does not itself infer information about the extent of technological development since it is likely to be high in countries that procure parts from the entire GVC or that specialize in specific stages within a GVC. It confirms, however, that China depends importantly on imported intermediate goods instead of indigenous inputs in producing its exports despite having one of the world's largest economies.

Figure 5.4 **Import contents of exports and origin of imported inputs (2005)**

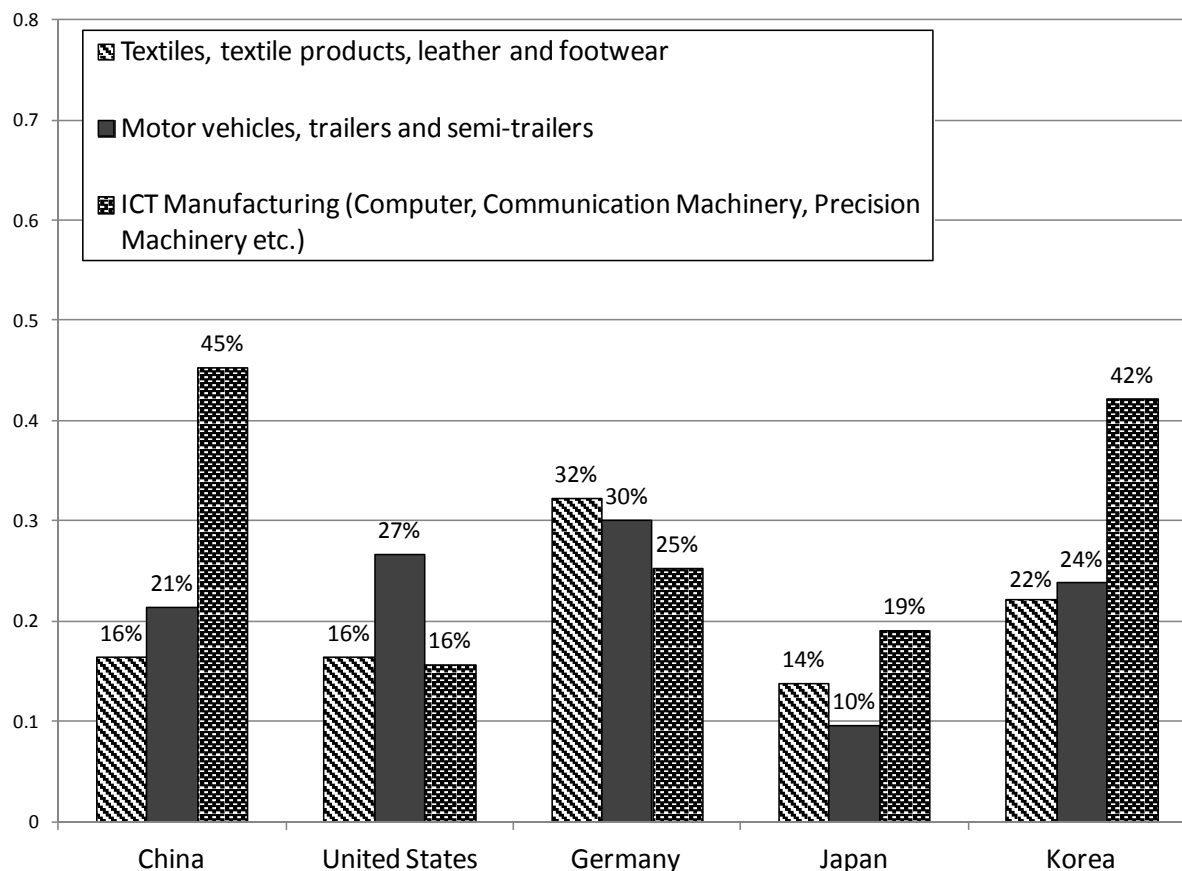


Source: OECD Science, Technology and Industry Scoreboard 2011 (OECD, 2011a).

The extent of import dependence varies across industries (Figure 5.5). While the import content of exports in textile and textile products is comparable to that of advanced countries, it is markedly higher in ICT manufacturing. This points to an essential difference in the nature of China's competitive advantage between exports of high and low technology goods. Although China has indigenous technological capabilities to produce competitive products in labour intensive sectors such as apparel, this capability is still limited in high technology sectors where it relies heavily on imported inputs. China's large exports of ICT products have been realised to a great extent by its successful integration into GVCs, while its exports of labour intensive products mainly reflect traditional comparative advantage. The import

content of exports of China is also relatively low in the motor vehicle industry, which may be due to the co-location of many global parts suppliers in China.²

Figure 5.5 **Import contents of exports for China and selected countries (mid 2000)**



Source: OECD STAN Input-Output Database.

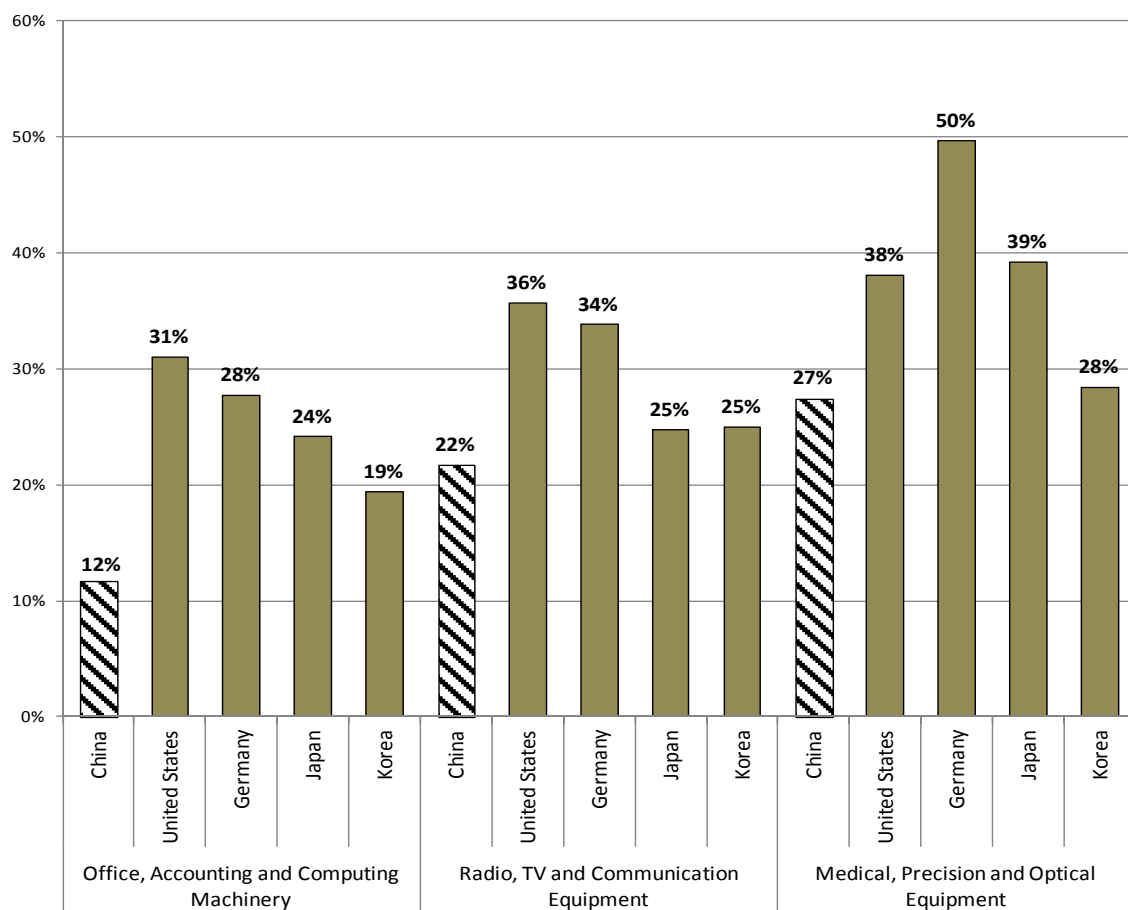
The high import content of China's exports - especially in ICT manufacturing - suggests that China's competitiveness within GVCs is still concentrated in processing and assembling activities. However, its role as the world's assembler allows China to generate only limited value added compared to other countries engaging in more technology and knowledge intensive activities within GVCs. This can be observed from the ratio of value added to industrial output in three major ICT manufacturing industries (Figure 5.6). China retains less value added from production of ICT manufacturing compared to other large manufacturing exporters, especially in office, accounting and computing machinery. While the import content of exports in ICT manufacturing is high for Korea as well (Figure 5.5), its higher ratio of value added to production suggests that it is specializing in higher value added activities within the GVC for ICT manufacturing.

Based on an alternative computation method, Koopman et al. (2008) estimated that the share of domestic value-added created from processing trade exports is less than 20%. A more accurate

² The GVC of the auto industry is often highly regionalized due to explicit or implicit requirements to locate assembly in the final market as well as pressure from auto makers on their suppliers to co-locate with the car factory in foreign markets for technical necessities and operational reasons such as just-in-time production (Van Biesebroeck and Sturgeon, 2010).

picture comes from a case study of the Apple I-Phone⁴. China exports the I-Phone⁴ at a unit price of just over USD 194, but generates only about USD 6.5 of value added. The largest portion of value added from the production of the I-phone is accounted for by imported intermediate inputs from countries providing key components, such as Korea.³

Figure 5.6 The ratio of value added to production for ICT manufacturing (2005)



Source: OECD STAN Input-Output Database.

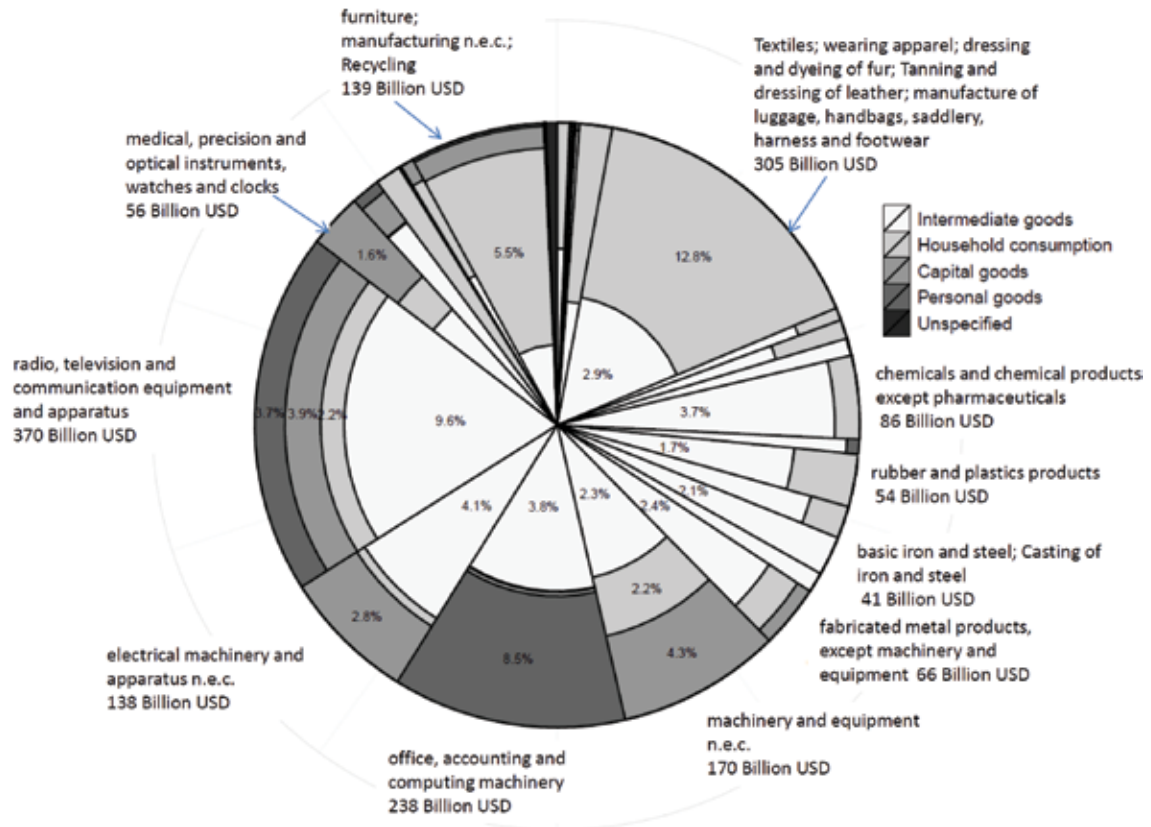
However, there is growing evidence that China's upgrading within GVC is on its way. First, China's ordinary exports have increased drastically and amounted to USD 721 billion in 2010, almost the same as Japan's total exports. Unlike processing trade, ordinary exports involve high domestic value-added and are mainly due to indigenous Chinese firms (Figure 5.6). While ordinary trade is concentrated in relatively labour intensive sectors (Koopman et al., 2008), it involves activities that create higher value added than final assembly, such as the production of intermediate inputs or the governance of China's own GVCs.

Secondly, China's share in world exports has increased not only in final products, but also in parts and components. Between 1995 and 2007, China's share in world's export of parts and components increased by 9.2% while that by the U.S. and Japan dropped by 6.3% and 7.1% respectively. The structure of Chinese exports has been changing and a substantial portion

³ Based on iSuppli for materials and Ali-Yrkkö et al. (2010) for distribution margins.

of China's exports in radio, television and communication equipment, electronic machinery and office, accounting and computing machinery involve intermediate goods, suggesting that China has become a key supplier of parts and components (Figure 5.7).⁴

Figure 5.7 The composition of China's manufacturing exports (2010)



Note: Percentage values indicate the share in total exports.

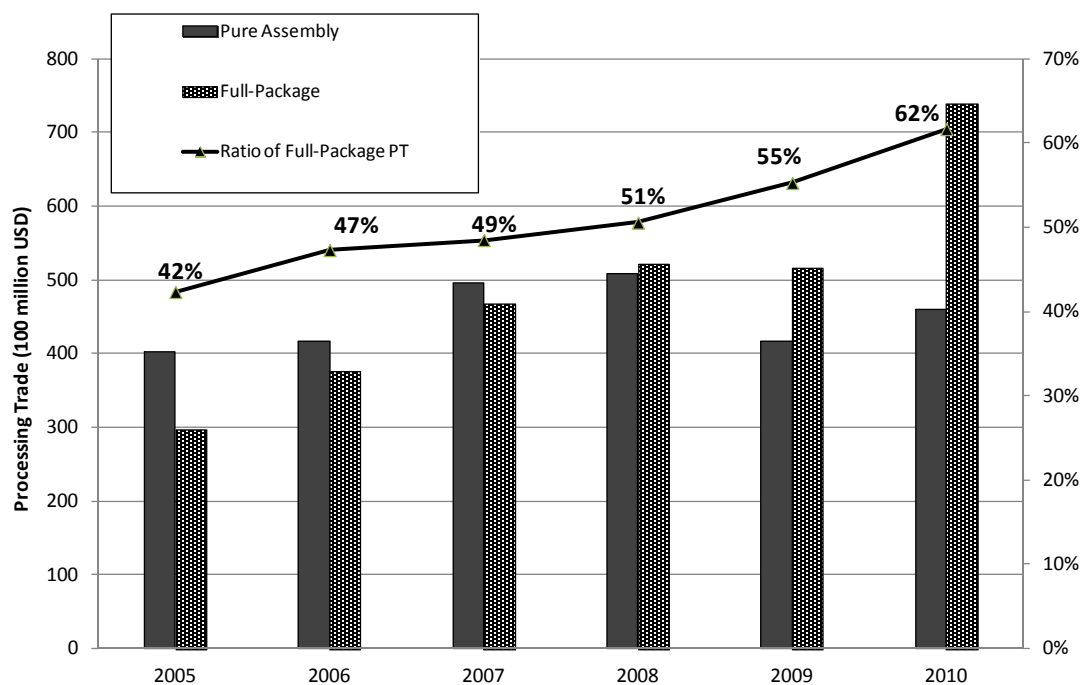
Source: OECD STAN Database Bilateral Trade Database by Industry and End , as described in Zhu et al. (2011)

Lastly, while processing trade is mostly due to FIEs, the part due to Chinese firms is shifting from simple contract assembly to “full-package” manufacturing where Chinese firms control all stages from material procurement to product design. Until recently the majority of processing trade by Chinese firms consisted of simple assembly contracts where material, equipments or product blue prints were transferred by foreign firms (Figure 5.8), Chinese firms now import parts and components themselves and decide on the quantity, price and specification of products to be exported to foreign firms to a certain extent⁵ This upgrading of processing exporters is analogous to the emergence of OEM (Original Equipment Manufacturing) observed in some other Asian countries, as an important early stage of GVC upgrading.

4 However, such intermediate goods may also be processed and assembled from imported parts and components. For example, Japanese SMEs that supply inputs to large electronics companies often relocate their assembly plants to China in order to respond to pressures to reduce costs. These SMEs exports key components to their Chinese plants and re-import the finished products.

5 Perhaps not surprising, 90% of processing trade by FIEs has been “full-package” given the role of FIEs as assembling and exporting branches of MNEs.

Figure 5.8 Processing trade exports by indigenous Chinese firms



Source: China Custom.

Strategies for China's upgrading within global value chains

As China aims for further upgrading within GVCs, an important focus will need to be on strengthening its indigenous technological capability, which will be essential for China to supply parts and components that embody higher value added and contribute to the competitiveness of the whole value chain. The necessary innovation requires also that Chinese firms develop their own intangible assets, *e.g.* high-quality intellectual property, supported by an effective IPR regime, or a stronger ability to perform more complex tasks in GVCs. Such assets are increasingly the key to earning sustained profits in a context of fierce global competition. Indeed, investments in intangible assets have intensified in the past decades in many OECD economies and are now sometimes larger than investments in tangible assets, *e.g.* in the United States (Corrado et al., 2010). The scope of intangible assets as suggested by Corrado et al. (2005) includes:

- *Computerized Information*: knowledge embedded in computer programs (software) or databases.
- *Innovative property*: scientific and engineering R&D and non-R&D innovation investments such as expenditure to develop copyrights, designs and trademarks, as well as new products.
- *Economic competency*: brand equity, firm specific human capital, investments in organizational change and development.

Although upgrading in GVCs is often described as a vertical concept such as moving up from assembly to product design, the most fundamental stage of upgrading starts from horizontal process where a firm or a country realizes substantially higher efficiency or sophisticated product development *within* the same stage in a GVC by deepening of technological capability

(Morrison et al. 2008). Such upgrading involves the realization of significantly higher process management abilities (higher productivity, lower defect rates or the ability to process complex orders), or the substantial deepening of technology and skill intensity of products (Kaplinski and Morris, 2002). This kind of *horizontal* upgrading is considered a pre-requisite for more advanced ways of upgrading. The case study of the apparel GVC by Gereffi (1999) provides a good example. East Asian firms first upgraded from simple contract assemblers to OEM (Original Equipment Manufacturing) where they controlled the whole production process including quality control, aimed at meeting international standards. This process upgrading was followed by a transition to ODM (Original Design Manufacturing) where these firms acquired the ability to develop new products on their own. Intensified cost competition with other emerging or developing economies prompted some firms to further upgrade into OBM (Original Brand Manufacturing) which integrates their manufacturing expertise with design and sales of their own branded merchandise.⁶

Strengthening China's performance in process and product innovation is thus the important first step toward GVC upgrading. Strengthening indigenous capabilities, e.g. through investment in research and development (R&D) also shapes the ability of firms to absorb external knowledge (Cohen and Levinthal, 1990). For instance, technology spillovers from FIEs have been found to benefit only the domestic firms engaging in R&D (for example, Girma et al., 2008, Blalock and Gertler, 2009).

Climbing up the technology ladder is an essential part of China's GVC upgrading, but is clearly not the whole picture. The value generated from innovation by some parties can be extracted by other parties that hold assets that are vital to the whole operation of a GVC (Teece, 1986). By leveraging their ownership of key intangible assets (such as product brands or key designs) that defines the competitiveness of the whole value chain, lead firms will try to establish a monopolistic position within a specific stage of a GVC. Becoming a "bottleneck" in a GVC allows those firms to appropriate a large portion of the total value added created by a value chain (Jacobides et al., 2006). For example, by providing key design and acting as the "guarantor of quality" of products processed through its GVC, Apple Inc. captures about 45% of the total value of the I-Phone4. Chinese firms will also need to focus on developing such assets – again often intangible in nature – and make the necessary strategic investments.

The focus on investment in intangible assets raises challenges for the management of intangible assets, which is more complex than for tangible assets as the value and return from such investments are often harder to infer (Lev, 2001). China also needs to strengthen awareness on the value of intangibles assets and build up experience in managing intangibles. Recent improvements in IPR protection and legal enforcement, for example, may encourage Chinese enterprises to value intangible assets as an important driver of profits and a strategic tool for business growth (Waldmeir, 2011).

Policies to support China's upgrading in GVCs are generally consistent with policies fostering enterprise-led innovation, improvements in framework conditions often being the key. The 2008 OECD Review of Innovation policy provides an extensive review of China's innovation policies, including the framework conditions for innovation (Box 5.1; OECD, 2008a). The remainder of this section highlights the importance of enhancing the role of profit driven enterprises in China's upgrading.

⁶ It is recognized that participation in GVCs per se does not guarantee upgrading. While MNEs governing the GVC often assist quality upgrading by their suppliers, they do not help suppliers' upgrading if this may erode their core competencies or weaken their position within a GVC (Humphrey, 2004).

Box 5.1 Policy recommendations on the framework conditions for innovation in China

- *Improve the enforcement of intellectual property rights protection*, as a condition both for attracting knowledge-intensive FDI and for increasing the propensity of domestic firms to innovate.
- *Foster competition*, notably through the adoption of modern and effective antitrust legislation to encourage firms to put innovation more at the centre of their business strategies.
- *Continue to improve corporate governance*, with a view to improving incentives for business to invest in R&D and innovation.
- *Foster open and efficient capital markets* to support the founding of new and innovative ventures, entry into new markets and the development of innovative products and services.
- *Implement innovation-oriented public procurement policy* with care to avoid hampering China's prospects for joining the World Trade Organization's (WTO) Government Procurement Agreement (GPA), which will open public procurement markets abroad to Chinese firms, and those in China to foreign firms.
- *Use technology standards* to foster innovation following international best practices, in line with WTO regulations, avoiding distortions of national and international competition which may eventually stifle innovation.

Source: OECD (2008a), *OECD Innovation Policy Reviews – China*.

China has invested heavily in strengthening its technology capabilities over the past decade. In absolute (PPP) terms, China became the world second largest spender on R&D in 2009, overtaking Japan and lagging only the United States (OECD, 2011a). The growth in R&D expenditure has mainly been driven by the enterprise sector which increased in-house R&D expenditure at an annual average rate of 25% between 2000 and 2009. The enterprise sector's R&D investments accounted for 73% of China's R&D in 2009.

Expenditure on R&D is, however, only part of the investment in technology capabilities that Chinese firms have been engaging in over the past decade (Table 5.1). Chinese enterprises invest more resources in new product development and also in technology renovation (defined as the application of the latest technology to existing products, technology and equipment to improve production efficiency and quality) than on in-house R&D. Between 2000 and 2009, such investments have grown at an annual average rate of 27% and 14% respectively. The amount of technology renovation expenditure was much larger than R&D in 2000, supporting the view that incremental efforts in adapting the latest technologies have been an important driver of China's industrial development (Breznitz and Murphree, 2011).

However, a notable feature of investments in innovation in China's enterprise sector is the concentration of such activities in state-owned enterprises (SOEs) or state-controlled enterprises (Figure 5.9)⁷. These companies account for about 45% of R&D expenditure, 44% of expenditure on new product development and 70% of expenditure on technology renovation. Moreover, expenditures on the absorption and adaptation of externally acquired technology are dominated by SOEs. However, their innovation output is much less pronounced. For example, their weight in the application of inventive and other patents (utility and design) is only 35.3% and 28.9% respectively, and SOEs account for a low share of overall exports.

⁷ Large and medium enterprises are firms with sales over 30 million Yuan, employment of more than 300 persons and assets over 40 million Yuan. As seen from Table 5.1, those enterprises conduct the majority of in-house R&D.

Upgrading is a competitive process which requires rigorous and successful innovation *relative* to rival firms (Kaplinski and Morris, 2002). It requires firms to focus on their core competence, and to identify and exploit new processes, products or markets (Teece, 2007). This “Dynamic Capability” for market selection is most likely to be strongest in Chinese firms that have a strong business and profit orientation. It is therefore essential that profit-driven enterprises such as private enterprises play an important role in China’s upgrading. Moreover, as noted in recent OECD work, young and entrepreneurial firms play a critical role in innovation, in particular in driving more radical forms of innovation (OECD, 2010a; 2011a). Increasing the weight of profit seeking entrepreneurs in China’s innovation drive is therefore essential to achieving sustainable economic growth based on productivity improvements (OECD, 2010b).

Table 5.1 **Technology expenditures by Chinese industrial enterprises**

(100 Million yuan)	2000	2009	Annual Average Growth rate
In-House Expenditure on R&D	489.7	3775.7	25%
of which by Medium and Large Enterprises	353.4	3210.2	28%
Expenditure on New Products Development	529.5	4482.0	27%
Expenditure for Acquisition of Foreign Technology	304.9	422.2	4%
Expenditure for Assimilation of Foreign Technology	22.8	182.0	26%
Expenditure for Purchase of Domestic Technology	34.5	203.4	22%
Expenditure for Technical Renovation	1291.5	4344.7	14%

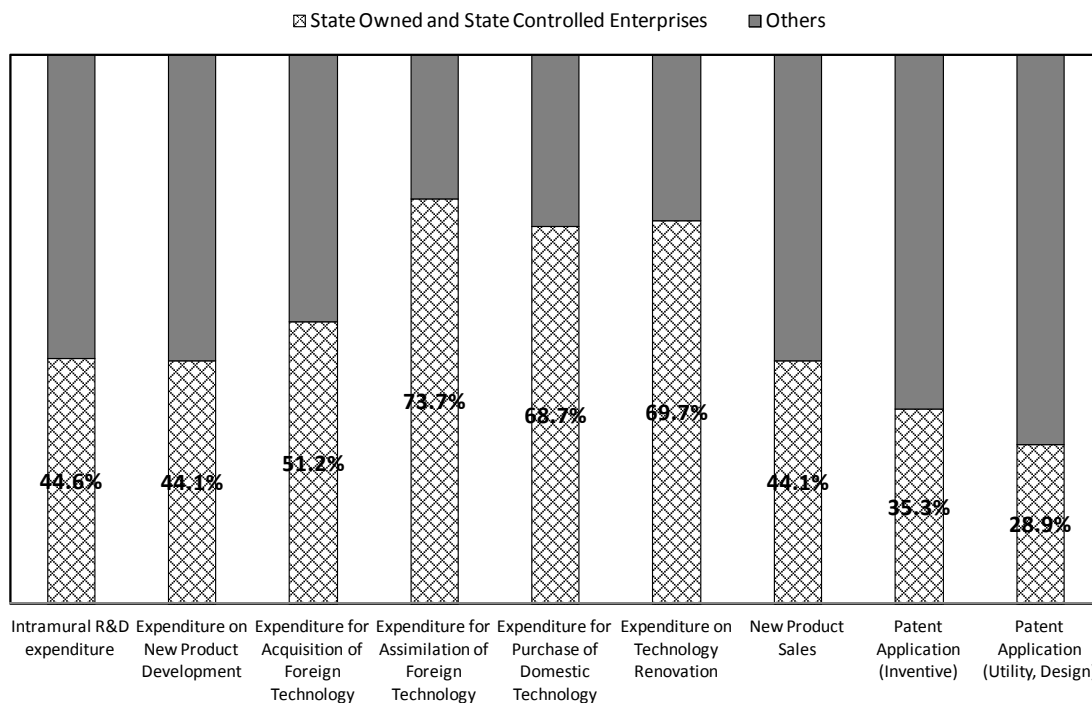
Source: 2010 China Statistical Yearbook on Science and Technology.

While private enterprises account for 71% of the total number of domestic enterprises, only 4% of these firms conduct R&D. This is partly due to the fact that 96% of private enterprises are small firms.⁸ Those firms are also often young, sometimes managed by relatively inexperienced personnel and lack the capability to absorb, adapt and create new technology (Zhang et al, 2009). Shortage of funds and knowledge in managing successful innovation processes can prevent private enterprises from investments in innovation and intangible assets. It is thus essential to support the technological capability building of private enterprises and expand their role in China’s GVC upgrading.

One promising approach is to promote the internationalization of private enterprises. Internationalization such as exports or FDI rewards firms with larger and more stable cash flow, which allows them to make continuous investments (Shaver, 2011). It also motivates efforts to upgrade quality and technology because the expected returns from such investments can be reaped from foreign markets in addition to the domestic market. Trade liberalisation, which facilitates export entry, is often seen to promote innovation activities as well (Lileeva and Trefler, 2010, Bustos, 2011). Internationalisation also provides important opportunities for firms to acquire new knowledge from foreign markets. It allows firms to learn about the world’s latest innovation and business strategies of foreign competitors, as well as to acquire ideas for innovation from foreign customers (Salomon, 2006).

⁸ Due to high uncertainty and large initial cost, small enterprises generally face barriers in conducting R&D activity and engaging in other innovation investments. In 2009, while 62% of China’s large enterprises conducted R&D, this share was 28% for medium sized enterprises and less than 10% for small enterprises.

Figure 5.9 **Share of State-owned enterprises and State-controlled enterprises in technology expenditure (2009)**



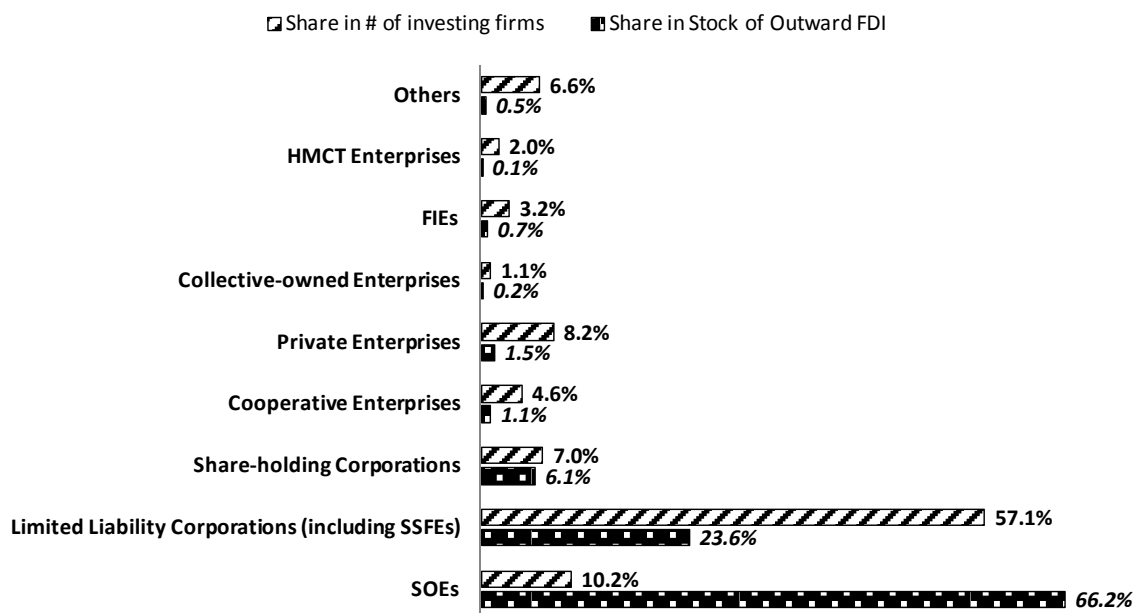
Source: 2010 Statistics on Science and Technology Activities of Industrial Enterprises

FDI is especially an important mode of internationalization where Chinese enterprises absorb spillovers from foreign knowledge clusters and acquire intangible assets. For example, globalized enterprises like Haier, Huawei and Lenovo have undertaken extensive FDI in OECD countries to establish production and R&D bases (Bonaglia et al., 2007). Such FDI is not only motivated in bypassing non-tariff barriers but also in acquiring innovative property such as advanced R&D, design and technology in which OECD countries hold a comparative advantage, as well as to establish global brand recognition through operations in advanced markets (Deng, 2007).

Most Chinese FDI providers are owned or controlled by the state. A full analysis of the ownership of foreign assets is not possible as official statistics do not breakdown corporations into those that are state-controlled and those that are privately controlled. However, at least two-thirds of the stock of non-financial FDI belonged to SOEs in 2010. The ten largest Chinese multinational enterprises by FDI stock are all SOEs and more than half are operating in the natural resources sector (OECD 2008b). Companies registered as private enterprises account for only slightly over 1% of foreign investment. More profit oriented FDI, motivated by the strategic acquisition of intangible assets and the need for GVC upgrading, would be beneficial.

The shift in global markets and opportunities for China

As the weight of the world economy shifts from OECD countries to emerging countries, it is likely that the end markets served by GVCs will shift as well, with China being the most prominent future end market. This shift will bring substantial structural change to existing GVCs and provides both opportunities and challenges for China's upgrading.

Figure 5.10 **The composition of China's FDI by enterprise type (2010)**

Note: HMCT: Hong Kong, China, Macau, China and Chinese Taipei; SSFE: Sole State Funded Enterprises

Source: 2010 Statistical Bulletin of China's Outward Foreign Direct Investments

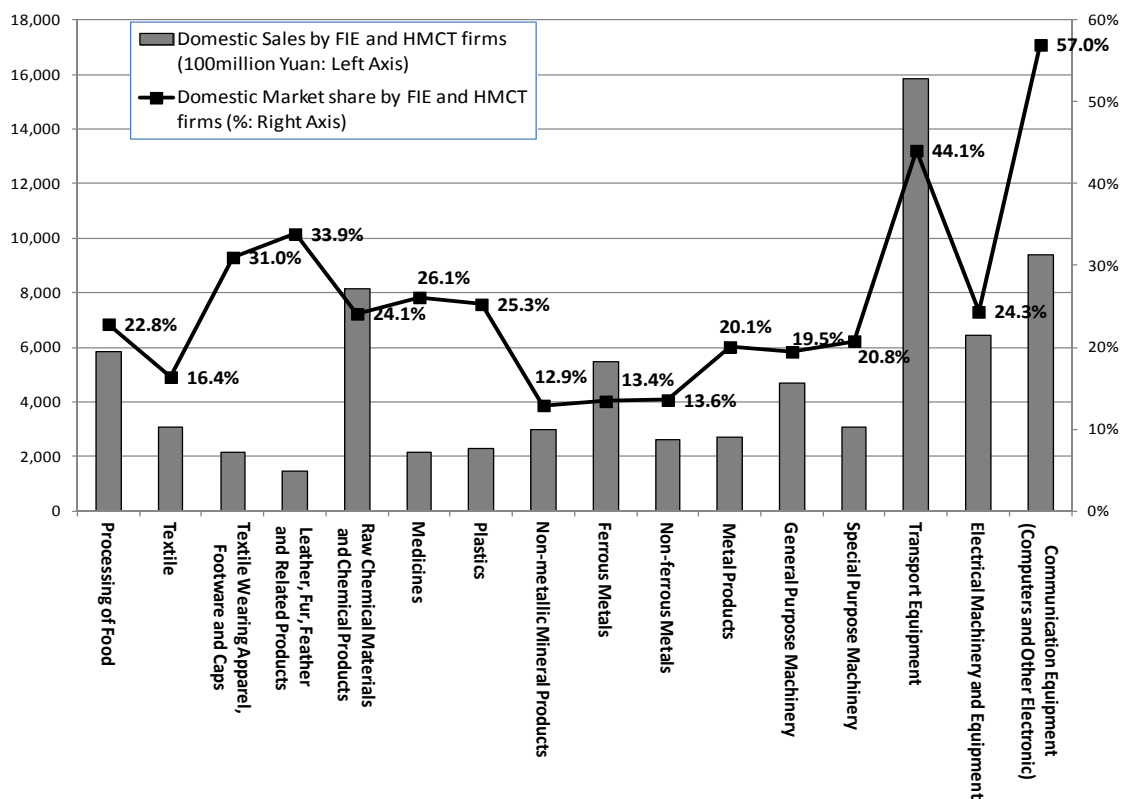
Currently, the lower levels of per capita income in emerging countries require higher cost efficiency from GVCs to remain competitive. On the other hand, demand for quality may be less stringent in such markets (Kaplinski and Farooki, 2010). This may appear to suggest that the source of competitiveness in such GVCs would be the capability for mass production rather than the ownership or control of key intangible assets. However, demand for quality and brands is rising quickly among wealthy consumers in emerging countries. For Chinese enterprises, competition with OECD firms is likely to be strongest in such markets. Focusing on the mass of consumers with the lowest income levels entails a risk of specializing in low quality goods with limited value added, which will eventually be substituted by higher quality goods as incomes grow. The shift of global demand to emerging countries and the South more generally is therefore unlikely to alter the importance of technological capability and intangible assets in China's upgrading.

On the other hand, the shift in end markets provides a valuable opportunity for Chinese firms to acquire a larger role within GVCs. Chinese indigenous enterprises have been developing their own designs and brands targeted to China's large domestic market and to other emerging markets. Such intangible assets will provide an advantage for Chinese firms compared with OECD firms that often have to adapt their products to emerging markets. By leveraging their expertise in domestic markets and in other emerging markets, Chinese firms can act as providers of new designs and concepts. However, firms from OECD countries still hold a strong technology and quality edge and most established brands are from OECD countries. Many MNEs are also already developing products targeted to Chinese consumers. FIEs and firms from Hong Kong, China, Macau, China, and Chinese Taipei hold a substantial market share in some industries ranging from apparel to transportation machinery and computers (Figure 5.11).

Chinese enterprises therefore must continue their investments in technological capability

and intangible assets. The nature and extent of upgrading within new GVCs will be based on their ability to propose high quality but yet affordable products that capture the fast changing preferences of Chinese consumers. This again points to the importance of profit-driven enterprises for China's future. Such enterprises are likely to respond more quickly to emerging needs and tend to be more efficient in translating ideas into commercial products.

Figure 5.11 **Domestic sales and market share by FIEs and Hong Kong, China, Macau, China and Chinese Taipei firms (2009)**



Source: 2010 China Industry Economy Statistical Yearbook

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Chapter 6:

Measuring Skills to Support Economic Transformation

Introduction

China has made remarkable progress in raising access, quality and equity in education. Shanghai now leads the world in student performance as measured by the OECD's Programme for International Student Assessment (PISA) (Box 6.1). However, China also faces daunting challenges to provide high quality education and training for its large rural population.

Strengthening skills will be vital for China's long-term growth, employment and competitive edge. Similarly, effective skills policies are an indispensable part of addressing inequality. At the same time, there is growing recognition in China that skills do not automatically translate into higher incomes and productivity. To successfully convert better skills into jobs and growth China, like other countries, needs to develop a solid understanding of those skills that drive strong and sustainable economic and social outcomes; ensure that the right mix of skills is being taught and learned in effective, equitable and efficient ways; provide guidance for its labour market to fully utilise available skill potential; and build strong governance arrangements with sustainable approaches to who should pay for what, when and where.

To meet these objectives, effective skills policies critically hinge on relevant and reliable measures which are still scarce for China. Following a brief summary of key outcomes from PISA for Shanghai, this chapter sets out a framework for the measurement of skills where such measures are most critically needed in China, namely to support people in rural transformation, and then lays out how to implement such measures to support the design of policies. It describes both the traditional measurement instruments presently available, and a new tool for the direct assessment of skills currently being developed by the OECD. It concludes by discussing the need for a strategic, evidenced based approach to skills policy.

Measuring skills through PISA

OECD's PISA provides an instrument for countries to assess quality, equity and efficiency in school education. PISA focuses on the ability of 15-year-olds to use their knowledge and skills to meet real-life challenges. This orientation reflects a change in the goals and objectives of curricula in many countries, which are increasingly concerned with what students can do with

what they learn at school and not merely with whether they have mastered specific curricular content. PISA reveals what is possible in school education, in terms of the achievements demonstrated in the best performing and/or most rapidly improving education systems and thus provides opportunities for peer learning on the development and implementation of education policies. In many countries, PISA is also used to set policy targets in terms of measurable goals achieved by other systems, and to identify policy levers and establish trajectories for educational reform. Last but not least, PISA can assist with gauging the pace of educational progress, through assessing to what extent achievement gains observed nationally are in line with achievement gains observed elsewhere.

Shanghai has been the first Chinese province to fully take part in PISA. The results from this exercise show that 15-year-olds in Shanghai reached the highest performance standards in every subject assessed. In mathematics, the proportion of students reaching the highest level of proficiency was, at 27%, almost ten times the corresponding proportion at the OECD average level. At the very same time, Shanghai was also one of the education systems most successful in moderating the impact which social background has on student performance.

These statistics reflect a consistent trajectory of educational reforms. Shanghai was among the first cities to achieve universal primary and junior secondary education and was also among the first to achieve almost universal senior secondary education. Enrolment at the age of compulsory education is now practically universal, and 97% of the relevant age cohort attends senior secondary school (general and vocational). It is notable that enrolment for preschool programmes was 98%, a rate which surpasses the new national preschool education goal for 2020. OECD data also show that over 80% of the city's higher education age cohort are admitted into higher education in one way or another (compared to the national figure of 24%). Indeed, Shanghai has always been a preferred place to pursue higher education, perhaps second only to Beijing, and has attracted the best students from the national pool of elite candidates.

While Shanghai has been successful in financing a programme to offer free education to migrant children, there are still problems in the provision of upper secondary education to migrant children due especially to the need for children to take university education entrance examinations in the place of their registration rather than the place where they live. Elsewhere in the country, the education of migrant children still poses a considerable problem.

Nine other provinces in China have since carried out their own PISA assessments.

A framework for the measurement of skills

While educational performance in Shanghai illustrates what China can achieve, skills-related challenges elsewhere, particularly in the rural areas, are still monumental. As noted above, building a robust evidence base and framework for measurement will be an essential step to address these.

Measurement to guide skills policies needs to go beyond a simple estimation of the stock of skills expressed in terms of educational attainment and it is essential to think of skills as involving both the supply and the demand side perspective. A conceptual framework for the measurement of skills therefore needs to cover several dimensions as illustrated in Figure 6.1. There are various sources for the **supply** of skills comprising the education and training system as well as migration of skilled workers and participation in the labour market. The **demand** for skills on the other hand is affected by a number of factors. Skills measures also need to consider the **match** of skills demand and supply which in turn will have an impact on economic

performance as well as on individual economic and social **outcomes**. Finally, there are a number of **contextual factors** underpinning skills development which vary from one country to the other and need to be taken into consideration in the design of skills measures.

Box 6.1 The OECD's Programme for International Student Assessment (PISA)

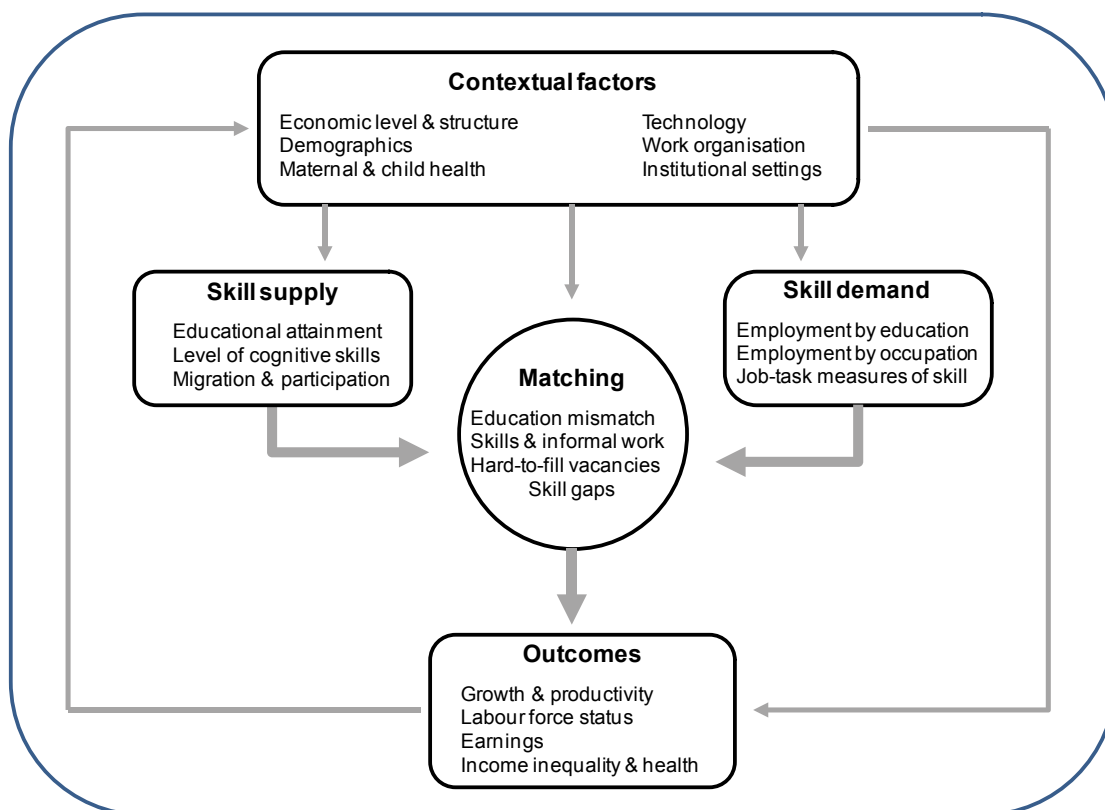
The OECD's Programme for International Student Assessment (PISA) launched in 2000 is a triennial survey of 15-years-old students in OECD member and partner countries that measures the extent to which students near the end of compulsory education have acquired some of the knowledge and skills that are essential for full participation in modern societies.

In total 74 economies participated in the PISA 2009 cycle. Between 4 500 and 10 000 students are tested in each cycle. Students are selected from a random sample of schools (public and private) and are selected according to their age (from 15 years and 3 months to 16 years and 2 months at the beginning of the assessment) as opposed to which grade they belong to.

Focusing on reading, mathematics and science, PISA assesses not merely whether students can reproduce knowledge, but also how well they can extrapolate from what they have learned and apply it to unfamiliar situations, both in and outside of school.

Factors influencing their performance and potential for lifelong learning are also explored in the background questionnaire in which they are asked about their approaches to learning and their social background. The organisation of schools is also taken into account through a questionnaire filled out by school principals.

Figure 6.1 Conceptual framework for the measurement of skills



Current and emerging measures of skills for economic transformation: skills supply

The domain of skills supply has several dimensions. The first dimension covers the stock of human capital in the economy which has been acquired through past investments in skills through education and training as well as the future supply of skills derived from ongoing investments in skill formation. Not all of this investment in education and training takes place through formal channels. In many developing and emerging economies, skills are often acquired informally, on the job and through experience. This has to be taken into consideration when assessing the skills supply. In addition, other factors affecting skills supply in rural areas, in particular, immigration and emigration, movements of population between regions and the level of labour force participation should equally be considered in a comprehensive framework.

Skills development through education and training

The traditional measure to assess the stock of skills available to the economy is educational attainment in the population. In most countries, including developing and emerging economies, labour force and other household surveys provide basic information on the proportion of population by gender and age group at each level of education. To be meaningful for the purpose of developing skills for rural transformation, data needs to be disaggregated by region because typically, the gap between rural and urban educational attainment is high and a national average hides important local variation.

In addition, measures of current enrolment in education and training at different levels, including primary, secondary, post-secondary or tertiary education as well as participation in adult education and training provides information on the kind of skills which will be available to the economy in the near future. More comprehensive data sets provide additional levels of detail, for instance data which distinguishes between the different orientations of post-compulsory education and training programmes (general vs. vocational) and the field of study (*e.g.* science and technology).

Quality of education and training provision

The Millennium Development Goals for developing countries refer, amongst other things, to increase participation in education. Many countries, have made considerable and successful efforts to reach this goal as reflected in the substantial increase in enrolment in schools over the last decade, nowhere more so than in China. However, assessing the quantity of education is not enough: more years of education or higher levels of education qualifications attained, does not necessarily mean more skills have been acquired. The quality of education may vary, especially in the poorer areas of countries. Measures that focus on inputs to education such as student-teacher ratios, teacher absenteeism, school infrastructure and the availability of learning materials add important information on the quality of education provision. Ultimately only a direct assessment of skills can provide a meaningful measure for the quality of education output.

Towards a direct measure of skills

Measures of skills presently available and used in OECD countries as well as developing and emerging economies focus primarily on quantitative proxy for skills such as years of education or the level of qualification attained. However, these quantitative measures are based on the assumption that each additional year of education adds the same amount of skills in all countries and that qualifications acquired in different countries equip people with exactly the same skills.

They also ignore the fact that skills can be acquired informally and outside the education and training system through work experience and that skills decline over time if they are not used.

Recognising the limitations of these approaches, methods have been developed to assess skills directly. School level direct assessments have been used to test performance of pupils at different ages in foundation skills, in particular literacy, numeracy and sciences. OECD's PISA (Box 6.1) is the most comprehensive of these studies. It has been carried out every three years over the past decade and covers now more than seventy economies, including a number of emerging economies. The results of these studies give an indication of the skills of new entrants to the labour force in many economies where progression beyond school is low.

The OECD has also developed methods to assess skills in the adult population through the Programme for International Assessment of Adult Competencies (PIAAC) to contribute to the understanding of how skills are acquired, used and translated into economic and social outcomes. While the methods involved in PIAAC are complex and resource intensive, they increase our knowledge on skills considerably and can set standards for future development of skills measures (Box 6.2) in ways that complement existing evidence as described above to support the development of effective skills policies.

Assessing foundation skills on a continuum

For older cohorts, PIAAC allows the examination and analysis of the processes of skills loss and maintenance and the effectiveness of education and skill formation systems in supporting skills development over the lifecycle. Findings from previous data on adult skills have helped to reveal a consistently negative relationship between foundation skills and age. However, the data also shows that the depreciation of skills may be offset by what people do at work and in their daily lives. For example, evidence from previous data on adult skills suggests that frequent engagement in reading at work and at home may help to mitigate the proficiency declines associated with ageing, though this curve may also reflect cohort effects (Figure 6.2).

Other sources of skills supply: migration and labour force participation

Skills development comprises more than just the education and training system. To get a comprehensive picture of the supply of skills it is necessary to consider also data on migration and on participation in the labour market. Investments in skills which take place locally are not necessarily available to the local labour market later because individuals migrate. In many developing countries, people migrate to urban centres to continue their education and training or to find a job. Or they leave the country altogether to seek opportunities abroad. Therefore, a measure of migration between localities and international migration can provide valuable information on the skills supply. Similarly, skilled workers might become inactive for various reasons so that their skills are not available to the labour market at all, neither locally or elsewhere. A measure of the share of inactivity in the local population complements the information on skills supply.

Measuring skills demand

Increased access to good quality education and training does not automatically lead to better economic outcomes. Skills development above all has to be relevant to the current and future needs of the economy. The reason why participation in education and training is weak in the first place might have to do with the (perceived) lack of relevance of the education provision for the

population. Lack of relevance of educational programmes and curricula can range from a focus on occupations which are not in demand to the language of instruction which is not the one spoken by the local population. In order for education and training provision to be relevant, and hence to be taken up, it is important to assess the specific demand for skills.

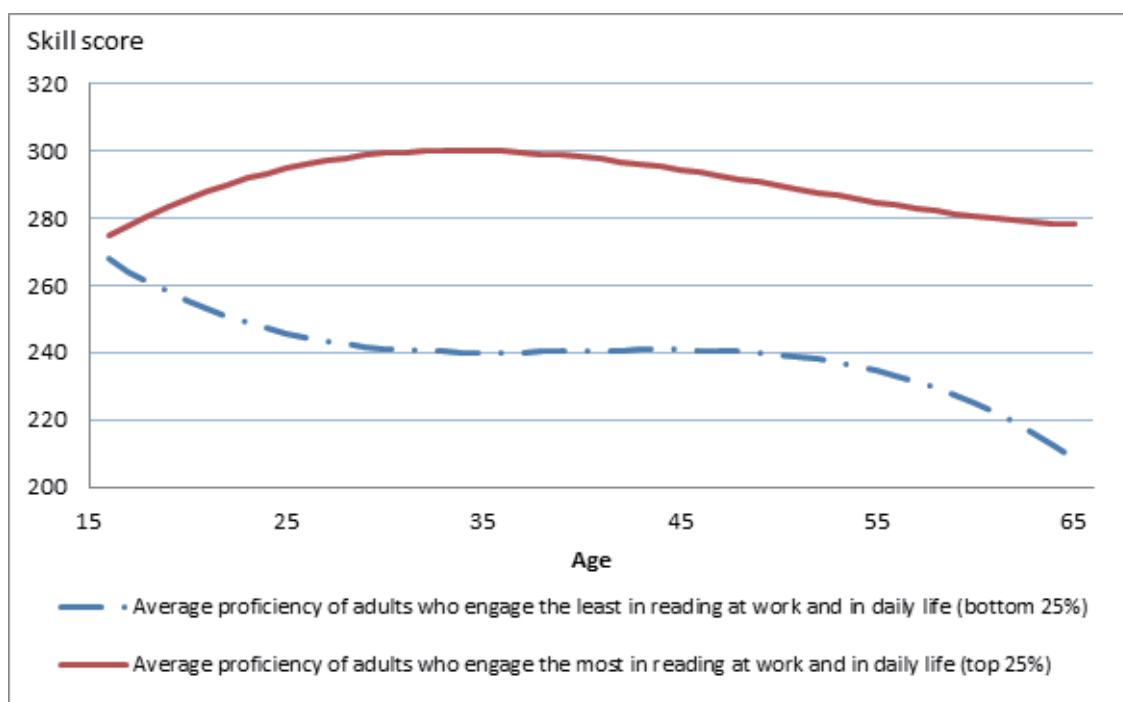
Box 6.2 **The OECD's Programme for the International Assessment of Adult Competencies (PIAAC)**

PIAAC is the OECD's international assessment of adult foundation skills. The survey is based on interviews with a sample of adults aged 16-65 years in their homes to assess their literacy and numeracy skills and their ability to solve problems in technology-rich environments. It also collects a broad range of information on the antecedents, outcomes and contexts of skill development and use. In addition, as part of the assessment of literacy, an assessment of the mastery of the basic building blocks of reading is administered to respondents with low literacy in order to provide detailed information about this important group.

PIAAC focuses on a limited set of general skills, not including an assessment of a broad range of occupation specific skills necessary for rural transformation. However, the survey is based on a broad conception of literacy as a foundation skill which can add complementary value to a simple binary measure of literacy or illiteracy. First, literacy - defined in PIAAC as 'the ability to understand and use information from written texts in a variety of contexts to achieve goals and further develop knowledge and potential' - is a skill, along with numeracy and problem solving, which provides a foundation for the development of other higher order cognitive skills as well as constituting a pre-condition for gaining access to and understanding of specific domains of knowledge. Second, it provides a foundation for acting in an extremely broad range of contexts, from education through work to everyday life. Literacy is also viewed in PIAAC as an enabling skill. Literacy is valuable and valued because it enables people to do things. In other words, literacy is not seen as an end in itself but as a means by which people realize goals and achieve their aims in the various contexts (i.e. home, education, civil society and work) in which they act. PIAAC thus does not seek so much to measure knowledge as the ability to appropriately use information in context.

Moreover, PIAAC conceives literacy (as well as numeracy and problem solving) as a continuum of proficiency involving the mastery of increasingly difficult cognitive operations as well as the ability to respond appropriately to texts containing increasingly complex features. In other words, PIAAC treats literacy as a skill that one can have more or less of and does not try to define a threshold which distinguishes literacy from illiteracy. The downside of such a binary definition is that a share of 100% literacy is easily reached when people have acquired basic literacy skills. However, this does not tell much about how well these people are equipped to operate in more complex situations. A continuous scale in contrast allows the assessment of the level of skills on a scale and to track developments from a low skills equilibrium towards a higher skills equilibrium which is what rural transformation aims to achieve.

PIAAC also contributes to the knowledge about the factors that facilitate the acquisition and maintenance of foundation skills recognising that skills can be gained both inside and outside the formal education system and decline again over time. PIAAC will enhance the understanding of the effectiveness of education and training systems in developing basic cognitive skills and key generic work skills. In particular, it will be possible to examine the extent to which the formal education system has been effective in developing broad based cognitive skills. PIAAC will also allow exploring the sources of skills acquisition and maintenance beyond formal education which is relevant in particular in developing countries and rural areas where much of the skills acquisition happens informally.

Figure 6.2 Reading engagement and foundation skills¹

1. Average proficiency in foundation skills on a scale ranging from 0 to 500 points for adults aged 16 to 65, by reading engagement at work and in daily life, adjusted for years of schooling and foreign-born status.

Source: International Adult Literacy Survey, 1994-98.

In order to make skills supply relevant for the economy, information needs to be acquired about the demand for skills in the first place. Two key indicators might be used to assess the demand of skills in rural areas: employment shares by education background and by occupation. Typically, census, labour force and other household surveys provide this kind of information. In addition, it might be considered to measure the importance of self-employment, as this form of employment is very common in many developing countries and requires its own set of skills, particularly entrepreneurial skills.

One important challenge for measuring the demand for skills in developing and emerging economies arises from the fact that big shares of the economy are in the informal sector. Hence, the demand for skills is equally informal and, due to its very nature, difficult to measure or to include in official statistics. This should be taken into consideration when estimating the relative demand for different skills and developing skills policies based on these estimates.

Responding to radical changes in skills demand

Skills demand can change radically when an economy experiences rapid economic growth and industrial transformation like in China. New sectors emerge requiring new skills, while traditional sectors, especially the agriculture sector, shrink, making some previously needed skills obsolete. This can lead to problems of skills shortages which if they are genuine and persist can put a brake on economic growth, primarily through their negative effect on labour productivity. Therefore it is important to monitor the changing demand for skills and to feed this information into the education and training system so that the supply of skills can be adapted to the changing demand.

To tackle problems of unmet skills demand quickly and efficiently some countries have designed local approaches to skills policies which help to support economic growth leading to major transitions and requiring a strong skills support to be sustainable.

Matching of skills demand and supply and outcomes

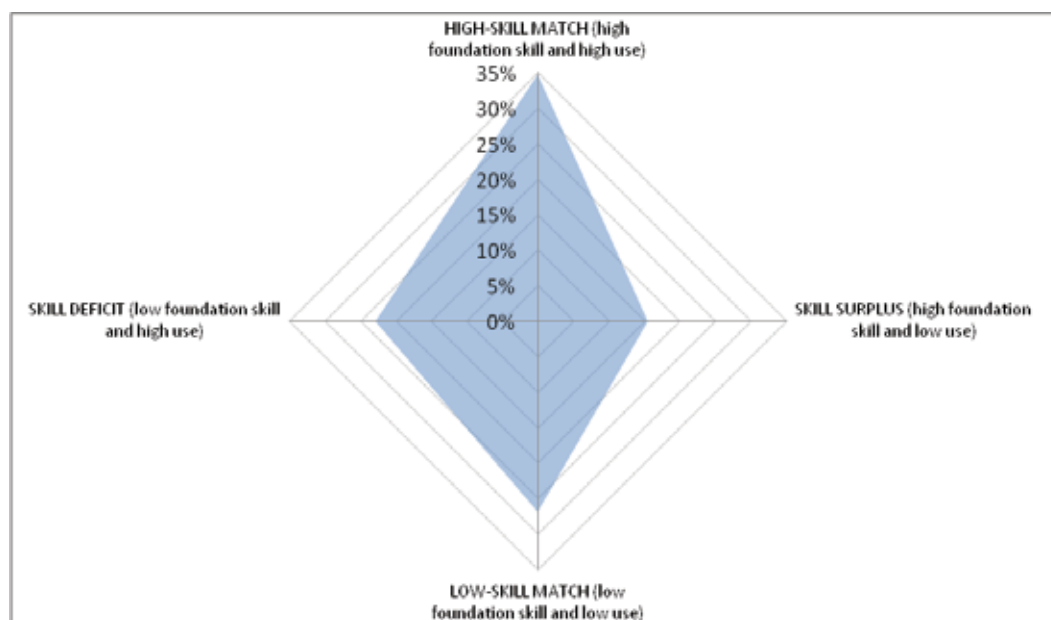
An important issue in all countries is to ensure that on the one hand the education and training system produces skills that are relevant for the labour market and on the other hand that there is effective matching of workers and jobs to ensure that the skills that exist are productively used. In principle, a good match of the skills required in the labour market and skills supplied supports productivity. Higher productivity in turn leads to better outcomes and returns to education both for the individual and the economy as a whole. Rural areas, however, might be stuck in a low-skills equilibrium where demand and supply of skills do match but at a very low level, preventing further development. In such a situation, only an over-supply of skills can trigger a change in the economy towards a higher value-added production and an adaption of the demand for skills to the higher level skills available locally. Moreover, even if the demand for skills in the economy does not follow the supply leading to a higher skills equilibrium, equipping people with minimum foundation skills is desirable as it enables people to acquire the knowledge, skills and values which allow them to improve the quality of their present and future lives.

Measures are therefore also required to assess the match of skills that have been obtained through education and training with those required by employers including those in self-employment. Indicators of over- and under-qualification from census, labour force and other household surveys can be used as one way to measure this, although a more direct measure of skills rather than qualification levels can add complementary value (see below). Two other, more indirect, measures of the matching process might be considered. These are changes in unemployment rates and earnings differentials by educational attainment. All else equal, a rise in the returns to higher education or a drop in the unemployment rate associated with this level would suggest that the demand for workers with these qualifications is outstripping supply. Ideally, it would be useful to supplement these measures with information based on employer surveys of skill gaps and shortages.

Assessing the match of skills and job tasks directly

Traditional measures of mismatch rely on quantitative measures of education (years of education or qualifications attained) as proxies for skills or on the self-assessment of individuals which might introduce substantial measurement error. Data from PIAAC allows examination of the extent to which individuals are in jobs which reflect their level of proficiency in literacy by using direct measures of the skills individuals possess and direct measures of the use of these skills at work.

Data from previous surveys of adult skills presented in Figure 6.3, show how PIAAC (which will provide very similar kinds of data for a larger number of countries) can be used in the future to identify high and low skills match as well as mismatch situations whereby individuals possess high levels of literacy proficiency but are in jobs which do not require them to read or write at a high level or on the contrary individuals which possess only low levels of literacy but work in jobs which require them to read and write at an advanced level.

Figure 6.3 **Match-mismatch between skill proficiency and skill use**¹

1. Percent of workers aged 16 to 65 in each category reflecting match or mismatch between literacy proficiency skills and the use of those skills at work

Source: Adult Literacy and Lifeskills survey, 2003-2007.

Ultimately, policy makers need to understand the impact of skills on economic and social outcomes. Skills contribute to rural transformation and economic growth both directly, through increased productivity, allowing regions to develop their production beyond subsistence, and indirectly, by creating greater capacity of individuals *e.g.* to identify business opportunities and to adopt new technologies and ways of working. Skills also improve the economic and social outcomes of individuals as foundation skills are linked to empowerment, better employment and earning chances and hence poverty alleviation but also with strong positive impact on health and other social outcomes.

A number of indicators of economic performance and labour market and health outcomes can provide information on the links between skills and outcomes. In terms of economic performance, indicators could focus on production growth and the level and growth of labour productivity. Labour market outcomes are represented by employment rates, unemployment and underemployment rates, and earnings. Health outcomes could be assessed using a wide range of indicators, including general health status as well as the prevalence of specific diseases.

As with all other indicators, to be meaningful for the purpose of assessing the role of skills, it is essential that these statistics are gathered at a local level which might be a challenge even for more advanced countries where the local statistical infrastructure is not available and information is accessible only in form of aggregated figures which obscure local details.

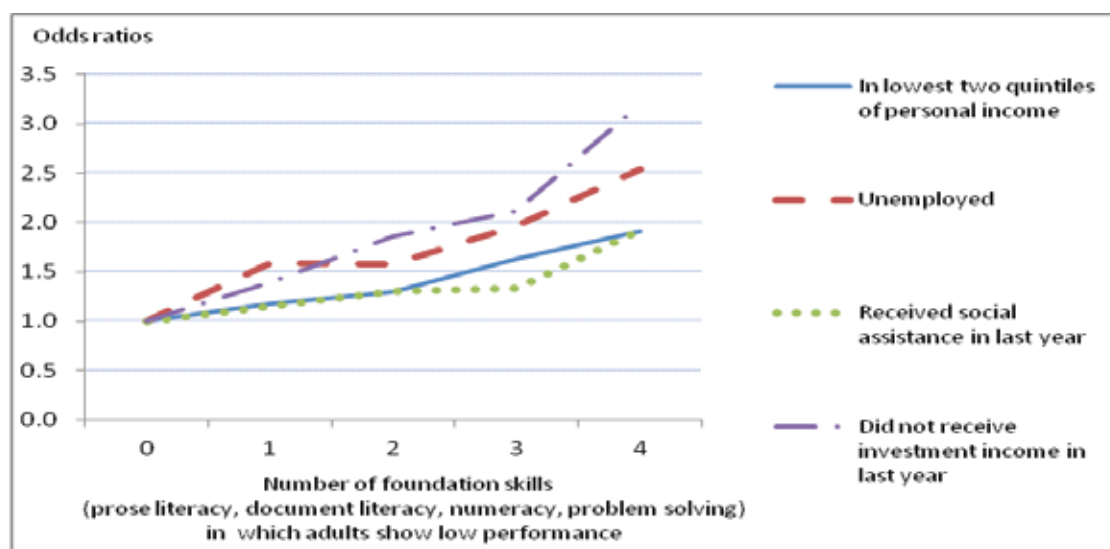
Foundation skills and economic outcomes

Traditionally, indirect quantitative measures of skills such as years of education or qualifications attained have mostly served as proxies to assess the impact of skills on economic and social outcomes. In the future, direct measures of skills from PIAAC for a broad range of

countries will provide policy makers with a better understanding of the role of proficiency in foundation skills in improving the labour market prospects of individuals as well as of its relationship with other outcomes such as participation in training, use of information technology and health.

As an example, Figure 6.4 presents data from a previous study on adult skills demonstrating the strong positive relationship between foundation skills (including literacy) and economic advantage. As the number of foundation skill domains with low levels of proficiency increases, the likelihood of disadvantage increases too. Similar analyses can be undertaken with respect to other outcomes.

Figure 6.4 **Foundation skills and economic disadvantage**¹



1. Adjusted odds ratios showing the likelihood of experiencing economic disadvantage, by foundation skill level, adults aged 16 to 65. Odds ratios reflect the relative likelihood of an event occurring for a particular group compared to a reference group. An odds ratio of 1 represents equal chances of an event occurring for a particular group vis-à-vis the reference group. Coefficients with a value below 1 indicate that there is less chance of the event occurring for a particular group compared to the reference group, and coefficients greater than 1 represent increased chances.

Source: Literacy and Lifeskills survey, 2003-2007.

Contextual factors having an impact on skills development

A set of contextual indicators is required to capture the main drivers of skill supply and demand as well as the key factors affecting the efficiency of the matching process between them. Many of these factors will also affect the outcomes of skill use. Accordingly, a range of measures can be considered including demographics, early childhood development and health, aggregate economic conditions, technology and work conditions, and education and labour-market institutions and policy settings in rural areas. Moreover, it has to be stressed that skills policies are only one of many factors supporting productivity and growth, along with other policy measures aimed at rural transformation, technological change and innovation and more efficient markets.

The supply of skills from education and training is influenced by the quality and relevance of the education offered. In addition, a range of contextual factors can have an impact on skills acquisition, particularly in poorer rural areas. These factors include the cost of education and

the access in terms of availability of transportation or density of education institutions. Other impediments to skills development, in particular in rural parts of developing and emerging economies, are health related. Therefore, data on the health status of mothers and children at different ages are required.

Demographic transformations can have a profound impact on the demand and supply of skills. In China, the combined effects of people living longer and low fertility rates is leading to a rise in the proportion of those aged 65 and over. As a result, the demand for skills is expanding in the health sector. More broadly, in an aging society policies need to support people's continued participation in the labour market.

There are also a number of context factors that need to be taken into consideration when it comes to assessing the demand for skills to support economic development and well-being. These include the structure of the economy, employment patterns, and the share of informal employment. Furthermore, developing ICT skills is only useful if there is demand for such skills and access to ICT related infrastructure is ensured. Likewise, entrepreneurship is unlikely to develop even if entrepreneurial skills are fostered if conditions are not conducive to business. Therefore, indicators on the ease of doing business are helpful to supporting skills development.

Implementing a strategic approach to skills policies based on sound evidence

Developing realistic and targeted skills measures

Only a comprehensive approach to skills policies taking into account all elements of the framework outlined in this chapter will ensure effective skills policies and steer complex systems of skills development and use. Ideally, measures of skills should comprise all dimensions set out in the conceptual framework. However, the capacity to collect and analyse skills data varies across countries. The challenge for many developing and emerging countries is to establish a statistical infrastructure that can ensure that the range of statistics needed for policy purposes are collected on a regular and timely basis and gradually move to the collection of more complex data that are comparable internationally.

In addition, one of the serious obstacles to the analysis of rural-urban differences regarding skills relates to the lack of disaggregated data. Therefore, in order to make measures of skills meaningful for the purpose of rural transformation, it is essential that data collection is designed not only to guide policies at the national level but also to provide reliable disaggregated data and estimates specifically in rural areas.

Using evidence to design effective policies

Developing sound measures of skills demand, supply, match and outcomes as well as contextual factors having an impact on skills is only a first step. Data and evidence need to be used and applied strategically to support a structured approach to skills policy-making for rural transformation. And measures of skills need to be analysed and operationalised to support the development of sound skills policies leading to rural transformation.

Some countries already successfully measure skills and use this data to inform policy design. For example, Sweden took part in the International Adult Literacy Survey (IALS) in 1995 to assess the level and distribution of literacy skills in the population. Based on the results, the government started an adult education initiative (Kunskapslyftet) to boost the level of foundation skills in the population (Veeman *et al.*, 2003). This included study grants and study leave with priority given to the least educated in addition to the existing nation-wide system of adult education provided by every municipality in the country. Other countries have made similar experiences. Box 6.3

describes the case of Australia which has developed a strategic and evidence-based approach to skills policy making that can serve as a model for other countries.

Box 6.3 Using sound skills measures to design effective skills policies in Australia

The 2006 Adult Literacy and Life Skills Survey (ALLS) revealed that Australian language, literacy and numeracy levels have shown little improvement in the decade since the 1996 International Adult Literacy Survey (IALS). It found that:

- Approximately seven million Australians (46 per cent) had literacy scores below the minimum level needed to function fully in life and work; and
- Approximately 7.9 million (53 per cent) had numeracy scores below the needed minimum.

Based on these results, Skills Australia published a National Workforce Development Strategy with recommendations to the government that included upscaling already successful approaches such as the Workplace English Language and Literacy Program for existing workers and the Language Literacy and Numeracy Program for jobseekers. It also recommended developing and implementing a national adult literacy and numeracy strategy to drive improvement and decisively lift Australia's performance for adult language, literacy and numeracy levels. Concrete recommendations included:

- Reframing language, literacy and numeracy as central to participation and productivity;
- Reviewing and building on the extensive work underway through schooling;
- Outlining the total national effort in adult language, literacy and numeracy training and identify gaps and needs;
- Setting clear and achievable targets for success;
- Providing strategies to enhance the language, literacy and numeracy training of the workforce, including a wide range of alternative approaches appropriate to both low and high skilled workers and varied workplace and community settings;
- Providing best-practice models for engaging those who would benefit from language, literacy and numeracy training;
- Including measures to develop the adult language, literacy and numeracy training workforce, including considering the identification and addressing of language, literacy and numeracy issues as a core — rather than elective — component of the Certificate IV in Training and Assessment.
- Evaluating the integration of language, literacy and numeracy skills in training package qualifications; and
- Recognising the shared responsibility of governments, employers and workers as contributors to the development of these skills.

Source: Skills Australia (2010).

A strategic approach to skills policies

Skills policies are complex and involve a broad range of stakeholders. They concern on the one hand a number of supply side actors, typically including the ministries of education, science and technology, but also education providers as well as actors concerned with migration and labour market policies. On the other hand they concern those actors dealing with skills demand.

This includes ministries of labour and industry but also the private sector as well as institutions having as their mission the linking of the two such as employment offices responsible for assisting the unemployed find work. In rural areas, where health status can have an important impact on whether individuals participate and succeed in education, and where, conversely, education can have a strong influence on health outcomes of individuals, it is important to consider actors dealing with issues of welfare and health in conjunction with skills policies.

Given the range of actors involved in skills policies and the linkages between different policy fields, a systematic approach is needed to avoid duplication of effort and take advantage of possibilities for synergies. Similarly, to optimise the efficiency of investments in skills from private and public sources and maximise the returns to such investment, a strategic and coordinated funding approach based on sound principles helps to avoid underinvestment and inefficiencies. Finally, the evidence on skills, which is often collected and managed by different institutions and not always available to all relevant actors, needs to be drawn together and used to support a strategic approach to skills policy-making.

Recognising this, the OECD has embarked on the task to develop a global Skills Strategy, a systematic, evidence-based approach to skills policies aiming to support countries in their effort to formulate sound skills policies on the ground.¹ This strategic approach to skills policies integrates the available evidence on the supply, demand, match and outcomes of skills under a common framework and suggests policy measures on all these areas as well as the financing of skills development and steering of skills systems derived from international best practice.

This blueprint provides guidelines for countries or localities not only regarding which kind of information they would need in order to evaluate their current supply and demand of skills, skills match and outcomes of investment in skills, but also on how to deploy this information to support policies that make the most of each country's or region's human capital by nurturing, and using, the skills of its citizens to foster development.

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¹ A first issues paper has been published in 2011: OECD (2011), *Towards an OECD Skills Strategy* (<http://www.oecd.org/dataoecd/58/27/47769000.pdf>). The complete OECD Skills Strategy is scheduled to be launched in May 2012.

Chapter 7:

Health Care in China: Recent Trends and Policy Challenges

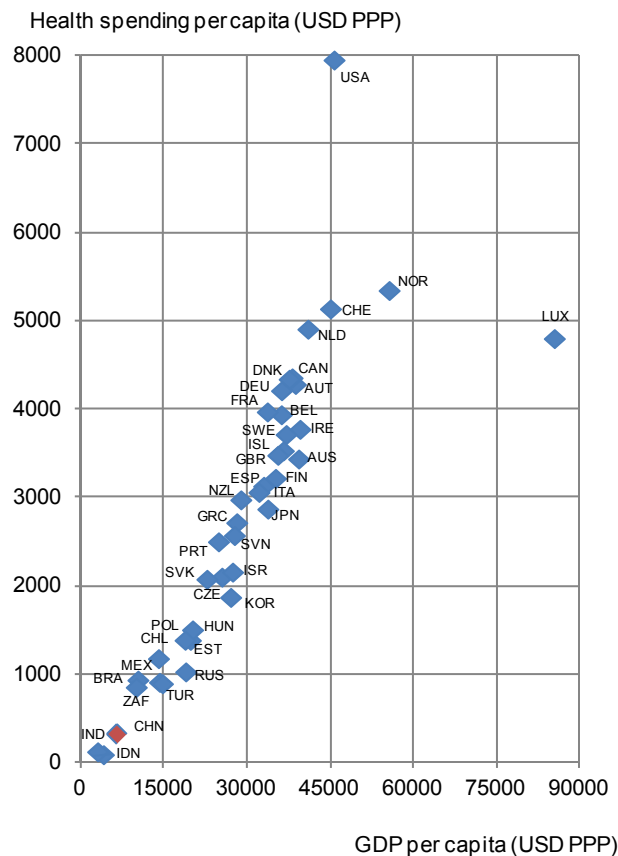
Introduction

Recognising the importance of the health of the Chinese people for future economic growth and well-being, the Chinese government launched a series of ambitious reforms to improve the health of its citizens by achieving universal access to health insurance coverage. Health insurance entitlements and benefits have been reformed to improve access to medical care in all parts of the country. Policies have been introduced to provide affordable access to essential medicines and to align provider payment incentives with general objectives of the health systems. Over time these reforms will further boost the health of the Chinese population, building on earlier major reforms, including those which led to a sharp decline in the prevalence of infectious diseases.

This chapter reviews recent reforms and future challenges for China. Looking ahead, like many OECD and emerging countries, China must address the rise of non-communicable diseases. The growing burden of chronic diseases requires a new approach that can tackle the high level of risk factors and ensure provision of a primary care system that can better detect and treat such diseases. The growth of health insurance has been remarkable, but there are future challenges in coordinating the different schemes. There are also considerable problems in the organisation and financing of the growing hospital sector. Currently, hospitals depend heavily on revenues from selling pharmaceuticals and the current fee-for-service system fuels inefficient use of hospital services. Finally, there is the challenge of improving access to essential pharmaceuticals at affordable prices.

Sustained growth in health spending has accompanied China's economic growth over the past decade. Total health expenditures are now over 5% of GDP, in line with international standards given China's national income. Most of the population is now covered by health insurance and progress has also been made in reducing the share of privately financed health spending including out-of-pocket payments. However, those covered by health insurance are not always protected against catastrophic health expenditure, defined as out-of-pocket payments greater than or equal to 40% of household's non-subsistence income, and many families still fall into poverty due to health care expenditures.

Figure 7.1 Total health expenditure per capita and GDP per capita, 2009



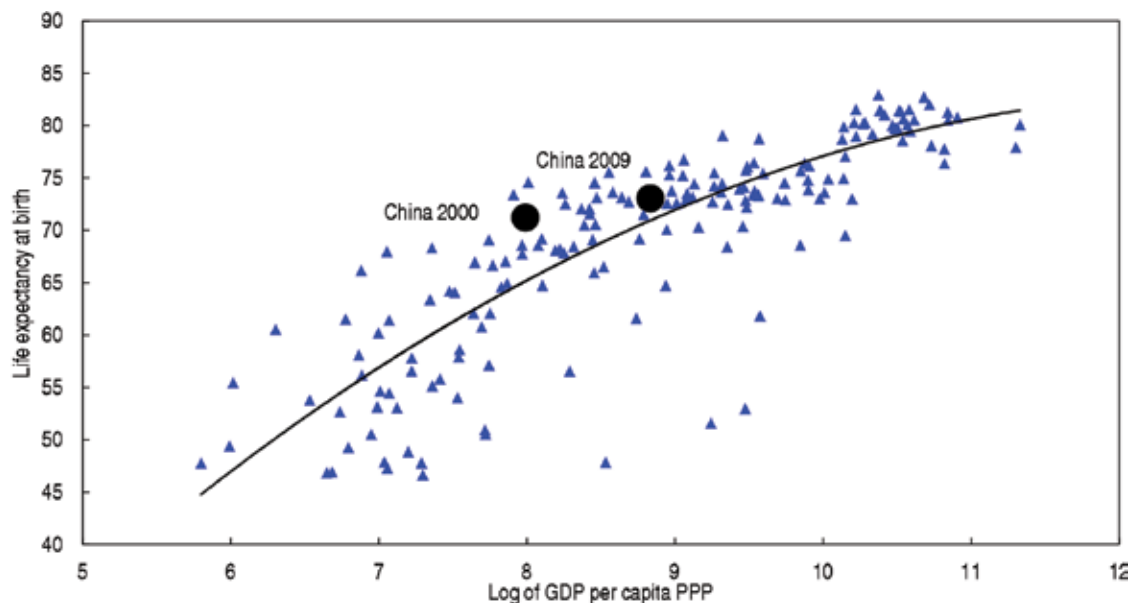
Source: OECD (2011)

China made considerable progress in improving health outcomes at a relatively early stage of development, with life expectancy reaching 67 years by 1980. Since then progress has continued to be made, but at a slower pace, with life expectancy reaching over 73 years by 2009. As a result, whereas life expectancy in China was once high relative to its income level, it is now close to its expected level (as shown on Figure 7.1). Progress in China has been slower than in the poorest OECD countries, as well as in several middle income countries. Moreover, there has been no convergence in Chinese life expectancy relative to the leading OECD countries, despite sustained high economic growth and rising healthcare expenditures.

Improved life expectancy in China is due primarily to dramatic reductions in the incidence of infectious diseases. There has also been rapid progress on the Millennium Development Goals, with substantial reductions in infant and child mortality. China's success in reducing maternal mortality is a model which other countries could emulate, especially concerning expanded access to emergency obstetrics. However, the control of some infectious diseases remains a concern. China has become a global hotspot for multi-drug resistant tuberculosis (TB) with a 100 000 new cases per year (WHO, 2010a). The latter is a man-made phenomenon caused by poor compliance with treatment for TB and is a marker for other health system problems such as weak primary care and the heavy financial burden assumed by individuals for drugs and physician visits. China

also faces an emerging HIV/AIDS epidemic estimated by UNAIDS, WHO and the Ministry of Health at 780,000 people in 2009. Although the prevalence of HIV/AIDS grew rapidly in the last decades, there have been signs that it might have slowed down in the recent years. However in order to scale-up prevention especially among high risk groups and OECD countries have good experience that China could learn from.

Figure 7.2 **Life expectancy and GDP per-capita**



Source: World Development Indicators.

The challenge of non-communicable diseases

The decline in infectious diseases has given way to non-communicable diseases as the major health challenge. Like OECD countries, with older populations and longer life expectancy, China now faces a growing burden of non-communicable diseases: cancer, heart attacks, strokes, asthma, chronic obstructive pulmonary disease, and mental health. Death rates from cancer and cardiovascular disease (strokes, heart attacks, diabetes) have soared since 1990. Non-communicable diseases now account for over 80% of China's 10.3 million annual deaths. Although the change in the disease pattern is partially due to the success of China in reducing infectious diseases, it also reflects the high rate of risk factors for non-communicable diseases.

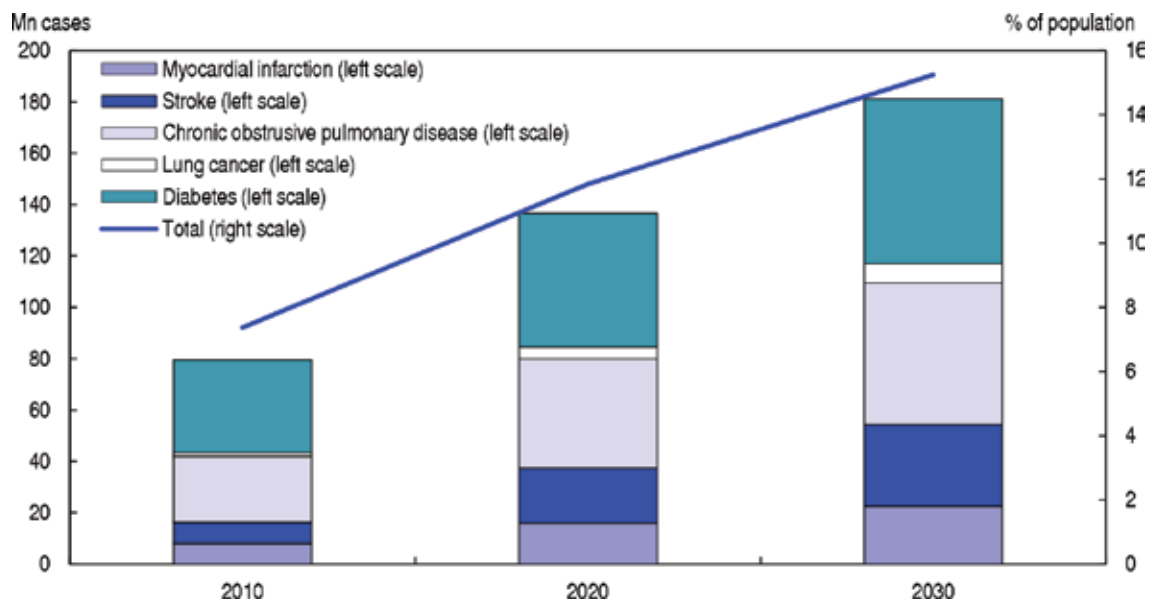
The most dramatic risk factor is smoking. Chinese men have one of the highest smoking rates in the world. About one third of the population over 15 smokes, and the rate for men in 2008 was 57% (70% for those aged 30 to 60) (OECD, 2010c). This is a time-bomb for China and the consequences will have important implications for the future, leading to high rates of lung cancer and cardiovascular diseases. The health effects of smoking are compounded by dietary factors, particularly the high rate of salt consumption, and rising rates of obesity. Chinese salt consumption is 12 grams per day per capita, more than double the WHO recommended level, and in some areas it is as high as 20 grams (World Bank, 2010a). This is reflected in very high and rising prevalence and mortality rates for hypertension and stroke. In 2006, the Ministry of Health reported mortality rates for stroke of about 111 per 100 000 in

urban areas (Ministry of Health, 2006), while the OECD average is 42 per 100 000 for women and 54 per 100 000 for men (OECD, 2011a).

As in OECD countries, the percentage of the population that is obese or overweight has been rising rapidly over recent decades. During the last 15 years in China, overweight rates have doubled and obesity rates tripled. Now, 1 in 3 men and 1 in 4 women are overweight. The increase in obesity has important implications for the health system, since there are high costs for treating obesity and related morbidities (diabetes, cardiovascular diseases, etc.) In the case of China, it is estimated that, when the production losses are added to health care costs, obesity could account for 3.6% of GDP (OECD, 2010b).

China's non-communicable disease burden is higher than other G-20 countries and outcomes are worse. Non-communicable diseases are also projected by the World Bank (World Bank, 2010a) to double over the next decade (Figure 7.3).

Figure 7.3 **Projected cases of non-communicable diseases in China**



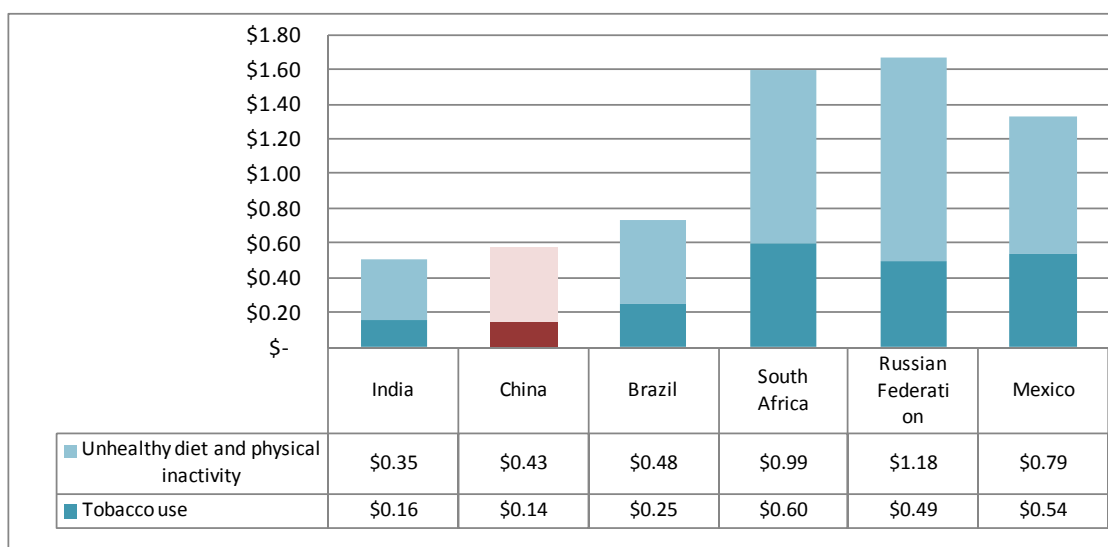
Source: UN population projections and World Bank (2010a).

Many of the non-communicable diseases in China are avoidable. Most of cardiovascular disease, diabetes, cancer, and lung disease are preventable using good population-based public health interventions, coupled with screening and treatment in primary care. The OECD, in collaboration with the WHO, analysed a range of interventions to prevent chronic disease by reducing smoking rates, improving diet and increasing physical activity. The purpose of this research was to help governments choose the portfolio of interventions that would make the best use of the resources available.

For instance, the high costs of smoking in terms of premature deaths from cancer and cardiovascular diseases have led most OECD countries to introduce a wide range of interventions to decrease smoking. These interventions were followed by a decline in smoking rates in most OECD countries. Therefore, there might be a scope for reducing high smoking rates in China through broad interventions as outlined in the WHO Framework Convention on Tobacco Control (FCTC). These interventions include increased taxes on tobacco products, enforcement

of smoke-free workplaces, requirements for FCTC-compliant packaging, labelling of tobacco products combined with public awareness campaigns about the health risks of smoking, and a comprehensive ban on tobacco. According to Cecchini et al. (2010), the cost of such a package would amount to \$0.14 per capita per year, much lower than in other large middle income countries (Figure 7.4.)

Figure 7.4 **Annual cost of a preventive package to tackle important risk factors for chronic diseases**



Source: Cecchini et al. (2010)

Mass media campaign, food taxes and subsidies, nutritional labelling and marketing restrictions are all cost-effective interventions (WHO, 2011). OECD and WHO (Cecchini et al., 2010) assessed the potential impact of a prevention package that encouraged people to have a healthy diet and practice physical activity using all these four intervention channels. In the case of China, they expected a yearly gain of up to 975000 life years. Figure 7.4 shows that the cost of this package in China would amount to \$0.43 per capita per year, again much cheaper than in the other large middle income countries except for India. Such an investment would be completely offset in the medium term (e.g. 30 years) by the savings from avoided health care episodes for major non-communicable diseases (Cecchini et al., 2010).

The analysis of cost-effectiveness of the intervention packages for obesity and in the context of middle income countries showed that:

- A strategy of several interventions would generate substantially larger health gains than would individual interventions. In the case of China, the suggested prevention package becomes cost-saving in approximately 30 years.
- Price interventions (such as a tax on fatty foods) and regulation (on food labelling) can produce the largest health gains in the short-run.
- Interventions in primary care (such as physician counselling on diet) can be very effective in scenarios with less capacity constraints.
- Health gains from interventions targeting children occur in the long term—over 50 years.

Regulation of food advertising to children can be more effective and efficient than can school-based health promotion.

- Cost-effective interventions aimed at tackling obesity by improving diets and increasing physical activity could usefully be added to a wider package of measures designed to deal with chronic diseases.
- Private-sector initiatives might contribute to tackling some risk factors while alleviating the burden on public-sector budgets, but more evidence of their effectiveness is needed.

That said, preventing the rise in chronic diseases is beyond the power of the health sector alone: tackling the social determinants of these diseases requires concerted government action across different policy areas.

There are also important implications for the health system in tackling chronic diseases. The current health system is tilted towards the provision of complex hospital care. The result is that chronic diseases are addressed very late in their course, leading to preventable complications such as stroke due to untreated hypertension. Instead, the focus should be on providing cost-effective interventions in primary care settings, including screening for hypertension and diabetes and effective treatment as well as increased public education. Unfortunately, the health insurance system provides greater subsidies for the treatment of conditions in hospitals rather than ensuring access to screening and essential drugs in primary care.

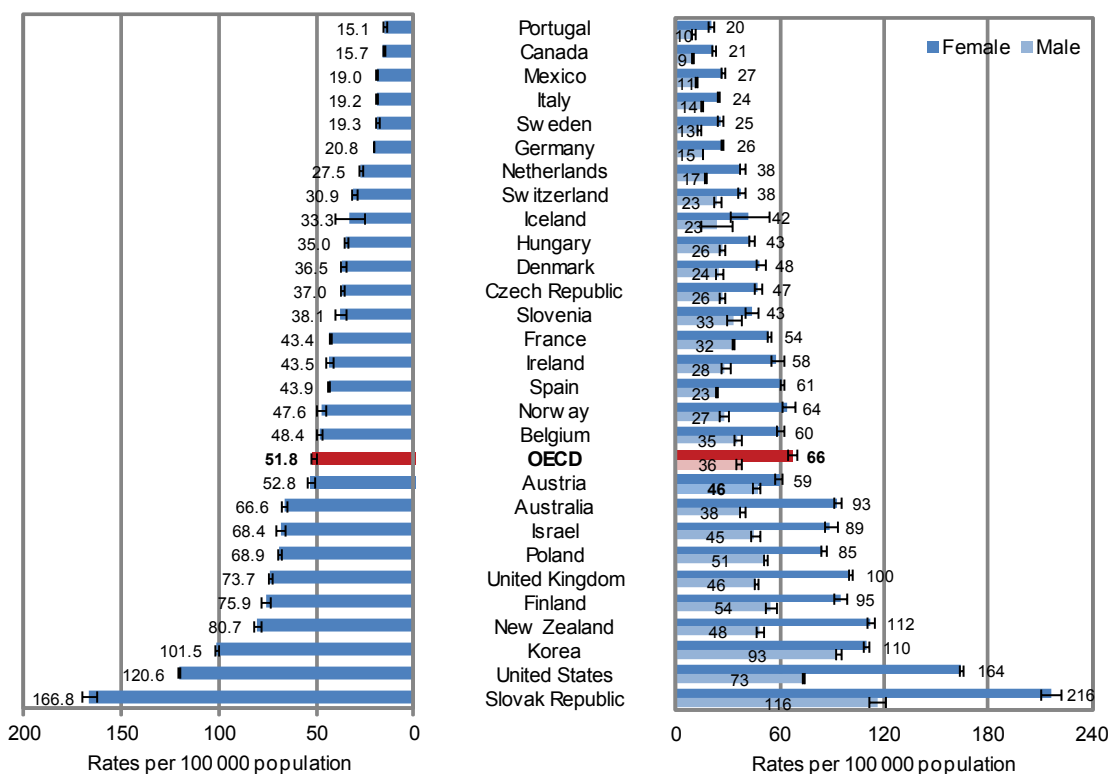
In 2011, the government released guidelines for the establishment of a general practitioner scheme which will be developed over the coming years. Following the approach used by a number of OECD countries, the scheme will see general practitioners play a key role in the provision of primary healthcare, and become gatekeepers of the health system. A cornerstone of the new scheme is the introduction of a standardised accreditation and training system, built upon a five year undergraduate degree programme plus a further three years of clinical training. Importance is also given to maintaining and upgrading skills of doctors through retraining, as well as professional evaluations. The system will give patients enough flexibility to choose their own general practitioner within a specified geographic area, such as a city or district, and fees will be regulated by the government. To ensure an adequate supply of doctors across the country allowances and other financial incentives will be provided to those working in remote areas.

Mental health also needs to be supported through prevention, concerted action and effective delivery of health care services. Although declining, suicide rates are especially high for patients with depression and anxiety disorders, particularly among women and migrant workers (Phillips, 2002). While OECD countries have moved towards deinstitutionalization, China is still responding to the rise in mental illness by building more and larger mental institutions. Although all countries require some mental health beds for those dangerous to the community, most people with mental illness pose no danger and can be treated in the community. The trend in many OECD countries has been a decrease in mental health beds and greater care in the community. Also, the largest burden of mental illness is for less severe conditions, *e.g.*, depression and anxiety disorders, which can be treated in primary care. These conditions may be neglected in China. For example, the treatment of depression is not included in the essential drug list for primary care, despite being highly cost-effective (OECD, 2012, WHO, 2010b).

A critical question for China is to assess and monitor the quality of care for people with non-communicable diseases. The OECD Health Care Quality Indicators Project was set up to allow countries to benchmark their performance especially for non-communicable diseases.

The project began in 2002 and now covers all OECD countries in the following areas: Health Promotion; Prevention and Primary Care; Mental Health Care; Cancer Care; Patient Safety; and Patient Experience. Quality Indicators are approved by national and international experts.

Figure 7.5 **An example of quality indicators collected in the OECD Health Care Quality Indicators Project: Asthma hospital admission rates, population aged 15 and over, 2009 (or nearest year)**



Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Note: Rates are age-sex standardised to 2005 OECD population. 95% confidence intervals are represented by H.

Source: OECD Health Data 2011.

China could consider collecting systematic Health Care Quality Indicators for non-communicable diseases, such as asthma (illustrated in Figure 7.5), myocardial infarction, stroke, diabetes and cancer. Currently, there are only a few cancer registries in China, covering a small proportion of the country. There is also virtually no information available on hospital mortality or re-admissions rates and data on primary care are scant. The growth of the new insurance system will provide an opportunity to begin collecting information on the quality of medical care.

Health insurance coverage has expanded, but fragmentation remains

As mentioned, health insurance coverage has been expanding rapidly in China and the government has made progress in unifying different schemes. In 2008, the co-existence of three health insurance schemes with different features and local variants made for a fragmented system, which did not guarantee access to basic medical services to the whole population. Reforms announced in 2009 by the State Council established priorities to overcome these difficulties.

The three schemes target different populations and are administered by different levels of governments, with different eligibility rules, approaches to financing and benefit coverage. The longest standing scheme, the Urban Employee Basic Medical Insurance scheme (UE-BMI), is mandatory for all employees and retirees in urban areas and covers over 230 million people, though in reality far from all employers declare their employees to the insurance funds. It is administered at municipal level and financed through employer and employee contributions (respectively 6% and 2% of payroll). Two newer schemes have been introduced. The Urban Residents Basic Medical Insurance scheme targets non-working urban residents, such as children, students, elderly and the disabled. It covers about 195 million people. The scheme is also administered at municipal levels, with variations across cities in eligibility, financing and benefit packages. Subscription to the scheme is voluntary and co-financed by government subsidies (Barber and Yao, 2010). The biggest extension of insurance came with the progressive introduction of the New Rural Cooperative Scheme (NRCMS), which targets rural populations, and covered 836 million people by 2010, over 95% of the targeted population (NBS, 2011). The scheme, administered at the county level, is voluntary and financed through individual fixed premiums and subsidies from central and local governments. Benefit levels are low, with the average annual payment per beneficiary being USD 16. These health insurance schemes are complemented by a Medical Financial Assistance Programme (MFA), funded by all levels of government, to ensure access to care for the poorest part of the population and prevent further impoverishment for medical reasons. The MFA covered a little over 93 million people in 2009.

The progressive implementation of these schemes has ensured that the proportion of the population covered by basic insurance has increased sharply, to around 95% by 2011. Concomitantly, the private share of health expenditures has fallen considerably, from 60% in 2001 to around 35% in 2010. High direct payments by households include high cost-sharing requirements - for instance, reimbursement for inpatient care in the NRCMS only accounted for 41% of costs in 2009. The government is pursuing efforts to expand coverage and limit out-of-pocket payments. More specifically, it intends to provide safe, affordable and effective health care to all citizens by 2020 by further raising health insurance coverage, establishing a national essential drug programme, introducing gate keeping to reduce the hospital burden, improving basic medical services for screening and prevention, and experimenting with reforms of public hospitals to improve their management (Herd *et al.* 2010).

However, there remain considerable challenges in coordinating the wide range of insurance schemes that cover different populations with different benefit packages. In particular, the fragmentation of insurance schemes has particularly affected the effective coverage of migrant workers. Typically enrolled in the NRCMS, migrant workers usually pay high out-of-pocket expenses and have to claim reimbursement of fees in their home county with much lower reimbursement rates and long time lags (Qiu *et al.*, 2011). Also, the method of payment used by the insurance funds is fuelling the growth of the hospital sector as discussed below.

Further reform of the public hospital system is required

Hospital reform ranks high on China's policy agenda, in particular, tackling the increasing problems with financing and managing public hospitals. To date, however, progress has been limited. The combination of rising incomes and expectations and greater financial coverage of health costs has driven a rapid expansion of the hospital sector especially in urban areas (Table 7.1).

Table 7.1 **Hospitals and hospital beds in China**

	Number of hospitals	Number of beds	
		Total	Per 1000 residents
1990	14377	1868900	1.6
1995	15663	2063300	1.7
2000	16318	2166700	1.7
2005	18703	2445000	1.9
2010	20918	3387400	2.5

Source: NBS (2011).

The increase in hospital capacity is not, however, uniform across China, with wide differences between provinces, as well as between urban and rural areas. Beijing has almost three times more hospitals per capita (around 27 per million residents) than Guangxi (around 10 per million residents). Hospitals have mostly expanded in urban areas, especially large university-based hospitals providing high-technology services. Although there are many smaller hospitals, they have low occupancy rates and make up a diminishing proportion of total hospital beds.

The number of hospital beds is still low, with around only 2.5 beds per thousand residents compared to the OECD average of 4.9. However, OECD countries are now beginning to reduce the size of the hospital sector in response to the rise in chronic diseases; it is expensive and often ineffective to concentrate care for these diseases in hospitals rather than in the community. There has been a steady decline in hospital beds in OECD countries, whose experience suggests that hospitals should focus more on new modes of integrated care to prevent and treat chronic diseases which require fewer beds and stronger primary care.

Both the number and skill level of doctors have also increased in the past five years. After a decade of stagnation, the number of doctors rose by over 20%. In hospitals, the proportion of doctors with at least a university degree in medicine has risen by 14 percentage points in five years, to reach 62%. However in lower level institutions, the proportion of doctors with this level of qualification is still below 10% (MOH, 2011).

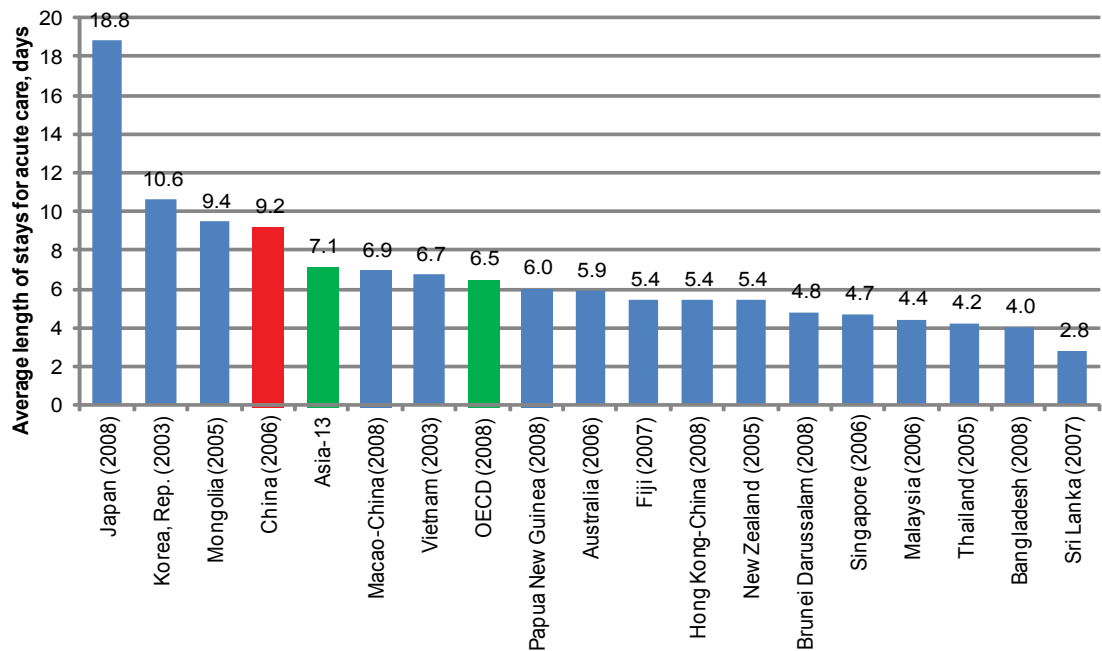
Currently, most hospitals are publicly owned and highly regulated, with restrictions on prices of hospital services and management of health personnel. However, although ownership remains public, most of the financing of hospitals comes directly from patients. It is estimated that government funds make up only 10-25% of the operating revenues of hospitals, the remaining part being mainly financed through charging patients for drugs- and high-technology procedures. Revenues from the insurance system have been increasing recently, thus creating an opportunity for change.

The current payment system for hospitals distorts the provision of services. Regulated hospital prices are structured in such a way as to give incentives to oversupply high-technology services and medications, since this is where more revenues are generated (see below). The government has attempted to deal with the problem by restricting the mark-up that can be charged on pharmaceuticals, but to date this is only at the primary care level. Yet, this approach does not address the underlying problem, which is that government is providing inadequate financing to fund the operating costs of hospitals and hospitals are required to make up the difference by charging patients.

There is widespread evidence that the Chinese hospital system is relatively inefficient. The best illustration of the inefficiency is the long lengths of stay compared to OECD countries. China

has an average length of stay for acute beds of 9.2 days, well above the OECD average of 6.5 days (OECD, 2011a).

Figure 7.6 **Average length of stays for acute care in hospitals, 2008**
(or nearest year available)



Sources: OECD Health Data 2010; National Data Sources (see Annex 1).

This suggests that the potential pay-offs from reducing the average time spent in hospitals are considerable in terms of efficiency gains, as significantly more patients would have access to hospital care. As mentioned, however, there is also evidence of a considerable scope for improving the quality of care provided by Chinese hospitals.

One particular efficiency problem is with township health centres, which are predominantly located in rural areas. These have very low occupancy rates, as most patients (except those too poor for any alternative) choose to bypass them and go to county or urban hospitals. This is unsurprising as township health centres are underfunded and provide low quality care. One policy question is whether they should remain part of the hospital system or be transformed into ambulatory clinics. Under the new reforms they receive a public subsidy to deliver the basic public health package which is a move in the right direction. However, China needs to determine whether to try to improve township health centres or shift rural care towards county hospitals and gradually make township health centres the hub of rural primary care.

The expansion of health insurance presents an opportunity to modernise the hospital sector. First and foremost, there needs to be a change in the hospital payment system. In the current administrative pricing system, the regulated fees bear no relationship to the cost of producing health services. At the very least, the fees should be raised to match the cost of production and should not favour high technology services. More importantly, a fee-for-service system is inherently inflationary, which is the main explanation for why most OECD countries have chosen

to abandon it. Notably, they have moved towards a case-based payment system, using diagnostic related groups, often combined with a global budget. Even though a case-based payment system is appropriate for China insofar as it helps to reduce the average length of stays, it does not control admissions, which have been increasing over the past decade. For China to move towards a mixed diagnostic related groups budgeting system for hospitals, considerable changes in the currently fragmented health insurance system would be required.

Given the large-scale reforms underway, China has the chance to re-think the role of the expanding hospital sector, taking into account that many countries are reducing their reliance on hospital care. Expanding primary care and care in the community while moving away from hospitals is a policy objective in many OECD countries, witness the de-institutionalisation of the mentally ill and care in the community for mental illness. For other diseases like diabetes and hypertension, early diagnosis and treatment should be improved, as well as public awareness campaigns. The health system needs to support patients to ensure that they understand their chronic conditions and follow the recommended treatment regimens which often require taking medications for the rest of their lives. This requires a strong system of primary care and patient support that is lacking in China. There is also a need for much greater information on hospital performance in China, for both quality and cost. China would benefit from more systematic reporting of health care quality indicators. Finally, China should give more consideration to solving the governance problems of Chinese public hospitals by giving them greater latitude to control their own personnel to adapt to rapidly changing circumstances. The rise of chronic disease will be the key future challenge for China and the health system will need to be adapted to move toward greater reliance on primary care that is well coordinated with specialist hospital care.

A national pharmaceuticals scheme is being implemented to improve access to affordable medicines

The National Essential Drug Programme, a recent reform priority of the State Council, aims to provide affordable access to essential medicines and promote the rational use of pharmaceuticals (Barber and Huang, 2010). The operational goals are to: ensure that “essential medicines” will be available in all public primary care facilities at no or low cost for patients; remove providers’ incentives to overprescribe medicines; and improve tendering processes to obtain inexpensive quality medicines.

The Essential Medicine List is defined according to a two-stage approach. First, a national list is defined at the central level by a committee of scientific experts and government representatives for all essential drugs expected to be available in primary care facilities. Provincial authorities then undertake another selection process to amend (within limits) and complement the national list, adapting it to local health needs and financial resources. Health insurance schemes define their own formularies with a similar process.

In order to secure access to inexpensive quality medicines, centralised procurement procedures are to be put in place, launched at provincial level. In this framework, provincial authorities have been piloting various tendering processes, whose assessment should help determine the most efficient ways to get low prices and high quality essential medicines. Centralised purchasing is also expected to improve the availability of drugs in health care facilities.

To promote the rational use of medicines, evidence-based guidelines have been disseminated

in the medical community, and efforts are underway to remove the financial incentives that encourage irrational prescribing. As noted above, community health centres and hospitals (in which people too often seek primary care services) have long earned a profit from selling medicines prescribed by their staff to patients. Indeed pharmaceutical mark-ups represent a large share of providers' institutions revenues: for instance, in 2007, community-based primary care centres drew 70 to 80% of their revenues from these mark-ups (Wang et al., 2011). This naturally provides an incentive to prescribe more and more expensive drugs. Under the new system, local governments have been increasing their funding to health care institutions – mainly publicly-run community health care centres – in exchange for the implementation of a “zero mark-up policy”.

These reforms represent a significant step forward and will help control future healthcare costs. In 2008, pharmaceutical spending accounted for 2.1% of GDP, or 49% of total health expenditures, which is high by international standards (Barber and Huang, 2010; OECD, 2010a). Pharmaceutical consumption is only expected to increase, driven by the shift in morbidity, population ageing, expansion of health insurance, and growing attention of pharmaceutical companies to one of the fastest growing markets in the world. As such, the adoption of a sound system to ensure efficient use of pharmaceutical spending is a priority.

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Chapter 8:

Nuclear Energy in China: Views and Prospects from the OECD Nuclear Energy Agency's Perspective

Introduction

As a result of strong economic growth, China's demand for energy has increased rapidly in recent years. China's biggest energy source is coal (over 71%), creating a significant impact on the environment. As reflected in recent Five-Year Plans for National Economic and Social Development, China has aimed to increase the use of non-fossil fuels. The 10th Five Year Plan (2001-2005) called for the construction of eight nuclear reactors, while the 11th Plan (2006-2010) included more ambitious environmental goals. The 12th Plan (2011-2015) specifies an increase in the number of reactors. From 40 Gigawatts electrical (GWe) today, the nuclear installed capacity would reach 60 GWe by 2020, 200 GWe by 2030, and 400 GWe by 2050. However, even by 2050, this is expected to represent only around 10% of China's electricity generation capacity.

According to the March 2005 Medium and Long Term Plan for Science and Technology (2006-2020) China aims to rely on self-design and innovation while making use of international advanced technology and experience. Above all, the government insists on putting safety and quality first. Its industry will provide an integrated capability for building advanced nuclear power plants in batches and will be able to build, operate and manage nuclear plants in a way that conforms to international advanced standards. During the period of the plan the government aims to establish a nuclear power industry with a complete set of regulations and standards.

The fleet of reactors and the impact of the Fukushima-Daiichi accident

China has currently 15 power reactors in operation and leads the world in terms of nuclear power plant new builds, with 26 reactors under construction and 51 planned. At the end of 2010, China's nuclear power generation was 87 400 GWe, amounting to less than 2% of the country's total electrical power production. Several major state-owned companies dominate the nuclear power industry, both as operators and owners, including the China Guangdong Nuclear Power Corporation, the China National Nuclear Corporation, and the China Power Investment Corporation.

Reactors in operation and under construction are from different generations and technologies, mainly from France and the US, but also from Canada and Russia. Historically, China's approach has been to import technologies to learn from world top nuclear players, then adapt, change, and finally build their own. China fulfilled its goal to develop domestically designed reactors mainly with the CNP¹-1000 and the CPR²-1000.

The Generation II+ domestic technology was intended to become the backbone of China's nuclear power plans until the Fukushima accident occurred. At present, China focuses its efforts on building Generation III+ reactors, given their improved safety features. A recent Chinese-French project of designing an improved CPR was announced in January 2012, while a Chinese-US Generation III+ design has been under development since 2008.

Generation III+ reactors under construction include US/Japan Westinghouse's AP-1000 (four units in Sanmen and Haiyang sites) and two EPR³ units from France's Areva (Taishan, Guangdong province). Specifically, EPR construction schedules have turned to be quicker than similar design reactors being built in Europe.

China has also completed construction of a fast neutron reactor, the Chinese Experimental Fast Reactor, which was connected to the grid in 2011. China, along with other countries, is conducting research on new reactor designs, Generation IV technology. Presently they are supporting two distinct concepts, the Very High Temperature Reactor and the Sodium-cooled Fast Reactor. The US has also chosen the same concepts.

There are 15 research reactors operating in China. One in particular, the Chinese Advanced Research Reactor, has the most advanced technology among all neutron beam research reactors in the world. It can be used for research in many fields such as nuclear physics and nuclear chemistry, neutron scattering experiments, testing of reactor materials and atomic fuels, neutron activation analysis and the production of radioactive species and neutron-doped silicon.

China is in the process of revising its safety regulations in the light of the Fukushima-Daiichi accident. On 16 March 2011, just 5 days after the Fukushima accident, the State Council announced the temporary suspension of the approval procedure for all new nuclear power projects, including those in the preliminary stages of development, and the safety assessment of all nuclear power plants under construction. A month later, a national inspection group, composed of the National Energy Administration, the National Nuclear Safety Administration and the China Earthquake Administration, began checking the safety of nuclear plants under construction and in operation.

The fuel cycle

China intends to become self-sufficient in most aspects of the fuel cycle. At present however, the country largely relies on foreign suppliers for all stages of the fuel cycle from imported uranium, conversion, enrichment to fuel fabrication services. Current domestic uranium mining supplies less than 50% of China's needs. Currently identified resources of 170,000 tonnes Uranium (tU) are inadequate for the country's long-term needs, although ongoing exploration efforts have led to discoveries in sandstones in the north and northwest China, and deep hydrothermal vein type deposits in southeast China.

1 Comprehensive Nuclear Power

2 Chinese Pressurized Reactor

3 European Pressurised Reactor

The China National Nuclear Corporation (CNNC) has established a subsidiary, the China Nuclear International Uranium Corporation, to secure uranium resources abroad. China has made several joint ventures and other types of contracts with countries such as Kazakhstan, Namibia, Niger and Australia, while other sources are progressively being added.

Increasing investment in exploration projects outside of China to secure the supply of uranium and, hence, to support the planned nuclear generating capacity expansion is a likely evolution. Also, with the vast amount of land available in China, additional efforts to increase uranium exploration within the country may be considered, as well as increasing investments in mining technologies to improve the efficiency of existing operations.

China has plans to re-use spent fuel with reprocessing technology and mixed-oxide (MOX) fuel production. A pilot reprocessing plant using the Purex process with a capacity of 50 tonnes per year was commissioned in 2010 at Lanzhou Nuclear Fuel Complex. In November 2007, Areva and the CNNC signed an agreement to assess the feasibility of setting up a reprocessing plant for used fuel and a MOX fuel fabrication plant in China. In 2010, a subsidiary of GDF Suez, Tractebel, signed an agreement with CNNC to build a MOX fuel fabrication plant.

Regarding waste management, China is committed to dispose in a national centralised geologic repository high-level and other radioactive waste that is not suitable for near surface disposal. While operation of a geologic repository is not expected before 2050, a R&D programme has been set up and an underground geological laboratory should be established by 2020. Siting studies and a site characterisation programme have been started on a granite formation in the northern mountains region in northwest China at Beishan, near the Gobi Desert. Currently, the Beijing Research Institute of Uranium Geology is exploring the site and several boreholes have been drilled to determine the suitability of the site for long-term disposal.

China and the OECD Nuclear Energy Agency

Currently, China is a member of the Multinational Design Evaluation Programme (MDEP). This international initiative, for which the OECD Nuclear Energy Agency (NEA) acts as the technical secretariat, aims to develop innovative approaches to leverage the resources and knowledge of the national regulatory authorities that will be tasked with the review of new reactor power plant designs. Within the MDEP, China participates in all working groups, including on the EPR and the AP1000 designs, vendor inspections, codes and standards and digital instrumentation and controls.

China participates in the Generation IV International Forum (GIF), where the NEA also acts as the technical secretariat. GIF is a co-operative international endeavour organised to carry out the research and development needed to establish the feasibility and performance capabilities of the next generation of nuclear energy systems.

China contributes to the Information System on Occupational Exposure project. This is a joint effort between the NEA and the International Atomic Energy Agency (IAEA) to collect data on the amount of radiation a worker receives in the workplace. Chinese experts also participate in an NEA project evaluating best practices in the management of radioactive effluents from nuclear power plants.

China also participates in the NEA-IAEA Uranium Group, an international committee that assesses global uranium resources, mine production and future demand every two years, publishing results in a series titled "Uranium Resources, Production and Demand" (commonly known as "the Red Book").

China took part in the International Conference on Access to Civil Nuclear Energy held in Paris in March 2010. French President Nicolas Sarkozy opened the conference attended by 40 ministers, and around 1200 participants from 63 countries. The conference was co-organised by the NEA. The objectives of the Conference was to respond to the needs of States wanting access to civil nuclear energy with regard to training, financing, support to the implementation of the highest safety and security standards as well as assistance for the setting up of the technical/regulatory frameworks and infrastructures.

Increased co-operation between China and the NEA: mutual benefits

Nuclear safety and regulation

The NEA nuclear safety activities provide participating members with policy and technical analyses that can be directly used in their day-to-day work of safety authorities. The activities may be grouped into four categories, policy and regulatory activities, technical activities, safety research activities and design review activities for new builds. Participating in NEA's activities has been considered beneficial by nuclear states as it allows them to:

- Have access to regulatory policies based on best practices resulting from NEA safety activities.
- Benchmark their own national regulatory practices against other NEA members' and the consensus derived from NEA safety activities.
- Compare their approach to regulatory inspection with the ones based on other members' practices.
- Use a reliable network of experienced regulators to interact easily and efficiently with other safety authorities.
- Share knowhow regarding technical safety of nuclear plants: the participation in NEA working groups on nuclear safety ensures that good practices and technical responses common to countries representing 85% of the world's installed capacity are shared among member countries' regulators and utilities.

Radioactive waste management and decommissioning

Though an operating repository is not expected before 2050, China has probably an interest, much like other nuclear countries, to develop a deep geological disposal location for high level waste. An NEA Collective Statement (September 2008) states that geological disposal affords unparalleled protection, is technically feasible and widely adaptable to diverse geology. Worldwide, increasing involvement of stakeholders has been noted and societal requirements are taken into account in developing geological repositories. Cultural, societal and geographical specificities have resulted in a variety of paths, yet with common underlying safety and security objectives; moving forward now with implementation of geological disposal is desirable from the point of view of both ethics and safety.

China could certainly build on NEA countries' experience in this area, as they have developed a common understanding of the strategic and policy issues associated with long-term waste management, developing a modern concept for the safety case for geologic disposal and ensuring stakeholder confidence.

The NEA also provides a focus for the analysis of decommissioning policy, strategy and regulation, including the related issues of management of materials, release of buildings and sites from regulatory control and associated cost estimation and funding. Beyond policy and strategy considerations, the NEA also reviews practical considerations such as techniques for characterisation of materials, decontamination and dismantling.

Radiological protection and emergency preparedness

The NEA has interacted actively in developing the new recommendations of the International Commission on Radiation Protection and with the IAEA to develop the International Basic Safety Standards. The NEA has for some time concerned itself with monitoring progress in science, in particular biology, genetics and new data from epidemiological research that could affect the way in which radiological protection is understood and implemented. To this end, the NEA summarised the state-of-the-art, either broadly, or more specifically with studies of such things as epidemiology, dosimetry and monitoring of radon, plutonium and tritium.

Currently, the Information System on Occupational Exposure (ISOE) has received data for 5 of the 15 power reactors in China. In addition, there is only one regulatory institution participating in the project, the Nuclear and Radiation Safety Centre (NRSC). An increased participation in ISOE would allow China to join other countries' efforts to develop international radiation safety standards and implement them. Finally, NEA has focused significant efforts on the management of nuclear emergencies. In particular, participating countries have organised via the NEA international nuclear emergency exercises, which might also be of interest to Chinese operators.

Economic, strategic and policy-relevant analysis

The NEA provides economic, strategic and policy relevant analyses for governments seeking to respond to the challenges of ensuring sustainable energy policies and effective new nuclear build processes. The strengths of the NEA derive from its specific expertise in economics, scenario modelling, technology assessment and uranium resources, the ability to quickly put together state-of-the-art thematic reports (technology, medical isotopes, education and training etc.), the involvement of experts from member countries in discussing best practices.

The NEA produces important studies to understand the cost of electricity, the role of nuclear power in combating climate change, the security of energy supply and trends in the nuclear fuel cycle. In the near future, the NEA plans to study or issue reports on, inter alia, education and training, system costs of energy technologies (including grid costs back-up power supply and siting costs), the impact of load following with nuclear plants and, of particular interest after Fukushima, the cost of nuclear accidents. Understanding the challenges to new build has been, and continues to be assessed in a number of NEA studies.

China would be much welcome to participate in NEA's High-Level Group on the Security of Supply of Medical Radioisotopes, after the recent disruption in the global supply chain and the international community's commitment to move world's facilities from highly enriched uranium to low enriched uranium targets.

Scientific cooperation

As the nuclear power reactor fleet grows, research reactors will certainly benefit the development of China's nuclear power program, as it has been the case for other nuclear states.

The Chinese Advanced Research Reactor reactor is of particular interest to the NEA because of the advanced neutron capabilities it possesses.

Participating countries benefit from NEA's activities in the field of science and its expertise in reactor systems, fuel performance, criticality safety, fuel cycle & waste management issues, multi-scale materials modelling, nuclear data, and integral experiments. The Agency has the ability to bring together internationally recognised experts to identify and analyse key technical issues and challenges, and to pass the knowledge gained on to the 'user community' through reports, discussion groups, workshops, training courses or conferences.

Legal expertise

The NEA constitutes a unique forum to meet and network with senior legal representatives from governments and nuclear regulatory authorities, and discuss the advantages and disadvantages of the various international nuclear liability conventions that exist today.

The NEA has two schools of nuclear law in Paris and Montpellier which have trained worldwide managers and legal experts (including some Chinese nationals) who want to learn and understand international and national regulations of the nuclear sector.

Concluding remarks

China's nuclear program is growing fast, as the rest of its economy. Post-Fukushima, it is expected to rely essentially on Generation III+ technologies with a clear intention to develop and use self-designs. In any case, the fast growth of China's reactor fleet raises policy issues that other advanced nuclear countries have encountered and for which international dialogue co-operation could play a very useful role.

The NEA could play a positive role in fostering and facilitating the development of China's fully integrated programme and looks forward to enhance its collaboration with the Chinese nuclear authorities.

Chapter 9:

Economic Transformation and Poverty Reduction: How it Happened in China, Helping it Happen in Africa

Introduction

Over the last 30 years, China has undergone a profound economic transformation lifting hundreds of millions of people out of poverty. This process reshaped the global economy and changed the economic context for nations and people all around the world. China's development experience shows what can be achieved when growth is broadbased and inclusive.

This chapter sets out how the lessons from China's growth and success in reducing poverty can be generalised to Africa. It summarises work by the ChinaDAC Study Group (hereafter the Group) established by the International Poverty Reduction Center in China (IPRCC) and the OECD's Development Assistance Committee (DAC).

The Group included representatives from a number of OECD countries, leading Chinese development research institutions and a number of African experts and institutions. More than 500 people, including academics, researchers, officials and development practitioners, from China, Africa and OECD member countries participated in these events, which were held alternately in China and Africa. From 2009 to 2011, the Study Group organised several international events on development partnerships; agriculture; infrastructure; and the enabling environment for enterprise development.

Peer learning processes can generate the ideas and evidence for promoting reforms. The Study Group identified two main points that merit highlighting:

- The extent to which China's economic transformation has contributed to its poverty reduction. The process of reform and opening up was based on experimentation, monitoring and the scaling up of successful models. It is this continual process of policy learning and innovation, including the explicit effort to draw from advanced international practice, that has driven China's transformation. This transformation involved re-positioning the roles of government and market, and absorbing lessons by promoting learning institutions and incentivising human talent. China continually identifies and confronts emerging new challenges, such as the need to rebalance its economy, boost domestic demand, upgrade skills, deal with environmental issues and find new sources of growth through innovation. China's 12th fiveyear plan makes these weaknesses and new challenges key reference points for public policy.

- There is a common interest among Africans, Chinese and OECD countries in the emergence of wellfunctioning economies and states throughout the world that encourage the participation of people in the development process. Rapid poverty reduction and rising human capital would furnish the basis for a rising middle class to sustain development in the 21st century, a goal shared by African nations and people, through the African Union and a whole range of other institutions and processes. The policies for economic transformation in many countries are being increasingly set by the evolution of accountable governments.

Box 9.1. What is the OECD's Development Assistance Committee?

The Development Assistance Committee (DAC) of the OECD has grouped the world's main donors, defining and monitoring global standards in key areas of development for over 50 years. The DAC is a unique forum for sharing views and exchanging lessons and has gained a reputation for neutrality and highquality work. One of the OECD's oldest and principal committees, it has ready access to a diverse array of policy communities. Increasingly, the DAC looks beyond the traditional aid arena to address pressing development challenges such as climate change, conflict and fragility, and more open and fair trade.

The DAC's overarching objective for 2011-2015 is to promote development cooperation and other policies so as to contribute to sustainable development, including propoor economic growth, poverty reduction, improvement of living standards in developing countries, and to a future in which no country will depend on aid. It pursues this objective by: i) collecting and analysing data and information on official development assistance (ODA) and other official and private flows; ii) reviewing the development cooperation policies and practices of its members and promoting mutual learning; and iii) providing analysis, guidance and good practice to assist its members to enhance the quality and effectiveness of development assistance.

The DAC currently has 24 members: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States and the European Union. The World Bank, IMF, UNDP and the regional development banks participate in the DAC as observers. OECD countries that are not members of the DAC are entitled to participate in all meetings of the DAC and its subsidiary bodies in areas of mutual interest. As set out in its Global Relations Strategy, other providers of development cooperation may participate in its work as full participants or as a regular or ad hoc observer.

The DAC welcomes the contribution of China and other providers of development cooperation resources and expertise to the common goal of reducing global poverty and increasing sustainable and inclusive economic growth. The DAC is forging relationships with China and other countries beyond its membership with a view to enriching dialogue and sharing knowledge on development and development cooperation. The DAC believes that development cooperation from the North or the South, from public or private sources would gain from collaboration among all actors, irrespective of their economic status or development tradition. This will serve the interests of poor people in developing countries.

For further information on the DAC and its activities, see: www.oecd.org/dac

The remainder of this chapter presents the main findings that the Group's members distilled from its events in recent years. Producing such a set of findings is itself an achievement, given the range of perspectives among members of the Study Group and the complexity and sensitivity of some issues. The next section describes the process of economic transformation and its relevance for poverty reduction. The third section provides the elements identified as being key to China's success in massively reducing poverty and creating a middleincome country. The fourth section presents messages relevant for Africa's economic transformation drawing heavily on the views expressed by African participants. Finally, the conclusion puts forward a number of lessons for development cooperation for consideration by China, OECD/DAC members and African countries.

Economic transformation and poverty reduction

Economic transformation can change poor developing countries into prosperous countries, with a dramatic fall in poverty rates. China stands out as a notable example. The transformation occurs when a poor, ruralbased country becomes a middleincome country with the growth of industry and services sectors. Productivity and income per capita as well as job creation grow fast. Agricultural productivity rises, while labour moves from farms to towns and cities, and there is a demographic transition as birth rates fall. The economy becomes involved in global supply chains in ways that generate continuous learningbydoing and upgrading of enterpriselevel capacities (otherwise known as "dynamic capacity development"). A supportive environment includes a state that provides vision and coordination. Infrastructure investment and institutional development are also dynamic elements of economic transformation.

China's growth and poverty reduction process over the last thirty years

The reform process started gradually with the liberalisation of the agricultural sector thirty four years ago. Collective farms were closed. Individual farmers were empowered to sell surplus products to the market which generated a major increase in food supplies and incomes. Emboldened by this success, many state-owned enterprises were closed and the remainder were turned into commercial enterprises, with the resource-oriented companies developing worldwide links. Extensive privatisation created a highly competitive enterprisebased economy with widespread regional and national transport linkages. At the same time, a series of special economic zones based on strong direct investment from abroad opened the way for a supply chainbased model of industrial learning, creating numerous industrial clusters and networks. Finally, the state reduced tariffs significantly when joining the WTO a process that facilitated China's engagement in the global economy. The private sector has developed substantially and is now the dominant source of employment (over 90%) and income (over 70%).

The Chinese authorities sought international aid and investment to supplement national resources, not as a major ongoing financing stream. They used foreign aid and investment to acquire knowhow and management skills to speed up the modernisation of Chinese agriculture, industry and infrastructure. Bilateral and multilateral donors have provided considerable expertise, knowledge and training, bringing in worldclass analytical methods for public management and economic development, including poverty reduction.

The state, provincial, and city authorities actively supported enterprise development by providing infrastructure, often on a costrecovery basis, and by expanding the science and technology base. The institutional infrastructures for higher education, including management training, were developed rapidly with students and their families paying a high proportion of total costs. The enterprise sector

has flourished with fast learning processes from engagement in international supply chains and joint ventures with foreign investors. The sector benefitted from major programmes for Chinese graduate scholarships abroad and schemes to attract back Chinese expatriates and engage eminent international experts. An integral part of the growth model has been the close and forwardlooking interaction between state authorities and enterprises.

The immense transformation process over the last 30 years has not been accomplished without serious economic, social and environmental costs: structural economic imbalances, a ruralurban divide, land rights issues, stresses linked to internal migration, natural resource degradation associated with intensive farming and social disparities across China. However, income inequality has been kept below that in most emerging economies. Poverty in rural areas has been reduced to just 6% of the rural population when measured at the \$1.25 per day benchmark for incomes. As described below, these challenges are now the focus of attention of the Chinese authorities.

Dynamic capacity development

China's experience shows that rapid economic and social development in poor countries can happen, when strong development-oriented leadership emerges focused on development performance rather than on entrenched policies and interests. The articulation of a national project to achieve economic transformation within a generation can activate a new national consensus. The Group, with strong involvement of African officials and experts, has been assessing how economic transformation in Africa can happen, against the background of the Chinese experience, and how collective aid efforts can help in the wider transformation process.

Key elements of China's experience

The Group identified the following fundamental elements in China's success in substantially reducing poverty and creating a middleincome country. These elements are expected to continue to underlie China's ongoing efforts to address the challenges that China now faces in its development, adjustment and social wellbeing.

The role of the state

Making economic transformation the central guiding objective of government, as China has done since the late 1970s, with its reform and opening up policies:

- i) Provided a basis for wide consensus and participation across society in a national project.
- ii) Drove pragmatic, evidencebased policy making and close ongoing review of performance.
- iii) Made performance in terms of growth and poverty reduction the test for policies and resource allocation.
- iv) Strengthened learning and innovation.
- v) Exercised discipline on the efficiency and effectiveness of both government and enterprises.
- vi) Put a high priority on policymaking capacity and investment in research and extension capacities in universities and institutes, including by linking them to ministries and the decision and implementation processes.
- vii) Encouraged the emergence of a welleducated professional middle class and attracted

talented people to return home to work for their country.

Self-reliance and ownership

Selfreliance is a fundamental principle of Chinese strategy. This principle is imbedded deeply in China's strong ownership of its own development path while it absorbs knowledge from a wide range of external actors, including investors and experts, and engaging with bilateral and multilateral policy processes. More specifically:

- i) China develops its medium and longterm development strategies in relation to ongoing changes in the national and global context and uses its FiveYear Plan instrument to implement those strategies with adjusted policy interventions.
- ii) External support, such as foreign investment and aid, is incorporated within these strategies and policies, rendering this external support more effective.
- iii) Policy development and technical capacities have always been central policy concerns, providing a basis for monitoring and accountability systems at both the central and local government levels.

Performance based public management and decentralisation

Developmentoriented leadership requires a high quality public management corps for policy formation and implementation at central and local levels. Several approaches were taken to support this:

- i) Selection procedures for civil service and political office were reformed to require educational attainment, handson experience and proven individual performance.
- ii) The central planning system was replaced by a marketoriented planning system.
- iii) Significant decentralisation generated bottomup initiatives that were widely replicated when successful.
- iv) Competition between cities and towns fostered increased growth and poverty reduction.

Policy research capacities and innovation systems

The transformation process includes intensive ongoing policy testing and adaptation based on evidence. China has created an extensive set of institutional capacities in the "hard" and "soft" sciences to enable the analysis of performance, problems and solutions. The "experimentevaluatescale up success" principle is widely applied and rapidly implemented. This has demanded the expansion of higher education and the development of research institutions linked to policy decision making and implementation. World expertise has been sought and attracted through incentive schemes, international partnerships and often via aid programmes.

Feedback mechanisms for identifying and addressing challenges

China's impressive transformation has generated stresses and imbalances both internally and externally. These major challenges are identified and addressed in the new FiveYear Plan which includes policy actions aimed at:

- i) Focussing more on the quality of growth and improving the functioning of accountability

- systems.
- ii) Tackling income and regional disparities, including rural/urban income and equity issues.
 - iii) Raising domestic consumption and reducing reliance on external demand.
 - iv) Repairing environmental damage, including farmland degradation, and managing urbanisation.
 - v) Eliminating extreme poverty through targeted measures for the still large numbers of very poor people.

Responsible development-oriented government remains essential in a more diverse and complex economy and society. With the challenges of becoming a high-income country and an active part of the global governance system, China's policy review and adjustment processes, informed by feedback mechanisms and global change, are more important than ever, both domestically and internationally.

Applying the lessons of China to Africa

Using China's success in reducing poverty as a background, the Group identified a range of messages relevant for Africa's economic transformation, drawing heavily on the views expressed by Africans themselves. The key orientations for African states and organisations and their development partners to share include:

- i) Make a green economic transformation within a generation to flourishing middle-income modern economies with low poverty rates, the key framework for thinking about Africa's future.
- ii) Support the emergence of responsible development-oriented states and address risks of state capture, conflict and breakdown, by ensuring, through transparency and national and international accountability systems, that income and natural wealth is harnessed for national projects of economic transformation.
- iii) Exploit the opportunities at hand now for agricultural modernisation, both small and large scale, to generate a widespread growth dynamic with supply chains and economic linkages that integrates the national and regional economies and joins up with global markets. Small farmers, men and women, take on the character of entrepreneurs in this modern sector, generating incomes and helping to correct high malnutrition rates.
- iv) Support the development of African regional knowledge platforms and centres of excellence as a means of speeding up the acquisition of technology in agriculture and in other areas.
- v) Think and work in terms of increasing the momentum on regional integration and the creation of regional and continental economic dynamics and infrastructure.
- vi) Adopt the dynamic capacity development approach to enterprise development, starting with current strengths/advantages, with ongoing adaptation and interaction between the state and enterprises to promote fast learning and capacity building in both the public and private sectors.
- vii) Take trade, investment and aid as opportunities to speed up learning processes, acquire technologies and management models and skills that can be adapted to the African context.

- viii) Support the emergence of a creative middle class through upward mobility and attracting expatriate talent to return home in the context of the national economic project for economic transformation, to provide the entrepreneurial skills and the well-educated human resources needed to manage a more complex, more organised economy that engages in regional and global markets.

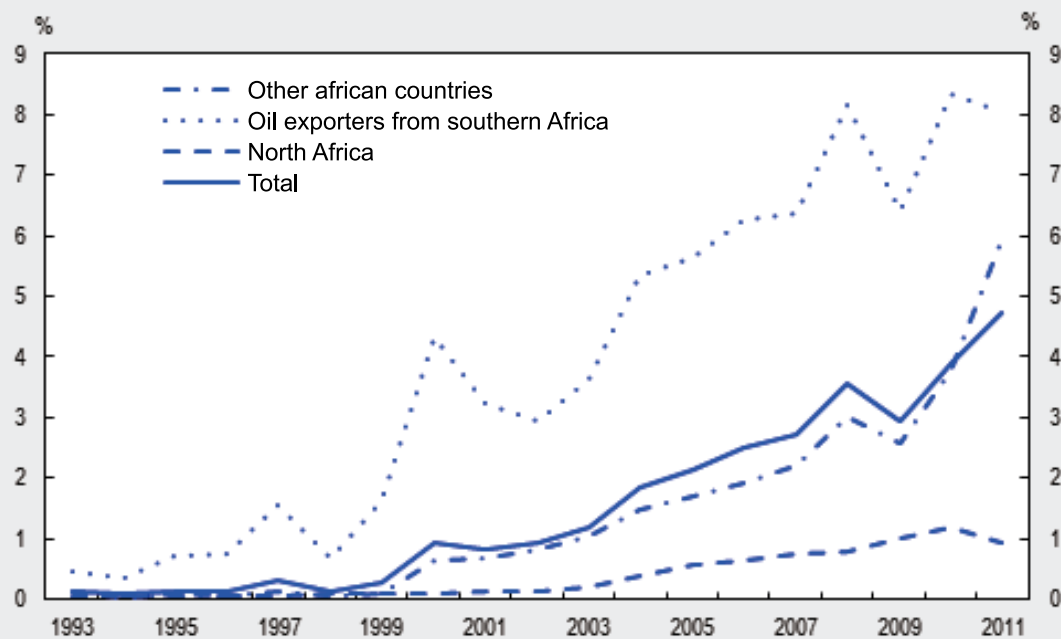
Dynamics of development cooperation in Africa

China's rapidly evolving role in African development was welcomed at the Group's events. China provides new scope and diversity to Africa's external economic relations and has transformed the economic outlook for many countries in Africa (Box 9.2)

Box 9.2 Economic transformation in Africa and the role of China and other emerging countries

Relations between Africa and its emerging partners, such as China, need to be understood in the context of the global "shift in wealth", (African Economic Outlook, 2011). This change in the distribution of incomes in the world economy has accelerated over the past decade. Building on improved policies, the continent has benefited from extra investment, trade and aid. The expanded palette of partners African countries are able to play on is also yielding considerable political and strategic advantages. China and others' high growth has had a significant impact on growth and poverty in other poor countries, including Africa. Its trade and investment have benefited oil- and mineral-rich countries disproportionately, but this "growth engine effect" has sustained world demand for goods that poor countries export. The scale of the increase of China's imports from Africa, especially sub-Saharan Africa, has been exceptional over the past decade (Figure 9.1).

Figure 9.1 Chinese imports from selected groupings of African countries as percentage of those countries' GDP



Source: Chinese bilateral trade data, CEIC; GDP for country groupings, World Development Indicators and IMF World Economic Outlook database.

(Box 9.2 continue)

Africa's business relations with emerging partners are often complementary to those with traditional partners. Because of their diversity, emerging partners offer African countries new opportunities to exchange goods, technology and development models. They make mass consumption goods affordable to the nascent African middle-class and supply production goods adapted to the productive conditions of developing countries. These goods have the potential to help African firms increase their productivity and move up global value chains. Indeed, while still small as a share of African output, exports of manufactured goods have actually doubled in nominal term over the last ten years.

The co-operation activities of emerging partners are also typically complementary to those of traditional partners. The latter have focused their assistance, mostly through ODA, on poverty reduction, health, education and governance. China and other emerging partners are more focused on removing infrastructural bottlenecks. Fears that the intensifying co-operation with emerging partners is boosting Africa's indebtedness are not supported by available evidence. However, a risk of re-emergence of over-indebtedness persists, particularly for the weakest African states. Similarly, existing aggregate governance indicators show no sign of a worsening of corruption. Policy autonomy is affected differently for different groups of African countries: the resource-abundant ones stand to widen their policy space more than others.

Source: AfDB, OECD, UNDP and UNECA (2011).

Although in the past, OECD countries have accounted for the major share of trade, investment and aid flows with Africa, Chinese trade and investment and aid policies are now making it a key driver in African development. The Chinese government's "Going Out" policy encourages Chinese enterprises to invest abroad, partly to help diversify China's large reserves of foreign exchange. Many Chinese aid projects are being structured on an enterprise basis to generate sustainability. China, along with OECD and other countries, is investing to expand oil and mineral resource supplies. There is major scope for China to increase further the scale of its trade, investment and aid to Africa depending upon the effectiveness and the sustainability of the growth trajectories of its African partners. It will also involve working with the larger agendas for regional integration and on achieving and maintaining peace and stability in Africa.

China's institutions for planning and delivering aid and other official financial resources have evolved significantly since the mid-1990s, with the creation of special financial institutions and the development of coordination systems among Ministries. The financial institutions are capable of putting together large packages of financial support for infrastructure.

China has shown readiness to be involved in transformative investment and infrastructure packages within countries and inter-regionally. It was felt however that China could make a more significant contribution to African enterprise development by providing more opportunities for local companies.

There are questions on sustainability and transparency, which are important for the full ownership and accountability of the developing countries concerned. In order for African countries to be fully able to drive their relations with development partners, it will be important for them to have more complete information about levels and conditions of assistance as well as on the terms of various commercial deals that partners bring to the table.

China and OECD countries share a basic objective: assist African countries to have

independent development capacities. Current developments in Chinese and DAC cooperation policies which promise to improve the coherence and quality of the support for African development include:

- i) The publication by China of two government “White Papers”.
- ii) The agreement that the African Union will now be a full member of the Forum on ChinaAfrica Cooperation (FOCAC).
- iii) A public statement by the DAC welcoming the increasing role of emerging countries as providers of development assistance (OECD Development Assistance Committee, 2011).
- iv) Implementation of the agreements reached at the Busan HighLevel Forum on Aid Effectiveness (see Box 9.3)

Transparency and corporate social responsibilities

African and foreign enterprises have key roles in shaping the future development path for African countries. A dedicated African platform on corporate social responsibility which brings together Chinese and African employers, enterprises and experts to address issues and challenges related to, amongst other subjects, green growth, labour standards and supply chain management could facilitate co-operation among all development partners and so contribute actively to the development of African economic governance arrangements in these areas.

Lessons for development cooperation

China, DAC members and African countries all aim to achieving the United Nations Millennium Development Goals (MDGs). As is the case of China, international assistance that is coherent with promoting economic transformation can support and speed up Africa’s growth and poverty reduction process. Drawing on the experiences shared at its events, the Group offers a number of lessons for development cooperation.

How China can enhance its contribution to African development

China has devoted much highlevel attention to African development in the past decade, with regular visits by top leaders. It has created the Forum on ChinaAfrica Cooperation (FOCAC) and associated processes to define and implement its assistance to Africa. A new ChinaAfrica Research Centre was set up in 2010. China participates in UN peacekeeping missions in Africa. It has also created financial institutions and instruments for official development financing. African countries appreciate the low cost rapidity with which Chinese aid is deployed, especially in infrastructure and construction, as well as its responsiveness to local requests. As mentioned previously, China also recently published two significant “White Papers”:

- **On trade and economic cooperation with Africa** which expressed China’s desire to work with others to jointly promote peace, development and progress in Africa.
- **On foreign aid**, which provided an overview of China’s aid efforts and policies over the past decades and announced a new interministerial coordination system for managing its foreign aid and plans to increase aid quality and to work and learn with international development partners in this respect.

Box 9.3 The Fourth High Level Forum on Aid Effectiveness

The Fourth High Level Forum on Aid Effectiveness—held in Busan, Korea, at the end of 2011—marked a turning point in international discussions on aid and development. The conference, co-organised by the OECD, delivered a number of important outcomes, the most important of these being the Busan Partnership for Effective Development Co-operation— an international agreement endorsed by all major stakeholder groups, including China and other emerging economies that continue to confront poverty but which are engaging increasingly in co-operation. Some of the key principles, including on ownership, results, transparency and accountability, were agreed as reference points for South-South co-operation on a voluntary basis. A commitment was also made to “examine the interdependence and coherence of all public policies — not just development policies — to enable countries to make full use of the opportunities presented by international investment, trade and to expand their domestic markets.” The following summarises the main achievements:

1. The Busan Partnership for Effective Development Cooperation is the most inclusive agreement on global co-operation for development: donors, South South co-operation partners, developing countries, civil society organizations (CSOs), private sector representatives and others participated in its formulation and lent their support to the final product. This agreement was underpinned by an inclusive and transparent negotiation process, in which China participated actively.
2. Developing countries were at the centre of the deliberations in Busan, as they were in the process leading up to the Forum through the Working Party on Aid Effectiveness. They drove the negotiations on the outcome document: the Busan Partnership for Effective Development Co-operation. And they fuelled — and led — the discussions on the unmet commitments from the Paris Declaration on Aid Effectiveness: 78 countries participated in the 2011 survey, managed by the Working Party on Aid Effectiveness, to monitor the implementation of the Paris Declaration.
3. A number of forward-looking agreements — on results, transparency, fragmentation, fragile states, climate change, South South co-operation, effective institutions and the private sector — which laid the groundwork to enable countries, firms and CSOs to begin to implement the Busan commitments immediately.
4. A commitment to work together under a new Global Partnership for Effective Development Co-operation, supported by the OECD and the United Nations Development Programme, to implement the commitments reached at Busan.

A number of voluntary international agreements on core development challenges were agreed at Busan including:

- The New Deal for International Engagement in Fragile States
- The Busan Joint Action Plan on Gender Equality and Development
- The Busan Action Plan for Statistics
- A New Consensus on Effective Institutions and Policies
- A joint Statement on public private co-operation for broad based, inclusive and sustainable growth

The Group found that China could contribute further to African development by:

- i) Bringing more of its transformational thinking into its policy dialogue with Africa.
- ii) Helping to show how the learning model of development can work to build the capacity for diversified participation in the global economy, including through learning from foreign aid and investment.
- iii) Supporting African Union structures and policy frameworks and working more at the regional and sub-regional levels, including to develop interregional infrastructure and knowledge platforms.
- iv) Helping African countries to learn from the ways China successfully managed aid and foreign investment, particularly through integration of aid project management into regular ministry structures.
- v) Being more transparent in its aid programming and the terms of its financing, and assisting African countries in the assessment of financial sustainability issues.
- vi) Helping to implement African and international codes on corruption, resource revenues and corporate social responsibility.
- vii) Strengthening knowledge about African conditions among aid staff working on and in Africa.
- viii) Working on its aid quality agenda and introducing a systematic approach to its aid management systems, including planning, monitoring and evaluation systems.

How can OECD members learn from the Chinese efforts to develop Africa

OECD/DAC members provide a wide range of support to African countries, including project, sector and budget support. Aid to Africa has grown significantly over recent years, though remaining some distance from the announced target of doubling aid by 2015.

The Group found that OECD/DAC members could contribute further to African development by:

- i) Framing their cooperation in terms of the economic transformation process, going beyond aid effectiveness to a wider development effectiveness concept applied to Africa.
- ii) Doing more to help build science and technology capacities, higher education systems and knowledge platforms, with the potential for creating regional and continental networks kept in view, drawing on their experience in these fields with China and other emerging countries.
- iii) Supporting African Union structures and policy frameworks.
- iv) Helping to implement African and international codes on corruption, resource revenues and corporate social responsibility.
- v) Maintaining the recent momentum of support for agriculture and infrastructure development, working in relevant forums with emerging countries with special knowledge and expertise.
- vi) Examining how aid reporting can better capture the technical cooperation activities of emerging countries in terms their impact, and not just their monetary cost.

- vii) Reviewing how comparative advantage, cost structures and complementarities may be shifting among assistance providers as emerging partners build up their aid activities.
- viii) Exploring how trade, investment and aid linkages and financing packages can mobilise additional actors and capital for economic transformation processes in Africa.

What African countries can learn from the Chinese development process

African participants in the Group's events were determined that their countries should define their own futures. Progress has been made, but much remains to be done. They stressed that regional integration is essential to overcome political and economic fragmentation. African leaders must take up the task of creating a responsible development-oriented state able to bring together ethnically complex societies. Leaders need to ensure peace and progress in their neighbourhoods. In fact, African institutions, policy analysis and review processes have been getting stronger over the last decade. Policy frameworks and economic management are clearly improving. New initiatives are helping to address complex and overlapping regional economic communities and the lack linkages. Agricultural development has become a high priority with an active, continental agenda. Communication technologies and business models have been found that work with great success in Africa. However, competitive elites and ethnicities are still a major problem in a number of countries. The African Union has the difficult task of facilitating solutions to such problems. It has to be recalled, however, that many emerging economies of today began their success stories from situations of conflict and turmoil, which transformational leadership was able to resolve. There are clear examples of this in Africa which can serve as an inspiration for sustainable political settlements in the remaining troubled parts of the continent.

The Group found that African countries can contribute further to development at home by:

- i) Fostering the emergence of a responsible, development-oriented state with a political consensus that reaches across competitive elites and ethnicities.
- ii) Taking the economic transformation paradigm, working through dynamic capacity processes as the framework for development strategies, nationally and regionally. Bringing development partners to think in these terms also, and presenting strategies and operational programmes and projects in this context.
- iii) Pushing ahead with the regional integration agenda and finding creative solutions to the development of interregional infrastructure.
- iv) Reinforcing the priority for agricultural modernisation and its role in creating a broadly based growth dynamic, nationally and regionally.
- v) Leveraging the communications revolution in Africa to exploit its potential for leapfrogging in knowledge acquisition and enterprise creation and global economic linkages.
- vi) Developing further the policy analysis and review capacities and processes now in place in Africa for pragmatic policy making and performance review. Ensuring that the civil service is performance oriented.
- vii) Creating close interactions between the state and market enterprises in a forward-looking performance-based mode and promoting learning and technology acquisition capacities.
- viii) Taking inspiration from successful emerging countries, including securing the maximum benefit from international assistance by strengthening ownership, capacity development and mutual learning.

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