OECD Reviews of Regulatory Reform

CHINA

DEFINING THE BOUNDARY BETWEEN THE MARKET AND THE STATE

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Foreword

The OECD Review of Regulatory Reform in China *is one of a series of country reports carried out under the OECD's Regulatory Reform Programme, in response to the 1997 mandate by OECD Ministers.*

Along with the review of the People's Republic of China, the OECD has assessed regulatory policies in 23 member countries, and in Russia and Brazil. These reviews aim at assisting governments to improve regulatory quality – that is, to reform regulations to foster economic growth and attain important social objectives. The reviews draw on the 2005 Guiding Principles for Regulatory Quality and Performance, *which bring the recommendations in the 1997* OECD Report on Regulatory Reform *up to date, and build on the 1995* Recommendation of the Council of the OECD on Improving the Quality of Government Regulation.

The country reviews follow a multi-disciplinary approach and focus on the government's capacity to manage regulatory reform, including regulatory frameworks in specific sectors.

Taken as a whole, the reviews demonstrate that the implementation of a well-structured programme of regulatory reform can make a significant contribution to better economic performance, boost opportunities for future investment and enhance social welfare. Economic growth, job creation, innovation, investment and new industries are boosted by effective regulatory reform, which also helps to lower prices and increase choices for consumers. Comprehensive regulatory reforms produce faster results than piece-meal approaches and help countries to adjust more rapidly and easily to changing circumstances and external shocks. At the same time, a balanced reform programme must take into account social concerns. Adjustments in some sectors have been painful, but experience shows that costs can decrease if reform is accompanied by support measures, including active labour market policies.

While reducing and reforming regulations are key elements of a broad programme of regulatory reform, experience also shows that in more competitive and efficient markets, new regulations and institutions may be necessary to ensure compatibility of public and private objectives, especially in the areas of broad services to the public. The challenges faced by sectoral regulatory authorities are discussed at length in this report. Sustained and consistent political leadership is another essential element of successful reform, and a transparent and informed public dialogue on the benefits and costs of reform is necessary to build and maintain broad public support.

The policy options presented in the reviews may pose challenges for each country. However, the in-depth nature of the reviews reflect the emphasis placed by the OECD on ensuring that the policy options presented are relevant and attainable within the specific context and policy priorities of the country.

The Regulatory Reform Review of China *is divided into three sections. The first covers the overall economic context for regulatory reform. The second section assesses China's policies covering the government's capacity to manage regulatory reform, competition policy and enforcement, and market openness. The final section examines the regulatory framework for the provision of public services and includes specific reports on the electricity and water sectors.*

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Table of Contents

Boxes

Tables

Figures

List of Abbreviations

ACFTA	ASEAN-China Free Trade Agreement
ALL	Administrative Litigation Law / Administrative Licensing Law
AMC	Asset Management Companies
AML	Anti-Monopoly Law
AMP	asset management plan
AQSIQ	Administration for Quality Supervision Inspection and Quarantine
ASEAN	Association of Southeast Asian Nations
ASEM	Asia-Europe Meeting
AUCL	Anti-Unfair Competition Law
BAT	best available technology
BOT	build-own transfer
CBRC	China Bank Regulatory Commission
CCC	China Compulsory Certification
CCGT	combined cycle gas turbine
CCIB	China Commodity Inspection Bureau
CEPA	Closer Economic Partnership Arrangement
CCS	carbon capture and storage
CIQ	State Administration for Entry-Exit Inspection and Quarantine (later AQSIQ)
CIRC	China Insurance Regulatory Commission
CIS	capital expenditure incentive scheme
CNAS	China National Accreditation Service for Conformity Assessment
CNCA	China Certification and Accreditation Administration
CNIS	China National Institute of Standardisation
COD	chemical oxygen demand
CPC	Communist Party of China
CSRC	China Securities Regulatory Commissions
Defra	(UK Government) Department of Environment, Food and Rural Affairs
EPB	Environmental Protection Bureau
EPZs	(special) export processing zones
FDI	foreign direct investment
FERC	Federal Electricity Regulation Commission (US)
FIEs	foreign-invested enterprises
FGD	flue gas desulphurization
FYP	Five-Year Plan
GIS	Geographical Information Systems
GPA	Government Procurement Agreement
IAF	International Accreditation Forum
IRBM	Integrated River Basin Management

JCCT	Joint Commission on Commerce and Trade
M&A	mergers and acquisitions
MEP	Ministry of Environmental Protection
MFN	most favoured nation
MII	Ministry of Information Industry
MOF	Ministry of Finance
MOFCOM	Ministry of Commerce
MOFTEC	Ministry of Foreign Trade and Economic Co-operation
MOH	Ministry of Health
MOHURD	Ministry of Housing and Urban-Rural Development
MWR	Ministry of Water Resources
NDRC	National Development and Reform Commission
NEA	National Energy Administration
NPC	National People's Congress
NPLs	non-performing loans
Ofwat	Water Services Regulation Authority (UK)
OGI	Open Government Information (Regulations)
OPSR	Office for Public Sector Reform
PBC	People's Bank of China
PR	Periodic Review Process (UK)
QDII	Qualified Domestic Institutional Investment programme
QFII	Qualified Foreign Institutional Investor programme
QTSB	State Quality and Technical Supervision Bureau (later AQSIQ)
RBMCs	River Basin Management Commissions
RCV	Regulatory Capital Value (UK)
RIA	regulatory impact analysis
RMB	Yuan renminbi
ROSCOs	rolling stock leasing companies (UK)
RPI	Retail Price Index (UK)
RTAa	regional trading agreements
SAC	Standardisation Administration of China
SAIC	State Administration for Industry and Commerce
SAOS	State Agency for Occupational Safety
SASAC	State Asset Supervision and Administration Commission
SCNPC	Standing Committee of the National People's Congress
SCOLA	State Council's Office for Legislation Affairs
SDPC	State Development and Planning Commission, later became the NDRC
SDRC	State Development and Reform Commission
SEPA	State Environmental Protection Agency
SERC	State Electricity Regulatory Commission
SETC	State Economic and Trade Commission
SFDA	State Food and Drug Agency
SMEs	small and medium-sized enterprises
SOCBs	state-owned commercial banks
SOEs	state-owned enterprises
SPC	State Planning Commission
TOCs	train operating companies (UK)

TVEs	township and village enterprises
WEFZ	Water Environmental Functional Zones
WFUZ	Water Function Use Zones
WPPCL	Wastewater Pollution Prevention and Control Law
WRB	Water Resources Bureau
WRPB	Water Resources Protection Bureau
WTO	World Trade Organisation
WUA	water user associations
WWTW	Wastewater Treatment Works
YRCC	Yellow River Conservancy Commission

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OECD Reviews of Regulatory Reform: China
Defining the Boundary between the Market and the State

Regulatory Reform Priorities in the Wake of the World Economic Crisis

Measures to deal with slowing growth, rising unemployment, and other dislocations arising from the world economic crisis are now at the top of the economic policy agenda of the People's Republic of China. While the crisis may complicate some of China's regulatory reforms in the near-term, it does not diminish the longer-term need for those reforms nor alter the key priorities discussed in the *OECD Review*. In fact, the downturn highlights both the importance of further regulatory reforms and the contributions they can make to China's economy.

The financial problems that began in the OECD underscore the wisdom of China's strategy of carefully pacing financial liberalisation in line with the strengthening of the capacities of financial institutions and markets to prudently manage the resulting risks. The basic goals of China's financial reform - to strengthen the soundness and governance of financial institutions and to develop and diversify financial markets - remain valid although in some cases specific measures may need to be adapted to future changes in international standards and practices. But the serious problems in financial regulation underlying the world crisis mean that redoubled and ongoing efforts to strengthen financial regulatory institutions and capacities in all countries, including China, are essential.

As China's authorities have emphasised, sustaining open markets and avoiding protectionism will be essential to avoid the vicious circle of protectionism and economic contraction that occurred during the 1930s. China's extensive measures to open its markets and improve competition over the past decade have paid significant benefits to the domestic economy and contributed importantly to the liberalisation and expansion of world trade. Continued efforts by China in these areas (including avoidance of resort to anti-competitive policies to deal with short-term disruptions) will help to ensure that the vicious circle does not emerge. By promoting more efficient markets and fostering innovation, the reforms will also strengthen the foundation for a sustained recovery and continued economic development.

The current crisis may make some regulatory reforms to utilities and infrastructure sectors discussed in the *Review* more difficult to achieve in the near-term. However, these reforms still need to be pursued to correct distortions that now exist and to ensure healthy development of the industries in the future.

Finally, the crisis has graphically underscored the risks that arise when regulatory institutions and practices fail to improve and adapt sufficiently to changing economic conditions. Poor co-ordination among key regulatory bodies and other government agencies, gaps and adverse incentives created by outdated or poorly formulated

regulations, and deficiencies in regulators' ability to predict or detect problems before they became serious fostered financial excesses and allowed them to grow to systemic proportions. Strengthening of regulatory institutions and practices to correct these problems is likely to be high on the policy agenda of OECD economies over the next several years. Improvement in regulatory quality is equally important to China, given the rapid and extensive changes that are occurring in its economy. Better co-ordination among government regulatory bodies, particularly those at different government levels, will be important to the success of current efforts to deal with the economic downturn. Better co-ordination along with greater clarity and transparency in regulatory measures and processes and the development of means to predict and measure the impact of regulations also will be important to the success of broader economic reforms.

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Executive Summary

The transition to a market economy in the People's Republic of China is among the great economic success stories of modern times. Since the beginning of economic reforms in 1978, real GDP growth has averaged almost 10% annually, a performance that compares favourably to that of the prior growth champions – Japan and Korea. China has become the world's third largest economy, its number two exporter, and its leading manufacturer. Living standards of all segments of the population have risen markedly over the past three decades and poverty has fallen from over 50% at the beginning of reforms to below 10%.

Regulatory reform – changes to regulatory institutions, methods, and practices – initially played a very limited role in China's economic reforms, but has now become central. This reflects the increased emphasis in the overall reform process on the ongoing formulation, implementation and adaptation of the laws and regulations needed to sustain an efficient market economy. High-quality regulation is very important to the success of such efforts. This first *OECD Review of Regulatory Reform in China*, carried out in partnership with the Government of the People's Republic of China, examines China's regulatory reform progress and its contribution to the country's development during the economic reform period. It reviews China's progress in competition policy and market opening as well as progress in establishing effective regulation of infrastructure sectors, with special attention paid to electricity and to water supply and sanitation. It also provides suggestions for consideration by China's reformers based on experiences of OECD member countries. As indicated in the remainder of this summary, China's regulatory reform has made impressive progress over the past decade and is gaining momentum. Much remains to be done, but a very good foundation has been laid.

Institutional development and evolving reforms

The first half of China's economic reform period was marked by rapid market development and opening largely within pre-reform formal legal and regulatory structures, a process that has become known as "growing out of the plan".[1] The achievements during this period laid the foundation for the institutional developments that were to come later. Restoration of individual farming through the "household responsibility system", along with increased agricultural prices, led to a dramatic rise in agricultural productivity and increase in household savings. These in turn supported increased capital accumulation and freed up workers to fuel the remarkable growth of township and village enterprises. This transfer of workers from lower-productivity jobs in agriculture to higher-productivity work in rural industry became an important driver of China's growth during the 1980s.

The gradual freeing of agricultural and industrial prices spurred the growth of markets. China's opening to international trade and foreign investment beginning in the early 1980s

(which came earlier and went farther than that of Japan and Korea during their rapid growth periods) was to prove increasingly beneficial to its development. All these developments occurred while state ownership continued to dominate most of industry and all but the smallest-scale services; while private enterprises remained severely restricted; and while township and village enterprises (TVEs) continued to operate under pre-reform legal provisions, although their practical operation was quite different. Moreover, despite the creation of a central bank and several commercial banks, credit allocation remained strictly subject to state planning.

The need for institutional development and transformation became increasingly apparent by the early 1990s, as serious imbalances and strains accumulated. The business sector had become fragmented between ownership segments – state, collective, foreign, and domestic private – operating under different sets of rules. Inequalities among regions were growing, as coastal regions benefited most from the growth of TVEs and opening to foreign trade and investment. Businesses, including state-owned enterprises (SOEs), had greater autonomy but weak governance structures, and internal controls limited their capabilities and incentives to function effectively as commercial enterprises. Incentives were further weakened by the allocation of credit under state planning rather than according to strict commercial criteria, and by the lack of mechanisms to ensure that debt was repaid. The resulting "soft budget constraint" was substantially responsible for large and growing debt loads and losses of SOEs, and to a lesser extent of TVEs, as well as increasing non-performing loans (NPLs) of the banking sector. Limited control of credit led to a series of inflationary boom-bust cycles. The fourth and most serious of these cycles, during 1992-94, left massive excessive capacity and inventories in industry. The already severe financial problems of SOEs and banks were at critical levels by the latter half of the decade.

These problems led to a major effort to build the formal frameworks and institutions to support and regulate the market economy. Between 1993 and 1995, four key laws were enacted: an anti-monopoly law; a company law providing for limited liability and joint-stock companies; a commercial banking law mandating commercial criteria as the basis for lending; and a labour law. Much reform was focused on dealing with the financial problems of SOEs and the banks, and ensuring that they did not recur. Beginning in the second half of the 1990s, SOEs began a major restructuring and downsizing. This included a massive reduction in employment – leading ultimately to a reduction of their workforce by almost one-third – and the divestment of small and medium-sized SOEs. The government began to provide financial assistance to banks and strengthened regulation and oversight of their activities. These efforts spurred broader reforms, for example to extend and strengthen unemployment and other social insurance; to develop an old-age pension system; and to strengthen bankruptcy mechanisms to allow failing companies to exit and to free resources for more efficient use. China also began to partially open electricity and other infrastructure services to outside participation and to address growing problems of environmental deterioration and regional inequality.

A new development paradigm emerged, based on two principles. The first was that all business segments, private as well as collective and state owned, were to be allowed to compete on a level playing field in the market, save for sectors deemed critical to national security or other essential needs. The second was that the state would seek to regulate the economy mainly by formulating, implementing and enforcing rules for markets and their actors rather than by directly intervening in pricing and resource allocation. The development of this paradigm was spurred by the run-up to accession to the World Trade

Organisation and reinforced and broadened by its achievement in 2001. The constitutional amendment recognising the legitimacy of private business and its role in the economy, enacted in 1999, was followed in 2004 by a further amendment explicitly mandating protection of private property.

Reform of regulatory institutions and practices has become a key theme of economic reform in this decade. The major government reorganisation instituted in 2003 marked a formal and decisive embrace of market-based regulation in place of economic planning, and incorporated the integration of domestic and foreign economic policies into the government structure. In 2006, four key laws that had long been in preparation took effect. These included a much-updated and improved competition law that explicitly addressed key issues, including administrative abuse, that had been inadequately addressed by the previous anti-monopoly law; and a comprehensive bankruptcy law that drew on international experiences. Amended company and securities laws also came into effect and mandated formal governance structures for joint-stock enterprises, rules for the issue and trading of securities on the exchanges, and provisions to protect investors and minority shareholders. Key regulatory institutions were created or extensively restructured and reformed. These include the China Bank Regulatory Commission, created in 2003 to regulate and supervise commercial banks and trust companies; the China Securities Regulatory Commission, which was originally created in 1992 but acquired the major responsibility for all securities regulation in 2004; and the State Asset Supervisory and Administration Commission (SASAC), established in 2003 to exercise the state's ownership in remaining SOEs. The authorities have made skilful use of international experiences and norms in designing and implementing these reforms.

The legal and regulatory reforms implemented over the past decade have already brought extensive and substantial benefits. For example, the reform and restructuring of the financial regulatory agencies have been very important to the success of efforts to restore the financial solvency of banks and securities companies, and to improve their governance and internal controls. These accomplishments are providing the foundation necessary to allow financial institutions to diversify their services and products to better meet the economy's needs.

The market opening and other reforms driven by China's WTO entry have spurred not only a boom in foreign trade and foreign direct investment (FDI), but also improvement in their quality. For example, China has become the world's leading exporter of information and communications equipment, and its firms are moving beyond simple assembly of imported parts into processes requiring higher skilled labour and greater technology inputs. The opening of the services sectors has already brought tangible benefits, notably in distribution where the entry of several major international retail chains has helped to improve efficiency and lower costs in the retail sector. Ultimately, the largest benefit from WTO is likely to result from its impetus to the broader economic reform process. The changes in laws and regulations mandated by WTO on competition, intellectual property rights protection and other areas are as essential and potentially beneficial to domestic businesses as to foreigners.

The ongoing process of regulatory reform

China's economic reforms have made much progress, but considerably more remains to be done. With many of the major strategic decisions and steps having been taken, the emphasis is now shifting toward implementing the reforms through an ongoing process of legislation, formulation of regulations, review, revision and, where necessary, removal of existing laws and regulations. Regulatory reform to improve the quality of these processes is now becoming crucial to ensuring that the major reforms are successfully sustained over time.

The Review documents the impressive and growing progress on regulatory reform that has been made in China. It notes that international experiences, including those of OECD members, point to several general principles for effective regulation. Effective regulation depends on the existence of regulatory bodies with clear mandates, authority, and accountability. Regulators need to be independent – not simply (or even most importantly) in a formal sense, but free from interference from regulated businesses and other government agencies. Effective regulation focuses on making markets work effectively, by fostering efficiency and innovation, promoting sustainable development, and maximising benefits to end-users. It is best separated from the pursuit of industrial policy or other government mandates. Regulation is a dynamic process in which transparency in rule formulation, effective dissemination to stakeholders and mechanisms for consultation and appeal are essential. It is also an intensely empirical process requiring detailed knowledge of market conditions and trends and tools for assessing the impact of particular regulations and their costs and benefits. Successful regulatory reform embeds these principles and practices in the decision making of each regulatory agency and its components.

The Review highlights a number of areas where China's still-young regulatory institutions and processes could be further improved. Regulatory authority in China is often fragmented across a number of bodies, some of which also have broader mandates. Both conditions can weaken regulatory responsibility and blunt its focus. Inadequate co-ordination among government bodies at the national and sub-national levels is a widespread and ongoing problem, and has led to unclear, duplicative, and often conflicting efforts in a number of areas. While improving, the ability of those affected to know and understand the regulations to which they are subject, to be consulted in their formulation, and to appeal adverse rulings is still limited. Judicial enforcement of laws and regulations tends to be costly and overly unpredictable, particularly in cases where a government body is a party to the litigation. Implementation is sometimes further complicated by an emphasis in formal legislation on general principles that can engender ambiguities about how the law is to be applied in practice. While China has a long history of experimenting with reforms before their nationwide adoption, the systematic use of empirical tools to measure the effectiveness of regulations once they have been imposed is still fairly limited.

The Review makes a number of specific recommendations for improving regulatory capabilities in China, including the following.

- Creation of a distinct body or network among key regulatory institutions to promote high-quality regulation throughout the government. Such a mechanism has proved an effective catalyst for regulatory reform in a number of OECD countries.

- Development of procedures to ensure transparency in rule formulation and application, including consultation with key stakeholders.
- Establishment of concrete mechanisms to simplify and improve regulations, such as "one-stop" windows to consolidate regulatory applications and approval; and "sunset" provisions requiring that certain regulations be reviewed periodically to determine if they should be revised or eliminated.
- Development and promotion of the use of empirical tools to measure the impact of specific regulations and their costs. In OECD countries, regulatory impact analysis comprising a set of tools, such as cost-benefit analysis, is increasingly used to ensure that regulatory impacts are achieved in a cost-effective manner.

Regulatory reforms to promote competition and open markets can have high payoffs to all sectors of the economy, and have been a major focus of reform in many OECD countries. Their experiences underscore that sustaining markets that are open and competitive is an ongoing process involving not only actions against collusion and other traditional anti-competitive practices, but also measures to ensure that regulations do not unnecessarily discriminate against certain participants or pose unnecessary burdens. Complex, opaque and often poorly enforced laws and regulations have long been a concern to China's trading partners and foreign investors, and were a major element in China's commitments under the WTO. While China ranks more favourably than other large emerging economies in international surveys on the ease of doing business, it ranks lower than most other Asian emerging economies.[2] China's domestic businesses stand to benefit at least as much from simpler and more transparent regulation, less burdensome compliance, and more effective enforcement of laws on intellectual property rights and other areas. Steps to achieve these goals could also help greatly in addressing another major concern of China's policy makers – corruption – since complex and opaque regulations increase opportunities for abuse.

The Review highlights the important efforts China has made in recent years toward strengthening competition and openness. The law on government procurement adopted in 2003 prohibits unreasonable discrimination among suppliers, including foreign suppliers. Extensive efforts are being made to review and simplify regulations and to harmonise China's domestic product and other technical standards across sectors and, as appropriate, with international norms. The Review notes that China has gone further than many WTO members in improving regulatory transparency: it has established an inquiry point to provide authoritative clarification of laws and regulations affecting international trade, and has agreed to publish all laws and regulations in at least one official WTO language in addition to Chinese.

These efforts are at an early stage; they will need to be further clarified, refined and broadened over time. The new competition law leaves some important questions unanswered, such as application of the law in industries now designated as vital to national security, that will need to be resolved through further measures or judicial decisions. The law's prohibitions on administrative abuses could be a powerful tool to combat local protectionism and promote more efficient and fair regulation, but its enforcement capabilities remain to be tested. Responsibility for enforcing the law is now divided between three major government agencies with broader responsibilities,[3] whereas the majority of OECD countries have found that lodging the authority with a single dedicated agency tends to be more effective.

OECD experiences suggest a number of steps that could help make competition and market opening reforms more effective.

- Develop and institute a broader competition policy framework and its incorporation throughout regulatory policy as a means of ensuring that regulations promote genuinely open access and efficiency. OECD members are increasingly using competition policy to provide means of systematically reviewing the impact and costs of laws and policies that affect market conduct.
- Broaden efforts to reduce regulatory complexity and to identify and correct constraints on enterprise activity that are more stringent than necessary to achieve policy goals.
- Further reduce entry barriers to service and infrastructure sectors by foreign and, where needed, domestic businesses. This would help to improve competition, efficiency, the variety of products and services offered, and fostering of innovation. In particular, liberalisation of remaining limits on foreign ownership of domestic businesses in the financial sector would help improve the quality as well as quantity of foreign investment.
- Strengthen efforts to harmonise China's technical standards with international standards and streamline conformity procedures, in part by developing the capacities of domestic accreditation bodies. Consideration might also be given to allowing qualified foreign-owned conformity assessment bodies to operate in China.
- Develop and incorporate in regulatory processes objective, empirical tools to evaluate the impact of regulations and their costs and benefits. Regulatory impact analysis and other tools used by OECD member regulators may be useful in this effort, although they will need to be adapted to China's circumstances.

The special challenge in infrastructure sectors

Infrastructure sectors present particular challenges as well as risks for regulatory reform. Formerly regulated entirely as natural monopolies, these sectors have been gradually and partially deregulated in OECD countries. The aim has been to introduce competition into those segments where it is viable while continuing to regulate segments where competition is not viable and monopoly provision is most efficient. For example, in the electricity sector, transmission is a natural monopoly since it is most efficient to have a single grid; but competition is feasible in electricity generation since many providers can connect to the single grid. China is in the process of undertaking similar reforms in its energy sectors, including electricity, as well as in water provision and sanitation and telecommunications.

However, while the principle may seem simple, practical introduction of multiple providers in competitive segments while maintaining regulation of pricing and other conditions in the monopoly segments has proved to be a complex task fraught with pitfalls. (Some non-infrastructure sectors, notably healthcare, also involve a mix of elements that can be left to competitive markets and elements that require regulation – and similar difficulties arise.) Infrastructure segments are closely linked, so that distortions in one segment can seriously impair performance in the others. Since infrastructure industries are critical suppliers to other industries and services, their performance has a major bearing on the economy's overall efficiency and development. Thus, while the benefits of successful regulatory

reform of infrastructure industries are large, so too are the potential costs of reforms that are badly designed or poorly executed.

Deregulation of infrastructure sectors in OECD member countries has a record containing notable failures as well as successes. Examination of these experiences offers some insights that may be useful for China's current infrastructure reform efforts. OECD experiences especially underscore the need for high-quality regulatory institutions and processes.

- Infrastructure reform is an adaptive process rather than a one-time, "big bang" event. It needs to be shaped by the particular circumstances of the industry and economy in which it occurs. The quality of the institutional design of reforms and the timing of their implementation are critical to establishing the credibility of the regulators and preventing their capture by the regulated or other outside interests.
- Introduction of competition requires strong effective regulation to ensure that benefits accrue to end-users. Regulatory interventions need to be carefully co-ordinated along the supply chain.
- Regulators need to be capable of balancing competing considerations, such as environmental or safety considerations *versus* technical efficiency. Empirical tools to evaluate impacts and the trade-offs involved, such as those in regulatory impact analysis, are likely to be particularly needed in infrastructure regulation.
- Because of information asymmetries, high-powered incentive schemes are the most efficient tool for regulating infrastructure service activities. Effective incentive systems in turn call for regulators who have a very clear understanding of industry conditions and a high degree of credibility.

The Review's examination of China's ongoing regulatory reform of electricity and of water supply and sanitation further highlights these points and offers other potential insights. Formal deregulation of China's electricity sector began in 2002 with the creation of five regional power generation companies and two transmission companies designed to operate as regulated monopolies. The State Electricity Regulatory Commission (SERC) was created as the main regulator over electricity, and is expected to ultimately assume authority over other energy sectors. Authorities plan to introduce multiple competitive providers in each of the geographic regions, and to gradually allow prices to be more responsive to market forces. The regulatory reform process is very much a work in progress, and the Review highlights several areas for improvement and some potential pitfalls.

One of the most pressing needs is to reform the pricing of electricity as part of price reform in the overall energy area. Failure of electricity prices to keep in line with energy and other costs has led to erratic investment and periodic shortages in electricity supply, most recently during 2003-06. Retail prices for electricity are below those in most OECD countries and probably lower than necessary to promote efficient use and adequate conservation. Comprehensive reform is likely to be needed to establish pricing that reflects costs in all components, from extraction to refining and distribution, and to end-users. The Review suggests a number of steps for consideration in order to achieve this goal, as well as to strengthen the broader process of electricity reform.

- A key priority is to complete the building of a sound legal and regulatory framework. Consideration should be given to following the practice in most other countries of

according the primary authority for electricity pricing, which now lies with the National Development and Reform Commission, to the sector regulator, namely the SERC.

- Regulation needs to foster investments in new transmission and other facilities that are economically viable and efficient in terms of their scale, efficiency, technology, and use of alternative fuels.
- Clear and effective policies and instruments need to be developed and embedded in the electricity regulation process to ensure that it promotes and does not hinder broader longer-term objectives, notably those for conservation and the environment.
- Introduction of competition into generation, while an important longer-term goal, needs to be done with care and rigorous monitoring and oversight. Inelasticity in electricity supply and demand and other factors make electricity markets particularly vulnerable to collusion and other anti-competitive practices, as well as large price swings. Fragmentation in China's transmission grid tends to add to the vulnerabilities. Maintenance of effective competition requires highly capable regulators with detailed knowledge of market conditions and analytical tools to detect changes in those conditions.

The high degree of decentralisation of water supply and sanitation and its importance to health, environmental and other policy objectives, present formidable challenges of co-ordination among a myriad of providers, regulators and government agencies at the central and sub-national levels. Effective regulators are particularly important because the nature of water supply affords consumers less choice among providers than in electricity or gas.

China has been refining its regulatory framework, institutions and practices in water and sanitation for many years, and has made significant progress. Outside (including foreign) companies have become key players in water provision, operating under build-operate-transfer and other arrangements to share costs and risks along with local governments and the providers. But much remains to be done. As in electricity, an important objective is to develop pricing mechanisms that adequately reflect costs, in order to encourage investment and also promote development and maintenance of clean water supplies. Water is inefficiently used in agriculture due in part to inadequacies in pricing, and end-users in urban areas are generally not charged directly for sewerage and water treatment costs.

Based on the experiences of several OECD members, the Review makes a number of suggestions to improve regulatory effectiveness in China's water sector:

- Better define, where necessary through legislation or new regulations, the roles and responsibilities of the central and local government bodies involved with water regulation, including water cleanliness and pollution control.
- Establish national water quality and environmental standards that are consistent with international norms. Establishment of a river basin approach to support and co-ordinate efforts of local authorities would help to ensure effective implementation of the standards.
- Develop and improve monitoring and evaluation capabilities and procedures, and improve public availability of information. These steps would help to establish a more predictable environment for investment in the sector and provide feedback to regulators when problems arise.

The links to success with other reforms

Regulatory reform is increasingly important to other economic reforms under way in China. Improvement in rural healthcare, and ultimately reform of the entire healthcare system, present formidable regulatory challenges to contain costs and deal with the adverse incentives and resulting inefficiencies that have afflicted China's system (as well those of OECD countries). Development of the pension system will require high-quality financial regulation to ensure that financial institutions can provide the savings vehicles needed for old-age security without incurring undue risks. The Review observes that the success of China's efforts to develop interior regions greatly depends on regulatory and governance reforms to improve the local business environment.

The success of regulatory reforms is also dependent on progress in other reform areas. For example, the Review suggests that further reductions in the scope of the SOE sector would not only help to improve efficiency in industry, but also facilitate improvements in the quality of supervision of remaining SOEs by SASAC. Macroeconomic stability, supported by effective and flexible monetary, fiscal and exchange rate instruments, is very important to ensuring that the payoffs from regulatory reforms are realised.

The Review highlights two areas that are likely to be especially important to further progress with regulatory reform. The first comprises efforts to strengthen the rule of law through judicial and other reforms. Numerous studies of China's economic reforms, including this Review, have stressed the importance of improving enforcement of laws and regulations. Judicial interpretation will be a key element in the process of clarifying laws and regulations, and is likely to involve far more proceedings in which government agencies are parties than in the past. Efforts now under way to improve the qualifications and training of judges and other officials in the judiciary will help to improve enforcement, but further efforts may be needed to better insulate the judiciary from undue interference, including from government and political officials.

The second area that will be critical to the success of regulatory reforms is comprehensive reform of relations among central and sub-national governments. The chapters in the Review highlight the obstacles to reform often posed by conflicting and inconsistent mandates among agencies at different levels, and the difficulty of ensuring that local government regulators and other agencies effectively implement national policies. The need to clarify responsibilities and develop mechanisms to improve accountability and oversight is a recurring theme not only in this Review but also in other studies of China's regulation and governance.[4]

However, the Review suggests that success in this area will require more than new laws and administrative decrees. China's highly but unevenly decentralised fiscal system has led to large gaps between expenditure mandates and the resources needed to carry them out at the local level, particularly in interior provinces. These gaps engender conflicts in the mandates of local officials, in which conformity to one set of central government requirements can interfere with other obligations. Thorough reform of fiscal relations among government levels is thus a pressing need that is likely to be important to the success of future regulatory as well as other key reforms in China.

Notes

1. Barry Naughton (1996), *Growing Out of the Plan: Chinese Economic Reform 1978-1993*, Cambridge University Press.
2. China ranks more favourably than its overall score in the World Bank survey when it comes to ease of registering property, conducting international trade and enforcing contracts. However, its rank on the ease of establishing a new business was in the lower quarter of countries surveyed, and its rank in ease of obtaining licences was near the bottom. See the World Bank, *Doing Business: 2008*.
3. These are the State Administration for Industry and Commerce, the Ministry of Commerce, and the National Development and Reform Commission.
4. For example, the OECD reports on *Governance in China*, 2005 and *China in the World Economy: The Domestic Policy Challenges*, 2003.

PART I

The Macroeconomic Context

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OECD Reviews of Regulatory Reform: China
Defining the Boundary between the Market and the State

Chapter 1

Economic Reforms

The advance to a market economy in the People's Republic of China is among the greatest economic success stories of modern times. China's performance seems all the more impressive given the distinctive manner in which it was carried out.

This chapter summarises the enormous progress that China has made in developing the modern legal and regulatory foundation for the market economy. The seven years since China's accession to the World Trade Organisation in 2001 have been especially productive for economic reforms. New laws have gone a long way toward establishing systems for ownership, competition, and mechanisms for entry and exit comparable to those of most OECD economies. At the same time, the chapter outlines the important challenges that remain. These include further reduction in the scope of state ownership, reform of relations among central and local governments, firmer establishment of the rule of law, and strengthening of regulatory institutions and processes.

Introduction

The advance to a market economy in the People's Republic of China is among the greatest economic success stories of modern times. Since the beginning of the reform era in 1978, real GDP has grown at an average rate of 9.8%, a performance that compares favourably to the earlier extended growth spurts of Japan and Korea (Table 1.1). China has become the third-largest economy overall, the world's largest manufacturer, and its number two exporter. Rapid growth has led to equally impressive gains in living standards and other indicators of wellbeing. Per capita GDP has increased twelvefold, catapulting China into the ranks of lower-middle-income developing economies. The portion of the population living below the poverty line (by national standards) has fallen from 53% in 1978 to 8% in 2005 (Table 1.2). The gains have been widespread, if unevenly shared, among all regions and segments of the population.

Table 1.1. **China's comparative growth performance**

Average annual growth in real GDP	
China: 1978-2007	9.8
Japan: 1950-1980	7.7
Korea: 1950-1980	9.1
India: 1978-2007	5.9
Average growth in real GDP per-capita at PPP exchange rate[1]	
China: 1978-2004	11.7
Japan: 1950-1980	11.1
Korea: 1953-1983	9.5
India: 1978-2004	6.9

1. Per-capita GDP at purchasing power parity exchange rate from Penn World Tables, using that source's PPP exchange rate estimates.

Source: Asian Development Bank and Goodhart and Xu, 1996 for real GDP growth figures; real per-capita GDP figures from Heston, Summers and Aten, 2006.

China's performance seems all the more impressive given the distinctive manner in which it was carried out. Other international experiences have suggested that the partial reform and state dominance of the economy that prevailed until recently more often led to sluggish growth and slow development. Yet China's success during the first half of the reform era largely reflected the impetus created from the liberalisation of severe restrictions on the rural economy and its opening to foreign trade and investment. As this impetus began to wane by the early 1990s, China's reformers embarked on a more comprehensive programme of building the frameworks and institutions for a modern market economy. It is these reforms that succeeded in renewing the impetus to growth and driving it to new heights in this decade.

As discussed in the next section, China has made enormous progress in developing the modern legal and regulatory foundation for the market economy. The eight years since China's accession to the World Trade Organisation in 2001 have been especially productive for economic reforms. The country's private sector is now the largest in comparing major ownership segments and the most important driver of new growth. New laws have gone a long way toward establishing systems for ownership, competition, and mechanisms for

Table 1.2. **Indicators of China's development**

	1978	1990	2006
Real GDP (PPP, USD billion)			
At 1995 exchange rates and prices	145[1]	408	2 154[4]
Per capital GDP (PPP, USD)	250[7]	2 340	5 370[4]
Percentage of employment in:			
Primary sector	70.5	60.1	42.6
Secondary	17.3	21.4	25.2
Tertiary	12.2	18.5	32.2
Average life expectancy at birth	67.9[1]		73.2[5]
Mortality of children under 5	60[7]	45	24
Adult literacy rate (% of 15 years old and above)			
Female		68	87[6]
Male	77[9]	87	95[6]
Portion of population below poverty line: national definition8	52.8[1]	22.1	8[5]
Urban population as % of total	17.9	26.4	43.9
Portion of urban population with access to tap water		48	86.7
Telephones (fixed plus mobile/sets per 100 persons)		1	69[4]
Automobiles per 100 urban households		0.34[3]	4.32
Refrigerators per 100 urban households	6.6[2]	42.3	91.6
Highway density (km of roads per 1 0000 km^2)	927	1 071	3 601
Railway density (km of rail per 10 000 km^2)	53.9	60.2	80.3
Foreign trade/GDP (merchandise exports + imports as ratio to GDP, %)	9.7	29.8	66.8[4]

1. Figure for 1981.
2. 1985.
3. 1999.
4. 2007.
5. 2005.
6. 2000-04 average.
7. 1980.
8. New definition of CNY 800 or below per year for rural persons and CNY 1 200 or below for urban persons.
9. Figure for 1982 for all adults, from *China Statistical Yearbook*.

Source: China Statistical Yearbook, 2007; Ravaillon and Chen, 2004; World Health Organisation; World Bank: *World Development Indicators*.

entry and exit comparable to those of more advanced economies. At the same time, important challenges remain, including further reduction in the scope of state ownership, reform of relations among central and local governments, firmer establishment of the rule of law, and strengthening of regulatory institutions and processes.

Box 1.1. **How economic reforms contribute to growth**

Growth in a country's per capita income can be determined by the rate of accumulation of capital relative to labour, by increases in the quality of labour and capital, and by improvements in technology, know-how, and other factors that contribute to overall productivity ("total factor productivity", or TFP) of those inputs. In the early stages of development, shifts in labour from agriculture and other lower-productivity activities to higher-productivity jobs in industry, and the adoption of technology and techniques from more advanced countries, have been important contributors to per capita income growth by increasing total factor productivity. At later stages of development, gains from sector shifts and absorption of know-how become more difficult, and other factors – in particular, productivity increases from better education and skills for the labour force ("human capital") and innovation become more important.

Box 1.1. **How economic reforms contribute to growth** *(cont.)*

Economic reform, including regulatory reform, is an important contributor to growth in aggregate and per capita income, in a wide variety of ways. Development of a well-functioning financial system encourages savings and their collection by financial institutions and markets – both of which are critical to rapid capital accumulation – and allocates those savings to the most efficient uses. Conversely, financial systems that offer inadequate or insecure returns, or are ineffective in allocating funds, cause savings to be diverted to less productive uses and thereby lower aggregate real growth.

Economic reforms also contribute to growth by improving resource allocation, the quality of factor inputs, and those inputs overall productivity (TFP). For example, integration of labour markets through removal of barriers to mobility is critical to achieving the sector shifts from low- to high-productivity sectors. Effective competition law reduces distortions in prices that lead to misallocation of resources and higher costs to consumers and businesses. Efficient labour markets that provide rewards to workers in line with their productivity foster accumulation of human capital through better education and training. Effective protection of intellectual property is critical to encouraging innovation and the diffusion of knowledge and expertise.

The gradual transition to the market and its macroeconomic consequences

At the beginning of the reform era in 1978, China's economy reflected the features of the centrally planned system initially adopted from the former Soviet Union (FSU). Virtually all prices and quantities were determined by the plan; formal markets were virtually absent. Businesses, except for the very smallest, were adjuncts of government agencies, and the financial system – mainly consisting of a single monobank, played a passive accounting role in resource allocation. All property was owned by the state (or collectives in agricultural communities) and there was virtually no mobility of labour. The most basic laws, regulations and institutions essential to a market economy were not present.

China's gradual transformation to a market economy since 1978 has been punctuated by important shifts in strategy and tactics and a number of major leaps, such as the one following Deng Xiao Ping's "southern tour" in 1992. The overall goals as well as the tactics of the strategy evolved during the reform period, and accompanied by the progressive upgrading of the official status of the private sector in the economy. The reform process has been highly pragmatic, indeed sometimes *ad hoc*. Nationwide reforms have often been based on prior experiments in one or more provinces. Reforms have slowed significantly at times when major problems were encountered, but the basic direction of reforms has been maintained.

A mutually reinforcing relationship between macroeconomic performance and economic reforms ("virtuous circle") has been a key driving force in the overall reform process for most of the past three decades. For example, the spurt in real growth following the initial agricultural reforms helped to ensure the success of policies allowing the emergence of township and village enterprises (TVEs). When, as in the late 1990s, structural problems become a drag on real growth, the authorities' persistence with necessary reforms succeeded in re-establishing the virtuous circle.

Partly because the transition has been gradual, a number of features of the central planning era continue to influence economic policies. The property rights regime has been greatly clarified but significant restrictions and some ambiguity remain, especially with respect to land and the sale of assets of central government-owned enterprises. The embedding of Party officials and structures in state-owned business enterprises and government agencies, based on the nomenklatura system first introduced in the FSU and adopted in China at the beginning of the central planning era, has persisted and is complicating reforms in a number of areas. The segmentation between the rural and urban economies that was reinforced during the pre-reform era is only gradually breaking down.

The geographic dispersal of industry, along with decentralisation of policy implementation (which contrasts with the centralisation characteristic of the FSU), has had a particularly profound impact on the economic reform process. Industry was deliberately dispersed for security reasons during the pre-reform era and in the early 1970s local governments were given formal ownership and responsibility for 98% of state-owned enterprises[1] (Goodhart and Xu, 1996). This, along with the extensive decentralisation of policy implementation, has continued to give local governments a large amount of effective autonomy even though China is constitutionally a unitary state. This local autonomy, because of the latitude it afforded for policy experimentation, has been helpful to reform at certain times, but it has also been a significant obstacle to reform implementation in a number of important areas.

Growth from initial agriculture reforms and emergence of the non-state sector

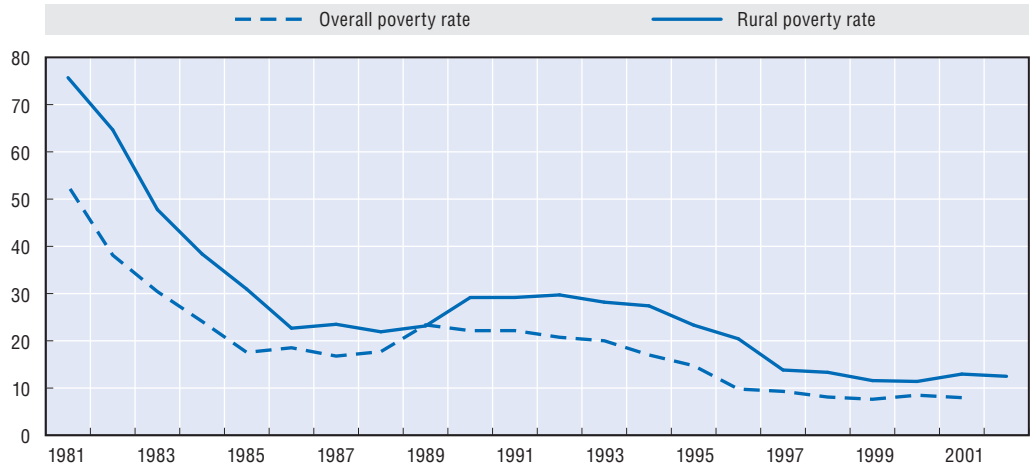
The first half of the reform period, from 1978 to the early 1990s, was marked by the gradual freeing of prices and economic decisions from the central plan, a process that has been characterised as "growing out of the plan" (Naughton, 1995). Although there was only limited formal legal and institutional development, the development of markets, emergence of the non-state business sector, and opening to foreign trade and investment laid the basis for the institutional reforms that came later.

The initial impetus to growth came in 1978-79 with the raising of agricultural prices and establishment of the household responsibility system. This system restored individual farming and allowed households to sell their output above a fixed quota at the new higher price fixed by the state. The improved autonomy and incentives for farmers led to a spurt in agriculture output and productivity, which respectively grew by 7.4% and 6.6% annually over 1978-1985[2] (Goodhart and Xu, 1996). Sharply rising farm incomes led to a dramatic decline in poverty, which fell from 76% of the rural population in 1981 to 23% in 1985, while overall poverty fell to 17.6% from 53% over the same period (Ravaillon and Chen, 2004) (Figure 1.1). These trends had profound repercussions for the broader economy:

- Rural household savings rose from virtually zero pre-reform to reach 20% of income by the mid-1980s, and to above 30% by the early 1990s. This together with rising urban savings provided the resources for rapid capital accumulation.
- The increase in productivity reduced the labour required in agriculture, providing a large pool of workers for the emergence and expansion of the TVEs.[3]

The agricultural reforms began the process of market development and freeing of prices. Beginning in the early 1980s, authorities introduced a two-tier pricing system under which output above the required quota could be sold at market-based prices.[4] A similar system was introduced for selected industrial products in the mid-1980s, as part of broader

Figure 1.1. **China's poverty rate**



Note: Rates are in accordance with the new Chinese definition.
Source: Ravaillon and Chen, 2004.

reforms to improve the autonomy and incentives of state-owned enterprises (SOEs). As output increased more rapidly than the quota and as the system was broadened, the portion of output sold at market prices steadily increased. Nearly two-thirds of agricultural products were sold at market-based prices by 1985, and by the early 1990s administered prices had become negligible in most sectors except for some agricultural products and energy and utilities.

Spurred by the exodus of workers from agriculture and their exemption from central planning, TVEs recorded spectacular growth and in fact became the growth engine of the overall economy. TVE output grew more than fourfold between 1980 and 1985, and employment rose from 30 to 70 million, or from 9.4% to 18.8% of the rural labour force (Goodhart and Xu, 1996). Rapid growth continued into the 1990s, with employment reaching 135 million at its peak in 1996; at that point TVEs accounted for 26% of GDP.

The transfer of labour from agriculture to higher-productivity jobs in the TVEs provided a major boost to growth in total factor productivity and potential GDP (OECD, 2005a see Table 1.3). According to estimates by the OECD Secretariat, the shift of workers to TVEs was responsible for nearly two-fifths of total factor productivity growth over 1983-88, which in turn accounted for nearly half of real GDP growth. The "extensive" growth

Table 1.3. **Source of real GDP growth**

	1983-88	1988-1993	1993-98	1998-2003	2003
	Percentage points				
GDP	12.1	8.9	9.8	8	9.1
Employment contribution	1.5	1	0.3	0.3	0.4
Capital contribution	5	4.5	5.5	4.9	5.5
Residual factors (=TFP growth)	5.6	3.4	4.1	2.8	3.1
Of which:					
Sectoral change	2.2	0.8	–0.3	0.5	0.7
Education	1	0.9	0.9	1.1	0.8
Multi-factor productivity	2.4	1.7	3.4	1.3	1.6

Source: OECD Secretariat estimates from OECD, 2005b.

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recorded by China during the 1980s contrasts with the greater dependence on capital formation beginning in the early 1990s.

The TVEs emergence posed a major competitive challenge to SOEs and spurred reforms to improve their incentives and ability to compete in the developing markets. Beginning in the early 1980s, the authorities began to separate SOEs from government departments and to give their managers greater autonomy in making business decisions. Incentives to operate efficiently were enhanced through bonuses based on performance and partial profit retention. The reforms were progressively broadened into the next decade as SOEs were allowed to retain an increasing portion of their profits, and output for sale at market prices and management incentives were enhanced.

Profound effects of early opening to foreign trade and investment

China's early opening to foreign trade and investment proved to be one of the most fruitful elements of its economic reforms. Compared to the growth takeoffs of Japan and Korea, China's opening occurred at an earlier stage and went further in terms of the scope allowed to foreign enterprises in the economy. The development of the export sector followed the strategy adopted by the East Asian tigers and (earlier) Korea and Japan; its growth was promoted by the integration of China's export capacity into the distribution production networks of the region.

The opening began with the establishment of the first special economic zones in Guangdong and Fujian provinces in 1979. This was followed by the proliferation throughout the country of special zones and foreign trading companies licensed to contract with domestic enterprises, mainly TVEs, to produce for export using imported inputs. Under this "ordinary" trading regime (Naughton, 2007), production for the domestic economy remained highly protected by high tariffs and quotas. In the late 1980s, a second separate trading regime was introduced by allowing foreign enterprises (only) to establish facilities in special export processing zones (EPZs) using imported inputs exempt from duties. Foreign firms' presence grew very rapidly and soon surpassed the ordinary trading regime to dominate the export trade.

Due in part to supportive exchange rate management (Box 1.2), exports expanded very rapidly under the trade opening. By the early 1990s, China's total foreign trade, measured by the sum of exports and imports to GDP, was already high for a large developing country, and continued to grow (Figure 1.2). Foreign direct investment (FDI) grew rapidly after the introduction of the EPZs and surged following Deng Xiao Ping's Southern tour in 1992 and the subsequent opening of the Pudong and other EPZs throughout the country. By the late 1990s, China had become the largest developing country recipient of FDI and the second largest among all countries.[5] (OECD, 2002, Chapter 10)

More limited institutional development

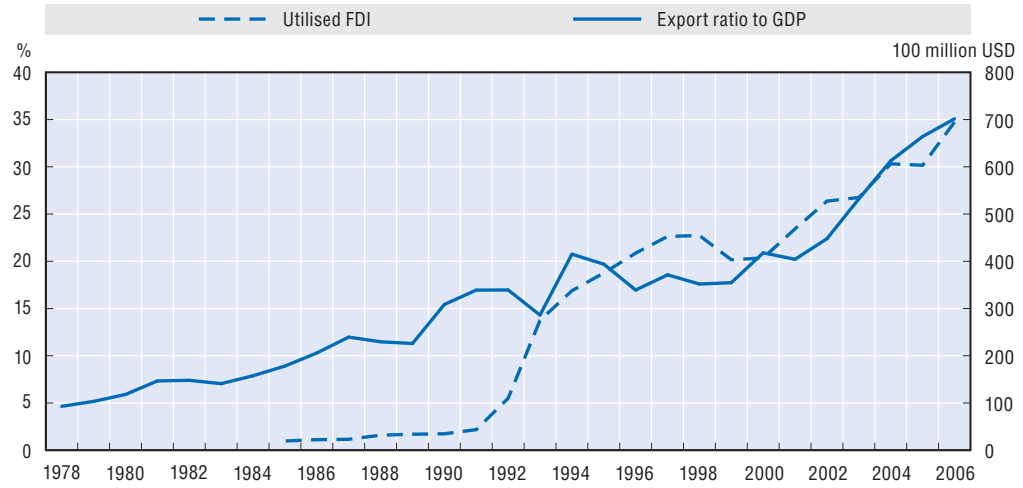
The profound changes in the real economy during the 1980s were accompanied by only limited changes in institutions or the formal legal and regulatory frameworks. TVEs operated under the legal framework of the pre-reform commune and village brigades as collectively owned enterprises. In practice, their management and organisation form was adapted to local circumstances and their support from local governments helped to secure access to credit and protection against interference from other government agencies. SOEs remained under the plan and subject to interference by their original as well as other government departments. Domestic private businesses were allowed (although enterprises

Box 1.2. **Exchange rate management during the first half of reforms**

China's export development was also facilitated by the flexible management and progressive liberalisation of the exchange rate regime. The official exchange rate was periodically devalued during the 1980s and first half of the 1990s to offset the effects of inflation. The introduction in 1981 of a dual exchange rate system further helped to maintain China's international competitiveness. Under this system, exporting firms were permitted to retain a portion of their foreign currency earnings for sale on regional "swap" markets to other authorised trading firms at a price determined by supply and demand. The swap rate typically was lower than the official rate and fell as it was devalued. As the portion of foreign currency earnings that could be retained increased over time, a growing portion of China's foreign trade – and by 1994, nearly all of it – came to be transacted at the market-determined swap rate. It was in 1994 that the exchange rate regime was reunified, with the official rate set at the lower swap rate prevailing just before its inception.

Opening to trade and foreign investment also spurred gradual and partial relaxation of restrictions on financial flows, especially to facilitate foreign-invested enterprises. China officially achieved current account convertibility in 1996, and seemed well on the way to capital account convertibility until the onset of the 1997 Asian Crisis prompted a shift toward more gradual liberalisation.

Figure 1.2. **Exports and Foreign Direct Investment**



Source: China Statistical Yearbook, 2007.

employing more than eight persons were not formally legalised until the late 1980s), but their development was constrained by ambiguities about their status and rights, especially their property rights.[6] Formal urban labour markets were barely developed due to the lifetime employment system at SOEs, which effectively bound workers to a single employer who provided housing, education, medical and other services.[7]

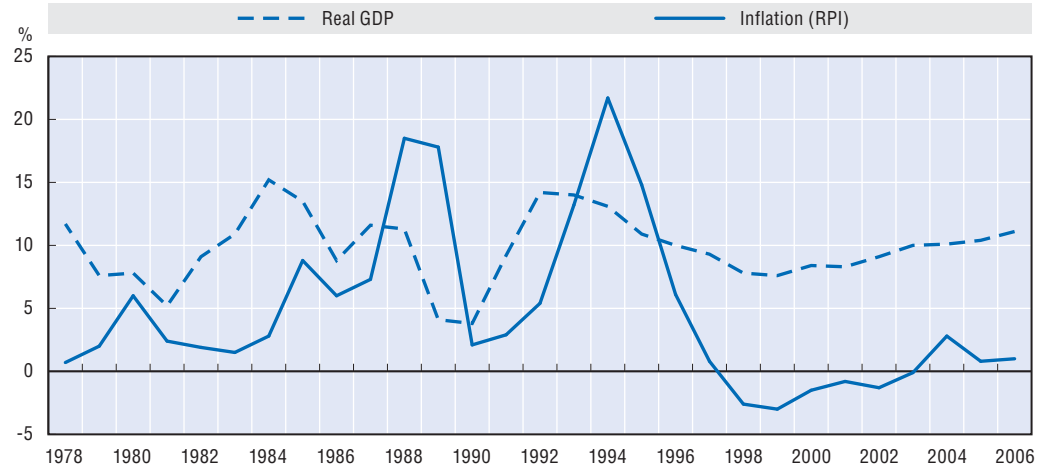
The creation in 1983 of the People's Bank of China (PBC) as the central bank and establishment of the four state-owned commercial banks (SOCBs) laid the foundation for control of money and credit through the market and provided facilities that were very successful in gathering the growing household savings. But most credit continued to be allocated on the basis of the plan at interest rates fixed by the authorities. The use of

commercial bank loans in place of fiscal outlays to fund investments that were not commercially viable created "soft budget" constraints for SOEs that blunted their incentives to operate efficiently; this contributed to their later problems and those of the banks.[8]

Incremental development contributed to other problems that became increasingly pressing in the following decade. Withdrawal of resources from rural communes following the initial agricultural reforms led to the collapse of the rural healthcare network that the communes had supported. The collapse initiated a progressive deterioration in rural healthcare access and quality. The favourable position given to foreign firms and, in effect, non-state firms in the export sector limited the incentives and ability of SOEs, particularly larger firms, to develop export markets (Naughton, 2007). The concentration of export development and FDI in coastal provinces reinforced growing inequality of development between the coastal and interior provinces. TVE development also occurred mainly in coastal provinces, due in part to the closer proximity of rural areas to urban markets, while industry in interior provinces continued to be overwhelmingly dominated by SOEs.

Institutional limitations were also manifest in three successive demand-driven business cycles during the 1980s, with peaks in 1980, 1985, and 1988[9] (Oppers, 1997). Mindful of the ravages of high inflation during the Nationalist era, authorities acted quickly in each case to tighten credit and raise interest rates. That led to a marked but short reduction in output growth and fairly rapid ebbing of inflation pressures (Figure 1.3). The rapid containment of inflation prevented inflation expectations from becoming embedded, and avoided the financial repression that has afflicted other developing countries with chronic inflation since real interest rates became negative only for short periods.[10]

Figure 1.3. **GDP growth and inflation**



1. RPI is the retail price index.

Source: *China Statistical Yearbook*, 2007.

The difficulty in restraining demand upswings during these cycles was largely attributable to the imperfect control of aggregate credit by the central authorities. Local branches of the People's Bank of China and the SOCBs, prodded by local governments to whom they were partly subject, had strong incentives to provide credit to support the growth of local industry. Real interest rates tended to fall during the upturns as the

administered lending rates lagged behind the rise in inflation, further fuelling the boom in investment. The still-limited profit orientation and capabilities of enterprises, particularly SOEs, aggravated the tendency toward overheating.

The fiscal system also lagged behind the transformation of the real economy, and came under growing strain into the mid-1990s. Reforms over 1980-83 introduced explicit corporate income and other taxes to replace the previous profit remittances from SOEs that had been the main basis of government revenues in the pre-reform era (OECD, 2002, Chapter 20). Taxes were explicitly shared: the sub-national governments assigned the major share of taxes on TVEs and other (domestic) non-state enterprises, while taxes on central government-owned SOEs were assigned to the central government and became its main revenue source. Tax rates and other rules were determined by the central government but tax collection was carried out by sub-national branches of the Ministry of Taxation, which in practice were subject to the influence of local authorities.

Largely because of the much slower growth of the central government tax base compared to that of lower levels, the share of the central government in overall tax revenues fell steadily during the 1980s and early 1990s. The introduction of fiscal contracting in 1988, under which provincial governments and some municipal governments were permitted to retain a portion of the increase in revenues in their jurisdiction above a fixed percentage of a specified base, contributed to this trend by giving local governments incentives to understate revenues to boost their retention of future increases (OECD, 2006). By 1993 the central government's share of total revenues had fallen to just above 20% of the total, an exceptionally low level by international standards. The central government's capacity to foster development of the economy declined as its revenue base shrunk.

The major tax reform introduced in 1994 largely succeeded in restoring the central government's revenue base and improving its elasticity with respect to economic activity. The new tax sharing arrangements immediately boosted its share of total tax revenue to 40%, where it has largely remained since.[11] However, the reforms left the assignment of revenues largely unchanged, and this – together with the divergences in growth among regions and between rural and urban areas – created growing strains and largely unresolved strains on sub-national governments that are discussed further below.

Waning impetus in the early 1990s

By the early 1990s, China's economy had made remarkable progress under the "growing out of the plan" strategy. Living standards throughout the country were much higher than before reforms began, and were rapidly rising further. Market forces had largely replaced central planning in most of the economy and the non-state sector was overtaking the state sector in its contribution to GDP and employment.

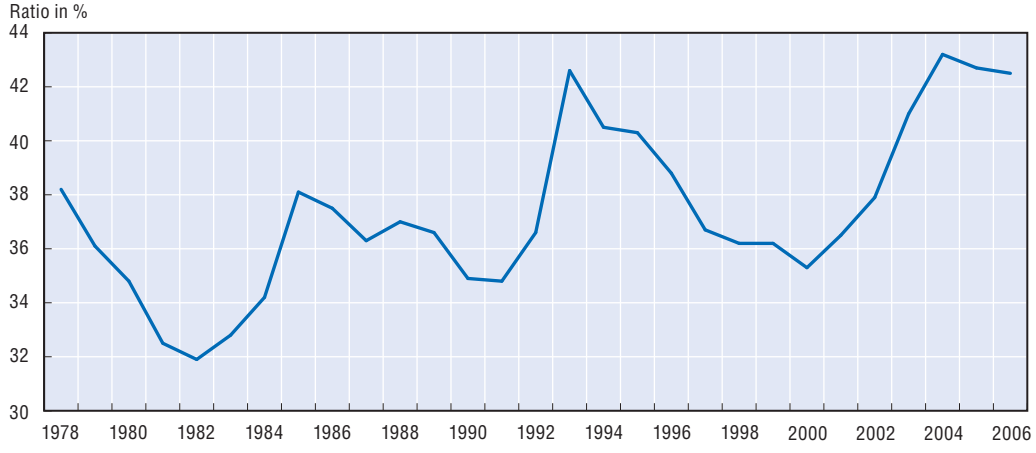
Nevertheless, strains and imbalances arising from the strategy were becoming significant obstacles to further development. The economy had become increasingly fragmented, with the business sector divided into four segments: SOEs dominating heavy industry and utilities; collectively owned TVEs focusing on labour-intensive products and export assembly; foreign-invested enterprises (FIEs) mainly confined to the export sector; and privately owned domestic companies of generally very small size. These segments operated under distinct and often very different legal and regulatory rules. Labour markets were segmented, not only between rural and urban areas but also between the formal, SOE

dominated, city sector and informal sector. Growth was becoming more dependent on capital formation as fragmentation constrained the further ability of the economy to raise productivity through sectoral shifts.[12]

Weaknesses in the competitive incentives and ability of SOEs and to a lesser extent those of TVEs, along with severe deficiencies in credit allocation by banks, were also becoming increasingly apparent in performances. By the early 1990s SOE profit rates had already fallen to levels that were low by international standards. SOE employment growth slowed to an annual rate of 1.7% between 1990 and 1995, from 2.8% over the prior five years. Lax lending standards and poor internal controls of banks, pressure from central and local governments to lend to SOEs and TVEs under their control, and lack of mechanisms to compel repayment all drove business debt accumulation to precarious levels. By the early 1990s the debt had risen to nearly twice the equity of an average SOE, while TVEs' debt ratios were even greater. Such leverage was in some cases as high as that seen in other East Asian economies before the 1997 crisis.

The severe overheating that developed during the 1991-95 economic expansion, which brought inflation from low single digits in 1990 to above 20% in 1994, underscored the continued institutional weakness in macroeconomic control instruments, and left an even more weakened business sector in its wake. The expansion was fuelled by a massive investment boom, reflected in a surge in the ratio of investment to GDP to 42%, its highest level so far during the reform period (Figure 1.4). Local SOEs undertook massive investments to try to buttress their position against the growing inroads of the non-state sector, and were encouraged by local governments seeking to support employment and boost revenues. Central authorities virtually lost control of aggregate credit as local governments successfully pressured local branches of the major banks to lend to support the investment. The investment boom again illustrated the soft budget constraints faced by SOEs; the incentives for expansion with inadequate consideration of diminished future profits resulting from local government backing for TVEs; and the weaknesses in internal management and governance of both groups of enterprises.

Figure 1.4. **Gross investment ratio**



1. Gross fixed capital formation/GDP.

As in China's past booms, the authorities acted fairly promptly to reassert control over credit once inflation became evident. At first, the economic slowdown was mild compared

to earlier cycles and China's growth remained remarkably robust in the immediate aftermath of the 1997 Asian crisis. However, it soon became apparent that the seemingly favourable macroeconomic performance was masking serious and growing economic imbalances. The 1991-95 boom resulted in an extensive overhang of excessive or unproductive capital throughout industry. By the late 1990s, the majority of China's industries were reporting excess capacity, a condition that persisted into the following decade. SOEs were further burdened by very high inventory levels of goods that they were unable to sell due to poor quality or other defects (OECD, 2000).

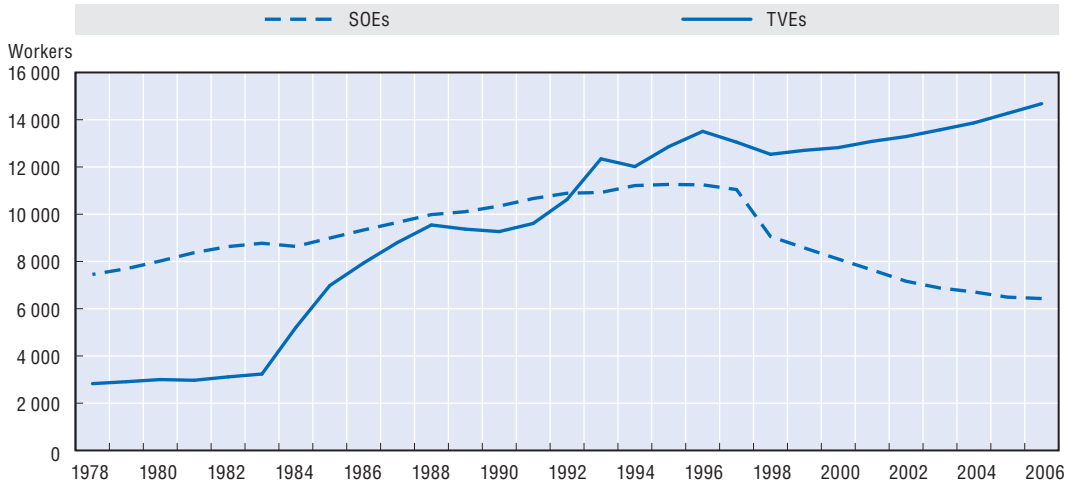
The economic boom masked a serious deterioration in financial conditions of the SOEs and rising problem loans of the banking system that were apparent in the aftermath but which were well under way by the early 1990s. Nearly 30% of SOEs (and 20% of all industrial firms) were experiencing net losses by 1994, and the ratio rose further in the second half of the decade to 50% by 1998 (OECD, 2000). A substantial portion of the TVE sector had also become loss-making by the late 1990s (Naughton, 2007). The problems of the SOEs were not simply cyclical but reflected extensive inefficiency in their plant and equipment, incoherent organisation, and the burden of their provision of housing and social services to their workers. SOE workforces were bloated by excess workers amounting to as much as one-third of the total workforce (OECD, 2000).

Although China's limited accounting and loan classification masked the problems initially, the severe deterioration in bank loan quality arising from the problems of the SOEs was apparent by the mid-1990s. Reported non-performing loans (NPLs) reached 27% of total loans for the four SOCBs by 2001, and the actual figure was probably much higher (OECD, 2002, Chapter 7; Lardy, 1998).[13] The deterioration went well beyond the SOCBs, and indicated that the problem was not simply due to their troubles. NPLs for the joint-stock commercial banks and urban credit co-operatives, which were more focused on non-state enterprises than the SOCBs, also rose markedly. The rural credit co-operatives ran into even more serious problems, with estimated NPLs of nearly 40% of their total loans (OECD, 2005b). By the close of the decade, China's banking system was effectively insolvent by the standards applied in other countries.

The macroeconomic economic consequences of these problems became increasingly evident in the late 1990s. Real GDP growth declined steadily after 1994, dropping to below 8% in 1998-99.[14] By 1998, inflation had given way to deflation and the retail price index continued to fall through 2002 (Figure 1.3).

The severity of the deterioration in macroeconomic performance is most evident in the employment figures. SOE employment began to fall in the mid-1990s and its decline accelerated sharply beginning in 1999, when the programme to shed excess labour began (Figure 1.5). According to the official figures, which are based on registered workers who accounted for only part of the urban workforce, the urban unemployment rate rose above 3% in 1997 and reached 4% in 2002. However, outside estimates, based on surveys and other information, suggest that the true rate was probably above 10% by the end of the 1990s (Giles *et al*., 2005). Employment in the TVE sector also slowed considerably in the latter half of the decade. As a result of these trends, the shift of workers from agriculture to industry slowed sharply, leading to a further drop in productivity growth from this source. The resulting slackness in the rural labour market led to increasing migration to the informal sector in urban areas and a growing population of "floating workers"; by 2003 these were estimated to number 140 million, or 30% of the rural workforce (*Peoples' Daily*, 2005).

Figure 1.5. **Employment**



Source: China Statistical Yearbook.

Building the legal and institutional underpinnings

The strains arising from *ad hoc* development prompted a fundamental shift in the development strategy beginning in the early 1990s. As with the earlier phase, the process was initially limited, experimental and at times tentative, and met with mixed success; but it became progressively more coherent and far-reaching. The new paradigm focused on building the legal, regulatory and institutional underpinnings for a market economy in which businesses, regardless of their form of ownership, could compete on comparable terms. Regulatory and other reforms addressing the economy as a whole, rather than individual sectors or business segments, became increasingly central, particularly after the entry into WTO in 2001. The process has entailed reorganisation of the government's regulatory functions and establishment of new regulatory institutions.

For the remainder of the 1990s, reforms focused on reducing the scope of the SOE sector, on improving the capacity of SOEs and other businesses to operate as commercial entities, and on developing financial institutions and markets with the incentives and ability to allocate credit efficiently. In order to accomplish these objectives, authorities faced major challenges in dealing with the dire financial conditions of much of the SOE and banking sectors. Resolution of these problems, along with the demands implied by China's preparation for WTO accession in 2001, spurred broader reforms during the present decade to bankruptcy law, the pension system, protection of property rights and competition law and policy, as well as initial work to reform migration policy. Improved regulatory institutions and practices to manage reforms in a rapidly changing economy have become increasingly necessary, and a major theme of the overall reform process.

Following the enactment of China's first Anti-Unfair Competition law in 1993, three landmark laws came into force in 1995 that marked a key step toward developing a formal and coherent legal framework for further development of the market economy. The Company Law authorised the formation of limited liability and joint-stock companies similar in character to those found in other countries, and established their legal rights. The Law also mandated governance mechanisms for joint-stock companies, including boards of directors and supervisors, and defined in broad terms their responsibilities and rights. Although mainly intended to facilitate the conversion SOEs into commercial

businesses, the Company Law provided an improved if still incomplete legal framework for private sector development. The Labour Law gave employers greater flexibility in setting wages and provided for formal contracts between employers and workers. The new Commercial Banking Law provided the legal mandate for the SOCBs to operate as profit-making commercial institutions and in principle transferred their prior obligations for making commercially non-viable "policy loans" to the four newly created policy banks.[15]

Extensive SOE reform

Beginning in the mid-1990s, authorities began a comprehensive overhaul of the SOE sector, based on three objectives:

- Wholesale divestment, mainly through effective privatisation of small and medium-sized state firms owned by local governments ("grasping the largest while letting go the smaller").[16] The goal was to reduce the SOE sector to the largest, mostly central government-owned, businesses concentrated in a limited number of "strategic" sectors.
- Extensive restructuring of retained SOEs, including reduction of their workforces to economically appropriate levels and divestment of the very expensive social services provided to employees, including housing.
- Conversion of remaining SOEs into corporate legal entities operating as profit-maximising commercial businesses and endowed with effective governance structures. Remaining SOEs were to be gradually prepared for stock market listing as a means of strengthening their governance and to improve their capital base. State asset management companies were to be formed to exercise the state's ownership interests in the remaining SOEs and separate the ownership from the other regulatory functions of the state. These reforms have been and continue to be at the core of efforts to establish an efficient SOE sector that can compete on a level playing field with domestic and foreign businesses.

Divestment of the SME SOEs proved to be the easiest of the objectives to achieve. Local governments, whose financial positions had come under pressure after the 1994 tax reforms, actively promoted transfer of their SOEs to non-state owners in order to escape the burdens posed by their losses and bloated workforces. Many firms were simply closed and a large fraction of the others were sold to managers or other insiders, often at very low prices. The process slowed temporarily in 1998 when the central government sought to crack down on abuses and deal with the disruptions that inevitably attended such a radical change. Shortly after, however, the process resumed. TVEs were also transformed, with many converted into joint-stock collectives still formally owned by their workers but in practice usually controlled by their managers. Over time, most of these became effectively privately controlled, although many continued to register as collectives ("red hats") as a hedge against a possible reversal in government policies.

By early in the next decade, the business landscape had been transformed. The number of SOEs fell by 60% between 1995 and 2001.[17] Privatisation of SME SOEs and collectives along with the improved legal/regulatory environment for private business and continued strong growth of FIEs led to a spectacular explosion of the private sector. By 2001, when China became a WTO member, the private sector, including foreign invested enterprises, had surpassed the public sector in contributing to real GDP: it accounted for nearly 55.5% of total output and 51.8% of the non-farm sector, compared to the 35.7% and 37.1%, respectively, contributed by SOEs. Domestic private enterprises had come to surpass

foreign-invested businesses in the private sector. The private sector was most predominant in industry, and dominant in export and labour-intensive industries, while the state-controlled firms remained dominant mainly in extraction, public utilities and network industries, and in financial services.

The letting go of SME SOEs was accompanied by a difficult but ultimately extensive central government effort to restructure the remainder. The traditional lifetime job guarantee system came to an abrupt end beginning in 1998 with a massive effort to reduce excess SOE workers. Nearly 45 million SOE workers – nearly one-third of total SOE employment prior to the reform – were "let go" over the next five years, most into employment centres (*xiagang*) providing temporary income support along with retraining and assistance in finding jobs. Ancillary units of the SOEs providing health, education and other services were gradually divested and converted (often with initial financial aid) into separate entities. The resulting reduction in financial burdens on SOEs were only slowly manifest, in part because they were required to supply one-third of the outlays to the re-employment centres (and often more, as local governments were often unable to supply their portion of the support and shifted the burden to local SOEs). However, the benefits became progressively larger over time as workers left the re-employment centres.

SOE downsizing and privatisation became major catalysts to the broader reforms needed to further develop the private economy. Reforms to allow individuals to acquire ownership rights to their residence, which began in the early 1990s and gained further momentum with SOE reforms, led to the development of urban housing markets and sparked a boom in spending on household-related items that helped support real growth. Legal ambiguities over claims on assets of failed or closed SOEs, unpaid taxes, and obligations to pension and other social welfare funds became important impediments to restructuring during the latter 1990s, but underscored the need for the modernised bankruptcy law that emerged in the following decade. The surge in laid-off workers increased the urgency of developing a system of unemployment and other welfare benefits and a pension system.

Efforts to improve SOEs efficiency and reform their governance proved to be the most difficult of tasks. Reforms to reorganise, consolidate, and merge SOE operations to create more commercially viable entities were hampered into the next decade by local protectionism, conflicts among government agency stakeholders, and in some cases industrial policies aimed at promoting national champions. The legal and regulatory underpinning for market-based mergers and acquisitions did not begin to develop until the next decade, and then only incompletely.

Conversion of SOEs into corporate entities also progressed slowly at first, although it gained momentum after China's entry into the WTO. Less than half of the SOEs had been incorporated by 2003, and many of those had not fully established the governance structures mandated by the Company Law (Naughton, 2007). Initial efforts to reform state oversight of SOEs through the creation of local asset management companies charged with exercising the government's ownership function had disappointing results. Most of these companies were organised along industrial lines and continued to be heavily involved in industrial policy and other regulation rather than exclusively focused on ownership oversight. Their efforts to restructure the companies under their tutelage were hampered by conflicts with other government agencies and other obstacles mentioned above.

The mixed success of initial reforms to recapitalise banks

Reforms began in the mid-1990s to restore the major banks to financial solvency while converting them into profit-making institutions whose lending would be based on strict commercial criteria. Following mandates specified in the 1995 Commercial Banking Law, the authorities greatly tightened bank loan standards – making individual loan officers accountable for loans that became non-performing – and began to introduce a new classification system based on international standards.[18] A plan was developed to convert the SOCBs into joint-stock companies, followed by listing on the stock markets.

The authorities began providing financial assistance to banks later in the decade, beginning with capital injections into the SOCBs and a number of ailing joint-stock banks. This was followed in 1999 by the transfer of CNY 1.4 trillion of SOCB non-performing loans – an amount thought to have originated before 1996 – to four newly formed bank asset management companies charged with working off the assets. The SOCBs were left with responsibility for the remaining NPLs, which turned out to be much higher than originally estimated by the authorities.[19]

The 1990s banking reforms did result in a significant improvement in the financial conditions of the joint-stock commercial banks, which were in much better condition than the SOCBs and had been commercially oriented since earlier in the decade. The reforms also laid the foundation for further improvements in loan assessment, classification and risk control by the SOCBs. However, their very low profitability, along with restrictions on their ability to write off loans imposed by the Ministry of Finance, prevented the SOCBs from appreciably reducing their NPLs over the next four years (OECD, 2002, Chapter 7). Moreover, the continued large NPLs risked interfering with other reforms, since banks with no capital of their own to lose have limited incentives to maximise profits or contain risk. Faced with intractably high NPLs and under strong pressure from the regulatory authorities to avoid new bad loans, SOCBs, and to a lesser extent other banks, became very conservative in their lending policies. The result was a slowdown in aggregate lending growth and a credit crunch for smaller and medium-sized SOEs that had been or were about to be privatised and now faced loss of their local government backing as a result.

Beginning in 2003, a more decisive strategy to resolve the NPL problem was instituted under the aegis of the newly established China Bank Regulatory Commission (CBRC). The China Construction Bank and Bank of China, which had made most progress on prior reforms, were each given a capital injection of USD 22.5 billion from the central government, and the bulk of their NPLs were transferred to their corresponding Asset Management Companies (AMCs**)**. A similar operation, involving a capital injection of USD 45 billion, was carried out for the Industrial and Commercial Bank of China in 2005. Capital was subsequently further raised by sales of subordinated debt and listing on the Hong Kong stock exchange of the three banks. These actions, together with strong economic growth, have led to a dramatic improvement in the banks' financial conditions and provided a much firmer foundation for their fundamental reform.

The priorities of inequality and sustainable development

The deterioration in SOE performance and overall slowdown in job growth accentuated concerns about growing income inequality that had been muted when growth was more robust and most people were experiencing rapidly rising living standards. Overall income inequality, measured by the GINI coefficient, rose fairly steadily beginning

in the latter half of the 1980s; by early in this decade it had exceeded that found in most other Asian emerging economies, and was approaching that found in major Latin American countries. Much of the inequality among regions reflected the growing gap between rural and urban incomes (see Figure 1.1), although differences among urban areas on the coast and in the provinces were also sizeable. Underlying the income inequality were substantial and increasing divergences in development between coastal and interior regions that had been accentuated by economic reforms. Compared to coastal provinces, the interior provinces – particularly those in the west – are more dependent on SOEs; have much less developed non-state and (particularly) private sectors; are less involved in foreign trade, especially in foreign direct investment; and are relatively poor in transportation and other infrastructure. Interior regions have also suffered most from the growing gap between expenditure mandates and fiscal resources of local governments.

To address the regional inequalities, the government introduced in 1999 an ambitious programme for Western Economic Development. The programme emphasised infrastructure development and involved tax preferences and substantial transfers of funds from the central government to western provinces. Several other policies were adopted subsequently to support rural living standards, including the abolition of a number of agricultural taxes and increased central government transfers to local governments to support education. These measures constitute the beginning of a regional development strategy, but much more needs to be done on a broader front.

Healthcare became an increasing policy concern during the 1990s (OECD, 2008b). The downsizing of SOEs extended the downward spiral in healthcare coverage and access into the cities, as workers in the growing informal sector typically lacked health insurance. By 2005, only 29% of the overall population – 7% of the rural population and 49% of the urban population – were covered by formal health insurance. Government spending on healthcare fell steadily, both in relation to GDP and in relation to total government expenditures, as local governments, which are primarily responsible for public health, cut back on health outlays to meet staff payrolls and other needs. By early in this decade, the share of overall healthcare spending in the economy contributed by the government was lower than in most OECD countries. The corresponding dependence on private healthcare spending reflected large disparities in access among income groups.

Decreasing access has been accompanied by increasing inefficiency and rising costs (OECD, 2008b). Market reforms introduced in the 1980s to decentralise provision, increase the autonomy of provider managements, and establish fee-for-service compensation backfired because they failed to address the adverse selection, limited information and other market failures inherent in healthcare markets. Government reforms since then have focused on cost containment, based on an extensive official "catalogue" of medicines, procedures and services, and their maximum prices. However, the controls have encouraged substitution of higher-cost remedies for equally effective lower-cost ones.

Due in large part to earlier public health improvements, China still compares relatively favourably to other developing countries in terms of infant survival, life expectancy and other indicators. However, much of the improvement occurred during the pre-reform and early reform period, and the gains since then have been modest. Inequality in access has produced substantial disparities in health outcomes. Some evidence suggests that life expectancy for individuals in the lower-income group is significantly less than that of those in the highest income group (OECD, 2006). The declining contribution of the

government to healthcare and rising costs has been particularly detrimental to preventive care and efforts to contain disease outbreaks, since these activities offer relatively low profits to providers. The 2003 SARS outbreak underscored the deterioration in the healthcare system, which was further highlighted by the reluctance of afflicted patients to go to hospitals for fear of incurring unaffordable bills.

As has occurred in other developing economies, China's rapid growth has led to increasingly acute environmental problems. Dependence on coal in power generation and the proliferation of automobiles in urban areas have resulted in exceptionally severe air pollution. By 2000, 16 of the 20 most polluted cities in the world were located in China. One-third of the country's water basins are classified as heavily polluted, and only one-quarter of the water flowing in urban areas is potable (OECD, 2005b). Water pollution has been aggravated by intensive use of fertilisers in agriculture. Prolonged drought in the north of China has contributed to acute water shortages. Inefficient use of water in agriculture, caused in part by protection of water-intensive grains and other crops in which China lacks a comparative advantage, contributes further to water scarcity.

Since the early 1990s, China has been making increasingly strong efforts to address environmental problems, particularly air pollution. Policies to improve the efficiency of and reduce pollution from coal-fired power plants, along with the shift in industry toward less energy-intensive activities, led to a rise in energy efficiency in industry during the 1990s. Dependence on coal dropped from 69% of total energy use in 1990 to 30% in 2004 (OECD, 2007c). The authorities have imposed increasingly strict fuel efficiency and pollution standards on automobiles. The establishment of targeted ceilings on sulphur emissions and the introduction of fees on emissions led to a decline in sulphur concentrations in urban air during the 1990s. However, considerably more needs to be done, as underscored by indications that energy efficiency has fallen during the present expansion while sulphur concentrations have begun to rise again (OECD, 2007c).

Revived growth momentum in the wake of WTO accession

By the time of China's entry into WTO in 2001, the downward cycle in real growth was coming to an end. Real GDP growth began to accelerate, rising to above 10% by 2003 and to nearly 12% in 2007. Investment picked up sharply, with gross fixed capital formation rising from a low of 32.3% of GDP in 2000 to 41% in 2003, and it has averaged nearly 43% over 2004-06 – the highest sustained level since the beginning of reforms. Overall, the current expansion is becoming the longest of the reform period. The price deflation seen in many sectors over 1998-2001 began to abate, although unlike prior cycles aggregate inflation remained moderate, in the low single digits, until recently.

WTO has been one of the factors contributing to the growth turnaround. China's exports boomed after 2001, bringing the export/GDP ratio to 35.1% by 2006 compared to 20.8% in 2000. China's ratio is well above that of the United States, Japan and other large emerging economies. FDI also picked up after entry, following the stagnation of the latter half of the 1990s: it increased by 70.6% between 2000 and 2006. The direct contributions of the export and FDI booms to growth were significant but modest; their indirect contributions, on the other hand, have been substantial.[20]

The emergence and rapid growth of the private business sector has almost certainly been a key factor in the revival of real growth. Growing evidence indicates both that private firms are considerably more productive than state-owned firms and that their productivity

is growing more rapidly (Dougherty and Herd, 2005). The displacement of SOEs by private firms has helped to raise overall productivity in the economy directly and indirectly, by facilitating the absorption of workers from agricultural sector. Overall, the development of the private sector may be the most important factor behind the apparent acceleration in total factor productivity growth in recent years and the rise in China's potential growth rate. This increase in potential growth may explain why inflation has not surged as much as during previous growth booms.

Progress in unwinding the imbalances of the 1990s also probably played a role in the revival of real growth. SOE employment stopped declining in 2003. SOE financial performances began to revive from the very distressed levels they had reached at the end of the 1990s, with average profitability rising to levels near those of some OECD countries and with lower, though still high, debt loads. SOCBs' balance sheet conditions improved dramatically following the capital injections and transfers of bad loans to the asset management companies beginning in 2003, and the revival in economic growth has led to further substantial improvement for all banks. By the end of 2007, the NPL ratio of the SOCBs had fallen to 8% of total loans from 20.4% in 2003, while NPLs for the banking system as a whole had fallen to 6.2% of loans from just below 18% in 2003 (OECD, 2008a). Capital adequacy ratios have risen steadily. By the end of 2007, all the nationwide banks and most city commercial banks had met or exceeded the BIS-mandated minimum of 8%. Bank profitability has also recovered impressively. The severe credit crunch that began in the late 1990s also probably began to ease by 2003.

The vicious circle of real economic growth and economic reform that threatened to develop during the late 1990s has given way to a virtuous circle during the present expansion. Robust real growth is responsible for much of the considerable improvement in bank financial conditions. There have been equally impressive improvements in the performances of other segments of the financial system and in the conditions of SOEs. These improvements have facilitated implementation of existing reforms and made it easier to introduce further measures that authorities were hesitant about earlier because of concern that they might aggravate problems of weakened sectors. Authorities became more willing to spend the large amounts needed to achieve a breakthrough in financial and other reforms as the economic expansion augmented fiscal resources.

Significant strains on macroeconomic performance have emerged over the past two years, however. Inflation measured by the consumer price index began to accelerate in 2007 and peaked at 8% (year-on-year) in the first four months of 2008 (World Bank, 2008). Although sharply rising food prices were the proximate cause and CPI inflation has since fallen somewhat, core inflation and urban wage increases appeared to be accelerating, at least through 2007[21] (World Bank, 2008). China's current account and balance-of-payments surpluses have risen steadily, reaching 11.3% and 14.0% of GDP in 2007. These exceptionally large surpluses have led many observers to conclude that China's exchange rate is seriously undervalued, and have fuelled speculative capital inflows in anticipation of a revaluation.[22]

China's authorities are now facing the additional challenge of countering the downward pressures on growth from the world economic slowdown sparked by the US financial crisis. Real GDP growth (year-on-year) fell below 10% in the third quarter of 2008 for the first time since 2005, and is expected to fall further in 2009. The growth slowdown has aggravated the decline in stock prices, which have fallen by more than 50% from their

peak in October 2007. The authorities have responded rapidly to the slowdown by cutting the central bank benchmark interest rate by a cumulative 81 basis points between mid-September and the end of October; reducing banks' required reserve ratio; and most recently by announcing a large fiscal stimulus package. While the growth slowdown has temporarily eased concerns over inflation and the external imbalances, they may well re-emerge once recovery is under way. The authorities' success over the medium term in supporting non-inflationary real growth in line with potential and achieving better balance in the external accounts will be critical to sustaining the virtual circle that has benefited reforms over much of this decade.

Taking stock: Progress on reform so far and its contributions

Economic reforms have gained considerable momentum over the present decade. Legal and regulatory reforms have become increasingly prominent and supportive of the overall reform process. Many of the frameworks and institutions for effective functioning and regulation of the economy are now in place and are bringing significant benefits. Several fundamental laws that have been in preparation for years and are subject to considerable controversy finally came into effect over 2005-08. There have been major breakthroughs in financial reforms. Governing and regulatory capacities have been significantly improved by the reorganisation of the government in 2003. However, much further effort in implementing the reforms will be required before they become fully effective, and new challenges are emerging.

Well-established national product markets

The process of price liberalisation has largely been completed. Market forces now dominate in most of the economy, leading to improved resource allocation. By the middle of this decade, 87% of producer prices and 96% of retail prices were determined by market supply and demand, compared to 46% and 69% in 1991 (Table 1.4). Oil and natural gas, electricity, tobacco, and grains and fuel oils remain subject to price controls (Hope and Hu, 2005).

Table 1.4. **Portion of transactions prices determined by the market**

Percentage of transaction volume	1978	1991	1995	2003
Producer goods				
Market prices	0	46	78	87.3
State guided	0	18	6	2.7
State fixed	100	36	16	10
Retail sales				
Market prices	3	69	89	96.1
State guided	0	10	2	1.3
State fixed	97	21	9	2.6
Farm commodities				
Market prices	6	58	79	96.5
State guided	2	20	4	1.6
State fixed	93	22	17	1.9

Source: OECD, 2005b, Table 1.3 and Oppers, 1997.

Product markets are also generally well integrated, although limitations in transportation infrastructure can lead to significant price differences among regions. Changes in demand and supply conditions seem to be transmitted among China's markets

at a rate and to a degree comparable to that found in more advanced economies (Fan and Wei, 2003). Agricultural markets also seem reasonably well integrated (OECD, 2002, Chapter 1). While local protectionism has been an important barrier to movement of certain products, *e.g.* beverages and automobiles as well as productive factors, its importance is declining (Box 1.3).

Box 1.3. **Local protectionism has been declining in importance**

Protectionist practices by local governments have been a chronic obstacle to the integration of both product and factor markets. Distortions in the tax system and other aspects of central-local government relations have often given local governments the incentives and ability to protect local industries and workers. Local protectionism has been concentrated on certain products, notably tobacco, alcoholic beverages and motor vehicles, which have been important sources of local revenue, rather than generalised, and is less important in coastal provinces than interior regions, particularly those in the West (Li, Yu and Chen, 2003). Local government attempts to protect local jobs and businesses are probably partly responsible for the comparatively low portion of mergers and acquisitions that occur across provincial boundaries (OECD, 2005b).

The balance of evidence suggests that local protectionism has been a significant impediment to competition and entry in some areas but not of overriding importance (Hope and Hu, 2005). A 2003 survey of Chinese enterprises found that local protectionism continues to be an obstacle but had become less severe, due at least in part to central government efforts to suppress the practices (Li, Yu and Chen, 2003). The survey also found that local protectionist measures were becoming less explicit (*i.e.* carried out via administrative procedures rather than overt rules) and were changing in emphasis toward protecting local workers from competition from migrants.

Economic reforms have substantially reduced the barriers to internal capital mobility over time.[23] Commercial banks have been free since the lifting of the credit plan in 1998 to transfer funds among their branches. The development of the money market in this decade, in which virtually all financial institutions now participate, allows funds to be transferred from surplus to deficit areas. The stock and bond markets, although still developing, provide additional channels for capital to flow among regions. Overall, China's capital markets probably are better integrated than they were even in the 1990s, although they are still probably less integrated than product markets[24] (Boyreau-Debray and Wei, 2004). Imperfect integration does not appear to have prevented the emergence of considerable regional specialisation in industry in line with regional comparative advantage (Batisse and Poncet, 2004). Moreover, regional specialisation appears to have increased since the 1980s (Bai *et al.*, 2003), which is consistent with improved integration of capital markets.

Fragmented labour markets

China's labour markets, particularly urban labour markets, have developed substantially since the 1990s under the impetus of rural migration and as workers shed from SOEs have found alternative employment. Wages in both the informal and formal sectors are largely free from official controls. Labour markets are relatively flexible in terms

of regulatory burdens and, at least in the informal sector, in terms of the ease with which workers can be hired or discharged (World Bank, 2008).

Further development of China's labour markets is hampered by substantial barriers to mobility among segments that are only slowly coming down. Migration from rural to urban labour markets continues to be impeded by the household registration system (*hukou*), which restricts rural migrants' access to education and medical and other services in urban areas. This restriction has been relaxed somewhat in recent years, but mainly in a few of the wealthier coastal cities. Rural migration is also impeded by the land tenure system, under which migrants risk losing the use-rights to their land if they fail to farm it for an extended period. Urban labour markets are segmented between the formal sector and the informal sector, which absorbs nearly all the migrants and now employs the majority of urban workers.

Impressive progress has been made over the past decade in establishing the framework for pensions, unemployment and other social benefits (Box 1.4). However, coverage is at present largely confined to workers in the urban formal sector, while workers in the urban informal sector and rural workers are largely uncovered. Moreover, workers entitled to pensions from their employer often face loss of their accumulated benefits if they take a job in another city or province. The limited coverage and portability are important contributors to labour market segmentation.

The lack of integration of labour markets is manifest in differences in wages and productivity among markets that are large even compared to other developing and transition economies (Fleischer and Yang, 2004). Migration is extensive but the portion of migrants moving across provincial boundaries is comparatively low, a pattern which may account in part for the relatively small average size of China's cities (OECD, 2005b). The potential benefits to improving labour market integration, from improved allocation of labour and better incentives for upgrading of human capital, are substantial.

The new competition law for sustaining open and efficient markets

Competition in China's product markets is uneven. Standard indicators of concentration for the nation as whole are moderate or low by international standards. However, competition is often less in practice than the indicators suggest because of geographic restrictions on market scope imposed by limitations in transportation and other infrastructure (OECD, 2002, Chapter 12). Many industries, particularly in labour-intensive sectors, are fiercely competitive. Although private firms have entered a growing number of industries previously reserved for state firms, several industries remain entirely or partially closed to their participation, including natural resources and national defence industries. Competition is limited in other sectors where the state has more recently withdrawn exclusive control, including petroleum processing, metals, chemicals and transport. As in other countries, government regulation not infrequently has been used to limit entry or to favour some businesses over others.

As discussed in Chapter 3, there has long been a need for a comprehensive competition law to redress gaps and other weaknesses in the 1993 Anti-Unfair Competition Law (AUCL) and to address developments in the business sector that have occurred since then. In 2008, following more than a decade of consideration and extensive consultations with competition experts in the OECD and other countries, a new law (Anti-Monopoly Law, or AML) came into effect. The new law aligns China with international

Box 1.4. **China's social benefits system**

China began developing worker safety net and other benefits in the mid-1990s. These began with maternity and worker injury insurance, which were followed later in the decade by medical and unemployment insurance. Coverage, now limited to the urban formal sector and to individually-owned businesses on a private basis, is relatively low by international standards: less than one-sixth of the overall workforce is covered by unemployment benefits and only about 5% by worker injury or maternity benefits (OECD, 2005a, Chapter 11). Contribution rates vary across provinces within ranges set by the central government. Contributions are typically pooled at the municipal level, although the central government authorities have been encouraging pooling at the provincial level to better address funding shortages in poorer localities. Each system is administered by a separate department of the local labour bureau, and subject to the overall oversight of the Ministry of Labour and Social Security.

The current pension system framework originated with reforms beginning in 1997; these were based in part on recommendations of the World Bank. The system presently covers only formal sector urban workers. The first tier of the system comprises two mandatory elements: a basic pension financed entirely by employer contributions (now equal to about 20% of payroll), with benefits paid from current contributions ("PAYGO"); and an individual account, jointly financed in most cases by employees and employers. The basic pension is intended to provide about 35% of a (male) worker's prior salary after a minimum of 15 years of employment and retirement at age 60. Although the individual accounts are supposed to be fully funded, in practice borrowing by local governments has effectively made them PAYGO. The creation of the National Social Security Fund in 2001 was intended in part to address this problem by maintaining funds to back the first-tier pensions. The pension second tier is a voluntary employer-sponsored plan to provide retirement annuities and is concentrated among private enterprises. The Enterprise Annuity Funds holding these contributions are becoming important institutional investors (OECD, 2008a).

The current pension system is characterised by relatively low coverage (less than 50% of urban workers) and very generous benefits paid to a limited fraction of retirees, which results in relatively high contribution rates (Salditt, Whitford and Adema, 2007). The longer-term challenge is to reduce benefit and contribution rates to sustainable levels over time while gradually extending benefits, first to the whole urban workforce and then to the rural population. These reforms are especially needed given China's rapidly ageing population. Reform will involve changes not only to the pension system itself but also financial changes to improve the risk-return profile on pension savings by broadening the range of assets permitted to insurance companies, mutual funds, and other repositories for longer-term savings.

practices by providing an updated and comprehensive legal framework for combating a wide range of anti-competitive practices, including those of government agencies. It addresses anti-competitive practices by groups of firms, monopoly and abuse of position by individual firms, mergers, and – particularly important – administrative abuses by government agencies that limit competition. It provides a general framework for mergers, which was missing from the earlier law, as well as remedies against anti-competitive practices by utilities. Chapter 3 indicates that the AML is likely to be more effective in combating price fixing and other collusive practices than the earlier law.

The AML provisions on administrative abuses could turn out to be among its most important contributions, particularly if it is effectively applied in those localities where local protectionism is still a serious problem. Government agencies, including local governments and their organs, are forbidden under the law to use approval, licensing, procurement, and other regulations to favour local businesses or otherwise discriminate among businesses. Regulations or practices requiring local businesses to give local residents preference in hiring are also prohibited. As with earlier laws, the prescribed remedy is limited to administrative action, with the next higher level of the agency committing an abuse responsible for its correction. This arrangement has impeded enforcement in the past since higher-level government agencies have often been reluctant to intervene against the decisions of their lower levels in local matters. The new law attempts to address this problem by authorising the relevant competition authority to notify an agency if it receives reports of abuse.[25]

Considerable experience with implementation, judicial interpretation, and clarification of ambiguities in a number of provisions will be required before the full effect of the new law can be assessed. A key question is how conflicts between competition considerations, other industrial policy and other official goals will be balanced. Although industrial policy has been gradually diminishing, it remains important in certain areas. The 2006 government work plan continued to call for rationalisation and consolidation in sectors with overcapacity, but achieving these goals in the past has involved agreements among firms and industry associations that could come into conflict with the new AML. Some provisions of the new law also require further implementing rules and may at some point need to be reviewed. The merger rules presently cover only foreign mergers with and acquisitions of domestic firms, and are subject to individual review and approval by the Ministry of Commerce (MOFCOM); in certain sectors they may also require review by sectoral regulatory authorities, and, where national security is involved, by the National Development and Reform Commission (NDRC). These requirements are elaborate compared to those applied in many OECD and non-OECD countries, and some international experts have expressed concerns that they may be unduly burdensome. The recent announcement of new rules lowering the threshold for anti-monopoly scrutiny of mergers or acquisitions by foreign companies with operations in China has heightened these concerns.[26]

Assignment of responsibility for overseeing and enforcing competition raises organisational questions that are also relevant in other areas of China's regulatory policy. Enforcement authority is now divided between the State Administration for Industry and Commerce (SAIC), MOFCOM and NDRC.[27] This division contrasts with the more common arrangement in the OECD countries of vesting authority over competition law in a single national competition body. The Chinese arrangement takes advantage of the expertise that has been built up in the existing agencies, but has at least two important disadvantages. First, information acquired by one agency may be relevant to issues before another but may not be adequately communicated. Second, decisions concerning competition issues may be interfered with by industrial policy and other issues under the purview of the agencies. The new AML does not explicitly change the earlier division of authority but does provide for the future establishment of a state anti-monopoly commission under the State Council. Whether this body will assume the main responsibility over competition law or play only a co-ordinating role remains to be seen.

The legal foundation for further private sector development

The past decade has seen the enactment of a series of laws and other measures that have finally established private business as a legitimate and essential component of the economy, and that have provided the essential foundation for its continued rapid development. The legitimacy of private business gained constitutional sanction in 1999 with the adoption of an amendment explicitly recognising private ownership and specifying that its rights should be protected. Two further clauses added in 2004 stipulate that the state encourage, support, and guide the development of the economy and forbid encroachment on private property rights.

These reforms, and the market-opening commitments made for China's WTO entry, highlight the shift in the earlier development strategy toward reintegration of the business sector by levelling the playing field among foreign-invested, domestic private, collective, and state-owned enterprises. In 2005 the State Council took a further concrete step in this direction by issuing "guidelines on encouraging, supporting and guiding the development of the individual, private, and other non-public economic sectors". The guidelines call on local governments to allow private firm entry into all sectors opened to foreign firms under WTO, as well as some other sectors not open to foreign firms such as utilities, health, education, and national defence.

The enabling laws essential to implementing this strategy began to fall into place in the middle of this decade with the introduction of amended Company and Securities Law**s** in 2005. The Laws mark a key step toward establishing a modernised framework for private sector development by extending the framework of the earlier 1994 Company Law, which was designed largely to facilitate incorporation of SOEs and which subjected even small companies to the same requirements as large SOEs (Wang and Hung, 2006). The new Company Law significantly broadens the range of permissible company forms by authorising the creation of single-person-owned limited liability companies (although it maintains the relatively high minimum number of 50 shareholders required to establish a joint-stock company) and setting much-reduced minimum and uniform capital requirements for establishment.[28] The new law drops investment restrictions imposed by its 1994 predecessor. It specifies provisions to strengthen the corporate governance of joint-stock companies by defining the functions and responsibilities of the boards of directors and supervisors, the duties of their members, and the inclusion of independent directors. The law also strengthens protection against abuses, for example by explicitly sanctioning related party transactions, and the protection of minority shareholders.[29] These provisions are further strengthened for listed companies by the amended Securities Law.

The following two years recorded the adoption of two other laws essential to the business sector framework. The corporate bankruptcy law, enacted in 2006 after long internal debate and drafting and effective in June 2007, replaces the 1994 "trial law" that was designed mainly for SOEs and which has been used only sparingly because of major gaps and ambiguities (Zhang, 2006). The new law draws heavily on international best practices and applies to all companies, including foreign-invested enterprises and overseas subsidiaries of Chinese companies. It (somewhat) clarifies the conditions triggering bankruptcy, defines expanded alternatives allowed for its resolution (reorganisation, reconciliation, or liquidation), and the procedures to be used in each case. The law remedies a major prior constraint on bankruptcy proceedings under the 1994 trial law by

specifying that claims of secured creditors take precedence over unpaid employee compensation, taxes, and social insurance contributions.[30]

The new property law adopted in 2007 defines and codifies the rights to private property and establishes equal protection of property rights of state-owned, collective and private businesses and individuals. The law defines each type of property; specifies means to enforce property rights; provides for the establishment of property registers; and broadens the range of property recognised as collateral to include inventories and business receivables. The law does not fundamentally alter the property rights regime for land but it does mark a beginning in defining use-rights to land as property rights, which in principle could allow their transfer. It also explicitly prohibits unilateral alterations of land use contracts by the legal owner for the life of the contract.[31]

Here again, considerable experience with the new laws, including judicial and administrative interpretation and clarification of their provisions, will be required before their effects are fully manifest. However, the benefits are likely to both large and broad. For example, the laws should make it easier for larger private businesses to develop, improving their productivity in sectors where optimal efficiency requires large-scale operations; to redeploy resources from failing companies to more productive uses; and to improve resource allocation and productivity through mergers and acquisitions and business alliances. The ability to use inventory and receivables as collateral should greatly improve the environment for SMEs, whose limited access to bank loans has been due in large part to their lack of collateral (OECD, 2008a).

The benefits from WTO entry

The agreement under which China entered the WTO in 2001 was one of the most comprehensive and far-reaching in the organisation's history. The agreement mandated a further reduction in tariffs in a wide range of sectors along with the conversion of quotas into tariff equivalents.[32] The agricultural sector was partially opened by elimination of the state monopoly on grain trading and the conversion of quotas into tariff equivalents with a schedule for their reduction. China committed to extensive changes in laws and regulations governing entry, approval, licensing and intellectual property to improve the environment for foreign businesses. The commitments to open key domestic services**,** including eventual national treatment in banking and several other areas, went beyond those made by any other developing country up to that point (Greene *et al.*, 2006). In return, China received tariff reductions, quota relaxations, and other measures to increase access of its businesses to markets abroad. These included a phased abolition of the multi-fibre agreement that had severely limited Chinese (and many other developing countries) exports of textiles and their products.[33]

The benefits of China's WTO entry along with the trade liberalisation that preceded it go well beyond the impressive increase in aggregate exports and FDI that has occurred since entry, and are likely to continue to be large. A recent OECD study using a computable general equilibrium model estimated that full implementation of China's WTO commitments would raise GDP by 2%, and that further liberalisation could add as much as an additional 1% (Greene *et al.*, 2006).

The quality of China's trade has been increasing in several dimensions, with rising value-added content in exports in a number of sectors, particularly electronics goods (Greene *et al.*, 2006; Molnar, 2005). In terms of their range and technology content, China's

Box 1.5. **WTO entry: Fewer costs than expected**

It was widely expected that WTO entry would impose significant losses on certain domestic sectors where foreign producers were known to be much more competitive (OECD, 2002, Chapters 1 and 4 and Annex II). Of most concern were: agriculture, especially the grain producers in the north of China who would have to compete against imports from the United States and other major producers that dominated world markets; automobiles, where the reductions in tariffs and relaxation of quotas were expected to drive many smaller Chinese producers out of business and force a massive restructuring of the industry that focused more exclusively on assembly; and in banking, where foreign banks appeared able to take a large portion of business away from the less efficient and financially weak domestic banks.

However, the costs have turned out to be much less than feared. Partly because domestic agricultural prices had fallen to near world levels on the eve of accession (OECD 2003, Chapter 1), China's grain imports have turned out to be much lower than earlier projected. The disruption to agriculture as a whole has probably also been softened by the extensive efforts to shift crops toward more competitive products, such as fruits and vegetables, that began in the run-up to WTO entry. The boom in Chinese demand for automobiles that began in the late 1990s greatly boosted sales, production, and profits of domestic producers despite a marked increase in imports. And, as noted earlier, domestic banks' financial conditions have improved greatly as a result of the strong growth in the overall economy and the reforms to remove non-performing loans and raise capital. Foreign banks' share of the market has remained quite small, although they have made more important inroads in investment banking and other sophisticated areas.

exports are becoming closer to those of more advanced countries such as Korea and Hong Kong, China (Rodrick, 2006). China has become the world's leading exporter of information and communications equipment, and its firms are moving beyond pure assembly of imported parts into processes requiring higher-skilled labour and greater technology inputs (Greene *et al.*, 2006).[34] While domestic reforms and government policies to encourage upgrading of China's export industries have been important factors behind the quality improvements, trade liberalisation has been a key facilitator. The opening of the services sectors has already brought tangible benefits, notably in distribution where the entry of several major international retail chains has helped to improve efficiency and lower costs in the retail sector.

Ultimately, the most profound benefits from China's WTO entry are likely to be those on the overall reform process. China's authorities have viewed WTO entry as integral to the development of a competitive market economy. The commitments to international partners solidified and improved the credibility of plans to further open domestic markets and to improve the capacity of domestic businesses to compete. The changes in laws and regulations mandated by WTO on competition, intellectual property rights protection and other areas are as essential and beneficial to domestic businesses as to foreigners.

Reforms to alleviate regulatory burdens: A mixed picture

China's system of business regulation has been emerging from the heritage of central planning, under which it was characterised by: a very large number of rules formulated and enforced by wide range of agencies with sometimes overlapping responsibilities;

differential treatment of businesses according to their role in the plan; heavy reliance on administrative discretion and at best limited transparency; and extensive decentralisation of regulatory responsibility, leading to wide differences in practices and standards among industries and regions. The regulatory system became further fragmented during much of the reform era as new rules enforced by new or expanded agencies were added. As a result, by the late 1990s, as China was preparing to enter WTO, the large costs and uncertainty imposed by the regulatory regime had become a major concern of China's foreign partners – and probably an even greater burden on the domestic business sector, particularly private businesses. Construction of a coherent and efficient regulatory regime that can promote development of the market economy has become a major priority, one that has been even greater impetus by China's WTO obligations.

Chapter 4 of this report discusses the great benefits offered by reforms in terms of improving the efficiency of business regulations and reducing their burden. Such reforms can lower costs for businesses and consumers by improving resource allocation, enhancing competition, and reducing the burdens of compliance with regulation. Higher-quality regulation also helps improve the variety and quality of products and services offered on markets. Reduction in regulatory complexity can be a powerful tool in combating corruption, since every encounter between a business and a regulator creates the opportunity to extract bribes or other favours (World Bank, 2008). In these ways, reform of business regulation is important to ensuring that the benefits from market opening are realised in improved economic performance.

China ranks very high in surveys of desirable outlets for foreign investment (MSN Network News, 2008), but mainly because of the immense potential of its large and rapidly growing market. China's ranking on international investment and business climate surveys is less favourable. Chapter 4 cites several areas of concern to OECD businesses as revealed in OECD business surveys, including discrimination, difficulty in finding out about and getting clarification on regulations, and protection of intellectual property. China has improved its rank in the World Bank "Ease of Doing Business Survey" (World Bank, 2008), rising from 92 in 2007 to 83 in the 2008 survey; but progress has been uneven (Table 1.5). China ranks particularly low in the cost of starting a business, due in part to the still-high minimum capital required; in the difficulty of getting licences and approvals (where it ranks close to the bottom); and in the cost involved in paying taxes. The investment climate varies considerably across the country, from relatively favourable in several eastern

Table 1.5. **World Bank rankings on ease of doing business, 2008**

	China	India	Singapore	Japan	Germany	United States
Overall rank	83	120	1	12	20	3
Starting a business	135	111	9	44	71	4
Dealing with licences	175	134	5	32	16	24
Employing workers	86	85	1	17	137	1
Registering property	39	112	13	48	47	4
Getting credit	84	36	7	13	3	7
Protecting investors	83	33	2	12	83	5
Paying taxes	168	165	2	105	67	76
Trading across borders	42	79	1	18	10	15
Contract enforcement	20	177	4	21	15	8
Closing a business	57	137	2	1	29	18

Source: World Bank, 2008.

cities to less favourable for both domestic and foreign businesses in many interior cities, particularly those in the western region (World Bank, 2006).

Successful reform of business regulation requires that several key principles be embedded in the regulations themselves and in the practices of the bodies that make and enforce them. First, formulation and implementation of regulations needs to be transparent and open to consultation and comment from those affected, and facilities for appeal against adverse rulings need to be available. Second, regulations need to be non-discriminatory in that businesses and individuals with similar characteristics are treated comparably. Third, regulation needs to be efficient: rules need to impose the least burden or restriction necessary to achieve the regulatory objective. And fourth, domestic technical standards need to be harmonised with international standards and conformity procedures streamlined so that they do not impose unnecessary costs. Achieving these objectives in China is requiring extensive changes in laws and regulations, and reform and reorganisation of regulatory responsibilities. Explicit incorporation of competition policy principles and tools into the regulatory process can help greatly in ensuring that reform is successful.

Chapter 4 describes the considerable progress that has been made in incorporating these principles into China's business regulation. For example, China has gone "a step further" than many WTO members in its efforts to improve regulatory transparency by establishing an inquiry point to provide authoritative clarification of laws and regulations affecting international trade, and in agreeing to publish all laws and regulations in at least one official WTO language as well as in Chinese. The law on government procurement adopted in 2003 prohibits unreasonable discrimination among suppliers, including foreign suppliers.

There are ongoing efforts to reduce unnecessarily burdensome or restrictive business regulations. Since WTO accession, 1 195 of 3 948 regulations requiring administrative approval have been nullified in an exercise spanning 65 departments. Two umbrella administrations have been established to spur and oversee the immense task of reforming China's technical standards regimes. China has strengthened its participation in foreign standards-setting bodies in order to facilitate the process of harmonising its standards with those prevailing internationally.

The basic foundation for improved business regulation has been established. Despite resistance in a few areas (notably foreign mergers and acquisitions), the reform process seems to be gaining momentum. Much remains to be done however, as the next section discusses. Progress has been greatest at the national level, where the central government has been the driving force, and in coastal cities such as Shanghai, where the prominence of foreign trade and investment has been a strong force driving reform of business regulation.[35] Reform is much less advanced in interior provinces, where it is also most crucial to development and to the reduction of regional inequalities.

A more coherent SOE framework – established, but effective?

Reforms over the past decade have significantly clarified the scope of state ownership while improving the governance and oversight of remaining SOEs so that they can function effectively as profit-making businesses. As noted earlier, the SOE sector has shrunk considerably in size, although it remains large compared to most other economies,

including most developing economies. Chinese SOEs have entirely or largely withdrawn from labour-intensive sectors of the economy.

The corporatisation process is approaching completion, with more than 80% of all SOEs, and virtually all those controlled by the central government, incorporated under the company law by the end of 2006. Most state-owned joint-stock companies have adopted governance structures with features broadly consistent with those found elsewhere, including boards of directors and supervisors that include outside members, and special audit and other committees that have been found to be crucial to effective corporate governance in other countries.[36] A growing number of SOEs are issuing annual reports, and the quality of those reports has improved as a result of the adoption of new accounting standards based on international best practices.

These reforms are fostering (and indeed are essential to) the transformation of SOEs away from their earlier role as agents of the plan into competitive profit-oriented businesses. The effectiveness of the reforms should improve as experience is gained with their implementation. Even where reforms are adopted, the committees and independent directors are not always functional due to lack of experience and the difficulty of finding qualified personnel. The ultimate benefits of the reforms are clouded by the ongoing difficulty of decisively severing the traditional ties between SOEs and government agencies and officials. Nearly half of the board chairpersons of central government-controlled SOEs, and more than one-third of the chief executive officers, have civil servant status, although the portions are lower for enterprises controlled by local governments (Hu, 2007). The limited protections for minority shareholders, although they are being strengthened, also diminish the effectiveness of the governance structures in promoting the interests of all the owners (OECD, 2008a).

Theory and experience in other countries suggest that the stock market provides important market discipline for enterprises, through the market judgement on performance reflected in the company's stock price and by allowing control to be contested. This experience has encouraged Chinese authorities to make stock market listing a central element of their SOE reforms. More than 1 100 wholly or partially state-owned enterprises, including most of the largest, were listed on the domestic exchanges by mid-2008, and more are expected to list in the coming years (*Xinhua News Services,* 2008). The listing process has had a positive effect on SOE incentives, since approval to list is based on a firm's performance and progress in implementing reforms.[37] Evidence on whether listing has subsequently improved performance is mixed, however: listed firms have performed better than non-listed companies with comparable characteristics, but this is at least partly because better-performing companies were given priority in listing. Moreover, SOEs' performances often deteriorated following their listing in the late 1990s[38] (Green, 2003).

The ability of the stock markets to discipline performance has been blunted by a number of factors: a tendency for prices to poorly reflect economic fundamentals, due in part to the dominance of trading by individual shareholders; the overwhelming control of the major state shareholders and limited power of minority investors; and, most important, the prohibition until recently on trading on the exchanges of the nearly-two thirds of shares directly owned by the state or state entities. Recent reforms and other developments are beginning to remedy these effects. The China Securities Regulatory Commission (CSRC) has strengthened enforcement of prohibitions on insider trading and

other abuses while encouraging companies to improve the transparency of their operations. Institutional investors, who in other countries play a key role in ensuring that market prices accurately reflect their fundamentals, are becoming an increasingly important presence in the markets (OECD, 2008a). Most important, under the reform introduced in 2005, all previously non-tradable shares have been converted and will become fully marketable by the end of 2009.[39] The reform should help greatly to improve market efficiency and provides the foundation for development of a more active market for corporate control.

The establishment in 2003 of the State Asset Supervision and Administration Commission (SASAC) marks an important step toward improving the state's exercise of its ownership in the SOEs. The central government SASAC now supervises 156 large SOEs, most of which are holding companies with many state controlled subsidiaries, and local SASACs have been established in provinces and major cities to oversee the holdings of their governments. The SASACs' basic responsibility is to monitor and manage state investments in SOEs so as to maximise their overall value, but without interfering directly in management or day-to-day operations. The commission exercises the state's voting rights in the boards of the SOEs they control, and typically designate the chairperson of the board of directors and the chief executive officer. The central government SASAC also formulates rules and standards for SOEs and oversees the local SASACs to ensure that they comply with central government mandates. Through these means, SASAC has become an important positive force for improving and implementing reforms to improve SOEs performances.

SASAC's mandate differs from that prescribed in the OECD Code for Governance of State Owned Enterprises (2005) in that it does not focus exclusively on exercising the state's ownership function but also has substantial regulatory responsibilities, including responsibility for restructuring in some of the industries where SOEs are now dominant. These regulatory functions may be necessary as a transition step to facilitate the extensive further restructuring of the SOE sector that is needed. However, experience in other countries suggests that mixing regulatory and ownership functions tends to degrade the quality of both. The SASACs face daunting challenges in their ownership role given the still very large number of SOEs and their wide scope of activities. The central government SASAC task is particularly great since it has only indirect control over the thousands of companies held by its SOEs which have increasingly complex and often opaque structures (Naughton, 2008).

The beginnings of regulatory reform of monopoly sectors

Significant progress has been made over the past decade in regulatory reform of energy, utility, and network industries previously dominated by state monopolies. In 1999, two new state telecommunications companies were split out from China Unicom, the state monopoly established in 1994, to provide satellite and mobile communications services respectively, while China Unicom retained its monopoly of fixed-line services. This was followed in 2002 by division of China Unicom into two competing oligopolies, and then a similar split of the mobile phone company. The state monopoly over electricity came to an end in 2002 with the creation of five regional power generation companies and two transmission companies to operate as regulated monopolies, subject to the State Energy Regulatory Commission (SERC). In 2005, a Renewable Energy Law was enacted to encourage development of alternatives to hydrocarbons. However, as indicated in Chapter 5, the legal

and regulatory framework in several these sectors needs to be completed and further strengthened and pricing needs to be reformed.

Segments of the electricity, telecommunications, and water sectors have been opened to private participation – including, subject to some ownership restrictions, foreign providers. Authorities have encouraged foreign investment in the electric power sector since the mid-1980s, although foreign private investors did not begin to participate until the mid-1990s (IEA, 2006). Domestic as well as foreign companies are allowed to offer services in segments of the telecommunications and water sectors. The authorities plan to open the power generation sector to competing providers at some future point.

Designing the rules and vehicles that maximise incentives for performance and effectively share the risks between private and public participants is a major regulatory challenge. Chapter 7 describes the various types of private-public partnerships that have been evolving in the water sector and notes that the framework for these partnerships is now fairly well developed. Nearly 15% of urban water is provided through such arrangements, 40% of which involve a foreign partner. In recent years, most partnerships have been in the form of build-operate-transfer arrangements in which private participants bear much of the risk but also reap the bulk of the profits. The BOT arrangement is also becoming the preferred vehicle for foreign investment in the electricity sector.

The benefits of regulatory reforms together with infrastructure investments have been most impressive in the telecommunications sector, whose development has been given high priority because of its importance to China's industrial development. China's telephone system has become the largest and fastest growing in the world, with 51 telephones per 100 persons compared to less than 3 in 1990; moreover, the country is close to surpassing the United States in terms of the number of Internet users (Li, 2008). In other sectors, the benefits are emerging more slowly. Although China's energy efficiency rose during the 1990s, it has started to fall back during the current expansion. Alleviating the boom-bust cycle in the electricity cycle that has afflicted China's economy for several decades is a major goal of reforms in that sector but did not prevent the emergence of severe shortages during 2002-06 (IEA, 2006).

Improved regulatory capacity, continuing problematic relations among government levels

Organisational and administrative reforms taken over the past decade have considerably improved the capacity of the central government to effectively regulate the market economy. The 2003 government reorganisation, the fifth major administrative reform of the reform era[40] and the most extensive, marks a formal and decisive embrace of market-based regulation in place of economic planning. The reform reallocated regulatory responsibilities along functional lines. The newly created Ministry of Commerce assumed the functions previously exercised by the State Economic and Trade Commission and the Ministry for Foreign Trade and Economic Co-operation, while the former State Development Planning Commission was reorganised into the National Development Reform Commission, with enhanced responsibilities for economic reforms. The reorganisation formally incorporates the integration of domestic and foreign economic policies into the government structure. The reform also created two new agencies, the CBRC and SASAC, which are playing major roles in the reform process.

Reforms have also improved the efficiency and quality of the central government workforce. Central government staffing has been cut by nearly 50% since the 1998 administrative reform. This together with a series of pay increases has improved the overall capabilities of the remaining staff and helped (although only partly) to retain staff in the face of rapidly rising salaries and opportunities in the business sector.

Budget reforms – notably the introduction of a Single Treasury Account and institution of formal department budgets in place of the traditional system, under which many departments received earmarked funding sources whose use they largely controlled – have improved the central government's capacity to plan and control revenues and expenditures. Extra-budget accounts, which in 2001 accounted for more than one-quarter of total government on-budget revenue and more than 4% of GDP, and which were subject to less stringent oversight and control, have been progressively moved onto the formal budget (OECD, 2008a).

Improvement in the organisation and capabilities of sub-national governments has been much less noticeable than that at the central level, however. This is only partly because organisational reforms initiated by the central government take time to be implemented at lower levels. The formal relations among government levels have not been fundamentally reformed since the 1994 tax reform, which mainly focused on reallocation of tax revenues. With a few important exceptions, the basic features of these relations, notably the jurisdiction of local governments over local departments of government agencies, have not changed appreciably since the beginning of reforms. Problems of lack of clarity, overlap, and inconsistent priorities in the allocation of responsibilities among and between central and sub-national government organs have become greater as the economy has developed and economic policies have become more complex. Large gaps between local governments' expenditure responsibilities and the fiscal resources they have to meet them have become an important impediment to national policy objectives in a number of areas. As discussed further in the next section, the need for reform of fiscal relations among government levels has become increasingly acute.

Strengthening of the financial regulatory regime and broader financial reforms

The development of China's financial system illustrates how improvement in the regulatory apparatus can provide a major impetus to broader reforms. China's financial regulation through most of the 1990s was handicapped by fragmentation among a number of financial and non-financial bodies with overlapping and sometimes conflicting mandates. This was particularly true of the capital markets; there the China Securities Regulatory Commissions (CSRC), the governing authorities of the Shanghai and Shenzhen stock exchanges, and their local governments shared responsibility for stock market regulation and were involved with the State Development Planning Commission, the PBC, and Ministry of Finance in various aspects of bond market regulation. Regulation was primarily command and control, and subject in some areas to industrial policy and other non-prudential considerations.

Reforms drawing heavily on international experiences and benefiting from the participation of several international financial bodies over the past decade have resulted in a much-improved financial regulatory system with improved capabilities and tools. The 1997 Asian financial crisis, which underscored the major risks posed to economic stability by distortions in the financial system, has provided a further important impetus and lessons for China's financial reforms. All depository institutions along with trust and

investment companies are now subject to the CBRC. The CSRC is primarily responsible for regulating the stock markets, the instruments traded, and their participants, including securities companies, while the China Insurance Regulatory Commission (CIRC) oversees the insurance sector. Some vestiges of older system remain, notably in the bond market where trading is divided between the interbank market and the stock exchanges and where the NDRC still has authority over bond issuance by non-listed companies. But overall, the lines of responsibility are significantly clearer and more consistent than they were ten years ago.

Regulatory strategies and tools have become more sophisticated and, probably more than in any other sector, aligned with international standards and best practices. Regulation has moved away from detailed control over the investments, products and operations of financial institutions to focus on establishing and enforcing basic prudential standards while ensuring that the institutions have the incentives, governance, and internal systems to sustain those standards. In the insurance sector, for example, traditional regulation through model contracts and prescribed pricing has largely been replaced by pre-notification. Authorities have made extensive use of conditionality in promoting reforms, notably by making progress on implementation by financial institutions a requirement for approval to enter new lines of business.

The improvement in financial regulation is largely responsible for the acceleration and broadening of financial reforms over the past five years. Improved regulatory capabilities were essential to the recapitalisation and restructuring of the securities industry during 2003-07 and have been instrumental to the emergence of a more comprehensive strategy to reconstruct the rural credit system (OECD 2008a). Financial institutions' standards and practices are increasingly coming into line with international standards. All of the nationwide banks and nearly all city commercial banks have adopted loan classification systems and capital adequacy rules broadly in line with BIS norms, and the standards are being extended to rural credit institutions.

Improved regulatory capacity has been a precondition for the gradual broadening of financial institution portfolio choices, products, and lines of business that is essential to the development of the financial system and critical to containing systemic risk. The success of financial regulators in promoting the strengthening of financial institutions' prudential capabilities, and their ability to enforce those norms and contain abuses, will be critical to the extent and timing of further capital account liberalisation.

Monetary policy instruments

Since the late 1990s, China's monetary policy authorities have been developing market-based control instruments to influence nominal spending and GDP through changes in the quantity of money and interest rates rather than through administrative controls on lending. The foundation for this development was laid in the late 1990s with the termination of the credit plan and the reorganisation of the PBC into regional branches, (in part) to tighten control over local branches that had undermined monetary control in the past. These steps were followed by gradual interest rate liberalisation leading to the freeing of interest rates on the interbank market; the progressive widening of the permissible band for bank lending rates; and, in 2004, complete abolition of the ceiling on bank lending rates.

The interbank market, a critical element in the monetary policy transmission mechanism, has grown impressively in both size and breadth. Nearly all financial institutions, including foreign banks, now have direct access to the market. Repurchase agreements and other basic instruments are well developed and derivatives to improve risk management are beginning to be introduced. The growth of the money market has facilitated the development of central bank open market operations, which began in the late 1990s, as the key operating instrument for controlling commercial bank reserves. The PBC remains formally subject to the State Council, which must approve changes in the central bank lending rate; since 2004 however it has been able to apply a surcharge without approval, and with considerable effective autonomy in determining that rate (Green, 2005; Geiger, 2008). The monetary policy framework has become increasingly sophisticated, with targets for money growth and other attributes similar to those found in more advanced economies. Monetary policy operations are becoming more transparent: the PBC now publishes a quarterly detailed account of its policies, *Monetary Policy Report*.

The transmission of monetary policy was weakened for much of the past decade both by the financial problems of banks, which blunted the impact of changes in central bank operating instruments on money market and bank interest rates, and by the incomplete commercialisation of the business sector, which limited the sensitivity of spending to interest rates. However, these impediments have become less important as bank financial conditions have improved, the private sector has developed, and SOEs have become increasingly market oriented (Green, 2005).

Overall, the framework and instruments now exist for conducting effective monetary policy in a manner similar to that followed in more advanced economies. However, these instruments do not seem to have been fully employed during the current expansion. In principle, central banks need to adjust their instruments to restrain credit growth and induce a rise in bank loan and other interest rates in real terms when the economy is starting to overheat. Although official interest rates have been changed several times since 2003, the overall rise has been modest and has failed to keep pace with rising inflation.

Monetary policy during this period has increasingly had to cope with the massive inflows of funds into bank reserves arising from the large and growing balance-of-payments surplus. Despite extensive capital controls, the BOP surplus has been driven by largely unrecorded capital inflows, probably motivated in part by expectations that the RMB will have to be revalued. Without a revaluation, the present exchange rate regime does not allow the RMB to rise enough to contain, much less reduce, the surplus. The monetary authorities have been remarkably successful in controlling bank reserves through sales of central bank bills and increases in reserve requirements, but there are signs the sterilisation is becoming more difficult[41] (Green, 2005). The reluctance to use interest rates more actively may reflect concern that they would add further to the inflows. Thus the limited flexibility of the exchange rate regime seems to at least be complicating the task of monetary policy (Goodfriend and Prasad, 2007).

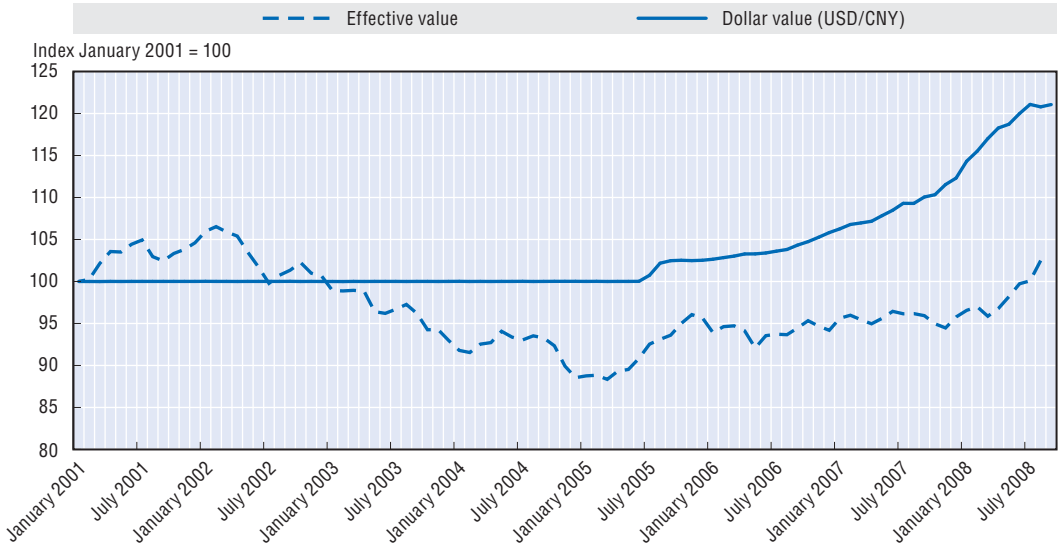
The need for a more flexible exchange rate regime

The July 2005 exchange rate reform established the preconditions for greater currency flexibility, but it has been overtaken by developments in world markets. Under the reform the RMB was immediately revalued by 2% against the US dollar, and the previous *de facto* peg against the dollar replaced with a basket of major currencies whose exact composition

has not been disclosed.[42] The reform was intended in part to provide for a gradual adjustment in the currency's value, to better maintain external balance in the current account and overall balance of payments.

The RMB has since (by September 2008) appreciated by about 21% against the dollar; the rate of appreciation has picked up somewhat since early 2007, and the daily permitted range for fluctuations against the dollar has been widened.[43] However, as a result of the steady decline in the dollar's value against the European euro and Japanese yen, the effective value of the RMB has risen by much less – 10.7% since July 2005. Moreover, its level is now the same as in 2003. The appreciation has not prevented the current account surplus from rising to over 11% of GDP in 2007, or a continued increase in the balance-of-payments surplus. While, as noted earlier, the authorities have been able to maintain control of bank reserves and bank lending, there are increasing indications that the large capital inflows have contributed to speculative pressures in the property and stock markets, and may be constraining the use of interest rates to prevent economic overheating.

Figure 1.6. **RMB dollar and effective exchange rate**



Source: Bank for International Settlements.

This situation underscores the need to increase the effective flexibility in the exchange rate regime as soon as possible. At the very least, this will entail establishment of the currency basket as the actual benchmark for official foreign exchange policy, as opposed to the crawling peg against the dollar that now effectively prevails. Limits on short-term fluctuations against individual currencies, notably the dollar, will need to be increased further in order to allow meaningful short-term fluctuations in the RMB's effective value against the basket. This will require significant technical adjustments in the authorities' exchange market operations. But, given its considerable development in recent years, the foreign exchange market should be capable of accommodating such greater flexibility.

Further capital account liberalisation would help in developing a more efficient exchange market and thereby facilitate the transition toward a freely floating exchange

rate similar to that governing other major currencies (OECD, 2008a). Particularly since the 1997 Asian financial crisis, China's authorities have been understandably cautious in liberalising capital account transactions, to ensure that those transactions do not get ahead of the capabilities of financial institutions and markets to manage their risks. The adoption in 2001 of the Qualified Foreign Institutional Investor programme (QFII) followed in 2006 by the Qualified Domestic Institutional Investment (QDII) programme marks significant steps toward, respectively, opening the Chinese capital markets to foreign participation and allowing Chinese institutional investors to diversify their portfolios to include foreign assets.[44] Nevertheless, China's capital account remains relatively restricted, even compared to those of other emerging economies such as India whose financial system is also developing.

The current world financial crisis has further underscored the need in China for continuation of a carefully phased approach to capital account liberalisation. Nevertheless, a number of considerations suggest that the liberalisation could be broadened and perhaps somewhat accelerated without undue risk, and with significant benefit to financial system development as well as achievement of a flexible exchange rate. First, the macroeconomic conditions that international experience suggests are essential preconditions for liberalisation – notably a sustainable fiscal deficit, low inflation, moderate government and external debt, and ample (indeed more than adequate) foreign exchange reserves – have been in place for some time. Financial institutions are now more able to evaluate and manage risks as a result of financial reforms, and financial regulators are more capable of overseeing those risks. Moreover, as has happened in other countries, capital controls are inevitably subject to evasion and tend to become increasingly porous over time. Faster liberalisation would reduce incentives for evasion, helping to reduce misreporting and potentially improving the ability of the authorities to enforce remaining limits and to monitor the exposure of the domestic economy to foreign exchange and other external risks.[45]

Regulatory reform: The remaining challenges

While further reforms will be needed in all of the areas discussed in the last section, their emphasis is likely to be somewhat different from those of past decades. With many of the fundamental steps having been taken, future reforms are likely to focus on completing the established frameworks and on strengthening implementation; the emphasis is likely to be on judicial, competition, and other policies applying to the economy as a whole rather than to individual sectors. The ultimate outcomes of reforms in some areas will partly depend on how two political questions are resolved: the role of the Party in state businesses and institutions; and the scope and modalities for citizen participation in the policy process.

The quality of regulation will be increasingly central to this next stage of economic reform. Reform is becoming an increasingly dynamic process requiring not only new measures, but also modification and in some cases discarding of existing policies as the economy develops. The success of this process depends on embedding several fundamental principles in the regulatory process. As discussed in Chapter 2, the regulatory process needs to be transparent and open to consultation with those affected if regulations are to be effectively implemented and unanticipated negative consequences minimised. Effective tools need to be incorporated in formulating regulations to ensure that they are not excessively burdensome or unnecessarily discriminatory. Such tools are particularly

important in those areas where specific regulatory objectives need to be balanced against other policy considerations. Finally, an effective regulatory process requires coherent co-ordination among concerned government agencies and especially government levels to achieve a proper division of labour, good communication among regulatory actors, and accountability.

The remainder of this section discusses key remaining challenges for China's economic reforms, highlighting their implications for the regulatory process in three broad areas:

- Reforms to clarify the scope of state involvement in the economy and the respective roles of the state and private domestic and foreign businesses in the economy.
- Reforms to further strengthen regulatory institutions and tools.
- Policies to extend the scope of reforms to lower government levels and other segments where reform is less advanced.

Further reduction in the SOE sector

Although much smaller than a decade ago, China's SOE sector is still greater in scope than seems warranted on the basis of strict economic criteria. China is virtually unique in its state dominance of all major segments of the financial sector. Chinese SOEs still dominate in the automobile, steel, and other metals industries; state enterprises have largely been withdrawn from these industries in most other countries on the grounds that state ownership is unnecessary and less efficient than private ownership. The continued role of Chinese SOEs in these sectors at least partly reflects policies pursued since the 1980s to emulate earlier attempts by Japan and Korea to develop "national champions". However, China's efforts to develop such champions have had at best meagre results, in part because the international integration of product and financial markets and changes in the organisation of global business have greatly reduced the potential payoffs to such interventions (Nolan, 2002). Moreover, any need for government intervention that might have existed earlier is declining as reforms in, *inter alia,* corporate governance and the financial system to improve business sector functioning progress.

Withdrawal of SOEs over time from competitive sectors could significantly improve performance in the sectors themselves, and thereby benefit the overall economy. This conclusion is supported by evidence that private enterprises have higher productivity and profitability than SOEs, and that privatisation of SOEs tends to improve their performance (Dougherty and Herd, 2005; OECD, 2005b). Limiting the scope of SOEs to national security or other sectors where their presence is genuinely essential to national objectives would reduce the risk that SOEs will again become a major drain on public finances, as they so often have in other economies.

The need to at least reduce the extent of state ownership is particularly compelling in the financial sector, where the contrast between nearly complete state ownership and the prominence of private business in the real sector is striking and growing. Moreover, banking, insurance and the other major financial segments are dominated by very large state-owned institutions with traditionally close links to the central government.[46] In the banking sector, the market share of the SOCBs has been falling only very gradually. As the SOCBs have been the least efficient segment of the banking sector, their dominance lowers overall productivity. Reforms have significantly improved banks' commercial incentives and ability to assess credit risk, and are slowly breaking down the traditional bias on the

part of the large banks toward lending to SOEs.[47] However, whether the system in its current structure can become as effective as counterparts in other countries, or adequately serve the needs of the growing private sector, is at least questionable. Again, international experience is not encouraging. Much evidence suggests that state-owned banks tend to be less efficient in their operations, less effective in allocating credit, and more prone to incur financial difficulties, than privately controlled banks (Hope and Hu, 2005; LaPorta, López-de-Silanes and Shleifer, 2002; Arun and Taylor, 2002).

Government encouragement and the development of the stock market and other reforms have led to significant diversification in ownership of SOEs and greater prominence of private minority investors in sectors still dominated by the state, including the financial sector. On the other hand, minority investors tend to have little influence on enterprise decisions in China, although recent reforms have been undertaken to increase their voice. Private interests have been able to acquire controlling interests in a growing number of listed state-owned companies, and the reform of non-traded shares should eventually foster the development of a more active market for corporate control. Nevertheless, state dominance, especially in the financial sector, is unlikely to decline more than gradually without an explicit government commitment to withdrawal and development of specific measures and timetables for achieving it.

Reduction in the scope of the SOE sector would also help to improve the exercise of the government's remaining ownership stakes and to contain interference by government agencies and government and Party officials in business decisions. Effective oversight by SASAC would be easier to achieve if it were responsible for a smaller and more narrowly focused group of SOEs. Such reduction might also facilitate concentration of SASAC's mandate on ownership exercise and the eventual transfer of its regulatory responsibilities to other agencies.

Greater foreign access to service sectors

Although China has opened its services sectors considerably under its WTO commitments, further liberalisation of access for foreign investors and businesses could bring substantial benefits. Increased access by foreigners can help in reducing SOEs dominance, improve competition, facilitate transfers of technology and know-how, and improve the variety and quality of services offered.[48] Foreign participation can be particularly fruitful in sectors whose development has lagged behind the needs of the economy.[49] Foreign investment is greatly needed and in some cases has long been actively sought to help finance the massive investments required in energy, water, and other infrastructure-intensive sectors.

Many countries, including China, have sought to protect their service sectors from foreign access because of concerns that foreign companies, with often greater capabilities, will harm domestic counterparts and prevent them from developing their potential competitiveness (the "infant industry" argument). Experience suggests that these concerns, if not entirely misplaced, are at least exaggerated. Domestic firms typically have considerable advantages over foreign firms in terms of their knowledge of the market and customers and familiarity with the local business culture. While foreign firms may initially make substantial inroads in high-profit segments requiring high technology or other expertise, their advantage is likely to erode as domestic firms develop their capabilities. China's experience in the banking sector is consistent with these observations. It was widely feared before WTO accession that foreign banks would make large inroads into the

domestic market and increase pressures on the already fragile domestic banks. In practice, foreign banks' market share has increased very little since 2001 and is still quite small, while domestic banks are in much better condition than they were then and have also been expanding and improving their products.

Foreign service providers have faced three types of barriers to entry into the domestic markets: restrictions on their ownership form and ceilings on the maximum share they may own in a domestic firm; restrictions on their geographic scope and lines of business; and other requirements, such as minimum capital requirements, not imposed on domestic competitors or imposed to a lesser degree. These restrictions have been substantially relaxed since WTO entry. Foreign banks and non-life insurance companies now enjoy close to national treatment, although ceilings on foreign investment in domestic banks and insurers remain. Foreign securities companies and mutual fund companies are still prohibited from establishing wholly owned subsidiaries and their maximum stake in a joint-venture or domestic company is subject to ceilings. Foreign participants in the telecommunications sectors and electricity sector face similar ownership restrictions and are confined to value-added services and power generation, respectively. These restrictions limit not only the market share of foreign providers but also the breadth and sophistication of the services they provide, since foreign companies are often reluctant to transfer technology or expertise in ventures where their control is limited.

As noted in Chapters 3, 5, and 7, foreign investors also face uncertainties and risks from the lack of transparency in laws and regulations, discriminatory treatment by local governments, uncertainties about enforcement, and weak intellectual property protection that are usually greater than those faced by domestic firms. Allowed rates of return in regulated monopoly sectors are often insufficient to compensate for the higher risks. Reduction in these obstacles is also important to raising the quality as well as quantity of foreign participation, and will require extensive further reforms to improve regulatory capacities.

Pricing reform – essential in utilities industries and urgently needed in energy

Establishment of effective pricing mechanisms in sectors where regulation is required presents formidable challenges. The pricing system needs to afford a return on investment sufficient to guarantee expansion of capacity in line with demand. Ensuring that prices to end-users reflect the full social costs of provision, including environmental costs, is essential to sustainable development objectives. Pricing mechanisms also need to provide sufficient encouragement for improvements in efficiency and innovation. Distortions in pricing can impose major costs through inefficient resource allocation and by stifling industry development. The importance of energy, water, and other utilities in household budgets further increases the difficulty of establishing effective pricing, since attempts to use price regulation rather than other means to ensure affordability and equity can easily impair achievement of the other objectives.

China has been moving towards more efficient pricing in its utilities sectors, but the process is uneven and incomplete. Most urban residents now pay for water via consumption charges, but these are typically below the level needed for full cost recovery. Wastewater charges, when they are imposed, tend to be applied to all users regardless of their use and many cities do not impose such charges at all. Overly low water prices in agriculture in relation to costs has encouraged overuse and pollution, and contributed to the shortage of water in some urban areas. Thus Chapter 7 argues that there is a need to

review the pricing system so as to better reflect the scarcity value of water resources, while preserving access of the poor to essential services. Further progress is required towards full cost recovery in order to enhance market base integration and encourage sustainable water use.

Price reform is most urgently needed in the energy sector, where the failure of regulated prices to keep pace with changes in costs has led to serious recurring problems. Defects in pricing have been an important contributor to the periodic shortages in energy, most recently during 2003-06, due to inadequate investment to keep up with rising demand. The establishment in 2002 of a two-tier pricing system under which newer generation plants receive tariffs based on their marginal costs is expected to better ensure an adequate return on new investment. Average electricity prices for industry in China are relatively high compared to those in OECD countries and a number other developing countries (Rosen and Hauser, 2007). However, retail prices for electricity as well as gasoline and home energy sources are generally below those in OECD countries and too low to promote adequate conservation and efficient use[50] (Rosen and Hauser, 2007; IEA, 2006).

The administration of retail prices for electricity, gasoline, and other energy sources has become increasingly difficult with the rise in world energy prices, and has led to gyrations in policies. The authorities froze retail energy prices at the beginning of 2007, in part in an attempt to dampen rising inflation in retail and consumer prices while allowing crude oil and coal prices to vary with the market. This led to increasing subsidies to compensate oil refiners for losses and a reversal in policy in mid-2008, when retail energy prices were increased, the price of thermal coal was frozen, and exports were forbidden. Such policy fluctuations do not help to create the market predictability needed to ensure adequate investment in capacity and in conservation.

The authorities are committed to eventual liberalisation of energy prices but have not specified a timetable. The basic need in electricity is to establish pricing that reflects costs in all components, from extraction and refining and distribution to end-users (IEA, 2006). Price reforms have been tied to the introduction of competition in power generation but earlier steps are likely needed to achieve more flexible pricing and so avoid the problems that have been occurring.[51] Greater flexibility in the exchange rate regime, which would allow the RMB to appreciate more rapidly, could help make liberalisation of retail energy prices more palatable by dampening costs.

More effective pricing, as well as maximisation of benefits from private participation and support of environmental goals, will all require further changes in the legal framework and strengthening of the regulatory institutions and processes. A comprehensive telecommunications law is increasingly needed to provide the foundation for the industry's further development (Li, 2008). Chapter 7 highlights the need to strengthen the regulatory framework for water provision and sanitation, clarifying responsibilities and improving consistency among the numerous national and local agencies. Separation of regulation from water delivery needs to be completed, with local governments concentrating on the former while divesting their ownership stakes in providers. Water quality (along with other environmental concerns) needs to be better integrated into broader economic policies, for example by developing integrated river basin managements in which local responsibilities are clearly defined.

The legal and regulatory framework particularly needs strengthening in the electricity sector. The law governing electricity needs to be updated to strengthen the role of the SERC

as the primary regulator and to explicitly incorporate environmental considerations into its mandate (IEA, 2006). The responsibility of the NDRC for electricity pricing, given its broad responsibilities for economic reforms and close relation to government authorities, can encourage conflicts with other objectives and may politicise the process. Conflicts are further encouraged by the present requirement for the national NDRC to negotiate regional prices with local authorities. At the very least, regulatory authority for electricity prices needs to be concentrated in the SERC with a clear mandate to establish cost-reflective pricing as the primary priority. The role of the NDRC needs to be limited to setting the basic rules and criteria for pricing within this mandate.

Equally important, regulatory processes and tools need to be improved. In electricity as well as other sectors, the methodology and rationale for pricing needs to be made transparent to ensure that the cost principle is objectively and fairly observed and not diluted by other considerations. Legal but also institutional safeguards need to be developed to prevent regulated firms from interfering with ("capturing") the sector regulator.

The tools of regulatory impact analysis and competition policy are especially needed in former monopoly sectors, given the interdependence of monopoly and competitive characteristics and the need to balance competing policy objectives. For example, regulatory impact analysis tools can be very useful in designing cost-effective regulations to contain pollution and promote other environmental objectives. Competition policy tools are likely to be essential in establishing competition in the electricity sector (see Box 1.6) as well as in designing pricing and access rules in telecommunications. Both sets of tools could be useful in refining public-private partnerships in the water and other sectors, to maximise incentives for efficient operation and equitably distribute risks among the partners.

Strengthening the rule of law – more than simply enforcement

Ultimately, the success of reforms and an improved regulatory process will depend on the extent to which the rule of law is established on a firmer and broader basis. Administrative directives and regulations can only go so far in ensuring that government officials implement laws and regulations in a manner consistent with their intent. Containment of corruption and its corrosive effects on the government's credibility in managing the economy in the public interest ultimately depends on strengthening confidence that laws will be enforced and lawbreakers effectively sanctioned. Establishment of the rule of law in fact rests not only on more effective enforcement but also, and as importantly, on ensuring that laws and regulations are clear and well understood, and on reducing incentives and opportunities to violate them.

Chapter 2 discusses two features of the lawmaking process in China that complicate the establishment of the rule of law. First, the highest-level laws, notably those enacted by the National People's Congress, typically focus on broader principles and goals but are often unclear about concrete issues, leaving ministries and other lower legislative organs to elaborate the specifics through regulations and decrees. This practice has the advantage of flexibility in that it allows laws to be effectively adapted to changing circumstances – but given the absence of mechanisms to limit lower-level bodies' discretion, it can undermine the original intent of a law and lead to inconsistent application. Second, China is governed by a plethora of laws, regulations and decrees issued not only by central and local governments and their agencies but also by lower-level People's Congress' and Party organs

whose relative status is often very unclear. The result is that it can be difficult to determine what law or regulation should prevail in specific cases.

Reforms to strengthen the judicial system are clearly essential to strengthening the rule of law. The unpredictability, discrimination and delays in judicial processes have been among the biggest concerns of foreign investors in China and are nearly as great a problem for domestic businesses and individuals. Equally important, the judicial system will be critically needed in coming years to provide interpretation of the competition, property rights and other laws that are the foundation for further economic development. For example, Chapter 3 highlights several aspects of the AML that likely will have to be tested and refined in the courts. Several new laws, including the Amended Securities law and the AML, provide greater latitude for individuals and businesses to institute civil proceedings against proscribed practices, including those by government agencies. These new laws are at least partly responsible for a dramatic increase in the number of litigation cases brought before the courts, from an average of 7 million per year over 2000-05 to 10 million during the first half of 2007 (Wan, 2007).

The judicial systems' ability to meet these challenges has been seriously impaired both by weaknesses in its own capacities and by external constraints on its authority. Judicial officials have been making efforts to reduce the first set of problems, notably through training, better selection, and other measures to raise the educational standards and professionalism of judges. Measures have also been taken to improve the transparency of judicial processes and decisions.

The greater challenge is to establish a genuinely independent judiciary free of undue interference from administrative or other outside political officials. This role is manifest in the responsibility local governments still have for funding local courts and appointing and certifying their judges. Judges can be administratively punished for incorrect decisions rather than simply reversed on appeal; and partly for this reason, lower-level judges tend to consult higher levels before making difficult decisions (OECD, 2005b). Judicial deliberations are subject not only to government but Party interventions – notably in complex cases involving a number of judicial divisions, or where no applicable law exists or existing laws run counter to revised Party policies (Hung, 2005). Thus the portion of civil and commercial cases involving government agencies is very low by international standards – in the low single digits (OECD, 2005b; Hung, 2005). Indeed, the judiciary's legal authority to overrule government policies is not unequivocally established in the law.[52] Further legal and other reforms to define the judiciary's jurisdiction *vis-à-vis* the government and to prevent interference from government and Party officials are essential to facilitate rather than hinder the implementation of regulatory and other reforms.

Success in checking administrative abuses and corruption depends as much on limiting opportunities and incentives for such behaviour as it does on enforcement. Excessively large numbers of required applications and procedures facilitate such practices. The opportunities are magnified when regulations are inconsistent or unclear and where the application of regulations lacks transparency, since they increase the discretion of officials while making it difficult to determine if their decisions are justified. Conflicting regulations or mandates also encourage violations by forcing officials to choose between acting within the law but failing to meet superiors' requirements, or going outside the law and succeeding. Thus reforms to improve the consistency and efficiency of regulations will be key to achieving greater honesty and rigor in their application.

Competition policy and other tools to strengthen the regulatory process

The profound transformation in regulation that is now occurring in China creates major challenges to ensuring that regulations in different areas are consistent, efficient in accomplishing their specific goals, mutually reinforcing in achieving policy priorities, and adaptable as conditions change. This is true in all areas but particularly in sectors such as natural monopolies, where a number of considerations – such as competition, efficiency, national security and equity – need to be balanced and where regulatory reform is in at early stage. In a market economy, consistency and mutual reinforcement in regulatory policies cannot be achieved by administrative rules and fiat, as was the case in the command economy. Instead, well-defined tools and criteria are needed to establish high-quality regulatory processes that can achieve these goals. The process needs to be objective, supported by sound analytical tools and good data and information, and actively managed to ensure that its quality is sustained.

As discussed in Chapter 2, establishment of such processes involves extensive institutional, legal and other reforms that are likely to take considerable time and whose exact form depends on a country's history, governance and social and economic circumstances. Tools not only need to be developed and adapted to country circumstances, but also embedded in the mandates and procedures of individual agencies. Reforms to the administrative registration and technical standards systems described in Chapter 4 as well as measures to improve the investment climate mandated by China's WTO entry mark a beginning of the formal incorporation of efficiency, competition, and other fundamental goals in the regulatory process. But the overall effort is at an early stage.

As in other reform areas, the effort to improve regulatory quality in China could benefit from experiences from and tools used in other countries. Regulatory impact analysis, which can be viewed as an extension and generalisation of traditional cost-benefit analysis, has become the primary tool of regulatory reform in the OECD area, and its use has expanded greatly in recent years (Jacobs, 2006). The purpose of regulatory impact analysis is to assess the benefits, costs and other effects of government regulations. It provides an empirical basis for determining whether government intervention is appropriate in a given area and, if so, the most effective way to achieve the goals in question. As such, it helps to improve not only regulation in particular areas but also co-ordination of regulation across the government, as well as transparency and implementation. Regulatory impact analysis is not a single methodology but encompasses a range of principles and tools that in OECD countries have been adapted and applied to a variety of areas depending on individual country priorities. Regulatory impact analysis is concerned not only with the analysis of regulatory policies but also with their effective communication to policy makers. Although the application of RIA varies widely among OECD members, a set of "best practices" has emerged, emphasising the need to effectively allocate responsibilities for RIA, to develop means to collect necessary data, to target RIA analyses to areas where they will be most effective, and to inform the public and involve them in the RIA process (see Chapter 2). Development of objective indicators to measure regulatory impacts and guide policy decisions has become an increasing emphasis.

The chapters on market opening and on competition highlight the potential benefits of using competition policy to improve regulatory quality. Competition policy, which is also increasingly widely used in OECD countries, provides a complementary set of principles and tools that can be embedded in the broader RIA process. The basic principle of

Box 1.6. **The utility of competition policy tools: Competition in electricity generation**

China's 2002 electricity law mandates the eventual introduction of competition in electric power generation in six regional markets, in each of which any single provider can have no greater than a 20% share. However, Chapter 6 notes that fragmentation in the transmission grid means that the effective market in a given area will often be smaller than the region. Thus the 20% overall limit may be insufficient to prevent dominance by a single provider in particular markets. Moreover, the low price elasticity of demand and (when near capacity) supply of electricity enhances the gains from collusion among providers and may lead to considerable fluctuation in market-determined prices.

Competition policy tools will be needed to evaluate conditions in individual markets to determine if genuine competition exists and to detect anti-competitive practices. Such tools may also be needed to establish rules for market pricing that preserve incentives for investment and efficient operation while limiting overly disruptive swings in prices.

competition policy is that regulation should seek to ensure competition to the maximum extent consistent with other social goals (OECD, 2002, Chapter 12). The utility of competition policy in the OECD area has been enhanced by the development of a set of specific tools for measuring competition in individual sectors (OECD, 2007a). These assess the impact of alternative measures on competition as a means of identifying unnecessarily restrictive regulations, and developing alternatives that achieve the same goal with less restriction. The principles have been applied to a wide range of areas, including reforms to health, electricity, water, the environment, and foreign trade and investment. Competition policy addresses not only issues such as barriers to entry, but also the competitive implications and costs of other regulations applying, for example, to advertising, safety and standards.

Neither competition policy nor RIA is intended to impose a rigid or mechanical framework for policy decisions. Rather, their role is to provide empirical guides to support decision making through the political process, expert consultation, social consensus and other traditional means (OECD, 2002, Chapter 11). RIA and competition policy vary widely among OECD countries, in the areas where they are applied (and not applied), the priorities they must balance, and the methods used. The institutions and arrangements for implementing RIA also vary widely depending on country circumstances. Specialised bodies have been established in a number of OECD countries to oversee implementation of RIA, while in others the responsibility has been given to existing budget or public management agencies or to a cabinet body.

Comprehensive reform of relations among government levels

Nearly all of the chapters in this Review cite distortions in the relations between government levels as important impediments to effective regulatory policy. Interventions by local governments in favour of local industries or workers remain a serious obstacle to effective enforcement of laws and regulations concerning anti-competitive practices, as well as to protection of intellectual property. Shortages of funds have crippled healthcare in rural areas. Enforcement of environmental mandates has been hampered by ill-defined assignment of responsibilities among central and local government agencies and conflicts among agencies with different mandates. Other OECD studies have pointed to similar

problems in other areas in China, including education, the collection of statistics, tax collection, and enforcement of labour regulations (OECD, 2006; OECD, 2005a, Chapters 5, 6, and 11).

Underlying these problems are major structural failings in relations among government levels that have become more acute with the decentralisation of economic decision making inherent in market development. Although legally a unitary state, government responsibilities are exceptionally but also unevenly distributed in China; autonomy in formulating policies rests largely with the central government while local governments bear all or most of the responsibility for carrying out expenditure and other policies but often lack sufficient resources or discretion to do so effectively. The result is not only to weaken the capacity for effective implementation of regulatory and other policies, but also to distort incentives. The imbalance between local government mandates and the available resources to meet them encourages local protectionism and resort to unsanctioned fees and charges to make up for shortages of revenue from sanctioned sources. The combination of insufficient legally sanctioned local government discretion and excessive *de facto* discretion due to weak oversight and accountability further distorts incentives. Legal and administrative reforms to strengthen vertical accountability and oversight are clearly necessary, but unless the adverse incentives created by the misalignment of responsibilities and mandates are addressed, their effectiveness is likely to limited.

Comprehensive reform of fiscal relations among government levels is an essential requirement for remedying these problems. Responsibilities for carrying out expenditure policies need to be aligned with the fiscal resources needed to effectively implement them at all government levels.[53] This entails changes not only in the distribution of responsibilities and revenues between the government and provinces, but also, for the reasons given in the prior section, changes in the way responsibilities and resources are allocated among government levels within provinces. Stronger legal and regulatory provisions need to be put in place to ensure that mandates from the central government or higher government levels within provinces are accompanied by adequate resources to carry them out. The rules for allocating fiscal responsibilities and resources across government levels within provinces – which vary considerably – need to be better defined and harmonised across the country. Allowing local governments greater discretion over certain local tax rates (for example the property tax) could also help reduce revenue gaps (OECD, 2006; OECD, 2005b).

Given the great diversity in economic circumstances of China's regions, no nationally harmonised set of expenditure and tax allocation will be sufficient to adequately align responsibilities and resources for sub-national governments. Substantial transfers, both between the central government and provinces and within provinces, are likely to continue to be needed, but the current, partially formed collection of numerous *ad hoc* transfers needs to be greatly simplified and rationalised. Transfers should also be better targeted toward areas where they are needed and better designed to improve incentives of governments to effectively implement policies. For example, transfers tied to local tax increases, originally instituted to improve revenue collection, are less necessary now that the capacities of the tax authorities have been improved and could be replaced over time with other types of transfers. Greater use of general purpose grants would allow local governments better flexibility to tailor their services to local needs.

Reforms are also needed to rationalise relations among sub-national governments and improve their efficiency. Local government workforces are still excessively large compared to their responsibilities (due in part to hiring of workers laid off from SOEs) and need to be further downsized. Redefinition of county and township jurisdictions for a more optimal scale – many of these are very small – could yield significant efficiency gains (OECD, 2006).

Equally important, incentives of local officials to effectively implement policies and national mandates need to be improved. Despite some modification in recent years, the evaluation system for local officials still overly emphasises aggregate growth and infrastructure spending, and so tends to weaken incentives to improve education, health and other services. Further refinement in the system is likely to be needed to better take account of these areas now underweighted. Ultimately, however, quality in local government requires mechanisms for feedback from and accountability to local residents. Efforts to improve the transparency of local government decisions and experiments in the election of local government officials represent initial steps toward developing these mechanisms. But much more will be required to improve local governments' accountability and responsiveness to local needs.

Extending the social insurance system, beginning with the urban sector

As noted earlier, further reforms to social insurance programmes are needed to better integrate labour markets as well as provide a social safety net and old age income security. The basic longer-term challenge is to develop nationwide programmes that ultimately cover the entire workforce. The first step, which could be accomplished in the medium term, is to extend coverage to the informal sector of the urban workforce, as well as to individual proprietorships whose participation is now voluntary. This step is particularly needed to provide retirement and other benefits to migrants from rural areas, who make up the bulk of the urban informal workforce. Unemployment and occupational safety benefits could also be extended to the rural sector in the medium term. Development of a rural pension system, however, is necessarily a much longer-term goal that will need to wait until rural income levels have risen to levels more able to finance such a system. Traditional old age support from family, land and personal savings is likely to remain the mainstay in rural areas for the foreseeable future.

Extension of coverage is necessary but not sufficient to establish a nationwide system of benefits. Although the central government has specified ranges for contributions and benefits based on local cost of living and wage rates, the segregation of insurance pools at the country and municipal level has led to wide variations in financing burdens and in benefits paid. Pooling benefits at the provincial level – which the central government has been encouraging – is a minimum step needed to harmonise systems. Equally important are reforms to make pension benefits portable across cities and regions. The minimum time an individual must contribute to the pension fund in a single area before acquiring vested benefits (now ten years) should be lowered, and preferably abolished. Rules facilitating the transfer of pension contributions and rights among organisations within cities, followed by similar rules governing transfers among cities, need to be developed as soon as possible.

Achieving nationwide benefit systems poses many specific challenges for regulatory institutions and processes. The network of labour offices and their social benefit departments will need to be expanded as coverage is extended to the informal sector, and efforts expanded to disseminate information about benefits and rights to workers and

employers. The capacity for enforcement, to ensure that contributions are paid and that labour standards and protections are observed, is likely to need strengthening, particularly as informal businesses are smaller on average than those in the formal sector and have long operated outside the formal regulatory net (OECD, 2005a, Chapter 11).

Development of the pension system is posing challenges for financial regulators as well. Returns on pension contributions have been low due in large part to the restriction of their investment to bank deposits and other safe but low-yielding assets; they will need to increase to support adequate pension benefits. The financial regulators have been expanding the portfolio choices allowed to mutual funds and insurance companies in order to improve the risk-return profile on old age savings. This requires formulation and enforcement of prudential standards and regulations to ensure that risks are properly managed and abuses contained. Allowing further diversification of the institutions' holdings in foreign assets, which could significantly further improve their risk-return profile, will pose further challenges to the regulators.

The critical need for healthcare reform, especially in the rural sector

Spurred by the SARS crisis, healthcare has been given top priority in the 11th Five-Year Plan, which commits to fresh and comprehensive reform aimed at ensuring equity in access and improving cost-effectiveness in delivery. Achievement of the first goal in urban areas will require extension of the employer-based health insurance system for non-government workers to the informal sector. Compliance to ensure that eligible workers are actually covered and the required payments made will need to be improved and benefit pools widened to the provincial level. Restoration of health insurance in rural areas entails both increased government spending and reconstruction of a coherent rural healthcare system. The advent on an experimental basis in several southern provinces in 2003 of a new rural co-operative medical care system marks a start toward these objectives. The authorities have announced their intention to establish this system nationwide by the end of 2008. Government spending on healthcare has been rising as a share of the overall budget since 2002, with much of the spending going to transfers to rural areas to support healthcare. Government outlays will likely have to rise considerably further to achieve nationwide coverage of the rural co-operative system.

The challenges of establishing an efficient healthcare system are especially great in China, because of the legacy of past reform failures and a healthcare industry structure that has changed very little since the 1980s. Hospitals and other providers are mostly state-owned public sector units with opaque ownership and supervision, limited accountability and transparency, overlapping and conflicting responsibilities, and adverse incentives typical of public service units in China. Medical facilities are owned or controlled by a wide range of governments, universities and other institutions subject to a range of inadequately co-ordinated supervisory authorities. The consequence is that the units are accountable neither to public sector mandates nor to the market, and are often operated for the benefit of their staff and management (Hougaard, Osterdaal and Yu, 2008). The provider industry needs thorough restructuring to establish medical facilities more clearly as public agencies, non-profit institutions, or private profit-making businesses as appropriate, with clear mandates as to their objectives and permitted funding sources. Allowing private firms to provide medical services, which is now prohibited, would help to alleviate the present shortage of resources in the sector and improve competition.

The current fragmented system of health regulation also needs to be restructured (OECD, 2008b). Primary responsibility needs to be concentrated with the Ministry of Public Health and its jurisdiction extended to the entire economy. A clearer allocation of responsibilities and accountability needs to be established among the ministry and subsidiary regulatory bodies at all levels of government. Subsidiary regulatory bodies, such as local health authorities, need to withdraw from provision through hospitals or other facilities.

Effective healthcare regulation involves a mix of market and non-market mechanisms. OECD experiences indicate that competition among hospitals can foster cost efficiency, but only if several conditions are met (OECD, 2008b). Compensation from insurers needs to be structured to encourage hospitals to treat as many patients as they able to effectively for a given payment, rather than based on cost-plus or other formulas that do not offer adequate incentives for efficiency. Selective contracting should be allowed, competing suppliers should be available, and purchasers should have adequate information about their alternatives. Establishment of benchmarks based on best or median practice can help in designing compensation formulas. Unnecessary restrictions on the use of medical personnel, which inhibit the ability to use the least cost resources needed for a given treatment, should be lifted. International experience also indicates that hospitals and other providers use drugs most cost-effectively when they operate independently of pharmacies rather than jointly, as is the case in China.

Much trial, error and revision will be needed to establish an effective healthcare system with an appropriate balance between equity and cost containment. These efforts will be more effective if they make use of objective, empirically based, analytical tools. For example, changing market conditions are likely to spur mergers and restructuring among existing providers, which may improve efficiency but which may also restrict competition. Competition policy tools can help monitor how competition evolves and, if necessary, signal when interventions are necessary to contain new anti-competitive practices. Other tools of regulatory impact analysis can help in designing policies to help poorer citizens pay for healthcare without encouraging overuse or at unnecessary cost.

Improving the business environment and economic integration

Despite their apparent success, past policies to develop China's coastal region are not the appropriate model for developing interior regions and the rural economy. The tax preferences and privileges given to coastal provinces during the 1980s and 1990s served mainly to offset constraints imposed by central planning on market and business sector development. With the market economy now established, development of interior regions needs to focus on improving the business environment and on integrating poorer areas into the rest of the economy.

While regional development policies need to be tailored to individual circumstances, OECD experiences suggest a number of lessons, in terms of both what to avoid (Box 1.7) and policies with the greatest chance of success. The basic positive lesson is that policies need to focus on exploiting and developing regional comparative advantages so as to maximise the benefits to the economy as a whole (OECD, 2005c). Regional policies in China have been moving in this direction. In 2004 a more comprehensive strategy was unveiled that sets out the broad outlines for each major region. Along with continuation of the Western Economic Development programme, the strategy calls for restructuring and revitalisation of industry in the old industrial core in the northeast, and for greater

Box 1.7. **Pitfalls of regional development: The OECD experience**

Most OECD countries have long had policies to develop poorer regions, examples being the programme to develop the Appalachian region in the United States and the effort to develop Italy's southern regions (*Mezzogiorno*). These efforts often have had at best limited success; they highlight pitfalls in once popular development strategies (OECD, 2002, Chapter 21).

- Reliance on large government transfers to regions with severe distortions in the business environment or where co-ordination is inadequate tends to waste resources and is of limited benefit.
- Infrastructure investments made without adequate assessment of future demand tend to be inefficient.
- Growth pole strategies, although once favoured, have not been very successful in practice.
- Fiscal resources need to be concentrated on promoting development rather than supporting or protecting declining industries.
- Policies need to take account of the circumstances of the region to which they are applied rather than to simply replicate measures being applied in more advanced regions. For example, the increasing emphasis on innovation in business development in coastal provinces may be premature in less developed provinces where the key challenge is to develop labour-intensive businesses.

emphasis on targeted policies to foster development takeoff in central provinces, which had received less attention in earlier regional policies (OECD, 2005b).

Infrastructure investment is essential to provide the transportation, communications, and other backbone for business development, especially in the west, but it is not sufficient by itself. As noted in the previous two sections, the burdens of excessive and inefficient regulation, uncertainties about discrimination, and inadequate protection of property are much greater in central and western provinces than on the coast, and typically more than offset the advantages lower wages offer to domestic and foreign investors. They also inhibit the development of local business. Development of interior provinces is further impeded by limited skilled labour and difficulty in retaining and attracting highly educated personnel. Improvement in the local business environment – including local education and training facilities, external surroundings and amenities – is thus equally crucial and could bring substantial benefits to those cities that now lag in these areas.[54]

Improvement in the living standards of the rural population will ultimately require migration of a substantial portion of that population to higher-paying jobs in the cities, along with the development of higher-productivity businesses in the rural sector itself to employ those who remain. Much of the increase in urbanisation is likely to occur in smaller and medium-sized cities, which some evidence suggests are below optimum size (OECD, 2005b). For this to happen, the rural sector needs to be much better integrated into the overall economy than is now the case. A phased elimination of the *hukou* accompanied where needed by central government support to help cities absorb rural migrants would be useful first steps. Reforms to ensure that rural migrants have adequate old age security, either through the pension system or by a clearer claim on their land in their former villages, are also likely to be needed.

The success of regional development efforts will ultimately depend on reforms to improve the quality of governance and to strengthen regulatory institutions and processes discussed earlier. Improvement in the business environment will not occur without substantial improvement in the efficiency of local governments and their accountability to local needs, or without more effective regulatory institutions and tools. A more rational and flexible set of fiscal relations among government levels is essential to improve education and healthcare in rural areas, while rapidly growing cities need to ensure that they have the resources needed to accommodate rural migrants. Above all, regional development demands excellent co-ordination among government levels and among agencies at the local level. The challenge of achieving this co-ordination is all the greater given that it is likely to involve new co-operative relations – for example between city and county authorities, and government authorities in different provinces – that traditionally have not had to co-operate (OECD, 2005c).

Conclusion

Thirty years of reform have transformed China from a centrally planned autarkic economic system, the majority of whose citizens lived in absolute poverty, into a market economy with exceptionally rapid growth, much improved living standards, and a major role in the world economy. The process responsible for this transformation has been unconventional in its sequencing but ultimately based on principles underpinning successful development in other countries. The reform process was most distinctive in the first phase even if it avoided the economic and social upheavals resulting from more sudden transitions elsewhere. While retaining the commitment to socialist dominance, reforms during the 1980s laid the basis for later development of the private sector and the integration of China into the international economy. The second phase of reform was initially dominated by efforts to address the severe imbalances that developed in the first, but these spurred legal and institutional reforms essential to further development of the market economy. The past decade has been especially fruitful in establishing a nearly complete set of legal and regulatory frameworks to underpin development in the future.

Pragmatism – particularly the willingness to make timely corrections to reforms when necessary without abandoning basic objectives – and the fostering of a progressively greater role for the private sector have been critical to the success of the process. Equally important has been the extensive and effective use of international experiences in designing reforms. The reform process has become increasingly comprehensive and sophisticated, and has built up an "infrastructure" of reform bodies and know-how that will be a major asset in the future.

The majority of the basic strategic decisions about the economy's nature have already been made. The pre-eminence of the private economy and its leading role in development is now firmly established, as is the protection of private property. State enterprises will operate as commercial entities and state, domestic private, and foreign companies will compete on equal terms in most sectors. The real economy, and ultimately the financial system, will become increasingly integrated with international markets. Regulatory bodies are being modernised into institutions that influence the economy by setting and enforcing rules for markets and their participants rather than through direct interventions. The state is likely to retain a greater role in the economy than is now the case across OECD countries, although its scope may narrow further. At the same time, the fundamental issue

of the Party's role in state businesses and some regulatory bodies has not been explicitly resolved.

Many of the fundamental reform steps have been taken, although considerable finishing work remains. Markets and the legal and regulatory framework for business development are well established. Foreign trade and investment liberalisation has gone beyond that of many other developing countries. The central government is now better organised to pursue reforms. The basic regulatory frameworks and institutions have been put in place for the social benefits system and the financial sector. Monetary and fiscal policy instruments are fairly well developed.

Major challenges remain. Relaxing constraints on monetary policy to avoid another boom-bust cycle that would undermine past progress by allowing greater exchange rate flexibility and reform of energy pricing will be particularly important in the near term. In the medium term, three sets of reforms will be crucial to progress in a wide range of areas, including health, education and the environment. The first is extension and strengthening of the rule of law through judicial and other reforms. The second is continued reduction in regulatory burdens in order to improve the business environment, particularly in interior provinces. And the third is a comprehensive reform of relations among government levels to align fiscal resources with mandates and to better define responsibilities and improve accountability among bodies at all levels. Reforms in this area are also crucial to the longer-term goals of developing an old age security system covering the entire population and to narrowing the gaps in development and living standards among regions and between rural and urban areas.

Regulatory reform has now become central to the overall reform process. Economic reform is coming to depend much less on major strategic decisions by the highest government levels and increasingly on implementing measures formulated by regulatory bodies and other agencies at all levels. These measures will need to be continuously reviewed and revised with experience and with further development of the economy. Success in this reform dynamic will depend first on the strengthening, and in some cases establishment, of effective regulatory bodies with coherent mandates, a clear division of responsibilities among organs, and the independence necessary to pursue their mandates. Second, effective reform will require the embedding of sound regulatory principles in regulatory and other policy processes, including transparency, accountability to stakeholders, and minimisation of burdens. And third, objective and empirically based tools will be need to be developed and incorporated in regulatory processes to weigh the costs and benefits of alternative regulations to accomplish specific goals and to balance competition, efficiency, equity, environmental, and other objectives. Efforts in these three areas are likely to be a major theme of China's reforms in the coming years.

Notes

1. The firms were part of local government departments that were in theory accountable to their national heads and subject to the plan. The geographic dispersal of industry resulted in a much larger portion of small and medium-sized enterprises, and much lower average scale, than found in the FSU and other European socialist economies.
2. The retention within the rural economy of a growing portion of agricultural output promoted diversification of rural enterprises into labour-intensive processing activities much more in line with rural comparative advantage than previously (Naughton, 2007).

3. The agricultural share of the rural workforce fell from 94% in 1980 to 82% in 1985, and from 70% of the overall workforce to 61% over the same period. See Goodhart and Xu, 1996.

4. In practice, a portion of the above-quota output was required to be sold at a "guided" price within a range set by the government, with the remainder sold at a free market price. In 1985, about one-third of above-quota agricultural output (and about the same portion of goods sold on retail markets) were subject to the guided range while the other two-thirds were sold on the open market. See Oppers, 1997, p. 26.

5. However, as numerous analysts have pointed out, a significant portion of FDI inflows originated with domestic Chinese investors who funneled funds through Hong Kong, China and Chinese Taipei ("round tripping") to take advantage of the tax and other preferences given to foreign-invested enterprises.

6. In 1988 the People's Congress approved a "provisional" act concerning domestic private enterprises, officially authorising their existence and their entitlement, in principle, to protection of their rights. The constitutional amendment act passed at the first meeting of the Seventh People's Congress on 12 April 1988 also stressed that "the private economy is allowed to exist and develop within the scope of the law, the private economy is a supplement of the socialist public economy, and the state protects the lawful rights and lawful profits of the private economy and carries out the supervision and management of the private economy." However, these declarations were not followed up by specific enabling legislation until much later.

7. The incidence of job changes from one employer to another in China's urban areas was exceptionally low compared to the FSU and other European socialist countries. See Naughton, 2007.

8. TVEs faced harder budget constraints. However, pressures from local governments on bank branches to lend to TVEs encouraged the latter to accumulate debt and blunted their incentives, although to a lesser extent than the SOEs.

9. The progressively higher peak inflation in measured inflation during these episodes is exaggerated by the rising portion of retail sales exempt from controls.

10. However, the surge in inflation during the third cycle did cause widespread discontent, as nominal wages lagged behind the rise in living costs and led to a temporary slowing – and in some cases, retrenchment – in reforms.

11. Under the reform, three-quarters of the value-added tax (the single greatest source of revenue) is assigned to the central government and one-quarter to local governments, while three-fifths of corporate (excluding central government-owned SOEs) and individual income taxes go to the central government and the remainder to local governments. The reform assigned revenues from tariffs and import duties, taxes on central government SOEs, and taxes on financial institutions exclusively to the central government, while local governments are given exclusive control over income taxes on locally owned SOEs, taxes on urban land use and housing, and various land use taxes. See OECD, 2006.

12. According to the analysis in OECD, 2005b, total factor productivity growth fell from an annual rate of 5.6% over 1983-88 to 3.4% over 1988-93. Productivity growth from sectoral change accounted for most of this change, falling from a 2.2% annual rate during 1982-88 to 0.8% during 1993-98; it fell further to an average of –0.3% during 1993-98.

13. The People's Bank of China did not begin to publish official estimates of bank NPLs until early in this decade. Initial estimates, including the figure in the text, were based on a traditional loan classification using backward-looking criteria and widely agreed to substantially underestimate the true level of bad loans. Official estimates of NPLs from 2003 onward are based on the new loan classification system introduced in the late 1990s, which is broadly in line with international standards.

14. A number of analysts argued that growth actually slowed by considerably more, perhaps to less than two-thirds of the official figures for 1997-2001 (Rawski, 2001). However, revised real GDP growth figures issued based on the 2003 industry census, which included the first comprehensive survey of the service sector, are roughly in line with the original figures for these years.

15. A new central bank law was also enacted in 1995, giving the PBC primary responsibility for regulation of money and credit. Although the Commercial Banking Law was supposed to end SOCBs' non-commercial lending, in practice they remained obligated to continue to lend to SOEs that were already delinquent on their past loans to ensure that employment was maintained. The need for this unofficial policy lending began to decline as alternative means for supporting surplus SOE workers were developed and as the social insurance system developed.

16. At least at first, privatisation was not an explicit goal because of its political and social sensitivity. Some of the "let go" SOEs were converted into collective form, although in most cases it was transitional.

17. The decline continued, and by 2006 there were less than 15 000 SOEs, about half the number in 2001. The transformation produced new hybrid ownership forms, such as state- and collectively-owned enterprises with mixed ownership, which greatly complicated statistical classifications by ownership type.

18. The 1995 Law also mandated the divestment of trust and investment companies that had been acquired by banks but that had been used as a channel for speculative investments in the stock market and real estate.

19. The rationale was that the Commercial Banking Law and creation of the policy banks had freed banks of the obligation to make policy loans. In practice, the SOCBs remained obligated to continue lending to non-viable SOEs.

20. Inflows of FDI accounted for an average of 7.4% of gross domestic investment during 2002-06, and its average growth rate was below that of total gross investment. China's exports are heavily import-intensive, so that the contributions of net exports to real GDP growth are less than the export/GDP ratio might suggest. Net exports contributed around or slightly less than one-fifth of GDP growth in 2004 and 2006, although the contribution was higher (about one-third) in 2005.

21. Recent studies suggest that China's potential growth rate is in the range of 8-10%, indicating that the gap between potential and actual output has almost certainly narrowed since 2006. See OECD, 2005b.

22. However, formal analyses of whether China's currency is undervalued have yielded mixed results. See, for example, estimates reviewed in Dunaway and Li (2005), which cover the period 2000-04 and range from no undervaluation to nearly 50% undervaluation. Estimates based on similar methodologies and more recent data would, however, very likely increase the presumption of undervaluation.

23. Mobility of capital among China's regions was severely restricted for much of the reform period. Controls on bank lending during the first half of the period largely prevented transfers of funds gathered from savers in one region from being allocated to other regions, especially if they were in the interior. Rural financing has depended on institutions distinct from those serving urban areas and most of industry, and its isolation was increased by the pullback from rural lending by the SOCBs in the late 1990s.

24. However Boyreau and Wei (2004) provide evidence that capital mobility may have declined.

25. Chapter 3 warns, however, that the competition authority needs to be able to notify the agency level above that of the offender since the local competition authorities, which are administratively subject to local governments, tend to be reluctant to do so.

26. The main concern is that transactions carried out outside China and not involving any Chinese-owned entity may still trigger scrutiny.

27. NDRCs role is focused on price fixing, predatory pricing, and related abuses in prices, while MOFCOM focuses on merger review. SAIC has broad authority over monopoly and other anti-competitive practices.

28. Under the 1994 law, a minimum of 2 owners were required to form a limited liability company, and a minimum of 50 shareholders to establish a joint-stock company. Authorisation for single-person limited liability companies has been controversial because of concerns that individuals would use its protection to avoid liability for abuses. In part to reduce this risk, the new law specifies that an individual can establish only one single-person limited liability company. The minimum capital requirements for incorporation under the 1999 law are exceptionally high by international standards: between 11 and 55 times 2005 per capita GDP for limited liability companies, depending on their sector; and more than 1 000 times per capita GDP for shareholding companies. The new law cuts the capital requirement for shareholding companies in half (from CNY 10 million to CNY 5 million), and sets a uniform minimum for limited liability companies of CNY 30 000, or about 1.5 times annual per capita GDP.

29. Notably, the new company law allows the total votes to which a shareholder is entitled (*e.g.* equal to the number of directors to be chosen) on a single candidate ("cumulative voting"). This system, which increases the ability of minority shareholders to elect at least one member of each board, has been adopted in a number of OECD economies (Wang and Huang, 2006).

30. Under the old law, creditors were not allowed to be paid or the company assets liquidated until back wages, taxes, and social insurance contributions were restored. This effectively blocked resolution in many cases.

31. The law reaffirms exclusive state ownership of all land not owned by agricultural collectives, natural resources, major infrastructure, and the radio spectrum, while collectives are the legal owner of all agricultural land. The prohibition on unilateral alteration of land use contracts addresses periodic abuses that have occurred when local governments or leaders of collectives have sold agricultural land use rights to commercial or other interests without the permission of or compensation for the farmers legally holding the rights.

32. China's average tariff rates fell considerably during the 1990s due to the exemption (for foreign-invested exporters) from duties on imported inputs. The WTO agreement mandated a further reduction in the average tariff on agricultural goods from 18.9% just prior to accession to 15% by 2005, and in the average tariff on industrial goods from 14.8% to 8.9% (see OECD, 2002, Annex 1).

33. The phasing out of the multi-fibre agreement was conditioned by China's agreement to allow its trading partners to impose quotas against its exports in case of a "surge" that posed unacceptable risks to the domestic industry of the importing country. This surge provision has since been used by the United States against imports of Chinese-made sleepwear and has also been invoked by several European countries. Overall, China's commitments to opening its internal markets appear large relative to the concessions in received in return as compared with prior trade agreements.

34. Greene *et al.*, 2006 also cites evidence of the rising quality of labour inputs in Chinese exports to OECD economies.

35. Indeed, efforts to reduce administrative burdens and increase transparency were well under way in Shanghai and the major southern coastal cities before China's WTO entry, and seem to have helped spur the efforts of the central government (see OECD, 2000).

36. Chinese corporate governance has adopted the dual board model found in Germany and some other continental European countries, under which the board of directors oversees the senior management while a separate board of supervisors, which includes representatives of the employees and (sometimes) other stakeholders, oversees the board of directors. In practice, as a number of observers have pointed out (OECD, 2002), the role of the supervisory board in China has been somewhat ambiguous, and in practice its functions have sometimes overlapped those of the board of directors.

37. Until 2001, new listings were allocated administratively, with SOEs in certain sectors and regions given preference. Approval authority was then ceded to a listing committee composed of outside experts and based (mostly) on objective indicators of firm performance and quality. This change has fostered greater "competition" in getting listed. However, a large backlog of companies that are approved but not yet listed has developed, and the authorities seem to continue giving preference to companies in priority sectors when it comes to determining which companies are allowed to make their initial offerings first (see OECD, 2008a).

38. Much of the evidence on the impact of stock market listing is based mainly on data from the latter half of the 1990s and first several years of this decade, and therefore may not capture benefits that took longer to become apparent.

39. Under the reform, holders of state shares in the listed companies were required to offer compensation to holders of the tradable shares, who had to approve the plan. Most listed companies had adopted conversion plans by the end of 2007. However, shares have only gradually become tradable because the authorities imposed a lockup period requiring larger holders to wait up to three years before selling their holdings. This lockup was imposed to cushion the impact on market prices and prevent the adverse reaction from investors that had aborted two earlier preliminary attempts at reform in 1999 and 2001 (OECD, 2008a and Beltratti and Bortolotti, 2006).

40. The first three reforms, in 1982-83, 1988, and 1993 focused on downsizing, separating government departments from SOEs and increasing the authority of organs with responsibility for aspects of the overall economy ("comprehensive departments"). The 1993 reform also established the civil service. In 1998, the government undertook a more profound re organisation – reducing the number of government departments from 49 to 30, cutting a large number of bureau-level staff, and including plans to downsize the central government civil service by 50% and local government staffing by 20-30% over several years.

41. The authorities have relied increasingly on "window" guidance on bank lending. This guidance is officially intended for prudential reasons to caution banks against excessive lending to real estate

and other sectors that may be becoming overinvested; in practice it seems to have been used to help restrain overall bank lending.

42. China's previous exchange rate regime was officially registered as one of managed floating with the International Monetary Fund, but in practice the RMB had remained pegged at 8.27 to the US dollar since 1995. The new regime is similar to that adopted by Singapore after the 1997 Asian financial crisis. Malaysia adopted a similar system shortly after the Chinese announcement (Ogawa and Sakane, 2006).

43. The RMB rose on average by 0.7% per month during 2007-08, compared with 0.3% from July 2005 to the end of 2006.

44. Participation in each programme is limited to licensed institutions meeting the regulatory conditions. The QDII programme has been managed rather conservatively, with an initial global limit of USD 10 billion that was raised to USD 30 billion at the end of 2007. The conditions favour insurance companies and mutual funds over banks and securities firms in order to foster longer-term investments, and until recently funds invested were subject to a delay of several years before they could be repatriated. The QDII programme has been expanding rapidly since its inception: 70 Chinese institutions participate with an aggregate investment total of about USD 30 billion by mid-2008. The authorities have also recently taken steps to increase the amount of RMB that individuals can convert into foreign exchange for investment in selected overseas stock markets and for education and other personal purposes. For further details, see OECD, 2008a.

45. More specific recommendations for further steps that might be taken are given in OECD, 2008a**.**

46. The SOCBs now account for just over 50% of total commercial bank assets, compared to about 58% in 2003. The dominance of large institutions is likely to be accentuated by the creation of the Postal Savings Bank in 2007 and by the planned transformation of the China Development Bank into a commercial bank. A large state-owned company accounts for nearly half of the market for life and non-life insurance. The restructuring of the securities industry has also increased concentration into several large state-owned companies.

47. Lending by several SOCBs to private domestic enterprises has risen noticeably. According to their annual reports, loans to this segment by the Industrial and Commercial Bank of China and China Construction Bank have risen to 15.1% and 17.2% respectively of their total corporate loans in 2007, compared to 11.5% and 11.8% respectively in 2005.

48. For example, Leigh and Podpiera**,** 2006 cites evidence that foreign bank participation helps to improve the capabilities of domestic banks and foster development of the banking market.

49. For example, the authorities recently announced plans to encourage foreign reinsurance companies to enter the Chinese reinsurance sector, which is crucial to developing products to insure against very large risks arising from natural disasters or other calamities, a domain that has remained underdeveloped due in part to state-imposed dominance by a single SOE insurance company.

50. See for example "Reform of the Energy Pricing System Crucial", *www.china.org.cn/english/GS-e/236930.htm*. The IEA (2006) report further notes that a "… key issue is that the current [pricing] framework does not encourage investment in end-use energy efficiency as an alternative to supply-side investments" (p. 94).

51. As the IEA report notes, pricing reforms need not and should not wait for establishment of competition, although the measures initially adopted will need to be adapted as competition is introduced.

52. This is underscored by a case in 2003 in which a local-level judge ruled against a local government agency, leading to conflict with provincial-level superiors and a controversy that received wide attention in the Chinese press ("A Judge Tests China's Courts, Making History", *New York Times*, 28 November 2005).

53. This will require some combination of greater responsibility for certain expenditures on the part of the central government and higher levels of responsibility within provinces, along with greater devolution of fiscal resources to lower levels. However, international experiences indicate that there are a variety of ways of rationally allocating fiscal responsibilities and revenues across government levels, and that the best arrangement is very much a matter of a country's history, constitutional and legal arrangements, and other factors.

54. The most recent World Bank Survey of the investment climate of Chinese cities estimates that raising the education and technical training, healthcare, and environmental quality of the bottom quintile of cities in China to the levels of the most advanced cities could increase the business productivity of the former by as much as 25% (World Bank, 2006).

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PART II

Thematic Issues

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OECD Reviews of Regulatory Reform: China
Defining the Boundary between the Market and the State

Chapter 2

Regulatory Governance

Across the OECD area, the liberalisation of domestic markets and international trade, coupled with the introduction of regulatory management tools, has led to a profound reformulation of the state's role in the economy. A similar trend has emerged in the People's Republic of China since the late 1990s. Even if the process remains in its early stages, there is still evidence that the central government has begun to construct a fledgling regulatory system that gives policy makers new tools to impose and enforce economic regulation. This chapter describes how China has gradually developed capabilities for setting economic regulation and thereby guiding market dynamics through regulatory agencies, commissions and administrative procedures that nevertheless maintain an arm's-length relationship between state and market. The aim of this chapter is to promote discussion on the development of regulatory governance in China and the relevance of regulatory approaches adopted by OECD countries. It raises a wide range of issues that deserve further thought in determining regulatory options for China.

Introduction

Across the OECD area, the liberalisation of domestic markets and international trade, coupled with the introduction of regulatory management tools, has led to a profound reformulation of the state's role in the economy. Scholars have labelled this trend the "rise of the regulatory state" (Majone, 1994; Moran, 2002). OECD member countries that previously relied on industrial strategies as the basis for influencing major sectors of the economy have increasingly adopted arm's-length regulatory bodies to oversee the development and performance of markets. A vital factor behind this change has been the creation of a host of new institutions – oversight bodies, regulatory agencies, administrative courts and ombudsman commissions – to manage newly liberalised markets (Thatcher, 2005). These specialised agencies have developed a host of tools to develop evidenced-based policies and to enforce economic regulations.

A similar trend has emerged in the People's Republic of China since the late 1990s. Even if the process remains in its early stages, there is still evidence that the central government has begun to construct a fledgling regulatory system that gives policy makers new tools to impose and enforce economic regulation. China has gradually developed capabilities for setting economic regulation and thereby guiding market dynamics through regulatory agencies, commissions and administrative procedures that maintain an arm's-length relationship between state and market. This new system differs from the previous era in which the party and government dealt with the economy through open intervention, command and control regulation, and state ownership of major enterprises. This marks a fundamental transition in defining the boundary between the market and the state in China (Cheug, 2005; Pearson, 2005).

Administrative reforms launched in the late 1990s

The first 20 years of market reforms which commenced in 1978, witnessed six rounds of government reforms in China. Despite the initial downsizing that generally characterised these reforms, the long-term results were always re-expansion of the bureaucracy. In 1997, the State Council consisted of 40 ministries and commissions with some 36 000 staff members. Each economic and industrial ministry had in its purview some 80 000 to 100 000 employees in the so-called "public units", which were mostly semi-administrative in nature. All told, some 38.6 million people were on the state budget, including 8 million government functionaries and over 30 million public unit employees (Lu, 2009). The pressure to downsize this large bureaucracy mounted as the market reforms continued to expand.

While the early reforms were slow to take root, the pace accelerated noticeably in 1998, in terms of both downsizing and changes in institutional functions. The reforms were motivated by the need to have an effective bureaucracy capable of steering economic modernisation, and were focused on streamlining ministerial duties, centralising

administrative oversight and integrating merit into recruitment and promotion decisions (Chow, 2005; Lan, 1999).

1998 reforms: streamlined administrative authority and curbed bureaucratic fragmentation

The 1998 government restructuring programme reduced the number of central ministries from 40 to 29, trimming staff size by nearly half. Additional streamlining occurred within ministries, and the number of departments decreased by more than 200 (Yang, 2004). The most significant restructuring affected the industrial ministries – largely a legacy of central planning, which continued to maintain control and oversight of State-Owned Enterprises (SOEs). Many of these ministries were streamlined under the supervision of the State Economic and Trade Commission (SETC). This was particularly significant given that the previous structure gave each individual ministry informal veto power in economic policy making, which often resulted in deadlock (Shirk, 1993).

The 1998 reforms also lead to the creation of a number of "supra" regulatory bodies. These included the State Development and Planning Commission (SDPC), which had regulatory responsibility for a number of infrastructure sectors, and the SETC, responsible for industrial planning and investment regulation.

A clear objective of the programme's streamlining and integration was to promote the unity of administrative authority and to curb widespread bureaucratic fragmentation. But the shakeup in China's institutional structure was also matched by a transformation in economic philosophy. Clearly the administrative units responsible for industry under the SDRC and SETC were still charged with the formalisation and implementation of sectoral policy and regulation. However, they lost the authority to directly supervise SOEs and intervene in their affairs.

Institutional reform also took place at lower levels of government. Compared with the reorganisation of the central government in 1998, the downsizing of provincial and sub-provincial levels of government was both more significant and more difficult to implement (Yang, 2004). Even the smallest township had an administrative structure – with a full complement of administrative agencies and organs – that largely replicated those contained in the central government. Beginning in 1999, the central authorities began to formally promote local government reform to match central level reforms, following central guidelines. The industrial and commercial bureaus at lower levels of government were downsized and absorbed in provincial-level economic committees.

The next wave of reform, 2003

Following the 1998 reforms, a major issue – made all the more prominent by the abolition of the industrial administrations and the divestitures of SOEs – was how to promote the trend toward a relatively neutral regulatory state and yet maintain proper and efficient supervision over the multitude of state enterprises. The profusion of formal and *ad hoc* institutions overseeing the major SOEs elicited demands for simplification. In spring 2003, the State Council announced a new round of administrative reforms, the bulk of which affected economic institutions; mostly these focused on reducing institutional conflicts of interests and improving bureaucratic coherence. At the same time, the regulatory apparatuses in banking, food and drug administration, power, and workplace safety were elevated to higher or independent status.

The most prominent part of the 2003 plan was the dismemberment of the SETC, which had been one of China's most prominent institutions for economic governance within the State Council. The SETC's bureaus on state enterprises were transferred to a newly created State-owned Assets Supervision and Administration Commission (SASAC). The SASAC is a ministerial-ranked agency directly under the State Council, whose mandate is to promote the strategic restructuring of state enterprises and further separate government ownership, enterprise, and management. The SASAC is authorised to draft laws and regulations regarding the management of state assets, and to provide guidance for and supervision of its local equivalents, which look after the state enterprises owned or controlled by local authorities.

While most of SETC became the SASAC, the SETC's important policy and regulatory functions relating to industry – industrial planning and policy, economic operations and control, supervision of investment in technical renovation, macroeconomic policy guidance on enterprises of all ownership types, promotion of small and medium-sized enterprises, and planning for import and export of raw materials – were given back to the SDPC, rechristened the National Development and Reform Commission (NDRC). The NDRC was created with the aim of promoting coherent policy making and implementation. With the SASAC looking after key state firms, the NDRC is to become more even-handed in its policy making and regulatory functions, and formulate policies and strategies with the entire economy in mind. The removal of the word "planning" from its name affirms the trend toward using market-oriented mechanisms to manage the economy rather than reliance on approvals, permits, and microeconomic interventions.

Another area of lingering regulatory fragmentation was China's trade apparatus. The 2003 reform merged the Ministry of Foreign Trade and certain bureaus of the SETC and the former SDPC (domestic commerce regulation, plan implementation for the import and export of certain key commodities and products, including agricultural products) into a new Ministry of Commerce. This offered a more unified approach to trade regulation and facilitated China's compliance with the terms of China's WTO membership.

The emergence of "independent" regulators

With efforts to upgrade bureaucratic capabilities well under way, the State Council turned its attention to setting up new regulatory bodies. Beginning in 1992, China had established regulatory commissions governing key infrastructure sectors, including the China Securities Regulatory Commission, established in 1992; the Ministry of Information Industry, established in 1997; the China Insurance Regulatory Commission, established in 1998; the General Administration of Civil Aviation, established in 2002; the State Electricity Regulatory Commission, established in 2003; and the China Banking Regulatory Commission, established in 2003. A number of scholars noted that the establishment of these new regulatory commissions has been influenced by regulatory reform initiatives taking place in a number of OECD countries.[1]

In both established markets and transition economies, the benchmark for new regulatory agencies is the independent regulator. The reasons for setting up such an agency are well known;[2] key among them is to shield market interventions against interference from political and private interests. Establishing independent regulators can greatly improve regulatory efficiency as well. They are also a necessary institutional development for marking out the separation of the state's roles as policy maker and owner

of productive assets. This role is especially important in China, which has chosen to maintain significant ownership interest in a number of industries.

2008 reforms establishing a number of "super ministries"

The most recent restructuring was institutional reform initiated in March 2008. It involved the establishment of five "super ministries" – of industry and information, human resources and social security, environmental protection, housing and urban-rural construction, and transport, plus a ministerial-level energy commission. Several agencies were consolidated to form these new super ministries. The reshuffle involved 15 government departments; it reduced the number of State Council ministries and commissions to 27 from 28.

In addition to the consolidations, the plan appears to signal a number of potentially important policy reorientations. For example, the former State Environmental Protection Administration was promoted to the Ministry of Environmental Protection. Likewise, the State Food and Drug Administration was placed under the jurisdiction of the Ministry of Health, to clarify the latter's responsibility for food and drug safety. Finally, China also established a national energy commission; an inter-ministerial consultation and co-ordination body; and a state energy bureau, which is under the jurisdiction of the NDRC. In addition, the plan calls for the NDRC to focus on macro regulation and phase out its involvement in economic micro management and the examination and approval of specific investment projects.

It is too early to make a comprehensive assessment of the plan; its impact on government efficiency will only become clear once the reorganisation is complete. Nevertheless, it seems fair to conclude that the administrative reforms carried out between 1998 and 2008 have reshaped the structure of government. This has been manifest in the abolition of industrial ministries – at one time the core of the planned economy – and the creation of regulatory agencies. The adjustment of the government structure and its associated functions, together with the evolution of the relationship between government and state enterprises, should help define the boundary of the state and the market.

Crisis and international pressure

Unexpected crisis also played a role in the development of China's regulatory system. The SARS outbreak triggered a review and reform of the public health regulatory system, making it more transparent and accountable.

The "Made-In-China" crisis of tainted food and other substandard exports in spring 2007 led to a renewed effort by the central government to enhance product safety, especially of food and drugs. A series of new rules were issued after high-level meetings on product quality and safety in Beijing in late July 2007.[3] This crisis may have been responsible for the creation of the new Ministry of Health in 2008, which assumed control of the State Food and Drug Administration – a regulatory body that had come under significant criticism in the past two years for corruption and inaction (US-China Business Council, 2008).

Finally, the contamination of a number of food products with the chemical melamine in late 2008 resulted in renewed calls for food safety regulation. As a result of the crisis, China signed a new agreement with the EU that strengthens the exchange of information

over faulty products; improves the ability to trace dangerous goods; and increases co-operation in taking those goods out of circulation.[4]

Bureaucratic reality limiting more profound change

China has made remarkable progress in creating a modern regulatory system almost entirely from scratch over the past 30 years. At the same time, China has encountered significant difficulties in remaking its system of economic governance. While many changes have been made in the formal institutional structure, the country's political system is far from converging with the dominant regulatory model that exists in a large number of OECD countries. Several bureaucratic and institutional difficulties confront China's regulatory agencies that continue to hinder reform of its system of regulatory governance.

The resilience of supra regulatory bodies

Despite efforts to empower the regulatory agencies governing key infrastructure sectors, a number of China's central institutions have remained viable and in some respects have even been strengthened in recent years (*Lin, 2003; Yang, 2004*). Comprehensive policy agencies have guided many of China's market-oriented reforms. They should not be considered anti-market, yet their continued presence in the system has helped establish the importance of key goals – potentially regressive from a pro-market point of view – such as protecting state assets, establishing national champions, and fostering certain social policies. Moreover, their overwhelming power often trumps the ability of China's new regulators to gain authority and act independently.

Several powerful organisations at the apex of the Chinese party state are involved in regulatory matters. Perhaps the most important is the National Development and Reform Commission.[5] In 2003 the NDRC consolidated authority for industrial regulation to become the primary central government institution responsible for macroeconomic management. Two of the NDRC's main functions were the approval of large investment projects proposed by state enterprises and the oversight of pricing in the infrastructure sectors. These are functions that are generally left to firms and regulators in market economies. It appears that the NDRC has lost some responsibility for industrial regulation in the last round of government reforms. At the same time it has taken on new responsibilities for energy policy. The new National Energy Commission, positioned within the NDRC, will combine some of the existing policy and regulatory functions for managing the energy sector. The exclusion of other agencies in this reorganisation, such as the State Electricity Regulatory Commission, implies that policy formulation in the energy sector could continue to be burdened with bureaucratic in-fighting.

The newly created Ministry for Industry and Information will likely play a significant role in regulation of major industries and in examining and approving new industrial investment and projects. The impact of this reorganisation may well be felt by companies in the energy, transportation and healthcare sectors, among others. It is not clear how the Ministry's examination and approval responsibilities will dovetail with regulatory responsibilities in other parts of government, *e.g.* the National Energy Commission, the Ministry of Transportation and the Ministry of Health.

Finally, the Chinese Communist Party maintains an important strategic and supervisory role in economic reform. The State Commission Office for Public Sector Reform

(OPSR) is a powerful body within the central CCP and government apparatus. Lu (2009) notes that its operation remains little known to outsiders due to the nature of its main function – reforming and restructuring government and other public institutions. It decides the authority, functions, personnel and organisational structure of all major regulatory agencies. Moreover, when conflicts over authority among different bureaucratic bodies arise, the OPSR is usually responsible for arbitration. In addition, the Party's policies are developed through "leading small groups" (*lingdao xiaozu*) – joint party-state organisations consisting of high-level officials in a given sector. These groups oversee finance, telecommunications, electric power and many other industries. Thus, through the tools of leading small groups and appointment power, the party has maintained an important degree of control over its most strategic industries (Chan, 2003).

A fragmented institutional framework

The creation of almost all of China's regulatory institutions involved a reordering of existing power within an entrenched bureaucratic machine. Although it is relatively easy to grant regulatory rights to a new organisation, it is harder to take such rights away from organisations that once asserted substantial control and often maintain ongoing interests. A consequence of various government reshuffling programmes is the highly fragmented institutional framework for policy making. Protracted negotiation and bargaining among different bureaucratic actors is endemic to the system, even more so than in the relatively fragmented systems of some other OECD countries (Eisner, 2000; Lieberthal, 1992). A major result of fragmentation is that many agencies within the government have a role in policy formulation.[6]

The difficulty arising from situations in which old bureaucracies, if not dismantled, retain an interest in regulatory policy is made worse by the fact that China's independent regulatory agencies have an ambiguous and ultimately weak status in the system. Many of the new agencies have a bureaucratic status within the political system similar to institutions that do not wield formal political authority. The three financial services regulators and the electric power regulator are *shiye danwei,* usually translated as "institutions".[7] The poor statutory demarcation of roles and responsibilities among the new regulators continues to cloud their authority, and hence their effectiveness.[8]

The independence of agencies

A deeper consideration as to the meaning of "independence" and its underlying assumptions is needed when assessing the status of regulatory agencies in China. In OECD countries the term refers to institutions that operate at arm's length from political and private interests. However, regulators in China owe their positions to the political-bureaucratic elite, and the possibilities for the exercise of independent judgements and action may be limited (Minogue, 2006). Thus, the core ideal of independent regulation in China may rest on the simplistic view given that economic governance cannot be insulated from overriding political considerations (Minogue and Carino, 2006). Creating institutions outside the realm of government does not of its own accord reduce the imperatives of politics, or render regulatory policy making any less deeply political than it already is.

Clearly, the Chinese government has seriously engaged the need to remake itself – that is, to undertake substantial administrative restructuring and institution building along lines followed by many OECD countries. Efforts to reform the administrative system and to create new institutions of the regulatory state have gone hand in hand with the

corporatisation of the economy and attempts to radically separate state firms from their former government patrons. But the attempt to add new institutions, processes and ideas, and even to eliminate some of the old hindrances, has not created a seamless transformation to a brand new system of economic governance. Rather, the new system of economic governance has, for the most part, been grafted onto other parts of the system that appear much less adaptable to change. From an institutional perspective, extremely fragmented politics characterised by protracted bargaining among interested bureaucracies remains a fact of political life, as does the conscious attention to formal government hierarchy and the positioning of units within it. Reformers designing China's new system of economic governance face the age-old problem of how to invest new regulatory institutions with authority in the context of powerful competing claimants to that authority.

The institutional framework for the creation of regulation

China has a complex array of legislative organs and agencies that have the legal right or the practical power to make variously binding regulations. The formal lawmaking structure of the Chinese regulatory system is set forth primarily by the Constitution, the Law on Legislation and the State Council's Regulation on the Procedures for the Enactment of Administrative Regulation. The National People's Congress (NPC) and its Standing Committee are at the apex of the regulatory system. Both have the power to pass primary legislation that has more authority than any other kind of legal instrument other than the Constitution. The State Council may enact administrative regulation in furtherance of constitutional and legislative objectives. The Local People's Congress – at the provincial level and for certain large cities – may enact "local regulation" to govern local issues. All the preceding regulations have the formal status of law within the Chinese legal system and are, in theory, enforceable by courts (Peerenboom, 2002, Yang 2004).

In addition to the formal structure outlined above, a number of other organs and agencies have regulatory power in China. Executive agencies of the State Council, sub-national-level government agencies and the Local People's Congress (below the provincial level) enact a host of rules, opinions and instructions that may best be described as "tertiary" regulation (Keller, 1994). The Constitution and other relevant statutes make it clear that tertiary regulation must yield before regulation of higher status. The problem is that there is no effective system either for enforcing jurisdictional and subject matter limitations on any particular body's lawmaking power, or for resolving the conflicts that consequently and invariably arise (Clarke, 2008).[9]

The court system would appear to be ideally suited to examine conflicting rules and overly ambitious claims of jurisdiction. This is not the case, however, in China. Although Chinese courts should, from a constitutional perspective, recognise and rule in accordance with high-level regulation rather than conflicting lower-level regulation, they are prohibited, constitutionally, from invalidating legislation. This prohibition is generally interpreted to mean that courts must uphold conflicting lower-level regulation, at least when it is issued from the same level of government that controls the court in question. In short, courts must either seek a resolution for the conflict from a high-level legislative organ, or rule in accordance with the lower-level regulation. Another important feature of the Chinese regulatory system that works against consistent enforcement is the dependence of courts on local government.

Regulation at different levels of government

A defining theme in Chinese economic reforms has been relations between the central and sub-national governments. Many major reform measures have touched upon these relations, which indeed have been crucial to the success of the reforms. Regulatory reform is no exception; it is an essential part of evolving central/sub-national relations. In fact, regulatory reform launched in the late 1990s can be seen as a corrective response to the problems caused by the decentralisation that had had its successes in the early period of reform.

China has a multi-level governance system with five sub-national levels: province, prefecture, county, township and village. Provincial governments sit above administratively subordinate prefecture governments, and so on down the line. The Chinese government is also divided into a broad functional system. The State Council is at the top of the government hierarchy. Below the State Council are agencies (commissions and ministries) that sit atop a functionally defined hierarchy of government units that exist at each territorial level of government. Thus, central agencies may have functional bureaus at the provincial, prefecture, county and township/village levels.

The inherent potential for conflict

This system carries an inherent potential for conflict: the functional authority between the vertical relations of administrative units *versus* the horizontal authority that emanates from the territorial government at the same level as a functional unit. The Chinese administrative system has long been characterised by the conflicts between centralised authority and the vertical structure (*tiao-tiao*) and territorial authority and horizontal structure (*kuai-kuai*).[10] These relations have been a defining and central feature the effectiveness of the regulatory regime.

Two types of political relationships further define the Chinese administrative system: those governed by binding orders, and those based on non-binding instructions. Any political unit in China has the second type of relationship with any number of other units. But it has the first type of relationship with only one, its direct "superior". A relationship based upon such binding orders is referred to as "leadership relations" (*lingdao guanxi*) while the other type is based on "professional relations" (*yewu guanxi*). In theory, centralised authority ensures that higher-level government decrees are implemented smoothly and uniformly. On the other hand, territorial authority-based leadership relations help local governments achieve a degree of independence from external influence, enhance sensitivity to local conditions in the policy process, and facilitate co-ordination between functional departments.

Early reforms and territorial authority's priority over central authority

While the specifics vary considerably, the first 20 years of economic reforms saw territorial authority take priority over central authority.[11] Early reforms in China resulted in a largely decentralised political system: leadership relations were often not with administrative superiors but *with local governments at the same administrative level* (Lieberthal and Oksenberg, 1988). The decentralisation of economic and political decision making to local governments was largely an attempt to establish the conditions necessary for markets to take root. At the same time, decentralisation also led to a high degree of local

protectionism and low national standards regarding policy implementation and enforcement.[12]

In an effort to counter these difficulties a new trend has emerged, which entails the partial centralisation of a number of key bureaucracies. This trend was started in the late 1990s in order to regulate and discipline local government agents in their management of the economy and the implementation of policy more generally (Table 2.1). Under this "centralised management" (*chuizhi guanli*) system, individual units within these bureaucracies are no longer beholden to superiors within local governments; rather, they are directly controlled by their functional administrative superiors and have only a consultative relationship with their former local government bosses. This centralisation, moreover, does not appear to be a temporary measure like the macroeconomic adjustments and retrenchment undertaken earlier.

Table 2.1. **Centralisation of regulatory institutions**

Name of agency	Centralised management	Form of integration and function	Since when
State Administration for Industry and Commerce	Yes	Sub-provincial units by province	1999
Financial services and products (insurance, banking, stock markets)	Yes	All with regional branch offices	1998
Quality and product safety (AQSIQ)	Yes	Sub-provincial units by province	2000
Environmental Protection (SEPA/MEP)	No	Regional offices, monitoring and supervision	2006
State Land	Yes	Sub-provincial units by province	2004
Statistics	Yes	All survey teams, stats collection and report	2004
Food and Drug (SFDA)	Yes	Sub-provincial units by province	2000
Occupation safety (SAOS)	Partial	Coal mining safety regulation	2005
Public health (MOH)	No		
State Audit	No		

Source: Lu, 2009.

Mertha (2005) refers to this trend as "soft centralisation", because although these bureaucracies are centralised from the township and county to the provincial level, many remain decentralised between the centre and the province. It appears that the principal beneficiaries of this shift to centralised management are the provinces, as the institutional mechanisms of personnel and budgetary resource allocations are concentrated at the provincial level. This has curbed localism to a degree. However, by transferring power from local governments to the newly centralised bureaucracies, it has also contributed to a situation in which newly strengthened provinces may play a key role in the emergence of a sort of quasi-federalism. Mertha (2005) goes on to argue that Beijing's experiment with soft centralisation, while somewhat successful, has nevertheless fallen short in its goals; thus far the transformation remains imperfect and incomplete.

Tools for regulatory quality

China has made remarkable progress in improving its legal and regulatory system, having essentially begun from scratch in 1978. Most if not all of China's regulatory environment is structured formally by a largely robust framework of laws and regulations. At the same time, its regulatory system has seen unprecedented growth with the promulgation of numerous commercial and civil laws at national and local levels. While the emphasis on lawmaking contributed to the growing authority and capacity of the

National People's Congress during this period, numerous inconsistencies and ambiguities created a level of tension within the regulatory system as a whole. Largely because of a shifting distribution of authority among the NPC, the State Council and the sub-national (primarily provincial) people's congresses, the regulatory environment is occupied by a number of agencies that have engaged in institutional turf wars at many stages of the lawmaking process.

The Legislation Law

Faced with the possibility of regulatory inconsistency derailing economic reforms, in the early 1990s China's political leadership began to consider a law on lawmaking so as to set out a more clearly defined and uniform regulatory hierarchy.[13] The *Legislation Law* represents a significant attempt to produce a more orderly and open legislative system in China.[14] The Law addresses substantive and procedural issues in the regulatory process and is a key instrument for the quality of lawmaking in China. Importantly, it sanctions, though does not require, the use of public legislative hearings as a mechanism for incorporating greater citizen participation in the legislative process. The submission of the Legislation Law coincided with a dynamic period for the development of rule of law in China.[15]

In order to be effectively implemented, the Legislation Law had to address a variety of challenging and sensitive issues. These include the vertical division of central and local legislative powers, the horizontal distribution of legislative powers between the National People's Congress and State Council hier-archies, the relationship between laws and regulations issued by compet-ing authorities, supervisory authority over laws, administrative regulations and rules, legal interpretation, and legislative processes and procedures.

A key governance challenge relates to the emergence of a quasi-federalist system in China. This has been characterised by an emerging division of legislative power among central and local legislatures and governments. The high degree of discretionary power at the local level has resulted in widespread local protectionism and attendant abuses of the legal system, corruption and uneven application of laws.

The Legislation Law addressed directly the division of authority between the NPC and sub-national people's congresses, which were determined to secure the rights of their locales. The Law clearly spells out the broad areas in which the central government has exclusive regulatory authority. This was met with resistance from provincial government, which argued that the authority of localities should be defined as well. In this regard, the Law formalised the long-standing practice of drafting "advance legislation"*(xianxing lifa)*. This ensures local government's ability to pass regulation in areas not yet legislated by the centre under the condition that it can be voided later once the national government has legislated. Both the NPC and local governments seemed to be in favour of this arrange-ment since it facilitates local experimentation, which often serves as pilot for national legislation.

Increasing progress in improving regulatory transparency

China has been making ever increasing progress in improving regulatory transparency and open access to government information. This is a considerable achievement given the 2000-year-old legacy of administrative secrecy which long predates the current Communist party regimes (Horsley, 2006). Lack of access to information was particularly acute during

the central planning era, when the Chinese government monopolised the production and dissemination of all types of information, including those in the area of law and regulation. But from the late 1970s, Chinese leaders began to see the need for more open availability to information in support of economic development. By the late 1990s, programmes to promote regulatory transparency – under which government agencies at all levels would release ever increasing amounts of information about their functions and activities, and provide services over the Web – had become widespread. This trend was formalised in China's accession commitments to the WTO, which called for making trade-related rules and requirements readily available to both domestic and foreign firms.

In 2001, the State Council issued *Regulations on the Procedures of Making Administrative Rules and Regulations,* to standardise the rulemaking procedures and so improve the quality of the processes. The creation and revision of regulation is by law delegated to the State Council and its administrative institutions. This legal base aims to bring better analysis and concentrate activities by specialisation, but also seeks more co-ordination and improves supervision. One of the latest efforts of the State Council was the establishment of the *Guideline for Advancing Administration in Accordance with the Laws*, issued in 2004. The intention was to set up a framework for continuing to build a law-based society. In addition to the above rules, individual agencies with regulatory functions have their own guidelines for the drafting of normative documents.[16] These internal provisions are based on the *Regulation on the Procedures for the Formulation of Rules* and are integrated with the specialised requirements of the respective regulatory departments. These procedures establish the basic principles for regulatory transparency.

Public consultation procedure

Public consultation is not a legally guaranteed right at present. Nevertheless, provisions for public consultation are included in the *Ordinance Concerning the Procedures for the Formulation of Administrative Regulations* and the *Regulation on the Procedures for the Formulation of Rules*. Similar provisions can be found in the rules of some individual departments and local governments for drafting regulations.

During the authorisation and application phase of drafting local government regulations, the public are entitled to apply for authorisation of regulations. However, there is no such stipulation in the administrative rules and regulations on the procedures for the drafting of regulations in government ministries and commissions. During the drafting period, the primary means of consultation include symposia, panel discussions and hearings. For those involving the immediate interests of citizens or where great differences of opinion exist, a hearing must be held and the results made public.

The *Regulation on the Procedures for the Formulation of Rules* sets forth four procedural requirements for holding a hearing.

- The hearing should be open. The drafting unit should publicise the time, place and content of the hearing 30 days prior.
- Related departments, organisations and citizens attending the hearing should be entitled to question and express opinions on the regulation being drafted.
- Accurate notes should be taken during the hearing to record speakers' opinions and the reasons for their opinions.
- The drafting unit should carefully study opinions presented in the hearing. The drafted regulation, when submitted for approval, should mention any conflicting opinions

presented at the hearing, their reasons, and how a settlement was reached to resolve such differences.

The *Regulation for the Formulation of Rules* stipulates that opinions from concerned parties shall be recorded and listed during the drafting of administrative and local rules. Experts shall be called upon to expound on professional or technical issues related to the drafting of regulations. During the period of examination, the investigating organ shall examine whether the drafting organ has correctly handled opinions on the draft regulation from different organisations, institutions and individuals. In the case that "no hearing record" or "no record of different opinions" is provided, the investigating organ shall "postpone or return to the drafting unit."

Improvements in these regulations indicate that the Chinese government is aware of the necessity and importance of ensuring public openness. However, current regulations do not provide complete guarantees. A formal standard for determining whether regulatory affairs are important or bear upon a citizen's immediate interests does not exist. The regulatory organ has full control of the right to decide whether a hearing is held and how the hearing is organised. Despite the requirement that different opinions be recorded in the draft regulation for examination, there are no requirements regarding the authenticity or scope of the opinions recorded. No regulations are available concerning participants in, or the effectiveness of, the hearing. The hearing functions merely to provide information to the regulatory department for decision making. Furthermore, a number of non-compulsory clauses accord the investigating organ excessive discretion, which makes it possible to exclude the public from regulation drafting procedures. At the same time, the public lack the means to appeal in such cases.

A major initiative to open access to government information

The *Regulations on Open Government Information* (OGI Regulations) marks a turning point in making Chinese government operations and information more transparent.[17] These regulations provide the legal basis for China's first nationwide government information disclosure system. Moreover, under China's unitary legal system, the OGI Regulations will not only apply to central government agencies but also extend the disclosure obligation downward through the Chinese government hierarchy to the provinces, counties and townships, the country's lowest level of government.

The stated purpose of the OGI Regulations is to ensure access to government information in accordance with the law; enhance the transparency of government work; promote law-based government administration; and have government information used in service of citizens' productivity and livelihood as well as social and economic activities. The Regulations define "government information" subject to disclosure more broadly than some local provisions, as "information recorded or preserved that is issued or obtained by administrative agencies in the course of carrying out their duties." They establish two methods of accessing government information: dissemination by government agencies on their own initiative, and disclosure in response to requests for information within 15-30 business days. The OGI Regulations stipulate the types of information to be disseminated by government agencies on their own initiative generally and at different levels, as well as various means of disseminating information. For example, they call for publicising information through official websites (of which there are already more than 10 000 throughout the country), government gazettes, news conferences and broadcast

media, community bulletin boards and reading rooms established in archive offices, public libraries, community centres and government agencies.

The OGI Regulations also follow earlier local OGI provisions in stipulating in some detail the categories of information that government agencies at different levels should ordinarily make public on their own initiative. This detailed approach to information dissemination, not frequently encountered in international practice, makes sense in the Chinese context given the lack of a tradition of public records and other forms of government transparency. The Regulations call for disclosure on the government's own initiative of information relating to government structure, functions and procedures as well as information that affects the "vital interests" of the public and matters that society broadly needs to know about or participate in.

Another aspect in which the OGI Regulations appear to depart from prior Chinese as well as OECD practice is the narrowly described scope of information that can be requested from government agencies.[18] Experience under existing freedom of information systems in OECD countries demonstrated the importance of not subjecting information requests for non-published records to any needs test or limitations. Given that one of the goals of the Chinese OGI system is to curb corruption and ensure good governance, it is important that citizens and the media be able to utilise the information request function to understand and better supervise government, as well as to more effectively engage in economic activities.

Central register

China does not yet have a central register of the supervisory regulations; that is being developed. However, it has established a uniform record-filing system for rules and regulations. Local decrees enacted according to legal authority and procedure by the following bodies shall, within 30 days of the date of promulgation, be submitted to the State Council for filing: the People's Congress of a province, autonomous region, municipality under the central government or large city, and the standing committee thereof; Special Administrative Regions (SAR), if the decree is enacted according to legal authority and procedure by the People's Congress of the province or city where the SAR is located, and the standing committee thereof; and the People's Congress of the autonomous prefecture or county.

According to Article 8 of Ordinance on the *Archivist Filing of Regulations and Government Rules*,"the filed and registered regulations and rules shall be promulgated by Legislative Affairs Office of the State Council on monthly basis. Scope of compiling and publishing the collection of regulations and rules shall be based on the promulgated contents of regulations and rules." In addition, the China National People's Congress website (*www.npc.gov.cn/zgrdw/home/index.jsp*) provides a database of regulations and rules.

Quality of legal drafting

Despite marked improvements in the standard of legal drafting in China over the past decade, regulation still tends to be drafted in language that is less than plain. Legal drafting tends to be characterised by broadly worded assertions and general catch-all clauses (Clarke, 2007). Basic law is customarily written ambiguously in the form of principle-like pronouncements, often providing only vague parameters of regulation.[19] There may be a rationale behind this approach. The drafting of law with greater detail and more precisely tailored regulations should promote economic development by increasing certainty and

more clearly defining market rules. However, detailed law limits the flexibility that the Chinese government currently enjoys in its ability to respond to rapid change, which is emphasised as an important virtue by China's political leadership.

The attitude until fairly recently towards lawmaking favoured short-term flexibility and the advantages of ambiguity over long-term considerations. This is still particularly true in the field of administrative regulation, for which adaptability is upheld as a meritorious feature. Consequently, most economic law in China has been meant only to outline basic policy, allowing any problems that arise to be solved on a case-by-case basis. More recently the NPC, in its effort to take control of most lawmaking, emphasises the stability (*wendingxing*) of law as a countervailing force to the principles elucidated above. To the extent that law does not contain a high degree of detail, however, it is still unable to ensure the stability of administrative regulations that are issued in its wake.

Administrative regulations are enacted to implement basic law and to add some detail to many of the matters left outstanding by the higher law. However, they too almost invariably exhibit the features outlined above, especially in controversial areas where a consensus among the drafters or between powerful interest groups has not been forged. Administrative regulations issued by the State Council also tend to exhibit the above features, as do lower-level rules enacted by State Council departments and local governments. Although the style of lawmaking in the economic sphere, particularly related to trade and investment legislation is less ideological and more concrete than are other types of laws, this is only a matter of degree and has by no means precluded foreign economic legislation from exhibiting the features listed.

Administrative and judicial review

The Chinese government has sought to strengthen various mechanisms for limiting administrative power and providing individuals with legal remedies against government agencies that have exceeded or abused their powers. At present, two procedures exist for disputes involving the central or local government: the first is an administrative review called administrative reconsideration, while the second is a judicial review referred to as administrative litigation. While these two procedures offer individuals important rights to seek legal redress, further reforms are needed to fully realise the potential of these mechanisms.

Administrative reconsideration

Administrative reconsideration is a form of alternative dispute resolution established under Administrative Reconsideration Law (ARL), which became effective in 1999. The scope of administrative reconsideration includes most enforcement actions and lower-level normative documents. The criterion of administrative reconsideration review for a specific administrative action is, "the facts are clearly recognised, the evidence for the action is conclusive, the application of grounds is correct, the procedure is legitimate, and the content of the action is proper."[20]

Administrative reconsideration is a common means for reining in administrative discretion and making administrative agencies act in accordance with law. It has several advantages over judicial review. Administrative review bodies may have a better understanding of the issues than courts of general jurisdiction, particularly with regard to highly technical matters. They may also have a better sense of the realities of running the

government and the difficulties of setting policies. Administrative reconsideration is also often faster and less expensive than litigation in court.

Despite the potential value of administrative reconsideration, it has not in fact been a very effective means of reining in administrative discretion. Relative to the total number of specific acts, the number of administrative reconsideration cases is small (Yang, 2004). The effectiveness of administrative reconsideration has been hampered by a number of factors, including the low level of legal awareness on the part of citizens; concerns of retaliation from administrative organisations; the failure of agencies to comply with procedural requirements – including the requirement to inform parties of the right to reconsideration; and the fear of losing face, causing agencies to settle disputes with disgruntled parties. There are, however, obstacles specific to administrative reconsideration, including problems with jurisdiction, scope of review, limits on standing, procedural shortcomings, and exclusion of certain normative documents from review (Yang, 2004).

Like the courts, reconsideration offices are subject to a wide range of external pressures, primarily from local governments. However, they also have the problem of being part of the agency that made the administrative decision under review. Some legal systems in OECD countries attempt to obtain greater independence by staffing the reconsideration offices with personnel who are provided similar tenure to judges, and whose promotion and other personnel matters are handled by a different government agency. They also require that the person who investigated the complaint not be the same person who hears the case, and impose strict limits on *ex parte* communications between the agency personnel and the reconsideration body personnel. At present, China has no such restrictions.

There are also various procedural problems that limit the effectiveness of administrative reconsideration. The deadline for challenging a decision is short – 60 days from the time the affected party becomes aware of the decision, except in unusual circumstances.[21] Moreover, the ARL spells out very few procedural requirements. The decision to hold a hearing is left to the reconsideration office. If a hearing is held, the parties are often passive and unclear as to their rights to participate at the hearing, although they may retain counsel.[22] The ARL provides that applicants may review the evidence supplied by the defendant agency except where state secrets are involved. However, it does not expressly give the applicant a chance to respond to any of the evidence provided by the agency. The review body can carry out investigations or take depositions from interested parties, but whether to do so is up to the review body.

To enhance the functions of the administrative reconsideration system, local governments and relevant administrative departments in various regions have introduced a number of innovations and reforms in recent years, by introducing public trials, hearings, conciliations and expert consulting mechanisms into administrative reconsideration procedures and implementing them in practice.[23]

Administrative litigation

If an individual or enterprise does not wish to pursue administrative reconsideration or, having pursued it, is dissatisfied with the decision, administrative litigation with the appropriate People's Court is an alternative approach. The Administrative Litigation Law (ALL), which came into effect in 1990, governs the administrative procedures for litigation.

The administrative litigation is limited in scope and only covers "concrete administrative acts".[24] It provides two criteria for review: the "legitimacy" review is the principal form and the "rationality" review is used in exceptional circumstances. Legitimacy review mainly determines whether the major evidence is reliable and sufficient; whether the application of law and regulation are correct; whether there is any violation of legal procedures; and whether there is any failure or delay in performing legitimate duties. Rationality review determines whether there is any abuse of power or whether the administrative penalty is obviously unfair.

In terms of application of law, the courts review the administrative actions in accordance with laws, administrative regulations, local regulations, autonomous regulations and separate regulations. When making reference to rules and regulations, the courts are required to judge whether the provisions therein are legitimate and effective. The specific application explanations and other normative documents formulated by administrative agencies do not have the binding effect of laws and regulations on the courts.

The overall effectiveness of administrative litigation has been limited, judging by the relatively small number of suits relative to the extremely large number of administrative acts and decisions that could be challenged.[25] To some extent, the limited effectiveness of administrative litigation is due to underlying shortcomings of the Administrative Litigation Law. For instance, standing requirements limit the effectiveness of judicial review in China. The ALL allows parties to bring suit when their "legitimate rights and interests" are infringed upon by a specific administrative act of an administrative organ or its personnel.[26] The requirement that one's legitimate rights and interests be infringed upon appears to have been construed narrowly to prevent those with only indirect or tangential interests in an act from bringing suit.

A difficult issue faced by all judicial systems is how deferential judges should be to administrative agencies. In China, courts do not have the power to review abstract acts (generally applicable administrative rules). They may only review specific acts, and then only for their legality rather than for their appropriateness.[27]

The courts in China have not been proactive in using their powers to review agency acts. The ALL authorises the court to annul or remand for reconsideration administrative decisions if the agency makes its decision without sufficient essential evidence, incorrectly applies laws or regulations, violates legal procedures, exceeds its authority or abuses its authority.[28] Similarly, "exceeding authority" and "abuse of authority" permit a wide range of interpretation, and have been interpreted in other countries to include principles of proper purpose, relevance, reasonableness, consistency with fundamental rights and proportionality.

Regulatory impact analysis

Regulatory impact analysis (RIA) is a core tool for regulatory quality. Its definition nonetheless varies greatly. The OECD defines RIA as "a systematic policy tool used to examine and measure the likely benefits, costs and effects of new or existing regulation" (OECD, 2008, p. 14). There is a tendency to view RIA simply as the final document that accompanies a regulatory policy proposal, or as an analytical method often associated with cost-benefit analysis. While RIA takes the tangible form of an analytical report that supports decision makers, the notion of RIA should be understood more widely as an

integral part of the regulatory reform programme, embracing an institutional, organisational and procedural dimension. RIA is a *process* of evidence-based decision making. Its use should assist governments in making their policies more efficient, legitimate and predictable.

Use of regulatory impact analysis has remained limited in China, which does not yet have institutions established to implement RIA programmes. However, the nationwide review accompanying the implementation of the *Administrative Permission Law*[29] indicates that the thinking of China's regulatory authorities is evolving along conceptual lines leading in the direction of RIAs.

RIA is a process that assists policy makers; it does not substitute for their decisions. The OECD formulated ten fundamental questions that comprise the 1995 *OECD Checklist for RIA* (Box 2.1). The Checklist should help the Chinese authorities develop regulations that are systematically assessed to ensure that they meet their intended objectives efficiently and effectively in a changing and complex world.

Box 2.1. **The OECD Reference Checklist for Regulatory Decision Making**

1. **Is the problem correctly defined?** The problem to be solved should be precisely stated. Evidence of its nature and magnitude should be provided, along with the reasons it has arisen (identifying the incentives of affected entities).
2. **Is government action justified?** Government intervention should be based on explicit evidence that government action is justified, given the nature of the problem, the likely benefits and costs of action (based on a realistic assessment of government effectiveness), and alternative mechanisms for addressing the problem.
3. **Is regulation the best form of government action?** Regulators should carry out, early in the regulatory process, an informed comparison of a variety of regulatory and non-regulatory policy instruments, considering relevant issues such as costs, benefits, distributional effects and administrative requirements.
4. **Is there a legal basis for regulation?** Regulatory processes should be structured so that all regulatory decisions rigorously respect the "rule of law"; that is, responsibility should be explicit for ensuring that all regulations are authorised by existing higher-level regulations, are consistent with treaty obligations, and comply with relevant legal principles such as certainty, proportionality and applicable procedural requirements.
5. **What is the appropriate level (or levels) of government for this action?** Regulators should choose the most appropriate level of government to take action – or, if multiple levels are involved, should design effective systems of co-ordination between levels of government.
6. **Do the benefits of regulation justify the costs?** Regulators should estimate the total expected costs and benefits of each regulatory proposal and of feasible alternatives, and should make the estimates available in accessible format to decision-makers. The costs of government action should be justified by its benefits before action is taken.
7. **Is the distribution of effects across society transparent?** To the extent that distributive and equity values are affected by government intervention, regulators should make transparent the distribution of regulatory costs and benefits across social groups.
8. **Is the regulation clear, consistent, comprehensible and accessible to users?** Regulators should assess whether rules will be understood by likely users, and to that end should take steps to ensure that the text and structure of rules are as clear as possible.

Box 2.1. **The OECD Reference Checklist for Regulatory Decision Making** *(cont.)*

9. **Have all interested parties had the opportunity to present their views?** Regulations should be developed in an open and transparent fashion, with appropriate procedures for effective and timely input from interested parties such as affected businesses and trade unions, other interest groups, and other levels of government.
10. **How will compliance be achieved?** Regulators should assess the incentives and institutions through which the regulation will take effect, and should design responsive implementation strategies that make the best use of them.

Source: OECD (1995).

Keeping regulation up to date and improving the business environment

Efforts to simplify administration

While all governments impose certain regulatory requirements on business and citizens, Chinese government agencies inherited from the era of central planning an elaborate system of licensing and approval requirements. The introduction of market reforms provided an important opportunity to reduce the scope and impact of many regulatory requirements that were once widely used in central planning. Yet China has continued to have one of the most elaborate administrative approval systems in the world,[30] one which empowers government agencies to make decisions that are often best left to the market. Such a system, moreover, generates numerous rent-seeking opportunities for bureaucrats and serves as a powerful incentive for them to block regulatory reforms.

Along with the downsizing and streamline of the administration, the Chinese leadership has also recognised that the power of the administration must also be limited. Central to these efforts was an administrative simplification drive to reduce the number of government approvals and licences. These reforms have most commonly been described in China as "administration in accordance with law" (*yifa xingzheng*); they include efforts to limit bureaucratic discretion, to improve administrative transparency and to recast the administration as a public service. This initiative appears to have been motivated by a number of factors, including the priorities of improving bureaucratic efficiency, curbing corruption within the Chinese administration and complying with the terms of WTO membership.

Even though reform of the administrative approval system was part of the overall government reforms beginning in 1998, there were few tangible results early in the process. In 2001 however, the central leadership, having completed the central government downsizing and reorganisation, took up the cause of reforming administrative approvals and licensing with renewed effort. In August 2002, the State Council announced that its departments had made an inventory of 4 159 administrative approvals and licensing requirements.[31] The State Council departments recommended retaining 3 297 items and scrapping the rest. After vetting these recommendations, the State Council announced the cancellation of 789 approval items from 56 governmental departments on 1 November 2002. In line with the drive to improve economic performance, 560 of the administrative approvals and licensing requirements that were scrapped were economic in nature. A few months later, the State Council announced the abolition of a second batch of 406 items.

Following the State Council announcement, individual government departments followed with details of respective reforms under their authority.[32] As most central government requirements have local equivalents, the State Council's announcement also gave new impetus to provincial and municipal efforts to rationalise administrative approval and licensing regimes at the sub-national level.

To sustain and consolidate these reforms, the State Council Office of Legal Affairs prepared the Administrative Licensing Law (ALL), which took effect on 1 July 2004. The ALL represents a systematic effort to delimit the scope of administrative licensing and specify the standards and norms for the establishment of administrative requirements. It stipulates that only the National People's Congress and provincial-level People's Congress (under certain circumstances) have the authority to establish administrative licensing requirements. While the State Council can impose interim administrative approval requirements, it needs to seek formal legislative enactment through either the NPC or its standing committee in a timely manner. More stringently, provincial-level governments cannot implement interim requirements for more than a year without securing formal legislative enactment through the corresponding legislatures, and even then only within certain limits. In a major departure from past practice, agencies within the State Council or local governments can no longer impose administrative licensing requirements on their own.[33]

The ALL also sets forth a set of principles for the establishment of administrative approval and licensing requirements. In general, the ALL confines licensing requirements to areas concerning national security, public safety, macroeconomic control, ecological and environmental protection, and personal health and safety. While the ALL allows for exceptions, the regulation of professions, industries and legal persons as well as equipment, products and commodities must be justified on the basis of public interest. Under this principle, a rule of minimalism applies: no administrative approval requirement should be established where citizens, legal persons, and organisations can decide for themselves where the market is sufficient, where the industrial association or intermediaries can self-regulate, or where the administrative agency can supervise after the event. Against the background of excessive government interference in business and personal life, the balance of the ALL is tilted toward the protection of the rights and interests of businesses and citizens. Many articles in the ALL are designed to promote transparency, fairness, and good service.

The growth of e-government

In China, the state of e-government reflects the transitional nature of contemporary Chinese society toward a "socialist market economy". The country's information society, which is just beginning to develop, has persisting digital divides, *i.e.* diffusion and access to information and communication technologies (ICT) are uneven. Although Internet penetration has grown rapidly in wealthy urban areas, it remains fairly low in per capita terms. Despite these drawbacks, China's leadership has set out to promote e-government with an eye on its relationship with broader reforms in law, administrative institutions and macroeconomic management.

Achieving China's ambitious e-government programme will first entail meeting a number of implementation challenges, many of which are more general challenges for the Chinese administration such as the legal and budgetary framework and inter-agency collaboration. The OECD generally advocates that the current commitment to reform

through e-government should be used to bring pressure to bear on addressing a number of priority areas.

A key goal for the Chinese authorities is to make greater use of one-stop shops. Making one-stop service a reality requires more than electronic service portals. The Chinese government will need to look at how it can streamline and improve the horizontal and vertical relationships within government in order to increase co-ordination and collaboration for seamless service delivery. Deeper back-office reform is needed in order to improve customer focus and data sharing among bodies and to eliminate institutional barriers that lead to redundant systems and inconsistent programme rules. In addition to its guiding principles, China needs more detailed implementation plans that specify priority orders, procedures and ways of adjusting to a changing environment.

Conclusion

The aim of this chapter is to promote discussion on the development of regulatory governance in China and the relevance of regulatory approaches adopted by OECD countries. A wide range of issues deserve further thought in determining regulatory options for China.

The understanding of the "regulatory state" notion itself is currently modest for even OECD countries, and greater consideration is presently needed to improve the knowledge of components such as "regulation inside government". The regulatory state model may even have limited direct relevance and utility for states such as China. Likewise, the difficulties of achieving independence outside the political-bureaucratic elite compromise the possibility of independent regulatory judgement and action. Moreover, the notion of regulatory agencies outside the influence of politics seems remote, given the deeply political nature of regulatory policy making and the broader domination of politics in regulatory governance. Traditional analyses of the performance of regulatory state components are also often not as strong as would be ideal. And as well as the professionalism required from the new regulators, the biggest challenge of all may be the underlying sense of trust required from both citizens and institutions as to the legitimacy of the new rules of the game.

Greater experimentation with aspects of regulatory systems may thus be required of China in its path forward, along with an improved knowledge base of both Chinese regulatory systems and what works in reality. Suggestions for relevant regulatory reforms in China will therefore need to ensure that there is a greater likelihood of the public interest being met in practice than private interests. Reforms may also usefully focus on improving regulatory relationships and efficiency inside government, as well as looking carefully at the cultural, historical and political parameters built within traditional Chinese regulatory and governance systems. Better regulation through indirect means may also be possible. Increasing the transparency of public sector institutions and government decision-making and activities will no doubt provide progressive incentives for changed behaviour. Similarly, improvements in real transparency and strengthened accountability to citizens may provide as much regulatory leverage as institutional reforms in the future.

A major intellectual challenge is to better understand how countries review, learn, revise and improve their regulatory systems as experience is gained. Part of this learning will involve assessing the degree to which China might take on ideas from other countries by way of copying, emulating, harmonising or adapting, as distinct from "home-growing"

regulatory solutions. And where ideas are gleaned from international experience, should reformers rely on the most common (and probably reliable) practices of governments, or those outliers most visible on a "best-practice frontier" and popular among the international community selling and advocating regulatory ideas? In translating regulatory models, crucial assumptions such as the power and legitimacy of a democratic polity are often taken for granted. These include a rule of law underpinning commercial contracts; an independent judiciary upholding regulatory decisions; consumer voices giving feedback on essential services; and a wide range of transparency and accountability mechanisms. The extreme position of transferring the regulatory state model from OECD countries into China may even be a "fatal remedy". Such a transplant risks the criticism of naivety in the attempt to remove politics from the institutions of regulation, and an overly anxious preoccupation with the notion of independence.

Caution and learning are thus needed in articulating regulatory reform options rather than haste towards simple reform models. The extent to which regulatory regimes from other jurisdictions can be usefully adapted to existing governance systems in countries such as China – as well as whether existing regulatory schemes can successfully be improved through "home-grown" solutions – remain open questions.

Policy options for consideration

1. Create an institution responsible for the overall quality of regulations.

The review of other OECD countries shows that having a specific institution responsible for the overall quality of regulation located as close as possible to the centre of government can be a valuable asset for regulatory governance. This institution should be responsible for taking decisions and making the final trade-offs on policies and their legal implementation. China currently lacks such an institution, despite the many players involved in the preparation of laws and regulations and especially in vetting their legal quality. The Legislative Affairs Office of the State Council (LAO) currently assumes some responsibility for regulatory quality though it has a number of other duties as well. The State Council could consider strengthening the LAO, or creating a separate institution that would in time have the mandate to promote the quality of new regulations by taking into account their costs and the induced effects on society. They would also have the task of regularly assessing the cost of existing regulations, and making recommendations to the State Council to reduce that cost. This institution could render an advance opinion on regulatory quality at the time regulatory and legislative bills are sent to the State Council. To prevent it from being overwhelmed by a flood of new regulations, this institution could be selective in scrutinising initiatives, depending on their economic impact. Finally, it could encourage public debate over regulatory quality issues and in this way play an educational role, particularly *vis-à-vis* the National People's Congress.

2. Institute an effective practice of regulatory impact analysis as a strategic tool to support regulatory policy.

In many OECD countries, the effective and systematic use of regulatory impact analysis (RIA) is a key component in ensuring regulatory quality. While China conducts some *ex ante* assessments, these are not co-ordinated and do not systematically take into account the overall costs and benefits of regulations from a social and economic perspective. This situation could be improved by using the RIA process as a systematic framework to rationalise existing practice and to ensure a relevant and consistent *ex ante*

evaluation. This improvement would also allow for a sounder *ex ante* decision-making process, in terms of an evidence-based economic approach. In time, RIA would need to be made a part of the legal framework governing the preparation of regulations, in order to ensure that a real impact analysis is conducted. To confine the RIA to significant proposals (perhaps a hundred a year), the quality institution described above could define precise criteria for identifying regulations subject to the assessment requirement, and it could have the power to demand a RIA in certain cases. A methodological guide and training materials should be prepared for this purpose, for example by the institution responsible for the quality of regulation.

3. *Improve the efficiency of the consultation process, making consultation of third parties systematic to improve transparency.*

Many OECD countries have a transparent and systematic process of public consultation to enhance the quality of the regulatory process by guaranteeing that the impact on citizens and businesses is taken into account. China has made enormous progress in developing its public consultation procedures, especially since its membership into the WTO. At the same time, the efficiency of the consultation process in China could be improved through more transparent and systematic processes. In particular, consideration might be given to requirements for government agencies to identify explicitly the range of "stakeholders" with whom they should interact on a frequent basis in the development of new regulations. Likewise, the regulatory quality institution mentioned above, could systematically audit these interactions in order to ensure a sufficient and appropriate consultation. Such an active approach is likely to yield important benefits in the context of a fundamental shift in cultural attitudes which existing government policies on regulatory management and reform lack. This could constitute an important part of the process of developing a broad constituency in favour of reform.

4. *Pursue and extend the move towards simplification by introducing sunset clauses and introducing instruments to measure and monitor the simplification process.*

China has recently expanded its efforts at administrative simplification. The experience of many OECD countries shows that administrative simplification is key to minimising the cost of regulation. The Chinese approach needs to consider the entire stock of existing regulations in order to reduce the cost overhang. Automatic sunset clauses are an important tool that could be introduced in Chinese regulation. This would reverse the burden of proof and force the administration into a systematic review of regulations, under threat of their expiry at a certain date. While such an approach may well be foreign to the Chinese tradition, an educational effort focusing on its expected benefits could help move things forward. In addition, a statistical effort to measure the economic burden of regulations – whether an individual measure or a whole complex set of regulations – could help steer the current simplification efforts towards maximising their economic benefits and fixing clear objectives for the future.

5. *Improve legal certainty by enhancing the transparency of procedures to implement the law.*

Legal certainty and transparency are key elements for the quality of regulation. Yet while the Chinese regulatory system is consistent from a legal perspective, elements of weakness are apparent, particularly regarding the enforcement of laws and regulations. Judicial interpretation will be a key element at clarifying laws and regulations. In addition, it is likely to

involve far more proceedings in which government agencies are parties, than in the past. Efforts now underway to improve the qualification and training of judges and other officials in the judiciary will help improve enforcement. However, further efforts may be needed to better insulate the judiciary from undue influence, including from government and political officials.

6. Clarify and rationalise the distribution of powers across levels of government.

In a number of OECD countries, decentralisation has been a means of bringing rule setting closer to users and setting the regulatory process at the most appropriate level. China has been engaged in a significant decentralisation effort over the past 20 years, during which considerable powers have been transferred to local authorities. In many ways this has been a positive move. However, the inextricable overlap of powers among the levels of government is detrimental to an efficient regulatory process. A more rational distribution of regulatory powers among the various levels of sub-national authorities would help to clarify the situation. In addition, greater awareness of regulatory quality among local authorities will be essential in light of their growing responsibilities. The process of decentralising responsibilities must be accompanied by clear and effective accountability requirements at all local levels, administrative as well as judicial.

7. Rationalise the framework of independent regulators.

The administrative status of Chinese regulators is highly heterogeneous. Several regulatory agencies were consolidated into a number of the "super" ministries (*e.g.* industry, energy, transportation, food and drug, and environmental protections). At the same time, China's financial service regulators were not consolidated in a single ministry. Procedures for consultation between regulators and the competition authority (which is also spread across three agencies) are neither systematic nor mandatory for all existing regulators with an economic role. Perhaps an independent experts' group could review the institutional architecture for market-oriented regulation and determine if a new harmonised framework would improve efficiency and competition in regulated areas of the economy.

Notes

1. Aberbach and Christensen (2003); Hasnie (2002); and Kamarck (2002) observe that the Chinese government has become aware of the institutional framework of independent regulators in large part through its contacts with international organisations. Moreover, in China's World Trade Organisation agreement on services, the country made commitments with regard to the impartiality of its regulators. It determined "that for the services included in China's Schedule of Specific Commitments [including financial and telecommunications services], relevant regulatory authorities would be separate from, and not accountable to, any service suppliers they regulated, except for courier and railway transportation services" (*WTO, 2001*).
2. There is a rich body of theoretical and empirical research covering independent regulators in network industries. For reviews see Laffont and Tirole (1993, 2000); Levy and Spiller (1994); and Newbery (1999).
3. Taking what *The New York Times* (29 July 2007) called "extraordinary steps", Premier Wen Jiabao spoke at the meeting and responded directly to the international media coverage.
4. Reported in the *International Herald Tribune*, 18 November 2008.
5. The NDRC is informally referred to as the "little State Council".
6. DeWoskin (2001) explains that in telecommunications regulation, the formal regulator – the Ministry of Information Industry (MII) – must routinely negotiate with the People's Liberation Army, which is responsible for information security concerns; the Ministry of Finance, which oversees accounting; and, on the regulation of Internet access, the State Administration of Radio,

Film, and TV, the State Secrets Bureau, the Ministry of Public Security, the Ministry of Commerce, and the State Administration for Industry and Commerce. The need to deal with all these actors is in addition to the leading small group in telecommunications; the NDRC; the SASAC; and the CPC.

7. Lam and Perry (2001) explains that the *shiye danwei* are subordinate in the State Council hierarchy to traditional "administrative agencies" (*xingzheng jiguan*), such as ministries, and "governmental organisations" (*jigou*).

8. Walter and Howie (2003) report that the status of the securities regulator, the CSRC, has been clearly marked out but only after protracted struggles.

9. Chen (2004) goes on to note that while the NPC Standing Committee has the constitutional right to review and invalidate regulation passed by lower-level bodies, it has been reluctant to exercise this right and very few administrative or local regulations have been overturned.

10. For a description and analysis of the *tiao/ kuai* regime, see Lieberthal (2004).

11. Lieberthal (2004) notes that the Chinese call this "making *tiao* serve *kuai*".

12. There has been some debate over the extent of local protectionism and its effects on the national economy. Naughton (2003) finds that local protectionism has little, if any, effect on cross-border trade when aggregated to the provincial level. Nevertheless, Mertha (2005) points out that local protectionism is widely *perceived* as a genuine problem by the authorities in Beijing, which does make it an important policy concern.

13. Paler (2005) develops the idea of a "uniform legal hierarchy", which refers to the ordering of the effect of laws and regulations in China's unitary system. This hierarchy begins with the Constitution, and moves down to national laws (promulgated by the NPC and the NPCSC); administrative regulations (promulgated by the State Council); and finally local regulations (issued by provincial people's congresses and local government agencies).

14. The Legislation Law (*lifa fa*) was passed by the NPC on 15 March 2000 and came into effect on 1 July 2000.

15. There is an extensive body of literature the development of rule of law in China; Paler (2005) on the Legislation Law itself, Yang (2004) on various intuitional and anti-corruption aspects, and Peerenboom (2002) for an overall assessment.

16. These regulatory procedures include the Provisions of China Banking Regulatory Commission on Legal Work by the China Banking Regulatory Commission, Measures for the Procedure for Formulating Regulations on Environmental Protection by the State Environmental Protection Administration, Regulation of the Ministry of Information Industry on the Procedures for the Formulation of Rules by the Ministry of Information Industry, Provisions of Ministry of Land and Resources on the Procedures for the Formulation of Rules by the Ministry of Land and Resources, Regulation of Procedure for Making Traffic Law by the Ministry of Communications, Provisions of China Insurance Regulatory Commission on the Procedures for the Formulation of Rules by the China Insurance Regulatory Commission, etc.

17. The OGI Regulations were promulgated by the State Council 24 April 2007 and came into effect on 1 May 2008.

18. Article 13 provides that citizens, legal persons and other organisations may request government information that has not already been disclosed on the government's own initiative "in accordance with the special requirements of their own production, livelihood, scientific research, etc."

19. Keller (1994) notes that China has adopted a rationale that lends itself to the creation of laws that may be adjusted according to human behaviour. Such laws are customarily expressed as general principles (*you yuanze xing*) which are inherently flexible (*you linghuo xing*) in application.

20. See ARL, Article 28. An English version of the Law can be found at *www.lehmanlaw.com/resource-centre/laws-and-regulations/administration/administrative-reconsideration-law-of-the-peoples-republic-of-china-1999.html*.

21. ARL, Article 9. The ARR only provided for 15 days.

22. ARL, Article 10. The ARL reflects the belief that administrative reconsideration should differ from judicial review and that reconsideration procedures should be simpler.

23. For instance, in Heilongjiang province, the "Three-Trial Decision Making System" is implemented during the decision-making process for administrative reconsideration to ensure the objectivity and fair handling of administrative reconsideration cases by means of collective case handling. A number of other regional innovations to administrative reconsideration are reported in Zhou, 2005.

24. The reviewable administrative acts are enumerated in ALL, Article 11, Section 1. They include actions infringing on the rights of a person and property rights – such as administrative penalty, administrative compulsory measures, administrative licence and administrative omission.

25. Statistics show that the people's courts at various levels in China have accepted administrative cases totalling 639 736 between 2000 and 2006. In addition, the courts have accepted over 2 million non-litigation administrative cases in the same period. See *www.lawyee.net/News/Legal_Hot_Display.asp?RID=724*.

26. See ALL, Article 2. An English version of the ALL can be found at *www.cecc.gov/pages/newLaws/adminLitigationENG.php*.

27. See ALL, Article 5.

28. See ALL, Article 54.

29. The National People's Congress adopted the Law on Administrative Permission, which took effect on 1 July 2004. Implementation of the Administrative Permission Law aimed to further improve China's investment environment and protect foreign investors from losses resulting from policy changes, political corruption and abuse of power by local officials.

30. The World Bank *Doing Business 2009* (*www.doingbusiness.org/Documents/CountryProfiles/CHN.pdf*) notes that starting a business in China requires 14 procedures, takes 40 days, which ranks China 151 out of 181 countries surveyed. In terms of requirements for construction permits, it requires 37 procedures and takes 336 days to build a warehouse in China, which ranks the country 176 (out of 181).

31. Yang (2004) notes that of these regulations, 1 657 were established on the basis of laws and administrative regulation, 733 were established on the authority of the Party Central Commission and State Council directives, and the rest were based on departmental regulation and directives.

32. For example, according to a list of 32 approval requirements scrapped by the China Securities Regulatory Commission, foreign securities firms would no longer need to get "primary" approval to set up representative offices or to appoint chief representatives; law firms would no longer need approval to do securities law business; and securities firms would not need regulatory permission to underwrite corporate bonds or to establish investment consulting units.

33. This means that about half of the existing administrative requirements will need to be either reauthorised by the legislatures or modified/abolished.

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Chapter 3

The Challenges of Transition for Competition Law and Policy

Conditions supporting vigorous market competition in the People's Republic of China were revived after the interruption of a generation-long experiment in central planning. Transition reforms began in the 1970s by acknowledging and encouraging initiative in local markets, which led to vigorous competition among township and village enterprises and regions. Opening to outside markets destabilised monopolies. As competition became established by the 1990s, the focus of reform turned to create the laws and institutions needed to support enterprise markets on a national scale. China adopted a general competition law in August 2007 that became effective a year later. China's Antimonopoly Law follows familiar international practices about horizontal and vertical restrictive agreements, abuse of dominance and mergers. Like competition laws in many jurisdictions, the Antimonopoly Law pursues several policy goals. Many details, such as merger notification thresholds, remain to be determined by regulations and guidelines and by experience in applying it. China is now completing the restructuring of the heavy-industry heritage of its once-planned economy. The challenges of transition to a market economy are being succeeded by challenges of development, along with the familiar problems of regulatory reform, of providing infrastructure and public services in a market setting. Curbing government intrusion that tries to protect special interests by dampening competition and favouring particular competitors is complicated by the complexity of the relationships between national and local levels of government authority.

Introduction

Conditions to support robust market competition in the People's Republic of China were revived after the interruption of a generation-long experiment in central planning. Transition reforms began in the 1970s by acknowledging and encouraging initiative in local markets, which led to vigorous competition among township and village enterprises and regions. Opening to outside markets destabilised monopolies. As competition became established by the 1990s, reform attention turned to creating the laws and institutions needed to support enterprise markets on a national scale. These included laws on unfair competition, abusive pricing (including price fixing, predatory pricing and discrimination) and bid rigging. These laws and regulations about mergers involving foreign investors have been applied by three institutions that represent three elements of competition policy: correction of abuses and unfair practices; control of monopoly pricing; and review of corporate combinations.

China adopted a general competition law in August 2007, after more than a decade of debate, extensive consultations and exchanges of views with experts from around the world. The later Anti-Monopoly Law follows familiar international practices about horizontal and vertical restrictive agreements, abuse of dominance, and mergers. A separate chapter addresses the important problem of administrative monopoly. Like competition laws in many jurisdictions, the Anti-Monopoly Law pursues several policy goals. Many details, such as merger notification thresholds, remain to be determined by regulations and guidelines and by experience in applying it. The law became effective in August 2008.

China is now completing the restructuring of the heavy-industry heritage of its once-planned economy. The challenges of transition to a market economy are being succeeded by challenges of development, along with the familiar problems of regulatory reform, of providing infrastructure and public services in a market setting. Curbing intrusive government attempts to protect special interests by dampening competition and favouring particular competitors is complicated by the complex relationships between national and local levels of government authority.

Competition policy foundations

Competition and market exchange are now well-established features of China's economy. Institutional structures for mediating marketplace disputes while protecting public interests have evolved as China has re-established an enterprise economy over the past 30 years. China's new competition policy system adopts many familiar elements of modern competition laws and institutions. On the other hand the generality of the norms in the basic legislation and the system of institutions for applying them are characteristic features of China's governing traditions.

Context and history

Long experience with market institutions underpins China's current growth record. The country's traditionally agricultural economy supported a thick network of markets. Sophisticated institutions within this traditional economy included formal commercial procedures and contracts, large organisations and associations, banks that transferred funds nationwide and legal and customary-law processes for resolving commercial disputes. There were competitive markets for land and labour, as well as for most products. Traditional production was fragmented, though, and capital accumulation was inefficient. The government sometimes intervened in markets to prevent monopoly exploitation, but it also funded its own operations with revenues from monopolies. Modern industrial development began in the generation after the collapse of the Qing dynasty in 1911, much of it in the northeast and in the treaty port areas where foreign trade had been concentrated. Despite the slowdown during the turmoil of the 1930s and 1940s, the economy grew over the first half of the 20th century, building on the foundation of traditional commercial and entrepreneurial networks and behaviours.

Equally long-standing traditions about the nature and role of government help explain the shape of China's reforms since the 1990s. The model of government in China for over 2000 years has been supervision of policy by experts operating from the centre of a unified state, motivated by a social theory emphasising harmony, with implementation delegated to local-level officials. In this model of government and society, control has been founded on respect and reciprocity, as much as on authority and sanction. Negotiation and relationship are more important than assignments and separations of powers. Case-by-case arrangements tend to be preferred over formal uniformity. *Ad hoc* adjustment also characterises the evolving relationships between central authorities and regional leaders and governments. Precise definition of legal categories and jurisdictional boundaries appear to be less important than indication of general policy direction, and flexibility in applying it to particular circumstances.

Before the era of central planning that began in the 1950s, China was developing a substantial modern market economy – but there was also substantial government direction of that economy. Government intervention increased during the civil war, so that the government already controlled 90% of iron and steel output and most of the banking, transport and power systems when the Communist party took over in 1949. Much of the staff from the previous planning agencies stayed on to work on the Communists' central plan.

Central planning controlled the economy for 22 years. Phasing the command-economy system into full operation took seven years, beginning in 1949 and culminating in 1956 when shops became co-operatives and remaining private ownership nearly disappeared. In the planning era, services such as retail trade dropped, since production of consumer goods was discouraged. The legacy of planning was shortage, because the agricultural sector could not, or would not, produce enough. Needs were going unmet because of underdevelopment and diversion of resources to promoting industry. The seed of change was planted in the agricultural sector, in a pilot project for contracting out production to individuals that began in Anhui province in the early 1960s. By 1973 more steps had been taken to return to a market system. In 1978, the Central Committee decided to shift in earnest back to a market economy. Nearly all of the institutional vestiges of the command economy – of dictated artificial prices, mandatory allocations of inputs and

products, and funding of the government from the revenues of state industries – have been dismantled since 1979.

Reform began in the rural, agricultural economy, with a return to the traditional market-based organisation of small-scale household and township businesses. These reforms aimed to create markets, diversify ownership and stimulate competition. Individuals were given more room for economic opportunity and entrepreneurial activity. Contract arrangements for farm production had become nearly universal by 1983. Individual operations proved to be highly productive, ending food shortages yet requiring less labour input than collective farming had. These first reforms did not eliminate state entities or market distortions, but loosening controls permitted resources to shift to respond to new opportunities.

Rural industrialisation catalysed the creation of a market economy. Entry of collectively owned township and village enterprises (TVEs) provided the competition and the market context that forced state-run enterprises to learn how to improve their efficiency. The TVEs, although collectively owned, began outside the plan, where they faced factor prices that better reflected China's true, non-subsidised endowments of labour and capital. Yet they could share in monopoly rents under the state-industry umbrella of inefficiency and protection, as well as move into promising empty niches, principally for consumer products. Local government institutions promoted these local firms with low taxes and financial guarantees and credits. Organisational forms – such as the extent of private ownership – varied across regions, so experimentation in that dimension accommodated growth and provided some demonstration effects for others. Regions and their enterprises were in competition and faced with hard budget constraints; they therefore had to become efficient. Ownership patterns shifted as the TVEs became private enterprises after the mid-1990s, when credit got tighter and competition intensified. Firms in this smaller-scale industrial sector have often linked together to become industrial clusters, in market structures similar to those that have longed characterised Chinese industry.

In the first phase of reform, from 1978 through 1996, the plan and the market coexisted as mechanisms for co-ordination. There was no single "big bang", but a process of institutional evolution. Freezing the extent of the plan enabled the market economy to grow out of it. To encourage enterprise initiative, the commands of the plan were changed into performance contracts. To encourage competition, the entry of new collectively owned firms or by other state firms was permitted. Flexible, market-driven prices were introduced at the industry level, while most consumer prices were gradually decontrolled. Profitability was promoted by reforming management, more than by privatisation as such. Changes were focused at first on activities outside the core of the plan, such as export trade. Macroeconomic stability was preserved by application of the remaining planning tools, rather than by market-based monetary and fiscal instruments, while private saving was encouraged to support investment. Reducing the scope of state monopoly encouraged new entry; new entry and market pricing increased competitive pressure; and competitive pressure eroded high profit margins and forced state-sector managers to respond to the marketplace.

With the planning structure largely dissolved, attention shifted in the mid-1990s to improving the rules and institutions supporting the market economy, concerning banking, taxation, corporate governance and international trade. In the first phase of reform,

decentralisation had permitted market-building experimentation, but in the second phase stronger central authority was needed to impose non-discriminatory regulation to support a larger, freer market, as well as to collect the taxes that replaced state enterprise receipts. To help ensure accountability in the administration of government, an Administrative Litigation Law was adopted in 1990. A Company Law was adopted in 1993, and a securities regulator was set up in 1999. Foreign trade reforms culminated in WTO membership in 2001. The extent of state ownership declined, as did the profits of state-owned enterprises; thus the rescue and reorganisation of state-owned enterprises occupied government attention.

Institutions evolved with the shift from the plan to the market. In the first five-year period, from 1993-98, the State Planning Commission (SPC) continued to apply the dual pricing system, while the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) and State Economic and Trade Commission (SETC) were established to promote international commerce and develop the institutional foundation for domestic markets, and the Bureau of Industrial and Commercial Administration was established to oversee the conduct of enterprises. Ministry-level industry organisations began to be transformed into industrial associations. In the next five-year period, from 1998-2003, the SPC became the State Development and Planning Commission (SDPC), concerned more with macroeconomic policy making and long-term development than with oversight of markets and investment. The SETC was expanded and charged with industrial and short-term development policies. The Office of Rectification and Standardisation of Market Economic Order was responsible for constructing a credit system, supervision of food and pharmaceutical industries, protection of intellectual property, regulation of commercial fraud and breaking regional blockages of domestic trade. In the latest five-year period, from 2003 to 2007, SETC has been dissolved and its responsibilities assigned to other bodies, including the Ministry of Commerce (MOFCOM), which has succeeded MOFTEC. SDPC has become the National Development and Reform Commission (NDRC), which is now the main economic and social development policy maker.

The State Asset Supervision and Administration Commission (SASAC) was created in 2003 to hold and manage the shares of enterprises in which the national government retains ownership stakes. Many state-owned enterprises are linked to local governments, and some have set up local versions of SASAC. SASAC holds few firms, but they include large and important ones in petroleum, metallurgy, electric power, military production and telecoms.

A functioning market economy had replaced the command economy by the mid-1990s, if not before. In the 1990s, hundreds of thousands of enterprises reorganised under the new Company Law, into limited liability companies or companies limited by shares. China opened to foreign capital in the early 1990s, recognising it as a source of technology (and inviting competing technologies, rather than granting monopolies). By 2000 there were over 350 000 enterprises with foreign investment, representing over USD 350 billion in FDI. The flood of investment by multinational firms in medium- and high-technology sectors has contributed to knitting China tightly into global production networks of high-tech products. WTO access sealed and codified promises of protecting property rights underlying these technology transfers. Price control was lifted in stages, beginning with processed goods and agriculture products and production outside the plan. By 2002, over 90% of consumer retail transactions were at market-determined prices, and markets

determined prices for over 90% of purchases of agricultural products and nearly 90% of capital equipment.

The extent of competition in China's domestic economy is mixed. Rivalry in many sectors appears vigorous, and by some standard indicators China's product markets appear to be reasonably competitive. Industry concentration at the national level is relatively low, and there has been substantial entry of new firms. National-level concentration measures may be deceptive, though. Limited transport infrastructure, local protection and other barriers to geographic integration create openings for market power that would not be apparent in national concentration data.

Government policies on competition have also been mixed. Some regional governments have protected local business interests, while some ministries have promoted national champions. Anti-competitive measures taken by sub-national governments and enterprises connected with them, to prevent competition from other parts of the country and to favour providers with connections to local government interests, have presented problems since the early stages of the transition. The complexity of local government structures magnifies the problem and makes it harder to address. Below the level of the national government are 23 provinces, five autonomous regions and four municipalities that are directly under the central government, plus the two special administrative regions of Hong Kong and Macau. These units further subdivide into three more levels of authority. Some local governments have conferred competitive advantages on enterprises affiliated with local bureaus or ministries, or set up entities that combine administrative functions with market operation. They have tried to prevent competition by banning or discouraging foreign products – that is, products from other parts of China – from entering the local market, or by preventing local products from being shipped elsewhere. Measures have ranged from imposing discriminatory fees to fining offending sellers or refusing them licences, in some cases even setting up checkpoints to enforce compliance and to intercept and confiscate offending shipments. Local governments have tried to protect local businesses by devices such as mandatory contributions to a "beer adjustment fund" or rules requiring use only of locally produced inputs such as fertiliser.

Ministries have ordered or encouraged combinations, to bring small, local firms together into national-scale entities. The motivation for encouraging consolidation is typically to improve efficiency and international competitiveness. The government's work plan for 2006 called for encouraging combinations and rationalisations in sectors with surplus capacity. Sectors considered particularly in need of rationalisation – because of inferior technology, surplus capacity or out-of-date management – include steel, cement, chemicals, coal, electric power, motor vehicles and textiles. The State Council has called for the creation of several large steel corporations during the current five year plan, each with a capacity over 30 million tons, in large part through market-driven mergers and acquisitions. Other opinions from the State Council about restructuring, vowing to support successful firms and close down unsuccessful ones, also emphasise the importance of market-driven combinations. SASAC promotes continued government ownership as appropriate in four sectors: national security, natural monopoly, "important public goods or services" and natural resources, as well as for major firms in a few priority industries. This position is in tension with SASAC's goal of improving governance to maximise asset value. NDRC, in line with SASAC, supports national champions and guides the structural adjustment of key industries such as automobiles and steel via industrial policies to improve the competitiveness of the dominant SOEs. For example, NDRC has been

Box 3.1. **Competition policy's roles in regulatory reform**

In addition to the general issue of whether regulatory policy is *consistent* with the conception and purpose of competition policy, there are four particular ways in which competition policy and regulation interact:

- Regulation can *contradict* competition policy. Regulations may have encouraged, or even required, conduct or conditions that would otherwise be in violation of the competition law. For example, regulations may have permitted price co-ordination, prevented advertising or other avenues of competition, or required territorial market division. Other examples include laws banning sales below costs, which purport to promote competition but are often interpreted in anti-competitive ways, and the very broad category of regulations that restrict competition more than is necessary to achieve the regulatory goals. When such regulations are changed or removed, the firms affected must change their habits and expectations.
- Regulation can *replace* competition policy. Especially where monopoly has appeared inevitable, regulation may try to control market power directly, by setting prices and controlling entry and access. Changes in technology and other institutions to make monopoly less inevitable may lead to reconsideration of the basic premise that had supported regulation, namely that competition policy and institutions would be inadequate to the task of preventing monopoly and the exercise of market power.
- Regulation can *reproduce* competition policy. Regulators may have tried to prevent co-ordination or abuse in an industry, just as competition policy does. For example, regulations may set standards of fair competition or tendering rules to ensure competitive bidding. Different regulators may apply different standards, though, and changes in regulatory institutions may reveal that policies that had appeared similar may have led to different outcomes.
- Regulation can *use* competition policy methods. Instruments to achieve regulatory objectives can be designed to take advantage of market incentives and competitive dynamics. Co-ordination may be necessary, to ensure that these instruments work as intended in the context of competition law requirements.

promoting rationalisation of the cement sector, aiming to reduce the number of firms from over 5 000 to about 3 500 – among them 10 national champions capable of competing globally – and identifying 30 to be supported by local governments. Regional agencies are encouraging consolidation in other sectors, such as steel.

Development of competition laws

China's first regulation about competition, issued by the State Council in 1980, was the Interim Provisions for the Promotion and Protection of Competition in the Socialist Economy, known more concisely as the Ten Articles on Competition. Already at that early stage of transition back to a market-based economy, the Ten Articles explicitly pointed out the key problems. The Ten Articles ruled out official monopolies and exclusive privileges unless authorised by the state. They called on departments in charge of industry, transportation, finance and trade to delete regulations that obstruct competition. And they stressed the importance of breaking down regional blockades and departmental divisions, ordering that no region or department may blockade the market or prohibit the sale of commodities originating in other regions or departments. However, they relied on the

regions and departments themselves to implement these principles. A 1984 Decision of the Party Central Committee and State Council, addressing concerns about unfair competitive advantage and corruption due to official action and insider dealing, prohibited the leading organs of the Party and the government from "abusing their power to engage in business, set up enterprises, seek personal gains, and harm the interests of the people in violation of the regulations of the Party and of the State". The State Commission for Economic Restructuring and the State Planning Commission issued opinions in 1987 and 1989 dealing with risks to competition due to industry consolidation. They instructed that monopoly enterprise groups should not be set up within an industry, that competition between enterprise groups within the same industry should be encouraged to promote technological progress and economic efficiency, and that mergers should achieve economies of scale without harming competition. Another circular trying to prevent regional market blockades was issued in November 1990.

Formal legislation about competition began to take shape in the late 1980s. In August 1987, the State Council set up an anti-monopoly law drafting group. Draft Interim Regulations against Monopoly and Unfair Competition appeared in 1988. In September 1993 the Standing Committee of the Eighth National People's Congress enacted the Anti-Unfair Competition Law (AUCL). But the draft interim regulations about monopoly were not incorporated into law at that time. Experts and legislators expressed some doubt that a law to address monopolisation was needed at that stage in China's development, because firms were still relatively small compared to relevant economies of scale and to major multinational corporations, while horizontal combinations were thought to be either uncommon in China or even desirable as means of achieving efficiency. Debate continued about a broader competition law. In May 1994, the government formed a group to draft an anti-monopoly law. The group was drawn principally from the State Economic and Trade Commission (SETC) and the State Administration of Industry and Commerce (SAIC). In developing the draft, the group consulted Chinese experts and experts from international organisations, including the OECD, and several national competition agencies. An anti-monopoly law was included in the legislative plans for the sessions of the Standing Committee of the National People's Congress in 1994 and again in 1998, but none was adopted. A complete draft of a law appeared in November 1999, with eight chapters and fifty-six articles. This draft includes most of the features of the competition law that was adopted in 2007.

During the years of debate over a general competition law, other laws and regulations were enacted to deal with competition issues. The Price Law, which took effect in 1998, prohibits collusion to control market prices. It also prohibits some abusive pricing and provides for price controls on some products. The Bidding Law, enacted in 1999, prohibits bid rigging and provides for stronger sanctions against it than the AUCL. Interim provisions providing more detail and guidance about collusive and predatory pricing were issued in 2003. These regulations, and similar interim provisions for review of mergers and acquisitions involving foreign investors, were precursors to the comprehensive competition law.

In 2004, the State Council put the draft competition law on the legislative agenda. The draft was debated at sessions of the Standing Committee of the National People's Congress (SCNPC) in 2006 and 2007. One focus of the debate was the treatment of industries dominated by state-owned firms, such as banking, insurance, energy, telecommunications, tobacco, petroleum and railways. During the final round of consideration in 2007, the draft

was revised to adjust the relative power of the competition enforcement authority and sector regulators; clarify that the market share presumption for establishing a dominant position is rebuttable; increase the fines against restrictive agreements and abuse of dominance; and give the competition enforcer a clearer role in pursuing anti-competitive abuses of administrative power. At the last minute, the SCNPC added a provision specifically targeting abuses by industry associations. The SCNPC adopted the AML on 30 August 2007 by a near-unanimous vote (150 out of 153). It took effect in August 2008.

Policy goals

Four policy goals motivate the Anti-monopoly Law: "safeguarding fair market competition, improving economic efficiency, protecting the interests of consumers and public interests, and promoting the healthy development of the socialist market economy" (Art. 1).* Rules about competition are to be suitable for the socialist market economy, and the state is to improve macroeconomic measures to support a unified, open, competitive and orderly market system (Art. 4). The policy goals of the precursor laws are similar. The goals of the Price Law are to strengthen the role of prices in the allocation of resources, stabilise price levels, protect the interests of consumers and enterprises and promote healthy development of the socialist market economy; in addition, it declares that the state should promotes fair, open and lawful market competition (Price Law, Art. 1, 4). The purpose of the 1993 Anti-Unfair Competition Law (AUCL) is "to safeguard the healthy development of the socialist market economy, encourage and protect fair competition, prohibit acts of unfair competition, and defend the legitimate rights and interests of operators and consumers" (AUCL, Art. 1). In the latest legislation, the goal of healthy development of the socialist market economy is listed last, not first. And for the first time, the AML includes the policy goal of improving efficiency, implying that the application of the AML could follow modern economics-based conceptions of competition policy. China's law now incorporates all of the elements of the long-running debate about the priority and consistency of policy goals of fairness, efficiency, consumer and public interests, and development.

When China embarked on the road to a socialist market economy, the leadership described it in terms that clearly support the importance of allocative and dynamic efficiency. The head of the Communist Party, Jiang Zemin, explained the principles to guide a socialist market economy in a speech in October 1992:

> The purpose of the socialist market economic system, which China is going to establish, is, under the macro-control of the socialist state, to give full play to the basic role of the market in the allocation of resources; to ensure that economic activities are carried out in accordance with the law of value and adapted to the changes in relations between supply and demand; to use the lever of price and the competition mechanism to allocate resources to the places where they can produce the best economic results; to implement the system of selecting the superior and eliminating the inferior so as to give pressure and impetus to enterprises; and to promote the timely adjustment of production and demand by taking advantage of the sensitivity of the market to various economic signals. (Wang, 2006)

* Unless otherwise indicated, citations to legislation are to the AML, in an unofficial translation that was prepared for the OECD Secretariat.

Substantive issues: Content of the competition law

China's new Anti-Monopoly Law is a comprehensive general competition law. It collects and revises rules from several existing laws and regulations, while introducing new, generally applicable rules about important topics such as merger review. Monopoly agreements are covered in Chapter 2 (which treats horizontal and vertical agreements separately), abuse of dominance in Chapter 3, mergers in Chapter 4, administrative monopoly in Chapter 5, investigative powers and processes in Chapter 6 and sanctions and

Box 3.2. **The Competition Policy Toolkit**

General competition laws usually address the problems of monopoly power in three formal settings: relationships and agreements among otherwise independent firms, actions by a single firm, and structural combinations of independent firms. The first category, *agreements*, is often subdivided for analytic purposes into two groups: "horizontal" agreements among firms that do the same things, and "vertical" agreements among firms at different stages of production or distribution. The second category is termed "*monopolisation*" in some laws, and "*abuse of dominant position*" in others; the legal systems that use different labels have developed somewhat different approaches to the problem of single-firm economic power. The third category, often called "*mergers*" or "*concentrations*", usually includes other kinds of structural combination, such as share or asset acquisitions, joint ventures, cross-shareholdings and interlocking directorates.

Agreements may permit the group of firms acting together to achieve some of the attributes of monopoly – of raising prices, limiting output and preventing entry or innovation. The most troublesome horizontal agreements are those that prevent rivalry about the fundamental dynamics of market competition, price and output. Most contemporary competition laws deal very harshly with naked agreements to fix prices, limit output, rig bids or divide markets. To enforce anti-competitive agreements, competitors may also agree on tactics to prevent new competition or to discipline firms that do not go along; thus, the laws also try to prevent and punish boycotts. Horizontal co-operation on other issues, such as product standards, research and quality, may also affect competition, but whether the effect is positive or negative can depend on market conditions. Thus, most laws deal with these other kinds of agreement by assessing a larger range of possible benefits and harms, or by trying to design more detailed rules to identify and exempt beneficial conduct.

Vertical agreements try to control aspects of distribution. The reasons for concern are the same – that the agreements might lead to increased prices, lower quantity (or poorer quality) or prevention of entry and innovation. Because the competitive effects of vertical agreements can be more complex than those of horizontal agreements, the legal treatment of different kinds of vertical agreements varies even more than for horizontal agreements. One basic type of agreement is resale price maintenance: vertical agreements can control minimum, or maximum, prices. In some settings, the result can be to curb market abuses by distributors. In others, though, it can be to duplicate or enforce a horizontal cartel. Agreements granting exclusive dealing rights or territories can encourage greater effort to sell the supplier's product, or they can protect distributors from competition or prevent entry by other suppliers. Depending on the circumstances, agreements about product combinations, such as requiring distributors to carry full lines or tying different products together, can either facilitate or discourage introduction of new products. Franchising often involves a complex of vertical agreements with potential competitive significance: a franchise agreement may contain provisions about competition within geographic territories, about exclusive dealing for supplies and about rights to intellectual property such as trademarks.

Box 3.2. **The Competition Policy Toolkit** *(cont.)*

Abuse of dominance or *monopolisation* is a category concerned principally with the conduct and circumstances of individual firms. A true monopoly, which faces no competition or threat of competition, will charge higher prices and produce less or lower-quality output; it may also be less likely to introduce more efficient methods or innovative products. Laws against monopolisation are typically aimed at exclusionary tactics through which firms might try to obtain or protect monopoly positions. Laws against abuse of dominance address the same issues, and may also try to address the actual exercise of market power. For example, under some laws regarding abuse of dominance, charging unreasonably high prices can be a violation.

Merger control tries to prevent the creation, through acquisitions or other structural combinations, of undertakings that will have the incentive and ability to exercise market power. In some cases, the test of legality is derived from the laws about dominance or restraints; in others, there is a separate test phrased in terms of the likely effect on competition generally. The analytic process applied typically calls for characterising the products that compete, the firms that might offer competition and the relative shares and strategic importance of those firms with respect to the product markets. An important factor is the likelihood of new entry and the existence of effective barriers to new entry. Most systems apply some form of market share test, either to guide further investigation or as a presumption about legality. Mergers in unusually concentrated markets, or that create firms with unusually high market shares, are thought more likely to affect competition. And most systems specify procedures for pre-notification to enforcement authorities in advance of larger, more important transactions, and special processes for expedited investigation, so problems can be identified and resolved before the restructuring is actually undertaken.

remedies in Chapter 7. Other laws and rules already address several of these topics, and many of those laws and rules will evidently remain in force.

Horizontal agreements

The AML dedicates a separate section to controlling agreements among competitors (Art. 13). Five types of horizontal agreements are specifically prohibited: those that fix or change prices, restrict output or sales, allocate markets or materials, restrict new technology, equipment or products, and refuse to deal (*e.g.* collective boycott). Other kinds of agreements may also be prohibited upon determination by the enforcement authority. The general definition of the "monopoly agreements" that the AML prohibits is broad enough to include group decisions and concerted actions. Sanctions against horizontal agreements that the AML prohibits include orders to cease the prohibited conduct, fines from 1% to 10% of annual turnover, forfeiture of gains from the violation and criminal penalties. If the agreement was not actually implemented, the parties may still be liable for a fine of up to CNY 500 000. Sanctions may be reduced or even eliminated for a party to a prohibited agreement that reports it to the enforcement authority and provides important evidence (Art. 46). Thus, the AML's rules about sanctions support the adoption of a leniency programme to facilitate enforcement against horizontal cartels.

The AML provides for exemptions from the prohibition against monopoly agreements, either horizontal or vertical. Six criteria could support exemption: improving the technology of, research into or development of new products; improving product quality,

reducing cost, enhancing efficiency, unifying specifications or standards or specialisation; improving efficiency and enhancing competitiveness of small and medium-sized firms; acting in the public interest, *e.g.* with regard to energy saving, environmental protection and disaster relief; moderating oversupply during economic depression; and ensuring legitimate interests in foreign trade and economic co-operation. In addition, to qualify for exemption the agreement must not substantially restrict competition in the relevant market and the benefits must be shared with consumers (Art. 15). These last two provisos do not apply, however, to exemptions based on foreign trade and economic co-operation. The parties bear the burden of showing that their agreement meets the criteria for exemption. The process for deciding about exemptions is not specified. Particularly with respect to claims to exempt "depression" cartels, it will be important for guidelines or regulations to make clear that the exemption would be conferred only for limited periods and in limited circumstances.

Whether the AML prohibition against horizontal agreements is a *per se* rule – one that does not require a specific showing of effect as a condition of liability – is not yet clear. The definition of prohibited "monopolistic agreements" describes them as agreements that eliminate or restrict competition. This phrase about competitive effects might be construed as another prerequisite for finding liability. Or, it might be treated as a characterisation of the likely effects of the kinds of agreements that are banned, and thus as guidance for identifying other horizontal agreements that should be prohibited. The definition is not qualified by a condition such as "substantiality". A conception of reasonableness or proportionality, reflected in enforcement practice or incorporated into guidelines if not into the actual text of the legislation, would help avoid mechanical and inefficient prohibition of all agreements that limit rivalry in any way. But enforcement against what is the most serious competition problem in developed economies, hard-core horizontal price fixing agreements, would be more efficient if they were prohibited *per se*.

Other laws already prohibit horizontal cartels and bid rigging. The 1997 Price Law prohibits collusion to control market price (Price Law, Art. 14(1)). Sanctions include seizure of illegal gains, a fine of up to five times the illegal gains, warning or order to correct behaviour and even cancelling business licences(Price Law, Art. 40). Regulations implementing the Price Law, originally adopted in 2003 as the NDRC's *Interim Provisions on Prohibiting Monopolistic Pricing Behaviour* and recently issued as regulations of the State Council, describe in more detail what the law prohibits: entering agreements, decisions or concerted practices that fix or change price or that limit output to control price. The Price Law also prohibits collusion to control price in bidding or auctioning, and it includes a general term to deal with other kinds of price-controlling behaviour. In addition to banning price control through private agreement, the Price Law also provides for official price control for key commodities and services (Price Law, Art. 18).

The AUCL prohibits collusive bids. Such bids are void, and the colluding bidders are subject to a fine ranging from CNY 10 000 to CNY 200 000(AUCL, Art. 15, 27). (This is the only kind of horizontal agreement covered in the AUCL.) The Bidding Law also prohibits bid rigging and authorises more serious sanctions than the AUCL, including seizure of illegal gains, a fine of from 5% to 10% of the project, disqualification from future bidding, cancelling business licences, criminal penalties and compensation to other, injured parties(Bidding Law, Art. 32, 53). And bid rigging can be prosecuted under the Criminal Law, where conviction could lead to fine and up to three years' imprisonment (Criminal Law, Art. 223). Enforcement against bid rigging has resulted in particularly strong sanctions. Two

officials convicted of bid rigging and bribery in 2004, in connection with reorganising state enterprises, were sentenced to prison for 13 years.

Enforcement against other kinds of price fixing agreements has not been as vigorous so far. Price fixing has been reported for products ranging from rice noodles to airline service. Frequently cited examples from the 1990s include an agreement to end a price war over air conditioners between state-owned department stores in Nanjing; an agreement on service fees between providers of pager services; and two agreements about washing machines, one between producers over the prices and terms for sales to retailers and one between department stores about prices for sale to the public. Enactment of the Price Law prohibition did not stop reports of similar agreements, such as one in 1999 to restrict output and keep prices up for video cameras, and another agreement in Nanjing about air conditioners, this time between manufacturers.

The fate of a short-lived "price alliance" among nine TV manufacturers shows the beginning of stronger policy response. After six price wars in five years, the manufacturers held a summit meeting to agree on standards and research and also to agree on minimum prices and a production cutback. The participants evidently had no idea that this would violate the Price Law. One industry executive claimed that the agreed price only covered production costs, so any price below that should be treated as unfair competition. An official in the Ministry of Information Industry greeted the summit as a sign of industry maturity, healthy development and self-discipline. But the State Development and Planning Commission (the predecessor of the NDRC, which now enforces the Price Law) promised to investigate, saying it looked like a monopoly in disguise. A few weeks later, the Ministry joined with the SDPC in admonishing the industry, saying that its agreement on price violated the law. No formal enforcement action was taken, because the agreement collapsed quickly: one of the parties had begun undercutting the minimum price the day after the summit meeting.

In the past, official calls for "self-discipline" in pricing sometimes led to market results that were the equivalent of collusion. The State Economic and Trade Commission issued *Opinions on Self-Discipline Pricing For Certain Industrial Products* in 1998, contending that this self-discipline was necessary to end price wars and disorderly competition. Producers of 20 categories of products such as plate glass, cement, cars, agricultural vehicles and electricity generators were required to observe minimum prices. Trade associations set the minimum prices, and the trade associations could enforce compliance by fining their members. In one case, a firm paid a fine of CNY 800 000 (plus an "inspection fee" of CNY 153 000) for cutting prices below the minimum; that fine for violating a price-fixing agreement is greater than the fine that SAIC could impose for bid rigging.

Trade associations are now subject to a special provision of the AML, added in the final reading. Associations "shall not organise" their members to engage in anti-competitive conduct that is prohibited by the chapter on "monopoly agreements" (Art. 16). This new article underscores the importance of the topic. It was not needed to close a loophole in the proposed law, however (unless some special treatment is implied by the admonition in Art. 11 that associations should strengthen their members' self-discipline to compete in accordance with the law). The general definition of the monopoly agreements that are prohibited by Article 13 should be broad enough to cover anti-competitive agreements reached through a decision by a trade association.

Box 3.3. **Classic collusion**

Several price-fixing arrangements surfaced in the summer of 2007, when the Standing Committee of the National People's Congress was finalising the AML. Publicity about these cases probably prompted the addition of an article specifically targeting trade association price-fixing agreements.

Noodles: Between the end of 2006 and July 2007, the China Instant Noodle Association called three meetings to discuss price increases. The association reached agreement on the extent and timing of price increases for three ranges of products, and the plan was published in the industry's trade journal. The July 2007 price increase announcement led to long queues of shoppers trying to buy before the price went up. Consumers complained to the NDRC, which opened an investigation. At first, the association did not provide complete documentation about its meetings, and it issued a media statement denying that the increases were collusive. But the NDRC determined that the meetings leading to the increases violated the Price Law and implementing regulations, by seriously impeding the market pricing system, restricting normal competition and harming consumer interests. As a remedy, the NDRC ordered the association to revoke the price increase plan and issue a public explanation of its conduct. The NDRC also called on all industry associations and firms to learn from the case and to stop price collusion. The NDRC invited the media and the public to pay attention to prices and to complain about suspicious pricing behaviour, using the NDRC's price-regulation hotline, "12385".

Car washing: In August 2007, a local price supervision department in Hubei province received complaints about price increases at car-washing shops. Two shop-owners had suggested a price increase to nine others. The next day, there were two meetings to discuss it, the last one a general meeting among 16 shops that produced an agreed schedule of increases and a means to enforce compliance. Each shop deposited an amount equal to the price of 50 car washes (or 100 motorbike washes), which would be forfeited if the shop cheated on the cartel price. The local price supervision office investigated immediately on receiving the complaints. Just three days after the agreement and the price hike, it convened its own meeting with the cartel members and instructed them that their deal was illegal. The cartel agreed to roll back the increase and not to collude on prices in the future. The office agreed that prices could vary depending on the service, and that they could be changed to meet the prices for similar services in nearby counties.

Restaurants: Another local price supervision office, in Zhejiang province, followed up on newspaper reports that the local restaurant association was planning a 20% price increase. This association evidently had not reduced its agreement to writing. The investigation resulted in a warning. The association promised to comply with the law in the future, while taking measures to cope with increased costs and maintaining "stability" of prices in the industry.

Source: NDRC.

Open, formal agreements to fix prices should become rarer as enforcement becomes stronger, backed by the new AML. It is not yet clear whether the AML will lead to stronger sanctions, though. In theory, the fine for violating the Price Law could be higher than the fine for violating the AML, since the Price Law sets no upper limit and authorises a fine of up to five times the gain from the violation. The Price Law sanctions even include revoking the violator's business licence. But reports of recent Price Law enforcement show that cases typically result in warnings or corrective orders, not fines. The AML provides for one

sanction, criminal penalties, that is stronger than the Price Law. Regulations for implementing the AML might provide more guidance for setting fines high enough to deter violations.

Vertical agreements

Another separate section of the AML covers vertical agreements – that is, those "among counter-parties" (Art. 14). Only two types of agreement are specifically prohibited: to fix prices for sale to third parties and to restrict minimum resale prices to third parties. The enforcement authority can also determine that other kinds of agreement constitute "monopoly agreements" under the law. How the AML applies to price recommendations, ceilings on resale prices, exclusive distribution and supply, franchising and other distribution arrangements will be determined by the course of enforcement practice. Enforcement practice may also determine whether the ban on resale price maintenance is considered a *per se* rule, or whether its treatment will follow the trend in other jurisdictions of considering its net effects on competition in the relevant market. Exemption from the prohibition against vertical "monopoly agreements" is determined by the same part of the law that specifies exemptions for horizontal agreements, so the same standards and presumptions would apply.

Regulations already in place have anticipated the AML's treatment of vertical agreements. The *Administrative Measures for Fair Transactions between Retailers and Suppliers* prohibit agreements requiring resale price maintenance, tie-in sales or exclusive dealing. These regulations were issued in 2006 jointly by MOFCOM, SAIC, NDRC and two other agencies at ministerial level. They also cover other common topics of dispute in distribution relationships, such as timely payment, returns and promotional support. They are enforced by local-level departments corresponding to the national-level bodies that issued them. Sanctions for violation include corrective orders and fines of up to three times the illegal gain or loss, subject to a ceiling of CNY 30 000. To avoid violation, the regulations encourage parties to use sample contracts, which are recommended by the departments of industry and commerce (Art. 5). The regulations contain no "competitive effects" test or provision for exemption or rule-of-reason balancing.

Abuse of dominance

The AML prohibits abuse of a dominant market position. One of the AML's opening general provisions states that firms with a dominant position shall not use that position to eliminate or restrict competition (Art. 6). Chapter 3 about abuse of dominance begins by listing six types of abuse that are specifically prohibited: exploitation by charging customers unfairly high prices or by unfairly underpaying suppliers, selling below cost, refusal to deal, requiring exclusive dealing, imposing tying and other unreasonable terms and discriminating in price or terms (Art. 17). The prohibitions are subject to the proviso that the conduct be "without justification", except that this proviso does not apply to exploitation. The enforcement authority may determine that other conduct also constitutes prohibited abuse.

A dominant position is defined as one that enables the holder to control price, output and conditions in a relevant market or to control entry into it (Art. 17). Identifying a dominant position thus presupposes definition of a relevant market. Factors to be considered in determining whether a firm is dominant include its market share, its financial and technical capacity, the extent to which other firms depend on it and the difficulty of entering the relevant market (Art. 18). A finding of dominance can be based on

market share and structure. For a single firm, dominance may be presumed from a market share over 50%. In a relevant market where two-firm concentration exceeds 67% or three-firm concentration exceeds 75%, any firm with a market share greater than 10% may be presumed to have a dominant position. These thresholds are rebuttable presumptions, so a firm could avoid liability by showing that it does not have the power to control price, output, entry, or market conditions. In joint dominance situations, the 10% threshold is a "safe harbour"; otherwise, the AML permits the enforcement authority to find that a firm is dominant, based on the defining criteria, despite having a market share below the level of the presumption. Enforcement guidelines explaining factors that will be relevant in applying the presumption could help ensure that the statutory criteria will not be treated too mechanically.

The Price Law also deals with exploitative and predatory pricing and with discrimination. It prohibits selling at prices below cost with an intention to eliminate competitors and monopolise the market. It also prohibits discriminatory pricing and excessive pricing, regardless of whether there is intent to eliminate competition. Sanctions include orders to cease and correct the violation, seizure of illegal gains, a fine of up to five times the gains, or cancellation of the offender's business licences (Price Law, Art. 14, 40). The NDRC, which enforces the Price Law, issued *Interim Provisions on Preventing Price Monopoly* in 2003 to elaborate its prohibitions and move toward putting them into a competition policy framework by introducing the element of dominance. These regulations provide that a firm may not rely on its "market predominance" to engage in exploitative, predatory or discriminatory conduct. A position of market predominance is determined by share of the relevant market and the ease of substitution of other products or of entry by new suppliers. The *Guiding Principles on Below-Cost Sales*, issued in 1999 by the NDRC's predecessor, provide further detail about what is considered to be a sale "below cost" under the Price Law. The cost reference is the cost of production and operation (Price Law, Art. 8). This implies a test based on variable cost, although average cost and the scope of the price cut may be used to establish the reference point if variable cost is difficult to determine. Violation depends on intent to squeeze out competitors or monopolise the market; pricing below cost is permitted for normal clearance sales, that is, to dispose of overstock, seasonal and perishable goods or in case of insolvency, transfer or termination of a business.

The AUCL also prohibits sales below cost and tying (AUCL, Art 11, 12). These prohibitions do not depend on showing that the firm has a dominant position. The AUCL prohibition on sale below cost is not a *per se* rule, though. It contains an element of intent to put competitors out of business, and it provides exceptions, such as for disposing of perishable commodities, overstocks and seasonal goods and for liquidation of a business (AUCL, Art. 11). These terms of the AUCL, which is enforced by SAIC, are analogous to the 1999 *Guiding Principles on Below-Cost Sales* under the Price Law, which is enforced by NDRC.

Abuse of intellectual property rights to eliminate or restrict competition could violate the AML (Art. 55). Private lawsuits about technology licensing and compatibility have raised claims about monopolisation, which have been framed in terms of unfair competition or infringement of the Contract Law in the absence of a general law about abuse of a dominant position. A contract that monopolises technology, impedes technological progress or infringes technological achievement by others is null and void

(Contract Law, Art. 329). A technology transfer contract may control the scope of use, if it does not restrict technological competition and development(Contract Law, Art. 343).

No provision for exemption from the prohibition against abuse of dominance is provided in the AML. The proviso that the conduct be "without justification" would encourage enforcers to assess net effect on competition, rather than apply the prohibitions literally and formalistically. But it might also envision balancing of anti-competitive effects against other goals or policies. Enforcement guidelines might clarify what would be considered adequate justification for otherwise prohibited conduct.

The application of the AML to network industries and public services remains to be worked out in practice. Where exclusive rights or monopolies have been authorised by law, the state is to protect the legitimate rights of the firms in those industries and also safeguard the legitimate interests of consumers and promote technological progress. These firms are not to use their exclusive or monopoly positions to harm consumers (Art. 7). It does not appear that this section of the AML would confer an exemption from the general prohibition against abuse of dominance, because it also provides that the firms subject to it are to conduct their business in accordance with law.

The AUCL controls some aspects of monopoly abuse by utilities. It prohibits public utilities and statutory monopolies from forcing transactions on their customers (AUCL, Art. 6). This prohibition responds to a pattern of abuses of telecoms, electric power, water and gas suppliers that refuse service unless customers buy designated telephones, distribution boxes, meters or heaters – ones typically supplied by affiliates and more expensive than others available on the market. The regulations that SAIC issued in 1993 elaborating this part of the AUCL, the *Provisions Prohibiting Public Utilities to Restrict Competition*, incorporate the concept of dominance. Firms in the sectors of water, electric power, gas, postal service, telecommunications and transport are prohibited from "using dominant position to impede fair competition of other business operators and to harm legitimate rights of consumers". The non-exhaustive list of prohibited behaviours includes forced transactions, tying, refusal to deal and excessive pricing. Sanctions for violation include orders to cease the practice and fines of up to three times the illegal gain. Customers and consumers can claim compensation for these violations by utilities; by contrast, suits for damage from most violations of the AUCL can only be brought by other firms.

Sectors that are the usual objects of regulatory reform, in which long-standing monopolies and public firms face new competition, could provide occasions to test application of the AML. In telecoms, restructuring has created seven operators, but the two mobile phone companies, China Mobile and China Unicom, are state-owned and controlled substantially by the Ministry of Information Industry and its local agencies. There have been complaints about excessive pricing, tying and exclusive dealing. In healthcare, state-owned hospital pharmacies sell most prescription pharmaceuticals, and there have been complaints that exclusive dealing, tying and bid rigging prevent competition from retail pharmacies. China may need special rules to address anti-competitive strategies by publicly owned firms, because their capital structure and connection with government give them incentives and opportunities to distort competition with privately held competitors.

Mergers

The AML establishes a general framework for applying competition policy to mergers and acquisitions. It covers mergers, acquisitions of shares or assets that lead to change in control, and acquisitions of control or "decisive influence" through contract or other means. A transaction can be prohibited if it may eliminate or restrict competition; thus, the general substantive standard is not tied to the concept of dominance. Factors to be considered include the parties' market power and share, concentration in the relevant market, effects on entry and technological development, effects on consumers and other enterprises, and effects on national economic development. A transaction may be approved if the parties show that it will lead to improvements in conditions of competition that outweigh adverse effects on competition, or that it is otherwise in the public interest (Art. 28). The opening provisions of the AML also make reference to mergers, in declaring that firms may agree to mergers to achieve economies of scale and improve competitiveness (Art. 5). By repeating this point in the context of the law's policy goals and general principles, the AML underscores that merger control will consider claims of improved efficiency.

The merger rules that are now in effect apply only to transactions by foreign investors taking over firms in China. The *Provisions on Mergers and Acquisitions of Domestic Enterprises by Foreign Investors* were issued jointly in 2006 by six ministries and bodies responsible for foreign exchange, securities regulation, taxation, state shareholding and competition policy and enforcement. These follow interim rules adopted in 2003. One policy goal is to maintain fair competition, and one of the substantive principles is that a foreign firm takeover should not cause excessive concentration or exclude or limit competition. Thus Chapter 5 of these *Provisions* provides for antitrust review, to determine whether the takeover may lead to excessive concentration, hamper fair competition or impair consumer interests. Other goals and purposes include promoting foreign investment, introduction of advanced technology, and management and protection of employment and national economic security. Approval by MOFCOM is therefore required for any acquisition transferring control of a domestic company relating to key industries with an actual or potential effect on national economic security, or of a company with a famous trademark or venerable company registration. A transaction may be exempted from review if it would improve competition in the market; if the target of the takeover is losing money and the takeover would preserve jobs; if the takeover would improve international competitiveness through transfer of technology and management; or if the transaction would improve environmental conditions. MOFCOM issued guidelines for notification in 2007 to clarify procedural issues such as the timing and content of notification. Parties are encouraged to contact MOFCOM before making a formal notification, to discuss whether notification will be necessary and to begin clarifying issues such as the relevant markets.

Pre-notification will be required under the AML. Details of the notification obligation will be set by the State Council. Earlier drafts of the law would have set specific notification thresholds, of aggregate turnover of CNY 12 billion for all parties worldwide and turnover of CNY 800 million for any single party in China. These specific thresholds were dropped from the AML as finally adopted, and provisions in early drafts that would have based notification on market share were also not included in the final law. Setting notification thresholds and terms through regulations issued by the government rather than in the basic legislation will increase flexibility.

Notification under the current rules about takeovers by a foreign party can be required under several different criteria. If the transaction is in China, notification is required if any party to the transaction has annual turnover in China of over CNY 1.5 billion; if the foreign party has acquired more than ten domestic enterprises; if any party has a market share in China over 20%; or if the post-takeover party will have a market share in China over 25%. For a transaction outside China, notification is required if the foreign party has CNY 3 billion in assets in China; annual turnover in China over CNY 1.5 billion; a market share (together with affiliates) in China over 20%; or a post-takeover market share in China over 25%. In addition, notification of an overseas takeover is required if, as a result, there will be more than 15 foreign-funded enterprises in the Chinese industry. A transaction that does not meet any of these thresholds might still have to be notified; such will be the case if MOFCOM or SAIC decides, after receiving a request from a domestic competitor, department or association, that the takeover involves a very large market share or presents major factors that would seriously impact market competition. Notification can be made to either MOFCOM or SAIC, and either may be involved in the competition review.

The two-stage review process under the AML will be subject to clear deadlines. The enforcement authority has 30 days from the original notification to decide whether to undertake a further review. If it does not, the transaction is deemed to be approved. This 30-day period cannot be extended. If a further review is undertaken, it must be completed within 90 days. That 90-day period can be extended by up to 60 days if the parties agree, if the parties' documents are insufficient, or if conditions have changed significantly since the notification. At the end of the review period, the transaction is deemed to be approved unless the enforcement authority has reached a decision to prohibit it or to impose conditions on it. Prohibition decisions will be published. Remedies for transactions that violate the AML's requirements include a fine of up to CNY 500 000 and orders to divest and other measures to restore the previous market situation (Art. 47). Review also involves two stages under the current rules for foreign transactions. The initial waiting period is 30 working days, at the end of which the transaction is automatically cleared unless there is a notice of extension for a second review. That second-stage review is to be completed in another 90 working days. If MOFCOM and SAIC determine that the substantive standards for rejection might be met, and the transaction is taking place in China, they will convene a hearing.

Acquisitions of domestic enterprises by foreign investors, and other forms of concentration involving foreign investors that concern national security, are subject to both a competition review and a national security review (Art. 31). The rules about foreign takeovers now require an application to MOFCOM if a foreign firm intends to take control of an enterprise that is in a key industry or that has famous or historic Chinese brands, or if the transaction may have an impact on national economic security.

Sector regulators may also have merger review responsibilities. Acquisitions in financial industries may require approval from financial or insurance regulators, for example. In civil aviation, rules about mergers and restructuring require approvals by the regulator or its local bureau. These rules, issued in 2005, call for promoting fair and orderly competition and preventing monopoly, but they contain no substantive competition standard, other than the invocation of competition among their purposes. They provide for a short review process of 20 working days, with a possible extension of 10 more working days.

Even without a formal programme for control over domestic mergers, major combinations may receive official attention. Two top appliance and electronics retailers announced a merger in 2006, creating a national chain with 800 outlets. Some manufacturers expressed concern that this new enterprise would wield too much bargaining power over prices and promotions. Producer and consumer representatives presented their views to MOFCOM at a hearing, which was closed to the merging parties. The transaction was allowed to proceed, however.

Administrative monopoly

The AML deals extensively with abuse of administrative powers. One of the general principles set out in the first part of the AML is that administrative agencies and other organisations empowered by law or regulation with responsibilities for public administration shall not abuse their powers to eliminate or restrict competition (Art. 8). Chapter 5 specifies in more detail the kinds of actions that these bodies may not do. They may not mandate exclusive arrangements, by directly or indirectly requiring dealing only with specified suppliers (Art. 32). They may not impede trade among regions, by setting higher prices or standards for products coming from other regions, imposing different technical or inspection standards and costs on them, subjecting them to special licence requirements or hindering trade through checkpoints (Art. 33). They may not prevent or discourage firms from outside the region from participating in bids (Art. 34). They may not discourage investment by firms from other regions, through discrimination in such functions as approving branch operations (Art. 35). They may not abuse their power by ordering firms to take action that would be prohibited by the AML (Art. 36). And they may not adopt regulations that eliminate or restrict competition (Art. 37). The AUCL also prohibits two aspects of administrative monopoly, namely requiring dealing with designated firms and restricting imports from other regions or exports of local products (AUCL, Art. 7). The longer list of prohibited practices in the AML expands the prohibition. There is no "catch-all" provision in Chapter 5 itself to deal with anti-competitive administrative abuses that are not specifically listed, but the general prohibition against administrative abuse in Article 8 might be a sufficient basis for action.

The remedy against these abuses is administrative. If an administrative or public organisation abuses administrative power to restrict competition, its hierarchical superior body is to correct that problem and discipline the managers responsible for it. The anti-monopoly enforcement authority may call these situations to the attention of the superior body and propose action (Art. 51). To be effective, this recommendation should come from an anti-monopoly enforcement authority at a higher level of government than the one where the abuse is occurring, and it should be directed to a higher-level hierarchical superior. Where a local government agency or official is the source of the problem, it would be unrealistic to expect that an anti-monopoly enforcer at the same level of the same government could intervene effectively against it there. In earlier drafts of the law, the enforcement authority would have had power to order the agencies to correct their behaviour and even to refer the problem for criminal prosecution, which could be appropriate where the abuse is connected to bid rigging, bribery or other corruption. The administrative correction called for by the AML is similar to what is already provided in the AUCL, except that the AUCL does not authorise the enforcement authority to recommend action by the offender's superior body (AUCL, Art. 30). The AUCL authorises an enforcement role, against the operator that benefits from improper official action if not

against the administrative agency itself. The control and inspection authority can confiscate the illegal income of a "designated operator" that charges excessive prices, and it can also impose a fine of from two to three times the illegal gain.

Unfair competition and consumer protection

The Anti-Unfair Competition Law, adopted in 1993, was China's first general legislation pertaining to competition. In addition to provisions about bid-rigging, predation, discrimination and tying, it deals with controversies about unfair practices between businesses. It prohibits passing off trademarks, trade names, packaging or other certifications of origin and quality, false advertising, commercial bribery, misappropriation of trade secrets, disparagement of competitors and lottery-based promotions (unless the reward is less than CNY 5 000). Injured competitors can sue each other for damages. Lawsuits have been fought recently over practices such as imitation of the trademark for Starbucks and demotion to the bottom of the stack on a website search engine. In the trademark case, the court awarded damages and ordered the offender to apologise publicly; in the website case, the court could not find a legal authority governing search engine results and rejected the complaint.

Public enforcement by SAIC and regional administrations is important, particularly in cases about passing off, misleading advertising and commercial bribery. In the first nine months of 2007, SAIC and the local administrations investigated over 5 000 cases of commercial bribery. Sanctions vary for different practices. For most unfair competition infringements, the maximum sanction is a fine of CNY 200 000 – except for lottery sales, for which it is CNY 100 000. For counterfeiting products and other trademark violations, the offender may be fined up to three times the gain from the violation, and its business licence may be revoked. Criminal penalties may also apply. For commercial bribery, the offender may be fined up to CNY 200 000, and its business licence may be revoked; here too, criminal law may also apply.

The Law for the Protection of Consumers Rights and Interests was also adopted in 1993. It provides for strict liability for defective goods and services, regulates unfair contract terms and provides for punitive damages. Individual complaints may be resolved through administrative investigations by SAIC, mediation by consumers' associations, arbitration or civil lawsuits. SAIC has set up special direct-dial phone lines for complaints. This system has tapped a torrent: in 2006, the "12315" network handled nearly 50 million enquiries.

Institutional issues: Enforcement structures and practices

Three bodies, the State Administration of Industry and Commerce (SAIC), the National Development and Reform Commission (NDRC) and the Ministry of Commerce (MOFCOM), have been principally responsible for enforcing the laws and regulations about competition. The AML authorises the State Council to establish an Anti-Monopoly Commission and to empower an Anti-Monopoly Enforcement Authority under the State Council, before the effective date of the AMP in August 2008. The three bodies continue to perform the same roles in enforcing the AML that they performed in applying the previous laws and regulations about competition.

SAIC is responsible for many aspects of market supervision, such as business registration, competition, consumer protection, marketing practices, advertising and

trademarks. In the government organisation, SAIC is directly under the State Council, which appoints its Minister and four Vice Ministers. SAIC was promoted from vice-ministerial to ministerial status in 2001. The Fair Trade Bureau of SAIC is responsible for developing and enforcing rules, regulations and practice directions for preventing monopoly and unfair competition. It also initiates investigations of monopolisation, unfair competition, smuggling, and selling of smuggled goods. The Anti-Unfair Competition Office is responsible for the rules about unfair trading practices, and the Anti-Monopoly Office is responsible for the rules about practices that restrict competition. These policy offices at the headquarters of SAIC are small, because enforcement is entrusted to officials at the local level. Fair trade departments in governments at the province, prefect and county levels are responsible for monitoring and investigating conduct covered by the AUCL. The staff at these levels who are involved in performing SAIC's many responsibilities number in the hundreds of thousands, and over 60 000 of them deal with matters that arise under the AUCL.

MOFCOM oversees domestic market development and international trade. Its responsibilities include supervising industrial associations, creating and developing markets in rural areas and standardising commodity markets in urban areas, reforming particular sectors such as distribution and dealing with international trade co-operation and dispute resolution. Some of its responsibilities were performed by the former Ministry of Foreign Trade and Economic Cooperation (MOFTEC) and State Economic and Trade Commission (SETC), and some were performed by the former State Planning Commission. Competition policy matters are handled by MOFCOM's Department of Treaty and Law, which set up an Anti-Monopoly Investigation Office in November 2004. MOFCOM's principal competition enforcement function has been merger review.

NDRC is the principal economic and social development policy agency under the State Council. NDRC has 26 departments and about 900 staff. NDRC's predecessor was the State Planning Commission. This body was created in 1952, renamed as the State Development Planning Commission in 1998, merged with the State Council Office for Restructuring the Economic System and part of SETC in 2003 and then restructured into what is now the NDRC. NDRC's Department of Price Supervision administers the Price Law and the *Monopolistic Pricing Provisions*. It investigates and takes action against violations, which include failure to observe prices that are set by regulation as well as price fixing, exploitation and predation. NDRC's Department of Price is responsible for forecasting and policy planning, investigating costs of major agricultural products, and setting prices of important commodities and the prices and fees that are administered by the central government. There are also price administration agencies at provincial, city and county levels.

The institutional structure for enforcing the AML is determined by the State Council. The 1999 and 2002 drafts of the AML envisaged an Anti-Monopoly Administration Body under the State Council. The 2004 draft substituted establishment of a "competent commercial authority" under MOFCOM. The April and July 2005 drafts returned to the 1999 and 2002 model and suggested a ministry-level Anti-Monopoly Authority with substantial investigating and decision-making powers. But the November 2005 draft did not include the model of a single ministry-level or independent enforcement body. The AML refers to "the authority empowered by the State Council to have functions for anti-monopoly law enforcement" and the "Anti-Monopoly Enforcement Authority under the State Council", which will be responsible for enforcement (Art. 10). These terms support maintaining the

division of responsibilities, with MOFCOM, SAIC and NDRC empowered with enforcement authority with respect to particular aspects of the AML. MOFCOM continues to deal with mergers, NDRC continues to deal with cartels and SAIC continues to deal with antitrust matters involving distribution and abuse of dominance and undertakes some merger review. The anti-monopoly enforcement authority, in whatever form, is a body under the State Council, that is, the central government.

An Anti-Monopoly Commission of the State Council will be responsible for organising, co-ordinating and guiding anti-monopoly work (Art. 9). Its authorities and responsibilities will include research, formulating policy, investigating and evaluating overall competition conditions, drafting and promulgating guidelines and co-ordinating enforcement. Creation of an Anti-monopoly Commission to co-ordinate enforcement foreshadows a tripartite division of enforcement authority, since a supervisory Commission would have little function if there were only one enforcement body to supervise. The Commission will also be in a position to oversee relations between the enforcement authority applying the AML and the sector regulators whose functions and responsibilities affect competition.

Enforcement at the local level will also be important. Early drafts of the AML would have provided for provincial branches of the national enforcement authority. As adopted, the AML provides that the enforcement authority, in whatever form it takes, can authorise enforcement by corresponding organs of governments at the next level below the national government.

Competition law enforcement

Chapter 6 of the AML establishes enforcement powers and procedures. Investigation of a monopoly agreement or abuse of dominance can begin on the initiative of the enforcement authority or in response to a complaint. The undertaking involved has rights to state its case and to defend itself. If the undertaking makes a commitment to eliminate effects of the conduct, the enforcement body may suspend the investigation pending fulfilment of the conditions. The enforcement authority will supervise performance of the commitments. It may decide to terminate the investigation (without a formal decision), and it may reduce or cancel the penalties upon satisfactory performance. The enforcement authority may reopen a proceeding if the parties fail to perform the commitments, if the facts supporting the suspension the investigation change substantially, or if the parties have presented incomplete or misleading information.

Investigative powers are backed by financial sanctions. Failing to submit information or documents in investigations or destroying evidence or otherwise obstructing investigations can be punished by fines. The maximum fine is CNY 200 000 for a firm and CNY 20 000 for an individual, although in serious cases the fine against the firm can be as high as CNY 1 million, and individuals could face fines up to CNY 100 000 and firms and individuals may also be subject to criminal liability (Art. 52).

Sanctions for infringing the substantive prohibitions of the AML include orders, fines and confiscation of gains from the violation. The maximum fine is 10% of turnover in the affected market in the most recent year, and the minimum is 1% (Art. 46, 47). Factors to be considered in setting the fine include the nature, extent and duration of the infringement (Art. 49). If a restrictive agreement is not actually implemented, the maximum fine is CNY 500 000 (Art. 46). If a party to a restrictive agreement reports the agreement to the enforcement body and provides important evidence, its fine may be reduced or even

eliminated (Art. 46). This flexibility will support a leniency programme to improve enforcement against cartels.

The People's Courts have power to review enforcement actions, as well as to adjudicate claims for compensation by injured parties. The Administrative Litigation Law provides more context about judicial oversight. Ordinarily, administrative litigation over legal and factual issues in matters such as competition enforcement would begin in one of the nearly 400 intermediate People's Courts at the municipal level, and there would be an appeal to the next higher court. A request for administrative review appears to be a necessary prerequisite for appealing to court about a decision to approve or block a merger. A request for administrative review can also be made about other matters, but in those cases it is evidently not a prerequisite for an appeal to the court (Art. 53).

Parties who are injured by a monopoly agreement or abuse of dominance may recover damages through civil lawsuits. The AML does not indicate whether a prior finding of infringement by the enforcement authority is necessary before a private suit can be filed. The AUCL similarly authorises enterprises that are damaged by acts of unfair competition to recover their damages through civil suits. If it is difficult to show the actual damages from the unfair practice, the plaintiff can recover the defendant's profits from the infringement (AUCL, Art. 20). Provisions about effects on competition in the Contract Law have been invoked in private litigation about intellectual property licensing.

Local and regional laws sometimes cover the same topics as national laws about competition. The local government in Beijing adopted its own law on unfair competition in 1994, shortly after the national law. Over 20 other local governments, in Shanghai, Wuhan and elsewhere, have adopted similar laws and regulations. Price fixing was first specifically prohibited in the regulations of Guangdong province implementing the AUCL. The Regulations of the Hainan Special Economic Zone against Unfair Competition prohibit market division, boycotting in purchase or sales, fixing prices, limiting output and bid rigging, in terms that are more stringent than those of the AUCL.

International issues

The international "effects test" is incorporated into the AML. Its prohibitions apply to conduct outside China that eliminates or has restrictive effects on competition in China's domestic market (Art. 2). Most provisions of the law apply equally to domestic and foreign firms. The exception is the requirement of an additional national security review for acquisitions of domestic firms by foreign investors and for other circumstances involving concentration of foreign capital that raise national security concerns (Art. 31). A report issued by SAIC in 2004 called for a stronger competition law to protect against anti-competitive strategies of large foreign firms. This viewpoint might have been encouraged by advice such as that offered by the OECD (2002a), that in the absence of a general competition law China's economy was vulnerable to anti-competitive abuses by foreign firms. If the anti-monopoly enforcement authority takes the position that foreign firms present particularly serious threats to competition, then foreign firms may face closer enforcement scrutiny.

Co-operation agreements were entered into with Russia in 1996 and Kazakhstan in 1999. These call for exchange of information where possible about investigations of monopoly, unfair competition and consumer rights violations. These agreements designate SAIC as the body responsible for co-operation in the Chinese government.

Resources, actions, and implied priorities

At SAIC, most enforcement matters arising under the AUCL are about trademarks and deceptive marketing practices. Among SAIC's competition cases, most have been about restrictions by public utilities. From 1995 to 2002, SAIC handled about 3 400 cases of public utility abuses, along with about 900 dealing with bid rigging, about 650 with tying, about 350 with administrative monopoly and about 250 with sales below cost. NDRC emphasises the consumer impact of its price enforcement, most of which is about misrepresentation, unfair charges and failure to observe regulated prices rather than price fixing or predation. A hotline for consumer complaints has been in place for five years. In 2006, the price monitors received over 500 000 complaints and investigated about 10% of them. Enforcement actions led to consumer refunds totalling CNY 190 million (and to collecting CNY 110 million for the State Treasury). The largest number of complaints, accounting for two-thirds of the total in 2006, have been about prices for education, transport, medical care, real estate and property management and telecoms. For merger review, SAIC and MOFCOM have each assigned about a half-dozen staff at their headquarters. The number of transactions reviewed has been modest, but the rate is accelerating. There were only nine notifications in 2004, but there were 61 in the first eight months of 2006.

Limits of competition policy and enforcement

Exclusions

The AML does not contain a broad exclusion for conduct that is subject to supervision by other regulators. The AUCL, by contrast, defers to other laws and regulations in the event of a conflict. That is, for acts for which laws or administrative rules and regulations provide that other departments are to exercise supervision, those other provisions apply rather than the AUCL (AUCL, Art. 3). In early drafts of the AML, there was a provision like the one in the AUCL excluding conduct that was subject to control under other laws or regulations, but that was dropped from the final legislation. The 1999 draft of the AML proposed another way to deal with sectors where conflicts are likely to arise. It set a five-year transition period during which the general competition law would not apply to natural monopolies or public utilities such as postal services, railroads, electricity, gas and water, as long as the conduct at issue was authorised by the relevant regulatory authorities reporting to the State Council. The idea of a transition period did not reappear in the 2002 draft, and it is not included in the AML as finally adopted.

Instead, accommodation between the AML's general prohibitions and the demands of other regulatory programmes and public policies is covered by Article 7 of the AML. Different unofficial translations of this Article vary in potentially significant details. It provides that the state will protect the legitimate business operations of firms in industries in the state-owned economy, which are important to the national economy or national security, and those with legally granted rights of exclusive operation or sales. In addition, though, it says that the state will supervise and control their operations and prices to protect the interests of consumers and to promote technological progress; these firms are to operate in good faith and in accordance with the law, accepting public supervision and not using their exclusive or controlling positions to harm consumers. This inclusive language, protecting the "legitimate business activities" of these firms yet also requiring that they comply with laws and not harm consumers, is obviously a compromise between industrial policies and competition policy. It does not appear that the Article creates an

exclusion from the AML; rather, it seems to announce authoritative guidance about how the AML will be applied, instructing state-owned enterprises about proper behaviour. Its actual effect remains to be determined in application.

As a general matter, claims of inconsistency between different legal norms might be resolved by reference to their hierarchy. The AML and the AUCL, as laws adopted by the National People's Congress, would normally be more authoritative than administrative regulations issued by the State Council, or rules adopted by ministries, committees or commissions, or notices issued by local governments. The concept of a "state action" defence is implicitly rejected, because the AML prohibits an administrative body from requiring parties to engage in conduct that would violate it (Art. 36).

The only sectoral exclusion from the AML involves agriculture. The AML is not applicable to alliances or concerted actions among farmers and farmers' economic organisations in connection with production, processing, sales, transportation or storage of agricultural products (Art. 56). This is a commonly encountered exclusion, to support co-operation among small-scale producers. Whether it impairs competition depends on how large the co-operative organisations become, whether they engage in extensive end-product processing and achieve large market shares there, and how they treat would-be entrants and former members.

Sectoral regulation and competition policy

In the telecommunications sector, the rules recognise the importance of competition. Adopted in 2000, they call for separating governmental functions from enterprise management, prohibiting monopoly, encouraging competition and facilitating development, openness, equity and fairness (Telecommunications Rules, Art. 4). Several specific requirements promote and protect competition. Major telecommunications enterprises may not refuse requests to connect to the network. Predatory pricing and unjustified cross-subsidies are prohibited. Customers can choose their service suppliers, and forced transactions are prohibited. The rules are administered by the Ministry of Information Industry and departments of information industry at provincial levels. Legislation for this sector is still being drafted.

In electric power, market reforms began in the mid-1980s, by permitting parties other than the central government to invest in generation. The Electric Power Law, adopted in December 1995, regulates entry, operation and pricing. The State Power Corporation took over most of the assets of the Ministry of Power in 1997, and in 2002 they were split into two transmission companies and five power generation groups. This separation of generation from transmission and distribution established an important precondition for wholesale and retail competition. Important aspects of regulating grid operation and pricing remain to be worked out. For example, local control over dispatch often means that preference goes to locally owned plants, which may be smaller and less efficient, while newer plants that are more efficient and have better pollution control may be left idle. The State Electricity Regulatory Commission, established in 2002, and electricity departments above the county level supervise and administer the industry. NDRC has policy, regulatory and administrative functions, such as making development plans and issuing project approvals. Competitive power pricing has been tested in Shanghai and five other provinces, but that pilot programme covered less than 10% of the electricity generated in those areas. Until now, power sector investors have had the security of sales contracts based on a cost-plus pricing regime. Planned retail pricing reforms include a mechanism to

adjust end-use prices to reflect fuel cost increases. In the long run, the pricing system is expected to be further reformed to make electricity prices fully cost-reflective and to give timely and adequate signals to consumers and investors. The price reform policy seeks to allow the wholesale market to determine tariffs on the generation side, while the government will regulate transmission and distribution prices as well as the relative prices to end-users.

Postal services are a public monopoly, governed by the Postal Law adopted in 1986. Mail delivery and related services with the characteristics of mail delivery are monopolies of the public postal enterprises, unless the State Council makes exceptions. The State Post Bureau and SAIC supervise and administer the postal law and postal service. Postal services have been the object of several complaints about anti-competitive forced sales. Objectionable practices range from specifications that, in effect, required using packing materials sold by China Post and envelopes produced by its affiliates to requiring patrons to open postal savings accounts or to use debit card services from a particular bank.

Administrative monopoly and competition advocacy

The principal administrative monopoly problem has been regional protectionism. In the first phase of reform in the 1980s, the rapid creation and expansion of town and village enterprises led to excess capacity. Many of these firms were below minimum efficient scale, or they needed sales to other regions in order to make a profit. Regions and their firms found themselves in rivalry. To protect struggling local enterprises and preserve jobs, many local governments set up trade barriers such as local customs posts and supported exclusionary tactics ranging from price predation to slashing tires. Overt barriers and exclusive dealing rules have been prohibited by the AUCL since 1993, and SAIC has had some success in correcting these "regional blockades".

But anti-competitive regional protectionism can take more subtle forms. Measures such as discrimination in taxes, standards, inspections and licensing also create significant barriers to commerce and competition. Local governments have sometimes blocked mergers that would eliminate the separate identity of local firms or prevented firms from exiting unproductive businesses through bankruptcy or merger. By interfering with restructuring in order to protect local business interests, local governments undermine the efficiency-promoting goals of reducing excess capacity and realising economies of scale. The general prohibition in the AML and the detailed listing of prohibited practices will extend enforcement oversight to indirect, complex abuses and barriers. Article 34, prohibiting discrimination, may provide a basis for the anti-monopoly enforcement authority to correct protectionist local decisions about mergers. If not, it may be useful to create another means for ensuring that national anti-monopoly authorities have the opportunity and authority to review and approve, or reject, mergers that fall below the thresholds for notification and approval under Chapter 4.

Observers, including the OECD, have identified the weakness of remedies under the AUCL as a reason for the persistence of regional barriers. A more significant problem may be the delegation of enforcement to local levels. Local enforcers are employees of the government that is engaging in the abuse. If the local enforcer of the AUCL finds a violation, its only power is to inform a higher level of the offending body. In this circumstance, enterprises have little incentive to make a complaint and the law enforcer has little incentive to act on complaints it does receive. Some transition competition law regimes provide for direct competition law enforcement to control administrative abuse.

The power is used infrequently, due to the obvious practical and political challenges it presents, but it can be valuable even if held in reserve. Correction and discipline by the administrative superior body, as provided by the AUCL and the AML, may be the strongest power that would be clearly consistent with current organising principles of China's government bodies. Authorising the anti-monopoly enforcement authorities to initiate the inquiry and recommend action gives them a positive role. The power to make the recommendation public could be important to making the process effective.

The role of the anti-monopoly enforcement authorities under Chapter 5 verges on advocacy, seeking correction of rules and decisions that impair competition. Article 37 prohibits regulations that eliminate or restrict competition, and thus it explicitly authorises the anti-monopoly enforcement authority to raise concerns about regulations that interfere with competition more than is necessary to achieve their other, presumably legitimate purposes.

Competition law and policy in the transition to a developed market economy

China's transition began by re-energising traditional market patterns in the countryside. Small-scale industry was encouraged to evolve out of the plan, and private and foreign-invested firms emerged to challenge state-owned enterprises that remained from the era of central planning. New entry, creating an intensely competitive product market, has been the most important external factor driving change in Chinese industry. State-owned enterprises were turned into corporations to improve their efficiency. However, this step just shifted their financial problems from the state budget to the state-owned banks, and another round of financial sector restructuring was needed to clear out zombie firms. While they were struggling under the new competitive conditions, the government encouraged "self-discipline pricing", evidently as a form of depression cartel. Despite these hesitations along the way, reform succeeded in replacing the command economy with a vigorous, competitive market without a "big bang" rejection of state enterprise and all of the other institutions of the planned economy.

In the first phase of reform, re-establishing confidence in the integrity of market transactions was more important than maximising efficiency by preventing monopoly and collusion. Thus the first law about competition was the AUCL. This was followed by laws to deal with obvious abuses involving prices and bidding. Similarly, after government institutions managed the economy for a generation, problems of administrative monopoly were considered more serious and more destructive than those of business monopoly. The second round of reforms since the early 1990s has set up the key financial, legal and regulatory institutions needed to support a developed enterprise economy. The capacities and qualities of many of these new laws and supervisory institutions remain to be established. With corporate governance and regulatory oversight both still embryonic, the principal constraint and discipline on corporate management has come from product market competition (according to a survey of Chinese company CEOs). Ensuring that competition can continue to discipline enterprises requires a strong legal and institutional foundation for competition policy.

China has now adopted a general competition law, as its economy has reached the point where all of its tools are needed to correct and deter exclusionary abuse, exploitation and collusion, and to control the creation of market power through structural combinations. The AML's most significant addition to the laws and rules that were already

in place is a comprehensive programme of merger control and notification. That addition marks a turning point in the transition process. There is still room in many sectors for consolidation to improve efficiency and achieve scale economies. But merger review under the AML will recognise the pro-competitive importance of improving efficiency, and thus it should permit consolidation while preventing and disciplining abuses that would deny the public the benefits. To be sure, some commentators in China have called for a competition law in order to protect Chinese business against foreign competitors. This apprehension may explain why the AML provides for national security review of acquisitions by foreign investors. The OECD has noted, in commenting on the similar requirement in the current merger regulations, that an extra hurdle like this could substantially impede the stability of cross-border merger and acquisition transactions (OECD, 2006). The case is still being made to the public that stronger competition law enforcement would benefit the economy. In the debate over the AML, some warned against going too far in prohibiting horizontal agreements, and defended price fixing as sometimes necessary to avoid cutthroat competition among Chinese firms, to protect safety and health, and to resist being taken advantage of by other countries. The extended debate about the AML itself shows how stronger competition policy marks an important stage in the transition process. The transparency of the process, in which drafters and legislators have welcomed comments from the public and from experts in China and elsewhere, has educated the world about the evolution of China's system of governance, as well as the development of its market economy.

Challenges of development – investment, institutions and social security – are replacing those of the transition from plan to market, now that the market has been re-established as the foundation of the economy. China faces the same challenges now as many other countries, to encourage more competition in sectors such as infrastructure, finance and primary materials: that is, the challenges typical of regulatory reform. Vigorous competition policy can help China achieve its development goals by channelling rivalry away from claims for rents and privileges into contests over efficiency and innovation.

OECD reports on China's economy and regulatory process have emphasised the importance of strengthening competition policy (OECD, 2002, 2005). These reports analysed conditions in China's markets to show why some indicators about the state of competition could mask problems. Where the structure of the economy still reflects the one-time goal of local self-sufficiency, or local barriers have prevented national markets from developing, national concentration ratios would understate concentration in relevant markets. Some national markets show structural problems. In many areas once dominated by the state economy, excessive vertical integration, due in part to the high cost of enforcing contracts, undermines efficiency and discourages entry. Some important industrial sectors – including petroleum processing, ferrous metallurgy, non-ferrous metallurgy, transport, and basic chemicals – have been relatively closed to competition. The reports noted that a market structure featuring low national concentration and many regional enterprises operating below minimum efficient scale has important implications for competition policy. Market distortions such as soft budget constraints, regional protectionism and exit barriers that undermine the efficiency goals of competition can nonetheless spark intense rivalry, even "destructive competition" that drives prices below marginal cost. Collusion to end these price wars typically breaks down quickly. As reforms make budget constraints harder and exit easier, consolidation to improve efficiency will reduce excess capacity but also raise industry concentration. Those conditions would facilitate oligopoly co-

ordination and even more durable, non-public collusion, making it more important for China to have an effective general competition law.

The OECD reports pointed out three important steps that China should take to make its competition policy more effective. By enacting a general competition law, China has taken the first of these steps. The AML incorporates concepts that are common to modern competition laws around the world. Priorities and means for applying these common principles often vary, though, responding to differences in legal and political traditions and in economic and development conditions. Thus the OECD (2002a) noted that for developed, competitive economies the top enforcement priorities are cartels and anti-competitive mergers, while many transition countries concentrate on demonopolisation; in China's situation in 2002, the top priority was preventing exclusionary practices. Implementation of common principles can vary too, as different economic conditions explain difference choices about "rules of thumb" such as *per se* rules and market share tests.

The structure and evolution of enforcement institutions depend on differences in political traditions and legal systems, which can reflect differences in values other than economic efficiency. In most jurisdictions, in the OECD area and elsewhere, core competition provisions are enforced by a single agency. In China, three bodies applied the previous laws, and the anti-monopoly enforcement authority established under the AML has the same three component bodies as well, as SAIC, NDRC and MOFCOM are designated as the enforcement authority with respect to their particular functions. In principle, unifying authority encourages policy coherence, while dividing authority creates inefficiencies. For example, expertise about a market gained while dealing with price fixing there would not readily be available to a different body dealing with a merger in the same markets. Experience in other countries with multiple enforcement bodies shows that the inefficiencies, though real, are not insuperable. Exchange of expertise can be encouraged by detailing or rotating the staff experts. Similarly, policy coherence may develop through interchanges of senior officials. In any event, institutional structures often embody policy choices that have emerged from extended political debate, and thus they can be particularly resistant to change.

Independence and transparency are more important for effective enforcement than institutional integration. None of the three bodies that enforce aspects of competition law is structurally independent from the government. Complete independence would be difficult to design in China's system of government. Thus transparency about processes and decisions will be important to show that they are based on sound, general principles rather than on bargains among interests. Government ownership of enterprises remains important in China, so competition policy must minimise the marketplace distortions that typically accompany government ownership, such as soft budget constraints and opportunities and incentives to confer preferential treatment. The best assurance of competitive neutrality in the treatment of state-owned enterprises is to keep anti-monopoly enforcement independent of the missions of industrial policy and promotion. Providing several institutional means for enforcement, with different constituencies and priorities, might also reduce the risk that enforcement would pursue unrelated goals.

The second step to more effective competition policy recommended (in OECD, 2002a) was to apply a competition policy approach to regulating infrastructure monopolies, in order to introduce efficient market competition where that is feasible and to improve government regulation where that remains necessary. Principles for pro-competitive regulation were drawn from experiences of OECD member countries and developing

economies. That report and others have also made analytical comments and recommendations about China's policies for electricity, natural gas, telecommunications and railways. China is in the process of applying this approach in several infrastructure sectors, notably electric power and telecommunications.

Box 3.4. **Steps in pro-competitive infrastructure reform**

- Define the boundaries between commerce and the state, and the respective roles of commercial enterprises to operate and the state to regulate. Competition is hampered where the division between state and commerce is unclear, because potential competitors to state-owned enterprise fear a "tilted playing field" and will hesitate to enter. Further, the separation means that government policy decisions must be made explicit in order for the commercial operator to carry them out.
- Establish state regulatory institutions that have the powers and the resources necessary to regulate commercial infrastructure enterprises so as to ensure that they achieve efficiency and other regulatory goals. These institutions will use regulations to create incentives for commercial entities by, for example, reducing regulatory barriers, ensuring fair and efficient access to essential facilities, and ensuring that regulation is predictable. Thus, a market environment requires regulatory institutions that make decisions that are neutral, transparent, and not subject to day-to-day political pressures or capture.
- Put into place corporate governance systems to ensure adequate control and incentives for commercial infrastructure enterprises.
- Use competition principles to specify the structures of the sectors and the regulations that will be applied to ensure that they are efficient and will meet universal service objectives.

Source: OECD, 2002a.

The third step represents the challenge for the future: to adopt and implement a comprehensive national competition policy. Underlying China's reform programme to establish a socialist market economy is a strong, implicit competition policy, to reduce entry barriers and promote markets. Now that the transition to an enterprise economy has matured and the important institutional structures are in place, China could benefit from a more explicit competition policy. A central element of a national competition policy would be a system to review laws and policies that affect market conduct, to locate and correct constraints on enterprise activity that are more stringent than necessary to correct market failure or to achieve other policy goals. An analytical framework for such a programme has been developed at the OECD. The OECD "Toolkit" for competition assessment provides a general methodology, beginning with a checklist to screen for laws and regulations that could restrain competition sufficiently to require more thorough analysis. A comprehensive competition policy should be applied to proposed laws and regulations as they are being developed, and also to existing laws and regulations. The central government should take the lead in developing and implementing this approach at the national level. Regulation at the regional and local level is also important, though, and indeed may be a more serious source of market distortions. The approach should also be applied to those levels of government, following guidance from the central government. The aim of a national competition policy is not to elevate competition above all other social and economic priorities. In asking whether laws and regulations interfere with enterprise

and initiative more than is necessary to achieve their policy goals, a national competition policy would detect and correct rules that constrain competition and growth.

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Defining the Boundary between the Market and the State

Chapter 4

Enhancing Market Openness through Regulatory Reform

The People's Republic of China is a large and rapidly growing economy that has benefited substantially from international trade and investment. Economic reforms beginning in 1978 under Deng Xiaoping have gradually introduced a market sector within a centrally planned economy, and leveraged international trade and investment to support this process. China's piecemeal process of economic reform over the past thirty years has yielded significant results in economic growth and integration into the global economy. China's accession to the WTO on 11 December 2001 symbolised its ongoing integration into the world economy by providing more secure and predictable market access both for China and its trading partners. WTO accession entailed obligations to implement a spectrum of reforms to broaden the adoption of market-based economic and trade policies. WTO obligations have been important to China not only in terms of locking in existing reforms, but in supporting domestic policymakers when advancing behind-the-border reforms to enhance the quality of existing market liberalisations. WTO obligations have and continue to underpin systemic institutional and regulatory reforms across the administrative bodies governing the Chinese economy. Domestic political conditions for further "second generation" trade-related reforms – tackling border and domestic regulatory barriers are becoming more difficult. Industrial policy interventions and restrictions on foreign investment have marginally increased in recent years. This chapter traces the path of China's regulatory reform in the trade area. It pays special attention to the way in which rules are implemented. This report uses as its basic yardstick the six "efficient-regulation principles" developed by the OECD. The chapter concludes with a series of policy options which Chinese authorities should consider as they move toward a fully open and efficient trading system.

Introduction

The People's Republic of China is a large and rapidly growing economy that has benefited substantially from international trade and investment. Economic reforms beginning in 1978 under Deng Xiaoping have gradually introduced a market sector within a centrally planned economy, and leveraged international trade and investment to support this process. Often described by Chinese policy makers as "*mo zhe shi tou guo he*", or "crossing the river by feeling for stones under foot", the country's piecemeal process of economic reform over the past 30 years has yielded significant results in economic growth and integration into the global economy.

China's accession to the WTO on 11 December 2001 symbolised its ongoing integration into the world economy by providing more secure and predictable market access both for China and its trading partners. WTO accession entailed obligations to implement a spectrum of reforms to broaden the adoption of market-based economic and trade policies. WTO obligations have been important to China, not only in terms of locking in existing reforms but also in supporting domestic policy makers when they advance behind-the-border reforms to enhance the quality of existing market liberalisation. WTO obligations have underpinned systemic institutional and regulatory reforms across the administrative bodies governing the Chinese economy, and continue to do so.

Domestic political conditions for further "second generation" trade-related reforms – tackling border and domestic regulatory barriers – are becoming more difficult. Industrial policy interventions and restrictions on foreign investment have increased in recent years, albeit marginally. This chapter traces the path of China's regulatory reform in the trade area. Special attention is accorded to the way in which rules are implemented, with the six "efficient regulation principles" developed by the OECD serving as the basic yardstick. The chapter concludes with a series of policy options that the Chinese authorities could consider as they move toward a fully open and efficient trading system.

The economic and trade policy context

China's opening to world trade over the past 30 years is one of the more impressive aspects of its economic reform and structural change. This move has been a gradual and highly managed transition. China began by allowing export processing on a small scale. As manufacturers were drawn into world markets, export processing grew substantially, facilitated by currency appreciation in neighbouring Asian countries. With greater incentives to fragment production in search of lower-wage labour, investments also increased in China. The result was that this previously closed economy was increasingly integrated into East Asia's dynamic production chains.

In 1992, when China declared its intention to establish a "socialist market economy", it began to unilaterally cut tariffs. As Table 4.1 shows, the reduction of tariffs during the 1990s has resulted in China being perhaps one of the most open developing countries to join the WTO in 2001. The simple average Chinese tariff rate was reduced from 42.07%

Table 4.1. **China's simple and trade-weighted statutory tariffs, 1992-2006**

Percentage

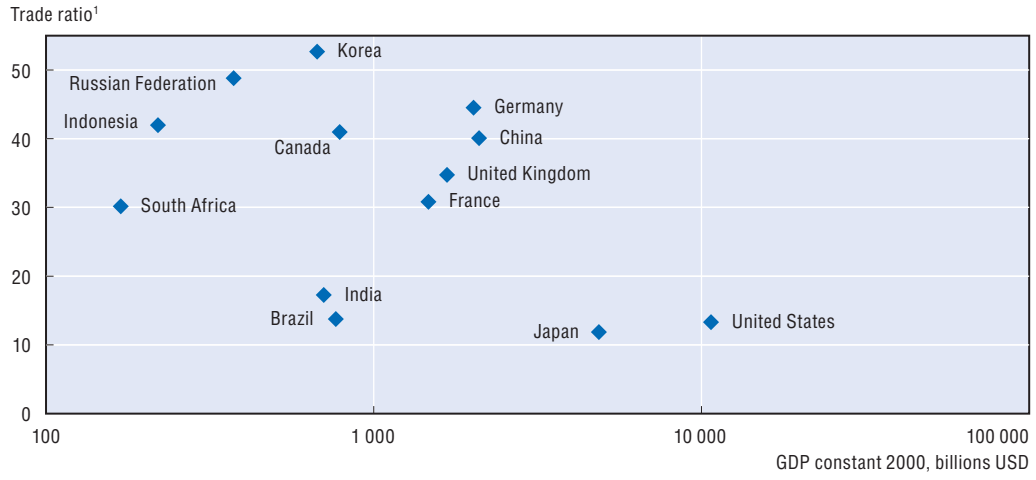
		1992	2001	2004	2005	2006
Total Trade	**Simple average**	**42.26**	**15.92**	**10.49**	**9.78**	**9.81**
	Weighted average	**32.17**	**14.11**	**5.96**	**4.90**	**4.39**
Capital goods	Simple average	27.43	13.88	8.25	8.08	7.86
	Weighted average	26.65	11.73	4.19	3.93	3.18
Consumer goods	Simple average	63.95	21.05	14.42	13.28	13.40
	Weighted average	63.76	18.90	12.41	10.02	9.67
Intermediate goods	Simple average	35.09	13.39	8.53	7.94	7.96
	Weighted average	33.59	12.66	7.50	6.54	5.91
Raw materials	Simple average	32.96	14.38	10.09	9.46	9.88
	Weighted average	8.63	27.13	5.09	2.61	2.99

Source: UN Trans Database.

in 1992 to 15.88% in 2001. After accession, the average tariff dropped to 9.82%. Beyond the increase in market access for its trading partners, this reduction has spurred major efficiency and productivity improvements in China.

China's trade openness can be measured by the ratio of total exports and imports in GDP. This ratio is usually used as an indicator to measure a country's "openness" or "integration" in the world economy, but it is influenced by various endogenous factors, such as the size of the economy, distance from major or dynamic markets, and variations in economic growth. China's trade turnover/GDP ratio is comparatively high in relation to the OECD member countries as well as BRIIC economy averages.

Figure 4.1. **Trade ratios[1, 2] in BRIICS countries and selected OECD countries, 2006[3]**



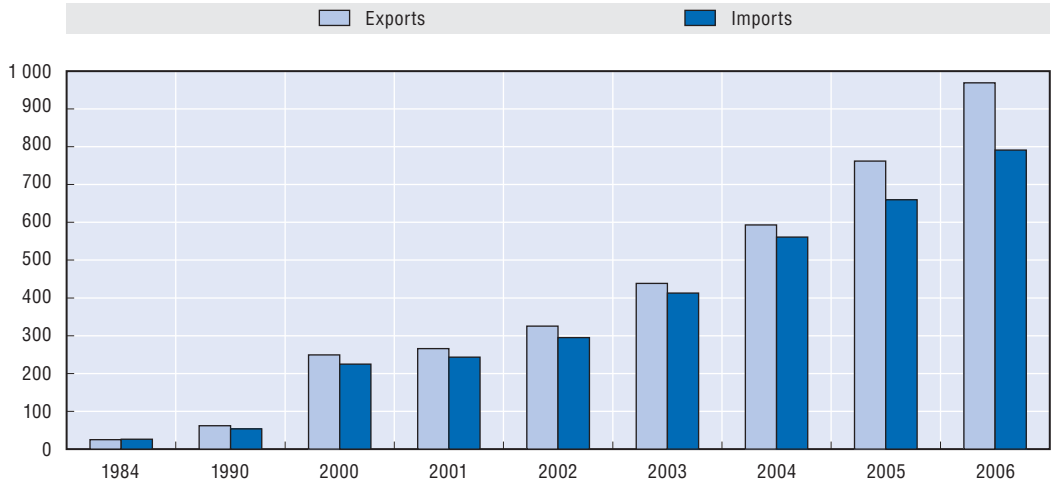
1. Average of exports and imports of goods and services as a share of GDP (constant 2000 USD).
2. Logarithmic scale on the horizontal axis.
3. 2005 for Canada, Japan and United States.

Source: World Development Indicators.

The expansion of China's international trade has been the key in its rising prominence in the world economy, with average annual growth rates of trade three times world rates. Figure 4.2 tracks China's goods exports and imports over the past two decades; it shows a

Figure 4.2. **Trend in China's foreign trade, selected years**

In billions USD



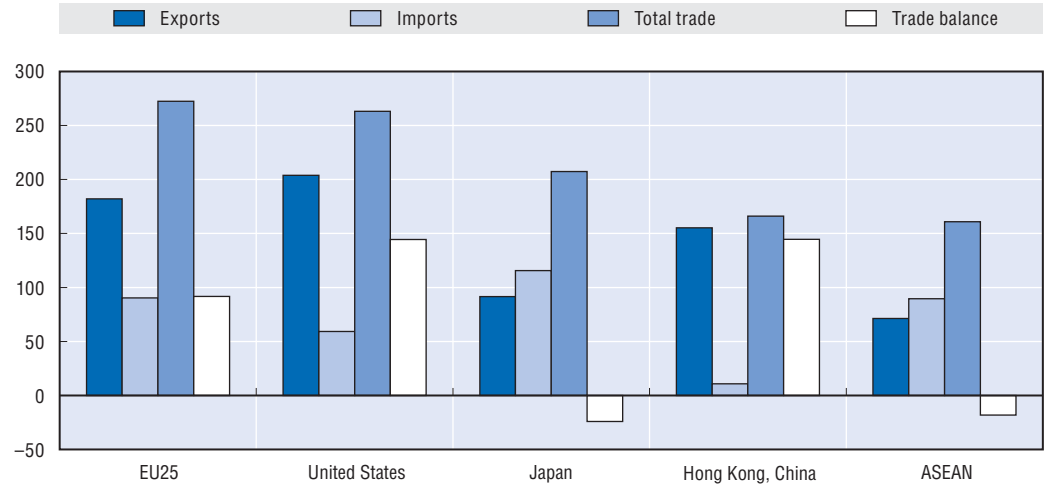
Source: UN ComTrade Database, 2007.

significant surge since its 2001 WTO accession, with a trade surplus reaching over USD 177 billion in 2006. The unsustainable nature of China's current trade surplus has received official recognition as a prominent problem by the then Chinese Minister of Commerce Bo Xilai; he has made reducing the trade surplus a top priority' of the year's [2007] foreign trade development (CHINA Daily, 2007).

China's trade expansion in part reflects greater specialisation in production in the Asia region. China has emerged as the final processing and assembly platform for a large volume of exports originating in its Asian OECD neighbours but destined for markets in Europe and North America. Almost half of China's exports are part of this "triangular"

Figure 4.3. **China's top trading partners, 2006**

In billions USD



Note: ASEAN corresponds to Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam.

Source: UN ComTrade Database, 2007.

pattern of trade. This has resulted in a shift in China's bilateral trade relationships, which now show increasing trade surpluses with Europe and North America and rising deficits with many Asian countries (Figure 4.3).

Institutional reform

As part of China's 2001 WTO accession and its further integration into the multilateral trading system, the country committed to adopting more market-based economic and trade policy reforms. In order to implement these reforms, China streamlined its bureaucracy and reorganised its major trade-related institutions. Although the country's highest executive body – the State Council – has carried out five large-scale institutional reforms over the past 20 years,[1] the 2003 reform put in place the necessary institutions for implementing a more market-based policy agenda. In March 2003, the First Session of the 10th National People's Congress approved the State Council's Institutional Restructuring Plan. The Plan reduced the number of ministry-level departments from 29 to 28, created two new departments and restructured five old departments. As a result, several major agencies were formed, including the Ministry of Commerce (MOFCOM). Aiming to integrate China's domestic and foreign trade policy into one ministry, the former Ministry of Foreign Trade and Economic Co-operation and the State Economic and Trade Commission were dismantled and their work incorporated into the new MOFCOM.

An iterative process of reforming economic policy and then the economic institutions that carry them out has come to be the hallmark of the gradualist approach to economic reform in China. Current institutional reforms indicate that China is increasingly orienting its domestic economy to facilitate continued integration with the global economy. China's institutional architecture has historically been characterised by the separation of regulatory institutions handling domestic and international regulation, even in identical fields. Its recent institutional reforms, however, have merged institutions once divided by domestic and international work streams, particularly when they had similar regulatory functions. The mergers that established the Administration for Quality Supervision Inspection and Quarantine (AQSIQ) in 2001 and MOFCOM reflect this trend in consolidating economic agencies along functional lines. Such consolidation, of a type followed by many OECD countries, should strengthen China's regulatory capacity to participate in the global economy.

The policy framework: Basic principles

The general objective of regulatory reform is not deregulation or less regulation, but better-quality regulations supported by adequately designed and functioning regulatory institutions. The OECD has developed "efficient regulation principles" to guide the development of trade-related policy and its institutional regulatory framework. Among them, the principles that can also serve to monitor the progress of individual countries are as follows:[2]

- *Transparency and openness* of decision making. Information on new and revised trade-related regulations is necessary to foreign firms and investors, so that they may accurately assess potential costs, risks and market opportunities.
- *Non-discrimination* means equality of competitive opportunities among like products and services, irrespective of country of origin.

- *Avoidance of unnecessary trade restrictions*. To fulfil legitimate objectives, governments should ensure that regulations are not more trade-restrictive than necessary.
- *Use of internationally harmonised measures*. To avoid the additional costs resulting from cross-country disparities in standards and technical regulations, countries should use internationally harmonised measures when appropriate and feasible.
- *Streamlining conformity assessment procedures*. The negative effects of duplicative conformity assessment systems can be reduced by recognising the equivalence of regulatory measures and the results of conformity assessment performed in other countries.

Transparency: Equal access to information

Transparency is perhaps one of the most important criteria for the continuous development of a healthy business environment in China. China's evolving legal and regulatory framework shows improving conditions of transparency in the dissemination of information. Regulatory transparency – that is, equal access to information on the legal and regulatory framework – is a prerequisite for effective competition. It is essential for all market participants, but particularly to foreign operators coping with additional obstacles such as language barriers and country-specific business practices. Regulatory transparency has three main aspects: *i)* access to information on existing regulations, *ii)* openness to the rulemaking process through public consultation prior to the adoption of final regulations, and *iii)* the possibility of market participants accessing appropriate appeal procedures. In addition, transparency is essential for ensuring international competition in two specific areas: *iv)* technical regulations and *v)* government procurement.

Information dissemination

The first aspect of transparency is easy and open access to information. Every firm operating in the market should have information about regulations, procedures and other measures that affect its interests and indicate the conditions, constraints and risks that firms will encounter in the market. Having all this information reduces uncertainties over applicable requirements and helps companies to better foresee the costs and returns of their trading activities and investments. Access to information is particularly relevant for foreign firms and new market entrants as they are often unfamiliar with the local regulatory environment – and at times the economic, political, social and cultural environments.

In its efforts to ensure transparency in terms of information dissemination, China has committed to publishing and making readily available all laws, regulations and other measures concerning trade in goods and services. China has gone a step further than many WTO members in terms of its transparency commitments by establishing an enquiry point. The enquiry point is responsible for addressing requests for clarification of laws and regulations affecting trade and for providing all laws and regulations in Chinese as well as one official WTO language. Since 1987, China has drawn up more than 280 transparency-related laws and regulations (WTO, 2006d, p. 37). Although not trade-specific, the Chinese government recently made significant efforts to increase transparency by adopting its first nationwide government information disclosure system on 24 April 2007 – which took effect on 1 May 2008 – with the *Regulations of the People's Republic of China on Open Government Information* (OGI Regulations) (Horsely, 2007). The OGI Regulations put forward two ways of

assessing government information. The first is dissemination by government agencies, on their own initiative; the second is disclosure in response to requests for information within 15-30 business days. Importantly, the OGI Regulations will apply not only to the central but also to the provincial, county and township levels of government. Their success, however, will depend on the quality of implementation and enforcement.

The *Legislation Law*, which came into effect in July 2000, requires that all laws and regulations except those enacted by the National People's Congress (NPC) be published prior to their coming into force. This legal guarantee of transparency was an important step in the development of transparency in the area of publications. New laws and regulations of the People's Republic of China can be found on the government's official website in Chinese, *www.gov.cn*, and are often available in English, *http://english.gov.cn*. The General Office of the State Council has designated China's *Foreign Trade and Economic Co-operation Gazette* (Gazette), issued by MOFCOM, as the publication to contain all trade-related laws and regulations. The State Council stipulated that the Gazette appear on a regular basis and be readily available to individuals and enterprises (MOFCOM, 2002a, b). It is available on the Ministry's official website, at *www.mofcom.gov.cn*.

By March 2006, the State Council had issued a notice directing all central, provincial and local government entities to send all trade-related measures to MOFCOM for publication in the Gazette (USTR, 2008). MOFCOM has sought to make the Gazette a single source for trade- and investment-related regulations. However, research suggests that although most laws and regulations affecting trade and investment are published in some format, they are not always published in the Gazette. In April 2006 at the United States-China Joint Commission on Commerce and Trade (JCCT), the Chinese authorities agreed to publish all laws, regulations and other measures of all government ministries and agencies at all levels pertaining to or affecting trade in goods, services, IPR and the foreign exchange regime in the Gazette (JCCT, 2006).

Indications are that within the past year, other ministries have increasingly been publishing their laws and regulations in the Gazette. However, one source claims that many ministries still fail to publish their final policies – and MOFCOM has no administrative powers to enforce compliance (USFCS, 2007, p. 116). Even with the availability of information from other online sources (such as *www.Chinaonline.com* and *www.sinolaw.com.cn* in English and *www.sohu.com* in Chinese), a consolidated and comprehensive journal is still needed.

Information on the General Administration of Customs in China can be found in the quarterly publication *China Customs,* published on the website *www.customs.gov.cn*. Additional information can also be found in the *Chinese Statistical Yearbook,* published on the website *www.stats.gov.cn*. Data on regulatory measures concerning foreign exchange are available at the website of State Administration of Foreign Exchange, *www.safe.gov.cn*, where an email (*safe-info@mail.safe.gov.cn*) is provided to allow for more detailed inquiries.

A predictable policy environment and simplified procedures are perhaps the two fundamental components of transparency. In conjunction with this study, the OECD surveyed member country firms on specific regulatory barriers they faced in China.[3] Businesses were asked questions on issues of transparency and predictability of laws and economic policies. Even given the improved transparency since WTO accession, the survey indicated there were still problems with up to date information on existing policies. More than 55% of the respondents indicated that the problems were "medium" to "serious".[4]

When asked about information on changes in regulations, the results similarly showed that almost 59% of the foreign firms reported medium to serious problems.[5]

China made a strong commitment to translating all laws, regulations and other measures concerning trade into at least one of the official WTO languages (WTO, 2001, pp. 69-70) as part of its WTO accession commitments. Currently, 96% of central government institutions and most of the local governments have launched their respective official websites (WTO, 2006b, p. 12); however, the amount of information available on the websites varies significantly, particularly at the local level. An OECD study published in 2005 indicates that Chinese officials are well aware that their websites may be visited outside China. It found that 53.6% of Chinese government websites had English language versions, 10.4% had Japanese versions and 22.3% had traditional Chinese character versions that are used in Chinese Taipei and Hong Kong, China (OECD, 2005a, p. 155).

Consultation mechanisms

A second fundamental aspect of transparency relates to the openness of the regulation-making process, in particular, the opportunity for all stakeholders to participate in formal or informal consultations. Consultations and equal access to them have important effects on the quality and enforceability of regulations in general, on the efficiency of economic activities, and on the level of market openness.

The Chinese government is seeking to support the consultation process with pronouncements at higher political levels and limited experimentation. In March 2006, Wu Bangguo, Chairman of the NPC's Standing Committee in his annual report to the Standing Committee of the 10th National People's Congress – reinforced the need for public consultation. He stated that China would further promote democratic principles in its legislation by increasingly soliciting public opinion. "We will continue to publish draft laws, to solicit suggestions and to hold increased public hearings on bills which the public care about the most" (China News, 2006). One example has been the draft *Law on Property Rights*. Appearing in print media and the Internet in July 2005, the draft law received 6 515 suggestions in the first 16 days (China News, 2005) and had received a total of 10 000 comments by March 2006. In March 2007, China's National People's Congress adopted the law, which came into effect on 1 October 2007.

According to provisions of draft legislation adequate time for meaningful consultations with all relevant stakeholders is the cornerstone of a predictable regulatory environment that is conducive to large and long-term investments that maximise overall welfare. There are indications that China has made progress in the transparency of its rule-making process. In specifically allowing for public consultations on draft legislation, the *Legislation Law* (2000) has advanced this area of reform. Consolidating the benefits of transparency in the rule-making process will require further that consultations are mandatory for all relevant stakeholders and that draft laws are similarly made available prior to consultations. The current approach of providing "guidance" or "opinions" to select stakeholders (USFCS, 2007, p. 116) has meant that lawmakers are not implementing laws with input from all relevant stakeholders. As a result, not all interested stakeholders (often foreign ones) are able to provide relevant information to China's lawmakers on how legislation can be improved. This is particularly the case when foreign enterprises are not provided with draft legislation for review in instances where domestic stakeholders have had access to draft legislation (USFCS, 2007, p. 116).

China has demonstrated increased commitment to regulatory transparency. A recent study notes that foreign businesses have had the opportunity to comment on the draft *Labour Contract Law*, the *Anti-Monopoly Law* and many industry-specific regulations (American Chamber of Commerce, 2007, p. 18; European Union Chamber of Commerce in China, 2007, p. 11). Although foreign enterprises are sometimes included among the "concerned constituents", they tend to be treated less favourably than domestic counterparts. The study further indicates that authorities often circulate drafts to academics, individuals and some of the affected companies, but often exclude foreign firms. Summaries of provisions rather than the full drafts of the laws are released, little information is provided on time frames for written comments – or, if time frames are included, they are much shorter than international standards (American Chamber of Commerce, 2007, p. 18).

Similarly, foreign enterprises were not consulted or provided draft legislation for consideration in a recent case concerning new regulations on cross-border mergers and acquisitions (OECD, 2006a). The MOFCOM posted on its website in Chinese (MOFCOM, 2008)a new set of *Regulations on the Acquisition of Domestic Enterprises by Foreign Investors* (2006 Regulations), but only one month before they took effect, on 8 September 2006. There appears to have been no notification to the relevant external parties concerned, and no opportunity to submit comments (OECD, 2006c, pp. 2 and 4).

This lack of consultation is also evident from the OECD survey on the business environment in China. Foreign firms were asked about the adequacy of consultation with business entities prior to introducing new laws or economic policies. The results showed that over 70% of the firms surveyed found there were medium to serious problems. When asked specifically about access to information on legislation regarding mergers and acquisitions, over 56% of the respondents reported difficulties.

There are examples where the government is trying to improve consultations with the relevant parties. The *Provisional Regulation on Administrative Transparency* (Provisional Regulation) applied by MOFCOM is a useful example already operating within the Chinese regulatory system. The Provisional Regulation requires the ministry to release drafts of rules that may affect non-government interests for a minimum 10-day comment period and to take public comments into consideration when the draft regulations are finalised. The rules also describe the channels to be used to disseminate the drafts and the publication deadlines for each channel. The Provisional Regulation may be a case in which WTO accession has supported beneficial domestic regulatory reform, as it is substantively related to the 2002 State Council *Notice on How To Handle the Notification, Enquiry and Review Work After Entry Into WTO Issued By the Office of State Council* (Notice). The Notice mandated that a reasonable period should be granted to collect comments and suggestions after publication and before enforcement of the laws, administrative regulations and other measures involving or affecting trade. The exceptions are those involving national security, the foreign exchange rate and monetary policies, and measures whose publication would obstruct their enforcement.

The Ministry of Commerce has issued several key drafts for public comment, including the 2004 amended *Foreign Trade Law*. Shang Ming, the Director-General of the Treaty and Law Department of MOFCOM, noted that the ministry solicited the opinions of domestic experts, scholars and institutions widely during the drafting process of the revised *Foreign Trade Law*. Those asked included commercial branches of foreign organisations, economic

representative institutions and foreign invested enterprises (FIEs) in China.[6] Many of the comments on the draft from foreign interests have been incorporated into the final law. In a similar example, the consultation process applied in the preparation of China's *Anti-monopoly Law* has been commended both for the transparency of the process – drafts had been provided to relevant stakeholders, including foreign ones, throughout the process – and for the fact that the comments had been reflected in the subsequent drafts (USFCS, 2006, p. 155).

Important signs of the Chinese government's own efforts to review transparency can be found in a State Council report published in early 2006, which presented an evaluation of government websites (CCID Consulting Co., 2006). The findings of the study notably support the reform of transparency regulations in the direction of the Provisional Regulation applied by MOFCOM. This study and the updated information from the WTO's Trade Policy Review of China reported that by end-2006, of the 76 agencies under the State Council, including ministries, public institutions, offices and administrations, 73 had official websites. For local government, all 31 provincial governments and 323 of 333 city governments had websites (WTO, 2008b, p. 30). The study further found that the websites provided facilities for public feedback through suggestion boxes, contact points for relevant officials and public opinion surveys. However, little information was available regarding the responsiveness of the government to such feedback. Indeed the study highlighted the need for mechanisms to ensure that suggestions and opinions can be assessed and answered in a timely and accountable fashion (WTO, 2008b, p. 30).

Appeals procedures

A third important aspect of transparency is the openness of appeal procedures. Market participants who have concerns about the application of existing regulations find it important to have appropriate access to appeals procedures. Regulations are better accepted and work more efficiently if both domestic and foreign economic actors have access to remedies when they are confronted with overly burdensome or unclear regulatory requirements, or unsatisfactory results. These remedies can be included in formal legislation, or they might be part of effective informal channels for lodging and advancing complaints that are open to domestic and foreign parties. In either case there should be clearly defined time limits for appeals processes, and adequate explanations, when for example requests are denied.

Systematic and transparent procedures for appeals remain an important instrument of transparency as they allow misinterpretations of laws and regulations to be reviewed and corrected. A smoothly operating appeals system clarifies the meaning of laws by reducing the uncertainty created when instances of misinterpretation are left unchallenged. A culture traditionally more supportive of mediation over legal outcomes resulting from adversarial approaches, China continues to have a legal system that places heavy emphasis on mediated outcomes. Today, it remains the case that more than half of legal cases are resolved through mediated outcomes, although it is unclear if challenges to administrative actions are included in this figure (WTO, 2006d, p. 33).

Efforts have been made to strengthen the process of judicial review in China; improvement is likely to continue "incrementally". Hurdles to substantial improvements in the short run stem from a culture and history that today leave China with the interconnected difficulties of insufficiently qualified judges, pervasive corruption and significant limitations on judicial independence (OECD, 2005a, p. 296). As part of its WTO

accession commitments, China agreed to establish "tribunals" in which appeals could be made regarding administrative decisions and interpretations of trade-related laws and regulations (WTO, 2001, pp. 14-15 and 75), but no data on the operation of tribunals were available at the time this report was being prepared (USTR, 2006a, p. 159). The WTO *Report of the Secretariat* prepared for the Trade Policy Review conducted on China in 2006 indicated that in the case of appeals regarding administrative procedures, parties are able to make appeals to higher courts. Where an appeal has been made to the people's court of second instance, the decision is final. Only in cases where the relevant procuratorate considers that the decision is in error is there a possibility for a retrial at the same level as in the previous case (WTO, 2006d, p. 33).

Transparency in the field of technical regulations and standards[7]

Transparency in the field of technical regulations and standards is essential for firms facing diverging national product regulations. Transparency reduces uncertainty over applicable requirements and thereby facilitates access to domestic markets. Best practice in transparent regulatory regimes entails not only access to information, but transparency in the standards-setting process. The area of standards development is one in which the ability of all stakeholders, including foreign ones, to contribute to the process will lead to the adoption of standards that are both effective in attaining regulatory objectives and efficient in the manner that they do so. Significant efforts to restructure the standards-related bodies in China have fostered more coherent institutional relationships and contributed to transparency in the field of technical regulations and standards.

Prior to China's entry into the WTO, the country's regulatory system for standards and conformity assessment was fractured. There existed different schemes, product catalogues, charges and technical requirements run by different organisations. Such regulatory divergence in technical regulations and standards made the system opaque and created obstacles to domestic and international trade alike. In anticipation of its WTO accession, China undertook significant institutional restructuring and regulatory reforms to enhance the co-ordination and transparency of its standards and technical regulations framework. Regimes were put into place to address problems that foreign companies had encountered in locating relevant regulations and understanding how they would be implemented. Steps were also taken to overcome poor co-ordination among the numerous regulators in China. The intended result was to unify technical regulations, standards and conformity assessment procedures; create one compulsory product catalogue and mark; and standardise charges. By enhancing transparency at the systemic level, regulatory uncertainly was reduced both for domestic and foreign enterprises.

In 2001, China began to take steps to address problems associated with its multiplicity of standards-setting and conformity assessment bodies. In April, the State Council merged the former State Administration for Entry-Exit Inspection and Quarantine (CIQ) and the State Quality and Technical Supervision Bureau (QTSB) into a new ministerial-level agency: the Administration for Quality Supervision Inspection and Quarantine (AQSIQ). The merger was designed to eliminate discriminatory treatment of imports and requirements for multiple testing. AQSIQ's administrative authority is broad. It manages China's standards and conformity assessment regulatory structure, enforces compliance with certification requirements, and conducts quality entry-exit inspections for commodities. AQSIQ reviews and approves China Compulsory Certification (CCC) product catalogue, issued jointly with the China Certification and Accreditation Administration (CNCA).

The significant efforts put into overhauling the standards regime have advanced institutional coherence, and thus transparency. This process is ongoing, however; much scope exists to improve regulatory quality to meet the potential enabled by the new institutional relationships. The consolidation of two former agencies to create AQSIQ in the standards area resembles the case of MOFCOM; both bodies were created from two functionally similar organisations that were previously autonomous due to the historical division of labour between agencies dealing with international *versus* domestic affairs. However, the sheer number of agencies that are involved at different levels of government – among which AQSIQ must co-ordinate activities – makes the product of this merger in the standards regime much more complex.

Difficulties with co-ordination continue to prevent the reorganisation from yielding the full transparency benefits that it was intended to create. The sense that the reorganisation has taken place institutionally while not necessarily in operation is most evident in the case of China's notification of technical regulations and assessment procedures to the WTO. MOFCOM has been designated as the single authority for making notifications on technical and Sanitary and Phytosanitary measures standards to the WTO. This was due to the long list of Chinese government ministries and agencies that are able to approve and promulgate technical regulations.[8] Institutional reforms have been implemented to require domestic standards-setting organisations to report all new standards to MOFCOM. Concerns remain that with the exception of AQSIQ and the Standardisation Administration of China (SAC), other standards-setting agencies are not fulfilling their reporting requirements to MOFCOM, and thus to the WTO (USFCS, 2006, p. 128). To address this situation, an interagency committee chaired by AQSIQ was formed in 2003 to try to achieve better co-ordination for reporting new technical standards to MOFCOM (USFCS, 2006, p. 128).

Increased effort to ensure that draft standards are sufficiently complete for effective review and that adequate time is allowed for meaningful consultations on draft standards is elemental to reaping the benefits of transparency in the rulemaking process. The periods provided for comments by China on new draft standards after they have been notified to the WTO have sometimes been insufficient to allow for meaningful consultations (USTR, 2006a, p. 109). Clear efforts have been made by China to move its standards regime towards international practice; however, foreign enterprises continue to experience difficulties attaining membership to private standards-setting bodies. On occasions that foreign enterprises have been able to secure membership it has been in a non-voting capacity, and foreign firms have had to pay membership dues much higher than their domestic counterparts. Renewed effort to engage all stakeholders within the standards-setting process will be needed to improve transparency.

In a further move to restructure and increase transparency, China established a new accreditation body called the China National Accreditation Service for Conformity Assessment (CNAS) in March 2006. In addition, China replaced the CCIB (China Commodity Inspection Bureau) mark for imported products and the Great Wall mark for domestically produced goods with China Compulsory Certification (CCC) mark in August 2003. The establishment of the CCC was an important achievement, in that it sought to remove the distinction between compulsory standards for products intended only for domestic use and those traded internationally. The CCC should thus reduce inconsistency and support more uniform quality product standards for Chinese consumers. To enhance the benefits of implementing the CCC mark, however, more effort should be directed both to clarifying

the definition for products requiring this certification and to improving the consistency by which regulators identify such products (EUCCC, 2007a, p. 12).

Transparency in government procurement

Transparency of procedures and practices relating to government procurement is another critical determinant of market openness. Government procurement is an area not covered by WTO rules except for those members that join the WTO Government Procurement Agreement (GPA). WTO members joining the agreement are bound under the GPA to provide enterprises from other members of the GPA non-discriminatory access when bidding on government contracts above pre-specified thresholds. Possibly more important than opening domestic procurement markets to foreign bidders are the transparency provisions that must be applied once a WTO member becomes party to the GPA. Benefits of transparent government procurement procedures can be substantial given that government procurement can account for 15-20% of GDP in most countries (WTO, 2006d, p. 94). China's WTO accession commitments contained a pledge to join the GPA as "soon as possible". In February 2008, China took its first steps towards accession to the GPA when it presented the first draft of its schedule of commitments.

Reforms of China's government procurement practices date at least as far back as 1980.[9] From the mid-1990s, the Chinese government sought to bring its procurement practices in line with international practices, using guidelines from the World Bank and Asian Development Bank to prepare initial drafts of procurement regulations (Chou, 2006a, p. 434). In apparent anticipation of China's eventual accession to the GPA, the *Government Procurement Law,* which came into force in 2003, has been described as one that "attempts to follow the spirit of the GPA and incorporates provisions from the United Nations Model Law on Procurement of Goods" (USTR, 2006a, p. 154). Importantly, the law removed the limitation on foreign suppliers participating in government procurement and prohibited unreasonable discrimination against any suppliers. It should be noted that Article 10 of the same law exempts the construction services sector.

Rules on the publication of information are detailed and specify the media outlets on which procuring entities must make detailed information available. On 1 July 2000, the National Development and Reform Commission (NDRC)[10] indicated that the Ministry of Finance (MOF) government procurement website (*www.ccgp.gov.cn*) and several newspapers were the official media for posting tender notices. In addition to this site, 31 provincial-level governments set up similar websites. In 2004, MOF issued measures detailing rules on bidding procedures, publication of information and the handling of complaints. These rules apply to central government financed government procurements above a pre-designated threshold, which in 2004 was RMB 1.2 million. Significantly, MOF and local finance administrations provide facilities for appeals and are required to respond to complaints by bidding entities. At least ten such cases have been heard to date (WTO, 2006d, p. 97). In cases where these responses are considered unsatisfactory, application can be made for administrative review, or an administrative suit may be filed in court.

Unless a WTO member has joined the GPA, the WTO Agreements do not impose disciplines related to local content or technology transfer requirements in the area of government procurement (as they do in other areas of trade). Improving application of parallel disciplines in the area of government procurement – or better yet, acceding to the GPA – clearly advances market openness and its benefits. Measures recently adopted in December 2007 provide preferences to local procurement,[11] and reports from within the

international business community suggest that some awards of procurement contracts have been made contingent on technology transfer agreements. Such practices tarnish the attractiveness of the Chinese government procurement market to the most efficient and advanced providers of goods and services, and reduce their ability to support the modernisation of China's government facilities and national infrastructure. Improving the market openness of China's government procurement market *vis-à-vis* world-class providers of goods and services is an important way to strengthen the China's government capacity to provide a high-quality regulatory environment and efficient infrastructure for growth. China's process of accession to the GPA represents a clear opportunity to leverage access to the sizeable government procurement markets of GPA members.

Although MOF has made efforts to increase transparency, the information on the website and tender notices are available in Chinese only. Hence, foreign suppliers unfamiliar with the language encounter *de facto* discrimination. If and when China joins the GPA, the provision of information in one of the WTO's official languages (English, Spanish or French) should be encouraged. Although provincial websites have been set up, some lack the most basic information. This limits business opportunities for both domestic and foreign suppliers (Chou, 2006a, p. 434). Perhaps one of the most pressing problems is the considerable discretion local officials use to carry out procurements without prior authorisation [Xinhua (Online), 2005]. Not only does this hinder the government's ability to make appropriate budget forecasts for procurement, but it also allows opportunities for corruption.

The Chinese government is aware of the problems in government procurement. In May 2006, as part of its efforts to continue financial reforms and promote government transparency, then Finance Minister Jin Renqing announced the government's intention to crack down on corruption in its USD 37.5 billion government procurement market. The Ministry also set up a telephone hotline for the public to report corruption and irregularities (Xinhua News Agency, 2006a). According to the study, the potential savings of a well-organised procurement system in China could be as large as 10-14% of the Chinese procurement costs (Chou, 2006b, pp. 542-543). Such cost savings, together with the increasing openness of the economy to foreign trade and investment, are spurring the Chinese government to harmonise its government procurement regulatory framework with international practices.

Non-discrimination: A core concept

Non-discrimination is the idea underlying the two core obligations of the world trading system: the Most Favoured Nation principle, which holds that goods and services from all countries are to be treated equally, and national treatment, in which foreign goods and services are to be treated on an equal footing with their domestic equivalents. WTO members must comply with both rules. But the regulatory principle of non-discrimination goes still further: it seeks to ensure that domestic regulations give equal opportunity to similar goods and services from all sources.

The following sections review progress in non-discrimination by examining three areas of the Chinese regulatory system. The first looks at investment and restrictions on entry and operations of foreign firms. The second part examines trading rights where significant improvements have been recorded. The third section reviews preferential trading agreements.

Restrictions on entry and operations of foreign firms

China's trade and investment liberalisation over the past few decades has created an attractive business environment and significantly impacted foreign direct investment (FDI) inflows. FDI has grown from almost USD 3.5 billion in 1990 to over USD 70 billion in 2006. China is the third-largest recipient of FDI in the world after the United States and United Kingdom, and the single largest developing country recipient of FDI. On a per capita basis, however, FDI is diminutive in China in comparison to the United Kingdom and the United States and, by this measure, would likely not be the lead recipient of FDI among developing countries (UNCTAD, 2006, pp. 299-301). This gap suggests that room exists for China's inward FDI to grow, particularly if institutional and regulatory reforms integrating the principles of market openness make the central and western provinces of China more attractive regulatory environments in which to invest.

One of the first steps taken by the Chinese government after accession to the WTO was to reissue the 1997 *Catalogue for the Guidance of Foreign Investment Industries* (Foreign Investment Catalogue) in April 2002. Two years later, minor revisions were made and a new Foreign Investment Catalogue came into force on 1 January 2005. The new Foreign Investment Catalogue represented an improvement in non-discrimination over the 1997 version. It establishes four separate categories of FDI, namely encouraged, permitted, restricted and prohibited investment. Projects that fall outside these four categories are generally considered permitted. The number of investments contained in the "encouraged" category was increased from 186 to 262 between the 1997 and 2005 versions, and corresponding figures for the "prohibited" category declined from 112 to 75 (OECD, 2005a, p. 445). In general, encouraged investments include those that use more advanced technology and are less polluting. Investments in the restricted and prohibited categories generally are those that use dated technology, over-exploit natural resources and harm the environment (WTO, 2006d, p. 53). Investments that endanger the safety of the state, or damage social and public interests; impair human health; occupy large amounts of arable land; endanger the safety of military; and adopt unique Chinese craftsmanship also fall within the prohibited category.

While the government has repeatedly affirmed its commitment to further open the domestic market to foreign investment, China adopted a series of more restrictive foreign investment policies in 2006. In an effort to further clarify the investment regime, China introduced the *2003 Interim Provisions on Mergers and Acquisitions of Domestic Enterprises by Foreign Investors* (Interim Provisions). In its *Investment Policy Review of China* (OECD, 2006a) the OECD analysed the Interim Provisions, declaring that they were the most comprehensive set of regulations on cross-border mergers and acquisitions (M&A). Among the recommendations OECD called for were further relaxation of foreign ownership restrictions and increased regulatory transparency. However, in August 2006, the MOFCOM introduced the *Regulations on the Acquisition of Domestic Enterprises by Foreign Firms* (2006 Regulations). Although the 2006 Regulations are commended for further opening cross-border M&A in line with international standards and increasing corporate transparency, they also introduced a new screening requirement (OECD, 2006c, p. 3). This requirement is necessary if the foreign investor obtains controlling rights of a Chinese firm that *i)* involves a major industry, *ii)* has or may have an impact on national economic security, and *iii)* may result in the transfer of famous trademarks or traditional Chinese brands. OECD research highlights that the new screening measures amount to "an *ex post*

restriction, which can substantially impede the stability of cross-border merger and acquisition transactions" (OECD, 2006c, p. 3).

Later in 2006, the NDRC announced its FDI policy for the 11th Five-Year Plan on 9 November. It is the first time such a document has been published. The NDRC said, "This is an important measure taken by China in creating a stable and transparent foreign investment management system as well as a fair and predictable policy environment."[12] The plan signalled an important shift from quantity to quality foreign investment, especially in higher-value-added sectors. It also puts forward an industrial policy promoting the less developed regions in the west, central and north-eastern parts of China, identifies industrial sectors and targets higher levels of technology. It advocates environmental protection and the efficient use of natural resources. However, some analysts see the plan as a means to erect more barriers to the operation of foreign firms. The plan states that emerging monopolies by FIEs are posing a potential threat to China's economic security and that foreign businesses are harming Chinese enterprises' capacity for independent innovation (OECD, 2006c, p. 2). Because of perceived concerns regarding foreign acquisitions of leading Chinese firms in critical sectors, the new FDI policy provides for increased supervision of sensitive acquisitions, to ensure that entities identified as "critical industries and enterprises" remain under Chinese control (OECD, 2006c, p. 2).

In 2006, China also continued to employ various sector-specific measures that had effectively imposed new restrictions on foreign investors. One example is the steel industry. Between 2004 and 2005, the Chinese government implemented measures to cool the economy that placed FIEs at a disadvantage. The steel policy implemented in July 2005 treated FIEs steel producers more strictly than domestic counterparts and are considered by some FIEs to have amounted to *de facto* technology transfer requirements (USTR, 2007, p. 84). This, along with other instances under which investments including technology transfer seem to be more strongly favoured, appears to depart from the spirit of China's obligations under the WTO Agreement on Trade Related Investment Measures. If such measures were applied equally to domestic enterprises, they would not be considered departures from non-discrimination. However, they would then likely represent an area where regulations could be considered more trade-restrictive than necessary.

Trading rights

Before its WTO accession, China restricted the types and numbers of firms having the right to trade internationally, and allowed only those domestic and foreign firms with trading rights to import and export goods. In 1999, the former Ministry of Foreign Trade and Economic Co-operation announced new guidelines that allowed a wide variety of Chinese firms with annual export volumes valued in excess of USD 10 million to register for trading rights. Two years later, this regulation was extended to allow FIEs to export their finished products, but still contained restrictions on import rights. Foreign firms could only import equipment and other materials directly related to their manufacturing or processing operations. Domestic firms and FIEs without trading rights had to use local agents. In its WTO accession agreement, China committed to substantially liberalise trading rights, granting close to 50 000 FIEs full foreign trade rights in the first year after accession.

In April 2004, the NPC Standing Committee passed the amended *Foreign Trade Law*, establishing the legal framework for the reform and development of China's foreign trade regime. The revised law implemented three major changes. First, foreign and domestic firms and individuals were allowed to conduct foreign trade business.[13] This enabled all

firms to import and export without intermediaries, thus providing easier access to global markets and reducing transaction costs. The amendment enabled China to implement its trading rights commitments nearly six months ahead of its scheduled WTO commitment. Second, legally registered foreign trade operators can now import and export goods and technology without obtaining administrative approval. Third, a percentage of foreign trading rights for special products such as petroleum, grain and chemical fertiliser, which were previously the exclusive reserve of state-owned enterprises, will be granted to formerly unauthorised companies. The law also includes clauses on protecting intellectual property rights of both domestic and foreign property owners, and new clauses on enabling domestic traders to utilise the anti-subsidy and anti-dumping protections of the WTO to safeguard their interests. Although China has made great progress in complying with its trading rights commitments, one study notes that there are a few areas (*e.g.* the importation of foreign publications such as books, periodicals and audio and video products) where China still reserves for state trading (USTR, 2006b, p. 13).

Preferential agreements

Regional trading arrangements (RTAs)[14] are necessarily discriminatory, as they normally involve trade with and investment liberalisation for parties joining the agreements that are not equally applied to non-parties. Thus RTAs represent a departure from the principles of MFN (most favoured nation) and NT (national treatment). An important way to support the balance between regionalism and multilateralism is to uphold market openness considerations when negotiating RTAs. Doing so is an important way to minimise discrimination *vis-à-vis* third countries and ensure that maximum benefits are attained from RTAs. "Multilateralising" liberalisation commitments reached at the bilateral or plurilateral level is an ideal approach that has been achieved only very rarely. (Such was the case of Mexico with regard to investment liberalisation negotiated bilaterally and implemented multilaterally.) But market openness may also be assisted by attention to the transparency of RTAs, so that third parties may more accurately forecast the impact of such agreements on their trade.

Amounting to a quarter of its total trade at USD 344.5 billion in 2005, China has completed or is in the process of negotiating nine RTAs encompassing 27 countries and regions (WTO, 2006b, p. 17). In keeping with trends in the development of RTAs globally, China's RTAs include provisions that go beyond simple trade liberalisation. They also include agreements that do not necessarily liberalise trade *per se*, but contain provisions on co-operation in a variety of areas that facilitate trade among the parties to the agreements, or that support mutual co-operation relating to technical assistance and capacity building. Most if not all of the agreements explicitly recognise China as a market economy.

China's RTAs are diverse in terms of their geography, architecture, level of completion and underlying rationale. This complexity precludes in-depth treatment on market openness within the context of the exercise; however, the more salient features of selected agreement contained in Table 4.2 are highlighted in the following. China is part of ACFTA, which is only a framework agreement, but appears to have ambitions towards deep integration based on the comprehensiveness of the issue areas detailed in the "framework agreement" for further development. Indeed, the ACFTA includes an unusual "early harvest" provision to eliminate tariffs on trade in unprocessed agricultural trade, a sector normally treated lightly in RTAs. Very few tariff lines within HS 1-8 have been excluded from the ACFTA (Tsai, 2006) and substantial increases in agricultural trade among its

Table 4.2. **China's involvement in trade agreements, negotiations and forums**

Regional agreements	• *Association of Southeast Asian Nations (ASEAN)* –China free trade agreement (ACFTA) – Brunei Darussalam, Cambodia, China, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore and Thailand. • *ASEAN+3* – ASEAN, China, Japan and Korea. • *Asia-Europe Meeting (ASEM)* – China, Japan, Korea and seven ASEAN countries (Brunei, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam), 15 EC member states and the European Commission. • *Bangkok Agreement* – Bangladesh, China, India, Laos, Korea and Sri Lanka.
Bilateral agreements	• *China- Hong Kong Closer Economic Partnership Arrangements (CEPA).* • *China-Macao, China CEPA.* • *China-Chile Free Trade Agreement (FTA).* • *China-Pakistan Preferential Trade Agreement (PTA).* • *China-New Zealand FTA.* • *China and Australia signed a Trade and Economic Framework Agreement (TEFA).*
Other potential agreements	• *China and Iceland* launched FTA negotiations. • China and Peru have launched FTA negotiations. • *China and the Southern African Customs Union (SACU)* have launched FTA negotiations – Angola, Botswana, China, Democratic Republic of Congo (DRC), Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. • *China and the Gulf Co-operation Council* have signed a Framework Agreement on Economic, Trade, Investment and Technology Co-operation – UAE, Bahrain, China, Kuwait, Oman, Qatar and Saudi Arabia. • *China and Korea* have launched a Joint Study Group for possible FTA negotiations. • *China and India* have agreed to launch a Joint Study Group on expanded trade and bilateral co-operation. • *Comprehensive Economic Partnership in East Asia (CEPEA)* – ASEAN 10, China, Japan, Korea, India, Australia and New Zealand.
Unilateral Preferences	• China maintains a preferential tariff regime for 39 least developed countries.

members have resulted (Gavin and Tsai, 2006, p. 11). China's bilateral agreements include CEPA agreements with Hong Kong, China and Macao, China. They have established elaborate institutional mechanisms, comprise significant services liberalisation, and should have eliminated all tariffs on internal trade by 2006 (WTO, 2006d, p. 48). China signed a bilateral TEFA agreement with Australia that includes provisions on co-operation across a range of industries in which the partners have mutual interest. Notable among these is a provision on co-operation to assist development in the central and western regions of China, which is a novel way to address domestic economic challenges *via* a bilateral agreement. As TEFAs do not themselves contain substantial provisions on trade liberalisation, China is currently negotiating an FTA with Australia. In April 2008, New Zealand and China signed its most comprehensive bilateral FTA to date. Significantly, it is the first with an OECD country (New Zealand Ministry of Foreign Affairs and Trade, 2008).

Unnecessary trade restrictions

Research suggests that efforts by Chinese regulators to reduce unnecessary trade restrictiveness in domestic regulation have been advancing. Although progress is being made overall, it likely overlooks disparities in the quality of regulatory environments across the sectors and regions of the Chinese economy. An effective way to improve inconsistencies in the topography of national regulatory environments would be to conduct regulatory impact analyses (RIAs) that include market openness considerations. This procedure would assess the regulatory quality of proposed measures and looks to possible alternative solutions, which would fulfil the final objective without imposing unnecessary administrative restrictions on business activities. China does not yet have institutions established to implement RIA programmes; however, the nationwide review accompanying the implementation of the Administrative Permission Law[15] indicates that the thinking of China's regulatory authorities is evolving along conceptual lines leading in the direction of RIAs.

Assessing the impact of regulations on trade

Unnecessarily burdensome regulations disproportionately impact market openness. Although such regulations and administrative practices or "red tape" may affect domestic and foreign enterprises without distinction when viewed from the perspective of the regulator, they normally impact foreign trade and investment more significantly. This is because local enterprises generally have an advantage due to their knowledge of local customs and circumstances. While large foreign firms are often able to overcome unnecessarily restrictive rules and regulations due to their more substantial resource base, small and medium-sized enterprises (SMEs) are particularly disadvantaged due to limited resources and administrative capacities. The impact of red tape on foreign SMEs is compounded not only by their size, but also by their lack of familiarity with local business and regulatory culture. For this reason, the input of foreign SMEs should, to the extent possible, be elicited to support the development of domestic rules and regulations.

Chinese officials are well aware that unnecessarily burdensome regulations hinder commerce and hold back economic growth. Their efforts at the national level to reduce red tape have, to date, been impressive. The State Council has already promulgated or amended at least 47 administrative regulations and retired 756 administrative regulations that were in place prior to 2000. Since WTO accession, 1 195 of 3 948 regulations requiring administrative approval have been nullified in an exercise spanning 65 departments.[16] Between 1 January 2006 and 11 September 2007, the State Council enacted 48 administrative regulations (including 8 amendments) and abolished 24 regulations. Local governments from 31 provinces, autonomous regions and municipalities – and 49 large cities – have the right to formulate local regulations (WTO, 2008b, p. 27). Late in 2006, China moved up 12 rankings to 19th place out of 61 economies in an assessment of national competitiveness conducted by the Switzerland-based International Institute of Management Development (IMD) (CHINA Daily, 2006). The World Bank similarly ranks countries according to the ease of doing business based on regulations and their enforcement. Out of 181 economies tracked in 2008, China moved up 10 places with a score of 83. Table 4.3 compares this overall score of doing business with the large developing and transition countries (BRIICs: Brazil, Russia, India, Indonesia and China). It shows that China is ahead of its peers.

Table 4.3. **Ease of doing business in the BRIICs**

2008 ranking of 181 economies

Brazil	Russia	India	Indonesia	China
125	120	122	129	83

Source: World Bank, *Doing Business* (2008).

China faces substantial challenges to furthering reform as a result of the geographic expanse of the economy, which has led to an uneven environment of regulatory quality across the country. This varying quality with regard to market openness remains a significant impediment to investments outside the wealthier coastal provinces (USFCS, 2006, p. 154). Economic incentives for FDI into the central and western regions of China are unlikely to be sufficient to attract significant inflows. Nationwide statistics probably mask severe unevenness in regulatory quality west of the thriving coastal provinces (OECD, 2005a, pp. 63-64).

An important way to improve the consistency of regulatory standards and thus their market openness is by implementing systemic reviews of regulatory quality across the nation. Such reviews should be wide-ranging in terms of both the economic sectors and the geographic regions examined. The State Council's Office for Legislation Affairs (SCOLA), which is similar to regulatory oversight bodies in many OECD countries, is institutionally well placed to carry out systematic regulatory reform, but lacks the capacity to implement the types of comprehensive reviews and reforms that enable the OECD countries to fare better on average in terms of consistency in regulatory quality. SCOLA is the gatekeeper between proposed legislation and cabinet approval; it plays a key role in planning and co-ordinating the law-making process. SCOLA prepares materials that are used by ministries and commissions to produce legislation. It is also in charge of assessing the constitutionality of all draft regulations at the central level and assessing the conformity of laws with the *Legislation Law*. In carrying out these duties, SCOLA re-drafts laws proposed by ministries and commissions and engages co-ordination functions among the sources of legislation where required. SCOLA has final authority over whether draft laws are forwarded to the State Council. Augmenting SCOLA with analytical resources to conduct RIAs that assess the economic and trade impact of proposed legislation would be a logical next step in the gradual development of China's capacity to "regulate regulators", and improve not only laws and regulations but also the quality of their application.

OECD experience conducting reviews of regulatory reform also suggest that the involvement of the trade ministry in the process contributes significantly to the quality of market openness throughout domestic regulatory systems. As the ministry responsible for China's relationship with the WTO and its trading partners, MOFCOM is most cognisant of the manner in which domestic regulations impact international trade and investment. In fact, the establishment in 2002 of an internal review mechanism with a mandate to address inconsistent application of laws, which is overseen by the Department of WTO Affairs under MOFCOM, indicates that MOFCOM has already established some capacity to address important aspects of regulatory quality (USTR, 2006a, p. 159). A synchronisation of efforts between MOFCOM and SCOLA would, at some point in China's ongoing process of institutional and regulatory reform, be an important way to support results of regulatory reform that best serve the large economic objectives that China's economic policy makers are pursuing.

In OECD countries, the application of RIAs to assess the impact of proposed laws and regulations and to systematically assess the quality of existing regulations is commonplace. The utility of a well-functioning RIA process in creating efficient regulation is underscored by a significant body of OECD work on regulatory reform, endorsed in the *1995 Recommendations of the Council of the OECD on Improving the Quality of Government Regulation* and reaffirmed in the *2005 Guiding Principles for Regulatory Quality and Performance*. Although the designs of RIAs need to be country-specific, the *APEC-OECD Integrated Checklist on Regulatory Reform* provides an excellent overview of considerations that should form the basis for designing all RIAs. OECD experience with reviews of regulatory reform in OECD countries demonstrates that integrating the potential impact of proposed and existing regulations on foreign trade and investment *via* co-ordination between trade and regulatory agencies is an important way to improve an economy's entire regulatory framework *vis-à-vis* foreign trade and investment. Further enhancing SCOLA's analytical resources and co-ordination with MOFCOM would enable SCOLA to review existing regulations across the expansive Chinese regulatory system. It would also facilitate better

efforts to reduce the uneven regulatory quality, which exacerbates geographic and rural-urban economic inequalities in China.

Although SCOLA does not (yet) have the capacity to implement RIAs to comprehensively and systematically review regulations and their application, efforts such as implementation of the *Administrative Permission Law* signal China's commitment to tackle one significant aspect of regulatory quality in a comprehensive and methodical way.

The *Administrative Permission Law* is a strong indication that Chinese regulators are headed in the right direction. Coming into effect on 1 July 2004, the *Administrative Permission Law* seeks to make the process of granting "administrative permissions" transparent and less prone to corruption. It applies to all administrative permissions except those related to personal privacy and business secrets. It specifies, *inter alia*, that all administrative permissions must be published; and that administrative departments make all relevant requirements and information relevant to the application and the permission readily available on their premises. Significantly, a nationwide review to standardise and improve the transparency of administrative permissions processes was conducted alongside establishment of the *Administrative Permission Law* (USTR, 2006a, p. 38). The review counted 4 000 types of activities requiring administrative approval and, following three rounds of review, abolished nearly half (1 795) of the approvals. The review itself showed that a large number of the administrative approval items did not have any basis in law (OECD, 2005a, p. 294). Importantly, another review was conducted on a nationwide basis that included assessment of reforms in the central and western regions of China, where lower standards of regulatory quality have been noted for holding back potential investments.

The *Administrative Permission Law* does not explicitly state whether it applies equally to foreign and domestic enterprises. Clarification on this matter would represent a substantial move forward in the regulatory quality and market openness of China's regulatory reform efforts.

Example of customs procedures

Declining tariffs worldwide have made arbitrary or excessively burdensome administrative requirements in the area of customs a focus of attention in international trade negotiations. Increased customs efficiency serves to reduce costs related to border fees and – more importantly often reduces delays at borders that create cost inefficiencies that have gained importance as product cycles have shortened. China's efforts to continue improving the regulatory environment implemented by its customs administration – especially toward consistent application of the new rules – would yield important gains for market openness.

China's customs management is facing tremendous pressure and challenges with the rapid growth of its foreign trade. Its workload has risen with increasing trade volumes that have not been matched by sufficient growth in resources and staff. In order to combat these pressures, China Customs put forward the Second-Step Development Strategy for the Establishment of the Modern Customs System (2004-10) (China Customs, 2008), which is to make customs procedures more efficient, simplified and cost-efficient. The core to the strategy is to establish a high-technology mechanism that would resolve the contradiction between effective controls, simplified procedures and facilitated international trade. The aim for China Customs, in addition to further improving management effectiveness and

efficiency, is to prevent and control the smuggling and non-compliance risks, and to accommodate the needs of the rapidly developing Chinese economy.

A primary challenge facing improvements in the market openness of customs procedures is the inconsistent way in which they are applied. This leaves customs officials with broad discretion in their application, especially in the area of customs valuation. As part of its WTO accession, China addressed many of the inconsistencies in its customs regulations by implementing the *Measures for Examining and Determining Customs Valuation of Imported Goods* in 2002. In the area of royalties and licence fees, the implementation of the *Rules on the Determination of Customs Value of Royalties and Licence Fees Related to Imported Goods* in 2003 was intended to clarify ambiguities with pre-existing legislation covering relevant imports (computer software and other types of digital media in particular). The result, however, was not greater consistency in the application of customs duties. Indeed, the new rules may even have generated increased uncertainty for importers. It is difficult to determine the extent to which the inconsistent application of duties in this area is due to insufficient training of customs officials or lack of clarity in the regulations themselves. Whatever the case, the resulting flaws in the quality of regulatory environment directly affect the openness of the Chinese economy to innovative goods in this product segment.

An OECD business survey questioned foreign firms on their experience with customs procedures in China (Table 4.4). When asked about clear and transparent rules, predictability and impartial customs procedures, and pressures to make illegal payments, 40% of the surveyed firms reported medium problems. The perception of OECD firms held by China's customs procedures is that room for improvement exists in the manner that customs procedures are applied.

Table 4.4. **OECD firms' experience with Chinese customs procedures**

Percentage

	Not a problem	Minor	Medium	Serious	Very serious
Clear and transparent general rules for customs procedures (*e.g.* information on required documentation)	24	19	41	13	2
Predictable and impartial customs procedures (*e.g.* uniform rules applied in all customs posts)	19	17	40	18	5
Pressures for **illegal payments** in conjunction with customs procedures	30	15	40	11	2

Source: OECD Business Survey, 2008.

Internationally harmonised measures

As part of the reorganisation of domestic standards and the conformity regime described in the above section "Transparency in the field of technical regulations and standards", the State Council established the Standardisation Administration of China (SAC). Under the authority of the AQSIQ, SAC is responsible for unifying China's administration of product standards and aligning its standards and technical regulations with international practices and China's commitments under the WTO TBT Agreement. It drafts China's annual national standards agenda and approves, records, and publishes the final standards. It also manages and co-ordinates the technical committees assigned to draft technical standards. More than 27 000 experts from academia, industry, and other groups working in over 230 technical committees and 360 subcommittees are involved in the development of Chinese standards.

In addition to reorganising the institutional framework, the Chinese authorities issued a series of new and revised regulations to meet WTO obligations. The National People's Congress has amended or is in the process of amending three important trade-related laws. In September 2000, the 1993 *Product Quality Law of the People's Republic of China* was amended. The amendments stipulated tougher punishment for the manufacture and sale of fake and substandard goods. Enforcement agencies were given the right to order inspections, view business documents and confiscate counterfeit products. In October 2002, the National People's Congress amended the 1989 *Import and Export Commodity Inspection Law*. Previously, the quality certification system was used for import and export commodities while the compulsory certification system was used for products sold only on the domestic market. The amendments stipulate a uniform national certification system.

The third trade-related law is the *Standardisation Law*, which came into force 1989, and is currently being revised in a process that was to be completed in 2007. It is unclear when the revised law will be ready and sent to the NPC for approval. The revised draft should improve the adoption of international standards but could be significantly strengthened by providing guarantees for foreign participation within the domestic standards process. OECD best practice and current experience by foreign enterprises in China would support the inclusion of an additional guarantee for foreign enterprises to be consulted and provided adequate time for meaningful consultations within the domestic standards process. Such a provision in the revised *Standardisation Law* would greatly strengthen the quality of market openness in China's standards process, reduce trade frictions with its trade partners, and improve the regulatory environment for trade as well as investment in the central and western regions of China.

China is increasing its participation in international standards-setting bodies through the SAC. This participation is credited with increasing the alignment of Chinese standards-setting practices with international norms. Under the guidance of AQSIQ, SAC launched an effort to improve the harmonisation of China's standards with international standards in April 2004. The current mandate of SAC includes four general components: to review all standards older than five years; to revise standards that are inappropriate for current conditions in a timely manner; to harmonise domestic standards to international ones where appropriate; and to actively participate in international standards-setting organisations. SAC embarked on a review of all 21 000 existing technical regulations to determine their continuing relevance and consistency with international standards. The exercise concluded that 44.2% of the then existing standards remained relevant, 44.2% were to be revised, and 11.6% were to be abolished (WTO, 2006d, p. 90). China reported to the WTO TBT committee in November 2005 that as of October that year, the country had abolished 1 416 national standards as a result of the review (USTR, 2005, p. 42); however, little is known of the extent to which the standards to be revised will be aligned to international ones.

Chinese standards fall into four categories: national, sectoral, local and enterprise. National and sectoral standards are either voluntary or mandatory. The mandatory ones generally involve public health, personal safety, and the protection of property and the environment. Voluntary standards serve as guidelines: the government encourages their use, but they do not have the force of law and are not governed by regulatory requirements. Technical requirements need to be agreed throughout the whole country and are adopted either on a voluntary or a mandatory basis. Once a national standard is approved, any

competing sectoral or local standard has to be withdrawn. *Sectoral standards,* of which there are roughly 29 000, can be issued by the relevant central ministries and should be reported to the SAC for registration. They deal with the technical requirements in any one specific industrial sector throughout the country. They are more professional and technical, and are complementary to national standards. *Local standards*, of which there are more than 13 000, are issued by provincial governments in the absence of national and sectoral standards and reported to the SAC. They cover technical requirements in safety and hygiene within a province, autonomous region or municipality. They apply only within the administrative area concerned. *Enterprise standards*, of which there are roughly 1.32 million, are issued by the enterprises themselves (WTO, 2006d, p. 90). They refer to product standards and are developed as guidelines for managing the production of those items for which no other standards exist. Enterprises are encouraged to develop their own standards, which are stricter than national, sectoral or local standards.[17]

A Chinese government paper, "Study on Development Strategies of China's Technical Standards", was drafted by China National Institute of Standardisation (CNIS) in co-operation with ASQIQ, SAC and the Ministry of Science and Technology in November 2005 (Zhao and Graham, 2006). The main theme of the study is that China can, through scientific development, spur domestic innovation and create indigenous and exportable standards. China's goal by 2010 is to bring the technical level of indigenous standards up to international standards while increasing the proportion of Chinese technology in key international standards (Zhao and Graham, 2006, p. 78). This new approach states that one of its aims is for the large-scale adoption of international standards. One of the priorities in China's 11th Five Year Plan (2006-10) is to develop independent innovation by accelerating the development of high-technology industries (Ma, 2006). In March 2006, the NDRC issued the "Guiding Catalogue for Industrial Restructuring".

Some WTO members consider that China's industrial policy has resulted in the application of technical regulations and product standards that favour locally produced products over imported ones. Standard setting can be a benign exercise in regulatory oversight, but in some circumstances may also be conducted in a manner that indeed favours domestic firms over foreign enterprises. China's trade partners have raised concerns that its regulators may be strategically "guiding" the development of product standards for a wide range of electronics products, including consumer video discs, digital televisions, integrated circuits and cellular telephony (Linden, 2004). Such divergent standards have the potential to create significant barriers to trade and increase the cost of compliance for foreign firms, thus reducing the market openness of the Chinese economy to the trade and investment that it seeks to promote.

Streamlining conformity assessment procedures

Recognising the results of conformity assessment based on accreditation is strongly supported by OECD best practices. Doing so requires the existence of adequate domestic capacities for accreditation – in particular, the establishment of an efficient accreditation mechanism and accreditation institutions. National accreditation bodies, which usually operate under the supervision of the public authorities, are responsible for inspecting and acknowledging the competence and reliability of conformity assessment, and share inspection results through international networks such as the International Accreditation Forum (IAF).

China has significantly rationalised its institutions dealing with standards and conformity assessment. Under the AQSIQ, the Certification and Accreditation Administration (CNCA) is charged with the task of unifying the country's conformity assessment regime. It establishes, guides, implements and supervises the compulsory product certification system.[18] CNCA designates certification bodies, testing laboratories, inspection organisations and certification-issuing bodies; publishes an official list of certified products and manufacturers; and directs local AQSIQ branches to find violators of compulsory certification. CNCA also has the power to approve the exemption of products from compulsory certification and to deal with complaints or appeals regarding compulsory certification. CNCA draws up and modifies the product catalogue published jointly with AQSIQ and issues implementation rules for certification of products listed in the catalogue (Weeks and Chen, 2003).

In March 2006, China established a new accreditation body called China National Accreditation Service for Conformity Assessment. CNAS is responsible for the accreditation of certification bodies, laboratories, inspection bodies and other similar assessment bodies. There are more than 110 accredited certification bodies currently operating in China (APEC-PAC News). Although these bodies have been accredited to certify for the purpose of the new China Compulsory Certification (CCC) mark, capacity remains limited when compared to demand for testing. China committed under the WTO to accredit qualifying minority and majority foreign-owned conformity assessment bodies to apply the new CCC mark.

To date, only one United States-based conformity assessment body has been accredited under a Memorandum of Understanding with China to conduct follow-up but not primary inspections of facilities manufacturing CCC certified products for export to China (USTR, 2008). Foreign enterprises seeking CCC certification for their products have reported that they are allowed only to receive testing in designated laboratories, which has meant long delays due to limited capacity. One study argues that the CCC is seen by foreign and domestic companies as an unnecessary technical barrier to trade as it imposes a costly and time-consuming "double certification" procedure for products (EUCCC, 2007a, p, 12). Attention to strengthening non-discrimination within the process of regulation would further enhance the market openness of the Chinese conformity assessment regime, and provide consumers with a broader selection of products from around the world.

The recent restructuring of the Chinese standards and conformity assessment infrastructure has improved conformity assessment practices overall. However, inadequate capacity, non-transparent rules for products receiving the CCC mark, inconsistent application of rules and duplicative testing requirements continue to hamper market openness to foreign trade and investment. The foundations for significant progress have been established; reforming the regulatory processes should continue with particular attention to market openness principles.

Some policy options for the future

With its 2001 WTO accession, China has locked in much of its trade liberalisation commitments. The focus is now on "second generation" trade-related reforms – tackling border and domestic regulatory barriers. Transparency is perhaps one of the most important criteria for the continuous development of a healthy business environment in China. Improving conditions of transparency in the dissemination of information can be

found in China's evolving legal and regulatory framework. The *Legislation Law* has provided an important foundation for enhancing transparency throughout the Chinese regulatory system, in that it requires the publication of legislation prior to implementation, and specifically provides for public consultations.

Progress in transparency

- China has drawn up more than 280 transparency-related laws and regulations, including the adoption of its first nationwide government information disclosure system, *Regulations of the People's Republic of China on Open Government Information,* which took effect 1 May 2008.
- MOFCOM publishes the *Foreign Trade and Economic Co-operation Gazette* (Gazette) dedicated to communicating all trade-related laws and regulations. The Ministry should be commended for the Gazette, as it comes close to being a single source for all trade- and investment-related regulations.
- China has made significant strides in e-government. Government ministries and bodies have established Internet websites to make legislative acts available to WTO Members, the business community and the general public. Many such websites also contain information in English. Such transparency is also evident at the provincial and local levels, as these governments and many cities have websites.
- Progress in developing a regulatory culture for public consultations can be seen in the procedural transparency practices now applied by MOFCOM, which regularly engages foreign and domestic enterprises when drafting new laws and regulations. MOFCOM has often been noted for providing adequate time for meaningful consultations and incorporating relevant comments within final texts.

Challenges

- The Gazette does not currently contain *all* new trade- and investment-related legislation. The diversity of publications that contain new legislation – despite efforts by MOFCOM to consolidate all trade-related laws within a single publication – results in a regulatory environment where new laws affecting trade and investment are published, but publication does not necessarily increase transparency.
- Full information on laws and regulations is often available only in Chinese. And if such information is available in English, it is rarely as complete as the Chinese versions.
- China's general law on transparency, while requiring public consultations, does not contain provisions for *mandatory notice* and comment practices in line with international best practices. Periods for consultations are often insufficient to allow for comments to be adequately taken into account in the final texts.
- An efficient appeals system is not yet in place.

Recommendations

- MOFCOM should be provided sufficient authority to receive all trade- and investment-related measures for publication in the Gazette.
- Make mandatory the provision of complete draft legislation texts – as opposed to summary provisions – prior to public consultations. This would enable foreign input to reduce the possibility that final legislation contains unforeseen impacts on market openness.

- Require the provision of periods for public consolations that are sufficient for comments to be taken into consideration within the final drafts of new legislation.
- Implement a standardised and general regulatory process allowing foreign enterprises to lodge appeals that would enable misinterpretations of rules and regulations to be corrected, thus reducing regulatory uncertainty and enhancing transparency.
- It is important to maintain efforts towards improving the domestic system of appeals and towards ensuring that rules and regulations are clearly defined. It is also critical to continue institution building for an integrated and well-functioning system of appeals with attention to market openness principles. These actions would significantly enhance the overall quality of China's regulatory system.

China's economy has gradually reoriented itself outwards towards greater international trade and investment. This process has benefited greatly from WTO commitments that have locked in initial domestic reforms in the area of non-discrimination.

Progress in non-discrimination

- China's efforts to reduce discrimination between domestic and foreign enterprises are apparent in the recent restructuring of regulatory institutions, notably through the creation of MOFCOM and the Administration for Quality Supervision Inspection and Quarantine (AQSIQ). The new institutions have created a basis for, and in fact improved, the quality of non-discrimination in domestic regulatory processes.
- Trade and investment liberalisation has enhanced the attractiveness of China's business environment, which in turn has boosted inward foreign direct investment (FDI). Since joining the WTO, a growing number of industrial sectors have been opened to foreign investors.
- Many service sectors are increasingly open to foreign and private entities and trading rights have been extended to most entities.

Challenges

- Since 2006, a number of explicitly discriminatory measures were introduced – especially on cross-border mergers and acquisitions – that can be seen as erecting barriers to the operation of foreign firms.
- China continues to implement industrial policy interventions.

Recommendations

- Continue to improve the general and sectoral regulatory framework and eliminate explicit discriminatory restrictions affecting foreign traders and investors, in particular limitations on the level of foreign ownership in some sectors, and reconsider the screening requirements for cross-border merger and acquisition transactions.
- Strengthen training for regulators at the sub-national level on the principles of good regulatory practice, including the value of non-discriminatory regulatory practices. Such an effort would enhance overall quality in the administration of regulations and particularly improve market openness.
- Pursue a strategy to harmonise federal and regional trade policy and regulation and ensure its unified implementation throughout China.

- Reconsider the list of restricted and prohibited investment sectors for FDI.

Even when regulations are applied in a non-discriminatory manner, market openness can still be sub-optimal if regulatory measures are more restrictive *vis-à-vis* trade and investment than is necessary to achieve their intended policy goals. Chinese officials are well aware that unnecessarily burdensome regulations can restrict trade. Efforts at the national level to reduce unnecessarily burdensome regulations have been noteworthy.

Progress in unnecessary trade restrictions

- Efforts at the national level to reduce administrative burdens or "red tape" have yielded significant results to date.
- Implementation of the *Administrative Permission Law* provided an important example of administrative oversight and discretion that reduces unnecessary restrictiveness in regulations.
- In 2008, China moved up 10 positions on the World Bank's ease of doing business scale, ranking higher than other large developing and transition economies.

Challenges

- Officials continue to hold broad regulatory discretion when applying a variety of laws and measures. The result is regulatory uncertainty that reduces the confidence of investors considering large and long-term investments within the domestic economy.
- Challenges remain to further advancing reform beyond the wealthier coastal provinces.
- China does not yet have institutions established to review regulatory quality such as regulatory impact assessments (RIAs).
- China's customs management is facing tremendous pressures with the rapid growth of its foreign trade.

Recommendations

- Consider applying a review similar to that which accompanied the *Administrative Permission Law*, including a provision for non-discriminatory application, in selected sectors where FDI is substantial and likely to be significant.
- Consider, on a pilot basis, providing the State Council's Office for Legislation Affairs with the analytical capacity and financial resources to conduct RIAs of a pre-defined selection of impending economic draft legislation, in co-operation with MOFCOM.
- Pursue regular monitoring of the impact regulatory measures have on the business environment. Continue to foster the awareness of authorities at different levels and responsible agencies of the primary objective of adopted regulatory measures. Ensure that regulations continue to be systematically applied, not only immediately after their introduction but also in the longer term.
- Continue customs reforms, including streamlining and simplifying regulations to avoid diverging interpretations by local customs officers; ensure adequate financing, training and technical equipment of customs administration.

The application of different standards and regulations for like products in different countries confronts firms wishing to engage in international trade with significant and sometimes prohibitive costs. There have been strong and persistent calls from the international business community for reform to reduce the costs created by regulatory

divergence. One way to achieve this is to promote harmonisation of domestic with international standards where the latter effectively address domestic regulatory objectives.

Progress in harmonisation towards international standards

- China is increasing its participation in international standards-setting bodies, such as the International Organisation for Standardisation. This has resulted in the increasing harmonisation of Chinese standards-setting practices with international standards.
- China has aligned over 30% of standards at the national level to international standards. In the review of national standards initiated in April 2004, a large number of standards were abolished and 44% were earmarked for revision.
- The *Standardisation Law* is also currently being revised to better support harmonisation of domestic standards.

Challenges

- There are uncertainties as to whether China will continue to develop domestic standards that diverge from established international standards.
- Uncertainties remain as to when the revision of the *Standardisation Law* will be complete.

Recommendations

- Consider including in the revised *Standardisation Law* a provision to guarantee that foreign enterprises will be able to participate in domestic standards-setting activities.
- Include a provision within the *Standardisation Law* requiring harmonisation towards international standards as the basis for interventions to reconcile conflicting standards at the national, sectoral, local and enterprise level. Such a provision would facilitate foreign imports *and* support the ability of locally produced goods to be exported internationally.
- Require that the 44% of national standards designated for revision under the recent review be harmonised internationally wherever practicable.
- Develop domestic capacities for accredited certification bodies and allow foreign-owned conformity assessment bodies to operate in China where they qualify.

Streamlining conformity assessment procedures and upgrading conformity assessment capacity not only facilitates the operation of foreign enterprises, but also is indispensable if domestic producers are to continue upgrading their export capacities, particularly in more technologically sophisticated goods. China has significantly rationalised its institutions dealing with conformity assessment.

Progress in streamlining conformity assessment procedures

- In March 2006, a new accreditation body called the China National Accreditation Service for Conformity Assessment was established. This new body is responsible for the accreditation of certification and inspection bodies and labs that issue the China Compulsory Certification (CCC) mark.

Challenges

- Capacity remains limited in relation to the demand for testing. Only Chinese conformity assessment bodies are allowed to conduct assessments and there are no generally applied measures providing for third party testing outside China.
- The insufficient number of accredited domestic conformity assessment bodies continues to result in long delays for testing and certification.
- The introduction of CCC has been marked in practice by inconsistent application as well as duplicative testing requirements.

Recommendations

- Further develop domestic capacity to accredit certification bodies and allow foreign-owned conformity assessment bodies to operate in China where they qualify.
- Promote the practice of recognising the equivalence of conformity assessment procedures performed in other countries, whether unilaterally (following assessment accompanied by surveillance) or by entering into mutual recognition agreements.

Notes

1. These reforms are included in documents entitled "Decision on the Institutional Reform of the State Council", passed by the 5th National People's Congress on 8 March 1982; the 7th National People's Congress on 9 April 1988; the 8th National People's Congress on 22 March 1993; the 9th National People's Congress on 10 March 1998; and the 10th National People's Congress on 10 March 2003.
2. The OECD efficient regulation principles for market openness have been identified by trade policy makers as key to market-oriented trade and investment-friendly regulations. They reflect the basic principles underpinning the multilateral trading system (see "Integrating Market Openness into the Regulatory Process: Emerging Patterns in OECD countries" [TD/TC/WP(2002)25/FINAL], 17 February 2003).
3. The OECD Secretariat worked closely with the Business and Industry Advisory Committee (BIAC) to the OECD and its China Task Force to survey the business community on these barriers. The survey was designed and distributed to OECD member country business associations (in English) as well as one Chinese business association (in Chinese) in the latter part of 2007. Close to 150 responses were received. Some of the results have been used in analysis throughout the report.
4. See Greene, M. and C. Tsai (20008), "Enhancing Market Openness through Regulatory Reform in the People's Republic of China", OECD *Trade Policy Working Paper*, No. 83, December.
5. *Ibid*.
6. The first amendment of the Foreign Trade Law was completed on 6 April 2004: *www.gddoftec.gov.cn/wjmxx/Detail.asp?ID=2629*.
7. In accordance with established terminology in the WTO TBT Agreement, technical regulations are documents with which compliance is mandatory, while standards provide rules and guidelines for common and repeated use but compliance with them is not mandatory.
8. These include: MofCom, Ministry of Education, Commission of Science, Technology and Industry for National Defence, Ministry of Public Security, Ministry of Civil Affairs, Ministry of Land and Resources, Ministry of Construction, Ministry of Railways, Ministry of Communications, Ministry of Information Industry, Ministry of Commerce, Ministry of Agriculture, Ministry of Health, General Administration of Customs, State General Environmental Protection Administration, General Administration of Civil Aviation, State Administration of Radio, Film and Television, State Drug Administration and State Forestry Administration.
9. The Temporary Provisions on the Initiation and Protection of Socialist Competition of October 1980 permitted using bidding on a trial basis. It was the first official document signalling ideological liberalisation of competition. Such bidding was initially used for vehicles, office supplies and later extended to engineering services and management information systems (Wang, 2000, p. 73).

10. The NDRC is a department of the State Council formerly known as the State Planning Commission. It is a macroeconomic regulatory agency with a mandate to develop national strategies for economic development.

11. The two measures are the Administrative Measures on the Government Procurement of Imported Products (relating to the government procurement of imported products) and Administrative Measures for Government Procurement on Initial Procurement and Initial Procurement and Ordering of Indigenous Innovation Products (relating to the government procurement of indigenous innovation products developed by domestic enterprises or research institutions). Both were adopted as implementing measures in support of China's Medium-to-Long-Term Science and Technology Master Plan issued by the State Council in 2006. The NDRC is charged with developing regulations to implement this strategy, which includes preferences for the purchase of domestic goods. See USTR, 2008.

12. See website of the NDRC, *www.ndrc.gov.cn*.

13. Article 8, Chapter 2 of the New Foreign Trade Law of PRC, amended 4 June 2004.

14. The term RTA is used here as a generic term which includes free trade agreements (FTAs), customs unions (CUs) and preferential trading areas (PTAs), which are not necessarily limited to regional groupings.

15. The National People's Congress adopted the Law on Administrative Permission, taking effect 1 July 2004. Its implementation aimed to further improve China's investment environment and protect foreign investors from losses resulting from policy changes, political corruption and abuse of power by local officials.

16. Huang Hai, 2005. Zhang Xiangchen, Department of WTO Affairs, Ministry of Commerce, made general comments on four years after China's accession to the WTO to the People's Daily on 11 December 2005.

17. See the SAC website, *www.sac.gov.cn*.

18. See the Certification and Accreditation Administration website, *www.cnca.gov.cn*.

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A selection of useful websites

China Customs: *www.customs.gov.cn*

China National Regulatory Commission for Certification and Accreditation: *www.cnca.gov.cn*

China News: *www.Chinanews.cn*

Information on Chinese legislation: *www.sohu.com* and in English *www.Chinaonline.com*, *www.sinolaw.com*

Invest in China: *www.fdi.gov.cn*

Ministry of Commerce: *www.english.mofcom.gov.cn*

Ministry of Finance government procurement website: *www.ccgp.gov.cn*

National Bureau of Statistics of China: *www.stats.gov.cn*

National Development and Reform Commission: *www.ndrc.gov.cn* and in English *www.en.ndrc.gov.cn*

People's Republic of China: *www.gov.cn*, and in English: *www.english.gov.cn*

Standardisation Administration of China: *www.sac.gov.cn/english*

State Administration of Foreign Exchange: *www.safe.gov.cn*

WTO/TBT National Notification Authority and Enquiry Point of PRC: *www.tbt-sps.gov.cn/Pages/Channel_90/Class/Index.html*

PART III

Regulatory Frameworks For Public Services

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Defining the Boundary between the Market and the State

Chapter 5

Infrastructure Services: Lessons from 30 Years of Reform in OECD Countries

The organisation of infrastructure industries in OECD countries has undergone massive changes in the past thirty years. Taken as a whole, their experience constitutes a rich source of information on infrastructure service industries and their governance. Such information can be of great value for the People's Republic of China, where infrastructure development will be one of the major development challenges in the years to come. The aim of this chapter is to provide an overview of the experience of OECD countries in the management of their infrastructure service industries, and draw some lessons of relevance for policy making in China. The first part of the note provides a sketch of the public utility model that prevailed in most infrastructure industries of OECD countries until the end of the 1970s, discusses why and how this model has been challenged and gradually modified in the past thirty years, and illustrates some of the opportunities and risks of the reform process through three examples. The second part proposes a more detailed analysis of the main issues that infrastructure industries pose to policy makers today and some possible responses. The third part summarises the policy lessons drawn from the recent experience of OECD countries and examines what this entails for the management of infrastructure services in China.

Introduction

The term "infrastructure" designates the basic facilities, equipment and supplies that are needed for a country, a region or an organisation to function normally. It usually covers industries such as electricity, gas and water supply, telecommunications, post, transportation by air, rail or road, sewerage and waste disposal.

The organisation of infrastructure industries in OECD countries has undergone massive changes in the past 30 years. Until the mid-1970s, member countries commonly left to state-owned monopolies control of the entire supply chain related to a national infrastructure, from production facilities and distribution networks to retail market activities. Nowadays, most of these integrated monopolies have been privatised and dismantled. Some activities related to infrastructures are still provided by national or local monopolies, while others are organised as competitive markets. The term *infrastructure services* is used in this report as a generic classification for the myriad activities related to infrastructures, regardless of their position in the supply chain or their industrial structure.

One common element of all these changes is a shift of focus from the physical infrastructure to final services. The past model of organisation intended to provide the best conditions for building and operating the considerable stock of capital needed to produce and transport electricity, water, gas, telephone communications, etc. The new model, by contrast, emphasises the price and quality of services that are delivered to the customers, in a context where most OECD countries have very high levels of equipment in infrastructures – even though the maintenance and renewal of this equipment will necessitate a considerable investment effort in the coming decades (OECD, 2006a). New forms of regulation have gradually been developed in accordance with this change of focus, in order to respond to the challenges of restructured infrastructure industries.

These common trends should not overshadow the diversity of national and sectoral evolutions. Industry-specific economic and technological factors have brought about substantial differences between, for instance, the telecom industry, power supply and postal services. In some sectors a new economic equilibrium has emerged, while in others mutations are only beginning. Because of national differences rooted in history and culture, the OECD countries have also adopted different solutions and timings for restructuring their industries. Taken as a whole, their experience constitutes a rich source of information on infrastructure service industries and their governance. Such information can be of great value for the People's Republic of China, where infrastructure development will be one of the major development challenges in the years to come.

The aim of this chapter is to provide an overview of the experience of OECD countries in managing their infrastructure service industries, and draw some lessons relevant to policy making in China. The first section provides a sketch of the public utility model that prevailed in most infrastructure industries of OECD countries until the end of the 1970s; discusses why and how this model has been challenged and gradually modified in the past 30 years; and illustrates some of the opportunities and risks of the reform process through

three examples. The second section proposes a more detailed analysis of the main issues that infrastructure industries pose to policy makers today, and some possible responses. The third and final section summarises the policy lessons drawn from the recent experience of OECD countries and examines what this entails for the management of infrastructure services in China.

The development of infrastructures has been closely related to notions of public utility and service in all OECD countries, an acknowledgement of the fact that the utility of infrastructure services extends to society at large. There is in particular a large consensus over the principle that public utilities should be accessible to and affordable for virtually all of the population, although what this principle exactly entails in terms of prices and capacity has been subject to different interpretations. The dual objective of accessibility and affordability has provided a rationale for public intervention in infrastructure sectors in all OECD countries, in degrees and forms that have varied according to countries, sectors, and periods of history. In this regard, the past 30 years represent a historic shift towards market-based forms of organisation, away from the public utility model that prevailed until the end of the 1970s.

Infrastructure services in OECD countries: The state of play

The public utility model of infrastructure services

The public utility model of infrastructure service provision is characterised by public ownership, a high level of regulatory intervention, and vertically integrated, monopolistic industry structures.

Forms of ownership

Utilities can be owned by the central government, by local governments, by private investors, by their customers (in the form of co-operatives), or by any combination of these (joint ventures, partnerships). It is common that several forms of ownership coexist within the same industry, as in the US electricity sector. Prominent forms of ownership also vary from one industry to the other, often within the same country: in France, for instance, electricity and gas supply and railways belonged to the public sector during most of the 20th century, while water and wastewater services were chiefly provided by the private sector.

However, the model of state-owned enterprises (SOEs) became dominant in utility sectors in most OECD countries (with the exception of the United States) in the aftermath of the Second World War. At that time, public ownership was perceived to be more adapted to the goals of universal access and affordability – enhanced by the development of the welfare state – and to the considerable investment needs of post-war reconstruction. In a context where capital markets were small in most countries and not integrated internationally, financing infrastructure development was in itself a major challenge. As will be explained in greater detail below, this trend reversed in the 1980s.

Regulatory regimes

Utilities can be regulated in terms of prices, entry and exit, investment and service quality. Like public ownership, regulatory intervention was extended particularly following periods of economic disruption, such as the Great Depression or the Second World War. Private providers were then typically blamed for inefficiencies caused by market

fragmentation and excessive costs, and/or for taking undue advantage of their monopoly situations. In state-owned enterprises, prices, service quality and investments in capacity were administered in line with various economic, social and political considerations, often leaving considerable discretion to policy makers. Private utilities would operate under public franchising, which usually provided exclusive rights to supply a given geographic area, against the obligation to serve all customers at prices approved by regulatory authorities.

Regulated prices were supposed to reflect production costs (*cost-of-service* or *rate-of-return* regulations), and remain reasonably low for consumers while at the same time preserving profitability for producers. Both administered and regulated prices involved mechanisms of cross-subsidy among groups of users, to the benefit of low-income or high-cost groups (in particular in rural areas). In the 1970s and 1980s, criticisms of public interventions on the grounds of economic inefficiency led to an unprecedented wave of deregulation in utility sectors.

Market structures

Notwithstanding differences in ownership and regulatory regimes, the same industry model emerged in virtually all infrastructure sectors and countries. Economies of scale related to the capital-intensity of infrastructure services naturally ruled out the presence of many competing firms. Monopolies could be local (water supply and sanitation in most countries, electricity supply in the United States) or national (electricity and gas supply and railways in most European countries).

In addition, in order to meet their obligations in terms of pricing and investment and minimise their risks, producers had an advantage in owning and operating the entire supply chain, from production and storage facilities, through transmission and distribution networks, to retail services. Vertically integrated monopolies were hence the monolithic form of industrial organisation in public utilities until the end of the 1970s (Newbery, 2002).

The paradigm shift of the 1970s-80s

By the late 1970s-early 1980s, the economic and policy context had considerably changed. The persistence of slow growth and high inflation in the 1970s and concern about the productivity slowdown gradually led the governments of OECD countries to put economic liberalisation at the top of their policy agendas. On the international stage, governments adopted a more active stance towards free trade and investment, which in turn supported domestic policies enhancing competitiveness. The movement was initiated in the United States in the late 1970s and reached the United Kingdom in the early 1980s and other OECD countries later. One of its key foundations was the criticism of economic inefficiencies generated by existing regulations, particularly in public utilities (Joskow and Noll, 1994).

Stronger emphasis on regulation-induced inefficiencies

Economic analysis of regulation became an active field of research in the early 1970s. Its message clearly favoured change: the economic case for regulating prices, entry and exits had weakened (if not altogether vanished) in many segments of utility industries, due to changes in technology and demand; the costs of existing regulations were far outweighing their benefits, which were essentially accruing to specific interest groups.

A classic line of criticism of economic theory against price regulation focuses on the distortions it induces in the general allocation of resources – price regulations affect *allocative efficiency*. In an influential paper, Averch and Johnson (1962) pointed to another side-effect of rate-of-return regulations, namely the fact that the utility, when aiming to maximise its profit, has an incentive to overinvest in physical assets, and hence adopt an inefficient mix of capital and labour. The difference between the utility's cost function observed by the regulator and minimum cost function (that would result from an efficient choice of inputs) represents a loss in *productive efficiency*.

A more radical strand questioned the very purpose of regulation, linking it to private interests rather than the general interest. For Stigler (1971), the primary aim of regulation was to provide a rent to producers by protecting them from competition: "regulation is acquired by the industry and is designed and operated primarily for its benefit". Subsequent developments argued that regulation could also be captured by other groups to serve their interests at the expense of general welfare (Peltzman, 1976; Becker, 1983).

These theoretical arguments matched the actual conditions of many regulated industries. The financial situation of state-owned operators in activities such as rail and air transport had considerably deteriorated during the 1970s. While soaring energy prices had been the trigger for their difficulties, inefficiently high levels of employment and overinvestment often took the general blame. The electricity sector, for instance, had large overcapacity in many OECD countries in the 1980s, at a time when demand had slowed. In some cases, transparency requirements and monitoring capacities over SOEs had been clearly inadequate, leaving the door open to low levels of productivity, excessive managerial discretion, opaque subsidy mechanisms and support of "national champion" policies, none of which had a clear link with public welfare. In France, for instance, the monopoly rents of the state-owned telecommunications operator, based on prohibitive pricing of medium- and long-distance calls, were an important source of funding for the government's budget, while the population suffered a shortage of fixed telephone lines until the early 1970s (Cohen and Henry, 1997). Finally, in the context of the 1970s' stagflation, the general feeling that "prices are too high" provided political support to the idea that regulation was at best ineffective (Noll, 1989).

The liberalisation of utilities proceeded through two important policy shifts: deregulation and privatisation.

Unbundling the monopolies

Deregulation consisted in lifting institutional barriers to entry in utility industries whenever it was felt that competition would deliver better results that existing regulated monopolies. In some cases, however, monopoly remained the optimal mode of organisation in one or more segments of each industry, raising concerns about potential issues of vertical control between these monopolies and the competitive segments of the industry. The principal mechanism for addressing these issues has been *vertical unbundling*, through which the various parts of the supply chain in utility industries have been formally separated.

The deregulation wave started in the United States in the second half of the 1970s, first in transportation industries: air transport (Airline Deregulation Act of 1978), railways (Railroad Revitalisation and Regulatory Reform Act of 1976 and Staggers Act of 1980) and trucking (Motor Carrier Act of 1980). An important case of vertical unbundling was AT&T's

divestiture in 1984. Later, deregulation extended to natural gas (Federal Energy Regulatory Commission Order 636 of 1992), telecommunications (Telecommunications Act of 1996) and electricity (Federal Energy Regulatory Commission Order 888 of 1996).

In Europe, a major step was made towards economic integration and competitive markets within the European Community with the adoption of the Single Act in 1986. There were two ways in which this goal was potentially in contradiction with the existence of regulated national monopolies. First, it set forth explicitly competition in infrastructure sectors, to the extent that this was economically possible; second, it ruled out practices in the regulated sectors that would distort market conditions in other sectors. As a consequence, the European Commission's first decisions regarding utility monopolies after the Single Act were to forbid anti-competitive cross-subsidies and to forbid the free use of monopoly rents by governments.

Later, the European Union issued a series of directives extending the rules of the Single Market Act to utility sectors: telecommunications (1990), railways (1991), electricity (1996), gas (1998) and post (2002). These directives introduced the principles of vertical unbundling and competition, and created a common framework for regulation among the EU member states.

Privatisation

In European countries in particular, the ownership structure of utilities has been totally transformed through privatisation. The leading country in this field was the United Kingdom, where privatisation of public utilities started in 1984 with the selling of 51% of the shares of British Telecom by the state, and later concerned British Gas (1986), British Airways and the British Airports Authority (1987), public water and sewage companies (1989), public electricity companies (1990), British Rail (1995), and the nuclear activities of British Energy (1996). In Germany, the Deutsche Bundespost was privatised in 1995, giving birth to two separate private utilities, Deutsche Post AG and Deutsche Telecom AG. In France, the state sold its majority stakes in France Telecom (2004) and Gaz de France (2007), as well as 30% of the shares of Electricité de France (2005).

Economic literature on this topic clearly indicated that ownership does not matter as much as competition and the quality of regulation in producing efficient outcomes (Vickers and Yarrow, 1991; Kole and Mulherin, 1997). SOEs are outperformed by private firms in competitive industries (Boardman and Vining, 1989), but the difference disappears, or even reverses, in sectors where barriers to entry limit competition, which was typically the case of utilities (see for instance Fare, Grosskopf and Logan, 1985). Altogether, only second-order gains, if any, can be expected from privatisation compared to the first-order gains attributed to opening to competition or efficient regulation.

In practice, however, privatisation did not necessarily coincide with the opening of utility sectors to competition and the dismantling of vertically integrated monopolies. Although privatisation provided a unique opportunity to restructure the utility industries, practice in the early cases consisted in preserving the existing structure and simply transferring it to the private sector.[1] Rather than enhancing competition, the driving forces behind privatisation in Europe then seemed to be the general belief that the government should not get involved in business activities, and public finance. With the continuous rise in public debt in most European countries, privatisation was an opportunity to raise exceptional revenues, and to involve the private sector in the financing of future

investment needs in infrastructure activities. Pro-competitive restructuring actually gained momentum only in the 1990s, in particular under the impetus of the European Union's directives.

Successes and shortcomings of three decades of reform

Infrastructure services today do not have much in common with what they were thirty years ago, in particular in terms of market structure. Technological progress and globalisation have, of course, had a huge impact on these industries, but so has regulatory change. There is ample empirical evidence that regulatory reform has led to greater economic efficiency, with net benefits ranging from substantial (in telecommunications) to modest but real (in electricity supply).

In the telecommunications industry, deregulation and dramatic changes in technology have triggered wide-ranging restructuring. Numerous entries and exits and radical changes in firms' organisation recomposed market structures during the 1980s and 1990s. Olley and Pakes (1996) find that following the 1984 divestiture of AT&T, increased competition and the associated reallocation of resources from less productive to more productive firms led to a sharp increase in the aggregate rate of growth of total factor productivity.

In the railways, reforms undertaken in various European countries have increased efficiency compared to the status quo according to Friebel, Ivaldi and Vibes (2003).

In the electricity industry, cost savings have been achieved at plant level through higher productivity of labour and inputs (Fabrizio, Rose and Wolfram, 2007; Bushnell and Wolfram, 2005 for the United States). Admittedly, gains observed are fairly limited (typically, in the order of 5-10%). Fabrizio, Rose and Wolfram (2007) report that "the plant operators most affected by restructuring reduced labor and nonfuel expenses, holding output constant, by 3-5% relative to other investor-owned utility plants, and by 6-12% relative to government- and co-operatively-owned plants that were largely insulated from restructuring incentives". Bushnell and Wolfram (2005) compare fuel efficiency in generation plants in US states that have opened the power generation industry to competition and in those where the status quo has prevailed, and find that competition has increased fuel efficiency by 2%.

But it should be noted that current operating costs to some extent continue to reflect past choices in terms of technology and capital formation. At the industry level, efficiency gains have so far been mainly related to the reduction of existing overcapacity, and only in a few cases to technological shifts.[2] Therefore, more significant gains resulting from efficient investment decisions – such as the development of combined cycle gas turbines – could gradually materialise in the future (Joskow, 1997).

Indications that consumers have actually reaped the benefits from these efficiency gains are more limited. Prices have substantially decreased for long-distance communications, but overall price-cost mark-ups have widened in the telecommunications industry (Bortolotti *et al.*, 2002). Electricity prices have somewhat declined following market liberalisation for industrial consumers, but much less for households (IEA, 2005). In parallel, margins have increased – in some cases very significantly. Market liberalisation has often been followed by a reduction in regulation-induced cross-subsidies between groups of consumers on one hand and increased price differentiation on the

other. Resulting distributional impacts have been identified in the literature (Pollitt and Domah, 2001).

The experience of past years also shows that liberalisation and restructuring entail substantial risks. One of the most consistent lessons of recent developments in infrastructure sectors is that the role of policy, far from being reduced, is actually magnified by liberalisation – and changed. The scope for regulation and competition policies ranges from providing appropriate incentives to the monopoly operators, enhancing competitive behaviours in the liberalised segments, and overseeing vertical relations and co-ordination issues along the value chain to integrating "external" considerations regarding universality of access, environmental impacts, etc.

Three cases can illustrate how the benefits of liberalisation depend absolutely on the quality of the policy framework in which it takes place, and highlight the associated challenges for policy makers.

Electricity sector reform in the United Kingdom

The example of power supply in the United Kingdom demonstrates some of the risks and opportunities associated with infrastructure reforms, and shows that the balance between the two depends entirely on market design and regulatory choices.

The most radical changes took place in England and Wales (Newbery, 2002). Starting in 1990, the Central Electricity Generating Board (CEGB) was unbundled into a grid operator and three independent generation companies. A centralised wholesale market, the Electricity Pool of England and Wales, was created, effectively excluding other forms of trading. The local distribution companies were privatised. In the electricity generation segment, the reform triggered productivity gains and cost reductions that Newbery and Pollitt (1997) estimate at 6% of production costs. However, these gains were retained by the generation companies, whose profits soared for several years while prices remained unchanged. Wolfram (1999) found that between 1992 and 1994, prices exceeded the production costs of the generation unit needed at the margin to balance supply and demand by 25% on average. In fact, the small number of actors enabled collusive bidding on the wholesale market, since only two firms were effectively setting the market price most of the time. This was aggravated by chronic network congestion, which made the overall reliability of the grid dependent on supply from a few plants, thereby giving them considerable (though temporary) market power.

From 1994 onwards, the regulator, the Office of Electricity Regulation, took several rounds of measures to address market power issues, notably by imposing a cap on market prices and requiring the two dominant generators to divest some of their capacity. In 2001, the British government replaced the Electricity Pool by the New Electricity Trading Arrangements (NETA), which were inspired by the experience of countries such as Norway, where trading is less centralised.

The wholesale market became structurally more competitive over time. High margins attracted new entrants, including international generation companies, and by 2001 a *de facto* duopoly had evolved into a relatively competitive industry. Smaller and more efficient generation units were built, using the Combined Cycle Gas Turbine (CCGT) technology. The most modern nuclear power plants were privatised. There is substantial evidence that the strong incentives created by competitive wholesale electricity networks led to lower generator operating costs and improved availability (Fabrizio, Rose and

Wolfram 2007; Bushnell and Wolfram, 2005). In addition, price-cost margins eventually fell dramatically. There is a lively debate about whether it is the reduction in seller concentration or the introduction of NETA that lowered market power in recent years (Evans and Green, 2005).

The restructuring of California's electricity sector

Experience in many countries makes it clear that the transformation of infrastructure industries is a complex task, and that implementing incomplete or ill-designed reforms can have very substantial costs for governments and customers. The restructuring of California's electricity sector illustrates how reform failures happen and what they entail.

The US electricity sector was believed to perform well at the time of its restructuring in the mid-1990s: electricity was available throughout the country with a fairly high level of reliability; investments in new capacity were matching growth in demand; labour productivity was among the highest and prices among the lowest of the OECD countries (Joskow, 2003). Additional gains in terms of productivity and efficiency were thought to be possible but limited. The main motivation for restructuring electricity markets in the United States was that in the early 1990s, retail prices were much higher in some parts of the country (including California) than others. This was due to inappropriate investment choices and procurement decisions made by vertically integrated utilities in the course of the 1970s and 1980s, partly in response to regulatory requirements (White, 1996). On the retail market, supply was governed by long-term commitments with local generators, and regulated prices covered the costs of existing generation facilities. In other words, the regulatory regime consisted in transferring all risks related to sunk costs to the customers. At the same time, on the wholesale electricity market, prices were kept down by the low cost of fossil fuels and an overall excess of generation capacity. Reform then consisted in opening the generation market to competition, and shifting to a regulatory regime where risks related to sunk costs would be borne by the investors – that is, where low-cost production would become more profitable high-cost production. This, however, would happen after a transition period during which utilities would be compensated for their "stranded costs", through mechanisms that varied from one state to the other. In short, one of the principal aims of regulatory reform was then to allow for the phasing out of non-performing generation capacities, and to let future investment choices in electricity generation to be led by market incentives.

While the primary aim of the reform was to lower generation costs through market mechanisms, prices on the national wholesale electricity market suddenly soared in June 2000 to more than twice the levels that had prevailed since the market's opening in April 1998. The utilities, which had to buy electricity on the wholesale market and sell it to their customers at much lower regulated prices, rapidly faced insurmountable financial difficulties. In March 2001, after its largest utility declared bankruptcy, the State of California had to take over electricity purchases on the wholesale market, at prices on average ten times higher than one year before, effectively putting an end to the market's existence at a very high cost. Later investigations showed that even during its first two years of existence, the market was highly unstable, and led to two series of lessons: one specific to California's experience, in particular concerning the faulty design of the wholesale market and the role of a sudden rise in the price of pollution permits; and one more general, regarding the sensitivity of the electricity market to demand and supply conditions, and to issues of market power in electricity generation (Borenstein, 2002).

A report by the US General Accounting Office attributed the collapse of California's electricity market to the exercise of market power by wholesale electricity suppliers (GAO, 2002). The report mentioned that rising input prices contributed to the crisis, but it also underlined the disastrous consequences of the freeze on retail prices in the context of a supply/demand imbalance. All in all, it is clear that poor choices in the design and regulation of the market had both largely aggravated the situation and made corrections more difficult (OECD, 2005a).

The privatisation of British Rail

The UK experience in privatising and restructuring the rail industry illustrates two other challenges of the reform process, namely the importance of a clear and consistent regulatory framework and the need for effective co-ordination among the unbundled segments of the industry.

The transformation of the rail industry was triggered by the 1993 Railways Act, following adoption of a plan for privatisation of British Rail by the government in 1992. British Rail was vertically and horizontally unbundled into more than 100 companies, in a process that separated infrastructure from operations and constituted five main operational components: 25 train operating companies (TOCs), 5 freight operators, 3 rolling stock leasing companies (ROSCOs), 19 maintenance suppliers, and the rail infrastructure operator Railtrack, which first remained under state ownership but was later privatised.

In 2006 train operation franchises were let through an auction process. But because of the lack of competition among bidders, the operators who won the franchises were able to secure themselves very high levels of public subsidy for several years. Prior to the privatisation of ROSCOs, the government also announced that it would guarantee 80% of their leasing revenue, which turned out to be an enormous advantage for the privatised firms. Soon after privatisation, the industry's profits soared. According to calculations made by *The Economist*, the companies that once formed British Rail together recorded GBP 1.1 billion, or 19% of their revenues, in profits in the financial year 1997-98 (*The Economist*, 1999).

Privatisation was also followed by initial improvements in the reliability and punctuality of trains, but from 1997 onwards the situation deteriorated. In the fiscal year 2001-02, an estimated 78% of trains arrived on time, compared with 90% in 1997-98. Punctuality and reliability problems were to a large extent due to deficiencies in the infrastructure, in particular the poor quality of tracks and signalling and the lack of capacity of tracks and terminals.

After years of underinvestment prior to privatisation, investments in infrastructure were an area of concern. Railtrack launched a modernisation programme focusing on signalling systems and control centres. But by the end of the 1990s, broken rails and "gauge corner cracking" had become such widespread problems that Railtrack had to impose hundreds of emergency speed restrictions around the network. The derailment that occurred at Hatfield on 17 October 2000 and killed four people revealed the extent of the problem, and at the same time led to increased speed restrictions, causing large-scale disruption and overcrowding. Congestion, which was in part caused by problems in infrastructure reliability, resulted in large incentive penalty payments by TOCs.

The government had already responded to the situation by putting in place the Strategic Rail Authority in 1997. After the Hatfield accident it launched a recovery

programme that entailed replacement of hundreds of miles of rail, and finally brought Railtrack back into public ownership; it became Network Rail in 2002.

Recent years have seen a sharp increase in the number of passengers (40% since 1997). Although the United Kingdom is still well below countries such as Germany and France in terms of railways usage (International Union of Railways, 2006), congestion problems have continued to seriously affect the network. Capacity is notoriously inadequate in areas such as Greater London. At the same time, rail fares have increased by more than 35% between 1995 and 2005, compared with 20% for motoring costs (*The Economist*, 2007).

The main focus of the industry since privatisation has been on cost cutting. Long-term co-ordination of investment and service choices along the supply chain has been far from adequate, making clear the costs of vertical separation and the need for better contractual mechanisms.

Policy options and challenges regarding infrastructure services

The evolution and current state of infrastructure services in OECD countries cannot be solely attributed to liberalisation. Technological change and demand-side developments have also together exerted influence on the provision of infrastructure services. This will continue in the future, not least in relation to the challenges of climate change, demographic trends, and development. Rather than a one-off liberalisation "big bang", the governance of infrastructure service markets has to be understood as a continuing process.

As a consequence, a case-by-case, adaptive approach is necessary, one that accounts for local conditions such as the state of development of existing infrastructure, technology, regulatory capacities and socio-economic policy objectives. Consistency in the choice of policy options is key. This section reviews in greater detail some of the developments of the past 30 years and the policy challenges and responses that economic theory and regulatory practice have identified.

Raising efficiency in infrastructure monopolies

The traditional view of infrastructure services emphasised the "natural monopoly" aspects of the industries, and the role of regulation in securing an efficient outcome (Box 5.1). The restructuring of public utility sectors in OECD countries has not been based on a rejection of the idea that natural monopolies exist, but rather on a much stricter definition of their boundaries, and the conclusion that the remaining parts of the supply chain can be partly or fully competitive. The domain of monopolistic activities has therefore been narrowed, and at the same time attention to economic efficiency within these activities has been enhanced.

Box 5.1. **Monopoly pricing and regulation under complete information**

Monopolistic activities have traditionally been subject to various types of public intervention, in particular entry, exit and price regulations. These interventions were grounded in the early theory of natural monopolies and efficient monopoly pricing

Box 5.1. **Monopoly pricing and regulation under complete information** *(cont.)*

In economic theory, a natural monopoly is an activity where, at all levels of output serving the market, the average cost of production is decreasing – in other words where, because of large fixed costs of production, there are economies of scale. Fixed costs are said to be sunk in cases where, if a firm had to withdraw from the market, its production assets would lose all or most of their value. Sunk costs generate significant risks for potential entrants. Such risks, together with the existence of economies of scale, act as a powerful barrier to the entry of potential competitors.

When an industry is a natural monopoly, competition is not only unsustainable – it is also sub-optimal. Economic theory states that the most efficient outcome from the standpoint of social welfare is characterised as *i)* production at minimum cost, and *ii)* prices equalling marginal costs. In a natural monopoly, this optimum is reached when a single firm supplies the market, and increases output as long as the price that consumers are willing to pay covers its marginal cost of production. The behaviour of an unregulated monopoly, however, does not conform to these conditions. A monopoly raises the market price to maximise its profits, especially when this can be achieved with a limited loss of output (*i.e.* demand is inelastic, for instance because there are no substitutes to the product). The extraction of a monopoly rent through monopoly pricing leads to an inefficient equilibrium: it entails not only a transfer of welfare from consumers to the firm, but also a net loss, usually called deadweight loss.

Early on the theory of regulation had it that public intervention is necessary to *i)* monitor entries and exits in order to ensure that producers fully benefit from economies of scale; *ii)* control the rent through regulated prices based on marginal costs of production; and iii) if need be, subsidise the monopoly for the difference between its profits and fixed costs. Such intervention was considered the only solution for reaching the economic optimum (*first-best solution*). However, the theory was based on strong assumptions: that the funds used to subsidise the monopoly are raised at no cost to the economy; that the regulator is perfectly informed about demand and supply conditions; and that the regulator's only objective is to maximise social welfare.

As governmental subsidies to commercial activities were recognised as distortive and gradually dismantled, monopolies were constrained to balance their budget. As marginal pricing was no longer a viable solution, alternatives for efficient monopoly pricing were proposed in order to minimise the welfare loss *(second-best solutions)*:

- The *cost-plus* (or *full cost*) price, which comprises the marginal cost and a mark-up to cover fixed costs, was the basis of cost-of-service price regulations.
- The *two-part tariff* is the preferred option when customers can be charged a fixed access fee to cover fixed costs, and a price per unit of output equal to the marginal cost.
- *Ramsey-Boiteux pricing*, finally, is the superior option when the monopoly has multiple products (or can discriminate among different groups of customers), and can set mark-ups in proportion to the elasticity of demand for each product (or each group).

These early facets of the theory of regulation were later criticised on two fronts. Some economists challenged the view according to which regulation was driven by general interest, and showed how private interest groups can influence the outcome of the regulatory process. Others emphasised the importance of information asymmetries between the regulator and the firm, and demonstrated that under incomplete information, the best option for the regulator was to provide the firm incentives to reveal its private information (see *infra*).

Source: Ramsey, 1927; Hotelling, 1938; Coase, 1946; Boiteux, 1956; Baumol and Bradford, 1970.

Redefining "natural" monopolies

The natural monopoly paradigm continues to be dominant for the distribution and transport segments of utility industries, which rely on networks: high-voltage transmission grids and low-voltage wires and transformers for electricity; pipelines and local distribution lines for gas; transmission and switching centres for telecommunications; railway tracks, signals and stations for railways; and sewers, distribution pipes and wastewater collection for water supply and sewerage. Network infrastructures entail considerable fixed costs, which are essentially sunk since assets are largely specific to the utility activity. Economies of scale are also related to the role of the infrastructure operator as co-ordinator of actions throughout the network. In the architecture of power systems, for instance, real-time management of power streams in order to balance demand and supply at all points of the grid is an essential task of the grid operator; it conditions the overall reliability of the system.

In other elements of utilities, fixed and sunk costs also exist, but are more limited: electricity generation plants, gas refineries and storage facilities, water treatment, inter-exchange services and mobile services in telecommunications – as well as maintenance and retail activities in most utilities – all entail some economies of scale, but not enough to rule out competition in a reasonably large market.

Many developments in the economic environment have contributed to changing – usually, restricting – the domain of natural monopolies in infrastructure services over the past 30 years. Among these, the most important has certainly been technological change. Technology influences market structures through at least four channels: it determines the optimal (or minimum efficient) size of production units, transport and storage costs, the costs of new investment, and the time needed to actually enter the market (*i.e.* design, plan, build and operate new production units). In the past, technological change has frequently had a substantial impact on the optimal size of units, in one direction or the other. In recent years it has considerably reduced the optimal size of production units in telecommunications (particularly inter-exchange services) and electricity generation (Bayless, 1994). The impact has been less significant in electricity transmission and distribution and in public transportation, and almost negligible in water distribution.

The telecommunications sector has been revolutionised by the technological burst of optical fibres, Internet platforms and cellular telephones, and continuous productivity improvements in integrated circuits, computers and software. Not surprisingly, the cost structure of the industry has dramatically shifted, and some consider that no segment of telecommunications nowadays appears as a natural monopoly. In 1997, considering that telecommunications had become a fully competitive sector that did not call for specific regulations, the Australian government decided to put an end to the activity of Austel, its regulatory agency for telecommunications. And with the development of "voice over the Internet" alternatives and the considerable challenge they represent for traditional service providers, changes do not seem to be over. For many authors (*e.g.* Hausman and Sidak, forthcoming), the "endpoint" for the industry will be reached with facilities-based competition on local markets among cable, Internet and wireless service providers.

In the electricity industry, smaller-scale units have changed the landscape of power generation. Combined cycle gas turbines (CCGTs) have brought about the most spectacular changes, being both cheap and limited in scale. Importantly, because CCGTs can be built and made operational rapidly, they have enhanced competitive pressures in the generation market well beyond their market share.

Regulating monopolies: The challenge of information asymmetries

The basic problem of monopoly regulation is not simply to let the monopoly recover its (fixed and marginal) costs of production while at the same time limiting its profits. It is also to replicate some of the efficiency-enhancing effects of competition in order to make sure that the monopoly seeks to minimise its costs. The latter has been the motive for intensive regulatory reform in the past 30 years.

As explained earlier, cost-of-service regulations were primarily aimed at controlling monopoly rents. The regulatory process provided some incentives for cost reduction to the monopoly, notably through the time lag between two reviews.[3] But these were generally considered inadequate, as production costs were ultimately transferred to customers. This led some economists to suggest that regulation should use higher-powered incentive schemes or find ways to introduce a degree of competition in utility sectors (Joskow and Schmalensee, 1987).

Already in 1982, with the privatisation of British Telecom, the United Kingdom government had introduced a new model of price-cap regulation, based on the "RPI-X" formula (Littlechild, 1983). The price-cap regulation consists of a commitment by the regulator, over a defined period of time, to allow the monopoly to increase its prices according to a pre-established formula. In the case of RPI-X, this was the difference between inflation (as measured by the retail price index) and an X-factor reflecting the industry's (relative) productivity gains and input price changes. The regulated company has an incentive to further reduce costs and improve productivity in order to increase its profits. The basic price-cap model has been gradually refined, in particular to integrate criteria aimed at preventing deterioration in service quality. Price caps have become the standard in regulation of network operators in the United Kingdom, and in various US industries including telecommunications. In other cases regulators maintained the framework of cost-of-service regulations, but introduced targeted incentives for cost efficiency – for instance by restricting the conditions under which input cost increases were approved.

The introduction of *incentive regulations* has had some positive effects, but has also faced some obstacles. Kridel, Sappington and Weisman (1996) survey empirical studies on the impact of incentive regulations in the telecommunications industry, and estimate that the results are conclusive regarding increases in productivity, infrastructure investment, profit levels and telephone penetration, but not regarding the effects on overall costs and final prices. Ai and Sappington (2002) find evidence of greater network modernisation in the US telecommunications industry with incentive regulations than with former cost-of-service regulations, but the effects on costs depend on the degree of local competition and those on prices are negligible. Knittel (2002) examines the use of incentive regulations in electricity generation in the United States, and concludes that regulatory schemes targeted at plant performance enhanced efficiency while broader schemes, including price caps, had non-significant or even negative effects.

Forecasting the evolution of an industry's productivity and input prices over an extended period has in practice proved particularly challenging for regulators. In the United Kingdom, the regulators for the water industry and for electricity distribution both had to break their five-year commitments over RPI-X formulas, because the operators' revenues seemed inadequate in one case and excessive in the other (Armstrong, Cowan and Vickers, 1994). In that country's electricity sector, the considerable profits made by the

newly privatised Regional Electricity Companies under price-cap regulations led the government to impose a specific lump-sum tax on the industry. As a consequence, the common practice in OECD countries across infrastructure industries is to review price caps on an annual basis (OECD, 2008).

The source of these difficulties is the regulator's limited knowledge of the industry. Demand elasticities, cost structures and technological and organisational innovations are all areas where firms have an informational advantage over regulators. A new theoretical approach, which emerged in the 1980s and became known as the theory of incentive regulation, placed these information asymmetries at the heart of regulation.[4] According to this theory, regulation should be designed as a mechanism that brings the monopoly to truthfully and willingly reveal its information. In order to provide the right incentives, the mechanism has to grant a rent to firms that admit having low costs or better technology. Importantly, the regulator has to commit not to change the terms of the agreement after the firm has revealed its information, and the firm has to deem this commitment credible. The theory of incentive regulation therefore considers that monopoly rents are a price that regulators have to pay in order to induce firms to use their superior information for the benefit of society.

The theory of incentive regulation has attracted considerable interest in academic circles in recent years. However, three features have so far hampered its practical use. First, the optimal mechanism depends on the source of the firm's informational advantage, on the regulator's policy instruments, and on various other factors. This means that the policy recommendations derived from the theory are dependent on the institutional, technological and informational context, and can be highly sensitive to changes in parameters. Second, the theory assumes that in spite of their informational differences, the regulator and the monopoly have some common knowledge (typically, that they agree on the possible values of cost or productivity parameters, and on their probabilities) – but it does not specify how that knowledge is acquired. Since agreement on these assumptions largely determines the regulatory mechanism, it is more than likely that it will involve strategic interactions, and raise legitimacy and acceptability issues (Crew and Kleindorfer, 2002). Third, the theory considers that the regulator can commit to the original mechanism over an extended period, even when it turns out to be too favourable for the firm. In practice, as shown by the examples above, it seems extremely difficult for a regulator to maintain a mechanism in the presence of excessive profits.

Introducing competition into monopolistic markets

An alternative to regulation in monopolistic sectors is the introduction of a dose of competition, or rather of competitive pressures. In a *contestable market*, for instance, the threat of competition is sufficient to force a monopoly to give away part of its rent (Baumol, Panzar and Willig, 1982). Market contestability depends entirely on barriers to entry: a slight change in technology or regulation can have dramatic consequences for market structures if it facilitates the entry of new suppliers. Air transport provides an illustration of the development of market contestability. Local monopolies are commonplace in air transport, since the size of traffic on most routes does not allow for the presence of more than one or two carriers. However, aircraft leasing has significantly reduced the capacity of monopolistic suppliers to exert market power, since a large profit margin on a given route would quickly attract new entrants. This example illustrates how vertical unbundling of formerly integrated activities (ownership and maintenance of aircraft fleets *vs.* operation

of airlines) has eliminated a large part of the sunk costs from the monopoly segment, reduced barriers to entry and achieved some of the advantages of competition.

Even in activities that have a monopolistic nature, competition can be introduced through a process of bidding for limited-duration monopoly franchises, *i.e. competition for the market*. Provided that their number is large enough and there is no collusion among them, competing incumbents can give away a large share of the monopoly rent (Demsetz, 1968). Moreover, franchise renewals act just the same as market contestability in creating incentives for the operator.

It is usually considered that competition for the market is difficult to implement in utility sectors because of the magnitude of information asymmetries and transactions costs (Vickers and Yarrow, 1991). Franchising is conditional on an unequivocal statement of mission and of control procedures regarding its completion.

In complex markets such as infrastructure services, franchise contracts can seldom integrate all possible contingencies. Indeed, the monitoring and enforcement of complex contracts have many of the features of regulation, including in terms of costs (Williamson, 1976). Contracts are therefore incomplete, and can leave substantial rent opportunities to the operator. In such a case, renegotiations would also be at its advantage, and regulators might be tempted to change the rules *ex post* (Williamson, 1975).

In some cases however, it has proved possible to get an operator to reveal private information and to establish appropriate incentives through the use of benchmarking and yardstick competition techniques (Shleifer, 1985).

Policy messages

In conclusion, the view according to which infrastructure services are best provided by integrated monopolies monitored by regulators has been amended in several important ways. The domain of truly monopolistic activities is more limited than previously thought, and continues to be reshaped by changes in the economic environment.

While traditional forms of public intervention in monopoly activities have been shown to be inefficient, better regulation through either the introduction of competition for the market or incentive-based contracts has proved challenging.

Managing the relations between monopoly and competitive sectors

The most significant step in the process of restructuring utilities is the formal separation of competitive and monopoly segments, often called “vertical unbundling”. As part of the unbundling process, minimal conditions for the functioning of competitive markets have to be fulfilled, including unregulated prices, free entry and exit, information enabling consumers to make a choice between suppliers (in particular regarding market prices) and non-discriminatory treatment of competing suppliers. Gathering these conditions entails specific challenges in industries that have been both structured as monopolies and integrated vertically (Joskow, 1997).

Alternatives for unbundling infrastructure sectors

The most clear-cut option for vertical unbundling is to completely disconnect the two sectors by making separated ownership mandatory. Privatisation can provide a convenient opportunity for this type of unbundling, since the ownership of at least one of the entities changes. By contrast, in the case of private sector integrated utilities, ownership separation

can only come from voluntary divestiture decisions. Regulatory authorities can, however, create strong incentives to divest by imposing stringent restrictions on vertical relations between the utility elements. AT&T and British Gas are examples of privately-owned utilities that decided to divest from downstream activities under pressure from regulators. As an alternative to ownership separation, the integrated entities can be separated legally, and required to hold distinct accounts and conform to competitive behaviours. For instance, the Federal Electricity Regulation Commission (FERC)'s Open Access Rule has only imposed legal separation on the United States' electricity industry.[5] In the European Union, directives concerning infrastructure sectors usually encourage member countries to engage in ownership separation, but only make legal separation mandatory.

Unbundling actually happens when customers are given direct access to the competitive segment of the supply chain. This solution has been applied to the restructuring of the electricity industry in a number of countries, including England and Wales, New Zealand, and Norway. Customers can directly select their electricity generation service with competing suppliers, either through long-term contractual arrangements or (for larger customers) on a spot market. The transmission operator and local distributors are responsible for their own services, and electricity prices are unbundled accordingly.

Alternatively, the structure of the retail market can be maintained, with a distributor in charge of delivering a bundled service to the customers of a given area. Distributors then get their supplies from a wholesale market through competitive procurement mechanisms, and integrate the wholesale price into their retail price. This option was chosen for the restructuring of California's electricity market and in other US states.

One of the important lessons from these experiences is that the role of regulators varies from one case to the other, as do their needs in terms of capacity and instruments. Typically, regulators have to monitor vertical relations more closely under functional separation than under ownership separation. Likewise, they need to have a better understanding of market conditions when the end-product is bundled than when customers can make their own choice in the competitive segments of the supply chain. In turn, regulators have a greater capacity to influence outcomes in the competitive segments when unbundling is partial rather than complete. In short, unbundling can be accommodated in a variety of forms, going from the creation of a fully competitive activity alongside regulated monopolies to the limited reduction of regulation in parts of the value chain in utility sectors.

Externalities and access issues

Various forms of interdependency can exist between the different segments of a value chain. This variety of relations is particularly common in infrastructure industries. Within the railways industry, for instance, both positive and negative dependencies have been observed (Cantos, 2001): track infrastructure and passenger operations are cost substitutes – higher track costs lead to lower operation costs by permitting faster services; track infrastructure and freight operations are cost complements – higher track costs increase freight operation costs via higher maintenance costs.

Vertical integration allows accommodating such dependencies within a single organisational structure. In the electricity industry, it has even been argued that complementarities between generation, transmission and distribution were the principal purpose of vertical integration, rather than scale economies (Joskow and Schmalensee,

1983). With unbundled structures, on the contrary, dependencies fall outside the scope of economic decisions. The existence of such externalities is usually associated with socially inefficient private decisions, due to free-riding or co-ordination failures. Cantos (2001) considers that "if important decisions regarding infrastructure are going to be made, rail-operating costs will be notably affected. … if these vertical relationships are present in a vertical unbundling structure, the risk of inefficiencies and loss of co-ordination effects between infrastructure and operations will be extremely high".

A particular co-ordination issue concerns investment. In most infrastructure service sectors, it is critical that production, transmission and distribution capacities develop in parallel with the evolution of demand. For instance, as will be explained in the following section, the congestion of power transmission lines can affect competition in power generation markets, while inadequate generation capacity jeopardises the reliability of the overall power grid. Differences of incentive and time horizon in investment decisions between monopoly and competitive segments further increase the risk of co-ordination failures.

The costs associated with vertical separation can be substantial, and can actually outweigh the benefits of complete unbundling. In the railways industry, for instance, separation can generate a 20% to 40% increase in production costs, according to some estimates (OECD, 2006c). But the balance of costs and benefits is case-specific, and has to be assessed in accordance with market conditions. Shires and Preston (1999) find that in Sweden, operating costs decreased by 10% following vertical separation.

Finally, vertical unbundling of an integrated utility raises the issue of access to the distribution network, which is often still controlled by a monopoly, for the firms operating in the competitive segment of the industry.

Regulating vertical relations

Third-party access to bottleneck networks can be either negotiated or regulated. Regulation is almost inevitable when vertical separation is not complete, *i.e.* the network operator is also a market participant in the downstream segment. This is a common issue in telecommunications, where for example long distance telephone operators have to buy access to the local loop from local telephone companies, which can also provide long distance call services.

As a monopoly operator would tend to charge inefficiently high prices to the firms using the network, access pricing also needs to be regulated. But this has proved to be a very complex issue for regulators. First, there is no unique solution for allocating network costs, and all available options (full cost *vs.* incremental cost, *ex post vs.* forward looking, etc.) involve some drawbacks for incompletely informed regulators. Second, access conditions affect the dynamics of investment, prices and quality of service in both upstream and downstream markets (Guthrie, 2006).

Efficient monopoly pricing would mean selecting buyers of access according to their demand elasticity (Box 5.1). However, such discrimination can violate competition rules, according to which all market participants should be subject to the same conditions of access to the infrastructure. This contradiction was clearly illustrated by the conflict between Germany's railway infrastructure operator Deutsche Bahn AG and the competition authority Bundeskartellampt in 2003 over the possibility for the monopoly to propose a tariff menu as a way to discriminate between infrastructure users.

Two-part tariffs comprising a fixed and a variable charge are commonly used for pricing access in the railways industry. Experience shows that the tariff structure has a strong influence on network usage, investment and transport quality. High fixed charges combined with low variable charges encourage operators to run many trains and inefficiently saturate network capacities. Low fixed charges combined with high variable charges, on the other hand, create incentives for efficient train operation but reduce the monopoly's incentives for investing in network enhancement (Pittman, 2004).

The problem is further complicated by the fact that regulators, when establishing access-pricing regimes, might give priority to affordability objectives over the long-term development of the infrastructure. Through access pricing, regulators can indeed influence both the costs of operating trains and the conditions of entry in the market. Lowering access prices can reduce retail prices directly, by making infrastructure service delivery cheaper, and indirectly, by increasing competitive pressures among operators. However, inadequate access prices prevent the infrastructure monopoly from recovering its fixed costs, and penalise investment. Access price determination therefore imposes a trade-off on regulators between short-term improvement of service affordability and long-term development of network capacity and reliability.

Finally, the presence of strong externalities also provides the rationale for regulatory interventions in the liberalised segments of infrastructure services, usually in the form of minimum requirements and mandatory long-term commitments. In the electricity industry, the infrastructure operator is responsible for assuring network reliability, and can in turn require power generation firms to comply with certain technical criteria. These go from frequency, voltage and stability attributes to operating reserve and long-term capacity obligations (Joskow and Tirole, 2007).

Policy messages

In order to tackle issues such as market power, regulators have to monitor the liberalised segments of infrastructure services and to co-ordinate their interventions all along the supply chain. This issue is discussed in the next section.

It should be noted that supervising the conditions and terms of contractual arrangements between network utilities and downstream operators or directly regulating access conditions and prices gives regulators *de facto* power to influence the downstream market.

Enhancing competition and investment in the liberalised sectors

The overall benefits of restructuring an infrastructure service industry depend on the degree of competition that eventually prevails in the liberalised markets. A host of factors determine if a sector is apt to support competition, including economies of scale, legal barriers to entry (for instance in terms of access to technology), market size, and search and switching costs for consumers. One of the main challenges of restructuring is to evaluate how these factors will affect the market structure in the long term.

For instance, train freight exhibits such economies of density that according to some experts, it can only be supplied by a monopoly, or at best oligopoly, in equilibrium (Pittman, 2003a). This means that decisions to open the freight market, which are being considered in many OECD countries, should be based on the assumption that competition has few chances to prevail in the long term.

Market power

When the number of suppliers on a market is small, each of them can influence market outcome through its decisions, and no longer acts as a price-taker. This behaviour defines market power, which usually leads to welfare losses of the same nature as those caused by a monopoly, with higher prices and lower quantities than the optimum (Box 5.1). As illustrated during the first phase of the liberalisation of England and Wales' electricity sectors (Newbery, 1995), it is crucial to have an adequate number of competitors in the market if prices are to be kept close to the level of marginal costs and an efficient outcome is to be secured.

In some cases, however, even small firms with numerous competitors can have market power, at least locally and/or temporarily. Two conditions favouring the emergence of market power are the existence of bottlenecks in the facilities through which firms supply their markets, and low elasticity of demand. These conditions are generally valid in most infrastructure service industries.

Demand for infrastructure services has the particularity of being highly volatile. Typically, a large share of production and distribution facilities is unused most of the time, and capacities get close to full utilisation only during demand peaks. During short periods, both production and distribution capacities can be saturated.

When distribution lines are congested, suppliers located at certain points of the network can have a monopoly over the supply for local demand. Distribution capacity can therefore limit the degree of competition that actually takes place throughout the network. Equally, in most infrastructure service industries, demand is not highly responsive to price increases. Therefore, when demand nearly saturates supply capacities, marginal suppliers can charge prices well beyond their production cost.

Electricity generation provides an illustration of how congestion and low elasticity of demand can combine to lead to market failure (Box 5.2).

Box 5.2. **Market power issues in electricity generation**

Electricity grids function in such a way that an imbalance between supply and demand at one point can disrupt transmission throughout the grid and lead to a general blackout.

Delivery of electricity, the product consumed, must take place through a potentially congested transmission network. If a supplier owns a portfolio of generation units that are connected at different but relatively nearby locations in the transmission network, how these units are operated can congest the transmission path into a given geographic area; in so doing it limits the number of suppliers able to compete with those located on the other side of the congested interface. According to demand and supply conditions, congestion can appear at various points of a network, in ways that are very difficult to predict. With binding transmission constraints, the electricity market is fragmented into smaller, more concentrated markets. Generators located at specific points of the grid are, alone or collectively, in a position to ensure the reliability of supply, and can therefore impose a scarcity rent for their contribution. In England, prices up to six times the normal level were observed in such conditions (OFFER, 1992).

Box 5.2. **Market power issues in electricity generation** *(cont.)*

Historically, how electricity has been priced for final consumers makes the wholesale demand extremely if not perfectly inelastic with respect to the hourly wholesale price. In the United States, customers are typically charged a single fixed price for each kilowatt-hour (kWh) they consume during the month, regardless of the value of the wholesale price when this kWh was consumed. Part of the reason for this single fixed retail price is the fact that most residential meters are only capable of recording the total amount of kWh consumed between consecutive meter readings. Consequently, a significant barrier to implementing retail electricity prices that reflect wholesale market conditions is the availability of metering technology that records hourly consumption for all hours of the month.

During the few hours of very high demand, the most expensive resources set the price – usually plants with low capital costs and high marginal costs, such as open cycle gas turbines (OCGT).

A generator subject to competition will be willing to produce at a price that pays the cost of each additional MWh, but this marginal cost will not cover depreciation or provide returns on the capital invested. Generation plants recover invested capital during periods in which the price is set by the more expensive plants. Thus, plants with high capital costs must operate most hours of the year to be profitable, even if marginal costs are low. These base-load plants will recover the invested capital when prices are set by plants with higher marginal cost. Plants with low efficiency will only recover the invested capital during hours in which the most expensive resources are setting the price. The most expensive resources are only activated during the very few situations with very tight supply/demand balance.

Thus, the profitability of investment in plants such as OCGTs depends on the possibility to bid at prices above marginal costs. This is not usually a problem because the owner of the facility will have substantial market power in the specific hours within which it is needed, and will therefore be able to collect a scarcity rent. However, this market power may pose a threat to the economic efficiency of the entire market and raise political concerns. An important point for the functioning of the market is that a generator should never be the "supplier of last resort".

All of the above factors also make wholesale electricity markets substantially less competitive if there is a shorter time lag between the date the sale is negotiated and the date delivery of the electricity occurs (Borenstein and Bushnell, 1997). The longer the time lag, the more suppliers are able to compete to provide the electricity. As the time horizon between sale and delivery shortens, more potential suppliers are excluded from the market. For this reason alone, it is not surprising that real-time prices are far more volatile than day-ahead prices, which in turn are far more volatile than month-ahead or year-ahead electricity prices.

Capacity development

The strength of competition and the level of prices also depend on the availability of excess production capacity. It is usually the case that the marginal cost of production rises sharply as available capacity nears saturation. With excess capacity, prices based on marginal costs can be very low, and even temporarily fall below average costs. In a competitive market, the least efficient producers incur considerable losses and can be forced out of the market. Such an outcome was expected from the restructuring of

California's electricity sector in the middle of the 1990s. On the other hand, if production capacity is inadequate, prices based on marginal costs rise above average costs. In a competitive market, the most efficient producers can make very substantial profits. Naturally, if the market is not competitive, profit margins are even larger. This is what happened in California in 2000, as the western US electricity grid went from excess supply to excess demand in the course of the 1990s.

More generally, restructuring and privatisation have been more successful in cases where large investments had already been made, a technologically advanced network was in place, and there was excess supply, than in tight markets (Kessides, 2004).

Timely development of additional capacity is key to the efficient operation of liberalised markets, but it raises specific issues. Peaking capacity is used only when demand is at its maximum, which occurs only occasionally. A normal rate of return on peaking capacity investments therefore entails including a margin larger than usual (sometimes called scarcity rent) in the price of peaking production (Joskow and Tirole, 2006). Such a premium might be difficult to distinguish from the exercise of market power, particularly when demand is inelastic and/or there is congestion. When prices are regulated, scarcity rents cannot be applied, and incentives for the development of peaking capacity are weakened (Brennan, 2005).

Regulating competition

In key industries such as infrastructure services, the exercise of market power can lead to large welfare losses and substantial transfers of income from consumers to producers. Regulatory intervention is required to address such situations or, preferably, to prevent their occurrence. There are a number of ways in which regulators can limit the ability of suppliers to exercise unilateral market power.

The most direct type of intervention consists in penalising firms that appear to exert market power, or in dictating the price that suppliers will receive in market conditions conducive to the exercise of market power. The goal here is to simulate the signals and incentives of a competitive market even when the actual market stops being competitive. One example is the Automatic Mitigation Procedure (AMP) commonly used in US wholesale electricity markets.[6] Under the AMP, a reference price is calculated for each supplier on the basis of its past bids, and is imposed whenever behaviour suggesting use of market power is observed. A supplier is deemed to use market power when it makes a bid in excess of its reference price by a certain (predetermined) margin, *and* this bid causes the market price to increase by more than a certain (predetermined) amount.

The main limitation of such interventions stems from informational deficiencies already discussed in the previous sections. The regulator (or system operator) ignores the exact cost curve of market participants, and can only estimate it (or incite firms to reveal it) at a cost. The regulator's lack of information is one of the foremost reasons that competitive markets are desirable. In the AMP, for instance, incomplete information brings the regulator to determine the reference price on the basis of prices observed in the past. The scheme acts as a disincentive for making low bids in competitive market conditions, since a low bid reduces the expectation of future profits in tight market conditions. It is estimated that the AMP results in higher off-peak prices, on-peak prices still above the competitive price level, and – all in all – a net welfare loss (Wolak, 2007).

Structural interventions aimed at preventing the development of market power – rather than merely mitigating the effects of its exercise – have better chances of success. There is a precondition, however: regulators have been able to come up with a precise diagnosis of the structural roots of market power.

When market concentration appears to hamper competition, regulators can reduce barriers to entry or impose capacity divestiture. For instance, severe problems of market power in the England and Wales power generation industry were in large part tackled when the regulator imposed the divestiture of the three incumbent companies into twelve suppliers.

Local market power due to network congestion points to a geographical mismatch between production and consumption, and has to be addressed by either encouraging the start-up of new production facilities located in the vicinity of large consumption centres, or securing additional investments in transmission capacity.

Ill-designed market rules can also be at the origin of chronic market power issues. When the balance between demand and supply relies heavily on short-term markets (in particular on spot markets), individual producers have increased chances of having a monopoly over the service of residual demand. Long-term arrangements, on the contrary, give buyers additional opportunities to find alternative sources of supply and can even open the door to new entries. Short-term markets of course remain necessary to respond to the volatility of demand and supply, but they should be managed with the aim of avoiding situations where the overall balance between demand and supply relies on a single producer. Improving the mix between spot markets, futures markets and long-term contractual commitments is therefore one of the important tools for enhancing competition in infrastructure service sectors.

Concerning capacity development, a variety of approaches have been tested in the electricity generation industries of OECD countries. Some countries fully rely on the incentives provided by market price signals (Australia, United Kingdom). Others have set up markets for capacity reserves (Sweden, Norway, Netherlands) or established specific payments to generation companies for maintaining peaking capacity (Spain, Korea). Capacity markets are considered an effective mechanism for restoring incentives when wholesale prices are capped, while capacity payments can be costly for consumers and have been subject to manipulation in the past (IEA, 2005).

Finally, regulators can introduce changes in retail markets in order to make demand more responsive to price changes. In particular, there has been a tendency in the past to price infrastructure services uniformly, irrespective of the time of the day or the season in which they are consumed. Consumers did not receive any incentive to reduce the seasonality of demand by shifting on-peak consumption to off-peak periods. In the context of liberalised markets, this means that final demand has been totally isolated from markets signals such as wholesale prices. Over the years, differentiated retail prices have been gradually applied in the electricity sector, in telecommunications and on toll roads. But only air transport and (to a lesser extent) railways have generalised the use of dynamic demand-side management techniques relying on real-time information systems. It is usually estimated that other infrastructure industries have a large potential for increasing the elasticity of demand with moderate costs for consumer welfare, and that this would represent the most fundamental response to market power issues (Joskow and Tirole, 2006).

Policy messages

In conclusion, the experience of OECD countries reaffirms that regulatory interventions are still necessary in the liberalised segments of infrastructure industries, once these are unbundled from natural monopoly segments. The evidence suggests that liberalisation and restructuring generate efficiency gains, but it takes substantial regulatory capacity and efforts to pass those gains through to consumers (Domah and Pollitt, 2000). In many OECD countries, the responsibilities and competence of regulatory authorities were actually extended as state-owned integrated monopolies were gradually dismantled.[7]

While long-term efficiency gains related to better investment decisions were perhaps the greatest benefit expected from liberalisation, adequate capacity development is likely to be one of its greatest challenges in the coming decades (OECD, 2007). Drawing lessons from liberalised electricity markets, the International Energy Agency considers that "investments in power generation seem to be the big test for the development of robust and sustainable markets" (IEA, 2005).

Providing public goods and universal services

Infrastructure services as public goods

Infrastructure services involve a number of important externalities that have not been mentioned in the previous discussion.

The positive influence of infrastructures on productivity and growth is acknowledged, although it is difficult to measure empirically (OECD, 2008). In particular, infrastructures reduce transport, transmission and communication costs, and facilitate the diffusion of technology. As a consequence, they are believed to play an important role in regional development through their positive influence on a region's attractiveness for external investors and workers. In many OECD countries, infrastructure expansion has been closely linked to growth and regional development policies.

Health and environmental externalities, both positive and negative, are of paramount importance in infrastructure sectors such as electricity, gas, water, sewerage, railways, airlines and road transport. Some health and environmental benefits of infrastructures are classical public goods (Box 5.3), and it is usually considered that market mechanisms do not properly account for their value in the absence of regulatory action.

Increased attention to the use of natural resources and to environmental impacts, notably in the context of global warming, is expected to strongly influence policy interventions in infrastructure sectors in the coming decades. In electricity generation, many countries have already developed high-profile actions in favour of technologies based on renewable resources. In the water and wastewater industries, OECD countries are expected to move towards dispersed small-scale systems in order to optimise the use of scarce resources (Palaniappan *et al.*, 2007).

Infrastructure services have a well-documented impact on poverty reduction (see for instance ADB, 2005). Poverty is often defined as deprivation from a bundle of goods and services considered a minimum living standard (either relative to a society's living standards, or in absolute terms). Power, water, sanitation, communication and transport are usually considered both part of this bundle, and important factors determining the capacity of individuals to afford it (*e.g.* by improving their health and mobility).

Box 5.3. **Public goods**

Whether an economic good has the nature of a public good depends on two criteria (Samuelson, 1954): first, it should not be possible to prevent people from using it (*non-excludability*); second, its use by some people should not reduce the capacity of others to use it (*non-rivalry*). National defence, for instance, is a pure public good that benefits all citizens and is available for everyone irrespective of the degree to which it is used. By contrast, a good is a pure private good when people can be totally excluded from its usage and when using it reduces the amount available for others. Although pure public goods exist, mixed goods, which have features of both a public and a private good, are more commonly found. In particular, a good is called a *common good* when its usage is non-excludable but is rivalled (*e.g.* hunting), and a *club good* when its usage is not rivalled but is excludable (*e.g.* cable TV).

Because of these two features, the supply of a public good is typically lower than it should be from a social welfare standpoint if solely individual decisions determine the outcome. Indeed, the potential for opportunistic consumption reduces the incentives to provide the good privately, since any person could use the good and refuse to pay for the benefits they get from it (*free-riding*). Hence public intervention is needed to ensure that the supply of public goods is optimal. Various forms of supply of public goods have existed in OECD countries, from direct public provision and public/private partnerships to private sector delivery (under procurement or regulation).

Determining the appropriate level of supply is a daunting task, whichever form of public intervention is actually chosen. According to economic theory, the optimal level of supply is such that the cost of producing an additional unit of good equals the sum of the individuals' willingness to pay for it. However, the price that a person would be ready to pay for a unit of public good is not observable, and individuals are not inclined to provide that information willingly if they can benefit from the good at a lower cost. The producer of public goods therefore has to design specific mechanisms to make individuals reveal their preferences (Laffont, 1987).

In the presence of positive externalities, public intervention is needed to account for the difference between the social and the private benefits of infrastructure provision, and secure an adequate level of investment. Intervention can take the form of direct provision, investment subsidies or incentives.

Infrastructure services as rights

A closely-related notion is that of infrastructure services as *merit goods*, a type of public goods for which *non-excludability* is ethical and political more than technical. Various authors have highlighted the role of public utilities in providing individuals with the capacity to effectively benefit from freedom and fundamental human rights (Dasgupta, 1986).

The essential importance attributed to infrastructure services in democratic societies is one of the reasons they were often structured as public or social services. State intervention in utility sectors aimed, among others, at levelling prices and access geographically (*e.g.* between urban and rural areas), either by organising cross-subsidies between groups of users (usually to the benefit of the rural population or low-income groups), or by using monopoly rents to compensate for cost differences related to economies of density (Peltzman, 1989).

Subsidised prices for specific population groups have been a common feature of infrastructure services in OECD and non-OECD countries. Economists usually consider that targeted subsidies distort prices, provide incentives for inefficient use of infrastructures, and altogether constitute poor tools for income redistribution. Recent research shows, however, that targeted subsidies, in particular cross-subsidised prices, are on the contrary effective and that their efficiency costs are often moderate (Ravallion, 2003).

Efficiency-increasing reforms have had some adverse effects on the affordability of and access to infrastructure services, in particular in developing and transition countries. The dismantling of cross-subsidy mechanisms has had regressive effects, as observed for instance during the restructuring of Chile's telecommunications industry (Armstrong and Sappington, 2006). Similar impacts have been documented in transition economies and in developing countries (Lovei *et al.*, 2000; Romanik, 1998). Governments have often been unable to compensate the adverse effects on poorest regions or population groups through direct subsidies. In some cases they have applied policies that in fact tended to aggravate those effects – such as increases in indirect tax rates applied to infrastructure services (Estache, 2004b). Negative effects have been more severe when infrastructure reforms were associated with a fall in government capital expenditures, because of the complementarity between private and public investment in infrastructures (Calderon, Easterly and Serven, 2003).

Regulating the provision of universal services

The challenge for regulators is to replace the broad cross-subsidy schemes of former utilities by mechanisms for the delivery of universal services that can be sustained in the context of liberalised infrastructure service industries. This entails defining and enforcing service obligations that assure access and affordability, and compensating operators in charge of delivering universal services while preserving a level playing field.

The European Union's doctrine in this area is an interesting case in point. It gradually emerged in the course of the 1990s through the directives that liberalised infrastructure services, decisions of the European Court of Justice, and new treaties and common declarations of the member states. It entailed replacing the broad notion of public service by the more focused notions of universal service and services of general economic interest.

The term *universal service* was first coined in the Council Resolution of 7 February 1994 on the telecommunications sector, and later used in all directives concerning telecommunications, electricity and the post. Through it, the European Union recognised "that the maintenance and development of a universal telecommunications service, ensured through adequate financing, are a key factor for the future development of telecommunications in the Community" and "that the principles of universality, equality and continuity are the basis for such a service to permit access to a defined minimum service of specified quality to all users everywhere and, in the light of specific national conditions, at an affordable price" (Resolution 94/C48/01). The subsequent directives indicate a list of such services in each of the concerned sectors. For instance, Directive 98/10/EC on telecommunications stipulates that member states must require each operator to provide, as a minimum, a connection to the landline network, itemised bills at no extra charge, free use of an emergency number, and so on. In Directive 97/67/EC, universal service is defined as the collection, sorting and transport of delivery of postal items up to 2 kilogrammes and parcels up to 20 kg for any user on any working day and at least five days a week. Importantly, however, the directives define only a baseline, and member states are free to specify additional services as part of the universal service, such as the

density of infrastructure over their territory, or lower tariffs for specific groups of customers.

In its decisions over the cases Paul Corbeau (C-320/91), and Municipality of Almelo and others (C-393/92), the European Court of Justice acknowledged that services of general economic interest could justify derogations to the general rules of competition in the EU. Following these decisions, it was deemed that the necessity to maintain – and finance – a network of post offices over the territory of member states justifies the maintenance of a monopoly over baseline postal services (up to 350 grammes until 2006, up to 50 grammes henceforth) and the possibility for post operators to offer financial services (with tax advantages). Since it was estimated that these advantages were fair compensation for the social objectives imposed on monopoly operators, other segments of postal services were opened to competition.

These principles were enshrined in the Treaty establishing the European Community as amended in Amsterdam in 1997: "Without prejudice to Articles 73, 86 and 87, and given the place occupied by services of general economic interest in the shared values of the union as well as their role in promoting social and territorial cohesion, the Community and the member states, each within their respective powers and within the scope of application of this Treaty, shall take care that such services operate on the basis of principles and conditions which enable them to fulfill their missions." The European Charter of Fundamental Rights, proclaimed in 2000, states: "The Union recognises and respects access to services of general economic interest as provided for in national laws and practices, in accordance with the Treaty establishing the European Community, in order to promote the social and territorial cohesion of the Union."

Policy messages

One of the potential downsides of the general increase in efficiency brought about by the reforms of the 1990s is reduced access to infrastructure services and lower affordability for the poor. The policy response to this risk lies in the definition, clarification and extension of universal service obligations. It should be stressed that a key change in this area, particularly in Europe, has been to make regulation conditional on a clear statement of its justification and objectives. Implementing and enforcing such missions within the framework of reformed infrastructure sectors remain important challenges for regulators.

Limiting the risk of regulatory failure

The initial intent of the promoters of infrastructure industry restructuring was to roll back regulation. What has actually happened is, rather, a process of continuing regulatory reform, where regulatory interventions are constantly put to the test by rapidly changing economic conditions.

The preceding sections highlighted some of the issues that regulators at large have to tackle in this new environment: integrating high-powered incentive schemes in the regulation of monopolies; understanding interactions along the supply chain and co-ordinating upstream and downstream regulatory interventions; in particular, striking a balance between the interests of the infrastructure operator and those of the liberalised segment of the industry when determining the conditions and price of access to infrastructure networks; identifying market power issues at an early stage and providing effective responses; determining and enforcing appropriate universal service obligations; and accounting for the environmental costs and benefits of infrastructure development.

In addressing these challenges, regulators are often in possession of limited information, have limited instruments at their disposal, and face the contradictory expectations of the industry, policy makers and the public at large.

Regulatory quality and flexibility

Regulatory quality hinges on the ability of regulators to monitor and understand market conditions, swiftly identify important changes and adapt regulatory measures accordingly.

Joskow and Tirole (2007) consider that many non-market mechanisms have been imposed on emerging competitive wholesale and retail electricity markets, often carried over from the old regulated regime without much consideration for their appropriateness in a market context. According to these authors, a broad range of regulatory interventions are not adapted to restructured electricity markets, such as wholesale market price caps, capacity obligations placed on Load Serving Entities, frequency regulation, operating reserve and other ancillary service requirements enforced by the system operator, procurement obligations placed on system operators, protocols for non-price rationing of demand to respond to shortages, and administrative protocols for system operators' management of system emergencies.

Similarly, Hausman and Sidak (forthcoming) observe that in telecommunications, the regulatory process has often failed to take sufficient notice of the importance of new product and service innovation. They observe: "Telecommunications differs in an important respect from many other regulated industries because of the rapidity of technological change. Telecommunications regulators have found it difficult to adapt to these changes and outdated regulatory policies may create perverse economic incentives for investments in new technology."

Although the regulatory design process has to account for the specific circumstances of each case, a number of elements are always necessary for its success:

- To clearly define the issue that regulation is supposed to tackle, and the main objectives.
- To examine whether and how regulation can reach these objectives; determine if its expected benefits balance its costs; and establish that there is no better alternative.
- To identify the specific regulatory actions needed to achieve the objectives.
- To select legal and institutional solutions adequate to these actions.

Credibility and commitment abilities

The need for regulators to flexibly adapt to changing circumstances should, however, be weighed against the need to be credible. The perception of a risk of regulatory change typically leads to underinvestment by private providers. To avoid this, a regulator needs to be able to make credible commitments that it will not change the rules – especially when contracts have a long duration and the potential gains from a change are major.

Institutional and political settings clearly have a strong influence on the risk of administrative expropriation and the credibility of regulators. Levy and Spiller (1994) consider that "performance can be satisfactory with a wide range of regulatory procedures, as long as three complementary mechanisms restraining arbitrary administrative action are all in place: *i*) substantive restraints on the discretion of the regulator, *ii*) formal or

informal constraints on changing the regulatory system, and *iii)* institutions that enforce the above formal – substantive or procedural – constraints."

In OECD countries, there has been a marked trend towards independent regulatory agencies in the past years (OECD, 2005a). There are two main reasons for governments to delegate regulatory or quasi-regulatory powers to independent agencies: to reduce decision-making costs, for example by taking advantage of agency expertise; and to enhance the credibility of long-term policy commitments, by isolating regulatory decisions from short-term political considerations (OECD, 2004b).

But the credibility of regulators also depends on their ability to adopt courses of action that will prove sustainable in the long term. A counterexample is given by the privatisation of British Gas, where according to Armstrong and Sappington (2006) the government maximised its present revenues at the expense of regulatory consistency in the future.

Dynamic consistency of regulation, in turn, highlights the importance of reform timing.

Friebel, Ivaldi and Vibes (2003) find that reforms in the railway sector are associated with efficiency gains, but that their effect depends on sequencing. In particular, they observe that introducing multiple reforms in one package has at best neutral effects, while sequential reforms enhance efficiency.

Clearly, there are irreversibilities in a reform process (*e.g.* privatisation tends to "freeze" the market structure), and minimising the cost of these irreversibilities can justify delays in the reform agenda (Kessides, 2004). In particular in developing countries, investors' management of "political and regulatory risks" leads to contractual rigidities for future regulatory decisions: independent power producers (IPPs) are "protected against political risks – including regulatory ones – often by explicit government guarantees. These risks are passed on to the off-taker…" (Albouy and Bousba, 1998).

In the United States, deregulation and vertical unbundling in the electricity sector were anticipated, and the way paved, by important regulatory initiatives taken from the second half of the 1970s onwards in order to spur the development of the wholesale electricity market. Two prominent examples are the 1978 Public Utility Regulatory Policy Act and the 1992 Energy Policy Act (Joskow, 1997).

Legitimacy, accountability and capture

The theory of regulatory capture has highlighted an additional risk inherent in regulation: that regulatory bodies can be unduly influenced by the industry or other interest groups (Stigler, 1971, Peltzman, 1976, Becker, 1983). The key factor is that a small stakeholder group can have high stakes in regulation, and consequently devote large resources to collecting information and lobbying regulators, whereas potential benefits for the general public are dispersed among many individuals and hence receive lesser support from each of them.

Laffont and Tirole (1991) show that the risk of capture can itself have unexpected effects. In response to the risk of capture, regulators might have to reduce the stakes of regulation, in particular to favour low-incentive schemes. Even in the absence of collusion between interest groups and regulators, therefore, the risk of capture can be a source of regulatory inefficiency.

Besley and Coate (2003) find evidence of a form of capture among state-level utility regulators in the United States. They observe that, since regulation becomes bundled with other issues in the choice of a government, regulators who are appointed by the government are more likely to represent the interests of specific stakeholders than directly elected regulators, who focus on consumer interests.

Competent regulators with adequate resources, backed by mechanisms to enhance their credibility and accountability, are naturally less exposed to the risk of capture. If, on the contrary, the institutional capacity for good regulation is not in place from the onset of reform, there are considerable risks of capture, resulting in important welfare losses (documented in sub-Saharan Africa by Auriol and Blanc, 2008).

Policy messages

Liberalisation and restructuring of infrastructure industries increase the importance of good regulation, but at the same time generate complex regulatory issues. Regulators have to adapt to a rapidly changing economic environment, and detect and address emerging issues before they develop into large-scale crises. But they also need to have the ability to make long-term commitments, and to be protected against the risks of capture.

In order to conform to these requirements, regulators need to develop a high level of expertise, have at their disposal accurate information they can rely on, and have adequate funding. But good regulation also depends on institutional design and the capacity of governments to adopt a consistent strategic approach to infrastructure reform.

Lessons for the reform of infrastructure governance in China

Summary of policy messages

Perfect competition and perfect regulation are, in theory, two equivalent ways of achieving an optimal economic outcome, where production costs are at their lowest and prices reflect marginal costs. In the case of infrastructure services, both of these solutions are out of reach. Because of their cost structure and the existence of positive externalities, infrastructure services cannot be fully competitive industries. Regulators, for their part, have incomplete information, and their decisions are not always aimed at maximising public welfare. The available policy options therefore represent different mixes of imperfect competition and imperfect regulation. The experience of OECD countries in reforming infrastructure industries provides a number of lessons with regard to these options.

First, there are benefits to introducing competition into infrastructure service industries, but strong regulatory capacity is needed to ensure that these benefits will accrue to consumers. Regulators can be faced with severe problems of market power, vertical restraint, or underinvestment. They need to co-ordinate their interventions all along the supply chain, and to balance conflicting interests.

Second, the costs of regulatory failure can be large. Regulators can err, both on the side of too much intervention (or inappropriate intervention), thereby generating inefficiencies and discouraging investment; and on the side of excessive laissez-faire, which can eventually lead to monopoly rents.

Third, rather than a one-off liberalisation "big bang", the governance of infrastructure service markets has to be understood as a continuing process, in which institutional design

and the timing of reform are critical to securing the credibility of regulators and preventing risks of regulatory capture.

Fourth, a case-by-case, adaptive approach is necessary, one that accounts for local conditions such as the state of development of existing infrastructure, technology, regulatory capacities and socio-economic policy objectives.

The importance of information and the role of information asymmetries are a central theme in these lessons – and also emphasised by recent developments in economic theory. Lack of information not only imposes serious limits on the effectiveness of regulators; it also indicates what achievements regulators can aim for, and how. Because of information asymmetries, high-powered incentive schemes are the most efficient tool for regulating infrastructure service activities. Effective incentive systems in turn call for regulators who have a very clear understanding of industry conditions and a high degree of credibility. Finally, institutional arrangements that support the competence and credibility of regulators appear to be the backbone of efficient infrastructure services.

The best "model" is the one best adapted to the specific needs of each industry and to the economic, social and institutional conditions of China.

The criteria for determining which infrastructure model works "best" might vary with social and economic conditions. For instance, while developed countries are seeking to optimise well-developed infrastructure systems, developing countries may be more concerned with network reach and expanded access and usage (Armstrong and Vickers, 1994).

In developing countries that have opened up infrastructure industries to private participation, there is widespread concern that the provision of infrastructure services has suffered as a consequence of the retrenchment of the public sector and the insufficient response of the private sector. In Latin America, for instance, overall infrastructure investment has fallen and private sector participation has been mostly confined to the telecommunications industry. However, there is considerable disparity across countries. Countries most successful in attracting large volumes of private investment (Chile, Colombia, Bolivia) are precisely those where public investment has remained high (Calderon and Serven, 2004).

A recent report by the International Energy Agency concerning power sector reforms in China states:

> Competitive power markets are not an end in themselves; rather they are a means to an end: access to environmentally sustainable electricity services to achieve China's social and economic welfare objectives. To serve as an effective instrument, many electricity policies must be considered simultaneously: regulatory policies and structures must integrate competition principles and cost-reflective, competition-based pricing alongside policies to encourage energy efficiency and policies for the environment. Without a holistic approach, competitive markets can raise problems for demand management (*e.g.* dispersing incentives to reduce demand) and the environment (*e.g.* because environmental costs and benefits are not yet appropriately reflected in power pricing and investment decisions, system dispatch sometimes favours dirtier plants). China's progress towards competition should proceed carefully. Important actions should be taken now to improve economic and energy efficiency

without compromising the long-term goal, and to lay a sound basis for a fully competitive market in due course (IEA, 2006).

Reforming the governance of China's infrastructure service industries should therefore be seen as an open-ended process where success depends critically on the existence of a coherent strategy and the adoption of a gradual approach.

China's strategy in the years to come will be oriented towards infrastructure development and modernisation rather than efficiency gains.

China's economic development has been spectacular. Two decades of sustained economic growth at an average rate of 9.5% per year have resulted in a sixfold rise in China's GDP. With several hundred million people lifted out of poverty in the past 20 years, China has accounted for over three-quarters of poverty reduction in all developing countries, and achieved the best performance by any single country in recorded history. The country's economic boom is expected to continue in the coming years. The IEA's long-term projections, for instance, are based on an average annual growth rate of 6% by 2030 (IEA, 2007).

It is increasingly clear that the development of infrastructure services will be a crucial element of continued economic growth. This will impose unprecedented levels of investment in infrastructure industries, but also very significant modernisation efforts, in particular with regard to pollution. The electricity and water industries can help to illustrate the issues.

In 2004, the Chinese electricity system was the world's second largest, with installed capacity of about 440 gW (IEA, 2006). Since 1995 China has also become the world's second-largest electricity consumer. In 2000 the total installed capacity of electric equipment for final use was more than twice the total generating capacity. Power generation and consumption are both currently above 2 trillion kilowatt-hours.

However, on a per capita basis, electricity consumption is still very low. In 2002 it was close to 1 000 kWh, about twelve times less than in the United States and five to six times less than in major European countries (World Bank, 2002). Millions of rural Chinese still have no access to electricity. Economic development and rising standards of living are therefore expected to stimulate growth in electricity consumption for several decades to come. To match the growth in demand, huge investments in power generation, transmission and distribution will be needed. According to some estimates, China's cumulative electricity investment needs by 2030 amount to USD 2.8 trillion (2006 dollars), and represent 20% of the world's total (IEA, 2007). In addition to securing such levels of investment, which have never been reached before, over the long term the authorities will have to try to avoid the kind of boom and bust cycles that have been observed in the past.

Transmission bottlenecks have been and will remain a difficult challenge. China's energy resources are mainly located in the north (coal mines) and the west (hydro), while the large urban centres are in the south and the east. Congestion of transmission grids explains in large part the chronic power shortages that have affected 26 of the country's 31 provinces since 2000.

Coming to water infrastructures, the 11th Five Year Plan (2006-10) has set the target of providing access to safe drinking water to 98% of the urban population and 60% of the rural population. However, urban water systems alone require USD 250 billion of investment according to some sources, while USD 10 billion are needed to build wastewater treatment

facilities (China Economic Net, 2005). Only half of wastewater is currently treated, and only a third of existing systems are considered to be well functioning.

In order to facilitate the financing of these needs, Chinese authorities have taken measures to encourage investment and participation by national and foreign companies in the water industry. These efforts have been particularly targeted towards the poorer inland provinces where the lack of infrastructure is most severe. International institutions such as the World Bank and the Asian Development Bank have also taken initiatives to improve water supply and treatment facilities in these regions. Still, private participation remains low. A key factor in attracting foreign investment in the future will be the capacity of the government to reshape its role into that of a regulator responsible for price, quality, rights and competition in the water industry (Ashley and Cashman, 2006).

The benefits of infrastructure development for the Chinese people will be a key factor in support for reforms.

Between 1950 and 2000 the urban population increased by over 500% and now accounts for some 40% of the total (United Nations, 2002), with 72% of growth due to rural migration. By 2030 about 60% of the population – some 883 million people – will be urbanised (OECD, 2005b).

Such growth is placing enormous burdens on urban electricity, water supply and sanitation systems, and generating large-scale pollution.

In the electricity industry, energy efficiency and pollution are two areas where large improvements will be necessary. The level of energy efficiency is 20% to 40% lower than in OECD countries in various sectors, and policy reforms have fallen short of improving incentives in this area (IEA, 2006). The electricity industry is the primary source of air pollution and greenhouse gas emissions. Air pollution levels are already extremely high: five of the ten most polluted cities in the world are Chinese, and acid rains affect one-third of the territory. Greenhouse gas emissions are still limited on a per capita basis, but growing rapidly.

Monitoring of local pollution and enforcement of health and environment protection laws are also problem areas, in particular due to weak institutional capacity. Devolution of authority in this area, together with insufficient resources and supervision, has weakened law enforcement and led to serious corruption problems. Resource problems are aggravated by the lack of adequate financing instruments (Turner *et al.*, 2003; McGill, 1999). As a consequence, water pollution is high, with a third of major water basins declared highly polluted. Extensive use of water resources is beginning to pose problems for economic development and competition for available water resources (Economy, 2005). The lack of water for arable land might generate millions of "environmental refugees" flowing into the cities in the coming years. However, there seem to be large margins for improving efficiency in the use of water, *e.g.* for irrigation (OECD, 2005b).

With this background, improvements in the population's access to basic infrastructure services such as water, sanitation and electricity will be an important test for the reform process.

Trade-offs between efficiency and fairness in the restructuring of infrastructure services should be examined in this light. On the one hand, price discrimination in favour of the poor to achieve equity concerns has well-known undesirable efficiency consequences. Cross-subsidies have long been criticised for this specific reason. On the

other hand, when the ability of the government to finance direct subsidies is limited, some argue that cross-subsidies may be unavoidable if the social concerns should prevail over efficiency goals (Estache, 2004a).

A second related trade-off involves the allocation of efficiency gains between users and operators, while maintaining the incentive of the operator to maximise these efficiency gains. If all gains must immediately be passed on to the users, there is no incentive for firms to cut costs, since cost cutting frequently has a high initial cost (staff, equipment, investments). At the other extreme, allowing the firm to keep all efficiency gains achieved in the delivery of infrastructure services will be socially and politically unrealistic, even though the government might benefit from such rents through taxation.

Most of these issues will have to be addressed by regulators. Strong, accountable regulators will aim at ensuring a fair and transparent balance in the handling of such trade-offs. More of the benefits will then eventually be passed on to all users, in particular the large low-income category. Weak regulators, on the contrary, are very unlikely to maximise efficiency gains while at the same time controlling rents – a situation that can ultimately generate considerable social discontent and economic costs.

In the short term, priority should be given to building a sound regulatory framework and strong regulation capacity.

The crucial role of regulation in the success of a competition-based model can be particularly difficult to achieve in a country where "modern" regulatory institutions do not exist and where the institutional setting is expect to substantially evolve under the action of "exogenous" factors in the coming years.

The importance of good regulation is enhanced by China's decentralised political system, which is prone to weak governance and political opportunism (Guasch, Laffont and Straub, 2007).

China is still a politically centralised system, although there is now a considerable degree of decentralisation of power at national, provincial, prefectural, county and community levels. Legislative and regulatory powers as well as planning and development are the responsibility of national government, but the management and maintenance of infrastructure systems are the responsibility of the various lower tiers.

The structure and governance of the electricity industry have undergone important changes in recent years. The vertically integrated utility has been unbundled into two grid operators (one of which covers most of the country) and five generation companies. A number of other firms have entered the generation segment, and several regional wholesale electricity markets have been launched on a trial basis. A State Electricity Regulatory Commission (SERC) has been created.

However, the price-setting system is still the source of economic inefficiency. On the generation side, the electricity purchasing price varies greatly according to different power plants costs (Development Research Centre, 2002). On the supply side, the final price of electricity varies for different categories of consumers and partly reflects the policy priorities of different regions, leaving room for local government abuses. The State Development Planning Commission, which sets the initial price schemes at local level, seems to have little control over the actual pricing policies of provincial and local governments.

Further reform proposals exist, particularly as regards pricing, but have not yet been implemented. The 11th Five Year Plan calls for expanding electricity structural and price reforms but does not provide the details of specific measures or timetables.

Concerning water and wastewater, municipalities are primarily responsible for service provision, and own and manage more than 60% of water capacity. Responsibility at central government level is shared between the Ministry of Water Resources and the Ministry of Environmental Protection. State-owned water companies further complicate the picture. The government has passed a number of reforms to clarify responsibilities, improve co-ordination, strengthen property rights and enhance efficiency in the management of public water systems. Importantly, regulation has been distinguished and separated from supply. Recently, government funding has been conditioned by the introduction of full-cost pricing in some specific cases (Ashley and Cashman, 2006).

However, several factors raise concern about the future of the reform process. Structural reforms aimed at increasing economic efficiency have often stopped before completion. Environmental policies lack an integrated approach and clear definition of roles and responsibilities. The institutional framework needed to support a decentralised market economy is also still lacking. In particular, regulators such as the SERC have not yet been empowered to actually play their role in supervising markets. The resulting gaps and uncertainties "possibly raise questions about the current strategic thrust of the reform process" (IEA, 2006).

All in all, institutions – and their legal and political underpinnings – may matter more than ownership or market structures for the future of China's infrastructure industries.

Notes

1. For instance, Newbery (2002) cites the case of the United Kingdom's monopolies in telecommunications, gas, water and sewerage.
2. On such case is the England and Wales electricity market, where the shift from coal- to gas-fuelled plants was the main source of efficiency gains (Newbery and Pollitt, 1997).
3. By reducing its costs below the level approved by the regulator at a review, the monopoly could increase its profit until the efficiency gains were observed and passed through to prices at the next review. Joskow (1974) and Hendricks (1975) showed that regulatory lags could be used as an incentive mechanism.
4. See the seminal paper by Baron and Myerson (1982), and a complete view of the approach in Laffont and Tirole, 1993.
5. United States Federal Electricity Regulation Commission, Order 888, 1996.
6. The AMP is actually applied by the transmission system operator.
7. See for instance the evolution of the United Kingdom's Monopolies and Mergers Commission (later replaced by the Competition Commission), discussed in Armstrong, Cowan and Vickers, 1994.

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Chapter 6

Power Sector Reform

The continued success of rapid economic growth in the People's Republic of China – and the accompanying economic reforms – will depend in no small measure on the continued growth of the electricity sector. With the aim of improving the commercial and technical performance of the sector, the Chinese government has undertaken a series of reforms in the electricity sector. These include the now standard reform strategy of separating the assets and operations of generation from those of transmission and distribution. This chapter describes the challenges, both politically and economically, of implementing this strategy. The aim of this chapter is to examine the progress of reforms and to evaluate the outlook for continuing the reform of China's power sector in light of developments in energy markets in recent years, both within China and around the world. The chapter concludes that given the current situation in China, the introduction of widespread competition in generation runs a number of risks and that competitive markets should only be introduced gradually. It further suggests that a period of several years could be used constructively to build up the institutional framework for later competition, and a range of instruments other than competitive markets could be employed to address urgent priorities relating to system security, security of supply, sector efficiency and the environment.

Introduction

The continued success of rapid economic growth in the People's Republic of China and the accompanying economic reforms will depend in no small measure on the continued growth of the electricity sector. With the aim of improving the commercial and technical performance of the sector, since the late 1990s the Chinese government has undertaken a series of reforms in the electricity sector, including the now-standard reform strategy of separating the assets and operations of generation from those of transmission and distribution. The contemplated outcome includes a generation sector characterised by independent enterprises competing among each other for access to the transmission grid – and so for customers, with liberalised wholesale prices that both ensure that the most efficient generation assets are called into production, and provide a return to the owners of those assets.

However, it is not at all clear how realistic or likely this contemplated outcome is, either politically or economically. Politically, the Chinese government has so far been unwilling to allow either wholesale or retail electricity prices to increase in line with increases in costs. Economically, certain aspects of the electricity sector are not likely to change quickly, especially the heavy dependence on coal generation and the limited interregional transmission capacity. These constraints may render generation competition difficult to implement, unpredictable in its impact, volatile, and ineffectual at achieving the goals of restructuring.

This chapter updates and builds on an earlier report on China's power sector by the International Energy Agency (International Energy Agency, 2006). The aim of this chapter is to examine the progress of reforms and to evaluate the outlook for continuing the reform of China's power sector in light of developments in energy markets in recent years, both within China and around the world. The chapter will begin with a review of the motivations and context for the major reforms undertaken in the period 2002-04, before detailing the nature of these reforms. The sections that follow will examine developments in China's power sector since that time and re-evaluate the original and current reform strategies given these recent developments and the experience of power sector reform around the world in recent years.

The context of the reforms in 2002-04

Proposals to reform China's electrical power sector emerged during the 1990s in response to two sets of drivers, international and domestic. Governments around the world were drawing up and implementing plans to progressively liberate most sectors of the economy from direct state control and introduce market forces. These plans covered utility companies, including the electrical power industry. At the same time, China's government was driving through a rapid transition from tight state control to increasing market orientation across much of the domestic economy. As a result, government

strategies for the development of the country's power sector were influenced by international ideologies and experiences, as well as by domestic priorities.

International context

The growing desire to remove government from the operational management of most sectors of the economy arose in the 1980s from a change in perception of the role of government and its ability to manage industries effectively for the benefit of the country. Economic theories highlighted the tendency of politicians to maximise votes, of bureaucrats to pursue their own interests, and of governments to lack the ability to monitor and control the enterprises they owned. At the heart of the proposed reform process lay the need to remove government interference from industry, to provide commercial incentives for managers, and to remove or reduce the burden of non-commercial obligations placed on the companies. It was believed that the profit motive, private ownership and competition were key to maximising the economic benefits of sector reform. In particular, competition was believed to be critical for stimulating technical and management innovation, for driving improvements in technical and economic efficiency, for reducing or at least constraining prices, and for providing consumer choice.

All of these arguments could be and were applied equally to the electrical power sector and other industries (Helm *et al.*, 1988; Jaccard, 1995). Indeed, in some countries the need to reform the power sector was particularly pressing. Economic growth and development required a rapid and sustained expansion of the power industry to supply electricity to all sectors of the economy and to all households. Yet many national power industries were bankrupt, with high costs and low revenues; they required large subsidies and were unable to maintain the existing systems, let alone invest in new capacity. As a consequence, power sector reform tended to be driven by a combination of two primary objectives: to improve efficiency and reduce costs through competition, and to attract investment in new capacity, including from overseas. The relative importance of these two priorities varied between countries.

The transformation of the power industry from a vertically integrated monopoly to a competitive market requires a change, from command and control systems dominated by vertical relations to a network of horizontal relations defined by contracts. This in turn requires new systems to constrain potentially high transaction costs relating to dispatch, investment, settlement and safety, as well as new approaches to regulation, in particular for those parts of the electricity supply chain not open to competition.

A sequential approach to reform can be represented by four models (Hunt and Shuttleworth, 1996). The power sectors in most developing countries resemble the first two described below, while those in countries that have vigorously pursued power sector reforms tend to resemble one of the second two.

Model 1 comprises one or more vertically integrated monopolies, in which construction and dispatch are planned within the company. In such systems the government may face great difficulties when trying to enhance efficiency. As a result, either the customer or the government pays for the inefficiencies of the monopolist, unless the company is commercialised and prices are carefully regulated. In this model independent power producers (IPPs) may sell to the power company under a power purchase agreement (PPA) and individual utilities may trade power with each other.

Model 2 involves the development of a moderate degree of competition in generation, providing some incentive for generators to improve their performance. In order for this to happen, the generating companies must be separated from the rest of the utility and sell their power to a purchasing agency. This purchasing agency chooses, on the basis of cost, from among different generators to supply electricity and sells it either to the grid at a regulated wholesale tariff or directly to large consumers.

In this model the generators have PPAs that contain incentives for efficiency and investment. These agreements comprise a capacity or availability payment to cover fixed costs and an energy charge to cover variable costs. The power stations will be dispatched on the basis of variable cost, which requires constant cost monitoring in order to drive through efficiency gains, as well as links to fuel price. Competition is achieved through competitive bidding for the construction and operation of power plants.

Though the incentives for efficiency enhancement are only moderate here, this model has the advantage that the government retains significant authority over the sector to impose social obligations and to address objectives relating to technology or fuel.

Full wholesale competition in generation is introduced in Model 3. The distribution companies buy directly from the generators and the transmission grids are open to all buyers and sellers of power. Electricity is traded in a spot market or pool, based on bids made on an hourly or half-hourly basis.

A separate tariff is imposed on transmission. While this model places much clearer incentives on the generating companies, especially if they have been privatised, it leaves the regulator with a number of challenges relating to the market power of generating companies and to stranded costs. At the same time, the government's ability to impose social obligations and to determine technology and fuel is curtailed in comparison to Models 1 and 2.

Model 4 takes reform one step further and involves competition in retail for all consumers. This in turn requires the separation of the retail function from distribution, and the removal of entry barriers to the retail function. Challenges concerning stranded assets, social obligations and technology control are greater.

Experience around the world has shown that reform of the power sector carries considerable risks. These include the potential for interest groups to distort the reform process for their own benefit, continued interference by government in the operation of the industry, and abuse of market power by players in the industry.

These and other risks have their roots both in the design of the reform itself and in the structures and systems for regulating the industry during and after reform. Of these two, the structures and systems for regulation are of the greater importance. As the United Kingdom experience has shown, a flawed reform process can, to a greater or lesser extent, be remedied by an effective regulator (Helm, 2003).

The key responsibilities of an electricity regulator lie in economic regulation, though they may also be obliged to address environmental and social concerns. The main tasks relate to the implementation of the reform strategy, to investment decisions, to pricing in the non-competitive parts of the industry, and to monitoring the behaviour of players in those parts of the market open to competition.

The regulatory agency has to balance the interests of the government, the industry and the consumers, and must be, as far as possible, independent of the government and of

the industry. It needs the authority to obtain information from companies, the capacity and expertise to analyse this information, and the power to make and implement decisions, however unpopular with one or more parties (Foster, 1992; Bishop *et al.*, 1994; International Energy Agency, 2001). Though the establishment of such regulatory agencies has proved possible in developed countries, the structures and systems of governments in many developing countries and the reluctance of government departments to yield power have resulted in regulatory agencies that lack the capacity or the authority to carry out their functions effectively. In such circumstances, the weaknesses of the regulatory agency may undermine the entire reform process.

The domestic context in China

The reform of China's power sector in the 1990s was directly affected by this evolving understanding of the reform process around the world, especially in international financial organisations such as the World Bank. However, the desire to reform the power sector was part of a much deeper plan to reform the entire economy and to restructure all the state-owned enterprises, which in earlier decades had dominated the national economy.

The key elements of industrial reform included diversification of enterprise ownership, increasing autonomy and commercialisation of enterprise management, and the gradual alignment of prices with market forces. The government progressively removed itself from both the operational management of the industries and from the financing of their investments. These and other reforms were implemented incrementally, often with local experiments. Though the reform process started in the early 1980s, the most radical steps were taken during the 1990s: there were also reforms to the banking sector, the launch of domestic stock markets, and the establishment of new accounting rules, as well as growing foreign involvement in China's economy both through direct investment and through local and international stock markets (Chiu and Lewis, 2006).

The structural reforms were particularly pronounced in 1998. That year saw the abolition of a number of industrial ministries, the creation of new state companies, and the restructuring and commercialisation of existing state-owned enterprises. The energy sector was completely transformed by these changes (Andrews-Speed, 2004).

During the 1990s the primary objectives of China's government in reforming the power sector were to increase the quantity and quality of power supply in order to support economic growth; to raise technical and commercial performance and thus constrain costs in the industry; and to pass the benefits of these cost reductions to the consumer (Li, 1997; Shao *et al.*, 1997). As was the case with other industrial sectors, these reforms were directed at industry structure and at pricing (Xu, 2002; Andrews-Speed, 2004). The main ideas were outlined in the Electric Power Law, which came into effect in 1995.

Before 1997, the Ministry of Electric Power acted as policy maker, regulator and enterprise manager for most of China's power industry. Under the ministry the provincial power bureaus held monopoly control over transmission, distribution and supply within their respective areas. Some of these bureaus were consolidated into regional power groups for the purpose of inter-province transmission of power. In 1997, the State Power Corporation of China was established to take over the enterprise management functions from the ministry. The provincial and lower-level bureaus were renamed companies.

The year 1998 saw the abolition of the Ministry of Electric Power and the transfer of its government functions to the SETC. From 1998 to 2002 a number of measures were taken to

reorganise the State Power Corporation, to corporatise the subsidiary provincial power companies, to implement a limited separation of generating assets from transmission and distribution, and to embark on experimental "market" trials in a number of provinces.

In the early 1990s foreign participation was seen as vital to ensure that investment in generation reached a sufficiently high level. Until this time most foreign funds flowing to the power sector had come from international financial organisations, such as the World Bank and the Asian Development Bank. Between 1994 and 1997 the government issued a number of regulations intended to encourage foreign direct investment by private sector.

Electricity tariffs had already been undergoing reform for several years. Since 1986 the tariff paid to power generators had been based on a "new price for new power" policy that provided significantly higher tariffs for new plants in order to provide those plants with the revenue to pay off their debts. These new and higher prices applied to plants constructed between 1986 and 1992 that did not use central government funds, and to all plants built after 1992. This scheme was successful in encouraging investment but provided no incentive for investors to reduce their costs or to seek more favourable financing terms.

During the 1990s the numbers of parties investing in power generation multiplied, as did the numbers of plants. The "new price for new power" policy evolved into a system in which most offtake prices were set by the government, usually by the provincial pricing bureau, with final approval from the State Pricing Bureau. The price was based on the age, efficiency, fuel, location and type of power generated (peak or off-peak).

The government introduced a new policy in 1998, known as the "operating period tariff". This approach sought to base the tariff on the expected lifetime of the plant, rather than on the debt repayment period. The lifetimes were set at 20 years for fossil fuel plants and 30 years for hydro-electricity. The assumed return on equity was set at 2-3% above the long-term bank lending rate, and the costs of each plant were benchmarked against plants of similar types of fuel, age and unit size. The objective of this approach was to control and lower the capital cost of new plants and place the responsibility for negotiating suitable financing terms on the project sponsors.

Beginning in 1999 bidding by power generators was carried out on an experimental basis in four regions of China: Shanghai, Shandong Province, Zhejiang Province and in the northeast (Jilin, Heilongjiang and Liaoning Provinces). Though the detailed rules varied from case to case, a number of common features ran across all the experiments. Only a small percentage of total available power was bid into the "pool" and tariffs were capped.

Despite these progressive changes to wholesale tariffs, the system for setting consumer prices changed little during the 1990s. The Catalogue system for consumer tariffs started in the 1960s as a method of giving preferential treatment to heavy industry, chemical plants, agriculture and irrigation, both in terms of allocation of power and the price of power. It has evolved to comprise eight main categories of consumer with three voltage classifications, making 24 basic categories. The Catalogue forms the basis of end-user tariffs throughout China. Each of the categories is assigned a Catalogue price which forms the starting point for calculation of the final price. To this price are added a range of charges and fees to reach the final end-user price.

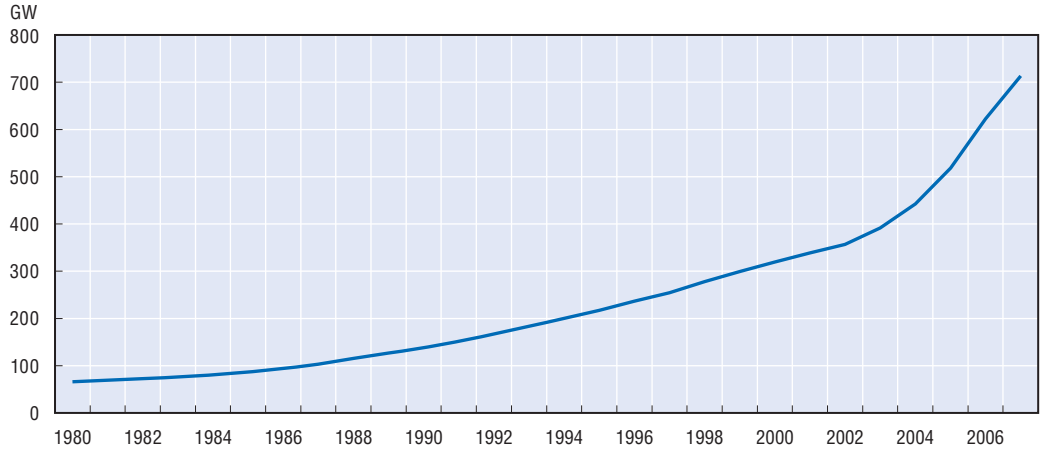
Lack of a change to the way consumer prices were set did not prevent the government from raising these prices in order to allow the power industry to recoup its costs and to encourage energy efficiency. Prices in 1997 were set at levels 40-50% higher than those for 1995, at a time when inflation was running at about 10% p.a. This reflected a real

increase of 15-25% over a two-year period, except for household consumers who were protected with a price increase equivalent to inflation (Andrews-Speed, 2004).

The desire to protect individuals from high energy prices was and continues to be a constant consideration in government policy. A further social dimension to its strategy for the power industry was the need to extend access to electricity to as many rural households as possible and to protect these users from unfairly high levels of tariffs (Shao *et al.*, 1997).

The success of these measures can be seen in a number of improvements from the late 1980s to the late 1990s. First, the generating capacity of the industry grew at a spectacular rate, from 100 GW in 1987 to 200 GW in 1994 and 300 GW by 1999 (Figure 6.1). Second, the proportion of central government investment in the power sector declined as the role of local governments and enterprises grew and progressively more of the central government funds came from banks rather than directly from the government itself (Xu, 2002). Finally, great progress was made in providing access to electricity to rural communities. By the year 2008, only about 30 million people lacked electricity supply, just over 2% of the total population – a remarkable achievement for a developing country.

Figure 6.1. **Installed power generation capacity in China, 1980-2007**



Source: Energy Information Administration, 2008.

The rate of increase of demand for energy in China declined sharply in 1997 on account of the Asian financial crisis, and a surplus of generating capacity emerged as a result. This enhanced the perception that continued reform of the power sector was indeed feasible, for competition in power generation should only be introduced when a surplus of capacity exists. Thus the government continued to formulate plans for further restructuring of the industry and the introduction of competitive markets in generation.

Reforms to China power sector, 2002 to 2004

By 2002 the government was ready to embark on the next stage of reform of the power sector and in March of that year the State Council published the key elements of the proposed reforms (State Council, 2002). The plan followed most of the ideas that had been

proposed by the World Bank and other external advisers, and comprised three main elements:

- The restructuring of the State Power Corporation into five generating companies, two grid companies and a number of service companies.
- The immediate establishment of a State Electricity Regulatory Commission under the State Council to formulate market rules and to regulate the developing markets.
- A new approach to power pricing and the development of competitive markets for power generation across 5-6 separate regions of China, with participation of most major power plants in this competition by the end of 2005.

In addition to these major reform measures, the government introduced other changes to state institutions.

Industry restructuring

The separation of generation from transmission and distribution was the most important component of the restructuring of the State Power Corporation. The generating assets of the State Power Corporation were unbundled from the grid and, together with those of the pre-existing Huaneng Group, were assigned to five companies whose sole business was to be power generation:

- The China Huaneng Power Group.
- The China Datang Corporation.
- The China Huadian Corporation.
- The China Guodian Corporation.
- The China Power Investment Corporation.

The redistribution of generating assets to the five new companies was carried out in such a way that no single company held more than 20% of the generating capacity in one of the planned regional power markets. Immediately after the restructuring, each of the five generating companies owned about 20 GW of generating capacity, though through their majority ownership of consortia the amount of capacity each company controlled was higher, ranging between 30 GW and 38 GW.

Though each company started with an equivalent total generating capacity, the structure of this capacity varied depending on the previous histories of the entities forming the core of the new companies. Datang retained its strength in the north of China, near the coal supplies; Huaneng was strong along the east coast; and Huadian was well represented in Shandong Province. Datang had the lowest proportion of hydro-electricity, while China Power Investment, at 30%, had the highest. China Power Investment was the only one of the five with significant nuclear capacity, and Guodian was an important player in wind power.

The transmission and distribution assets of the State Power Corporation were divided between two new companies. The State Grid Corporation was to own and control the majority of the regional grids in the country, as well as the interregional transmission lines. The Southern China Power Grid Company took over the assets in the far south of the country, in Yunnan, Guizhou, Guangxi, Guangdong and Hainan. The two new grid companies were required to progressively sell off most of the generating capacity that had been previously assigned to the transmission and distribution subsidiaries of the State Power Corporation.

Although these five new generating companies were created from the pre-existing State Power Corporation, they, together with the two new grid companies, only owned about 40% of the generation capacity across the country. The remaining generating capacity was owned by a wide range of industrial and financial enterprises. These players formed consortia to own and operate individual plants, with or without the involvement of one of the new large five generating companies. Some of these players were state-owned at national level, such as the Three Gorges Dam Corporation, the Shenhua Group, the China Nuclear Power Corporation, and the State Investment and Development Company. Most participants in these consortia were owned at local rather than at national levels, and some had been partially floated on one or more stock exchanges.

Likewise, the two new grid companies did not own the entire transmission and distribution network. Some of the grids were owned by the local governments and other entities. For example, the State Grid Corporation owned about 75% of the transmission and distribution lines in its service area and about 88% of the transformers.

Despite the radical nature of the restructuring, it did not include two steps that form part of most programmes of sector reform. Distribution was not separated from transmission, and the function of dispatch was not separated from grid ownership. The state dispatching centre within the State Grid Corporation remained responsible for dispatching the interregional transmission lines and facilities, and regional dispatching centres within each regional grid subsidiary continued to be responsible for dispatch within the region.

Restructuring of regulatory agencies

The period 2002-05 was marked by a series of reforms to the structure and function of government agencies charged with oversight of the electrical power industry. The result was an increase in the number of agencies responsible for regulating the electricity industry, a redistribution of functions, and the creation of some new functions.

The most important of these measures was the creation of the State Electricity Regulatory Commission (SERC) in November 2002. SERC reported directly to the State Council and was charged with wide-ranging responsibilities relating to both strategy and regulation. It was to become the major source of proposals for the development of power markets and for further reforms to the power sector. At the same time it was responsible for the routine technical regulation of the operations of the power industry, including both technical and environmental standards, as well as for collecting data. With respect to economic regulation, its powers were deliberately limited. SERC could investigate "irregular" or anti-competitive behaviour in the power markets and could help to resolve disputes, but was empowered only to make proposals relating to tariffs and then to supervise implementation of the agreed tariffs. Ultimate authority for all electricity tariffs remained with the Pricing Department of the National Development and Reform Commission (NDRC), the successor to the previous State Development and Planning Commission (SDPC).

In addition to a head office in Beijing, SERC established offices in each of the six grids and in eleven additional cities.

Two further agencies were created in March 2003: the Energy Bureau and the State-owned Asset Supervision and Administration Commission (SASAC). The Energy Bureau was created within the NDRC. This brought together many, but not all, of the energy

functions that had been scattered across the previous SDPC and State Economic and Trade Commission. The functions of the Energy Bureau included formulating policy, drawing up plans for sector reform and development, and managing the strategic oil stocks. It was also charged with routine oversight of the country's energy sector, including the approval of major investments (Downs, 2006). The Energy Bureau continued the NDRC's traditional role of approving major construction projects, including power stations and transmission lines. Despite the importance of pricing to the energy sector, it was the Pricing Department, not the Energy Bureau, that retained control of energy prices.

It soon became clear that the Energy Bureau, with a staff of less than thirty, could not possibly fulfil its mandate. Two years later, in 2005, the government set up an Energy Leading Group within the State Council, supported by a State Energy Office. The role of this Leading Group was to set strategic directions and to improve policy co-ordination (Downs, 2006; Rosen and Hauser, 2007).

SASAC was established with the role of executing the functions of government as a shareholder in state corporations; it executes this function at central, provincial and municipal levels. It has authority to approve a wide range of actions by the relevant corporations, including the appointment and removal of directors and senior managers, plans for restructuring or public listing, mergers and acquisitions, and asset disposals.

In addition to these changes, the status and resources of the agency charged with environmental regulation, the State Environmental Protection Agency (SEPA), were enhanced in 2003. This expansion gave the agency greater administrative capacity to monitor and investigate the environmental consequences of large construction projects. SEPA thus became more capable of evaluating proposed power construction projects and the environmental behaviour of power plants, in order to enhance their power to ensure compliance with the relevant laws and regulations.

Among these institutional reforms, the one potentially most significant for the power sector was the establishment of SERC as an industry-specific regulatory agency reporting directly to the State Council. The only other equivalent body within China's central government was the China Securities Regulatory Commission. SERC's most important task in the reform process was to make proposals on price changes and on the introduction of markets for power generation. As a consequence the State Council, the NDRC and SERC issued a number of documents during the years 2003 to 2005 that set forth the key elements of central government strategy for these two critical next steps for power sector reform.

Price reform and market development

Proposals for price reform over 2003-05 took two forms: strategic proposals for substantial reform of the approach to electricity pricing and for the introduction of competitive markets in generation, and short-term measures to address specific concerns relating to coal.

Strategic proposals for price reform

In 2003 the State Council issued the "Scheme for Power Price Reform", (State Council, 2003) which outlined a strategy to overhaul the current tariff system for the electrical power sector and to develop competitive markets for generation and retail. This was

followed by a further notice issued by the NDRC in March 2005, which described these plans in some detail (National Development and Reform Commission, 2005)

The strategy foresaw the creation of three separate sets of tariffs, for generation, transmission and distribution, and retail, with the eventual separation of transmission and distribution tariffs.

The wholesale generation tariff would have two parts: a capacity payment and an energy fee. The capacity payment would be determined by government, while the energy fee would be set by market competition in regional pools. A formula was provided for the calculation of capacity payments which included depreciation and financing costs. The nature of the market and the bidding rules were not specified, but were to be determined separately for each regional market. Bilateral sales from generators to large consumers were to be permitted.

Coal, oil, natural gas, nuclear and hydro-electric power stations would participate in the market competition. Wind, geothermal and other new and renewable forms of energy would not, and would be subject to separate rules. Foreign-invested power plants approved and constructed before 1994 that had signed power purchase agreements or that had received other forms of government undertaking would be obliged to renegotiate these arrangements.

A tariff for transmission and distribution would be set on the basis of cost recovery, reasonable profit and tax liability. Initially the "postage stamp" approach would be used, by which the tariffs in a region are shared according to the capacity of the user or producer. A specific service tariff would be set separately and would include a connection fee. Formulas were provided for the calculation of permitted profit and capital cost.

The Catalogues were to be retained for end-user pricing, but the number of categories would be reduced to three: residential, agricultural, and all industrial and commercial users. The first two categories would be subject to a single tariff, and the third category to a two-part tariff for users with a transformer capacity of 100 kVA (kilo volt ampere) or greater, or a capacity of 100 kW or more. A range of new tariffs would be introduced where appropriate, including peak and off-peak, dry and wet season, high reliability and interruptibility.

The Pricing Department of the NDRC was to retain responsibility for setting or regulating end-user prices as well as wholesale prices prior to the introduction of competitive bidding. This agency would also retain responsibility for transmission tariffs until such time as distribution was separated from transmission. From that time on, provincial pricing departments would be responsible for distribution tariffs.

Market development

SERC set out its vision for the establishment of regional power markets in 2003. A document entitled "Guidelines for Establishing Regional Power Markets" (State Electricity Regulatory Commission, 2003) described the objectives, the main models and the main trading types in the planned regional markets. By the end of 2005 or early in 2006 six regional power markets would be established with regulatory systems and institutions in place. A majority of generation companies would bid to be dispatched, and qualified large end-consumers (including independent supply companies) could directly purchase electricity from generators.

The first trials of the new markets were held in northeast China and east China. The northeast China power market was put into a monthly bidding simulation in January 2004. It initially adopted a one-part price model with 15% of total electricity bid into the market. Following the recommendation of NDRC, the market changed to a two-part price model (a capacity payment and an energy fee) with all electricity bid into the regional power market. At the beginning, only those generators with capacity of 100 MW or above (excluding co-generators and self-serviced generators) were allowed to participate in the pool. During the simulation period, only the bidding system was put into operation and there was no actual settlement. The east China power market was put into monthly bidding simulation in May 2004, again without actual dispatch and settlement.

Both these pilot markets took the form of a mandatory pool with a single buyer. Bidding to the pool was compulsory for qualified generators which, in the case of east China, covered coal-fired plants with capacities of 100 MW or greater. The grid company was the single buyer. Trading arrangements were dominated by contract trade, and supplemented with trading in the spot market. The trading types included yearly contracts, monthly bidding contracts, day-ahead bidding and real-time balancing. Monthly bidding and day-ahead bidding were operated in the regional trading centre with all the coal-fired units of capacity of 100 MW or above participating. The provincial dispatching centre was responsible for scheduling the implementation of the annual contracts and for real-time balancing to control the provincial power system.

Further trials were launched in south China in 2005. Unlike the pilot programmes in northeast and east China, this simulation programme had the intention to stimulate a greater degree of competition. Two characteristics distinguished it from the earlier pilot programmes. First, it engaged not only multiple sellers, but also multiple buyers in the market. The programme required grid companies from four provinces (Guangdong, Guangxi, Yunnan and Guizhou) to participate in the market, and these grid companies competed with each other for power purchase. Second, the programme separated the dispatch function from the market operator.

The development of these pilot regional markets faced a number of challenges. The varying levels of economic development in different provinces in same region made it difficult to implement a unified pricing system, because the poorer provinces were not able to afford a higher price. Allegations emerged that grid companies were favouring their own generators. The weakness of inter-provincial transmission capacity led to grid congestion. Finally, the growing shortages of power rendered these pilot markets irrelevant and all these trials were abandoned (Zhang *et al.*, 2005; Wang, 2007).

In anticipation of actual implementation of power markets, the government sought to bring a greater degree of order to prices offered to generators and at the same time improve incentives for efficiency. The new approach was described in a document issued by the NDRC in April 2004 (National Development and Reform Commission, 2004). New plants in the same region and using the same fuel were to receive the same price, and the prices paid to existing plants were to be gradually brought into line with these regional average levels. Further, coal-fired plants that installed and operated desulphurisation equipment would receive a higher price, set at a national level.

Measures concerning coal

Coal is the primary source of energy for almost 80% of electricity generated in China, and therefore its pricing has a direct bearing on the financial health of the electricity industry. Since 1994 a large proportion of the nation's coal output has been sold through wholesale markets, and prices in coastal provinces are at close to international levels. Despite this "liberalisation", coal continued to be sold to large power stations at subsidised prices. The SDPC (later NDRC) ran an annual meeting at the end of each year at which the principal producers, transporters and consumers of coal reached agreement, under SDPC guidance, on coal prices for the following year (Thomson, 2003).

The rapid rise of coal prices during 2003 and 2004 put a great strain on power-generating companies and on their relationship with coal producers. To solve this problem the NDRC agreed to allow the price of coal for power stations to be set by market forces and announced, in December 2004, a new scheme to link wholesale power prices to coal prices. The link was defined by a formula that included coal digestion ratio, standard coal consumption and the calorific value of the coal. The scheme provided for approximately 70% of any rise in coal price to be passed through to the grid. A change in coal price of 5% or more would trigger an immediate adjustment of wholesale prices. Lesser changes of coal price would be addressed in six-monthly reviews.

Progress and significance

The measures drawn up over 2002-04 marked fresh determination on the part of the government to push ahead with the reform and liberalisation of the electricity sector. The State Power Corporation was unbundled, generation was separated from transmission, and an entirely new regulatory agency, SERC, was created. Pilot markets for power generation were run. Yet, much remained unchanged. The NDRC retained authority over both pricing and project approval, and the proposals for power pricing and markets for power generation were shelved in 2005 on account of the growing shortages of electrical power across the country.

As a result, the industry saw a change of structure but with little change in the way that electricity was bought and sold or in the way the industry was regulated. In some ways China's power industry resembled Model 2, with a purchasing agency (the grid companies) buying power from the newly unbundled generating companies – except that the processes for purchasing this power were neither transparent nor predictable, nor were they underpinned by contracts.

The ensuing years, from 2005 to 2008, were marked by stagnation in the reform process, while the power companies focused their attention on increasing the capacity of the industry to satisfy the rapidly rising demand (Figure 6.1 above) and the government sought to enhance its control over the industry. Though few substantial reforms were implemented during this period, the power sector continued to change in a number of ways. These changes, discussed in the next section, will necessarily affect the way in which further reform can be implemented.

Key trends and changes in China's power sector, 2004-08

The five-year period from 2004 to 2008 was characterised by a dramatic increase in demand for all forms of energy across China, including for electrical power. The resulting shortages of energy caused both the government and the power industry to switch their

attention from sector reform to security of supply, and in particular to investing in new generation and transmission capacity. At the same time, in order to address the energy shortages, the government introduced a number of policies to enhance energy efficiency in all sectors of the economy.

In the international arena two further trends were affecting the government's approach to energy policy. First, prices for energy and other raw materials were rising, exacerbating concerns relating to growing import dependence on oil and gas and contributing to a rise in domestic inflation. Secondly, the growing consumption of energy within China was taking the country to the top of the league table of emitters of greenhouse gases. As a consequence, pressures on China were mounting to take steps to limit these emissions.

For these reasons, as China's government seeks to restart the stalled reform of the power sector, it is faced with a policy context that has changed significantly since the late 1990s and early 2000s, when the reform strategy was first drawn up. The aim of this section is to examine the changes that have taken place in China's power sector since the reforms of 2002-04 were implemented; that will provide the basis for an evaluation of the options for further reform in the following section. This section starts with a description of how the power industry responded to the challenge of rising energy demand, before examining how the policy environment has changed and how the government has responded to these changes. It concludes by identifying the key features and changes in the regulatory structures and systems during this period.

Surging energy demand

During the four years from the end of 2002 to the end of 2007 primary energy consumption in China grew by a total of 80% (BP, 2008), equivalent to an average of 16% per year. Demand for electricity grew at a similar rate. Total power output doubled from about 1 600 TWh (Terawatt-hour) in 2002 to about 3 200 TWh in 2007. This sudden growth of demand created an immediate shortage of electrical power, for a ban that had been placed on the construction of large new power stations in 1999 was lifted only in 2002. Thus the consumption statistics underestimate the actual level of demand during this period, as many provinces across China suffered power shortages, especially in the hot summer months. The growth of demand was greatest in the industrial sector, whose share of national electricity consumption rose from 73% to 75% from 2002 to 2006. Demand in the urban and residential sectors also saw strong growth (State Electricity Regulatory Commission, 2008a).

In order to attempt to satisfy the rising demand for electricity, power companies of all types across the country embarked on a massive campaign to invest in new generation capacity (Table 6.1). Given the time and resources required to construct so many power stations, the quantity of additional capacity becoming available grew steadily each year until 2006, when a total of 104 GW of new capacity was commissioned. The aggregate generating capacity of China's powers sector doubled, from 356 GW at the end of 2002 to 713 GW at the end of 2007 (Table 6.1).

The further rise of coal consumption

This growth of generation capacity was characterised by two trends, one unfavourable and the other favourable. The unfavourable trend was the rise in the proportion of coal-fired power stations in the total generating capacity (Tables 6.2 and 6.3). This arose from

Table 6.1. **National power investment in 2002-06**

Year	2002	2003	2004	2005	2006
Growth of GDP (%)	9.10	10.00	10.10	10.40	11.10
Total investment (billion Yuan)	229.692	289.443	328.489	475.422	522.784
Growth (%)	18.12	26.10	13.49	44.73	9.96
Elasticity of investment growth	1.99	2.60	1.34	4.30	0.90
Power sources investment (billion Yuan)	74.743	188.043	204.756	322.806	312.209
Growth (%)	14.25	151.59	8.89	57.65	–3.28
Power grids investment (billion Yuan)	150.748	101.400	123.733	152.615	210.575
Growth (%)	43.88	–32.74	22.02	23.34	37.98
Total capacity (GW)	356.5709	391.4078	442.3873	517.1848	622
Net increase (GW)	18.084	34.8369	50.9795	74.7975	104.8152
Growth (%)	5.34	9.77	13.02	16.91	20.27

Source: State Electricity Regulatory Commission, 2008a.

Table 6.2. **Fuel mix for power sources, 2002-06**

Year	Hydropower			Thermal power			Nuclear power		
	Capacity (MW)	Growth (%)	Share (%)	Capacity (MW)	Growth (%)	Share (%)	Capacity (MW)	Growth (%)	Share (%)
2002	86 074	3.70	24.14	265 547	4.95	74.47	4 586	102.2	1.29
2003	94 896	10.25	24.24	289 771	9.12	74.03	6 364	38.77	1.63
2004	105 242	10.90	23.79	329 480	13.70	74.48	7 014	10.21	1.59
2005	117 388	11.54	22.70	391 376	18.78	75.67	7 014	0	1.36
2006	128 570	9.52	20.67	484 050	23.68	77.82	7 014	0	1.18

Source: State Electricity Regulatory Commission, 2008a.

Table 6.3. **Fuel consumption for power generation, 2002-06**

Year	Standard coal		Raw coal		Oil		Gas	
	Consumption (Mt)	Growth (%)	Consumption (Mt)	Growth (%)	Consumption (Mt)	Growth (%)	Consumption (10^{T2} m^3)	Growth (%)
2002	472.9008	12.16	655.9455	13.81	10.8912	6.48	21.438	16.76
2003	550.4206	16.32	765.4312	16.69	13.2199	21.38	31.657	47.67
2004	624.6809	13.49	895.1227	16.94	13.8650	4.88	80.681	154.86
2005	694.3816	11.16	1 009.0721	12.73	12.7700	–7.90	124.274	54.03
2006	792.7356	14.16	1 182.4107	17.18	9.9366	–22.19	71.392	–42.55

Source: State Electricity Regulatory Commission, 2008a.

two factors. First, coal has long been the major feedstock of the country's power stations and domestic reserves of coal are plentiful. Second, the time and cost involved to build a coal-fired plant is significantly less than for the other preferred fuel, which is hydropower. The alternative fuels were not suitable for such a large expansion of capacity for a variety of reasons: natural gas was not available in sufficient quantities; oil was becoming increasingly expensive and, though its use in power generation did surge in 2003 and 2004, the government was seeking to reduce its application; and the renewable energy industry in China lacked the capacity to deliver such a vast capacity in such a short time.

The favourable trend was the substantial improvement in the nature of the coal-fired stations being constructed with respect to both scale and technology (Table 6.4). A majority of new plants were 600 MW or larger, and between 2002 and 2006 the proportion of plants

Table 6.4. **Composition of capacity of thermal and hydro units nationwide, 2002-06**

Item			2002	2003	2004	2005	2006
Thermal power	100 MW and above	Number of units	855	931	1 026	1 174	1 393
		Capacity (MW)	190 761	208 818	236 184	277 989	358 748
		Proportion to thermal total (%)	71.84	72.06	72.69	72.37	74.11
	200 MW and above	Number of units	519	554	612	708	880
		Capacity (MW)	152 015	164 120	186 440	221 230	295 420
		Proportion to thermal total (%)	57.34	56.64	57.38	57.59	61.03
	300 MW and above	Number of units	314	342	394	480	635
		Capacity (MW)	110 715	121 180	142 180	174 910	244 410
		Proportion to thermal total (%)	41.69	41.82	43.76	45.53	50.44
Hydropower	40 MW and above	Number of units	361	388	418	452	505
		Capacity (MW)	49 417	55 696	62 151	68 586	74 921
		Proportion hydropower total (%)	57.41	58.69	57.41	58.86	58.21
	200 MW and above	Number of units	94	104	109	125	135
		Capacity (MW)	26 905	32 090	35 790	40 790	43 440
		Proportion hydropower total (%)	31.26	33.82	33.06	35.01	33.79

Source: State Electricity Regulatory Commission, 2008a.

with a size of 300 MW and above rose from 41% to 51%. Many of the new plants incorporated advanced technologies that greatly enhance thermal efficiency and reduce pollution. As of the middle of 2008, 8.2 GW of ultra-supercritical plants were in operation and another 100 GW were under construction. A small number of plants using circulating fluidised bed combustion were also coming into operation (International Energy Agency, in press; State Electricity Regulatory Commission, 2008a).

Less successful has been the application of flue gas desulphurisation technology (FGD), intended to reduce sulphur dioxide emissions. This technology is not new and has been available for many years in China, but its high cost has discouraged its widespread use in power generation. Though the rate of installation in existing plants is about 30% and in new plants about 40%, a relatively low proportion of these plants use the FGD equipment. This is on account of the significant incremental operating costs in comparison to the low tariffs received by power generators, and on account of ineffective environmental regulation (International Energy Agency, in press).

At the same time as the industry has been constructing large and efficient plants, the government has been closing down small and inefficient plants. As part of its energy efficiency strategy, the government aims to decommission 50 GW coal of coal-fired capacity during the period 2006-10. This plan covers all plants less than 50 MW and many older plants up to 200 MW in capacity. At the same time the government has lowered the tariffs for power dispatched from plants with capacities of less than 50 MW as well as from some plants in the size range 100-200 MW. This strategy to enhance overall plant efficiency has been offset in part by the construction of many new plants with capacities under 135 MW, as a result of poor control over the planning and approval process during the construction boom.

These behaviours with respect to investment in and use of coal-fired generation have resulted in a very modest decline of 3% in coal consumption per kWh over 2002-06. They have also led to a continuing rise in total emissions of both dust and sulphur dioxide from the power industry, but a decline in emissions per kWh (Table 6.5). Average utilisation rates

Table 6.5. **Emissions from the power sector, 2002-06**

Year	2002	2003	2004	2005	2006
Net coal consumption (g/kwh)	383	380	376	370	367
Dust emissions of thermal power plants (Mt)	3.24	3.30	3.46	3.60	3.70
Growth of dust emissions (%)	0.62	1.85	4.85	4.05	2.78
Performance in dust emissions (g/kWh)	2.4	2.1	1.9	1.8	1.6
National total SO_2 emissions (Mt)	19.27	21.59	22.55	25.49	25.89
SO_2 emissions of power industry (Mt)	8.20	10.00	12.00	13.00	13.50
Proportion of power industry to total in SO_2 emissions (%)	42.6	46.3	53.2	51	52.1
Performance of power industry in SO_2 emissions (g/kWh)	6.1	6.3	6.6	6.4	5.7

Source: State Electricity Regulatory Commission, 2008a.

for thermal plants rose substantially from 2002 to 2004 as the power shortages grew more intense, before starting to decline from 2005 (Table 6.6).

Table 6.6. **Average utilisation hours of generation equipment in 2002-06**

Year	National		Hydro		Thermal	
	Hours	Growth	Hours	Growth	Hours	Growth
2002	4 860	272	3 289	160	5 272	372
2003	5 245	385	3 239	–50	5 767	495
2004	5 455	210	3 462	223	5 991	224
2005	5 425	–30	3 664	202	5 865	–126
2006	5 221	–204	3 434	–230	5 633	–232

Source: State Electricity Regulatory Commission, 2008a.

The power sector has traditionally been the main user of coal in China's economy, along with other industrial sectors. Yet as the share of coal consumption for non-industrial uses has declined, the share taken by the power sector has increased from 38% in 1998 to 50% today (Thomson, 2003; International Energy Agency, in press). Thus China's power industry and its coal industry have become increasingly interdependent.

Though investment in new coal mine capacity did allow coal production to rise by 75% between 2002 to 2007, from 1 450 million tonnes to 2 520 million tonnes, the power generators faced two sets of challenges. First, the government was constraining their ability to pass the rising price of coal through to the grid companies, as a result of which their profits were reduced. Second, the excess of supply of coal over demand declined after 2003 and the level of net exports of coal fell sharply, so that in some months of 2007 and 2008 the country was a net importer of coal. This struggle to meet the rising demand for coal has been exacerbated by shortages in rail capacity to transport coal from mines to the power stations. These twin pressures of commercial profitability and feedstock supply led to intermittent power shortages in 2008 despite the apparent adequacy of the aggregate generating capacity.

The role of other fuels

While investment in new generating capacity has been directed primarily at coal-fired plant, additional capacity has also been constructed for hydro, nuclear, natural gas and renewables.

China has one of the largest hydrological power resources in the world. Most of these resources are located in the southwest, with 50% in just three provinces and one municipality: Yunnan, Guizhou, Sichuan and Chongqing. Since 2002 an average of 10 GW of new capacity was commissioned each year and by 2007 the total installed capacity was 145 GW. Pump storage has been an important component in the expansion of hydro-electricity in order to supply peak load. At the end of 2007 the total pump storage capacity amounted to 9 000 MW with a further 14 000 under construction (Wang, 2008). Despite this construction programme, the proportion of hydro-electric capacity in China's power sector has gradually fallen from more than 30% in the early 1980s to about 20% in 2007. This decline has been largely due to the more rapid expansion of thermal power capacity. Over 2002-06, the proportion of hydro-electricity to national electricity supply declined from 16.6% to 14.7% (State Electricity Regulatory Commission, 2008a).

The power shortages triggered a resurgence of China's nuclear power industry. As part of ongoing plans, six new units were commissioned between 2002 and 2004, bringing the total capacity to 7 GW, entirely in the southeast of the country. This represented just over 1% of China's total power-generating capacity, but because of the way nuclear power is used, this capacity could contribute nearly 2% of total national electricity supply (State Electricity Regulatory Commission, 2008a).

Five more units totalling more than 4 GW are due to come on stream between 2008 and 2011. The real surge is planned for the following decade, 2010-20, as a further 28 GW is to be built, bringing the total to 40 GW. At least 11 units amounting to more than 12 GW are currently in the planning stage, in Liaoning, Shandong, Fujian, Zhejiang and Guangdong provinces. The balance of about 15 GW to be built before 2020 remains a proposal.

Neither oil nor natural gas contributes substantially to the country's power supply. The use of oil in power generation has declined since 2004 as other sources of electricity have become available and as the government successfully closed down the oil-fired plants on account of the pollution they caused. Though the use of natural gas in the power sector grew until 2004, it then declined as a result of the lack of availability of gas and as a consequence of the policy decision of the government to prioritise the use of gas in domestic and commercial sectors over power generation (State Electricity Regulatory Commission, 2008a; National Development and Reform Commission, 2007a).

Aside from hydro-electricity, wind is the major source of renewable electricity in China. The country has substantial wind resources, mainly located in the coastal southeastern provinces and in the northwest and northeast of the country. As part of the government's strategy to rapidly enhance the proportion of renewables in the energy supply, it has been actively promoting the development of wind power. Installed capacity has doubled each year since 2003. New capacity amounting to 2.6 GW was installed in 2006 and a further 3.4 GW installed in 2007, bringing the total to 6 GW. This gave China the fifth-largest wind power sector in the world, behind India. Wind power accounts for nearly 1% of installed power-generating capacity. In addition to these plants connected to the grid, the country has more than 200 000 stand-alone turbines serving individual households, totalling more than 40 MW (International Energy Agency, 2007a; Martinot and Li, 2007).

One of the long-standing weaknesses in China's power sector has been the shortage of capacity in transmission and distribution. This has resulted in congestion and in the inability to dispatch all generating plant that is available. In this way, investment in new generating capacity may be wasteful. The period 2002 to 2006 saw substantial investment

in the transmission and distribution network; a total of nearly 100 000 km of additional line was created, marking a 50% increase in line length. Most of the expansion was at 500 kV and 220 kV (State Electricity Regulatory Commission, 2008a).

The power companies

All five of the large generating companies established in 2002 took part in the construction of power plants. As a result of construction – and possibly, also of acquisition – all of them have substantially increased their share of equity ownership of generating capacity. Between 2002 and 2006 this share appears to have grown from 30% in 2002 to 40% in 2006. Datang and Huaneng showed the greatest growth, while China Power Investment grew the least (Pitmann and Zhang, 2008).

Partial data on the geographic location of major power plants (Pittman and Zhang, 2008) show that the role of these five companies in the north of the country in 2008 is quite different from in the south. In the large north China market and in the smaller markets of northwest and northeast China, these companies own a substantial proportion of the larger power plants, whereas in the central, south and east China markets their role is diluted by the presence of the Three Gorges Dam – especially in central China – and by a large number of other investors, particularly in the south and east China markets.

All five companies have significant holdings of hydro-electric capacity in southern and central China – notably Datang, traditionally a coal-based company from northern China, with 12 GW. The state grid has been progressively restricted to pump storage capacity, as its other generating plants have been sold off to other companies.

Table 6.7. **Production and business conditions of the five large power generation groups**

Power generation enterprises	Year	Sales revenue		Total profit		Total assets		ROR on net assets	
		Amount (billion Yuan)	Growth (%)	Amount (billion Yuan)	Growth (%)	Amount (billion Yuan)	Growth (%)	Rate (%)	Growth (%)
Huaneng Corp	2003	44.7	/	6.4	/	140.3	/	/	/
	2004	52.8	18.12	6.9	7.81	155.8	11.48	6.25	/
	2005	73.6	39.39	8.1	17.39	226.9	45.64	6.14	–1.76
	2006	84.5	14.81	9.6	18.52	285.6	25.87	6.61	7.65
Datang Corp	2003	33.1	/	2.6	/	110.4	/	/	/
	2004	41.2	24.47	3.0	15.38	139.9	26.72	1.54	/
	2005	55.2	33.98	3.6	20.00	183.0	30.81	1.98	28.57
	2006	70.3	27.36	5.5	52.78	226.6	23.83	3.62	82.83
Huadian Corp	2003	29.9	/	1.0	/	95.7	/	/	/
	2004	35.5	18.73	1.2	20.00	117.9	23.20	0.46	/
	2005	44.1	24.23	1.9	58.33	146.7	24.43	2.57	458.70
	2006	55.6	26.08	3.1	63.16	196.1	33.67	3.32	29.18
Guodian Corp	2003	26.2	/	1.4	/	72.6	/	/	/
	2004	34.5	31.68	2.2	57.14	104.1	43.39	3.60	/
	2005	48.7	41.16	3.2	45.45	132.3	27.09	1.62	–55.00
	2006	58	19.10	4.0	25.00	188.0	42.10	4.16	156.80
China Power Investment Corp	2003	25.7	/	1.5	/	85.3	/	/	/
	2004	28.9	12.45	1.5	0	111.2	30.36	1.70	/
	2005	37.9	31.14	2.0	33.33	138.3	24.37	1.70	0
	2006	48.3	27.44	3.9	95.00	181.2	31.02	4.82	183.53
Total		928.7	/	72.6	/	1 077.5	/	3.35	/

Source: State Electricity Regulatory Commission, 2007a.

This expansion of generating capacity allowed each of the five main generating companies to increase their sales revenue over 2003-06. Each company also succeeded in raising their profits both in absolute terms and in terms of rate of return on net assets (Table 6.7). Recent analysis suggests that this improvement in profitability was driven, at least in part, by significant improvements in the efficiency of the use of key inputs such as labour, fuel and non-fuel materials (Du *et al.*, in press). The profits of these generating companies have declined in 2007 and 2008 as coal prices have continued to rise faster than the wholesale electricity price.

The role of foreign investment in China's power sector since 2002 has been relatively small, although the government has long permitted foreign direct investment in power stations with a capacity greater than 300 GW. Official statistics show that actual foreign investment in 2005 was USD 1.8 billion, equivalent to 2.6% of total investment in the power sector. This fell to USD 620 million in 2006 and USD 566 million in 2007 (Ministry of Commerce, 2008). This is a consequence of many factors, including policy ambiguity, legal instability and the low level of tariffs (Wee and Wee, 2003; Andrews-Speed, 2004).

The new policy environment and government responses

The period 2004 to 2008 was a time of significant change in the policy environment for China's energy sector. Since 2003, security of energy supply has been high on the agenda for both domestic and international reasons, and the government has identified energy efficiency and energy conservation as forming the core of its new energy strategy. This contrasts with earlier approaches to energy policy, which had emphasised the production of energy. The new approach has had immediate and significant consequences for the electrical power industry. More recently, concerns relating to climate change have supplemented the drive for energy efficiency. But behind both of these sets of policy objectives lies the long-standing priority of addressing social equity concerns through energy pricing.

Energy security and energy efficiency

The growing shortages of energy drove the government to undertake a thorough review of its energy strategies in 2004. The most authoritative report to be published was that of the Development Research Centre of the State Council. This report identified the following main priorities for China's future energy policy (Development Research Centre, 2004):

- Placing greater emphasis on energy conservation and energy efficiency, especially in industry.
- Integrating environmental priorities into energy policy.
- Maintaining domestic primary energy resources as the main source of energy supply, but improving the management of these resources.
- Enhancing the role of the market within the domestic energy sector.
- Increasing the use of hydro-electricity, renewable energy, nuclear energy and natural gas, in order to reduce reliance on coal.
- Developing alternative transport fuels.
- Constructing emergency oil storage.

At the same time, the NDRC issued its "Medium and Long Term Energy Conservation Plan". The Plan not only demonstrated that energy efficiency and energy conservation did indeed lie at the heart of China's new energy policy, but also set forth specific targets and objectives and identified the key steps to be taken (National Development and Reform Commission, 2004). A revised version of the 1997 Energy Conservation Law was approved in October 2007.

The stated overriding goal of the new strategy was to reduce energy intensity by 20% between 2005 and 2010. This Energy Conservation Plan and subsequent documents have set targets for individual energy-intensive industries such as electrical power generation, steel, nonferrous metals, oil refining, petrochemicals, chemicals, cement and plate glass, as well providing proposals for the technological, process or management improvements needed to achieve these targets. By the same year, 2010, standards for energy-fed appliances are to be raised to international levels, and the systems for policy, regulation and technical support for energy conservation are to be dramatically improved. These priorities were further elaborated in the Five-Year Plan for the period 2006-10 (National Development and Reform Commission, 2007a) and work has been under way since 2006 to draft an Energy Law that will encapsulate the key aims and approaches to China's new energy policy.

A number of detailed regulations have been issued relating to the power sector. The aim is to encourage high-specification generation technologies with large capacities, high efficiency, low water usage and effective environmental controls (International Energy Agency, in press). It is these regulations that have encouraged the construction of the supercritical and ultra-supercritical plants mentioned above. At the same time, small, old and inefficient plans are being closed.

In addition to adjusting the efficiency and cleanliness of national generating capacity through construction and closure, the government has taken steps to adjust the system for the dispatch of power plants. In August 2007 a new trial method for dispatch was announced (National Development and Reform Commission, 2007b), which set out the following order for dispatch:

- Renewable energy.
- Nuclear power.
- Coal-fired co-generation units and those using waste heat.
- Natural gas and gasified coal units.
- Conventional coal-fired units.
- Oil fired plants.

For thermal plants within the same category, the order of dispatch should be on the basis, first, of energy consumption and, second, of pollution levels. Trials were started in late 2007 in five provinces, Henan, Jiangsu, Guangdong, Sichuan and Guizhou. Guizhou was the first to implement the new dispatch method. It is reported that the province saved 592 tons of coal on the first day of the trial, and it is expected that the annual coal saving from the new method could reach 300 000 tonnes and sulphur dioxide (SO_2) emissions could be reduced by 150 000 tons.

More recently, governments at local level have taken active steps to introduce SO_2 emission trading programmes. For example, the Environmental Protection Bureaus in Shandong and Jiangsu issued the programme proposals in late 2007 and early 2008,

respectively. Guangdong and Hong Kong have been working on a plan for a joint trading programme since 2005. This programme was finally launched in early 2007; it aims to reduce SO_2 and nitrogen oxide (NOx) from power plants in both areas.

Climate change

The attitude of China's government to the global environmental impacts of energy use has also changed. Interest in adapting domestic policies to address the challenges of climate change had been rather limited, but late in 2006 the International Energy Agency predicted that China would overtake the USA and become the world's largest emitter of greenhouse gases (GHGs) by 2009. Indeed, at the beginning of July, 2007 the Netherlands Environmental Assessment Agency released the results of its preliminary analysis of the latest energy data; they showed that China had already become the largest emitter of GHGs in 2006.

Partly in response to this growing awareness of China's contribution to current (not historic) GHG emissions, China's State Council approved a national plan to address the challenges posed by climate change at the end of May 2007 (National Development and Reform Commission, 2007d). Ambitious though some of these targets are, most of those relating to energy are consistent with the newly developed energy strategies (Lewis, 2007). Three components of the climate strategy that are of relevance to electrical power are renewable energy, the Clean Development Mechanism (CDM) and carbon capture and storage.

The Renewable Energy Law passed in 2005 marked a new determination by the government to substantially enhance the role of renewables in the national energy supply. This law created, for the first time, a relatively coherent framework for promoting investment in renewable energy. It provided an obligation for grid companies to connect all renewable plants and to purchase all electrical power generated by these plants. Incentives for research and development were also provided in order to encourage the domestic manufacturing of the required technologies.

Despite these positive components, the law did not provide for a fixed and predetermined feed-in tariff (the price paid by the grid to generator). Rather, the tariff is set by competitive bidding. This has resulted in the state-owned power companies driving prices down to levels below what most would estimate to be commercially viable for wind power or other renewables. Private sector investors, both domestic and foreign, have failed to gain significant opportunities (Lema and Ruby, 2007; Li and Ma, 2007).

An added potential incentive for the construction of renewable energy capacity is the Clean Development Mechanism, the instrument established by the Kyoto Protocol to encourage financial support from developed economies for investment in clean energy in developing economies. To date wind power has been the prime beneficiary within the power generation sector of the CDM mechanism in China (IEA, 2007). Administrative obstacles and policy ambiguity have so far prevented rapid implementation for renewable energy within China (Zhang, 2006; Resnier *et al*., 2007).

The years 2007 and 2008 saw the launch of two major initiatives relating to carbon trading. In collaboration with the UNDP, the government established exchanges in Beijing and Shanghai to provide platforms for carbon trading, as well as to collect and publicise relevant information and undertake advisory and consultancy services. The second initiative, called MGD Carbon (Carbon Finance for Achieving Millennium Development

Goals), is intended to establish service centres in poorer parts of the country to enable them to take part in the carbon trading schemes.

Carbon capture and storage (CCS) is likely to become an important part of China's climate change strategy on account of the country's probable long-term dependence on coal as a major source of primary energy, especially in the power sector. Though the need to carry out research into this technology is mentioned in the National Climate Change Programme, no specific commitments or targets have been established. Despite the absence of a clear government strategy, the China Huaneng Group commissioned the country's first carbon capture demonstration plant in July 2008. The project, in collaboration with CSIRO of Australia, extracts carbon dioxide from the emissions of a coal-fired plant and uses this carbon dioxide in the food and drink industry.

Rising prices and social equity concerns

The pricing policies introduced in 1998 have led the power industry to be vulnerable to international markets and dependent on government policy. The price of the main primary energy feedstock, coal, is set by international markets, while the end-user prices for electricity are set by government, and at levels intended to address social equity concerns.

As international prices for coal and crude oil rose over 2002-08, so did domestic prices for the producers of coal and oil. The government allowed coal prices to react to supply and demand, and so border prices for steam coal rose from about USD 40 per tonne in 2004 to USD 110 in July 2008 in line with international prices. Inland, near the areas of production, coal prices were at lower levels but also increased by a similar proportion. The government has sought to constrain the price of coal sold to power stations but otherwise has not directly capped coal prices. Domestic crude oil prices likewise continued to rise as the government allowed them to follow trends in the international markets.

In contrast, in its concern to protect private citizens and, to a lesser extent, industrial and commercial enterprises, the government has proved very reluctant to raise end-user prices for electricity, for oil products and for natural gas. Though consumer prices for most forms of energy were raised at irregular intervals, end-user electricity prices continued to lag behind wholesale electricity prices, and they in turn lagged behind the rise in coal prices. The reluctance to raise energy prices further grew during 2007 with rising inflation.

By March 2008 power shortages were appearing across the country, despite the massive and ongoing investment in new power generation capacity over the previous five years. In part these shortages were caused by the severe winter weather in the southern part of the country. But a further cause was the unwillingness of power generators to operate at a time of rapidly rising coal prices and frozen electricity prices.

In June 2008 China's government could no longer resist the pressure for further substantial tariff adjustments and announced a round of price rises for energy products. From 1 July 2008 wholesale electricity tariffs were allowed to rise by 5%. This increase provided some compensation to the power generators, but the industry argued at the time that a further rise of 50% would be required to match the amount that coal prices had risen by over the previous 12 months.

Evolving systems and institutions for sector regulation

The period from 2004 to March 2008, when the government underwent significant restructuring, was a time of subtle rather than substantial change in the structures and systems for managing the power sector. Despite the dramatic change in the structure of the power industry itself in 2002 and the creation of the State Electricity Regulatory Commission, powers and functions remained with the traditional centre of authority, the NDRC (State Electricity Regulatory Commission, 2007b, 2008b).

The sudden rise in the importance of energy as a national priority saw the top leadership and the State Council becoming more involved in issues relating to energy than before, as was shown by the creation of the Energy Leading Group and its supporting State Energy Office. But the NDRC retained control over most of the key aspects of policy making and regulation in the electricity sector (Table 6.8). Specifically, the NDRC continued to be responsible for formulating energy policy and policy for the power sector, including sector reform. At the same time it held approval authority over pricing, investment, new technologies, and CDM projects.

Though these roles were concentrated in the NDRC, other tasks were dispersed among a number of other government departments such as the State Assets Supervision and Administration Commission (SASAC), the Ministries of Finance and of Science and Technology, the State Administration of Industry and Commerce, and the State Environmental Protection Agency (Table 6.8).

Table 6.8. **Summary of the allocation of government functions relating to the power sector between 2003 and March 2008**

Function	Responsible agency	Participating agency
Energy policy formulation	NDRC (Energy Bureau)	Energy Leading Group State Energy Office
Power sector policy formulation	NDRC (Energy Bureau)	SERC
Power sector planning	NDRC (Energy Bureau)	SERC
Price regulation	NDRC (Price Dept)	SERC
Investment approval	NDRC (Energy Bureau)	
Market entry approval	SERC	
Service obligations and quality	SERC	
Law-enforcement and administration	SERC or Local Economic and Trade Commission	
Demarcation of geographic area of power supply	SERC or Local Economic and Trade Commission	
Approval of new technologies	NDRC	
Approval of CDM projects	NDRC	
Technical and quality standards	NDRC	
Regulation of financial system of enterprise	Ministry of Finance	SERC
Regulation and management of national assets	SASAC	
Environmental regulation and management	SEPA	
Approved scope of enterprise operation	State Administration of Industry and Commerce	
Electrical power standards	Ministry of Science and Technology	
Safety regulation	SERC	
Public service	SERC	

Source: State Electricity Regulatory Commission, 2007b, 2008b.

SERC itself was left with few clear responsibilities except for drawing up proposals for the NDRC, drafting rules of minor importance, and undertaking certain minor regulator

functions. SERC appears to have carried out the former two tasks with great enthusiasm to judge by the large number of documents it has produced since January 2006. However, its capacity to undertake the minor regulatory tasks has been restricted by the shortage of staff and of offices at local level. As a result these functions continue to be carried out by local Economic and Trade Commissions wherever no local office of SERC has been established.

In a report that examined the sources of this failure to change the systems and structures of regulation, SERC (2008b) identified two factors preventing radical change:

- A general lack of understanding within government of the nature of regulation and of the need for change in both the structures and functions of government.
- A lack of a precedent within China to guide the creation of new regulatory systems and structures for the power sector.

To this should be added the apparent unwillingness of the NDRC to relinquish its power over policy, planning, investment or pricing.

Further, SERC (2008b) explained that it was unable to carry out even its present functions adequately, for a number of reasons:

- The inadequacy of existing laws and regulations to provide a framework for effective regulation.
- A shortage of skilled manpower to staff an effective electricity regulatory agency.
- The power of provincial governments to protect the interests of the provincial power industry.
- The ability of the power companies to resist calls for information by SERC.
- A lack of appreciation of the rule of law rather than the rule of authority.

Thus, despite a rearrangement of roles and responsibilities, the long-standing systems of regulation of China's power sector changed little over 2003-08. Authority remained concentrated in the NDRC for the most important regulatory functions, while other functions were highly dispersed. The result was excessive government interference where it was not needed, and inadequate regulation where it was needed (SERC, 2008b). After the fanfare that accompanied the creation of SERC as an "independent regulator", this new agency has been treated as a peripheral advisory body rather than a regulator of critical importance to the development of the sector.

The new government, installed in March 2008, undertook a radical reorganisation of some ministries and agencies, but the energy sector only saw minor changes. The Energy Leading Group was transformed into the National Energy Commission and the Energy Bureau was upgraded and enlarged to become the National Energy Administration (NEA). This new NEA incorporates the previous Energy Bureau and State Energy Office, as well as the nuclear power administration. At its launch in July 2008 the NEA had a staff of 112 in nine departments: energy policy, project planning, project approval, electricity, coal, oil, nuclear power, alternative resources and international co-operation. Though its rank has been raised to vice-ministerial status, the NEA is likely to continue to lack the capacity and authority to fulfil its mandate, not least because it remains within the NDRC and because the Price Department of the NDRC retains control over energy pricing (Downs, 2008; Miller, 2008).

In the same reorganisation the State Environmental Protection Administration (SEPA) was raised in status and re-named the Ministry of Environmental Protection (MEP). This upgrade means that, as a cabinet-level ministry, the MEP can be directly involved in high-profile decision making and has the authority to co-ordinate other cabinet-level ministries in order to address environmental problems. A further possible consequence is that the provincial governments may follow the central government's move and introduce the Environmental Protection Bureaus (EPBs) into their decision-making processes. For example, the Jiangsu provincial government has raised the status of its EPB to that of a Department of Environmental Protection.

It is not yet clear what the impact will be on SERC of the creation of the National Energy Administration and the Ministry of Environmental Protection. Their enhanced status may encourage these agencies to retain authority rather than devolve it to SERC. As of late 2008, the government has made no official statement concerning any adjustment of roles or responsibilities relating to SERC.

Re-evaluation of China's sector reform plans

By 2007 it appeared that the power supply crisis was easing, that a surplus of generating capacity was to be in place by 2008, and that systematic power shortages would disappear. In an effort to revive the process of power sector reform, the State Council issued a document in April 2007 (State Council, 2007) setting out the guidelines for moving forward, based on their original strategy published in 2002 (State Council, 2002).

The aim of this section is to evaluate China's plans and proposals for further power sector reform in light of the developments described above, and in light of likely future trends and developments.

The objectives and approach

As discussed above, the objectives of the Chinese government at the time the power sector reforms were launched in the 1990s were:

- To increase the quantity and quality of power supply.
- To raise the commercial and technical performance of the power industry.
- To pass the cost benefits to end-users in the form of tariff reductions.

The underlying ideas and plans for reform were formulated in the mid- and late-1990s, at a time when energy demand was rising, but at a slower rate than in the early 1990s. At that time the government believed that foreign investment was needed to support the expansion of the power sector and that this investment would be forthcoming. Further, the reform strategy was based on the understanding that the introduction of competition was vital to achieving the government's objectives for the power sector – namely, attracting investment, lowering costs and reducing tariffs.

In this respect, China's government was following the prevailing international wisdom at the time and focusing purely on the economic performance of the electricity industry, in the narrow sense of the word "economic". The government's approach was consistent with its wider industrial policy of progressive commercialisation and privatisation of state-owned companies, and of liberalisation of domestic commodity markets. This strategy for the electricity industry was also compatible with the wider energy policy of raising domestic capacity to produce energy to support economic growth.

A decade or more later, China's own energy policy priorities have changed dramatically, and international understanding of electricity sector reform and regulation has evolved (as will be examined in the next section).

In 2008 China's energy policy has been driven by a combination of short-term and long-term objectives. In the short term, the government has been expending considerable effort to achieve its goal of reducing energy intensity by 20% between 2006 and 2010. Many of these measures have been directed at the power sector, both at the production and at the consumption of electricity. At the same time, a relatively high level of inflation since 2006 has rendered the government reluctant to raise end-user prices for energy, including electricity, especially for households and rural inhabitants.

In the longer term, the government has been progressively adopting strategies that are intended to lead to a more sustainable use of energy, with respect to both energy intensity and environmental impact. These strategies recognise the need to adjust the structure of China's economy away from its dependence on heavy industry, to raise the level of energy efficiency throughout the economy, to diversify the fuel mix and to promote the development of new, clean and renewable sources of energy. Thus recent years have seen a drive to build wind farms and nuclear power plants, to install clean coal technology, and to carry out a trial in carbon capture.

Underlying these short-term and long-term objectives is the expectation that demand for electricity in China will continue to rise rapidly, barring a major economic or political crisis, at an annual rate of 7.5-8.0% between 2005 and 2015, and 4.4-4.9% between 2005 and 2030 (International Energy Agency, 2007a).

This combination of policy priorities is quite different from what existed in the mid- to late-1990s. In particular the drive for energy efficiency throughout the economy, combined with the push for cleaner energy, will have the unavoidable consequence that energy costs rise. Though an efficient and clean electricity sector will yield long-term benefits, investors need incentives to invest in new technologies for generating and using electricity, and end-users need incentives to be efficient.

The challenge of managing the transition to a more sustainable energy system faces not just China but also OECD countries that have a low or negative rate of growth of energy demand. China and other developing countries face the additional challenges of managing this transition with a high rate of growth in demand for electricity, and the need for investment in new generation capacity and in new electricity appliances. At the same time, priorities relating to the macro economy and to social equity also have to be addressed.

Given this new context, it is not clear that the original strategy to introduce competition in generation will address the government's current priorities. The reform steps taken already have yielded some benefits with respect to increasing the quantity and quality of power supply, and raising the commercial and technical performance of the power industry. The third objective from the 1990s, that of passing the cost benefits to end-users in the form of tariff reductions, has not been achieved on account of rising fuel costs, though the government has protected some users from these price rises.

The current priorities for China's energy policy require that strong administrative and economic signals be provided to the producers and the users of energy (United Nations Economic and Social Commission for Asia and the Pacific, 2004; United Nations Economic Commission for Europe, 2005; Energy Charter Secretariat, 2007). These signals should furnish guidance with regard to their investments in infrastructure and appliances and to

their operating behaviours, in order to create a power supply system with adequate capacity and reliability, to maximise energy efficiency, and to minimise environmental impacts. For the electricity industry, these signals would cover issues such as:

- The choice of fuel, technology and location of new power-generating plants.
- The upgrading of existing plants.
- The construction of transmission and distribution networks.
- The operation of the generating plants and of the entire system, including dispatch.
- Investment in appliances using electricity, industrial, commercial and domestic.
- Research into and development of new clean and efficient technologies.

The introduction of competition in generation by itself will not achieve these objectives. Strong complementary measures will be needed. Given the urgency of the capacity, efficiency and environmental challenges facing China, the key question is whether or not the introduction of competition should continue to be the main priority for the future development of the electrical power sector.

In simple terms, two choices face the government:

- To press ahead with the introduction of competition in power generation, taking the industry towards Model 3, and at the same time bring in measures to address the challenges relating to capacity, efficiency and environment.
- Or, to continue to set aside the planned introduction of competition, and to continue implementing measures to address the current strategic priorities, and retain the industry within a Model 2 framework.

For several years it has been widely argued that China's power sector is not ready for the introduction of competition and that a wide range of actions must be undertaken in preparation for competition, but also that many measures can be implemented to address the challenges facing the power sector before the introduction of competition (Andrews-Speed, 2004; International Energy Agency, 2006; State Electricity Regulatory Commission, 2007b, 2008b).

Specific reform measures

The State Council's document of April 2007 (State Council, 2007) reiterated the components of power sector reform stated earlier, namely:

- Continuing the separation of generation from transmission.
- Continuing the separation of ancillary businesses from the main power companies.
- Improving systems for dispatch.
- Creating conditions for the separation of distribution from transmission.
- Improving the power sector in rural areas.
- Increasing the commercialisation and performance of power companies.
- Enhancing reform of electricity pricing.
- Revising relevant laws and regulations.
- Accelerating change in government functions.
- Accelerating the development of power markets.

All but the last of these proposals involve no introduction of direct competition in the sale of electricity. Indeed, these measures can be seen as vital steps in preparing *for* the introduction of competition.

That introduction faces a number of major challenges, irrespective of the changed nature of the energy policy priorities. Foremost among these are long-standing weaknesses in the legal system, in the governing laws and regulations, and in the institutional structures and systems for managing and regulating the power sector (Andrews-Speed, 2004; IEA, 2006; SERC, 2007, 2008).

A number of features of the power industry provide additional challenges. Some of these are long-standing, and others have appeared along with the reforms over the last few years (Pitmann and Zhang, 2008). The transmission system remains fragmented despite ongoing investment; this will constrain sales within the proposed regional wholesale markets, as well as the much-needed trade from the west and north of the country to the south and east. As a result, the wholesale markets are likely to be geographically smaller than intended, and this may allow certain generating companies to achieve undue market influence. The possibility of anti-competitive behaviour will be enhanced if individual companies own both base-load and peak-load plant in the same market, if there is little excess supply and companies can benefit from withholding supply, and if collusion arises between different state-owned companies. Further, the very high proportion of coal in the fuel mix, especially in northern and central China, is likely to render prices highly volatile.

Anti-competitive behaviour can be ameliorated if entry barriers to new, private sector investors are reduced. Unfortunately in China, barriers to private investors, especially foreign investors, have been high with the exception of a period of a few years in the 1990s. The main barriers to private sector investment in power generation in China continue to be (Andrews-Speed, 2004; Pitmann and Zhang, 2008):

- Ambiguity of the policies and plans for the reform of the power sector.
- Ambiguity of the laws and regulations.
- The instability of contracts.
- A system for setting wholesale tariffs that limits financial returns even in cases where power purchase agreements have been signed.
- The complexity of the regulatory system, which requires a high level of transaction costs.
- The abundance of domestic Chinese funds flowing to state-owned investors in power generation, combined with local protectionism.

Though China may not need private sector participation to provide additional capital at present, and although the industry may be able to obtain foreign technology through co-operation with foreign engineering companies, the involvement of domestic and foreign private investors should furnish the advantage of reducing the scope for anti-competitive behaviour by the incumbent players. But these investors will only be attracted to China's wholesale market if the entry barriers listed above are lowered substantially.

Given the high level of entry barriers to date and the specific technical and structural concerns discussed above, a strong case exists that China's power sector is not ready for the introduction of competition in power generation, and that the government should focus its attention on other measures that address its strategic priorities, and on further preparation for wholesale competition.

These steps have been elaborated previously by the International Energy Agency (IEA, 2006). They include those measures identified by the State Council's (2007) document as well as specific proposals drawn up at the time by other government agencies in China, such as SERC and NDRC. The steps proposed by the IEA to build on previous reforms and to prepare for the introduction of competition in power generation are more wide-ranging and in places have a different emphasis from those of the Chinese government.

The IEA's recommendations for specific actions to enhance sector efficiency and environmental performance have many similarities to the ongoing priorities of China's government, for example:

- Improving the dispatch system and the methods for setting wholesale prices, which would allow efficient and clean plants to be rewarded in a transparent manner; the wholesale tariffs would in two parts, one part for fixed costs and the other part for variable costs.
- Improving and enforcing administrative systems and economic incentives to control sulphur dioxide and particle emissions, by obliging companies to fit or retrofit the relevant equipment and to operate it.
- Introducing more rigorous planning systems and licensing rules to more effectively control the scale, technology, fuel and location of a new plant.
- Introducing a system of transmission pricing that encourages appropriate investment by the grid.
- Completely changing the system of end-user pricing to one that is transparent and based on costs, that provides incentives for all electricity consumers to enhance their energy efficiency, and that does not unduly discriminate against the commercial sector.

In addition, the IEA proposed a number of measures that are not explicitly identified in the government's strategy for the power sector, for example:

- Separation of the functions of dispatch from those of management of the grid, through the establishment of an independent system operator.
- Much greater effort to develop and implement systems to promote demand-side management (DSM) throughout all sectors of the economy and across the country. Although the steps needed were identified several years earlier and some measures have already been implemented in a limited manner, much remains to be done (Hu *et al.*, 2005). Particular emphasis could be placed on time-of-day pricing for industrial and commercial consumers.
- A change in the way poorer populations receive subsidies for electricity, by introducing lifeline pricing to replace the current indiscriminate low level of household tariffs.

Regardless of the direction and pace of future sector reform, the framework in which the power industry operates requires substantial improvement in a number of respects (International Energy Agency, 2006). The government needs to set out a clear reform strategy for the power sector, in which roles, responsibilities, goals and risks are identified, and in which the sequencing of measures is well-defined. A single agency must be charged with providing leadership for the reform process, and this agency should possess adequate authority and capacity in order to sustain the momentum and to adjust the reform process as and when required. The government should establish a strong legal foundation for the proposed reforms, including updating laws and regulations. Greater transparency is needed with respect to decision making and information in both the reform process and

the ongoing regulation of the power sector. Finally, the systems of governance of state-owned companies in the power sector need radical improvement to ensure that the reform measures have the greatest chance of yielding the intended benefits in terms of energy efficiency and environmental protection.

Of all the measures proposed by domestic and external agencies (Berrah and Wright, 2002; International Energy Agency, 2006; State Electricity Regulatory Commission, 2007b), the single most important is the development of a regulatory agency with the capacity and the authority to oversee the design and implementation of the reforms and to carry them out. When SERC was established in 2002, the expectation was that it would take on this role, but to date SERC has lacked the capacity and, more importantly, the authority to fulfil these tasks. The authority for the key regulatory tasks still lies with the NDRC, as discussed earlier, and yet the NDRC itself lacks the capacity to carry them out effectively.

Success in the reform process will require SERC to take over responsibility for regulating the market players and preventing anti-competitive behaviour; for overseeing system dispatch and system security; for regulating investment; for promoting energy efficiency and environmental protection; for consumer protection; for collecting and analysing data; and, eventually, for tariff regulation. In addition to the political process of transferring authority, SERC will need greatly enhanced resources in terms of staff numbers and skills, both at central level in Beijing and throughout the country. Further, specific steps will need to be taken to enhance the public image of SERC, so that its roles and responsibilities are clearly understood by the public and by the industry – for a regulatory body of this type is quite new in China.

All these measures comprise a major policy programme without the additional step of introducing competition in generation; they should yield substantial benefits in the short term in respect of electricity supply, total energy consumption and environmental impact.

Implications of recent lessons in OECD and developing countries

The first countries to embark on a radical reform of their electrical power sectors were Chile, the United Kingdom and Norway in the 1980s. As mentioned earlier in this chapter, the ideas behind the reforms and the lessons from the first years of reform in these and other countries provided the framework within which China's government formulated a strategy to reform its own power sector in the late 1990s and early 2000s.

Since the year 2000, two phenomena have stimulated a re-evaluation of the liberalisation strategy in some quarters:

- A number of countries that had embarked on liberalisation, mainly OECD countries, experienced severe blackouts and price volatility in the years 2000-05.
- Many countries face new challenges as they attempt to reconcile their sector liberalisation policies with pressing priorities relating to investment in new capacity and to climate change.

The aim of this section is to examine how events, trends, understanding and policy priority changes in OECD and developing countries in recent years have affected approaches to power sector management and reform, and what relevance these changes have to China. The section starts with a summary of key points from recent reports drawing on the 20 years of reform experience in OECD and developing countries, before addressing lessons from more recent experiences.

General lessons from the reform experience

A general consensus exists that the main aim of power sector reform is to provide a better-quality service as a result of improvements, aimed at supporting economic growth and development, in the quantity and type of investment and in the operating practices within the power sector. At the same time, these measures should reduce the financial burden placed on the government by the power sector, and provide improved and affordable access to electricity supply for the poor (International Energy Agency, 2005a; Besant Jones, 2006).

The extent to which power sector reforms can be declared as having proved "successful" is more contentious. However certain significant benefits can clearly be identified in a number of cases (IEA, 2005a; Besant-Jones, 2006; Nakano and Managi, 2008), for example:

- An improvement in the productive and allocative efficiency of the power sector.
- A greater diversity of fuels and players in the power market.
- A reduction in overcapacity within generation.
- Better co-ordination between market players.
- Lower prices for end-users.
- Greater involvement of consumers in the management of the power sector.

Understanding of the risks involved in power sector reform has improved. The greatest risk is that of power shortages or highly volatile prices, or both, and even consistently high prices. These can arise from a variety of causes, for example abuse of market power, poor operating practices, and inadequate investment in infrastructure arising from inappropriate incentives. In a competitive market, very low prices can create financial problems for certain types of investor; this may be perceived as having strategic importance, for example in the case of nuclear power or renewable energy. The market can thus undermine government strategy. Finally, high prices – while they may be necessary at times to provide incentives for investment – exacerbate energy poverty, and market mechanisms alone rarely provide incentives for the power industry to invest in supplying poor and remote communities.

In order to minimise these risks, great care must be taken in the design of the reform strategy and plans, and in preparing for an implementation of the reforms (IEA, 2005a). Strong involvement is required from government in the development of the strategy; political commitment to reform is needed to ensure the steady progress of reforms; and great efforts have to be made to gain acceptance from all relevant sections of society. The government should take great care to prevent abuse by vested interests at key stages of the reform, especially privatisation.

The government needs to draw up the necessary legislation and market rules, to establish a regulatory agency with as high a degree of independence as is feasible, and to maximise transparency in the policy making and regulatory processes. Active and robust regulation is needed throughout the reform process in order to increase the diversity of players and to prevent market abuses.

The most important determinant of successful reform is the regulatory framework (Besant-Jones and Tenenbaum, 2001; Bacon and Besant-Jones 2002; Besant-Jones 2006; IEA, 2001, 2005a; Jamsb and Pollitt, 2007). In addition to the need for independence from the government and from the power industry, the regulatory agency should have clearly

allocated powers and a high level of credibility throughout society. The actual allocation of powers between government and regulator is quite variable. The most liberalised markets tend to have the most independent regulators with the greatest powers, and the less liberalised markets have regulators more closely tied to government. To be effective, the regulatory agency must be suited to the needs of the reform process and to the national systems and structures of government and public administration. In a large country such as China, effective co-ordination is required between regulators at national level and those at local level, and also between the energy regulators and the environmental regulators.

Power sector reform is a process, not a single action, and it can last for years or decades. While certain goals may be easily identified and while there is general acceptance on the overall sequencing of key actions (*i.e.* Models 1-4), there are no "off-the-shelf" solutions. Each government has to formulate plans that address the context and needs of the power sector in its country at the time (Besant-Jones and Tenenbaum, 2001; Besant-Jones, 2006; IEA, 2005a). Of particular importance are the starting conditions with respect to the geographic size of the country, the size of its power industry, the size of any surplus in generating capacity, the state of its transmission infrastructure, the income level and macroeconomic conditions, and the political and administrative systems.

Regardless of the path of reform chosen, governments should refrain from embarking on power sector reform and the introduction of competitive markets until the key preparatory steps have been taken, especially those relating to laws, rules and regulation. Launching reforms without fulfilling these preconditions greatly reduces the probabilities of success.

A further important lesson from international experience is that the post-liberalisation market rules and regulatory framework require clear priorities and systems for addressing externalities relating to reliability of supply, the environment and social equity (IEA, 2005a). Many governments are only recently realising that they have not paid adequate attention to these issues. In their concern for tangible, short-term economic success, they have forgotten long-term priorities.

Lessons from more recent experiences

The years 2000 to 2005 saw severe blackouts and politically unacceptable price volatility in a number of power markets in some OECD countries, for example the United States, Canada, the United Kingdom, Scandinavia and Italy. At the time, many commentators argued that these events illustrated that the whole idea of power sector reform was fundamentally flawed, and as a result many governments slowed down or suspended the reform process. But more considered analysis showed that these incidents arose principally from failures in the design of markets or from failures in the regulation of the operating markets (Besant-Jones and Tenenbaum, 2001; IEA, 2003, 2005a, b).

The introduction of market forces changes the way investment decisions are made. The design of the market must allow price signals to all participants to be appropriate and timely, and the policy and regulatory framework should be transparent and predictable, especially for investment. Two particular dangers are the unpredictable intervention of government in the market and the setting of price caps. Investors must not fear government intervention and any price caps should be short-lived, otherwise investment is discouraged. Likewise, if prices in the market do rise suddenly, governments should not

panic, for these prices are sending signals to investors to invest in much-needed new capacity.

Government does indeed have a role in monitoring the adequacy of generating and transmission capacity and the nature and levels of investment in new capacity. Likewise, government has a clear responsibility to establish effective legal and regulatory frameworks for transmission system security. Maintaining system security and establishing emergency response measures require government intervention, for the market will not address these issues by itself. System security requires that roles and responsibilities be clearly identified, that a high degree of co-ordination, communication and information exchange be established between all the players, and that the best available technology and the most highly skilled people be employed (IEA, 2005b).

In addition to the challenge of addressing short-term disruptions and price spikes, many governments around the world are now facing two additional challenges, relating to security of supply and the environment. At the root of the problem is that, by definition, the process of liberalisation reduces the ability of governments to influence the market directly unless they put in place additional mechanisms to address such externalities.

In the power sector, security of supply rather than system reliability refers principally to the availability and suitability of generating and transmission capacity, though fuel supply may also be a concern. A number of countries, the United Kingdom for example, are facing an imminent shortfall of generating capacity. This has arisen not so much from demand growth as from a combination of low prices and government policy inaction, which together have delayed appropriate investment in base-load capacity to replace plants that are nearing the end of their life. Though high prices are likely to trigger the required investment, the time lag will be significant, especially if the government decides to support the construction of new nuclear plants.

These experiences show that governments risk losing control of investment policy in highly liberalised markets – whereas some government co-ordination of investment is required, especially if the sector is reliant on large-scale technologies. In contrast, smaller-scale, distributed technologies may respond more rapidly to signals for new investment (Finon *et al.*, 2004).

Both energy security and environmental concerns have forced many governments to pay progressively greater attention to alternative, clean and renewable energies such as wind, marine and solar power, clean coal technologies, carbon capture and storage, and nuclear energy. Though these sources of energy may address the concerns to varying extents, they nearly all have a higher cost than the cheapest available alternative that would be favoured by the market. The government is therefore required to intervene to established transparent and predictable incentives, both administrative and economic, so as to encourage certain types of investment and behaviour. The unavoidable result of successful implementation of such policies will be that energy prices for end-users will rise, in direct opposition to a stated objective of market reform.

Of greater concern is the current state of unpredictability of the policies themselves and of the likelihood of success of certain measures once they are implemented. Governments and supranational authorities such as the European Union and the IPCC are currently undertaking a radical re-think of policies relating to clean and renewable energy as well as nuclear energy, and many aspects of future policy at national and international levels are quite unclear. Given the long lead times and long lifetimes of investments in the

power sector, this lack of clarity is hampering investment in new technology as well as investment in new capacity (International Energy Agency, 2007b).

The slow pace of policy decision-making and of effective implementation of appropriate policies derives in part from very understandable uncertainties as well as from the challenge of addressing the implications of such policies for such factors as energy poverty and national competitiveness. These concerns are exacerbated in some countries by political and intellectual resistance to the introduction of measures that are seen to go against the deeply held belief in the power of market forces. In the case of renewable energy, for example, experience has shown that feed-in tariffs are much more successful at encouraging the rapid expansion of capacity than statutory obligations to buy renewable energy, and yet some governments seem unable to adopt the feed-in tariff for doctrinal reasons (Lipp, 2007; Mitchell, 2008).

Implications for China

The implications of these lessons for China in 2009 are:

- The introduction of competitive markets in the power sector can yield economic benefits, but only under certain conditions.
- The risks are substantial, and significant preparation is required in order to limit these risks to acceptable levels; in particular, measures to establish a robust legal and regulatory framework must be completed before competitive markets are introduced.
- Even if the market reforms yield short-term economic benefits, they may fail to address longer-term objectives relating to system reliability, security of supply and the environment, unless the government designs clear policies and instruments to address these concerns.

China's government faces the choice of whether to press ahead with the introduction of competitive markets in power generation in the near future, as apparently preferred by SERC (Zhang, 2008) or whether to suspend the move towards competitive markets and rather address the current challenges without competitive markets. Two considerations argue for the second, more cautious approach.

First, as discussed in previous sections, China has yet to establish, to the required extent, the necessarily legal and regulatory framework for the risks of failure to be limited to an acceptable level.

Second, and possibly of greater importance, the policy priorities for China's government have changed since the 1990s, as discussed above. Setting aside the economic downturn in the short term, China's demand for electricity is set to increase at a significant rate for the foreseeable future. As coal is likely to remain the fuel of choice, this presents substantial environmental challenges. Excess capacity in generation and transmission is likely to be temporary at best. The key priority for China's government is to promote appropriate investment in new generating and transmission capacity, *i.e.* appropriate in terms of fuel, scale, technology and location. At the same time, the government has to further reinforce its energy-saving measures among electricity users.

Thus in the current situation in China, the introduction of widespread competition in generation runs two sets of risks: first, that the limited economic objectives of competition are not achieved; and second, that the competitive markets undermine the government's

ability to address more pressing objectives relating to security of supply and the environment.

For these reasons it is recommended that the government pursue many of the proposals that SERC and the NDRC have put forward, as well as those of the IEA (2006) outlined earlier, but with the exception of the introduction of competitive markets. A period of several years could be used constructively to build up the institutional framework for later competition, and a range of instruments other than competitive markets could be employed to address urgent priorities relating to system security, security of supply, sector efficiency and the environment.

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Chapter 7

Water

The People's Republic of China faces many serious challenges in its water sector – including scarcity, pollution and flooding – that constrain economic growth and harm the health of the people. Despite massive investment in the sector, the overall situation of resource availability and water quality continues to worsen as economic development continues.

This chapter outlines some to the core challenges of water management in China, which include the fragmentation of the institutional and legal framework and the inefficient co-operation, both vertically and horizontally, among the different departments of government and the different layers at state, provincial and local levels. To understand and analyse how the Chinese authorities can solve these challenges, this chapter will consider the institutional and regulatory issues at river basin level that affect the allocation of water to different users for abstractions for irrigation, rural and urban domestic use, and industry. The chapter also seeks to address some of these points from the perspective of improving the regulatory systems, drawing on experience from OECD countries.

Introduction

The People's Republic of China faces many serious challenges in its water sector – including scarcity, pollution and flooding – that constrain economic growth and harm the health of the people. Despite massive investment in, for example, dams and canals for supply, hydropower and flood control, and urban infrastructure for water supply and sanitation, the overall situation of resource availability and water quality continues to worsen as economic development continues.

Unlike government functions for other resources, effective management of water resources has to be organised at a river basin level as well as through the normal geographic administrative divisions, because water moves itself across jurisdictional boundaries while other resources must be actively transported. Water is also a very unusual resource/economic good in that it is universally available (though unevenly distributed spatially and temporally) and may be obtained freely but commonly requires treatment and conveyance, which incurs a high infrastructure and operational cost. It also requires both delivery to the user and collection or disposal of the polluted wastewater. Almost all water supply and wastewater management systems operate as monopolies, since direct competition and trading of the commodity or the service is extremely difficult. It therefore has traditionally been treated as a public good and managed by public rather than private sector organisations. Urban water supply and sanitation may be organised along geographic and local administrative boundaries.

The situation of water management in China is changing with:

- The strengthening of the river basin organisations (at least for quantity management).
- The introduction of water allocation and water right trading systems and a shift in emphasis from supply-side to demand-side management.
- The strengthening of water quality and pollution control through the development of total load management and river basin water quality protection planning to meet specified ambient water quality objectives.
- The continuing introduction and expansion of the private sector in municipal water supply and wastewater treatment.

However, there still remain many challenges, most notably:

- The lack of co-ordination between water resource management and water quality and pollution control management – especially at the river basin level.
- The incomplete nature of the water allocation and water resource assessments, which do not yet account for environmental flows in a scientific manner – resulting in continuing over-abstraction and depletion of surface and underground resources.
- The incomplete incorporation of hydropower development planning into the overall river basin planning process.

- The uncertain nature of the regulatory environment for municipal water and wastewater companies, leading to risks to municipalities of exploitation by private sector companies and risks to private sector companies of inconsistent or unfair conditions or changes of conditions.

Resolving some of these issues will greatly facilitate both public and private sector investment in water resource and pollution control infrastructure, and allow the development of effective institutional systems with the capacity for better management.

There is a need for far greater levels of investment in water resources and pollution control. The losses to economic growth incurred by water shortages and pollution greatly exceed the costs of addressing the causes of such harm. Well planned investment in improved management and infrastructure should show very positive economic returns.

A key part of implementing more efficient planning and management of water use is by the introduction of water pricing mechanisms that act as effective economic instruments and incites people towards more efficient water use and to making the required investment in water infrastructure. Current Chinese policy for water pricing is to include the full delivery and treatment costs of enterprises supplying and disposing of water (while including mechanisms to protect poorer users), however such financially sustainable levels of charging have so far only been implemented in areas of some major cities while many lower capacity cities are still charging unrealistically low prices for water (and consequently provide low service levels) and relying on local government subsidies to balance their books. Ideally water pricing should also include the external costs of water use such as resource depletion, pollution and ecological impact and a consideration of the economic value of water uses (together these form the MOC or Marginal Opportunity Cost of water). The existing water resources fee is a mechanism by which such costs can begin to be included in water pricing. Gradual introduction of increased water resources fees could be phased in, with excess revenue substituting other forms of taxation and used for environmental infrastructure improvements. The full MOC of water when calculated for specific regions may immediately be used as a planning tool when considering not just water resources investments but Urban, industrial and agricultural development in general.

All improved management systems for water allocation, water pricing, discharge and abstraction permitting designed to encourage more effective water use and reduce waste and pollution through the introduction of economic and administrative incentives will require greatly improved monitoring and supervision otherwise their lofty goals will be thwarted by evasion and cheating. Great care will be required to strengthen the regulatory authorities and ensure that targets that are set do not precipitate counterproductive outcomes.

The Chinese administrative systems for water are complex and comprehensive but suffer from fragmentation across ministries and conflicting goals at the central and local levels. This fragmentation has had particularly serious consequences for water quality management and despite the recent issue of improved legislation (such as the Water Pollution Prevention and Control Law 2008) and reorganisation of some ministries the current institutional set up in China does not appear to be capable of delivering the kind of co-ordinated action required to address the serious crisis presented. Consideration should be given to radical reorganisation of water management to focus on institutions with truly integrated responsibility for the planning, delivery and supervision of water quantity and quality at a river basin level.

The current systems for the regulation of urban water supply and wastewater treatment businesses has overseen a massive increase in private sector involvement over the last decade and have created by far the most active world market in water utility businesses. But still this market is struggling to deliver the levels of investment required to meet China's water infrastructure needs. The system of regulation is rather poorly defined and inconsistently implemented leaving private investors with uncertainty and risks to their business and exposing municipal governments to risk of exploitation by private undertakers. A clearer and stronger regulatory environment coordinated from state to local levels would lead to greater levels of private sector participation, lower risks (and associated risk premiums) and improved levels of service to customers and the environment.

China has a quite different government and political culture to most OECD countries, therefore many models that have previously been successful elsewhere may not be applicable to China. The Chinese system also has some features that can be particularly conducive towards achieving rapid change towards more effective behaviour, particularly through the systems of official performance assessments against specific goals for department and individual senior officials. When considering regulatory reform along legislative and institutional lines china can also incorporate these changes to its comprehensive and well established human resources management systems.

The following sections seek to address some of these points from the perspective of improving the regulatory systems, drawing on experience from OECD countries.

The development of a fully comprehensive and integrated planning and regulatory system for the Chinese water sector should have many positive benefits in terms of reducing pollution, improving sustainable water use and increasing equity of access to resources. However, it will also result in more complex procedures for some activities. Consultation will be required before, say, permitting a major new discharge or abstraction of hydropower scheme, and that will require local government to act in a more co-ordinated way with provincial government, river basin management commissions and central government. The overall outcome should be better, but the pace of development may have to slow a little – as it has in OECD countries – to allow time for proper planning. The advantage here will be greatly increased capital investment efficiency and longer asset life for projects.

Regulatory reform in China's water sector

When considering regulatory reform in China's water sector, the first step is to clarify what is meant by regulation and how implementing regulatory reform can lead to better governance and a more prosperous and equitable society. This chapter will do so from the perspective of current concepts and practice in OECD countries. These concepts may vary considerably from current Chinese concepts of regulation and governance.

"Regulations" are official documents setting out how things are to be done, defining relationships and responsibilities. They are usually statutory in nature and provisions to clarify or define technical issues through regulations are often made in primary legislation. They can take a variety forms; ultimately, they are the formalising of administrative, technical and contractual relationships.

For regulations to be effective it is necessary that they be based on rules developed by consultation and negotiation among those drafting the regulations, the representatives of those affected, and those responsible for enforcement of the regulations.

Good regulation builds certainty, stability, confidence and predictability into the institutional frameworks that manage market forces. Along with the written regulation there must be the institutional capacity to implement, inform, monitor, enforce and manage conflicts of interest.

The task of reform is never finished: for every action there is a reaction, and for any sector the boundary conditions are forever changing. A strong yet flexible regulatory environment for the water sector can deliver greater capital investment and operational efficiency. Once the initial objectives have been achieved, reformed systems are required to meet more challenging objectives for service and environmental performance. They must ensure the maintenance of initial gains in the face of changing conditions, the inevitable wearing out and decay of capital assets, and the passing on of human resource capacity.

When developing regulatory systems it is usual to separate the policy, supervisory and operational roles. Roles must be clearly defined and set out in legislation that must provide the powers and duties for the actors to undertake their functions. These will include the ability to grant operating licences, set standards, require information, raise funds, take regulatory sanctions and provide information to the public. Written guidance may clarify roles and provide the technical basis for regulation and monitoring. The people involved in the regulated sector need to be informed and have sufficient training to understand and implement the systems. Technology can greatly increase regulatory capacity; IT communication, databases, Geographical Information Systems (GIS), spreadsheets and decision support tools allow the implementation of efficient systems that would previously have been impossible. The enabling role of technology in effective implementation should be considered when draft both policy and detailed regulation.

The overall government and institutional framework of China has evolved along a path very different to that of most OECD countries. China is currently in transition, with a shift of administrative procedures that date back to the planned economy era to newer economic instruments for managing the emerging market economy. Some systems and processes are familiar to OECD countries, and some are quite different.

China faces great challenges of water scarcity, water pollution and investment to deliver urban water utility services.[1] This chapter reviews the current situation and regulatory environment of the Chinese water sector and draws comparisons to the situations of selected OECD countries. From this it attempts to draw some conclusions and makes some recommendations that might be helpful to those contemplating ongoing reform in China's water sector.

The aim of regulatory reform of the water sector should be to ensure delivery of a public service of safe water supply, sanitation and environmental quality to meet the needs of both rural and urban water users, now and sustainably into the future.

In China at present there are basically three groups of water users with different needs and facing different challenges. They are:

- *Rural agricultural water users,* for whom the requirements are irrigation water for their crops, access to a basic safe water source for their domestic needs, and the provision of improved sanitation to prevent disease and improve quality of life. Many in this group are living in absolute poverty, and the vast majority have individual and communal revenues that are so low as to greatly restrict the choices and options for investment and improvement that are available to them. Under the opening up and reform policies of the past 30 years in China the opportunities available to the rural population have greatly

improved, but they are now getting left behind as the urban population attains the trappings of a prosperous industrial society. Rural water users and irrigation are by far the largest users of water resources, responsible for 60% to 70% of abstraction and for a significant proportion of pollution from non-point sources. Rural sources are responsible for much of the nutrient pollution (nitrogen and phosphorus) but a smaller proportion of the organic pollution and ammonia loads. Relatively small levels of investment in infrastructure for this group yield greater returns in water demand reduction and pollution reduction. However, the group has very limited access to the technology and finance required to attain the transition to sustainable resource use and livelihoods that are more harmonious with nature. Investments must be on an individual and communal basis with limited scope for establishment of water sector enterprises. Water resources management is organised by county and village governments, augmented with some stakeholder-led organisations such as water user associations, irrigation district organisations and private contractors providing improved irrigation channels and direct access to groundwater by drilling local deep water wells.

- *Those in smaller, less developed towns and cities,* in transition between agricultural and industrial production based livelihoods with limited infrastructure development. Here the challenge is to provide a reliable piped water supply to homes and enterprises and to provide sewerage and some level of wastewater treatment and industrial pollution control. For this group the quality of water infrastructure available is often very low and it is difficult to form effective water sector enterprises that can maintain and develop the urban water infrastructure on a sustainable cost recovery basis. Reform of the institutional and financial situation together with water price reform can help these small water departments and companies to attain financial independence and the ability to maintain and develop their assets. However, specific local and national capital investment will be required to develop the wastewater collection and treatment systems desperately required to reverse the current gross river water pollution arising from these communities. Water services are provided by the municipal water departments or semi-autonomous companies, supported in part by user fees but generally subsidised from local government budgets. Private sector companies are starting to enter this market.
- *Those in the major cities,* living in an industrial society and engaged primarily in service industries. Comprehensive water supply, wastewater collection and a reasonable degree of wastewater treatment infrastructure are in place. Here the aim is to attain the value for money and capital and operational efficiency of the best examples from OECD countries. Capital maintenance will be an increasing challenge for water companies in major cities as older assets serving the city centre deteriorate and compete for capital investment with the need to extend services to non-core areas of the city and meet tightening environmental and service standards. The water utilities are generally financially independent companies or departments financed operationally by user fees; infrastructure investment is via municipal, provincial and state funds. There is a rapidly growing private sector providing investment and management services to municipal water utilities through a range of contractual and asset transfer methods.

Overall massive investment in water services is required in China, especially in the second-level cities and in wastewater collection and treatment and pollution control. There is also a particular need for investment in sludge management to ensure that the pollutants removed from the wastewater do not re-enter the environment in an even more harmful form, but can instead be put to beneficial or at least harmless use.

It is also useful to consider from a river basin perspective the water users of each sector and their requirements and impacts on water resources: 71% of water use is by agriculture, 18% by industry and 11% by urban consumption (MWR, 2004). The primary issues affecting each of these sectors are:

- *Agriculture* – Water allocation and water saving/demand management; 44% of agriculture is irrigated, of which 40% has some degree of water-saving irrigation (MWR, 2007). The efficiency of irrigation systems is low by international standards with typically only 40 to 45% of abstracted water reaching the crop (rest lost in channel leakage etc.) (Wang, 2007). Though biggest water user the Economic Value of Water (EVW) for Agriculture is very low compared to industrial or services sectors, but the number of people dependent on agriculture and the social impact of change is very great. The pollution from agriculture is significant; agricultural chemical oxygen demand (COD)[2] discharges have been estimated at 1.4 times that of industrial and urban wastewater combined (ADB, 2006). Intensive livestock raising is increasing rapidly, with significant local pollution impacts. But how much of this pollution actually reaches and affects the main river sections is very difficult to calculate; more research into this is urgently required, especially as the current Chinese systems of pollution control planning barely consider the role of non-point pollution. The impact of runoff of nutrients (Phosporous and Nitrogen) from agriculture is the major cause of eutrophication which is an increasing water quality problem.
- *Industry* – Water use efficiency in Chinese industry is low by International standards and pollution is high. Each enterprise must consider and measure the water it uses and pollution discharged. Water efficiency audits, increased recycling and cleaner production investment can bring great improvements. Stronger control of existing discharges to meet basic discharge standards is essential (not just EIA[3] for new discharges). A move towards discharge standards set on the basis of total load calculations which will meet river water quality objectives has been put into legislation and now needs to be implemented.
- *Urban water* – Infrastructure development. Improved governance of the water utility sector. Investment in wastewater collection and treatment, sludge management, and ensuring water supply service that reliably meets quality standards. Financial basis of water business needs to be sustainable.

To understand and analyse how the water sector in China could meet the above challenges, this chapter considers the institutional and regulatory issues at river basin level that affect the allocation of water to different users for abstractions for irrigation, rural and urban domestic use, and industry. Some attention is given to the need to resolve the often-conflicting requirements of also providing flood protection and extracting hydropower from the rivers.

When conceiving regulatory initiatives for China, an important limitation is the rule that "If you can't measure it, you can't manage it." Co-ordinated monitoring and reporting of hydrology, water quality, abstractions and discharges is fundamental to any river basin management system. For urban water utilities, reporting of the service performance and compliance with standards and guidelines, as well as financial performance, are fundamental to regulation of water and sanitation departments and companies.

With regard to water resources and urban water utilities management, this chapter undertakes a comparative review of the Chinese situation and that in selected OECD

countries, and attempts to draw lessons from the successes and risks of OECD experience to identify transferable elements and suggest some policy options for China.

Institutional structure of the China water sector

The principal organisations responsible for the water sector in China are the Ministry of Water Resources (MWR), the Ministry for Environmental Protection (MEP), and the Ministry of Housing and Urban-Rural Development (MOHURD).[4] These are respectively responsible for quantity and quality management of surface and ground water; control of discharges to and pollution of surface waters; provision of urban water supply and wastewater collection and treatment. Each of these ministries operates through a state executive organisation with departments at provincial, municipal and county levels of government. These departments report to and are financed by the corresponding level of local government, rather than to the line ministry. MWR also directly administers the seven river basin commissions for the largest rivers as trans-boundary organisations; these commissions are responsible for managing water resources, protecting the main channels, and co-ordinating the provincial activities to manage the tributaries.

There are also a number of other ministries with important influence on water management, such as the Ministry of Agriculture (rural water use) and the Ministry of Health (drinking water quality).

The state-level ministries generally have corresponding departments at provincial and municipal levels. For example, for MWR there are Water Resources Bureaus (WRB) in local government, and for MEP there are Environmental Protection Bureaus (EPB). The functions of MOHURD are distributed across various offices at local levels.

An important feature of the Chinese government system at provincial level and below is double management, with vertical management and guidance from the line ministry but horizontal administration and finance from the corresponding level of local government.

Through these different levels of government the Ministry of Finance (MoF) and its subordinate offices are responsible for operational budgets, and the National Development and Reform Commission (NDRC) for capital investment planning and regulatory reform. Commodity pricing, such as water tariffs, is also determined through the NDRC and local development and reform bureaus in consultation with other departments.

Policy priorities, performance assessments and career progression of senior officials against specified targets are affected by the cadre responsibility system, which is managed by the Organisation Department of the Communist Party of China (CPC).

This overall system includes various checks and balances and reporting and assessment procedures. However, with regard to water sector management it is very fragmented. There is a complex split of responsibilities across multiple ministries, and co-ordination between state, provincial, river basin and local levels is not straightforward. Overlap, gaps and conflicting responsibilities result in an incomplete level of communication among the separate institutions involved. This results in notable gaps in effective administration, especially regarding river basin water quality management. For example, the MEP and its Environmental Protection Bureaus at provincial levels are responsible for controlling discharges to the rivers while the MWR and river basin organisations are responsible for protecting the quality of water in the rivers. There is limited co-operation and data sharing between these ministries, and as yet no effective

system for the application of pollution control to meet river needs (though this is under development).

The legal framework for the management of water resources quantity and quality is set by the Water Law 2002 and the Wastewater Pollution Prevention and Control Law (WPPCL), amended in 2008. The Water Law, drafted primarily by MWR, sets an overall framework for water resources management (amended since the 1988 version) to focus on river basin management rather than administration by administrative boundary. The revised WPPCL, drafted primarily by MEP, aims at better mandating of integrated river basin approaches to water quality management and increases enforcement sanctions available to regulators (see Box 7.1).

Box 7.1. **Revised Water Pollution Prevention and Control Law, 2008**

A revised Water Pollution Prevention and Control Law that came into effect in June 2008 introduced some key concepts to the Chinese environmental regulation framework. Primary among them was that pollution prevention should be planned in a unified way at river basin level (Article 15) and involve all water bodies and all pollution sources, point and diffuse (Article 3).

Other points are that the revised Law:

- Introduces a basin-wide pollution total load control mechanism that uses a system of indicators to link regional load management to load allocations to individual polluters, so as to meet local environmental needs (Article 18, subject to further definition in a State Decree to follow).
- Requires the introduction of a proper discharge permit system (Article 20) that would apply to existing discharges (subject to further definition in State Decree).
- Requires that water allocation processes now take into account the need to maintain environmental flows (Article 16) to support the aquatic ecology.
- Incorporates environmental targets in national planning process and cadre assessments (Articles 4 and 5).
- Requires the installation of automatic online monitoring, networked to the EPB, of major discharges (Article 23, details subject to further guidance).
- Requires use of the best available technology (BAT) principle for introduction of clean production (Article 41).
- Introduces negotiated water quality standards at trans-jurisdictional boundaries (Article 12).
- Establishes an ecological compensation (Article 7) allowing fiscal transfers to upstream regions providing ecological services for clean drinking water supply.
- Incorporates conflict management (Article 28), referring disputes to local government.

There are still some omissions and differences from the principles embodied in the EU Water Framework Directive (WFD) – most notably the lack of the inclusion of timetables in the legislation and the less specific phrasing of the target of all activity as being an environmental quality outcome of the aquatic ecosystem (summed up in WFD as "good status for water bodies by 2015"). However the provisions of the law are expected to work in the context of the Chinese government's five-year plans, which do introduce timetable elements.

Box 7.1. **Revised Water Pollution Prevention and Control Law, 2008** *(cont.)*

Generally the Chinese water legislation system lacks sufficient supporting detail on procedures for implementation, monitoring, supervision and enforcement. Thus the laws exist to set principles but are not effectively implemented through the different layers and divisions of the government system. For example, the Water Law does not clearly define the authority of local governments and river basin management commissions (RBMCs). Such ambiguity in the provisions causes a vacuum of authority and weakens the effectiveness of the legal system. Thus Article 25 requires environmental protection departments to monitor both discharges and ambient quality and report results in a unified way with the MWR units, and to report data through the river basin water resources protection department (Article 26). The Water Law (Article 32) requires the MWR to monitor water quality and plan total load management to achieve functional zone targets. This should show agreement of purpose but in practice has led to the establishment of two independent monitoring networks that do not share raw data or work toward the same targets. While the amended wording of the Wastewater Pollution Prevention and Control Law (WPPCL) goes some way towards mandating unified working, it does not clearly set out how this is to be done.

Supplementary guidance to be issued in state decrees (currently in preparation) may go some way to clarifying these points, just as state decrees related to water allocation (472) and water abstraction (460) supplement the provisions of the Water Law. But it is still difficult for the implementing authorities to know what is expected of them without direct ministerial guidance – which is likely to differ depending on the ministry involved and which then only applies to its subordinate line organisations and may yet conflict with the local government policies.

Also, the Water Pollution Prevention and Control Law requires that the state establish and improve the compensation mechanism for ecological protection of the water environment, but there are no national laws or regulations to support it. Nor is there a law on water rights or trading.

Lessons from the OECD area

In the European Union, fragmentation is being reduced through the principles embodied in the Water Framework Directive. The WFD promotes integrated river basin management by setting common goals in terms of environmental outcomes to be achieved over a set timetable by the systematic application of river basin management planning, monitoring and integrated pollution prevention and control.

In most OECD countries water utilities are managed at the municipal level, with an increasing degree of association and geographical consolidation. Benchmarking and regulatory oversight are increasingly being introduced, counterbalancing the increased influence of the consolidated water companies.

For example in the United Kingdom, which has the greatest degree of consolidation, a co-ordinated planning approach for water utilities is demonstrated by a regulatory system based on the assessment of the environmental and customer service performance of water companies against defined service performance indicators. Incentives are determined by the quality of the preparation and implementation of integrated business planning relative to competitive benchmarking between companies. A five-yearly review and planning process is in place.

Leading groups

The major institutional barriers to better management of the water sector in China are the incomplete co-ordination between the sectoral ministerial organisations and incomplete co-ordination between and across state, provincial and municipal levels of administration.

To improve the water sector situation, these issues need to be addressed both for river basin management issues of water quantity and quality, and for urban water utility development and performance.

River basin management

While the concepts and principles of Integrated River Basin Management (IRBM) are well accepted in China, the legal and institutional structure does not as yet fully support the implementation of IRBM. Reforms to the Water Law of 2002 and more recently to the Wastewater and Pollution Prevention Law in 2008 go some way toward providing the opening for IRBM and require that the various institutions involved must co-operate in their actions. However these two laws still result in overlapping responsibilities between the principle ministries of MWR and MEP and the many other ministries involved in water management. While co-ordination of the quantity aspects of water resources management and flood control are progressing, requiring mostly interaction between the RBMC and the provincial governments, whose interaction with water quality management is less well defined and still lacking effective integrated planning.

The Water Resources Protection Bureaus (WRPB) of the River Basin Management Commissions are currently nominally joint administrations between MWR and MEP, but in reality they are funded by and very much dominated by MWR in all operational matters. WRPB do act as trans-boundary organisations, co-ordinating planning across provincial boundaries. But the degree to which they co-ordinate MWR activities with EPB and other organisations is very limited. This leaves MEP / EPB without effective trans-boundary institutions through which to implement river basin pollution control planning or management of major pollution incidents.

The key mechanism of IRBM is the preparation of river basin master plans. This process is currently under way for the seven major river basins of China, with plans due to be submitted to the state council in 2009. However the role of the river basin management plan is not clearly defined in Chinese law and the current round of master plan drafting appears to have had limited stakeholder involvement, and security and confidentiality regulations prevent open discussion. Separate plans are produced by MWR and MEP organisations.

The obvious solution is radical reorganisation of the ministerial and provincial departments related to water as unified institutions focused on IRBM and water service delivery under some kind of super ministry. But this is unlikely to be politically acceptable in the foreseeable future. Current regulatory reform approaches therefore need to focus on improving co-ordination between the existing ministries and strengthening the role of the river basin management commissions as trans-boundary and multi-sectoral organisations with greater stakeholder involvement, charged with the preparation and execution of detailed river basin management plans.

Much further study and consultation is required to formulate the road map for such institutional arrangements. However, the key elements may include the establishment at

state level of a *Leading Group for River Basin Management Co-ordination*, led by a member of the state council with participation from the relevant ministries. This body would be tasked with co-ordinating policy development and dealing with conflicts among departments and jurisdictions, with the aim of reducing the level of overlap in duties among different departments. As the role of the river basin authorities develops, so this Leading Group could evolve into an IRBM committee co-ordinating the actions of ministries through the river basin authorities and provincial governments.

The *river basin management commissions* may be further empowered to act as integrated management and planning bodies co-ordinating the trans-sector and inter-provincial issues relating to water resource and water quality matters for all parts of the river basin, not just the main river channel.

Achieving this will require the participation of the provincial governments, environmental protection authorities and provincial water resources bureaus; initially a number of Leading Groups could focus on specific issues such as water resources allocation, flood control and water quality planning. In many river basins this has already been achieved for water resources and flood management, but so far only in Songliao has such a leading group been established for water quality management. The cross-sectoral challenges for co-ordinated water quality management are greater than for other topics. From co-ordination through these Leading Groups, the river basin authority may evolve to take a stronger role in the planning process for development of the river basin. Eventually, supported by specific river basin laws, the river basin authorities would take the leading role in financial allocation matters related to IRBM. Ideally the river basin authority should achieve independence from the other government agencies to take on a true trans-sector and trans-boundary role (probably reporting directly to the state council). However, the practicalities of this could be difficult when the existing Chinese river basin authorities incorporate an administrative secretariat very large compared with similar organisations in the European Union or the United States.

The role of *River Basin Planning* should be further strengthened. The current plans being prepared are comprehensive but have as yet unclear legal jurisdiction. In examples seen, they cover flood control, water resources allocation, sediment control, watershed management, water quality management, total load control and demand management and building a water saving society relating to agricultural, domestic and industrial water users. Specific objectives are set in some of these topics and general objectives in others. The plan should be written as an integrated document covering all parts of the river basin and assuming full cross-sectoral and inter-provincial co-ordination.

Such plans should be open and transparent to public scrutiny so that all stakeholders can know what is being planned and have access to the data used to formulate the plans. This information should be made available through multiple channels at stages through its development cycle, with opportunities for formal stakeholder and public consultation. Public participation would be strengthened by further incorporation in the water and environmental protection laws of rights of access to information, participation in decision making, and the right to challenge decisions.

Aspects that need further development in the river basin planning process are:

- Integration of abstraction and discharge management. This may be achieved via two mechanisms.
  - It is particularly important that water quality management/pollution control be integrated in the river basin plans by linking individual discharge control (for point sources) and land use management (for non-point sources) to river water quality planning. These plans must incorporate the environmental flow calculations from water allocation management systems. Considerable further scientific research is required to match international methods of environmental flow calculation to the specific conditions and ecology of each river basin in China. The use of Evapotranspiration (ET) calculations can help in the improved management of Agricultural water use (see Box 7.1). The calculation of proper water balances and pollution discharge control through industrial enterprises and urban centres can help reduce water wastage and better understand how human activity results in water moving from one source (say ground water reservoir) to another (say river flows downstream of wastewater discharge) and assess whether that water is still of sufficient quality to be regarded as a resource.
  - Improved co-ordination and data sharing between EPB and WRPB when implementing total load control calculations and setting discharge permits to meet river needs.
- Better strategic planning of hydropower development. The principle organ for development and supervision of major (>50 MW) hydro-electric schemes is the State Commission for Developing and Restructuring. Mini hydro-electric schemes (<50 MW) are planned by MWR, which is also responsible for resettlement planning. There are various other ministries involved in other aspects of hydro development and supervision; however, no one organisation has strategic responsibility for the hydro-electric development of the river basin. As a result local, political and commercial interests can dominate in the selection of sites for dams. This can result in sub-optimal development of the river basin and projects that do not best balance the multiple requirements of power generation, flood control, water supply, sediment control and especially the maintenance of sufficient environmental flows for ecological and functional use. There is a great need to improve the integration of hydro-electric development with other aspects of river basin planning. Ecological and social impacts must be taken into account as well as economic benefits, and eco-compensation mechanisms should be established to ensure greater fairness and equity in the process of such major developments.

Water utility sector

Though there are various state decrees and guidance documents related to water utility management, China does not yet have a clear regulatory framework for managing transition of the water sector from a planned to a market-based economy.

Water utilities anywhere face particular challenges. Raw water is widely available at relatively low cost but is difficult to transport, making it a largely non-tradable commodity. Water and sanitation services are almost always on a monopoly basis and require very high capital investment to deliver a relatively low value product to customers, many of whom expect it to be free. These features mean that classic free market principles cannot be applied. In most OECD countries water and its provision have undergone a transition from

Box 7.2. **Water resources planning using evapotranspiration quotas**

Past water management in China, based on water abstraction only, has encountered only limited success because the saved water was used to irrigate more land; that is, more water was consumed and less water returned to the surface and underground water systems. Recent advancements in remote sensing and geographic information system (GIS) technologies have made it feasible to manage water resources in terms of the amounts of water actually consumed through evapotranspiration (ET). The portion consumed through ET is the consumptive use that is lost and not available for users downstream, unless its quality has deteriorated to the point that the water cannot be reused, in which case this represents "real" losses. In contrast, the portion that returns to the surface or underground water systems is still available for other users downstream.

This approach encourages farmers to reduce the evaporation and transpiration that does not contribute to plant growth. For example, they will reduce evaporation by changing crop choices, reducing waterlogged areas, irrigating when evaporation is lowest (at night instead of during the day), using moisture-retaining mulches and films, and replacing open canals and ditches with pipes. Where excessive fertiliser and pesticides runoff is a problem, they will be encouraged to reduce non-point pollution, since return flows that are not reusable downstream will be deducted from their ET quota.

ET technology thus makes it feasible for China to adopt a more scientific approach for its water rights allocation

public good to economic commodity, moderated by various defined water rights and responsibilities.

Most water services in China are provided by individual municipal water and urban environmental service departments that are financially autonomous to various degrees. There has been very rapid expansion of private sector involvement, initially through joint ventures with major European water utility companies but increasingly in recent years by joint ventures with regional and local Chinese utility companies.

Treated piped water supply is available to 93% of the urban population, though in some cities during dry periods the supply may be intermittent and quality may be variable, with around 73% of samples meeting national standards. In rural areas 70% of people have access to a safe water supply. However, with 60% of China's surface water polluted to a degree below that suitable for water supply, water quality is a major constraint on resource development. Thus, more than 75% of drinking water supplies are now taken from ground water – which, though levels are mostly falling and quality deteriorating, still provides a cleaner source for drinking water supply.

China now has nearly 800 wastewater treatment plants in more than 400 cities. NDRC, 2008 reported that by end 2007 there is capacity to treat 59% in the major towns and cities (up from 42% in 2003). However, on average Chinese WWTP only operate at around 65% of capacity (so only 36% of urban wastewater is getting treated). In rural areas less than 50% of the population have improved sanitation and there is generally very little formal treatment of waste. Most is collected and used as fertiliser, either directly or mixed with animal waste. Then it may be passed through anerobic digestion (with biogas as by-product) or aquaculture.

The following section reviews some of the models that might be applied to strengthen regulation of China's water sector, drawing experience from the European and US water sector development.

Water and sanitation regulatory models

Integrated regulation

In utility regulation there are similarities and differences across sectors such as energy, water, solid waste management, transport, telecoms, healthcare and district heating. Each sector has a requirement to move towards a combination of public and private financing methods to make the required investments in infrastructure, and each sector needs to co-operate with the leading international service and technology providers to make available to China the global best practice in management and operation. However, China also needs to protect itself from suffering a loss of control of strategic assets to commercial interests. Under various economic conditions these assets may be subject to priorities that are at odds with the best interests of the service customers, or the strategic objectives of the wider economy.

When contemplating regulatory models there is a choice to be made between the establishment of multi-utility regulatory body to set the overall rules for private-public partnership in utility management, and the establishment of sector-specific regulatory organisations tailored to a particular utility.

There is also the need to establish regulatory and reporting responsibilities at the state, provincial and municipal levels. The water utility sector is growing rapidly with increasing asset values, revenues and technical complexity. There is an increased requirement for co-ordination and oversight at various levels, and the economic size of the industry justifies the expenditure of establishing properly funded oversight bodies.

There is also a need to greatly increase investment in this sector in China. The economic costs and losses incurred by water scarcity and pollution (World Bank, 2008) greatly exceed the levels of investment being made to address such problems. Thus the return on investments in water infrastructure and management should show positive returns for the overall economy. There are also vital social, health and environmental benefits of improved water management.

The following is a proposal for possible directions for regulation based on an understanding of the Chinese situation. It draws heavily from UK experience and US experience, in the knowledge that the current path in China for water and sanitation is following something closer to the French model. The proposal seeks to draw from the strengths and to address the weaknesses of each of these approaches, to meet the future needs of the Chinese situation.

Possible models

Meeting the needs mentioned above requires a multi-layer regulatory model. This will in turn require the establishment of temporary and permanent institutions to launch and then grow capacity in utility regulation.

The issues of general utility regulation could initially be developed by an expert group drawn from NDRC, MoF, the academies of science, etc. in order to fully analyse the regulatory models used around the world and make recommendations to the State Council on appropriate models to use in China. This expert group would identify the common and

contrasting themes of regulation of different utilities and interaction with general development planning and macroeconomic policy. The group could advise on the establishment of National Leading Groups for the co-ordination of regulation in specific sectors and then change or cease its initial function. It could also research and advise on general reporting and benchmarking protocols for utility regulation appropriate to China.

There could then be formed a *National Leading Group for water and sanitation* tasked with setting the overall framework for water utility regulation in urban and rural areas and co-ordinating regulatory activity across the sectoral agencies. This organisation should be formed under the State Council and chaired by a deputy prime minister. It should meet monthly or quarterly and establish a secretariat drawn from existing agencies.

It should also co-ordinate activities with the National Leading Group for river basin management, but remain separate in order to maintain focus on the particular economic and environmental issues of water utility regulation.

The core business of utility regulation would be handled by strengthened water and sanitation oversight offices within the provincial governments. Under a Leading Group headed by vice-governors, these offices would constitute a new regulatory affairs office within the provincial government. The newly formed body would consolidate economic regulation of the utilities in a secretariat and co-ordinate environmental regulation with the existing EPB, WRB and public health offices. The water and sanitation office would require some degree of executive power to oversee setting and controlling water tariffs in response to water company performance. In doing so the regulatory executive would have to be subject to scrutiny from representatives of the customers.

The provincial water and sanitation office would provide guidance and undertake periodic benchmarking and performance reviews of the municipal water companies. Direct regulation and oversight of water companies would be undertaken by municipal water and sanitation offices, dealing solely with those companies in their jurisdiction. A municipal water and sanitation office would come under a Leading Group chaired by an executive vice-mayor.

The water services would be delivered by water companies. Though these may take a variety of ownership models, they should be financially autonomous organisations with sufficient transparency of operation that the regulator, with the help of reporters, is able to monitor their financial, service delivery and environmental performance. The companies should be required to clearly separate their regulated water utility operation and accounts from any other unregulated business or regulated business in other utility sectors.

It may be seen that the above proposal achieves a separation between policy, supervision and operational functions within a regulatory structure.

When preparing such a regulatory structure there are a number of key issues to plan for:

- Goal-based rather than activity-based governance.
- Integrated utilities and co-ordinated regulation.
- Strategic investment.
- Reporting and performance benchmarking.
- Financial sustainability.

These are discussed in more detail below.

Goal-based rather than activity-based governance

Activity-based targets, such as provision of 70% urban wastewater treatment and achievement of a 10% reduction in COD discharges as set out in China's 11th Five Year Plan, are straightforward to understand and practical in an environment of limited data and capacity. But as the China water sector develops, so do more effective targets need to be set based on environmental performance and customer service targets that have been defined in policy.

Standards and targets also need to be appropriate for the capacity of the utility and local government to deliver them, and should incorporate a timetable for compliance in stages. In a major city with established infrastructure and the capacity for high revenues from water tariffs, it is reasonable to set drinking water, effluent and service level targets comparable with OECD countries and WHO guidelines. However, in smaller cities or county towns, applying the same service requirements where there is little existing infrastructure and limited revenue is a major roadblock to investment. In rural areas, totally different solutions may be required to achieve the same ends. It should be possible to negotiate appropriate and achievable standards within a timetable of 10 to 20 years, over which to move towards the higher-level standards. Economic regulation of utilities could reward performance against such a timetable.

Integrated utilities and co-ordinated regulation

The integration of treatment networks and distribution/collection networks has very significant advantages. It can greatly reduce conflicts over demand/supply issues that trouble private sector contracts for a treatment works where the demand from the network or supply from the sewer system does not meet with expectations for flow and quality. This is especially the case for wastewater systems, where the typical administrative separation of sewerage from treatment makes efficient planning and operation very difficult.

Considerable advantages of scale and efficiency can be obtained by combining different services within a company, *e.g.* water supply and wastewater. There are also advantages in companies operating over a greater geographic region or in multiple cities. There are examples of efficient operations from the United Kingdom with very integrated water companies, and from other European countries – especially Germany's non-integrated municipal utilities, each of which is able to attain a high degree of efficiency and good performance. Integrating and combining companies enhances the financial stability and access to additional finance to allow greater investment in the infrastructure.

In the United Kingdom, numerous municipal water companies were combined into a small number of regional water or water and sewerage companies, and then fully privatised, taking the assets into private shareholder ownership (in England and Wales; there is still public ownership in Scotland and Northern Ireland). This provided considerable advantages of enhanced efficiency and access to finance to fund major investment programmes aimed at dramatically improving service quality. In other countries such as the United States, France and Germany, the municipal water companies associate through various mechanisms in order to pool their resources across a number of cities and towns. In many cases that has led to these associations entering into agreements whereby international private water companies either manage or take over their service provision under contract, though with ownership of the assets normally remaining public.

In China there is considerable scope for municipal water companies to associate and so pool resources and expertise. If association includes a degree of financial merger, then this could also improve the creditworthiness of the group and increase the options for financing.

Strategic investment planning

Efficient and co-ordinated planning will be required to tackle the enormous infrastructure investment requirements of the water sector – especially in wastewater collection and treatment and sludge management in secondary urban areas. Rapid development of treatment systems to improve river water quality will require that investments are planned in a strategic manner based on the maximum benefit in terms of progress towards achieving river basin water quality objectives. Thus the potential projects for each town should be assessed and prioritised in relation to benefit-cost ratios. Centralised funding from state and international sources can then be used to promote those schemes with the highest benefit-cost ratios through the development planning process.

The provincial regulators would work closely with river basin Leading Groups for water quality in developing such plans, and then with the NDRC in assigning central funding. The strategic planning process would consider all interventions, including industrial and agricultural discharge controls to attain river basin objectives in a cost-effective manner. The regulated water and sanitation sector would then have to work together to help deliver the resulting plans in an efficient manner.

The river basin strategic planning need not exclude projects in towns, where the environmental benefit of the project is lower, as long as the scheme is able to be sustainably self-financing based on the local revenue available from local government and local private partners. However such strategic planning should be used to target central funding to encourage the most rapid and cost effective improvements.

China has the opportunity to plan wastewater infrastructure investment in a more efficient manner than happened in most OECD countries. The typical path in OECD countries was to do very little until GDP per capita had reach a relatively high level, and then to introduce more or less blanket requirements for wastewater treatment, often with very high levels of central government subsidy. This often led to very expensive schemes with limited environmental benefit being constructed ahead of other schemes that would have had greater benefits. The tools are available to China to plan to improve river water quality in a more optimal manner. This should take account of the application of appropriate standards and investment to reach goals over a defined timetable.

China also now has the opportunity for strategic planning of subsidised investments in wastewater, in order to optimise progress to attain river basin water quality objectives. However this overall macro-environmental goal must be balanced with each community's desire to sort out their own local environmental problems and improve their quality of life. Strategic river basin planning is a good idea where the problems have significant upstream and downstream interactions, but for communities on small tributaries or lakes it is the local impacts that are significant, and systems for prioritisation must take this into account.

The largest cost element in improving wastewater treatment will be the investment in sewerage to collect and convey the wastewater to the treatment works. Major interceptor sewers and pumping stations will be required, the costs of which generally exceed the cost of the treatment works. There are many examples around China of wastewater treatment

works having been built but with insufficient investment in sewerage, meaning that much of the wastewater does not reach the works and is discharged directly into the river while the works operate well under capacity.

There is a specific need to strategically plan investment in wastewater sludge management. The expansion of wastewater treatment is rapidly increasing the generation of sludge, the proper disposal of which has not always been planned in detail. Simply sending sludge to landfill can result in problems for landfill management and the production of effluents that end up returning the pollution back to the environment (see Box 7.3).

Wastewater treatment processes rely on maintaining a stable biological assemblage in the plant. Toxic compounds or sudden peaks in industrial discharges can have a very damaging impact upon the ability of the plant to operate, by interfering with the biological processes. High-strength or toxic discharges may also pose a health and safety risk in the sewer system, lead to septicity and odour, and damage the assets by causing accelerated corrosion. The treatment plant operator and sewer system operator need to have clearly defined and direct relations with the industry and knowledge of the flow and load of discharges to the sewer system. This is necessary both to ensure proper commercial compensation for treatment services and to be able to control discharges harmful to the condition and operation of the assets. Such co-ordination between dischargers, operators of sewers, and operators of treatment works is generally very weak in China and needs to be strengthened and formalised.

Integrated pollution control investment planning

Raising investment to the levels required to meet water quality needs is a huge challenge. The government of China has set targets for provision of urban wastewater treatment capacity at 70% and discharges of COD to be reduced by 10% over 2006-10 (11th Five-Year Plan). These targets have been written into the letters of responsibility issued to senior officials by the CPC and will comprise part of the criteria upon which their performance will be judged in annual reviews by the CPC Organisation Department. This provides real motivation to achieve such targets. The government is particularly pushing these targets in certain key river basins and lake catchments where plans have been prepared by the local governments.

Though central government funds have been set aside to support these programmes, the bulk of the finance must be raised locally – and ideally, with leveraging from private finance. Projects must be initiated at local level; then the local government should seek additional finance and raise revenues to pay for the investment. The favoured strategy is to seek BOT (build own transfer) partners to take on the development of the project. Success of such BOT initiatives outside major cities has been limited; even where BOT agreements have been entered into, many have collapsed before construction commences (especially with newer local Chinese joint venture partners), based on the late discovery that the conditions and risks are too difficult.

If no loan or private finance can be found, then municipal government is required to proceed anyway. Provincial and state governments may help in setting up financing vehicles and packages of projects. Central government incentives, grants or state bonds may be retrospectively awarded in response to good progress and initiative by the local government. Projects, once constructed, may be "sold" as TOT in order to recover investment capital.

Box 7.3. **The growing problem of sludge disposal**

The treatment of wastewater extracts a residue of solids and organic matter that has been separated from the incoming waste, or is the surplus of the biological processes that treat the waste. This suspension of solids and liquid is highly polluting, has physical properties difficult to manage and rapidly decays, producing further noxious emissions. Treatment of this generally involves further separating the fluids from the solids and then stabilising the remaining solids. Such treatment processes are difficult and require expensive capital equipment and a high level of operator skill and maintenance.

The resulting treated sludge does have some beneficial properties; it contains organic fertiliser content and has a reasonable energy content. Thus it may be processed to produce energy either by digestion and methane gas production or direct incineration. Treated sludge may also be applied to agricultural land as a fertiliser/soil conditioner.

Current policy in China is mostly to de-water sludge with centrifuges or belt presses to around 20% dry solids (80% water) and then transport it to landfill.

In Europe sludge is largely disposed of by application to agricultural land. For the EU as a whole, over 40% of sludge is disposed of this way. Acceptance of the practice varies from country to country, with 55% of sludge to land in the United Kingdom regulated by voluntary agreements for quality and pathogen reduction. In some countries, such as the Netherlands, the practice is banned due to public concern. Northern Europe generally shows more concern and regulation; in southern Europe the issue receives little attention.[1]

To increase sludge disposal to land in China poses certain challenges. The first is to identify land suitable for the application of sludge. Though the use of latrine waste as fertiliser is standard practice, it is done on an individual basis. Chinese agriculture has very low levels of mechanisation, with each farmer managing a small area 0.1 to 1 ha. Unless highly pre-treated, the safe application of sludge to land requires mechanised spreading. It is very difficult to organise this type of application in a non-mechanised and fragmented farming system.

To allow individuals to apply the sludge as a soil conditioner, the sludge would need to be treated to an advanced level by pasteurisation, and drying to 95% dry solids. This would produce a cake product that can be bagged and easily distributed or sold to farmers either in an open market or with financial or policy incentives. The product can also be incinerated for energy recovery. The capital cost of the equipment to dry sludge is very high, as are the requisite maintenance and operator expertise levels. The market for sludge products does not normally match the cost of production such that disposal to landfill seems cheaper and easier unless landfill disposal charges are very high and tightly enforced. Advanced sludge treatment is only viable when subsidised from wastewater treatment revenue.

Heavy metals and certain other persistent toxic compounds, if present in the sludge, limit the possibilities for land application. They are very difficult to remove during the wastewater treatment process or directly from sludge. It is therefore important to ensure that they do not enter the sewer system, by effectively applying discharge controls from industry to the sewer network.

1. EU Publications (2001), *Disposal and Recycling Routes for Sewage Sludge*, Part 1 – "Sludge Use Acceptance Report", *http://ec.europa.eu/environment/waste/sludge/pdf/sludge_disposal1.pdf*

For industrial projects there is a serious hurdle to overcome. Standards are tightening and enterprises are being put on notice that they must comply or face closure. In principle it should be "polluter pays" and it is the enterprise's responsibility to meet the cost of compliance. In practice the cost of adding full waste treatment may be so high that the financial burden would be too great and the enterprise would fail anyway. Therefore there is provision for the government to offer 20% subsidies to enterprises that show real initiative in investing in clean tech. The barrier is that the subsidy will not be awarded until after construction has commenced and so cannot form part of the budget or collateral for the investment.[5] The objective for the enterprise is to get itself moved from the "enterprise for closure" list to the "enterprise for subsidy" list of the local government.

Though high-level policy statements have been made committing to high levels of future government spending on water and wastewater infrastructure, the current system of retrospective financing by central government creates a situation of uncertainty among those responsible for making investments, and greatly reduces enthusiasm for such projects. A clear economic regulatory environment is required where the routes for long-term financing of projects are known before the project construction is started.

Reporting and performance benchmarking

To regulate a business, the regulator must be able to scrutinise and understand that business and be able to assess comparative efficiency in order to administer incentive systems to promote best practice. Whether in private or public ownership, the water company is managing the assets on behalf of the customers; therefore the regulator, in supervising this relationship, should issue clear reporting guidelines to know the asset value and condition, and report on:

- *Performance*. Water delivered, sewage collected; property/population and levels of services; interruptions; customer service; sewer flooding.
- *Activities*. Mains/sewers laid, bursts repaired, etc.
- *Finance*. Expenditure on operating (Opex); expenditure on assets (Capex); regulatory accounts.

The provincial water and sanitation office would then be able to compare the reports of different companies and assess comparative performance. This information could be used when making decisions on tariff setting or special measures.

The gathering of the data for reporting to the regulator should be the responsibility of the water company. However, China could consider establishing independent reporters to work with the water companies to ensure the correct collection and compilation of performance data in accordance with regulatory guidelines.

Financial sustainability

Primarily, this means setting water tariffs at levels that achieve cost recovery and some margin to fund investment.

There are many gradations on the road to financial sustainability. The unsustainable water company is one than runs at an operational deficit (let alone with new infrastructure investment) and has to be bailed out by the local government from general taxation at the end of each financial year. This is very common in China. On a higher sustainability rung are companies that can meet all operational costs from revenue, but not new or renewed infrastructure. Further up are those that can fund some investment and capital renewal

from revenue, but for whom major projects require periodic subsidy. Higher still are those that can fund all investment from revenue in a sustainable manner. Finally, at the top are those companies that are fully sustainable and reliably profitable, and are therefore creditworthy and able to borrow money on good terms.

Financially sound companies are much better able to raise finance – by joint venture with national or international private water utility companies; either through term contracts; by privatisation; by issuing of municipal bonds; or by debit finance through international or national bank loans or state bonds. The stronger the financial standing of the company, the greater will be the options and the lower the cost of capital. As a monopoly business with long-life assets and reliable revenues, water utilities can become an important part of the financial market.

The basis for water pricing in China is set out in the Administrative Method on Urban Water Supply Price (NDRC, 1998). This establishes *i)* the general principle that water supply pricing should attain cost recovery, reasonable profit, water conservation and social equity, *ii)* that municipalities are responsible for approving water tariffs; *iii)* tariffs should cover operation and maintenance, depreciation, and interest costs; *iv)* tariffs should allow for a return on the net value of fixed assets of 8% for domestic investments, while that for foreign investment is 10%; *v)* tariffs should be appropriate to local characteristics and social affordability; *vi)* municipalities should gradually adopt a two-part tariff consisting of a fixed demand charge and a volumetric charge or increasing block tariffs (IBT), where the first block should meet the basic living needs of residents; and *vii)* public hearings and notice should be conducted in the process of setting water tariffs. These principles are broadly in agreement with International best practice however the implementation of these principles has not been consistent across China, especially in the lower capacity cities.

The need to raise tariffs to financially sustainable levels must be balanced with the affordability of water charges for the users. With much lower per capita incomes in lower capacity cities, the water services are more constrained in how far they can raise water tariffs without imposing a burden on poorer households. This puts pressure on the price bureaus to keep water charges low. However very low charges lead to a lack of investment and it is then the poorest who suffer worst from this. With proper supply to poorer parts of town not being financed, the poorest people ironically end up having to pay the highest rates for water, having to buy from private sellers, and often of lower quality. Introduction of blocked tariffs with increasing unit rates for higher usage can help by lowering the burden on poorer households that tend to use less water overall, and also provides a water-saving incentive to all users. There can also be individual financial relief programmes for customers in most difficult financial circumstances. Such approaches are more effective in poverty relief that blanket low prices, which predominantly benefit the middle and upper income users.

Wastewater treatment is supposed to be financed from the wastewater component of the water bill charged to water users. In 2006, NDRC set a target minimum tariff of 0.8 RMB/m^3 to be added to the water supply tariff; however this level of tariff has not yet been applied in all cities. So far the level of investment has followed the level of prosperity in the cities financing wastewater collection and treatment. Thus the downstream cities of the southern and eastern coastal zones have high levels of treatment, and recover these costs through higher wastewater tariffs (0.7 to 1.0 RMB/m^3) (XiaoXiang, 2006) whereas the

upstream cities in the central and western regions of China have lower levels of investment and charge lower tariffs (0.25 to 0.5 RMB/m^3 where there is any charge at all). This does not represent efficient targeting of investment, as it is in the upstream areas that pollution has the greatest impact and consequence on all users downstream, increasing their water supply costs or even rendering the main rivers unusable for water supply. It is therefore here that the greatest attention should be paid to reducing pollution. The pricing mechanisms need to be adjusted to support this requirement. An attitude must be overcome in upstream local governments regarding impact on downstream cities as being somebody else's problem.

In addition to the water supply fee and the wastewater fees since 2006 water bills are also required to explicitly include a water development fee and a water resource fee. The water development fee goes towards the cost of provision of the raw water infrastructure. The water resource fee is supposed to reflect the scarcity and opportunity cost of the resource. The water resource fee is set by and paid to the local government with a small proportion (around 20%) going to central government. This money is used for further resource development and management.

None of the above charges value water at a level close to its true economic value (*i.e.* the Marginal User Cost – the loss that additional users would suffer were further supplies not available. See Box 7.1). In addition water use also incurs external costs in terms of resource depletion, pollution and environmental degradation that are barely considered in the pricing mechanisms. Adding all of these features together gives the Marginal Opportunity Cost of water (MOC), a true estimate of the full costs incurred in water use. The MOC of water would vary greatly by region depending upon the specific scarcity, pollution impacts and economic uses available. Though theoretically desirable it would not be practical to immediately increase the water tariffs to MOC levels. However MOC water pricing could be considered as an effective planning tool in planning both water resource investment and urban, industrial and agricultural development in general. MOC pricing could be phased in by gradual increases in water resource fees, and applied as part of a block tariff, affecting only the upper tiers of the pricing ladder. Issues with MOC pricing include: the need for much more robust metering – including of rural and agricultural users; the generation of excesses revenues beyond the immediate financial needs of supply which will need to be returned to local or central government as general revenue or in substitution of other forms of taxation.

A fully developed water and sanitation infrastructure most likely represents one of the largest revenue-generating capital asset of an industrial society. The capital cost is high relative to the revenue, but the asset life is very long – 10 to 50 years for above-ground assets and on average greater than 100 years for below-ground assets. Thus these assets become an important component of the macro economy.

The water and sanitation regulatory authorities must themselves be financially sustainable. The easiest way to ensure this is for them to be funded from the water tariffs by payments from the water company, either as a percentage of tariff revenue or as a licence fee.

A key part of establishing the true position of the water company is by undertaking a programme of properly surveying and cataloguing the above- and below-ground assets of the company in order to understand their value, condition and maintenance requirements. A second key part of establishing a viable company is to properly understand the supply-

demand balance and projected growth in customers and revenues. The third part is knowing the costs for operation, asset construction, capital finance and tax liability. Even in OECD countries much ongoing effort is required to better define these. In China most water companies and departments have only a very partial knowledge of these factors.

Advantages of improved regulation

Better management of private investment

With a defined regulatory environment and financially sustainable models for the utilities, local governments will find it much easier to attract private finance to help with infrastructure investment and expansion of services, and to secure such investments on terms that are good for the customers. The approach should be in this direction rather than waiting for a private investor to come along to sort out the problems. They may come, but if they do it will be at a price to cover the risk premium of an uncertain regulatory and financial position**.**

Clear rules and policies for private participation will reduce the risk to the government of entering into agreements with private companies that later have to be revised following negotiations.

Debt financing

The massive levels of investment required, especially for wastewater infrastructure, cannot easily be raised from local government sources. In many OECD countries the water utility companies, private or public, are able to raise finance through debt, borrowing from state development banks, issuing municipal bonds or borrowing commercially against their assets and revenues, which has a very low risk level. OECD water utility companies are typically geared to 50% of total assets, and in some countries such as the United Kingdom they are geared to as much as 90% of asset value.

Chinese local government financing rules do not allow the provincial or municipal governments to raise debt directly, though they can access debt finance from state bonds or international funding agencies through the NDRC, or borrow from the China Development Bank (CDB). To date most of these funds have been directed towards the larger cities. As the requirement for investment in China's water sector is now shifting to the lower capacity cities, so the criteria for state funding should shift to encourage application to the areas of need. This will mean providing support to smaller municipal governments that apply for funding.

It is possible for the municipal water utility companies to directly raise debt finance from various sources. Doing so could greatly increase the options open to local governments to fund their water investments. A prerequisite for this type of funding is a well and transparently governed, financially autonomous water company or department with water tariffs collected at cost recovery levels. The creditworthiness of the company will determine the funding options and costs involved.

In many of the lower-capacity cities and towns of China it will be difficult to raise the water utilities to a creditworthy status in the short term, and programmes of government subsidy and support to reform will be required to achieve the investments required to meet development goals.

Capital planning and design standards

When planning any reform or investment in a water company, the fundamental information required is knowledge of the:

- Assets.
- Revenues.
- Costs.

In most OECD countries, advanced Asset Management Planning Systems have been put in place. These catalogue in databases and GIS systems the assets of the company and information on their condition and performance. Risk-based statistical models are used to predict the overall amount of capital maintenance likely to be required each year (a considerable advance on simple asset life assumptions). Though models as yet are poor at predicting exactly where and when failure will occur, the aggregate impacts can be accurately predicted. There is a move to optimising whole-life costs and considering the operational and maintenance costs and the consequent costs of failure, discounted over the life of the asset, rather than just minimising the initial capital cost.

When designing assets it is essential that realistic estimates are made of the supply/demand situation at commissioning time and into the future horizons. Design standards and technical guidelines play an important role in this. If the assumptions used for design are incorrect or there are insufficient data available upon which to base designs, then the resulting assets will not perform well and revenues will not match projections. In China it is commonly the case that the design guidelines of per capita consumption and load are much higher than they are in reality. There is a general assumption that per capita water use will move towards US levels of consumption (around 450 litre/head/day), when there is actually no reason to suppose this, given that most other OECD countries manage on far lower per capita consumption – *e.g.* 150 l/h/d in Germany and about 160 l/h/d in the United Kingdom. Of course these figures depend very much on what is included, such as leakage and commercial use. Nonetheless, in China this often leads to assets being designed with far too much excess capacity. For wastewater there is a common tendency for Chinese urban domestic sewerage to be much weaker than international norms, again leading to operational problems if these assumptions are wrong at design. Such calculations are especially critical when designing biological nutrient removal processes; these are now commonly specified for new Chinese wastewater works on the basis of being the best available technology delivering the highest environmental standards. If the design data or operational procedures are just a bit wrong, these processes will simply not work properly, and the extra cost of providing them is wasted.

Understanding demand, flows and loads to treatment is especially critical for BOT–type contracts commonly being implemented in China. The entire business model is dependent upon the balance between the tariff and the volume. If outcomes do not match expectations, then conflicts are bound to arise. Where BOT contracts are implemented, the contractual terms generally require payment even if demand is greatly below capacity. This then represents an inefficient use of capital and revenue on the part of the municipality.

Water quantity management

The development of water allocation systems

The Water Law of 2002 confirms that all water resources belong to the state and that the state is responsible for implementing a system for controlling water allocation by quota. It is the State Council that exercises and implements ownership of water resources on behalf of the state. The local government does not have the right to allocate water resources except where delegated or instructed to do so.

River basin regulatory systems for water allocation have evolved by negotiation between state, river basin and regional authorities along different lines in different parts of China. The most clearly developed of these regulatory systems is in the Yellow River Basin. Here, in response to the complete drying of the river for many months each year through the 1990s, the state has been exercising unified allocation of water quantities to each of the riparian provinces and regions. As a result, there have been no further dryings since 1999. In 2006 this system was officially defined in State Decree 472, "Ordinance on Yellow River Water Quantity Allocation".[6] Discussion of the Yellow River System may be used to illustrate and discuss water allocation best practices in China.

The Yellow River Water Allocation Scheme is established by the Yellow River Conservancy Commission (YRCC), in consultation with local governments of the eleven riparian provinces, autonomous regions and municipalities through which the river flows or which receive diverted water.[7] The scheme is audited by the development and reform administrations and the water administrations of the State Council, and then submitted to the State Council for approval.

The Yellow River Water Allocation Scheme is established in accordance with the following principles:

- Operation on the basis of the river basin master plan and mid-term and long-term water supply and demand management plans.
- Emphasis on water demand management and water saving.
- Consideration of the physical conditions of water resources, present water abstraction and consumption, water supply and demand and their development trends in the Yellow River Basin, so as to obtain the comprehensive benefits.
- Integrated management of domestic, agricultural, industrial and environmental water use.
- Co-ordination between upstream and downstream as well as between left bank and right bank.
- Sound definition of sediment transportation, water demand and useable water.

"Useable water", mentioned above, means – putting aside the sediment transportation water use – the maximum water amount that could be used for domestic, agricultural, industrial and environmental requirements in a multi-year average runoff in the Yellow River main stream and tributaries.

As yet, environmental flows – those flows required to meet water quality and ecological objectives – are only partially defined. YRCC is undertaking further research to better define the criteria for these.

The preparation of the above plans and assessments is the responsibility of YRCC. In doing this YRCC will work closely with the Provincial Water Resources Bureaus, reservoir management bureaus and affiliated institutes.

The approved yearly water allocation plan is implemented through monthly water-regulating schemes and, in times of high water demand, ten-day water regulating schemes. Yearly total water abstraction indices of the Yellow River main stream and tributaries are set by YRCC, which controls abstractions and reservoir releases. These indexes may be adjusted in times of drought. The yearly water allocation planning is to be incorporated into regional socio-economic development plans.

The water allocation regulations affect the amount of surface water users are allowed to abstract and how reservoirs are to be regulated to balance supply and demand.

Changing agricultural water use

From the 1950s to the 1970s, under collectivised agriculture, major investments were made in surface water-based irrigation systems to boost agricultural production. These irrigation districts could cover areas of tens of thousands of hectares. However, following agricultural reform and de-collectivisation in the late 1970s, the smaller, village-level organisations of farmers found it harder to raise the capital and co-ordinate the activities required to take over ownership and then to maintain or extend such systems. As a result, many systems have fallen into disrepair.

In their place, entrepreneurs have established small companies in co-ordination with the village governments that raise capital to sink wells, buy pumps and construct low-pressure underground distribution pipe networks. Farmers then buy water from such an enterprise on a volumetric basis. Private well supplies are often more efficiently managed, as the water suppliers have direct incentives to maintain their assets. Farmers often prefer these sources as being more reliable than district irrigation schemes and offering greater control and autonomy. There are now more than 5 million tubewells in China, 4.6 million of which use electric pumping equipment with an installed capacity of 46 GW; of this capacity, 40 GW is used for irrigation and the rest for water supply. The rural electricity required to operate such systems is subsidised in order to protect farmer income (0.272 Yuan/kWh compared with 0.513 Yuan/kWh for retail electricity) (MWR, 2007).

All ground and surface water abstractions are regulated, with a requirement for a water drawing permit. Procedures are defined in State Decree 460, acted into provincial laws, and then implemented by the Water Resources Bureaus at provincial, municipal and county levels. Volumetric charges apply for these abstractions in the range CNY 0.02 to 0.25/m^3 (with an average water cost of 0.14 Yuan/m^3 across all uses). However, there are many abstraction sources that escape this levy, or where the metering systems are defective. Recent surveys indicate that less than 10% of small farm abstractions are covered directly by the permit regulations (Lohmar and Wang, 2008).

This situation of rural water supply entrepreneurs has led to a system under which farmers could be directly paying a volumetric fee for their abstractions. However, with a large number of small abstractions, monitoring, reporting and collection of charges are patchy. In fact, these abstraction charges often end up being levied on the village as a whole and then recharged to the farmers – bundled in with other local service charges many months later, and often prorated by land area, thereby breaking the link between water use and charge. This introduces a free-rider incentive for both the well operator (who

is not responsible for the sustainability of the common aquifer but only for their own infrastructure assets) and the farmer, who can benefit by taking more than his share of the commonly administered water supply to boost yields while sharing out the additional costs.

Though the abstraction cost of water from a tubewell is low, the pumping cost increases as water table falls (between 1996 and 2004, 75% of the North China Plain experienced falling water tables with 26% falling by more than 3 meters per year). Eventually this cost starts to impact on crop selection. It becomes necessary to switch from grain to more intensive fruit and vegetables, often using greenhouses, in order to maintain margins.

With the abolition of agricultural taxes in 2005, China now has greater flexibility to implement more effective irrigation pricing. In most remaining irrigation districts, fees charged to farmers are much less than the cost of providing the water. Most irrigation supplies are not metered and management systems are vulnerable to abuse of commons, with those who take more than their share benefiting without sanction. Water user associations (WUA) are being established more widely. These take ownership of the assets into a management company responsible for investment in infrastructure and setting and collecting user charges for irrigation water. Managers of WUA are elected by the water users and policy decisions are made collectively. An alternative approach is the village contracting water delivery to individuals or privately run enterprises.

Around 70% of China's rural population have safe and accessible water supplies, up from 60% in 1990. The other 30% have to carry water long distances or only have access to unprotected sources. However, even those with safe sources may lose their water supply during dry seasons. One target of the 11th Five-Year Plan is for 100 million more rural people to be provided with safe water by 2010.

New rural water supply schemes in China use water meters as a basis for charging users a fee for domestic water – normally CNY 1 to 2/m^3, sometimes with a minimum charge of CNY 3/m^3 per month – payable to the village water committee, which operates and maintains the infrastructure.

Challenges to reform

Water reform initiatives need to take account of the "governor's grain bag policy" to maintain a high level (95%) of self-sufficiency in grain production at national, provincial and regional levels. This policy, introduced in 1995 and retained under the 2004 regulation on grain marketing, makes it difficult to produce the crops that are best suited to local land and water resource characteristics. It responds to government objectives of food security, national security, social and macroeconomic stability rather than sustainable water resource management. Thus despite several factors – reduced availability of water resources; loss of agricultural land to urban development; and switching of prime land to intensive high-value production and slightly marginal land to forestry for ecological protection under "Green for Grain" incentives – grain production in China has been increasing over the past few years, with the 2008 harvest reported to be the largest on record.

Probably the greatest challenge to reform of the agricultural water sector is the incomplete monitoring and control of abstractions. For any system of water rights trading or incentive scheme based on volumetric charging to be effective, there must be full

knowledge of water abstractions, uses and returns. No system can be effective if it is easy to cheat, taking incentives for demand reduction then obtaining additional water from alternative sources. Such cheating is not so likely when irrigation water charges remain very low, but once incentives are introduced the benefits of cheating will increase.

Policy suggestions

A challenge for regulatory reform is to help the farmer/village overcome the investment hurdle of switching to more efficient irrigation or intensive cropping with higher margins. A possible solution is applying high fees for volumetric use but returning lump sums for farmed areas; this would create a non-crippling incentive to save water and a means to fund investment. However, it is hard to design and implement such a system in a manner that prevents abuse. Alternative approaches are to provide incentives to the managers of WUA for achieving water saving targets.

In those areas where electric tubewells are the main source of water, direct water metering (the weak link in any incentive scheme) may be replaced with electricity consumption. This is much more easily (and likely to be) reported. The challenge is in obtaining co-operation between electric utility companies and water resource bureaus to share data and enforcement responsibilities.

Water allocation and water rights systems still require further refinement and clarification. The nature and duration of water rights are not clearly defined at state, province, regional, community or individual levels, nor is the transfer of the water right to the water user. There are also inconsistencies between basin and regional water resources allocation plans, as well as between long-term and annual plans.

Improved hydrologic modelling leads to better water resources assessments and allows better calculations for water allocation plans. These plans should combine the elements of:

- Hydrological assessment.
- Environmental flows calculations.
- Supply-demand forecasting.

The process of breaking the water cycle into its components and developing models will provide much greater understanding. Ultimately, the ability to manage the resources is dependent upon knowledge and understanding of the resources. Each of these elements could benefit from the application of improved technologies for analysis. In particular, since there can never be certainty in such assessments, this uncertainty should be formally defined and managed – for example, *headroom* is the margin between supply and demand. The application of the formal analysis of *headroom uncertainty*, as used in the United Kingdom (UKWIR, 2002) allows application of a risk-based approach to water resources planning. That better allows reliability of supply to be managed within the water resources allocation planning system, and also improves long-term policy and infrastructure investment planning.

The allocation plans are implemented through the water abstraction permit system. Though the water-drawing permit system in China is well developed, it does not yet link to the processes of water allocation planning. This is an inconsistency in the system that should be addressed.

Flow returns of abstracted water also have important impacts upon both water resource availability and water quality. In the case of industrial and urban water use, around 80% of abstracted water is returned to the resource system but in a transformed state of quality. On the other hand, water abstracted for agricultural use will mostly be "consumed" through evapo-transpiration. The agricultural return and run-off water may have a much lower level of organic pollution (COD and ammonia) than the urban/industrial discharges, but will carry significant loads of nutrients (nitrogen and phosphorus), which can lead to serious water quality problems. The evapo-transpiration (ET) method of water allocation can be applied to consider these factors.

The quality of the water abstracted has a great bearing on its usefulness – the allocation planning system and the abstraction permitting and charging systems need to recognise this. The linking of abstraction and discharge permitting systems will enable the resource and quality/economic value elements of this relationship to be better developed. Understanding of the water quality is also essential to calculations for environmental flows. Thus the planning of abstractions for different purposes should take consideration of the impact of the return flows on water resource quantity and quality downstream.

River basin water quality and integrated pollution control

The various statistics available indicate that the quality of river water in China is very bad. According to the 700 or so sections monitored by MEP (covering the major river sections of China), in 2006 60% of river reaches failed to meet water quality Grade 3 (suitable for use as a drinking water source), with 28% failing to meet even the lowest Grade 5 (not suitable for any use unless pre-treated) (MEP, 2006). MWR data based on more than 3 200 monitoring stations in 2005 (and so also covering more of the smaller rivers and upper catchments) indicate that 39% of river reaches failed to reach Grade 3 and 21.3% were worse than Grade 5 (MWR, 2005).

The Chinese system for the management of polluting discharges from industry and urban developments is still evolving. Until this year there was no clear legal basis for discharge-permitting systems, apart from in a few pilot areas.[9] The amendments to the WPPC Law (2008) now open the way for a system of discharge permitting linked to total load allocation to meet river water quality targets. The detailed mechanisms of such a system have yet to be published.

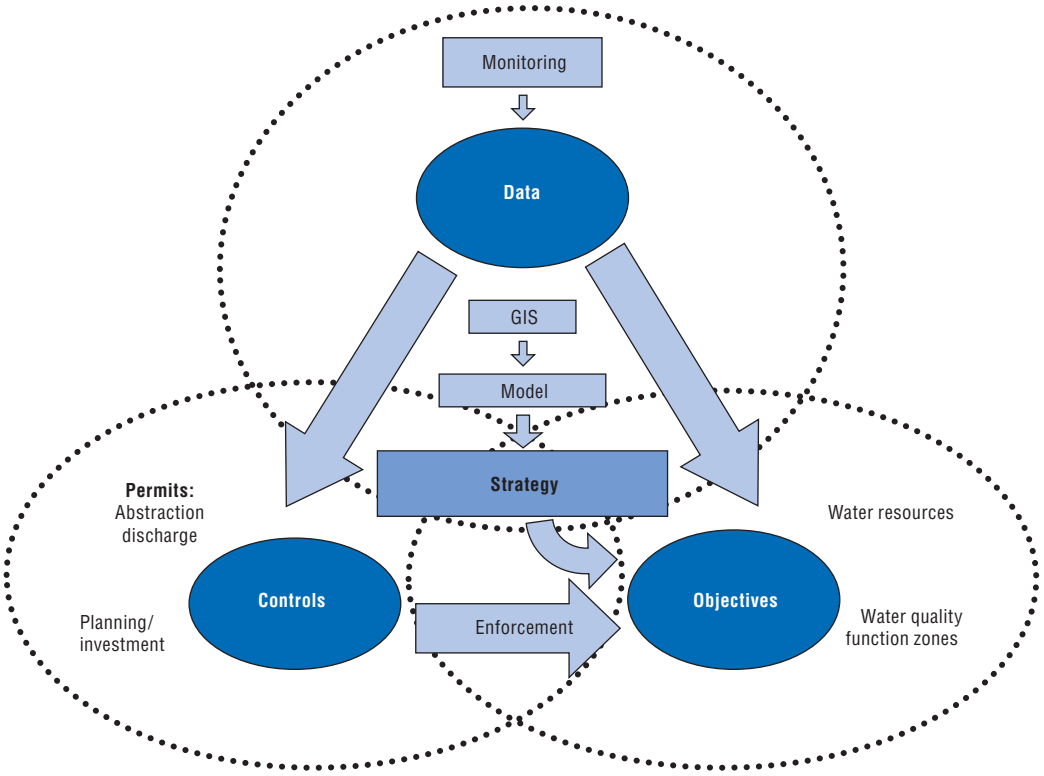
Government departments, enterprises and senior officials are now being motivated to achieve defined targets for actions and outcomes, through incorporation of conditions related to environmental performance in the systems of annual performance review against letters of responsibility. Under this system they must ensure provision of treatment capacity and percentage reductions in total COD discharges. They have also been tasked in certain areas to prepare lists of schemes to achieve these defined targets over the 11th Five-Year Plan period and to ensure that such schemes are financed and constructed by 2010. These schemes are generally planned for their overall contribution to the targets of the administrative region; they are not prioritised on the basis of contribution to achieving river basin water quality objectives.

Drawing on the experience of OECD countries and knowledge of currently available technologies, the following is a discussion of how regulations for integrated pollution control could be conceived in China.

Concepts for integrated pollution control

Conceptually the objective is to create systematic and rational links between monitoring data and legal control instruments, in order to achieve the objectives of an improved environment (in an economically realistic manner). This conceptual principle is illustrated in Figure 7.1.

Figure 7.1. **Conceptual framework for rational management of water quality**



Source: Simon Spooner, 2008.

The elements of effective water quality management are:

- Collection of monitoring data.
- Establishment of legal and political instruments for control of human impacts.
- Clearly defined objectives for environmental outcomes.

These elements may be linked by enabling technologies such as databases, GIS and computer models, in order to formulate the *strategy* of investments and interventions that will eventually achieve the objectives in an economically viable manner. The implementation of such a strategy (an integrated pollution control plan) will have to be enforced through legal instruments such as permits, through planned programmes of investments over a defined timetable, and by setting of related performance targets for the people involved.

A systematic approach to pollution control planning will enable the development of much more comprehensive plans for investment at the river basin level. These can be incorporated to the existing five-year development planning process and financed and scheduled in an optimised way.

Required elements of the regulatory system for integrated abstraction and discharge control

The objective is to control polluting discharges to rivers in such a way as to ensure that water quality objectives for each river reach may be achieved and there is sufficient water available to meet human and environmental needs.

The problem is that each polluting discharge from industrial and domestic sources (point sources) must be managed in the context of other point sources and also diffuse sources; and that the pollutants are transformed during transport from source to discharge point; also, once mixed in the river water, they undergo further transformation by decay and dispersion.

Water quality in the river is also dependent upon the available water quantity (dilution). The act of abstracting water from one source (*e.g.* ground water or upstream intake) and discharging to another (*e.g.* downstream river) has implications for both water resource management and water quality. Thus water quality management is strongly linked to water quantity management and the maintenance of environmental flows in rivers.

Such calculations rapidly become excessively complex when trying to apply them to a real river with constantly varying flow conditions. Therefore a regulatory model requires all calculations to be performed for defined reference flow conditions (*e.g.* annual average flow or 75 percentile low flow, etc.). Though an artificial concept, this simplification is necessary to enable the process to be managed. The objective should be an effective management tool and not a simulation of reality.

There is a wide consensus among many key figures in water resources and water quality management in China that the fragmentation between abstraction management and discharge management is a root cause of the difficulties in tackling river water quality, and that a solution must involve integrated abstraction and discharge-permitting systems.[10]

These principles have been incorporated to the Water Law of 2002 and the WPPC Law of 2008. The challenge now is in the effective definition and implementation of systems at river basin, provincial, municipal and county levels that will achieve the policy and direction expressed in the national laws. This will require co-ordinated and co-operative action by the authorities involved.

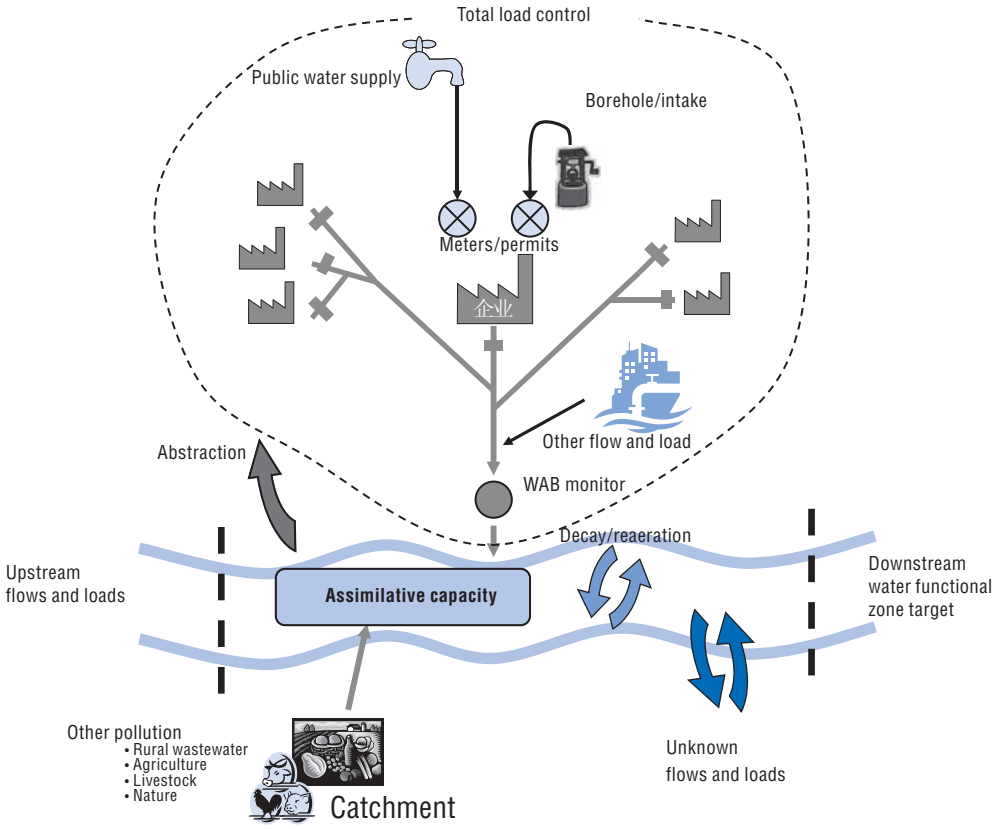
To understand the linking of these elements and focus on the methods of intervention available, some relevant parts of the water cycle are discussed below. The natural and unnatural physical elements are then considered in the context of the Chinese legal and institutional framework.

The elements that need to be considered for each river reach in an integrated permitting system in China are illustrated in Figure 7.2.

Figure 7.2 illustrates the typical case of an industrial facility drawing clean water from various sources (in accordance with abstraction permits or supply contracts), then discharging polluted water into urban sewers that convey the flow and pollution load to the river.

The quantity of the discharge flow will normally be closely related to the total amount of water consumed by the factory. The concentration of discharge flow will depend on the technology of the industrial production processes and provision/utilisation of wastewater

Figure 7.2. **Scope of items to be considered in integrated permitting system**



Source: Simon Spooner, 2008.

treatment. Thus the discharge flow may be characterised by volume and load, giving rise to a typical concentration. It is the concentration that is most readily measured by onsite monitoring. Discharge flow volumes are often difficult to measure directly, and so the total load may be better estimated from knowledge of the total inflow to the factory, likely consumptive of evaporative loss in the factory and the discharge concentration.

A key element for linking abstraction and discharge permitting is the calculation of water balance and load contribution for each enterprise. This requires that the authorities responsible for water supply and abstraction monitoring share data with those responsible for discharge monitoring. These data may be self-collected and reported by industry, but if so they must be thoroughly audited and checked by independent authorities.

The pollution load will mix with other sources prior to reaching the river. Some load will also decay or disperse during transport to the river. Thus it is not easy to identify the specific source of pollution in the river, and individual control on the polluter must take place at the point where the polluted flows leave the premises. This is the point at which the factory management is required to ensure their discharge meets the relevant requirements set by the local EPB. The EPB enforces procedures to ensure that all such discharges do not result in the river failing to meet its water quality objectives (Water Environmental Functional Zones, WEFZ).

The Water Resources Bureau (WRB)[11] also has responsibility for overall discharges to the river, approval of the structures at the point of discharge, and ensuring that the total

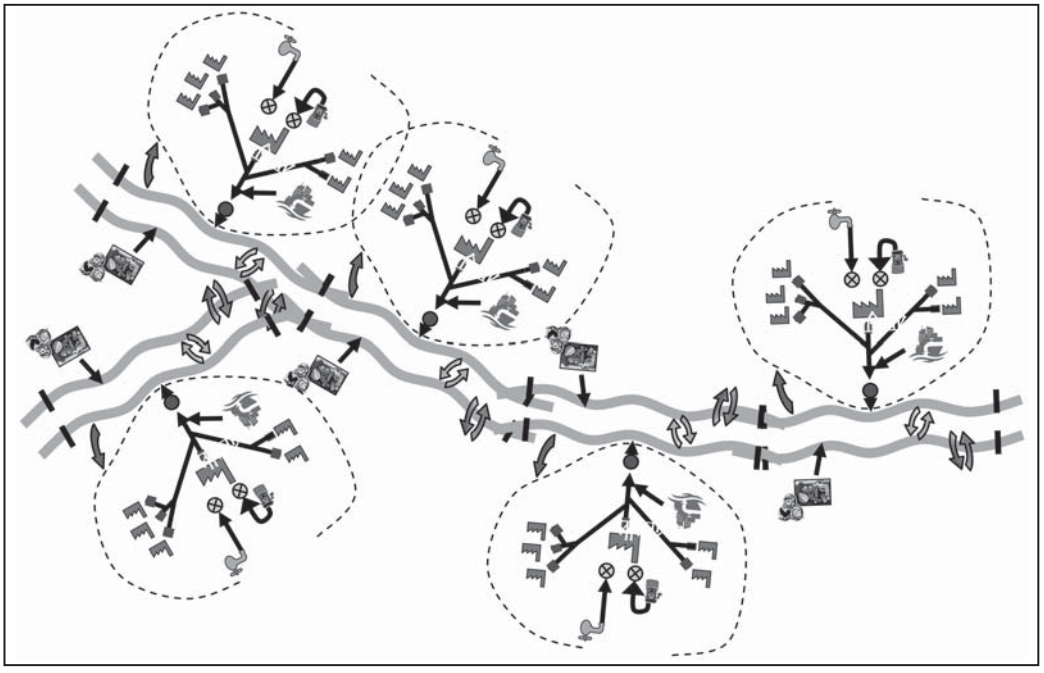
discharges from these points do not cause a failure of standards defined for Water Function Use Zones (WFUZ).

The provision of Wastewater Treatment Works (WWTW) prior to discharge to the river considerably modifies the relationship between a discharge from a factory and the impact on the river. The presence of WWTW also modifies the regulatory relationship between the discharger and the authority responsible for river water quality. Discharges to sewers with municipal WWTW may be considered more a commercial relationship between the discharger and the wastewater treatment provider.

The contribution of specific discharges needs to be considered within the context of pollution contributions from many elements as well as the self-purifying capacity of the river. Not all of these sources and processes can be defined with certainty. There will always be unknown elements in the system, and these should be explicitly defined and calculated. The explicit management of uncertainty is a key feature of modern European risk-based management systems.

Furthermore, a river reach cannot be considered in isolation but must account for upstream and downstream reaches, as illustrated in Figure 7.3.

Figure 7.3. **Relationship between each river reach and upstream and downstream river reaches**



Source: Simon Spooner, 2008.

River basin water quality management will be based on planning water resource and environmental flow objectives based on total load management at catchment, regional and individual discharge levels, enforced through permit-based controls for abstractions and discharges which are independently monitored and reported with significant penalties for non-compliance or evasion.

Given the complexities of assessing the impact of multiple discharges in different regions of a river basin against multiple water quality objectives, some form of computer modelling will be required to assist the regulatory authorities. The challenges in formulating such technical tools are not in the design of the software – the calculations required, though very numerous, are not mathematically very difficult – but in the conceptualisation of the calculation process and the provision of required data.

To assist in the understanding and communication of the condition of each river reach, some quantitative indices of performance at individual discharge, river reach, administrative region and river basin levels will be required. Regulatory models will be required for the rational allocation of pollution discharge total loads to each region of the basin, and for the sub-division of these regional loads to the discharge permit for each enterprise. The requirement for this is defined in the WPPC Law of 2008.

Currently in China, procedures for the management of water abstraction allocation by a system of water-drawing permits is well-defined in State Decree 460. These instructions are supported by administrative systems, in some areas utilising databases and GIS.

By contrast, the Chinese framework for discharge permit management and pollution control is not yet very robust, and does not integrate with the water quantity management system. The recent changes to WPPC Law open a framework for discharge management, but the details to be set out in a new state decree are still to be defined.

An integrated system for water quality management will require many elements that can gradually be linked together to form a system.

Combined approach to discharge management

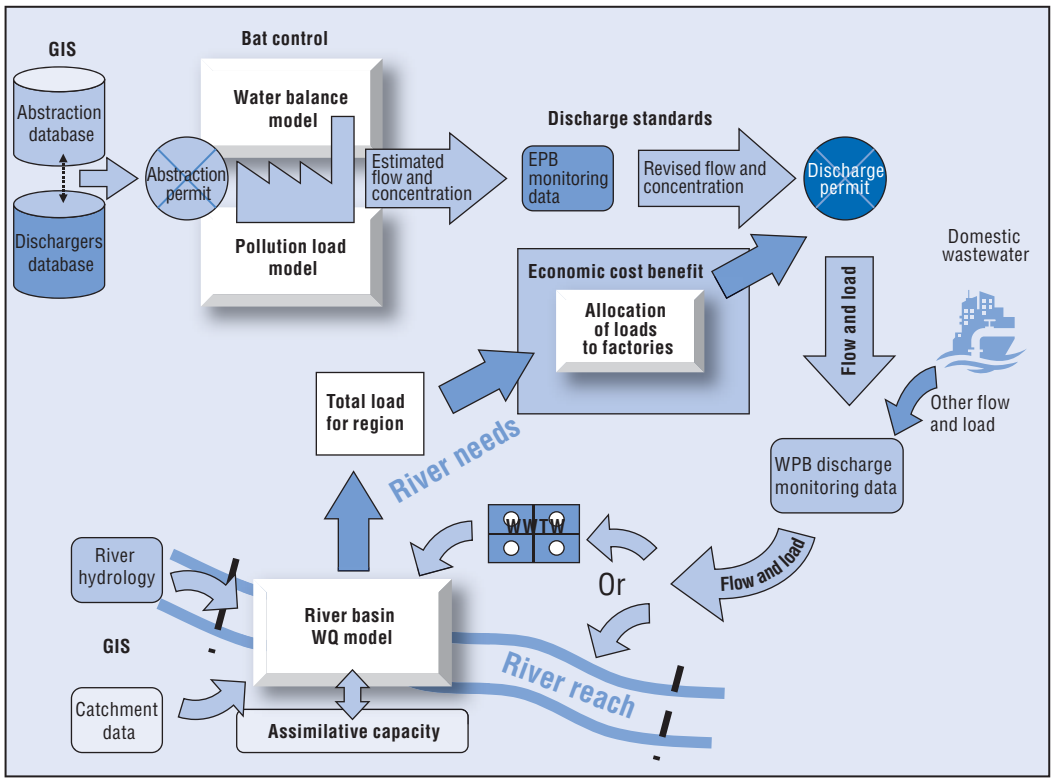
The interventions will be based on plans and investments to reduce loads discharged from polluting facilities such as factories and towns. The reduction of pollution should be based on the combination of three approaches, a key principle expressed in WFD:

- Use of *Best Available Technology* (BAT control) to improve production process water efficiency and reduce pollution generated at source. In EU, BAT for specific processes is defined in BREF notes.[12]
- The setting of general minimum *discharge standards* – basic effluent concentrations not to be exceeded (set at national levels, may be specific to the industry).
- The setting of local *river needs standards* to meet the specific local conditions required to achieve water quality objectives. These may be determined through total load calculations. Generally they are tighter than national standards. Compliance with these will need to be phased with an economically viable timetable.

These conceptual principles may be considered in the context of the Chinese legal and institutional system. That will make it possible to identify how the combined approach to discharge management fits with the technical tools of GIS systems and models, to enable abstraction and discharge permitting – together with total load management – to work towards achieving water quality improvements.

A key feature of the system proposed above is that there is a greater co-ordination between the EPB function and MWR functions. Currently it is very difficult to accurately estimate the load discharged from a factory because the responsible authorities each have only part of the data required to verify the statements of the factory. By sharing data on how much water goes into a factory from abstractions or town water supplies and

Figure 7.4. **Application of combined approach to discharge management for the Yellow River area**



Source: Simon Spooner, 2008.

monitoring discharge concentrations, it is easier to estimate the total pollution load of the factory and to analyse the water efficiency and potential for process improvements.

Description of an integrated abstraction and discharge management system

As well as being required to meet the statutory discharge concentrations as set out in GB8978-1996 or local provincial variations, each factory will be allocated a total load that it is permitted to discharge each year. The amount of this permitted load will be determined by calculating the total load for the region and reallocating to each factory. The total load for the region is determined by using river basin water quality models that take account of upstream and downstream balancing, the contributions from other sources in the catchment and the effect of self-purification, and waste treatment investments – and then calculating the reductions in loads required to meet river water quality objectives.

Since it is unlikely (because realistic) to meet the water quality objectives in a single, one-year cycle, a political decision will need to be made annually to determine how large a step is to be taken towards achieving environmental targets. The decision must take full account of the economic consequences and benefits of the required investment or impact on industrial productivity.

Water use by each enterprise is the total of that self-abstracted from boreholes or river intakes and that taken from public supplies. The amount used may be estimated based on water use norms for industry type and production levels, or determined with more accuracy from meter readings. The amount entering the waste stream will depend on

industry norms and levels of recycling, incorporation to product and evaporation. Typically, around 80% of water supplied is discharged as wastewater. The load of pollution added to the waste stream may also be estimated from industry norms; it may then be moderated by the presence and use of onsite treatment facilities. The actual flows and loads leaving the factory may be checked by monitoring by the industry itself or by the EPB. This whole process will aim to determine the quantitative and qualitative water balance of the factory and allow the calculation of the total load discharged.

Within the water balance analysis, reports may be prepared for water resource efficiency analysis. These would compare actual water use to that which would be expected for industries of that type, and also in comparison with the total amount permitted by the factory's water drawing permit. Similar comparisons may be drawn for the total discharge load relative to expected norms and the permitted load. Penalty and incentive schemes may be developed to motivate industry to comply with the systems.

Water balance analysis is the key element for linking the abstraction and discharge-permitting systems. Effective implementation of data sharing, compilation of industry norms, methods of calculation and cross-checking/correction against observed data will aid both the WRB and EPB in better understanding, managing and enforcing fair and efficient water use and pollution control.

In order to determine the total load for the region, the impact of loads from each enterprise on the river water quality must be determined, taking account of impacts from other sources and natural processes. Obviously there is a degree of circular feedback in this calculation, and guidelines will need to be developed to ensure a balance between detail and accuracy of calculation, and simplicity and speed of calculation.

River basin pollution indices and discharge impact pollution indices will assist in assessing the relative priorities of discharges in different parts of a sub-catchment or river basin. A high discharge pollution impact index for a factory will indicate that political pressure should be focused on mitigating such discharges, even if the financial incentives on the discharger are the same as for similar industries in less sensitive locations. In devising and using indices and incentives a balance must be struck between requirements to optimise investment in environmental improvement and the need to maintain fair competition between enterprises and to allow enthusiastic local authorities to proceed with schemes of local benefit.

Enterprises may be given financial incentives to achieve discharges that are below the permitted load and financial penalties for exceeding the permitted load. Once a reliable system of monitoring and enforcement has been established, it may be possible to introduce market mechanisms such as trading of permitted loads in order to optimise investment. However, such trading systems can only work reliably where there is a very high and verifiable level of knowledge of the exact amounts discharged by participants. Such confidence in monitoring does not exist at present and would require considerable institutional strengthening to achieve.

The incentives and penalties acting on each enterprise need to be reasonably fair and transparent, but it will not be possible to set regional total load targets that are equally achievable. Areas with lesser discharges but bigger river flows and less stringent functional water use objectives are likely to find it easier to achieve total load targets than areas with smaller receiving waters, more industry or high-grade water functional use objectives. Cross-regional investments or subsidies may be required to even out the economic and

political challenges of implementing stricter pollution control in different regions, or for providing ecological services for downstream users.

The consideration of the economic costs and benefits of infrastructure investments can include consideration of the schemes impact on the marginal opportunity cost (MOC) of water, either by making more / less quantity available by improving the quality such that more water is available for specific uses.

Individual factories or treatment works may be motivated by financial penalty and incentive systems related to total load compliance. Consideration could be given to the officials responsible for administration at a regional level being motivated by performance indicators based on the river pollution indexing systems. This will ensure that their decisions on development activity are related to outcomes that will produce improved environmental conditions. These indicators could be linked to ongoing reforms of the assessment procedures of the CPC Organisation Department. The success of any such systems will depend on the separation and independence of monitoring, analysis and assessment activities (see also Box 7.3).

Effective independent monitoring of discharged flow and load needs to be established. Currently the Chinese system is dependent on self-reporting with very occasional checking by EPB, usually with advance notice. The EPBs themselves are not fully independent of the interests of the local government, and in the case of larger state-owned industries they are a department of the factory. In such circumstances even continuous online automatic monitors could not be relied on to provide unbiased data. There needs to be independent monitoring and unannounced inspection visits to ensure compliance. In some EU countries, now that the procedures are established and trusted, it is becoming possible to return to a degree of self-monitoring and audited reporting. The solution to this issue lies in the strengthening of an independent environmental regulator and not in a technical fix of online monitoring; the latter is expensive, unreliable and easily circumvented.

Market instruments for industrial pollution control

There is enormous potential still for major reductions in industrial pollution discharge and water saving by the application of Cleaner Production (CP) technologies. There is not yet a culture in China of operating processes in an efficient and non-polluting manner. Often there are administrative separations within an industrial facility such as between those providing energy or steam, those running the process and those providing the waste treatment process. There may be limited communication and information flow making it very difficult for one part of the business to see the whole operation or take responsibility for integrated solutions.

Clean technology audits of the energy and water balance through the factory and identifying where pollution can be prevented at source by investment in better management and new technology can lead to substantial operational savings. Often simple improvements, better housekeeping and optimised process operation can lead to significant improvements. Thus such investments can give a strong positive economic return. Where more of a step change in environmental performance is required to meet discharge standards then major new investments in plant may be required. The barriers to wider application of CP are a lack of technical capacity to carry out audits and make recommendations, a lack of management awareness and difficulties in raising the finance to make necessary investments.

The investment by industry can be encouraged by the development of economic incentive systems linking – increased penalties / closure for environmental non-compliance with grants, favourable loans tax breaks etc. for enterprises investing in and operating cleaner technologies and improving their environmental performance. Cleaner production is being encouraged in part through financial incentives such as the Green Credit schemes (see Box 7.4).

Box 7.4. **Green Credits and pollution control**

In July 2007, MEP launched China's new Green Credit Policy in partnership with the Central Bank (CB) and the China Banking Regulatory Commission (CBRC). It is anticipated that the policy will encourage the incorporation of environmental costs and benefits in all existing and future development projects, including new funding applications for bank loans and supporting finance from public and private sector banks, plus municipal and provincial development agencies. China's banking sector has willingly co-operated in the "green loan" initiative.

The green loan initiative represents a major attempt by MEP to reform the Government's efforts to internalise environmental costs and benefits in all industrial development projects. In the past, SEPA/MEP and its provincial subsidiaries have struggled to control and enforce industrial discharge standards. Therefore, MEP sought to establish partnerships with other powerful Government departments and agencies to explore market-based approaches to environmental problems. It is argued that market instruments will have a more profound effect on the industrial sector than administrative measures, forcing businesses to internalise environmental costs and impacts from the start, rather than cleaning up afterwards.

In November 2007, CBRC issued new guidelines for energy conservation and emission reductions that apply to all financial institutions nationwide. The guidelines require tight control on lending to highly energy intensive and polluting sectors, while encouraging loans to "green" enterprises. Large commercial banks have begun developing internal mechanisms to incorporate environmental performance into lending operations and to link "green" loans with client rating and risk classification procedures. It is also reported that the Green Credit Policy will be used to assess the environmental performance of senior officials in municipal and provincial government, plus directors and managers of state-owned enterprises.

Trading in pollution discharge permits is a theoretical method of economic optimisation (Coase, 1960). However the implementation of pollution trading requires clearly defined and enforced permits and ambient environmental monitoring. These conditions do not yet exist in China. When such permit control, defined rights and monitoring are in place then more advanced economic regulatory systems may be considered.

Drawing on the experience of water utility management from OECD countries

In the EU, river basin policy is co-ordinated under the water framework directive implemented by member states in a co-ordinated fashion to meet local quality standards that match the principles of the WFD to attain "good status". Water and sanitation services are managed directly by the member states. On the other hand, blanket standards for

wastewater treatment provision in towns with populations over 10 000, 80% reduction in BOD or equivalent, and nutrient removal for discharges to "sensitive" receiving waters are set out in the Urban Wastewater Treatment Directive.

In most OECD countries there is a mix of public and private sector participation in water supply and sanitation. In France and England, private activity in water supply is prevalent; in the United States, Germany, Scotland and Ireland the public sector is prevalent but private sector involvement is increasing. Even where there is extensive private participation, that does not always mean that private entities own the sources of water or the infrastructure for distributing the water or managing wastewater. When water utilities remain publicly operated, the possibility of private alternatives can motivate improved performance by public utilities.

In this section some of the regulatory models used in OECD countries are described, following which there is a more detailed discussion of the UK regulatory model, which has features that may be of interest to those conceiving Chinese regulatory systems.

French model

Water and sanitation services are provided by municipal water corporations. Some municipalities associate to achieve scale economies, and they often combine water supply and wastewater services. Water resources development and water quality investments are subsidised from water abstraction and discharge fees, which are administered by river basin authorities. There is no regulatory authority for water and sanitation (just an audit office). Private contracts for water supply and sanitation are negotiated entirely at a local level. Recent attempts to establish consultative authorities have largely failed. The absence of performance benchmarking in France makes comparisons between the public and private sector performance difficult. Recent simple comparisons of tariff *vs.* service quality indicate a 22% higher tariff where operations are private but the comparison is confounded by the additional tax and land purchase requirements on private sector, and the fact that specialist private sector operators generally are brought in to manage the most difficult cases. However, once a contract has been let there is almost no real competition pressure on the private company, and upon renewal, the lease is re-let to the same company 90% of the time; it is very difficult to take a privatised company back into public ownership. The three big private water companies are in a very much stronger negotiating position than the local municipal authorities. The regulatory negotiation experience is concentrated on the side of the private company undertaking such transactions many times a year and diluted on the side of a local authority, which undertakes negotiation only every decade or so. The system in France does not ensure complete transparency of accounts, making it sometimes difficult to separate the regulated water activities related to the water tariff from other activities of the utility, especially where the company or municipality is engaged in multi-utility administration.

Germany

Water supply and wastewater collection are undertaken by municipal corporations, most of which are in public ownership. Water supply and wastewater treatment within a town are generally managed separately by different companies, and these companies administer both treatment and the supply and collection networks. There are many collaborative associations among the municipalities that allow operational merger and economies of scale. Germany has no federal regulators; six industry associations work to

maintain standards. These associations are effective in Germany but are not a culture that is easily transferable to China. There is an increasing move towards applying benchmarking to the municipal companies, especially as there is an increasing presence of private water companies (such as Veolia, Suez and RWE) operating under term contracts. Tariffs are full-cost recovery including capital investment. Investments are mostly debt financed, either through development banks such as KfW or by issue of municipal bonds.

United States

Most water service providers are municipal corporations. Investment is mostly by municipal bonds. Much of the wastewater infrastructure construction receives federal subsidy, therefore the business model does not require full cost recovery. Tariff regulation is overseen by state public utility commissions. Penetration into the US market by private water companies has so far been limited. Most of the private operations are foreign owned.

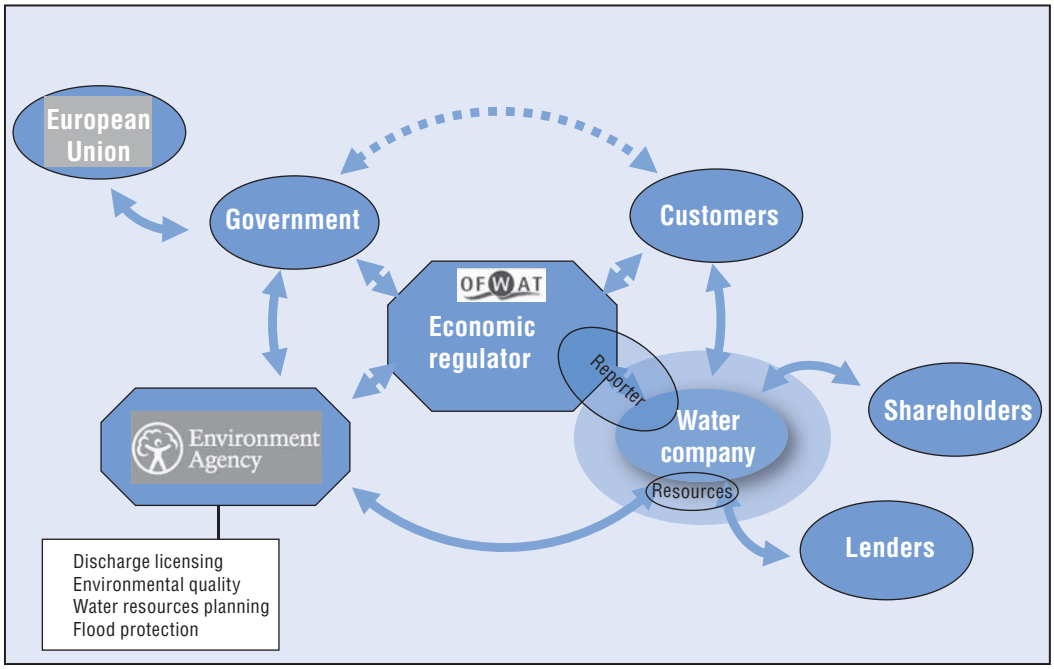
The United Kingdom model

The UK regulatory environment has a significant impact on the behaviour and development of the privatised water industry. It aims to do this through enabling dialogue, partnership, joint development and consultation. However, regulatory instruments are available should the need arise. The ability to use regulatory sanctions is important and is recognised by the water industry, bill payers and the general public as a necessary safety net.

The government and regulators have developed clear and complementary roles to provide a framework within which the water industry operates. The government is obliged to make arrangements to ensure compliance with European directives. The government Department of Environment, Food and Rural Affairs (Defra) sets the strategic direction and determines appeals. Ofwat, the economic regulator, sets prices, ensures that companies have sufficient resources to undertake their duties, and protects customers. The Environment Agency, as the environmental regulator, determines the environmental standards, sets permits for abstraction and discharge, and assesses compliance. The Drinking Water Inspectorate sets and monitors the quality of water provided at customers' taps. The Consumer Council for Water represents the views of customers. The Water Companies provide the drinking water and treat the sewerage, maintain and develop infrastructure, and operate their businesses within the terms of their operating licence. They must also deliver financial returns to shareholders and meet debt obligations to banks, who will take a keen interest in their asset values, revenues, and management performance. The economic regulator is assisted in gaining accurate information about the water company activities by independent reporters appointed to each company. These relationships are illustrated in Figure 7.5.

The roles of the regulators and the water industry have been determined by primary legislation, including the Water Industry Act, the Water Resources Act and the Environment Acts. These provide the statutory framework, which is supplemented by regulations and guidance from Defra. In addition, each organisation has developed strategies and guidance, setting aims and objectives and providing clarity on specific technical issues. These guidance documents form the basis of the day-to-day relationships between the organisations, and in many respects drive the behaviour of the water industry in meeting the regulatory requirements.

Figure 7.5. **UK regulatory model**



Source: Simon Spooner, 2008.

Each organisation's strategy documents chart key outcomes, activities and costs over a five- to twenty-five-year period. Each will be subject to pubic consultation and discussion with other key organisations, including government departments. This is especially important, as each requires co-ordination with the other regulators and the water industry. At a strategic level these policy statements influence the costs and actions of the water companies and ultimately the cost to customers.

The technical guidance produced by each organisation provides the detailed framework under which the water industry operates. This guidance is developed in order to introduce new requirements or changes to operational practice, or reporting. Whenever possible, guidance is drafted in close association with the water industry to ensure that it is workable and that it will result in the correct outcome. Policy and technical staff from each organisation work together within an agreed framework to draft and test this guidance. It is essential that good working relationships are maintained and that individuals have a good understanding of each other's needs and technical capability.

Agreement on guidance will be sought whenever possible, before it is ratified by the sponsoring organisation. However, on some occasions the responsible regulator will need to determine the guidance unilaterally. Significant guidance documents may be subject to public consultation, especially if there are cost implications or impacts on the public. Once ratified, all guidance is in the public domain and made available on request via websites.

The UK regulators each have slightly different ways of determining national guidance and informing the water companies and the public about this. Ofwat produces a sequence of numbered Managing Director (MD) or Regulatory Director (RD) formal letters. In this way new requirements or guidance are sent directly to prearranged communication routes into each water company and other regulators and interested parties. These letters aggregate

into a comprehensive suite of guidance upon which the water companies interact with Ofwat.

The Environment Agency produces an equivalent quality-controlled sequence of guidance notes covering its area of responsibility. These are assembled into a discharge permit manual and an abstraction licence manual. They are publicly available via the agency's website. Any changes to the manuals are sent to the water companies and to operational officers within the Environment Agency. Ultimately this guidance is imposed through changes to permit conditions, and enforced by monitoring and compliance assessments undertaken by the Environment Agency. Prosecutions are taken when necessary in the courts.

The Drinking Water Inspectorate issues similar Information Letters, which are available on their website. Compliance with this guidance is assessed by a self-monitoring and reporting regime, with Drinking Water Inspectors taking regulatory action if required.

Each water company needs to take this guidance into account in the way that it operates. Companies have some latitude in the way that they comply with guidance and achieve permit conditions. However, they must meet the outcomes and satisfy the legal requirements of their permits.

Depending on the regulatory issue, expertise or technical capability, water companies may choose to interact with the regulators at an individual company level or at a national level. The water companies work with their national trade association, Water UK, to co-ordinate responses and to combine their joint knowledge. Water UK facilitates a number of technical committees that work with the regulators to develop and negotiate guidance. Water UK also acts as a national communications facility and will draw experts and senior spokesmen from the industry as need arises.

A feature of the UK water industry – and water industries in most other OECD countries – is the involvement of consultants at every level of the system, from regulatory planning to programme delivery (though not normally operation). These experts and specialists, working mostly for independent private companies, provide a pool of expertise that is constantly moving between the different organisations involved and greatly increasing the capacity of the industry to perform effectively. Individual consultants will move seamlessly among projects for different companies and work for Ofwat, the EA, Water UK and other organisations, including academic institutions, within the space of months and so there is a transfer of knowledge and expertise. Equivalent accessible human resource pools have not yet been developed in China, making it much more difficult to access the particular short-term specialist skills required within programme and project cycles.

With this regulatory framework, occasions arise when there are conflicting requirements or where the water industry believes that the guidance is being disproportionately or unfairly applied. On these occasions the industry or individual companies can appeal, informally or formally. These appeals are determined by an independent inspectorate acting for the Secretary of State, the Planning Inspectorate. In important cases the Secretary of State has the right to "call in" an issue and determine it directly, or to require a public inquiry prior to determination.

There is a need to balance and take an overview of the current and future requirements for the water industry, and this is undertaken on an ongoing basis by the

regulators in a series of formal and informal quarterly meetings. Ongoing and frequent dialogue is important for all parties.

The objective of the economic regulatory process is to ensure financeability: the ability of appointed water companies to finance their functions through debt, equity or retained earnings. Companies being able to finance the proper performance of their functions is interpreted to mean two things. First, the companies should receive a return on investment at least equal to the cost of capital. Second, companies' revenues, profits and cash flows should be such that they can borrow as necessary in the debt markets and provide shareholders with sufficient incentives to produce additional funds through equity injections or retained earnings.

The Periodic Review Process (PR) is a five-yearly review of all the obligations and requirements of the water industry; it provides a formal and structured opportunity for dialogue and consultation. Following this, water prices are set for the next five-year period. These prices seek to balance the financeability of the companies with the need for maintained or improved service to customers and the environment, and affordability to the customers. At present the process of determining PR09, which will be used to set prices for the period 2010 to 2015, is ongoing. Box 7.5 describes the price setting mechanism.

Box 7.5. **How prices are determined in the UK regulatory model**

Economic regulation is by control of prices each company is allowed to charge customers, rather than by control of rate of return on investment as is the case in some other countries.

Ofwat uses company comparisons as a surrogate to mimic market competition. The objective is delivery of service, not infrastructure.

Some key terms:

RCV – *Regulatory Capital Value*. This is the main reference for the market value of the company and its assets under the scrutiny of Ofwat. It works out at about 10% of the replacement cost of the assets. The company is seeking to generate a return on this value.

K – How much a company may raise or must cut its price each year

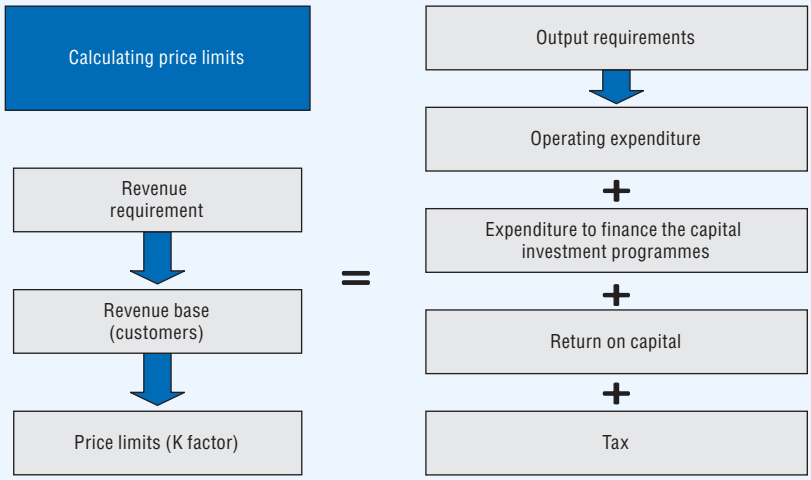
This is controlled by the price limit formula

RPI ± K + U.

K is a number determined by Ofwat at a price review every five years for each company, for each year, to reflect what it needs above inflation in order to finance the provision of services to consumers. It may be changed at an interim adjustment between price reviews. RPI is expressed as the percentage increase in the Retail Price Index in the year and U is the amount of unused K not taken up in previous years.

Many factors are taken into account in the calculation of K, including the past performance of the company as reported to Ofwat, the cost of capital, the investment obligations placed on the company by regulators, efficiency improvements of the company, and the prevailing cost of infrastructure construction. The determination of K is negotiated through the Periodic Review Process by submission and review of detailed company business plans.

Box 7.5. **How prices are determined in the UK regulatory model** *(cont.)*



In addition to these national processes, the water companies must work with their customers and local regulators within their geographical region. Some of these processes are duplicated at regional or company level, but follow and interpret national guidelines. Actual work on the ground, meeting environmental quality conditions and supplying services to customers, is very much a local affair. Local Consumer Councils, local enforcement via Environment Agency area offices, and relationships to local authorities are all critical.

Each abstraction from surface or groundwater will have an individual licence with conditions. Also, discharge permits are set for all discharges from wastewater treatment works and intermittent discharges from sewers and contaminated surface waters. The permits reflect local conditions and environmental need, and will greatly influence the level of treatment, maintenance and operational costs. These are set and maintained at a local level and monitoring and enforcement is also at water company level, although reported as part of the national statistics.

Water companies also operate customer service centres to deal with water supply issues, bill queries and other customer issues and communications.

Concerns about the UK water privatisation model

Prior to 1989, due to overall reductions in public expenditure, there was an acknowledged lack of funding in the water sector. Assets were deteriorating, wastewater treatment works were no longer meeting discharge consents, several pollution incidents occurred and river water quality was declining. A number of new European environmental and drinking water directives were driving further investment. The government was unwilling to increase borrowing or investment in the water industry, and privatisation was seen as a way of introducing private sector investment and more dynamic management to solve these issues.

The privatisation of the water industry in England and Wales was complete. This meant that all the overground and underground assets, buildings, associated land and operation of the infrastructure were sold to the private sector.

In the years since privatisation considerable asset stripping (*e.g.* selling valuable development land in city centres deemed no longer needed) has taken place, adding value to the companies and their shareholders but little to the customers or to the community.

In later UK privatisation models, as in Scotland, private sector investment and engagement has been through granting long-term operating contracts to the private sector, while retaining the assets in public ownership. This was deemed more acceptable to society. The French model is much older but is also similar in principle to that adopted in Scotland.

The water companies have been partitioned into core businesses, supplying water and sewerage services and non-core or unregulated businesses. Many non-core businesses aggressively entered into diversification and acquisitions in the United Kingdom and overseas in the 1980s. Most of these were not successful and, with a few notable exceptions, the UK industry has tended to move back to water and related environmental businesses in the United Kingdom.

In all cases the strong regulatory environment provided by Ofwat protected the core business and continues to prevent excessive movement of funds from the core to more risky investments. The collapse of Enron and its subsidiary Azurix, which owned Wessex Water, was an extreme example, but the core regulated business was protected from the insolvency.

The continued pressure for efficiency from the investors and the economic regulators has led to significant reductions in staff since privatisation. There are concerns that this continued reduction in staff has reduced the skills, knowledge and expertise in the industry, which is increasingly reliant on external contractors to undertake its functions. Some commentators see a focus on financial management and a loss of technical and engineering expertise as being detrimental and unsustainable. In addition, there is an emphasis on short-term delivery and a loss of focus on long-term planning. Some water companies have taken radical approaches; Welsh Water has outsourced all its operations to other water companies and external contractors, leaving a very small core of managers to run the company. Conversely, this outsourcing has allowed the development of centres of excellence that have provided engineering consultancy and technical services to the water industry, with the best teams able to continuously supply services to all or at least many of the companies at once.

There has been an increasingly short-term view being taken by some of the water companies, focusing on pressure for growth and return to shareholders. The economic regulators have provided some protection, and the asset management programmes and the five-year periodic reviews have focused minds. However, many of the companies wait for the regulators to drive investment decisions and then minimise expenditure within the settlement. Ideally they should develop progressive and independent programmes and proactively press the regulators to fund them. Often companies press for minimal investment programmes. In addition, they try to optimise business gain by stop-start construction and investment within the five-year period. This has difficult repercussions for the construction and service industries supplying the water sector.

There are some concerns over the financing models adopted by some companies, especially in the current economic climate. There is considerable diversity in approach, which brings strength and knowledge; however, not all models will work in the long run.

The regulatory capital value of the water companies is now GBP 45 billion (Ofwat, 2007-08). In contrast, the net debt for the water and sewerage sectors now stands at GBP 30.8 billion (Ofwat, 2007-08). According to Ofwat, in 2007-08 the average gearing for all companies was 66% debt/regulatory capital value, a percentage that has been progressively increasing from 59% in 2003-04. Individually, companies range from 53% to 93% gearing, showing the radically different approach of some of them. Investment and ownership is now truly international, following a number of investment models including: original independent water company plc (shares on London stock exchange); multi-utility plc; private equity buy-out; and private buy-out by investment banks on behalf of foreign pension funds.

The UK regulatory process, with risk-based approaches, econometrics and performance benchmarking etc., together with the complex financial arrangements of the water companies, is becoming increasingly sophisticated and optimised. However, there is a danger that it is becoming so complex and technocratic that it will become difficult to gain a real picture or understanding of what is actually going on.

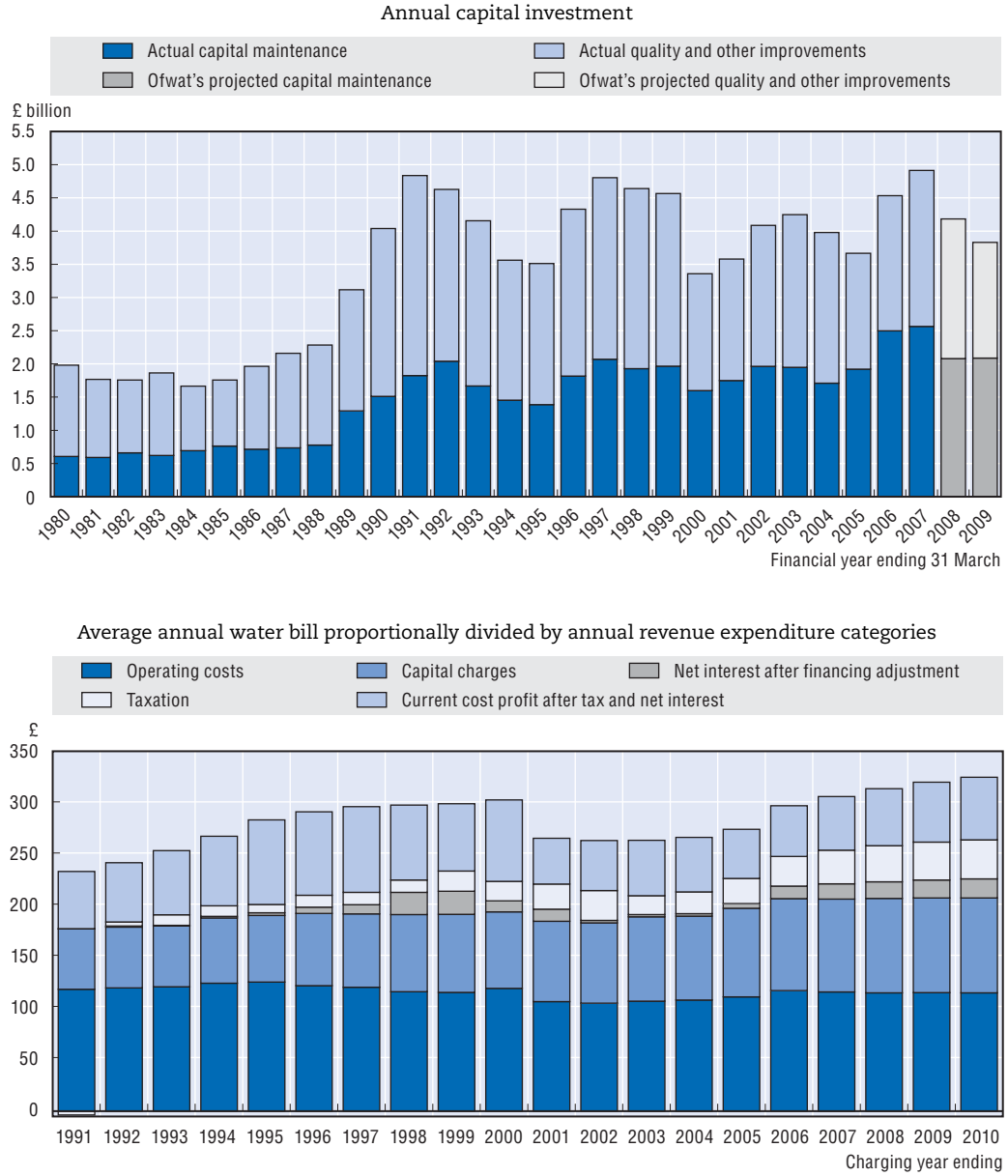
Outcome of the UK regulatory model

Since privatisation the UK water industry has delivered significantly increased investment in infrastructure and greatly increased the level of service provided while keeping water charges relatively steady. The greatly expanded asset base is being operated more efficiently, with operational costs falling over the period. However, the proportion of revenue required to service debts has increased steadily. The regulatory system has been effective in consistently ensuring that the service targets that were set were achieved at much lower cost than the projections and estimates prepared by the industry; this forces efficiency and innovation if a company wants to maintain their profit margins and survive commercially. Owfat provides data on the capital investment profile of the industry for investment in infrastructure to provide improved services and to maintain existing service levels. Figure 7.6 illustrates the capital investment profile of the industry for investment in infrastructure to provide improved services and investment to maintain existing service levels together with the effect of regulatory controls forcing lower expenditure than projected to achieve the same quality of service. Also shown is the relative apportionment of revenue, illustrated as portions of the average annual domestic water bill.

New directions for regulatory reform in UK model

A perceived weakness of the UK water industry economic model is that companies can profit by making excessively high estimates of their capital expenditure requirements for the coming five years, obtaining the price uplifts from Ofwat to fund these investments, then delivering at much lower cost and retaining the difference as high profit margins and paying high dividends to shareholders. Such behaviour is considered unfair to the customer, who has no choice but to pay for it through higher bills. It became clear that the UK water companies indulged in this behaviour particularly during the AMP2 period (asset management plan) (1995 to 2000), which was corrected by a very harsh determination by Ofwat in the AMP3 (2000-05) period. Ofwat would like to move to a capital expenditure incentive scheme (CIS): a system of incentives that explicitly recognises that appointed

Figure 7.6. **Capital investment and revenue profiles of regulated water industries in England and Wales**



Source: Owfat (2008).

water companies have access to better information about their future capital expenditure needs than the regulators do. It offers a system of incentives to deal with this, structured so that the company has an incentive to produce realistic and credible expenditure forecasts before price limits are set. After price limits have been set each company retains the incentives to outperform their regulatory price determinations, with the reward being higher for those companies that have made more challenging expenditure assumptions. However, so far the complexity of settling the detailed mechanism for such an approach has delayed its formal introduction.

Another mechanism through which Ofwat has sought to drive greater capital efficiency has been the increased requirement to demonstrate that projects have undergone cost-benefit analysis (CBA). PR09 for the period 2010 to 2015 is the first periodic review to require detailed CBA for all schemes. However, the reaction from the industry so far suggests that the uncertainties about the many hard-to-define factors required for CBA, and the diversity of approaches, have meant that as yet it does not appear likely that the increased capital efficiency hoped for will be delivered (CIWEN, 2008).

The planning process for price setting is highly dependent on reliable prior knowledge of the cost of various items of infrastructure. Data on past outturn costs have been pooled by each company to form its "cost base" submission, the basis of its future cost estimating. Despite many years of gathering and analysing data for cost bases there remains considerable variation in cost estimates between companies, and this is a significant source of uncertainty in the regulatory process. Great effort is given to the scrutiny of cost base information in the review process. Initiating a similar cost base in China would be a major undertaking, but the earlier it is started the sooner such information would be available to inform decision making.

Impact of the credit crunch

So far the impact of the credit crunch and the deepening recession has been relatively mild on the UK water industry. The share prices of the quoted companies have been more resilient than the market as a whole and may be regarded as relatively safe investments with reliable dividend returns in comparison with other stocks. However, there are a number of factors that can impact upon the profitability of the water companies and influence the Periodic Review Process for price setting. The most significant of these is the cost of capital. As heavily debt-financed businesses, the companies need to regularly renegotiate the loans they hold and to issue corporate bonds. The yield they have to offer on these bonds has increased very significantly. Recently the cost of capital (where available) has increased significantly in the short term. In the longer term the lower interest rates should filter through to lower capital costs. For the next five-year period, about 50% of the GBP 27 billion of new investment required will have to be funded from new sources of finance other than those existing arrangements; this could prove a significant challenge. In the United Kingdom, within the regulatory cycle a decision on the cost of capital must be taken by a committee of Ofwat economists in spring 2009, and will then form the basis of price determination for the following five years. In such an uncertain capital market as exists at present, this is a difficult call to make; some thought may need to be given to revising the basis of such calculations.

Another possible threat to water company operations would be rising customer debt as a result of an increasing number of customers experiencing financial hardship during the downturn. This will reduce revenues and increase costs for the water companies, and will also increase pressure within the Price Review Process for lower tariffs to permit greater affordability. However, just such a low and challenging determination could affect the credit rating of the companies, and so drive up the cost of capital and make programme delivery even more difficult.

Lessons for China

Clarity of role

The UK system may appear complex, but in fact roles are clear and have been further defined as the system has developed since privatisation. Roles are defined in the legislation governing each body and are set out in the primary legislation (Water Resources Acts and Environment Acts). They may be defined further by ministerial guidance and agreed memoranda of understanding between each regulator. While each organisation operates within this guidance, utilising their prescribed powers and duties, the system operates well. Occasionally one organisation has overstepped the mark and disputes have arisen, most times because of some ambiguity in law. This has usually occurred during price setting and has formed part of the adversarial debate. In this situation the Secretary of State has final jurisdiction and a ruling has been made.

In these respects of both structure and written regulation the UK system is much more transparent compared with the current Chinese situation with multiple and overlapping responsibilities across multiple ministries and levels of government ("9 Dragons") and limited written guidance. However the challenge of size is much greater in China and any Chinese regulatory system would have to be subdivided at a provincial level.

Improved standards

The quality standards for potable water should be set at national level in order to protect and improve public health. These would normally be derived from the best technical practice and would reflect international standards, for example the World Health Authority standards. They should be accompanied by levels of service in terms of availability of water for industry and households. A timetable for achieving these standards should be set and some discretion may be made available for individual provinces to phase implementation to suit local needs. Achieving the standards should be mandatory, but the timescale and how the standards are achieved could be modified with agreement from national government. Strong and clear regulation should be put in place to ensure that these standards and the agreed programmes are met.

A similar approach should be taken with environmental quality objectives – specifically those for water quality, but they may also include air emissions and sludge disposal. The core environmental objectives should be set by national government and would normally reflect international best practice. However, the objectives would also normally reflect the needs of individual water bodies and would be informed by a River Basin Planning approach. As with the drinking water standards, the timescale and the methods of achieving the outcomes should be agreed with the provinces and monitoring put in place to ensure that the improvement programmes are realised through an economically realistic investment programme.

A phased approach to achieving these objectives should be considered, and a 20-year programme with key milestones might be considered.

In the United Kingdom progressive improvement in water quality was achieved by phased investment in response to tightening UK and European laws. Municipal and industrial discharges were improved in a risk-based and progressive way. Freshwaters were improved first with initial emphasis on protecting drinking water sources and then fisheries. Protection was then extended to estuaries and then the marine environments. The EU Urban Wastewater Treatment Directive consolidated the improvements by setting

minimum standards for sewerage collection and treatment. The Bathing Water and Shellfish Waters Treatment Directives added tertiary treatment at specific sites. The Water Framework Directive promotes a more integrated view of river basin management to further improve environmental protection, based on achieving good ecological quality. It provides an environmental planning framework to set objectives and drive investment for the next 20 years of protection and improvement.

Monitoring and reporting

The clear and well-defined monitoring of investment programmes and performance has proved essential to ensure the delivery of outcomes. The UK water companies have to produce comprehensive reports on their activities and outcomes every year ("June Reports") which are scrutinised and checked by Ofwat and the Reporters.

Monitoring programmes need to be integrated and may be undertaken by a number of different organisations, but co-ordinated and agreed by all. The Ofwat Report "Levels of Service for the Water Industry in England and Wales 2006-07" provides an example; it is compiled by Ofwat from information derived from all regulators. The report focuses on outcomes, related to an agreed statistic or indicator (for example, have drinking water standards been met 95% of the time). It should be noted that the report also monitors key elements of the process. For example, the construction of a treatment works may take a number of years and important milestones need to be reported.

Public availability of information

The majority of regulatory performance information and environmental quality and drinking water quality information is published or can be easily obtained from the regulators or the water companies. Very little information is not in the public domain. Generally only commercially sensitive investment material is restricted. This is very important in maintaining public and customer confidence in the systems and services provided, and in developing a balanced view for future investment and priorities.

The setting of water company prices – the Periodic Review Process – provides an opportunity for public debate and discussion of options and opportunities, which will be paid for by customers. A sequence of consultation documents and open letters forms an important part of the process, leading up to guidance from the Secretary of State, and the final prices set by Ofwat. In the United Kingdom, this process operates separately in England, Scotland and Northern Ireland. A parallel to China would be a nationally consistent approach being operated in each province to a local timescale and data availability.

Importance of independent regulation

The key element of the privatised water industry model is the role and strength of the independent regulators. The water companies are unusual in that they are monopolies with little market choice for customers, unlike electricity or gas. For this reason the role of the economic regulator in setting prices, comparing performance and protecting customers is vital.

The role of the Drinking Water Inspectorate in setting standards for potable water, defining levels of risk in treatment processes and ensuring that national and European standards are met is critical. These standards and their timetable for achievement impact on drinking water treatment processes, networks and monitoring requirements, and the investment required.

In addition, the role of the Environment Agency in protecting the environment in terms of water quality and quantity has been a fundamental component in ensuring the performance of the companies. The statutory water abstraction licences and discharge permits form a key element in regulating the privatised water companies. Permits also influence treatment methods, infrastructure requirements and performance.

Increasingly the views and the needs of customers (who pay for the service) are taken into account directly. To reflect this, the government has strengthened the role of the customer in the decision-making process and set up a new body in 2007 called the Consumer Council for Water. This allows customers' views to be channelled into the discussions at local and national levels.

These quality standards greatly influence costs, and clear regulation – combined with monitoring and enforcement – and are essential to ensure that companies undertake their duties in an effective way.

Summary comparison of models

The typical Chinese privatisation model of letting contracts at a municipal level generally involves establishing a purchase cost for the investor to obtain a 49% stake in a Joint Venture company owning and operating the assets (which they may build) and negotiating a tariff that the local government will pay to the Joint Venture company for each unit of water, usually with conditions for taking guaranteed minimum quantities. The tariff paid by the customer to the local government may or may not be related to the tariff paid to the company, such that there may be a profit, or more often a loss, for the municipality. The tariff paid to the company was formerly related to a fixed return on investment rate, but is now better related to the real costs and revenues of the company. However, the Chinese regulatory models are far less sophisticated than incentive-based regulatory principles and processes that can help to strike the balance between the interests of the firm and the consumer in a fair and transparent way, as developed particularly in the United Kingdom.

During 2010-15, the water industry in England and Wales – serving a population of around 50 million, with around 23 million customers – will invest GBP 27 billion in capital maintenance and new infrastructure for improved service (Ofwat, 2008). That represents more than GBP 230 per year per customer from a total average bill of GBP 330 per customer. Between 1990 and 2010 the total investment in water services is estimated at GBP 70 billion. The industry has delivered a very high quality service, very much improved compared with that provided under public ownership up to 1989. The cost to customers has risen but to a lesser degree than the relative increase in the size of the industry. It is estimated that the efficiency gains of the regulated private industry save GBP 100 per year per customer (or 25%) (Water UK, 2008) compared with similar public provision.

Other OECD countries have found ways to achieve similar improvements in service and efficiency savings. In most areas there has been a move towards increased private participation in the industries, balanced by increased regulation and benchmarking. China can learn from these models but will need to invest considerable effort to establish the necessary institutional structures, reporting procedures and skilled human resource capacity to manage such systems.

The overall level of investment greatly exceeds anything that China has so far undertaken in its water sector. Scaling the UK rate of water investment (around GBP 3.5 billion per year) to China, with an urban population more than ten times the size

of the UK population, would represent a significant fiscal commitment by the Chinese government. Finding ways to better leverage private sector involvement could lead to a more efficient, diverse and resilient system. Getting the required investment in second-level cities will be more challenging than the initial successes in getting private sector involvement in the capital cities.

Future directions for China

The successes of the UK privatised model relied upon raising capital for investment not from the public sector but from the private sector, effectively by selling the public assets twice: first through the privatisation raising equity for the businesses and their assets through a public offering, and then again in subsequent years by the private companies borrowing against those assets and gearing the businesses to a high degree. Such a strategy reflects the course of capitalism generally over the past few decades – and as the current economic crisis indicates – such debt-based business has vulnerabilities. These problems have not yet precipitated a crisis in the water sector, and it is not certain that they will do so. But China should consider carefully the consequences of following such a privatisation route.

Notes

1. For a full description of the water resource and water quality situation and the legislative and institutional framework in China, see OECD (2007), *Environmental Performance Review of China*. For detailed analysis of the progress made towards integrated river basin management, see the 2007 WWF/AusAUD publication *Taking Stock of Integrated River Basin Management in China*. For a detailed description of the situation of urban water utilities in China, refer to World Bank (2007), "Stepping Up: Improving the Performance of China's Urban Water Utilities". This report draws from these and other sources to identify some of the ways forward.
2. Chemical Oxygen Demand (COD) is a measure of the amount of material in the water that can react with oxygen in the water. The depletion of oxygen in waster is very bad for the health of the river ecosystem. This is a relatively straight forward chemical test that gives a general indication of the degree of pollution. The simple COD test does not differentiate between material that would react quickly or very slowly nor does it indicate chemical toxicity or impact on ecosystems. Other pollution measures such as Biological oxygen demand (BOD), ammonia concentration and the measure of nutrients are also required.
3. Environmental Impact Assessment.
4. There was a major reorganisation of Chinese ministries in 2008, with the former State Environmental Protection Agency (SEPA) being promoted to a full ministry with increased influence and funding.
5. This assertion is based on an interview with officials of MEP.
6. Also translated as "Regulations of Yellow River Water Regulating".
7. The water authorities of Qinghai, Sichuan, Gansu, Ningxia, Inner Mongolia, Shaanxi and Shanxi provinces/autonomous regions are responsible for regulation of the main stream and tributaries.
8. The Henan and Shandong Bureaus are responsible for water regulation of the Yellow River main stream only; the water authorities of Hebei Province and Tianjin Municipality are responsible for regulation of the water diverted from the Yellow River to their jurisdiction.
9. The Implementation Rules (2000) of the WPPC Law mention a discharge-permitting system but do not define it and could be legally challenged. A pilot discharge permit system is defined by SEPA decrees for the Huaihe and Taihu lake areas. Elsewhere discharge permits have been trialled but are not enforceable; nor was there any sanction for an enterprise that refuses to obtain such a discharge licence.
10. For examples see: 7 key tasks in 2007 for the Water Resource Protection Bureau, CWRC (Web news, 2007-2-13); Approval on the implementation scheme for water-saving society 2006-08 developed by

Tianjin WRB; Proposals from Mingjian (a democratic party) in Jinzhou, Liaoning Province: To unify the management of water affairs in city and rural area; Mr. Ye Jianchun, Director of Taihu Water Basin Management Bureau, MWR – To stipulate the integrated water basin management so as to ensue the sustainable water utilization. May, 18, 2006; Mr. Chen Qingqiu, South Institute of Technology, Guangzhou – A study on schemes of reforming Guangdong provincial government institution for unifying water resources administration, web news from Guangdong WRB, April 29, 2006.

11. Here, WRB refers to the provincial or municipal MWR department responsible for water resources management. In some cities the responsibilities of MWR and MOHURD have been combined to form the Water Affairs Bureaus WAB, which holds joint responsibility for water resources, monitoring and provision of water supply and wastewater treatment (where provided).

12. BREF Notes = Reference Document on the application of Best Available Techniques; Origin: European Council, prepared in accordance with EC Directive 96/61/EC on Integrated Pollution Prevention and Control (IPPC) Article 16(2): Exchange of information between EU member states and industry. They compile industry experience and recommended methods of cleaner production for each industry sector for exchange and dissemination.

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CHINA

DEFINING THE BOUNDARY BETWEEN THE MARKET AND THE STATE

China's advance to a market economy is among the greatest economic success stories of modern times. China has made enormous progress in developing the modern legal and regulatory foundation for the market economy. The private sector is now the main driver of growth, and new laws have gone a long way toward establishing private property rights, competition, and mechanisms for entry and exit comparable to those of many OECD countries. At the same time important challenges remain, including further clarification of the scope of state ownership, reform of relations among central and local governments, firmer establishment of the rule of law, and strengthening of regulatory institutions and processes.

China's transition has recently been reviewed under the OECD Regulatory Reform Programme. The review focuses on the overall economic context for regulatory reform, the government's capacity to manage regulatory reform, competition policy and enforcement, and market openness. The review also examines the regulatory framework in the electricity and water sectors. As for OECD countries, the review follows a multidisciplinary and highly interactive approach. A number of OECD instruments and policies are used in this assessment, although the review also takes into account the specific challenges faced by the Chinese authorities.

The review contains a comprehensive set of policy recommendations, which should support China in its efforts to implement regulatory reforms in order to boost economic growth, job creation, innovation and investment.

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