

OECD Reviews of Tertiary Education

CHINA

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Table of contents

Executive Summary **5**

1. Introduction **17**

1.1 Purposes of the OECD Review 17
1.2 The Participation of China 19
1.3 Structure of the Country Note 20

2. National Context **23**

2.1 Geography 23
2.2 Government 23
2.3 Demography 24
2.4 Economy 25
2.5 China's economy in transition 28
2.6 Education 32
2.7 Tertiary education 33
2.8 Research 37
2.9 Reform of personnel management in TEIs 37
2.10 Main achievements to date 40
2.11 Challenges ahead 41

3. System Governance, Planning and Regulation **43**

3.1 Main features 43
3.2 Challenges 44
3.3 System-level planning and mission differentiation 45
3.4 Autonomy versus regulation 47
3.5 The role of the private sector 48
3.6 The societal and regional role of tertiary education 49

4. Labour Market Linkages **57**

4.1 Context 57
4.2 Labour market benefits from tertiary education 59
4.3 Pointers for future policy development 63

5. Learning Effectiveness and Quality **65**

5.1 Context 65
5.2 Learning effectiveness 67
5.3 Accreditation and quality assurance 69
5.4 Pointers for future policy development 70

6. Student Access and Equity of Opportunity **73**

6.1 Context 73
6.2 Major issues 76
6.3 Pointers for future policy development 80

7. Tertiary Education Financing **83**

7.1 Context 83
7.2 Main issues 85
7.3 Pointers for future policy development 88

8. The Role of Tertiary Education in Research and Innovation **91**

8.1 Context 91
8.2 The size and structure of China's RDI system 92
8.3 Policy development and evolution of RDI system 95
8.4 Pointers for future policy development 98

9. Internationalisation **101**

9.1 Context 101
9.2 Main issues and pointers for policy development 108

10. Concluding Remarks **111**

References **113**

Appendix 1: The OECD Review Team **117**

Appendix 2: National Co-ordinator, National Advisory Committee, and Authors of the Country Background Report **119**

Appendix 3: Programme of the Review Visit **121**

Appendix 4: Comparative Indicators on Tertiary Education **125**

This report is based on a study visit to China in March 2007, and on background documents prepared to support the visit. As a result, the report reflects the situation up to that point.

Executive Summary

This Country Note offers independent, external observations of the tertiary education sector in the People's Republic of China.[1] It forms part of the OECD Thematic Review of Tertiary Education. The Thematic Review is designed to examine policy frameworks and settings for tertiary education across participating countries. The scope of the Review considers tertiary education in its broad economic and labour market context, as well as its linkages with the other sub sectors of education.

The scale of the task

China is a vast country of great diversity. It is the world's largest in population and the fourth largest in area. Historically China is one of the great civilisations. It is emerging as a future global force. In just the last few decades, impressive gains have been achieved in poverty alleviation and socio-technical progress. Now, as a modernising developing country, China confronts the challenges of economic development and social cohesion in a context of unprecedented global competitive pressures and environmental stresses.

China's path to progress via a socialist economy does not neatly fit the norms of development of OECD member countries. There are many policy issues that China faces in common with other nations, and while the Chinese authorities are open to adapting best international practices in addressing them, it would be a mistake to believe that they are seeking simply to imitate the progress of others. Rather, they are pursuing a unique path and there are significant institutional differences in policy objectives, modes of decision making and governance culture. In approaching our task we cannot simply assume that institutional arrangements we might take as given for our own countries should or will fit the circumstances of China.

1 This Country Note does not cover the administrative zones of Hong Kong China and Macao China or Chinese Taipei, each of which has its own education system.

Several of the challenges for tertiary education arise from economic and social drivers beyond the education system and require policy responses not only in respect of education and training but also in broader economic and social policy frameworks, and inter-governmental financial relations. Our observations are necessarily limited to the scope of our brief visit but need to be seen within a broader whole-of-government policy perspective.

Significant achievements to date

In tertiary education, China has made truly remarkable progress since the early 1990s. The tertiary education participation rate has risen from less than 10% to over 22%, and student enrolments have expanded from 5 to 25 million. Annual graduate output reached 5 million by 2004, including 2.4 million from Bachelor Degree and Diploma programmes at regular tertiary education institutions, 1.9 million from adult and 0.4 million from web-based undergraduate degree and diploma programmes, and 0.2 million from postgraduate programmes. Additionally, some 20 000 graduates are now returning annually to China from studies abroad.

With 1.3 million researchers, China now ranks second worldwide behind the United States and is also the world's second highest investor in R&D after the United States. Major investments have been made in modernising teaching and research infrastructure.

Far-reaching reforms have been made to improve productivity in tertiary education and research. Academic personnel are recruited through open advertisement and on a merit basis. A strong system of performance management is being implemented. Steps are being taken to improve teaching practices and quality assurance.

Challenges ahead

China faces the dilemma faced by many countries of simultaneously seeking to expand the quantity of tertiary education, widen access and improve quality, within a tight fiscal constraint. But China faces this dilemma on an unprecedented scale in terms of student number and timeframes. China also has to meet particular challenges, on the one hand, arising from pressures to respond to rapidly rising student and parental aspirations for tertiary education as a means to upward social mobility, and on the other hand, reflecting the realities of absorptive limits and uneven price signals of labour markets in the rapidly transforming economy.

There are clear stresses on the tertiary education sector. Given the capacity limits to expansion, not least the availability of appropriately qualified teaching personnel, continuing rapid expansion without

appropriate new policy measures could diminish the quality of tertiary education. Opportunities for access and success are unequally distributed, reflecting differences in the economic circumstances of regions, the capacity and quality of their primary and secondary schooling systems, and further expansion of tertiary education without correction to underlying structural deficiencies could widen inequalities.

Employment opportunities for graduates are variable also on a regional basis, with current indications of graduate over-supply in general alongside skills shortages in particular areas. While longer term projections of labour demand suggest the need to produce much greater numbers of highly educated professionals and highly trained technicians, the current graduate unemployment and under-employment problems indicate deficiencies in the nature of tertiary education itself. It appears that China has exhausted the scope for cramming a mass system into an elite structure. It cannot reasonably expect to yield benefits from investment in human capital formation on the base of a traditional mode of education that does not cater well for diverse groups of learners and is more naturally suited to knowledge acquisition than to the capability development needed for a competitive global economy.

The Review Team found tertiary education in a transitional stage. The Chinese authorities understand well the condition of tertiary education and the need for its ongoing reform. After a period of very rapid expansion China has entered a period of stabilisation in an effort to address concerns about quality, equity and apparent imbalances between graduate supply and labour market demand. This period of stabilisation provides an opportunity for dialogue about the role of tertiary education in an economy in transition and a future vision for tertiary education in China.

The Review Team addresses the following seven policy areas as a contribution to this wider strategic dialogue:

i. ***Planning*** the scale and structure of the system, and its links with labour markets;
ii. ***Access*** for school leavers and adult learners;
iii. ***Learning*** for capability development;
iv. ***Quality*** improvement and quality assurance;
v. ***Financing*** on an equitable, efficient and transparent basis;
vi. ***Innovation*** through knowledge linkages contributing to enterprise and regional development; and
vii. ***Internationalisation*** of education and research.

Planning

China has sought to manage the development of its tertiary education system through its comprehensive quinquennial planning processes at the national level. These plans translate into investment priorities for growth in tertiary education participation and expansion of institutional capacity. However, the varying responses at local levels to social pressures can sit at odds with central planning pronouncements regarding the optimal scale of enrolments and structure of provision. Extensive decentralisation of administrative arrangements allows for gaps in provision, inequities in access, barriers to learning pathways, and worrying differences in the quality of learning experiences and outcomes. At the same time, various aspects of tertiary education are regulated centrally at a level of detail, and through a one-size-fits-all approach, that can reduce institutional flexibility, innovation and differentiation. Considerable scope exists for improving policy coherence and planning coordination and reducing regulatory prescriptiveness.

Through reasonably rigorous accreditation requirements, the Chinese authorities have endeavoured to manage the structure of tertiary education provision. In particular, authorisation to conduct postgraduate education and research training has been controlled on the basis of demonstrated capacity and performance. At the undergraduate level, however, there is less clarity and less consistency. Tertiary education opportunities reflect the relative financial capacity of different provinces and municipalities, and some programmes offered at Bachelor Degree level in some institutions, including in the more prosperous regions that can afford greater supply, appear less intellectually demanding than sub-Bachelor Degree programmes offered elsewhere. One unfortunate consequence is that students from several of the less advantaged regions face higher hurdles at the entry stage and achieve lower standard qualifications on exit than their counterparts from richer regions. Compounding the equity problem is the lack of systematic transfer arrangements and credit recognition across institutional and regional boundaries. Greater attention needs to be given to the structure and quality of tertiary education. There is a need for qualitative improvement at all levels. Quantitative expansion should be directed to vocational, technical and paraprofessional areas.

Continuing growth in the economy's demand for highly skilled personnel, and increasing social pressures for tertiary education access, will require gradual expansion of tertiary education opportunities. With the peaking of the 18-22 years age cohort in 2008, the future expansion will involve a greater diversity in the student mix as the participation rate rises. Accordingly, tertiary education will need to adapt to the changing student

composition through more diverse forms of provision and modes of learning, and the challenges of the necessary transition – in terms of cost-effectiveness, quality and equity – will need to be managed carefully.

In our view a stronger role needs to be played by central government in planning the scale and shape of tertiary education provision, assuring quality, ensuring more equitable access, and building articulation between the different parts of the system. A wider role for central government will require the enlargement of its financing responsibilities and a renegotiation of inter-governmental fiscal relations, as well as increased private investment. An important role for such an agency would be that of involving new constituencies in the process of policy formation, particularly employers of graduates.

Consideration will need to be given to the best way of steering the changes in the tertiary education system. A major task is to clarify the mission of all the different types of tertiary education institutions (TEIs) to achieve the diversity needed to meet varying needs, while ensuring a reasonable degree of consistency in the performance standards of TEIs within each type to achieve improvements in equity and efficiency. Particular care will need to be given to balancing the need for China to build research-intensive universities that are globally competitive while building-up the capacity of other TEIs to contribute particularly to China's national and regional needs, and not confusing these goals. At least for the transitional period ahead it may be worthwhile to establish a special authority for the national development of tertiary education, perhaps as an intermediary agency between governments, enterprises and TEIs.

Access

Equity of opportunity in tertiary education requires a number of pre-conditions as well as specific policy instruments. The first requirement is a framework of fiscal equalisation for creating a level playing field on a regional basis, which we discuss below under the financing heading. The second requirement is adequacy of student preparation through early childhood education and primary and secondary schooling. The third requirement relates to tertiary education policy architecture – the design of the system in terms of institutional missions and the linkages between them. The fourth requirement is for forms of financial assistance for students to overcome financial impediments to their participation, also discussed below. The fifth requirement is for institutionally-based student services for supporting students who have learning difficulties.

We note that increasing attention is being given to improving the effectiveness of schooling. During the course of this Review the Central

Government initiated measures to extend free compulsory education. We also note that China has developed a wide suite of equity interventions in tertiary education through needs-based scholarships, fee waivers, part-time work options, and student loans. Additionally, there is an extensive, well-designed and efficient system of distance education enabling access for many, especially in more remote areas. As a consequence, many more students are participating than could otherwise afford to do so, including ethnic minorities. Gender equity too is a notable achievement in China. We also observed some commendable practices in a number of TEIs in respect of student support. These interventions, however, with the exception of distance education and web-based initiatives, are directed to micro-level issues of access in a context where the macro policy framework is problematic from an equity perspective.

We believe there is a case for examining the extent to which accessibility can be improved by focussing the mission of some institutions on meeting the needs of under-represented groups; improving articulation between 'vocational' and 'academic' institutions so that credit accumulation and transfer arrangements are rendered more robust at a regional level; and developing formal 'hub-and-spoke' arrangements between institutions (perhaps modelled on successful examples in the public university systems in the United States) which combine outreach with seamless progression opportunities.

With a gradual increase in the tertiary education participation rate, which involves widening the range of students admitted to academic and (particularly) vocational programmes, consideration ought to be given also to broadening the means by which students are selected. The current national examination system offers advantages of merit-based transparency in admissions, and the high level of selectivity brings efficiency benefits through high rates of tertiary progression. However, the single system reinforces the second-best status of vocational-applied learning relative to academic-theoretical learning. Considerable pressure is put on young people in their years of secondary and upper-secondary schooling to achieve in the national ranking, and the options available for those who are seen to have 'failed', by not scoring the marks needed for entry to academic study, deny them many life chances. Vocational education ought to be seen as a worthwhile pursuit in its own right rather than a fallback when other options are closed off. Students who start out on one track should also have the chance to transfer to another track according to their needs and abilities. Wider options for students could be facilitated by additional flexibility in the national examination system.

Learning

An economy that lacks the skills to innovate will ultimately find its development trajectory will be truncated. It will be captive to a culture of emulation rather than leadership, dependent on the ideas, design creativity and technological inventiveness of others.

The Chinese authorities recognise the need for curricular and pedagogical reform in tertiary education, to ensure that graduates have the knowledge and skills that the modernising economy requires. In particular, there is recognition of the need for tertiary education generically to develop skills of critical inquiry, creativity, problem solving, communication and team work. A number of educators indicated to us that they see the need to move beyond a passive knowledge-oriented approach to a more active capability-development approach, and they appreciate how profound a change that involves in terms of culture and practice.

We gained the impression that discussions about this transformation are at early stages and that there are only a few places where serious efforts are being made to complement conventional classroom practices with interactive and experiential learning modes to help students to develop broader skill sets. Much more will need to be done to increase the value added by tertiary education to skills formation.

Consideration might be given to a more systematic approach to reform of curricula, pedagogy and evaluation. A National Qualifications Framework specifying for each level of qualification the expected attributes of graduates, could help to focus thinking about curriculum design, pedagogy and evaluation on learning outcomes. Such a framework could serve as a reference point for TEIs in designing and evaluating their programmes, and also indicate the links and pathways between different qualifications.

It is important that educational authorities and TEIs engage more directly with employers of graduates, in identifying changing job requirements and monitoring employers' expectations of graduates and their satisfaction with those they have employed. There is also a need for a more systematic and comprehensive approach to the provision of labour market information to guide student choice. Surveys of graduate destinations would be more informative if they were undertaken six or nine months after graduation rather than (currently) after three months. Additionally, these surveys should track the earnings of graduates. Consideration might be given to making wider use of the capacity of the China Central Radio and Television University to undertake national surveys of graduate and employer satisfaction, as a basis for expanding the provision of information

for parents and prospective students, and for improving the national data base for evaluating the effectiveness of tertiary education.

Taken together, the various challenges for TEIs pose new demands on TEI leadership, requiring a more professionalised approach to the appointment, induction and development of institutional leaders. The challenges also call for new approaches and new skill sets on the part of policy makers and administrators at the central and provincial levels of government.

Quality

China has recently developed a national system of quality assurance but the system is not yet applied consistently across all regions and municipalities. It seems focussed on input measures, relies disproportionately on student feedback and appears to pay little attention to the educational outcome standards expected across all institutions of a similar type irrespective of their geographical location. There appear to be particular problems in respect of private TEIs.

As a result there is an unacceptably wide variation in quality at the regional, and even sub-regional, level. This is not only potentially socially regressive (poorer students receive poorer quality education), but it clearly works against regional equity. It also fails to give China the skills it needs to build up economic sectors that are under-developed.

There is a need for a much higher level of investment in the national quality assurance system and a more nationally consistent approach to quality control. The development of a national qualifications framework that articulates what outcomes are expected for each qualification (see above) would help bring about the necessary change of focus on the part of quality assurance bodies that are otherwise inclined to be concerned predominantly with procedures. An expansion of the institutional 'twinning' arrangements across regions would also be worthwhile, including by extending the arrangements internationally.

Financing

Gradual expansion of tertiary education participation, alongside improvement in the quality of tertiary education, will require increased government and private expenditures, improvement in operational efficiency and a more equitable distribution of resources. China will need to raise its spending on tertiary education as a proportion of its expanding GDP.

A sustainable and equitable development path will require a better balance in intergovernmental fiscal relations. An assessment should be made of the relative revenue capacities and cost disabilities of regions, and a method should be negotiated for evening out the regional inequities through financial transfers.

To improve equity and efficiency, the financing of public TEIs should shift from the current semi-opaque approach to a more transparent and normative system of common funding rates per student place by field and level of education, within the revised approach to planning discussed above, including mission-based compacts with each TEI. This shift should enable wider tuition pricing variance across TEIs and help bring graduate supply into closer alignment with labour market demand as the economy matures. TEIs also would have enhanced responsiveness to meet varying student needs, and would have greater incentive to find internal operating efficiencies, were they to be given broader blocks of funding inputs, with some carry-over of unspent funds year on year, linked to accountability reporting for outcomes.

We note the recent initiatives to extend scholarships to promote the participation of high-achieving students from poor families in vocational secondary and tertiary education. We also see the emerging need for a broader system of student loans, preferably on an income-contingent basis, targeted to students on the basis of financial need. The current loans schemes involve an interest-free period while studying and a delay after graduation before repayments commence. After that, the graduates must make their repayments typically within six years, irrespective of their employment status or income. Given the extent of graduate unemployment and under-employment, the current arrangements may well entrap a number of graduates, and that experience may deter others from participating. A model where the government has leverage over repayment obligations also opens up the possibilities to waive debts for graduates working in occupations and regions of national priority. Consideration ought to be given also to extending the availability of income-contingent loans to students enrolled in *minban* that satisfy rigorous expectations of quality, as a means of expanding access through the private sector.

Innovation

China has given attention to the role of research in the development of new ideas for commercial application, and significant investment has been made in building up research expertise and infrastructure in universities and research institutes, in larger enterprises and in science and technology parks. The concentration of capability for basic research in selected universities is

laying firm foundations for the future. Further development of university research capability is essential for China to realise its aspirations as an advanced economy. Greater attention could be given to the flow of tacit knowledge into enterprises through the employment of graduates and linkages between universities and firms.

The further enlargement of China's national innovation system will require continuing efforts to build basic research capacity in selected universities, increase the science and technology researcher pool, and promote stronger processes of knowledge exchange. The prevailing 'science-push' approach to innovation will need to be complemented more by 'market-pull' approaches, and the research-intensive universities and other technology-intensive TEIs will need to be open to more fluid ways of working with enterprises. Towards this end, the absorption capacities in industries, which is weak, will need to be augmented.

Internationalisation

China is becoming increasingly open to the international business of tertiary education. Numerous Chinese students have undertaken undergraduate and postgraduate studies in foreign countries and continue to do so. China is now host to foreign tertiary students and to foreign tertiary education providers. However, internalisation is under-developed and overly formalised through institutional memoranda and agreements, many of which appear to be symbolic rather than substantive.

China is expanding its participation in international collaborations in research and tertiary education, including academic exchanges, joint research projects, and international alliances involving shared infrastructure. There is very much wider scope for such activities. More attention might be given to fostering and enabling dynamic researcher-led collaborations.

The internationalisation of tertiary education and research is changing the nature of educational demand as well as supply, and giving rise to new pressures on national policy frameworks, including qualifications recognition, tuition pricing, quality assurance and consumer protection.

Vision

In summary, we see tertiary education helping China to build an internationally engaged competitive economy and a cohesive society. We envisage China gradually enlarging participation in tertiary education over the next decade, developing a quality tertiary education system of diverse institutions that are capable of responding to changes in student demand and

labour market requirements, with a number of them performing research at the highest international standards.

We see a major improvement in quality of tertiary education through more consistent accreditation and quality assurance procedures, and improved teaching practices that enable students to develop the communication, reasoning, critical analysis, creativity, teamwork and problem solving skills they need for life, work and further learning.

We see much of the future enrolment growth occurring in areas related to emerging technician and paraprofessional occupations as China expands the service sector of the economy and develops its productive capacities on an environmentally sustainable basis. We see opportunities across the tertiary education system, through articulation pathways and bridges, for learners to continue to learn and advance their position, without having to repeat courses that teach them what they already know. We see better labour market information for parents and students to guide their educational choices.

While we see an expansion in tertiary participation, especially at the base of the sector, we also see an intensification of research capability at the top of the sector, whereby China's leading universities take their place among the world's leaders in the generation and dissemination of new knowledge, interacting with scholars from around the world, collaborating on international scientific projects on a major scale, and building bridges of understanding across the world's cultures.

1. Introduction

1.1 Purposes of the OECD Review

This Country Note on the People's Republic of China forms part of the OECD Thematic Review of Tertiary Education. This is a collaborative project to assist the design and implementation of tertiary education policies which contribute to the realisation of the social and economic objectives of countries.

The tertiary education systems of many OECD countries have experienced rapid growth over the last decade, and are experiencing new pressures as the result of a globalising economy and labour market. In this context, the OECD Education Committee agreed, in late 2003, to carry out a major thematic review of tertiary education. The principal objective of the review is to assist countries to understand how the organisation, management and delivery of tertiary education can help them to achieve their economic and social objectives. The review focuses on tertiary education policies and systems rather than the detailed management and operation of institutions, although clearly the effectiveness of the latter is influenced by the former.

The project's purposes, methodology and guidelines are detailed in OECD (2004a).[2] The purposes of the review are:

- To synthesise research-based evidence of the impact of tertiary education policies and disseminate this knowledge among participating countries;
- To identify innovative and successful policy initiatives and practices;
- To facilitate exchanges of lessons and experiences among countries; and
- To identify policy options.

2 Reports and updates are available from *www.oecd.org/edu/tertiary/review*

The review encompasses the full range of tertiary programmes and institutions. International statistical conventions define tertiary education in terms of programme levels: those programmes at ISCED[3] levels 5B, 5A and 6 are treated as tertiary education, and programmes below ISCED level 5B are not.[4] In some countries the term higher education is used more commonly than tertiary education, at times to refer to all programmes at levels 5B, 5A and 6 and at times to refer only to those programmes at levels 5A and 6. An additional complication is presented by the practice, in some countries, of defining higher education or tertiary education in terms of the institution rather than the programme. For example, it is common to use higher education to refer to programmes offered by universities, and tertiary education to refer to programmes offered by institutions that extend beyond universities. The OECD thematic review follows standard international conventions in using tertiary education to refer to all programmes at ISCED levels 5B, 5A and 6, regardless of the institutions in which they are offered.

The project involves two complementary approaches: an *Analytical Review strand*; and a *Country Review strand*. The Analytical Review strand is using several means – country background reports, literature reviews, data analyses and commissioned papers – to analyse the factors that shape the outcomes in tertiary education systems, and possible policy responses. All of the 24 countries involved in the Review are taking part in this strand. In addition, 14 of the tertiary education systems have chosen to participate in a Country Review, which involves external review teams analysing tertiary education policies in those countries.

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3 The International Standard Classification of Education (ISCED) provides the foundation for internationally comparative education statistics and sets out the definitions and classifications that apply to educational programmes within it.

4 Programmes at level 5 must have a cumulative theoretical duration of at least 2 years from the beginning of level 5 and do not lead directly to the award of an advanced qualification (those programmes are at level 6). Programmes are subdivided into 5A, programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements, and into 5B, programmes that are generally more practical/technical/occupationally specific than ISCED 5A programmes. Programmes at level 6 lead directly to the award of an advanced research qualification. The theoretical duration of these programmes is 3 years full-time in most countries (*e.g.* Doctoral programme), although the actual enrolment time is typically longer. These programmes are devoted to advanced study and original research. For further details see OECD (2004b).

China, although not a member country of the OECD, opted to participate in the Country Reviews and hosted a visit in March 2007. The reviewers comprised two OECD secretariat members, and academics and policy makers from Australia, Ireland, Switzerland and the United Kingdom. The team is listed at Appendix 1.

1.2 The Participation of China

China's participation in the OECD Review was coordinated by the State Ministry of Education in Beijing. The China Country Background Report (CBR) for the OECD Review was prepared by the National Centre for Education Development Research (details provided in Appendix 2).

The Review Team is very grateful to the authors of the CBR, and to all those who assisted them in providing an informative, analytical and policy-oriented document. The CBR covered themes such as: the background and content of tertiary education reforms; the structure of the tertiary education system; tertiary education and the labour market; regional development and tertiary education; the role of tertiary education in research and innovation; tertiary education financing; and the challenges faced in assuring quality, preparing graduates for work and further learning, achieving equity, and strengthening capacity for institutional governance and system steering. Major issues identified in the CBR and taken up in this Country Note, include:

- Resourcing the system adequately for future growth and quality enhancement;
- Expanding access for students who are under-represented, including students from minority groups and from rural and regional areas;
- Improving the readiness of graduates for changing labour market conditions; and
- Managing the processes of internationalisation.

The China CBR forms a valuable input to the overall OECD project and the Review Team found it very useful for its work. The CBR is the main source of data for this Country Note, and the analysis and points raised in the CBR are cited frequently hereafter.[5]

[5] Unless indicated otherwise, the data in this Country Note are taken from the China Country Background Report (Ministry of Education, 2007).

The review visit took place from 5 to 16 March, 2007. The itinerary is provided in Appendix 3. The friendship and hospitality extended to us throughout our stay in China made our task as pleasant and enjoyable as it was stimulating and challenging. The Review Team held discussions with officials of the state Ministry of Education and provincial education commissions, with senior personnel of a number of tertiary education institutions, with students, and with employers. We found these interactions to be open, frank and reflective. These discussions helped the Review Team to gain a variety of stakeholder perspectives regarding the functioning of tertiary education in contemporary China.

This Country Note draws together background information, the content of discussions with multiple stakeholders, and the Review Team's own observations. We benefited greatly from the background materials and the supplementary data compiled for us by the Ministry of Education at our request. We are very conscious of our limited exposure to such a vast and diverse country. We were able to visit only a small number of institutions and to meet merely a few stakeholder representatives in the time available. We are mindful of the limits to our capacity to generalise for China as a whole, not only because we could not experience many very different parts of China but also because the conceptual frameworks we bring from our experiences in developed western countries cannot be transposed simply on the conditions of China. The conclusions as well as errors or misinterpretations in this Country Note are the responsibility of the Review Team.

1.3 Structure of the Country Note

The remainder of this Country Note is organised into nine main Sections. Each of the Sections deals with current conditions, policy strengths and challenges, and pointers for future policy development.

Section 2 outlines national contextual factors affecting tertiary education in China, including social and economic pressures, achievements to date, and policy challenges ahead. Section 3 deals with matters of tertiary education system structure, governance, planning and regulation. Section 4 considers the links between tertiary education and the labour market(s). Section 5 deals with matters of learning effectiveness and quality assurance. Section 6 considers matters of student access and equity of opportunity. Section 7 discusses aspects of institutional and student financing. Section 8 deals with the role of tertiary education in research and innovation. Section 9 discusses aspects of the internationalisation of tertiary education as it affects China and as China influences internationalisation processes.

Section 10 provides overall conclusions and identifies major areas warranting further policy consideration.

Our approach is one of a 'contribution to a dialogue'. We are aware of and impressed by the considerable consideration of policy analyses within China. We are even more aware of our limited appreciation of China's diverse and dynamic circumstances. Given the scale and diversity of China, our limitations and a lack of definitive data in key policy areas, this Country Note is oriented to broad 'system' level issues, focuses on key areas warranting improvement (noting achievements to date), and raises issues in term of policy principles, options and trade-offs (rather than specific recommendations for action).

2. National Context

2.1 Geography

China has a total area of 9 596 960 km² (3.7 million square miles) and a land mass of 9 326 410 km². China is the world's fourth largest country in area, after Russia, Canada and the United States. Mount Everest, on the border with Nepal, is the world's highest peak. Less than 15% of the land is arable. Some 545 000 km² is irrigated land.

China borders the East China Sea, Korea Bay, the Yellow Sea and the South China Sea between Korea and Vietnam. China has land borders with 14 countries: Afghanistan; Bhutan; India; Kazakhstan; Kyrgyzstan; Laos; Myanmar; Mongolia; Nepal; North Korea; Pakistan; Russia; Tajikistan; and Vietnam.

2.2 Government

The People's Republic of China was established on 1 October 1949 as a communist state. The Party Congress, which meets every five years, is the principal body of the Chinese Communist Party (CCP). Main operating organs of the CCP are: the Politburo Standing Committee (9 members); the Politburo (24 members); the Secretariat; the Central Military Commission; and the Discipline Inspection Commission. The government gives effect to party policies. In important government, economic and cultural institutions (including tertiary education institutions) committees of the CCP work internally to promote consistency of practice with party and state policy.

Under the Constitution, the main organs of state power are the National People's Congress (NPC), the President, and the State Council. The State Council includes the Premier (head of government), four vice-premiers, five state councillors, 22 ministers and 4 state Council commission directors. The Head of State is the President: Hu Jintao. He is also General Secretary of the Politburo Standing Committee of the Chinese Communist Party, and Chairman of the Central Military Commission. The Vice-President is Zeng

Qinghong. The Premier is Wen Jiabao. The Chair of the NPC is Wu Bangguo.

The National People's Congress meets annually for about two weeks to review and approve major new policy directions and laws, the budget, and major personnel changes. When the NPC is not in session, its permanent organ, the Standing Committee, exercises state power.

The administrative divisions of the state comprise:

- 23 Provinces: Anhui; Fujian; Gansu; Guangdong; Guizhou; Hainan; Hebei; Heilongjiang; Henan; Hubei; Hunan; Jiangsu; Jiangxi; Jilin; Liaoning; Qinghai; Shaanxi; Shandong; Shanxi; Sichuan; Yunnan; Zhejiang. (The PRC includes Chinese Taipei in its list of provinces)
- 5 autonomous regions: Guangxi; Nei Mongol; Ningxia; Xinjiang, Xizang
- 4 municipalities under control of the State Council: Beijing; Chongqing; Shanghai; Tianjin
- 2 Special Administrative Regions: Hong Kong and Macao.

2.3 Demography

The estimated population of China in July 2006 was 1 313 973 713, with an annual population growth rate of 0.6%. Some 21% of the population are aged 0-14 years, 71% 15-64 and 8% 65 years and over. The median age of the population is 32.3 years for males and 33.2 years for females. Life expectancy is 70.89 years for males and 74.46 years for females.

The largest ethnic group is the Han Chinese (92%). Other ethnic groups include Zhuang (16 million), Manchu (10 million), Hui (9 million), Miao (8 million), Uygur (7 million), Yi (7 million), Mongolian (5 million), Tibetan (5 million), Buyi (3 million), Korean (2 million) and other minorities.

There are seven major Chinese dialects and many sub-dialects. Mandarin (Putonghua), the official language and the medium of government, is spoken by over 70% of the population, and is taught in all schools. About two-thirds of the Han ethnic group are native speakers of Mandarin; the rest, concentrated in southeast and southwest China, speak one of the other six major Chinese dialects. Non-Chinese languages spoken widely by ethnic minorities include Mongolian, Tibetan, Uygur and other Turkic languages (in Xinjiang), and Korean (in the northeast).

China's 2002 Population and Family Planning Law and policy permits one child per family, with allowance for a second child under certain circumstances, especially in rural areas, and with looser guidelines for smaller ethnic minority groups. The central Government's goal is to stabilise the population in the first half of the Twenty-First Century. Current projections are that the population will peak at around 1.6 billion by 2050.

China has 100.6 million people aged above 65 years, accounting for 7.7% of the total population. It is projected that the aged population will reach 170 million by 2010, 12.5% of the total, and 243 million (17%) by 2020. The workforce aged population (15-64 years) is projected to continue rising until 2016 to a peak of 997 million. The labour force stood at 940 million in 2005, and is projected to grow by 5.2 million persons per year on average over the next decade.

2.4 Economy

In terms of Gross Domestic Product (GDP) China ranks sixth in the world. In purchasing power parity terms China is now the world's second largest economy. China's economy grew at an average rate of 10% per annum over the period 1990-2004, representing the highest growth rate in the world. China's total trade in 2005 surpassed US$ 1.4 trillion, making China the third largest trading nation after the United States and Germany.[6]

China's total GDP has almost doubled over the last five years, as has average GDP per capita. China is accumulating substantial surpluses on the current account as export growth continues to accelerate. China's strategy of fostering foreign-invested factories, which assemble imported components into consumer goods for export, has been an important source of export growth.

6 The renminbi ("people's currency") is the official currency in the mainland of the People's Republic of China, whose principal unit is the yuan. It is issued by the People's Bank of China. The official ISO 4217 abbreviation is CNY, although also commonly abbreviated as "RMB". The Latinised symbol is ¥.

Table 2.1 Key economic indicators, China (2001 – 2006)

Economic Indicator	2001	2002	2003	2004	2005	2006[1]
GDP (US$bn)	1 324.8	1 453.8	1 641.0	1 931.6	2 234.1	2 554.2
GDP PPP[2] (US$bn)	5 933.4	6 586.4	7 392.2	8 352.8	9 412.4	10 518.2
GDP per capita (US$)	1 038	1 132	1 270	1 486	1 709	1 944
GDP per capita PPP[2] (US$)	4 649	5 127	5 720	6 426	7 198	8 004
Real GDP growth rate (%)	8.3	9.1	10.0	10.1	10.2	10.0
Current account balance (US$m)	17 405	35 422	45 875	68 659	160 818	184 172
Current account balance (% GDP)	1.3	2.4	2.8	3.6	7.2	7.2
Goods and services exports (% GDP)	22.6	25.1	29.6	34.0	37.5	38.9
Inflation rate (%)	0.7	-0.8	1.2	3.9	1.8	1.5

Notes: 1. Estimate; 2. PPP = Purchasing Power Parity.

Source: International Monetary Fund.

Some 45% of the working population is engaged in agriculture, even though only 15% of land is arable and only 10% of the land is suitable for cultivation and agriculture contributes only 13% of China's GDP. Manufacturing and construction, which contribute 46% of GDP, account for some 24% of the employed labour force. Services represent some 31% of employment.

In terms of agriculture, China is among the world's largest producers of rice, corn, wheat, soybeans, vegetables, tea and pork. Major non-food crops include cotton, silk and other fibres, and oilseeds. Programmes for increasing agricultural production are focussed on improvements to plant stocks, fertilisers and technology applications. Impediments to productivity improvement include policies that promote self-sufficiency in grains, restrictions to property rights, and deficiencies in storage, port facilities, warehousing and logistics. Productivity improvements in agriculture will be associated with continuing reductions in the share of the labour force involved in agricultural production.

China's major industries are mining and ore processing, iron, steel, aluminium, coal, machinery, textiles, clothing, apparel and footwear,

armaments, petroleum, cement, chemicals, fertilisers, electronics, automotive transport vehicles and components, ships and aircraft, and telecommunications. China is the world's largest producer of computers and mobile phones. Hi-tech exports comprised more than 28% of total exports in 2005.

Despite high rates of growth in GDP, trade and investment, overall economic performance is held back by inefficiencies in state-owned enterprises, which account for some 40% of GDP, and large non-performing loans advanced to them via the almost entirely state-owned banking system. Dependency on state-owned enterprises, as a source of employment and taxation revenue, inhibits necessary structural adjustment.

Services are currently under-developed in China's economy. The bulk of service sector jobs are in retailing, construction, transport, communications, tourism and commerce. There are currently limited opportunities in the high-end, value-adding services that are characteristic of sophisticated markets, such as in design, marketing, logistics, distribution, financial, consulting and management services. However, these fields are experiencing the fastest jobs growth and job vacancies are emerging as recruiters find it increasingly hard to find qualified personnel. White collar jobs in greatest demand include those in engineering, information technology, marketing, and project management.

The inter-governmental fiscal system in China is a combination of centralisation and decentralisation. Central government expenditure accounts for only 30% of total budget outlays. The majority of public services are financed at the provincial, municipal, county and town levels, including pension pooling, unemployment insurance and social welfare. Counties, districts and townships account for some 70% of public spending on (non-university) education. The imbalance in fiscal responsibilities has been exacerbated with the shift of costs to local governments for social services previously borne by centrally-financed state owned enterprises (SOEs), and the laying off of SOE workers with subsequent needs for income support. While local governments have absorbed extra expenditure responsibilities, and various efforts have been made to increase the revenue capacity of local governments, the assignment of expenditure responsibilities has been de-linked from revenue assignments. The resulting policy of local self-dependency, with no supporting systems of financial transfers to ensure minimum standards of service provision across regions, has led to regressive outcomes. The people who live in rich localities enjoy more and better quality public services while those in poor localities not only have access to fewer services of lower quality but also have to pay a proportionately higher share of the costs through user charges (Wong, 2005).

2.5 China's economy in transition

Since 1979, China has been reforming and opening up its economy (*duiwai kaifang*). It has sustained average economic growth of over 9.5% for the past quarter century. This performance has enabled unprecedented poverty alleviation. Attempts to combine central planning with market-oriented reforms in the 1980s were only partially successful. The agricultural commune system was replaced with a household-based system that gave people greater decision-making discretion. Non-agricultural enterprises were also encouraged in rural villages. There were moves to greater self-management of state-owned enterprises, and opening up to market competition, foreign investment and imports. With the economy over-heating through price inflation by the end of the 1980s, austerity measures were imposed.

The 14th Party Congress in 1992 sanctioned a renewed push towards "a socialist market economy". Deng Xiaoping projected a vision of a "comfortable society" (*xiaokang shehui*) wherein poverty would not be an acceptable part of socialism, economic reform should be driven more via a market economy, foreign capital should be invited in, central controls should be decentralised to provide local incentives, and some people and regions would prosper ahead of others, with the eventual aim of "common prosperity". President Jiang Zemin's approach (*quanmian xiaokang shehui*) gave priority to that part of Deng's vision, of some people and regions prospering first, with less attention to "common prosperity". In 2001, China formally joined the World Trade Organisation and agreed to lower tariffs and reduce market impediments. In 2005 the Government replaced pegging of the Yuan to the US dollar with a managed float against a basket of currencies.

The Fifth Plenum of the Sixteenth Congress of the CPC in October 2005 presented the 11th Five-Year Economic Plan aimed at building a "harmonious society" (*hexie shehui*). President Hu's approach is designed to address concerns arising from rapid, unbalanced development. The concerns include social divisions amid widening income disparities, rapid urbanisation, rural decline and associated internal migration flows, and environmental stresses brought on by unsustainable forms of production and energy utilisation, causing severe air and water pollution and degradation of natural resources. The 11th Five-Year Plan aims to double 2000's GDP per capita growth by 2010, but at a slower average annual rate of GDP growth of 7.5% compared with 9.9% achieved in 2005.

The 5th Plenary Session of the 10th National People's Congress was in progress during the Review Team's visit to China. The Congress passed two laws that will enhance the regulatory framework for investment. The

Property Law enshrines in law the landmark change to China's Constitution in 2004 to include protection of private property, and gives equal protection to private and public property. The Enterprise Income Tax Law unifies the tax rates of foreign and domestic corporations at 25%, reducing the former domestic rate by 8 percentage points and raising the rate by 10 percentage points for foreign-invested enterprises. Premier Wen Jiabao reported to the annual meeting that government policies would aim to continue reform of state-owned enterprises, including the closure or privatisation of non-viable enterprises, and further measures to develop the services sector of the economy. The Premier also announced that additional government investment would be directed to building rural infrastructure and developing new technologies to enhance capacity in rural areas. The Premier advised of the abolition of tuition fees for rural children from Grade 1 to Grade 9, a five-fold increase in spending on vocational and post-secondary scholarships, focussing on rural areas, and the waiver of tuition fees for students undertaking teacher education courses in rural institutions of the Ministry of Education.

Some 42% of the population live in urban areas (2004), substantially up from 29% in 1995 and 20% in 1980. Urbanisation has been increasing at the rate of 3.5% per annum on average (1990-2005). The urban population is projected to reach 60% by 2020. The rural population peaked in 1995 at 851 million and has declined to 754 million in 2004. However, rural employment has remained relatively stable at around 67% of total employment in China. Employment in primary industry has fallen consistently since 1990, when it comprised 60% of total employment, to below 50% in 2004. Millions of rural workers have transferred from agriculture, animal husbandry and fisheries to secondary and tertiary industries. Employment in rural township enterprises expanded from 30 million in 1980 to 169 million in 2000 (including employees of rural individually- and privately-owned enterprises) (Yanzhong, 2003). The rate of urbanisation has been slower than the release of surplus rural workers, while the rate of urban jobs growth has not kept pace with urban population growth. It has been estimated that around half of all urban employment occurs in the informal sector of the economy that lacks provisions for social security and normally involves lower wages (Zhang, 2006).

The labour force in 2005 totalled 752 million. The official unemployment rate is of the order of 4.2% (2004). However unofficial estimates put the rate at 8-10% in urban areas, where the Country Background Report notes there were as many as 24 million unemployed job seekers in 2004. Higher rates of unemployment and under-employment are to be found in rural areas. The unemployment problems reflect the flow of new entrants onto the labour market along with displacements from

agriculture and from state-owned enterprises and town and village enterprises. The flow of an increasing number of tertiary educated graduates into these labour markets has seen a rise in unemployment and under-employment of graduates shortly after completing their studies, with the rates varying according to level of qualification. In 2005 the employment rate for higher vocational graduates was 62%, whereas the undergraduate employment rate was 81.7% and the postgraduate employment rate 91.9%. The Review Team was advised that the overall graduate employment rate had fallen to 70% in 2006.

Regional economic disparities have been widening since 1990, whether measured by coefficients of variation of GDP per capita and per worker, or Gini coefficients of GDP per capita and per worker (Lin and Liu, 2006). In 2005, the per capita disposable income of urban households was reported as RMB 10 493 while that of rural households was RMB 3 255. As shown in Table 2.2, the ratio of the highest to the lowest GDP per capita was 10.5:1 in 2004. The World Bank has estimated that some 152 million people (11.5% of the population), mostly in the rural areas of lagging inland provinces, still live in poverty, on consumption of less that US$ 1 a day (World Bank, 2004). The Gini index has risen to 0.5. China's richest 10% had disposable income 11.8 times that of the lowest 10% at the end of the first quarter 2005. However, disposable income for the lowest 10% rose 7.5% from the first quarter of 2004 to 755 Yuan. So while the income relativities are widening there is an overall improvement in incomes in absolute terms.

In the absence of a mechanism for horizontal fiscal equalisation across the administrative regions there is considerable width between the revenue capacity of different regions. As Table 2.2 shows, the annual local government revenue capacity of Shanghai at 8 500 Yuan per capita is 14 times that of Sichuan with a per capita revenue of 609 Yuan and 17 times that of Tibet with a per capita revenue of 492 Yuan. Data are not available regarding the relative expenditure disabilities of the different regions, the different standards of local service provision, or the relative rates of local taxation effort. Hence it is possible only to raise questions about the apparent differences in the spending capacity of regions, such as the extent to which some regions are able to afford wider educational opportunities and/or higher quality of educational provision than other regions. This matter is discussed more fully with reference to tertiary education in Section 6.

Table 2.2 Population, GDP *per capita*, and local government revenue, by administrative region (2004)

Administrative Region	Population (000s)	GDP *per capita* (RMB)	Local Government Revenue (RMB million)	Local Government Revenue *per capita* (RMB)
Shanghai	17 359	42 800	147 557	8 500
Beijing	14 644	28 700	102 861	7 024
Tianjin	10 025	28 600	38 482	3 838
Zhejiang	47 121	23 800	119 353	2 532
Jiangsu	74 183	20 700	146 753	1 978
Guangdong	81 001	19 300	197 152	2 433
Fujian	35 212	17 200	49 214	1 397
Shandong	91 853	16 900	120 967	1 316
Liaoning	41 923	16 300	70 491	1 681
Heilongjiang	38 031	13 900	34 871	916
Hebei	68 342	12 900	56 317	824
Nei Mongol	23 675	11 400	30 445	1 285
Xinjiang	19 758	11 200	19 360	979
Jilin	26 962	10 900	20 349	754
Hubei	59 965	10 500	42 371	706
Hainan	8 107	9 410	7 117	877
Shanxi	33 414	9 120	55 482	1 660
Henan	97 112	9 080	60 557	623
Qinghai	5 261	8 640	3 775	717
Chongqing	31 306	8 540	28 081	896
Hunan	66 838	8 380	41 702	623
Jiangxi	42 725	8 160	27 092	634
Ningxia	5 757	7 830	5 416	940
Shaanxi	36 956	7 780	31 987	865
Xizang	2 767	7 720	1 362	492
Sichuan	87 192	7 510	53 142	609
Anhui	64 470	7 450	38 360	595
Guangxi	48 846	6 790	30 094	616
Yunnan	44 377	6 700	33 882	763
Gansu	26 054	5 950	12 496	479
Guizhou	39 033	4 080	20 601	527

Source: China Statistical Yearbook and China Statistical Data (*www.china.com.cn*).

The disparities in opportunity are exacerbated by restrictions on population mobility and access to jobs and social services outside a person's own region. The household registration system (*hukou*) was initiated in the 1950s to control the movement of people and effectively constrained the development of a national labour market. An individual's "hukou" status is assigned at birth and gives certain guarantees - an allocation of arable land in rural areas and rights to whatever social services are provided by local government in urban areas. For an individual to stay in a city and gain access to city-based services, including health, education and social security, it was necessary to have an urban *hukou*. Additionally, urban enterprises could not recruit labour from another province unless workers could not be found locally. Reforms to the *hukou* system began to take effect from 1997. Since 2001 a person with stable work and a residence can obtain a *hukou* in more than 20 000 small towns and cities, while retaining their land use rights in the countryside. Former charges levied on out-of-province immigrants, such as temporary residence fees, have been removed. Nevertheless, restrictions continue in respect of medium and large cities, and the requirements to have stable employment and to own a residence are very demanding for many rural migrants, both poorer adults and young people. Except for college-educated white-collar workers, and except in certain provinces and some smaller towns and cities, switching one's *hukou* from rural to urban and from one location to another continues to be difficult. Since the *hukous* of graduates will have temporarily moved to their universities, they may be able to find jobs in that location or at their family's location but may have difficulty in finding jobs somewhere else.

China's leadership has identified reform of state enterprises and the establishment of a social security system as government priorities. Strategies for achieving these goals include privatisation of unprofitable state-owned industries, downsizing of the government bureaucracy, and development of a pension system for workers. The government is committed to generating greater economic development in the interior and providing more services to those who do not live in coastal areas. Greater attention is being given to the environmental sustainability of urban development and economic activity. Capacity to provide for social security, particularly age pensions and unemployment benefits, is constrained by the difficulties in establishing a functioning financial system.

2.6 Education

Education is compulsory to 9 years of primary and secondary schooling. China has achieved effective universal participation at the primary school

level, with 99% of primary school entrants reaching Grade 5.[7] The secondary school enrolment ratio (2000-2005) is 73 for both boys and girls. The 11th Five-Year Plan aims to achieve universal 9 year compulsory education, develop pre-school and special education, increase the senior secondary enrolment rate to 80%, and maintain a balance in enrolments between vocational education and general secondary schooling.

The overall adult literacy rate (2000-2004) was 91, with 95 for males and 87 for females. Illiteracy exceeded 15% of the total population in six predominantly rural western provinces (Guizhou, Gansu, Ningxia, Qinghai, Xizang, and Yunan). In the same provinces, the proportion of the population with education beyond primary school was less than 15% (Brooks and Tao, 2003).

Vocational education and training in China provides pre-employment certification and skills formation for employed persons and for people retraining for job change. The provision of vocational education and training involves higher vocational institutions (part of the tertiary education system) and secondary polytechnic schools, advanced technical schools, technical schools, employment training centres, private training institutions and enterprise-based training centres. Technical schools and employment training centres adhere to the National Occupational Qualification Certification System whereby trainees are required to obtain an occupational qualification certificate as well as a diploma. Since 2000, entry-level certificates are required for ninety professions. The vocational qualification system comprises five levels: elementary, intermediate, advanced grade skilled worker, technician, and senior technician. Elementary (36%) and intermediate grade skilled workers (48%) account for some 85% of people with vocational certificates, with technicians (1%) and senior technicians (0.1%) in short supply.

2.7 Tertiary education

The provision of tertiary education in China comprises regular tertiary education institutions, adult tertiary education, in-service training leading to vocational qualifications, preparatory courses for State-administered College-level examinations for self-taught learners, distance education and virtual (internet-based) education. In 2004, there were 1 731 regular tertiary education institutions (TEIs). Of these, 73 were affiliated with the central Ministry of Education (MoE) in Beijing, 38 were affiliated with other central government ministries, 1 394 were local TEIs administered by the

7 UNICEF (2006), At a Glance: China, on-line statistics, *www.unicef.org/infobycountry/china_statistics.html*

governments of provinces, autonomous regions and municipalities, and 226 were privately-run. Some 60% of regular TEIs offered short-cycle programmes and awards below Bachelor degree, and 26% of the regular TEIs offered postgraduate programmes. Additionally, there were 315 research institutes offering postgraduate programmes. There were also 505 non-formal TEIs for adult education, and 1187 privately run, non-formal TEIs (see Tables 2.3 and 2.4). More than 300 of the private TEIs are affiliated with public universities and operate as commercial arms of the universities. Many private training institutions provide support for students undertaking self-study for national examinations. The independent adult TEIs have been gradually incorporated into regular TEIs. Adult education institutions have declined from 1 156 in 1995 to 481 in 2005. Some 67 regular TEIs are authorised to offer on-line education.

Table 2.3 Number of tertiary education institutions, staff and faculty (2004)

Type of institution	Institutions	Staff	Faculty
1. Institutions offering Postgraduate programmes	769		
Regular TEIs	454		
Research institutes	315		
2. Regular TEIs	1 731	1 610 658	858 393
TEIs offering bachelor degree programmes	684	1 137 005	575 334
TEIs offering short-cycle programmes	1 047	403 616	237 654
of which tertiary vocational-technical colleges	872	327 536	193 432
Independent branches of universities and short-cycle courses	364	70 037	45 405
3. Adult TEIs	505	154 986	86 065
4. Privately-run TEIs	1 187	54 941	26 048

Source: Country Background Report (Ministry of Education, 2007).

Table 2.4 Changes in affiliations of nationwide regular tertiary education institutions (1997-2004)

Year	Number of TEIs	TEIs affiliated with Ministry of Education	TEIs affiliated with other Ministries	Local TEIs	Privately-run TEIs
1997	1020	35	310	655	20
1998	1022	45	218	734	25
1999	1071	46	202	786	37
2000	1041	72	44	888	37
2001	1225	72	39	1025	89
2002	1396	72	39	1154	131
2003	1552	73	38	1268	173
2004	1731	73	38	1394	226

Source: Country Background Report (Ministry of Education, 2007).

The central state government has responsibility generally for policy, regulation and teaching quality evaluation in respect of tertiary education. The provincial governments are responsible for managing the institutions in their provinces, and for financing those public TEIs that are not managed by central ministries.

Student enrolments in Regular TEIs and Professional TEIs have grown fastest in Bachelor degree programmes. There has also been rapid growth in tertiary vocational institutions not affiliated to four-year institutions and in privately-run institutions. The predominant age cohort participating in tertiary education is aged 18-22 years. That period overlaps with compulsory military service, of a 24-month service obligation.

The tertiary education system is defined in terms of the highest qualification that an institution is authorised to award. TEIs seeking to offer awards above Bachelor degree are required to demonstrate their capacity to offer courses at the postgraduate coursework and doctorate degree levels. There are 699 TEIs authorised to offer postgraduate coursework degrees and 344 authorised to offer the PhD. There are 53 designated Graduate Colleges.

Table 2.5 shows the structure of China's tertiary education system (formal regular TEIs) categorised by Carnegie classification equivalence (Liu, 2006).

Table 2.5 Classification of tertiary education institutions

Institutions	Category	Number	Percentage
Research	I	7	0.4
Universities	II	48	2.8
Doctoral	I	74	4.3
Universities	II	116	6.8
Master's	I	83	4.9
Universities	II	126	7.4
Baccalaureate Colleges	I and II	201	11.8
Associate Colleges		1 047	61.5
Total		1 702	100.0

Source: Liu, 2006.

The 211 Project, announced in 1993 and implemented in 1995, approved funding from a pool of RMB 30 billion for 100 universities (including some that had merged into more comprehensive research and teaching institutions) to improve facilities and curricula, and build a network of

institutions for formation of the high level skills needed for future economic development. Priority was given to the development of capacities in engineering and technological sciences, physical sciences and biological sciences.

The 985 Project (1999-2001) provided for additional funding of RMB 14 billion to some 36 tertiary education institutions, including (in the first funding phase) the top nine identified for world-class university status: Peking; Tsinghua; Zhejiang; Fudan; Nanjing; Shanghai Jiao Tong; Science Technology China; Xian Jiao Tong (Shanxi), and Harbin Institute of Technology (Heilongjiang). Funds are available for attracting to China internationally renowned professors, and for developing international research collaboration and student and staff exchanges.

The private tertiary education sector has had a mixed experience in China. The first private higher learning institutions (*shuyuan*) emerged 1300 years ago. The first modern private higher education institutions were established at the beginning of the twentieth century, including Fudan University and China University in 1905, followed by Xiamen University and Nankai University in 1919. By 1949, 93 of the then 223 universities were privately run (Yuan, 2003). After a period of disallowance, between 1982 and 1986 legal provision was made for the establishment of private TEIs. Between 1987 and 1992 regulations were created to curb malpractice in private institutions. After 1992 private institutions (*minban*) were encouraged, and the Private Education Promotion Law of 2002 established the conditions for their current operation. All private *minban* are designated not for profit and they must use their assets only for educational purposes. Private TEIs may make "reasonable returns". Foreign investors are permitted to repatriate returns.

The founders of private TEIs may include (1) individuals, such as retired teachers, government officials or businessmen; (2) community organisations; (3) enterprises; (4) public universities; (5) Sino-foreign co-operations, and (6) others. It is normally required that applicants for private TEI accreditation will produce evidence of financial viability, qualifications of teachers and administrators, and internal governance procedures. Private TEIs must normally demonstrate satisfactory performance over a probationary period of 3 years.

Average annual tuition fees in public TEIs range from RMB 2 000 to RMB 6 000. In private TEIs, tuition fees range from RMB 8 000 to RMB 13 000. Limits are set at provincial level having regard to costs of provision, the socio-economic conditions of the region, and the disposable incomes of families. Student accommodation charges typically fall within the range of RMB 1 000 -1 500 per year.

2.8 Research

China spent 1.34% of GDP on research and development in 2005 (compared with an OECD average of 2.3%). China has been increasing its R&D spending progressively over the last decade. In 2000 gross domestic expenditure on R&D totalled 0.9% of GDP. China has also been steadily increasing its number of researchers. In 2004, there were 1.2 researchers per thousand employees (compared with an OECD average of about 7).

To boost output of high technology products, while addressing environmental stresses, China is investing in scientific research with priority given to energy and water resources, environmental protection, information technology, biotechnology, advanced materials, aerospace and aviation.

2.9 Reform of personnel management in TEIs

Since 2000, an extensive programme of reform of tertiary education personnel management has been underway. The former model of lifelong employment has been replaced with contract-based employment. The formerly closed system of appointments has been replaced with open advertisement for academic and administrative staff positions. A performance-based management system has been introduced for employment continuation (contract extension), promotion or demotion, and remuneration. Annual performance evaluations are conducted within TEIs, although these currently cover only academic staff and not administrative staff. Figure 2.1 illustrates the approach of one university.

Figure 2.1 An example of post allowances and workload standards

Academic posts are tiered into five levels, super grade, first grade, second grade, third grade and fourth grade. The first grade could further be divided into two levels: level A and level B. The work-load consists of three parts: teaching, research and services. According to the different proportions devoted to research and teaching, the research and teaching posts could be grouped into three categories: posts with equal proportion to research and teaching, posts with larger proportion on teaching and posts with larger proportion on research. The specific proportion of workload on research, teaching, and social work for each category are defined as follows:

1. Posts with equal proportion to research and teaching: teaching, 60%; Research, 30%; and services, 10%.
2. Posts with larger proportion on teaching: teaching, 75%; Research, 15%; and service, 10%.
3. Posts with larger proportion on research: teaching, 30%; Research, 60%; and service, 10%.

For those who have fulfilled the 100% workloads shall receive the full post allowance; for those who have fulfilled more than 80% while less than 100% workloads shall receive 80% of the post allowance; for those who have fulfilled more than 50% while less than 80% workloads shall receive 50% of the post allowance; for those who fulfil less than 50% of the workloads will not receive any post allowance. (Please refer to Table 7.3 and Table 7.4 for the post allowance standard and the workloads standard.)

In addition to academic posts, there are posts for administrators of student affair, librarian, and laboratory technician, which have their specific tiers of post allowance. The post allowances are closely tied to the performance assessment and employment status.

Items	Content	Scores	Note
I. Papers	1. Nature Science	2000 scores/paper	For paper with multi-authors, it is the responsibility of the first author to allocate the scores to each author; for papers with a corresponding author, the corresponding author will be regarded as the first author. The excellent humanities and social sciences journals refer to those that have been included in CSSCI and Chinese Humanities and Social Sciences Citation Database (Chinese Academy of Social Sciences). They account for about 10%-15% of all the journals (no more than 100 journals).
	2. Category A: SCI, SSCI, A&HCI, Chinese Social Sciences	300 scores/paper	
	2. Category A: SCIE, EI, ISTP, International (overseas) formal journals (published in English), (humanities and social sciences) the humanities and social sciences excellent academic journals	200 scores/paper	
	3. Category B: CSTPCD (Institute of Scientific and Technical Information of China), CSSD (CAS), Overseas formal journals not included in the formal information searching systems (natural sciences), CSSCI, Chinese Humanities and Social Sciences Citation Database (Chinese Academy of Social Sciences	100 scores/ paper	
	4. Category C (other officially published academic papers)	20 scores/paper	
	5. Category D (research and consultant reports)	100 scores/report	Adopted by central or provincial governments, and evidences should be provided.
II. Intellectual Properties	1. Invention patents	200 scores/item	The owner of the intellectual properties shall be the TEI. For those intellectual properties produced by more than one person, it is the responsibility of the first author to allocate the scores. Product certificate shall be appraised by provincial certificating agencies; Industrial standards should be determined by the managing authorities of the specific industry or trade.
	2. Practical new types	100 scores/item	
	3. Product Certificate	70 scores/item	
	4.Industrial standards (software for instance)	100 scores/item	

III. Books	1. Monograph	More than 400 thousand characters	300 scores/book	For books that are produced by more than one person, it is the responsibility of the first author to allocate the scores, the first author should be a faculty and/or staff working at this university.
		200 thousand – 400 thousand character	240 scores /book	
		Less than 200 thousand character	200 scores /book	
	2. Compilation, translation, ancient books collating		100 scores /book	
	3.Reference books, popular science readings, videos		50 scores /book	
IV. Teaching Materials	1. 21 Century Teaching Materials or National-level key teaching materials		7 scores per 10 thousand characters	
	2. Teaching materials for TEIs (including those edited under direction of the MoE)		6 scores per 10 thousand characters	
	3. Teaching materials for K-12 education		5 scores per 10 thousand characters	
	4. Reference books		4 scores per 10 thousand characters	
V. Research Projects	1.National-level projects	Key projects	800 scores/item	For projects conducted by more than one person, it is the responsibility of the principal researcher to allocate the scores, and the hosting organisation of the project should be this university; participating in projects in other TEIs/organisations/agencies shall be considered as Collaborative Projects.
		General projects	400 scores/item	
	2. Provincial projects		300 scores/item	
	3.Collaborative Projects)	Natural sciences	8 scores/item	
		Humanities and social sciences	25 scores/item	
	4.Educational reform projects at university level		50 scores/item	

In several cases, the structural salary of a TEI employee comprises a base paid by the state (40%) and an amount offered by each TEI (60%). Many TEIs have established a tiered salary system by appointment post (see Figure 2.1). The tiered post salary system involves the salary payable by level of appointment (academic rank) and by workload standard. An "allowance standard" is set for each category of post. For example, a Grade One level A Full Professor might have an allowance standard of RMB 35 000 per year, a Grade Two Associate Professor, RMB 20 000, and a Grade Four Teaching Assistant, RMB 8 000.

2.10 Main achievements to date

China today educates 25% of the world's students while using only 2% of the world's education budget.[8] On these measures China has a highly efficient system. This efficiency has been further enhanced by the closure or merger of TEIs over the last decade and by efforts to promote sharing of "high quality" resources across departments/disciplines, universities and provinces.

In tertiary education, China has made truly remarkable progress since the early 1990s:

- Total tertiary education enrolments have risen from 5 million to 23 million.
- Formal student enrolments in regular TEIs have grown from 2.9 million in 1995 to 13.3 million in 2004.
- Annual applications via the national examination system have risen from 3 million in 1998 to 8.7 million in 2005.
- The education participation rate for the 18-22 years cohort has grown from less than 10% to 22%.
- Participation has grown among students from rural backgrounds, women and minorities.
- The number of regular TEIs has expanded from 1 054 in 1995 to 1 731 in 2004.
- Private sector regular TEIs have risen from 20 in 1995 to 226 in 2004.
- Encouragement has been given to students to undertake undergraduate and postgraduate studies in foreign countries, and some 20 000 graduates are returning each year after studying abroad.
- Major investment has been made in research and communications infrastructure.
- The number of researchers in China increased by 77% between 1995 and 2004 and with a total of 926 000 researchers China now

8 Estimates made by the Council of Chief State School Officers, Asia Society (2005).

ranks second worldwide behind the United States with 1.3 million researchers (OECD, 2006a).

- By end 2006 China became the world's second highest investor in R&D after the United States, spending some US$ 136 billion, compared with Japan's US$ 130 billion (OECD, 2006a).

2.11 Challenges ahead

Raising the tertiary education participation rate

China's government is seeking to increase the tertiary education participation rate to 30%. The achievement of that target may be facilitated by the turnaround in demographically-driven growth for tertiary education.

The major age cohort participating in tertiary education, those aged 18-22 years, is projected to peak at 124.84 million in 2008, and to fall thereafter to 96.5 million by 2013 and to 87.97 million by 2020. In 2006, there were around 25 million students enrolled in tertiary education, representing some 22% of the age cohort. The average annual rate of decline in enrolments, without any offsetting rise in the participation rate, would be 0.68 million per year, accumulating to 8.11 million.

There are various implications for policy. On the one hand, opportunities could be seen to arise for effecting budgetary savings and efficiencies from a reduction in enrolments. However, those prospective benefits could incur costs associated with the non-viability of some existing institutions that might be forced to close or merge for lack of sufficient student demand, or whose continuation for broader social purposes would involve them operating on an inefficient scale. Additionally, a reduction in student enrolments, especially given China's low attrition rates in tertiary education, would flow through in a reduced supply of graduates to the labour market and deny the economy the skills formation needed for productivity improvement. On the other hand, opportunities could be seen to arise for enhancing the quality of tertiary education, effectively by raising student unit costs, such as through more intensive education involving smaller student-teacher ratios, within current overall spending limits.

Alternatively, opportunities could be seen to arise for raising the proportion of the age cohort participating in tertiary education. Every one percentage point increase in the tertiary education participation rate represents 1.3 million additional enrolments (see Table 2.6). Theoretically it would be possible to offset the projected demographic decline of 37 million over the next 12 years, without expanding the size of the system, by raising

the participation rate to 31.3% progressively, at an average rate of increase in participation of 0.78% per year. This action would stabilise enrolments at 27.5 million annually.

Table 2.6 Scenarios for stabilising tertiary education enrolments

Year	Projected population 18-22 years (million)	Enrolments at current participation rate of 22% (million)	Participation rate needed to stabilise enrolments at 27.5 million (%)
2008	124.84	27.46	22.0
2009	119.18	26.22	23.0
2010	113.52	24.97	24.2
2011	107.86	23.73	25.5
2012	102.20	22.48	26.9
2013	96.54	21.24	28.5
2014	95.32	20.97	28.9
2015	94.10	20.70	29.2
2016	92.88	20.43	29.6
2017	91.66	20.16	30.0
2018	90.44	19.90	30.4
2019	89.22	19.63	30.8
2020	87.97	19.35	31.1

If a stabilisation policy were to be adopted in aggregate, issues arise as to the composition of enrolments in terms of student characteristics and by level of educational qualification, and the distribution of enrolments by region.

The Review Team was not in a position to ascertain what proportion of the school leaver cohort is ready for tertiary education, given deficiencies in the schooling system. The longer-term human capital requirements suggest China might aim to achieve a rate of participation, of the order of 35%, to be competitive internationally. The major questions for policy and financing relate to the pace of expansion and its distribution.

3. System Governance, Planning and Regulation

This Section of the Country Note examines the structure of tertiary education provision in China, and the policy frameworks and actions for steering the system.

3.1 Main features

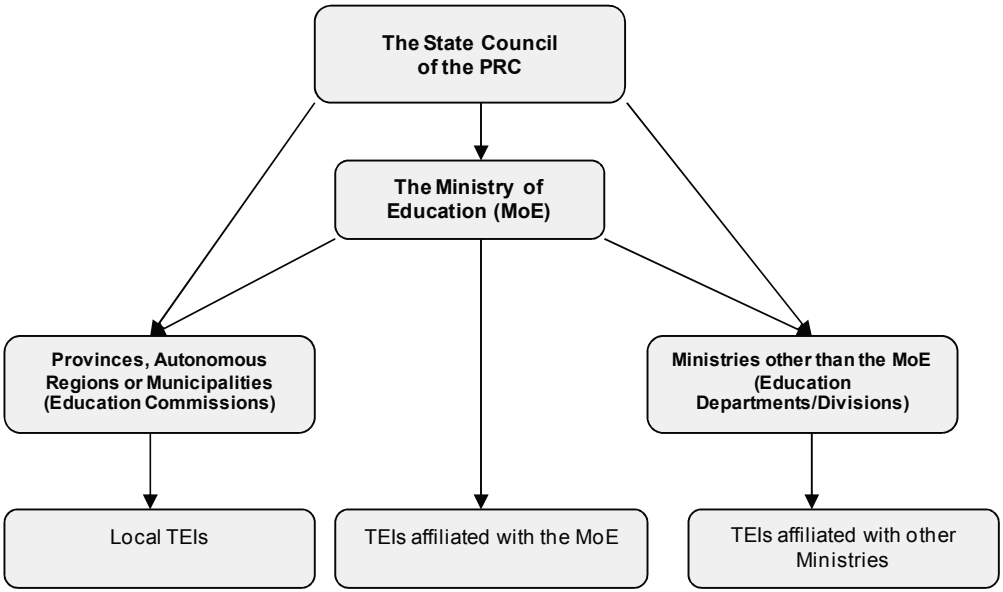
As we observed in Section 2, China, in common with most OECD countries, faces the challenge of simultaneously raising tertiary education participation rates, improving quality and achieving a sustainable level of financial support.

In 1949, when the People's Republic of China was founded, higher education was administered through a highly centralised system. Since the mid-1980s, and accelerating through the 1990s, this centralised system has been subjected to successive rounds of reform which have produced significant changes. In particular, since 1998 the Chinese tertiary education system has been quite radically restructured. Tertiary education institutions (TEIs) include both universities and vocational colleges and are administered at national, regional and local levels – or combinations thereof – and via different ministries, departments and committees at each level. Some institutions are highly specialised, others are comprehensive in their provision. Moreover, a series of institutional mergers have attempted to address the potential problem of fragmentation. A further complication has been the comparatively recent emergence of privately-run institutions – "*minban*" – whose numbers are increasing substantially.

All of this adds up to a highly complex sector. While fragmentation and diseconomies of scale continue to represent a risk to the achievement of an integrated and holistic approach to policy, the sector possesses a diversity which is a considerable strength. In a rapidly developing economy, subject to massive social change, the tertiary education sector possesses a range of institutions which can meet a wide range of social and economic needs and demands. Table 2.3 in Section 2 sets out the distribution of TEIs in 2004.

The changes in distribution are set out in Table 2.4 of Section 2, which demonstrates the growth in numbers of the *minban* – from 20 in 1997 to 226 in 2004 – as well as the growth in local TEIs, which more than doubled over the same period. That having been said, the flagships of the sector remain the 73 national universities, directly funded by the Ministry of Education in Beijing, and which are regarded as the key agents of leading the improvements in Chinese tertiary education to world-class levels. Figure 3.1 (reproduced from Figure 2.1 in Country Background Report) illustrates the overall structure of the sector.

Figure 3.1 The governing and administrative structure for tertiary education



3.2 Challenges

A number of challenges arise in developing a consistent and coherent set of policies across the sector. It is important in this context to recognise the distinction between regulation and planning:

– In terms of regulation the sector remains highly centralised. The designation of university title; the award of academic qualifications; academic quality and standards criteria; the conduct of entrance examinations – all these and many other aspects of the sector are centrally regulated by the Ministry of Education in Beijing. In this respect, at least, individual universities and colleges possess

relatively little institutional autonomy by the standards of OECD countries such as the United States, United Kingdom and Australia, although it conforms to most other tertiary systems elsewhere in Asia.

- In terms of planning, however, the picture is more complex. Since the mid-1990s centralised, direct management from the Ministry of Education has weakened and has been confined primarily to the relatively small number of "national" institutions. Elsewhere control has been decentralised to provincial, or even municipal, level. This provides a stratified system of control and administration which can impede effective strategic planning across the sector as a whole.

The distinction between regulation and planning is not hypothetical. In certain respects the Chinese system could be said to be over-regulated, but not necessarily over-planned – at least at the strategic level. The highly centralised regulatory framework continues to impact considerably on institutional autonomy. This is particularly the case with the 73 national universities, whose mission has been set to be globally competitive, in both teaching and research, so that China can sustain its international competitiveness in the global, knowledge-based economy. The leading, research-intensive universities must be imbued with a level of innovation, enterprise and dynamism which requires a level of institutional autonomy which centralised regulation can easily stultify.

By contrast the decentralisation of control in other parts of the sector presents challenges around coordination at both functional and spatial levels. For example, there is a wide spectrum of academic quality between national and local institutions and across different geographical regions. Progression pathways for students between local and national institutions are poor or non-existent. There are also contradictions between the selectivity of research investment in the national universities and the policy of equalising regional disparities in both research and teaching between the eastern seaboard and the western provinces.

These dilemmas are by no means unique to China, but such has been the recent pace of change, and such is the sheer scale of the sector, that they deserve urgent consideration. We suggest the key issues are as follows:

3.3 System-level planning and mission differentiation

There is evidence of a mismatch between graduate supply and labour market demand at the macro-level and this has produced concerns about as many as 30% of graduates being unable to find work shortly (3 months) after graduation. However, there are wide variations by region and by

academic discipline. Significantly rates of unemployment are lower among graduates of vocational colleges – and starting salaries are often higher. Furthermore the range of learning outcomes in the tertiary education sector is wider than would be common in many OECD countries. We observed much high-quality vocational training that was being certified with a tertiary education qualification. Thus on a like-for-like basis we would adjust the apparent tertiary education participation rate of 22% downwards to an actual range of 12-17%. This figure indicates that there is even more potential for expansion than the conventional measure of 22% would indicate. However, it is apparent that, at its current stage of development, the Chinese economy struggles to absorb even the current volume of tertiary education graduates that the sector is producing.

Clearly, such is the rate of economic development in China that it could be argued that continuing rapid expansion of tertiary education is necessary in order to anticipate future demand. No doubt there is some validity in this argument. However, such is the burgeoning social demand for university education from Chinese students and their families that careful planning will be necessary if levels of graduate unemployment are not to remain chronically and unacceptably high.

Anticipating long-term human capital requirements is never easy in any society and certainly not one undergoing the rate of change currently being experienced by China. Expanding to a rate of, say, 35% over the next generation (25 years) would conform to China's aspirations to be a global economic power. But expansion at this rate would present major challenges to academic quality unless the proportion of GDP devoted to the support of tertiary education were to rise significantly.

It is also apparent that an expansion of the sector on this scale could not be achieved on the basis of a homogeneous tertiary sector. In other words, expansion will bring about increasing differentiation of institutions across the sector as it has elsewhere in the world. All universities will be unable to be resourced in all of the functions of the modern university in equal measure. This is most obvious in the case of research – in China, as elsewhere, the major driver of differentiation. Through the 211 and 985 initiatives, China has concentrated resources with a view to developing a number of world-competitive leading research-intensive universities, yet there appears to be no clear strategic planning framework for the non-research intensive institutions. Should they be 'teaching only'? Should some of them be focussed on knowledge transfer? And what is the appropriate balance between national, regional and local mission focus across the sector as a whole?

Ironically the geographical division of labour between national, regional and local levels militates against the strategic planning of a functional division of labour within the sector. If affordable expansion is to proceed in a manner which does not perpetuate the mismatch between supply and demand which is currently manifest, then strategic planning across the sector needs to be strengthened.

3.4 Autonomy versus regulation

The strengthening of strategic planning is not the same as the strengthening of centralised regulation. Chinese tertiary education remains highly regulated; and thus regulation is highly centralised. However, the evidence from elsewhere in the world suggests that world-class institutions enjoy a degree of autonomy which is inadequate in China. World-class universities, in particular, flourish as autonomous – albeit, accountable – institutions which encourage creativity, innovation, dynamism and responsiveness to demand. In today's world all universities which aspire to global levels of excellence need to be agile, flexible and unencumbered by bureaucratic controls in order to succeed.

This presents dilemmas for all governments. Publicly-funded universities and colleges must be publicly accountable. So autonomy is not to be equated with *laissez-faire*. There is a public interest in tertiary education which needs to be reconciled with the benefits which institutional autonomy can bring. This is most obvious in areas such as guaranteeing academic quality and standards; ensuring the equity of student admission procedures; accessibility for students from poorer families; and so on. An appropriate balance therefore needs to be struck between securing the public interest on the one hand and encouraging institutional autonomy on the other. This implies allowing greater autonomy to institutions that have demonstrated their capacity to govern their own affairs effectively – but within a regulatory framework which constrains this autonomy in order to ensure that the public interest is secured.

There are no formulaic solutions to this problem. Different countries have attempted to deploy different mechanisms to reconcile these policy goals according to local history and circumstances. For example:

i. Some countries (*e.g.* United States, Japan) have developed what might be termed a 'managed market' approach which admits market forces into tertiary education, but within a public-sector regulatory framework.

ii. Other countries (*e.g.* United Kingdom, Ireland, New Zealand) have developed so-called "buffer bodies" – non-governmental agencies

which mediate the relationship between the government and the sector, implementing regulation and distributing funding in one direction, while offering policy advice and quality control in the other.

We observe that the Chinese tertiary sector, while under-planned at the strategic level, is over-regulated at the operational level. We recommend that one or other of the options referred to above (they are not mutually exclusive) be adopted as a way forward.

3.5 The role of the private sector

In many countries the burden on the public purse of tertiary education expansion has been mitigated by drawing upon private contributions to the cost, either from the students themselves through fees or by encouraging the establishment of private institutions.

In China we recognise that student fees, in purchasing power parity terms, are already high and that there is only limited scope for significant increases. Under these circumstances, and given the high levels of lateral demand in the population, it is not surprising that there has been a rapid expansion of private institutions. These include both for-profit and not-for-profit institutions. Many, somewhat confusingly, are established and controlled by affiliated public-sector institutions, providing the latter with a useful income stream. Many *minban* are widely regarded as being of poor quality. If this is the case, then their existence and their expansion is testimony to the weakness of a nationally-consistent system of quality control which applies equally to both public and private institutions.

In many countries the establishment of private institutions is a potentially sensitive, if not contentious, policy issue. However, elsewhere in Asia, the private sector has responded to the social demand for tertiary education where the public sector has not had the fiscal capacity to do so. Looking forward we believe that China will be no exception. The main issue, it seems to us, is less whether the necessary resources are publicly or privately generated than how these resources can be brigaded to assist in the achievement of public policy goals for tertiary education. In particular, how can private institutions be encouraged to develop via a regulatory framework which complements, rather than conflicts with, state-supported access – especially with respect to quality assurance and widening participation? Private institutions are also a possible source of innovation in tertiary education and are likely to be more responsive to labour market needs.

Since private institutions exist, and if additional private sector investment is to be encouraged, then the regulatory framework will need to

be more explicitly linked to public policy goals, not only in relation to quality control, but also in relation to social equity issues concerning access. Unregulated expansion of *minban* (not, we recognise, a serious policy option) will be contrary to the public interest. But so, too, will be a reluctance to acknowledge the important contribution that the private sector can make at all levels of the tertiary education sector.

3.6 The societal and regional role of tertiary education

In the twenty-first century to shift towards a more knowledge-based economy and society is changing the role of contemporary universities and colleges. Tertiary education institutions are key drivers of social and economic development, both in their role of developing the skills base (teaching and learning function) and developing the knowledge base (research and knowledge transfer function). Thus universities and colleges should no longer be separated off from the mainstream of society and the economy, as was the case in the nineteenth century – the so-called "ivory tower". Today the watchword is 'engagement': tertiary institutions lie at the heart of contemporary social and economic development. As a result tertiary institutions have become much more multi-functional and have developed a role in modern society which extends well beyond the traditional roles of teaching and (in some cases) research.

The multi-function character of the modern tertiary institution may be summarised as follows:

i. Teaching and learning – we should note here the almost universal shift in emphasis from teaching to learning in contemporary pedagogy; and the emphasis in the present fast-changing world of lifelong learning – the need for students throughout their lifetime to improve their knowledge and understanding, upgrade their skills and maintain their employability in a fast-changing labour market.

ii. Research – both curiosity-driven, 'basic' research, but also problem-solving, or 'user-led', research which seeks to provide solutions to particular, user-defined problems in business, in the public services and in the wider community.

iii. Knowledge transfer (increasingly referred to as 'knowledge exchange') – how the body of knowledge produced in universities and colleges can be made available efficiently and effectively, to all those who can make use of it and how, in turn, potential and actual users of this knowledge base can bring to bear their knowledge on this process (hence 'exchange' and not just 'transfer'). Thus knowledge transfer is not just about the

commercialisation of basic research, but embraces a much wider agenda, including continuing professional development, in order to develop knowledge transfer capacity in the wider economy and society.

iv. Social inclusion – ensuring that all sections of society, whatever their socio-economic, ethnic, gender or regional background have equality of opportunity to access tertiary education provided they can benefit from participation in it.

v. Local and regional economic development – contributing both directly (skills, knowledge – see above) and indirectly (by creating a better-educated population with higher disposable income).

vi. Civil society – inculcating civilising values among students, ones which emphasise rational enquiry, tolerance and respect, the pursuit of truth and respect for human rights within a sense of global citizenship.

As we noted above, it is unrealistic to expect all tertiary institutions to focus on all of these aspects in equal measure. The resources are simply not available to allow all institutions to address all of these functions simultaneously, especially as many of them will need to be addressed at global, and not just local or national, levels of quality. This implies some degree of formal mission differentiation.

We need to note also that these varying functions take place at different levels of spatial aggregation. In other words, as well as a functional division of labour across the sector (mission differentiation) there is a necessity to take into account the varying spatial differentiation (international, national, regional, local) which cuts across these functions. It is apparent that this implies a degree of complexity which requires careful, and planned, policy co-ordination at the strategic level if there are not to be unintended consequences which impact negatively on regional development. Below we explore these issues in relation to four key tertiary education policies: teaching and learning; research; knowledge transfer; and access and participation.

Our starting point for this discussion is the recognition that from the 1990s onwards there has been a concerted effort by the Chinese government to redress the considerable imbalances which have existed over many generations both between and within different regions. The historical pattern of much higher levels of expenditure in the eastern regions, compared to the central and western regions, has been acknowledged and determined efforts made to re-balance investment and expenditure. There is in place a number

of preferential funding policies aimed at supporting the underdeveloped regions.

As indicated above, it is unrealistic to expect regional economic development issues to be 'solved' simply by increasing educational expenditure. Moreover the extent to which tertiary education policy should lead, as opposed to follow, regional development policy is a complex matter. The regional development case for investing in human capital is a strong one, but it is a necessary rather than a sufficient condition. The implementation of tertiary education policies at the regional level needs to be tailored to sometimes distinctive regional needs and there are frequently structural and functional barriers which need to be overcome. Since universities and colleges of all types have different objectives, cultures and status incentives, and these do not always coincide with regional needs and demands. Frequently there is a mismatch between local needs in terms of innovation, enterprise and skills mix and the talent available in the institutions. There are issues to be resolved between 'academic' and 'vocational' approaches to tertiary education where the combination of peer-referenced status differentials in the academic community, alongside mission-drift at the institutional level, often militate against community needs for practical skills training, and the application of existing knowledge.

Important aspects of teaching and learning policy are organised at the national level – most notably the qualifications framework, teaching quality and standards, institutional structure, and governance. However, delivery is predominantly controlled and managed at local and regional levels and inevitably this creates inconsistencies in delivery and quality. We judge the major challenges to be as follows:

i) Teaching quality and standards

There is a widely-held perception that both teaching quality (how learning outcomes are delivered) and teaching standards (what learning outcomes are delivered) vary considerably across municipalities and regions and that this level of variation is beyond what would be considered satisfactory in terms of maintaining public confidence. Specifically tertiary education in the underdeveloped regions is considered to be of significantly lower quality than elsewhere. Underdevelopment is therefore reinforced by disparities in educational quality, rather than mitigating against it. And these variations are considered to be beyond what can reasonably be tolerated in any large-scale, mass tertiary system of the kind which China is developing.

China has recently developed a national system of quality assurance which seeks to address many of these issues, but it is early days yet and the system is yet to become firmly embedded or applied consistently across all

regions and municipalities. Our limited exposure to institutional practices left us with the impression that considerations of quality are very much focussed on input measures rather than outputs, is perhaps over-reliant on student feedback and appears to pay little attention to securing consistency of educational standards across all institutions of a similar type irrespective of their geographical location. As a result there is an unacceptably wide variation in quality at the regional, and even sub-regional, level. This is not only potentially socially regressive (poorer students receive poorer quality education), but it clearly works against regional equity. There is a real danger that poorer regions become locked into a cycle of educational deprivation which defeats the stated policy of reducing regional economic differences.

There is a need for a much higher level of investment in the national quality assurance system and a much greater determination to ensure that quality control is consistently implemented across all regions.

ii) Unit of teaching resource

We were surprised to learn that there is no nationally consistent unit of funding available to all institutions for teaching in particular disciplines (or clusters of disciplines based on cost) irrespective of their geographical location. Indeed the unit of resource seems to vary with 'elite' institutions receiving a higher unit of resource in order to sustain a higher level of teaching quality in these institutions. We are puzzled by this.

The educational needs of students do not vary by accident of geography and so the rational policy would be to establish a uniform unit of resource (albeit within price bands determined by cost – *e.g.* science, medicine, social science, humanities, etc) which would apply to all students in all institutions. If there were to be variations then they should be related to prior educational opportunity – *i.e.* students might attract a higher unit of resource where it could be demonstrated that there was a requirement to compensate for previous educational deprivation.

The present policy seems to be socially regressive at the individual level and, in effect, punishes students who, through no fault of their own, have not had the opportunity to progress to higher quality universities. At the regional level it is also regressive, since the majority of the elite universities who receive the higher unit of resource are located in the eastern provinces. This reveals a lack of joined-up thinking between regional development policy and teaching and learning policy which should be addressed.

iii) Teacher training and retention

One of the major barriers to improving teaching and learning quality in the underdeveloped regions is the recruitment, training and retention of high-quality teaching staff. This applies at all levels of the education system and tertiary education is no exception. A range of financial and other inducements have been introduced to address this problem and we commend them. But we recognise that they have mixed success since the issues are not only – or even particularly – financial: there are powerful cultural, social and aspirational forces at play here, too.

We also commend the 'twinning' arrangements which exist between institutions in the east and the west. Although it is not without risks it is a helpful adjunct to improving teaching quality in the underdeveloped regions. Indeed we believe that this model could be extended to international collaboration. We believe there is scope for establishing international collaborative centres on the campuses of universities in the underdeveloped regions aimed at improving the quality of teacher training, pedagogic research and practice, language training (especially in English) and, more generally, promoting internationalisation. Such centres would promote both staff and student exchange and would reduce the sense of intellectual and geographical isolation which high-quality staff frequently find de-motivating. We believe that, with appropriate inducements and incentives, there would be ample scope to build up international twinning arrangements to the benefit of both partners.

iv) Basic and strategic research

Research covers a spectrum of activities conventionally described as 'basic', 'strategic' and 'applied', although these categories are becoming somewhat obsolete. However, the regional aspects of research policy need to be handled with care since a uniform approach is not necessarily appropriate.

In common with many other countries China has a considerable regional disparity in the provision of basic research activity. With just a few exceptions basic research activity is carried out in a comparatively small number of elite research universities clustered in the eastern regions. They have currently benefited from considerable investment (Project 211 and Project 895) as China seeks to improve its global competitiveness in basic research, especially in science and technology subjects. Clearly the regional consequences of this policy are regressive – the greatest investment is going to the most developed regions (and the metropolitan urban centres within them). However, we do not recommend that basic research policy should take regional factors into account.

The reason for this is the recognition that basic research while it is increasingly a driver of innovation and economic competitiveness is organised on an international, if not global, basis. To be competitive research funding decisions must be driven by a judgment of research excellence and not by considerations of geography. In other words the best research must be supported wherever it is found and lower quality basic research in an underdeveloped region should not be supported at the expense of higher quality research elsewhere. It would diminish China's research competitiveness to allow regional policy to intrude on basic research policy and, in our view, the two must remain quite distinct.

Where regional policy has a part to play is in the development of research capacity to allow regional universities and research institutes to compete nationally and internationally for scarce research resources. But the development of this capacity must not be at the expense of sustaining research excellence elsewhere. In other words, while the funding of existing basic research programmes should always be determined by excellence, the development of research capacity is a legitimate matter for regional policy to consider. This in turn would depend upon regional economic development strategy and the role of encouraging basic research within it. In some regions this might be appropriate but there will be many regions where it is not and where, in terms of comparative advantage, other kinds of research and even other educational activities are deemed more appropriate.

v) 'Applied' or 'user-led' research

When one moves away from basic research policy to other kinds of research, then the regional function becomes more salient. Here we are considering research which is not so much curiosity-driven as 'user-led': research which is aimed at providing solutions for particular users. In an increasingly knowledge-based economy we believe that regions must develop and sustain the capacity to engage in this kind of research. It is therefore quite legitimate that this kind of research should be influenced by regional development considerations and should be managed and funded accordingly. This would assist in creating a more innovative and enterprising economy at the regional level, supporting local knowledge transfer activity (see below).

The balance between these two aspects of research is a matter for national policy to determine. China has a well-developed national funding system for basic research (see Section 8) which should not be unduly contaminated by regional considerations. However, alongside this we believe there is scope for an analogous regional set of arrangements to promote and sustain 'user-led' research explicitly harnessed to regional development goals.

vi) Knowledge transfer

Our consideration of knowledge transfer at the regional level proceeds largely from the comments on research set out above. Indeed at the regional level it usually makes sense to consider research and knowledge transfer policy together as a single unified approach since the rationale for supporting research at the regional level is overwhelmingly in terms of knowledge transfer potential.

National policy in China on knowledge transfer has been rather narrowly defined in terms of the commercialisation of basic research. It has therefore concentrated on the management of intellectual property rights (patents, etc) and facilitating the infrastructure of proceeding to market (science parks, incubator units, etc.) At the regional level, however, we believe it is essential to take a much broader view, focussing not only on the supply-side of 'research-push' but also on 'demand-pull' – enhancing the capacity of the regional economy to absorb the outputs of the tertiary education system. This involves a complementary focus on continuing professional development, lifelong learning and other forms of non-research investment in regional human capital. It implies a much more holistic approach to regional development, concentrating on innovation and enterprise in both the public and private sectors and the role of tertiary education institutions in supporting this agenda.

This more holistic approach may require further consideration of the structure of tertiary education at the regional level. Given the multi-functional nature of modern universities and colleges referred to earlier in this Section, we believe there is a case for examining the extent to which some institutions should be given a very specific knowledge transfer mission in order to assist in the regional development process. In terms of funding, incentives, performance indicators and performance management they could be differentiated from other parts of the sector with a remit specifically to support regional development needs. This would form an important component of any wider discussion (at the national level) of mission differentiation across the sector.

vii) Access and participation

We have already noted that, to some extent, preferential policies already exist concerning the support of ethnic minorities in raising their aspirations for, and participation in, tertiary education. And we have noted earlier in this Section how national policy on the unit of resource for teaching could be seen to work against, rather than promote, widening access in the underdeveloped regions. We also recognise that there are issues of access within regions, especially between rural and urban areas, and not just

between them. At the regional level, therefore, flexibility of delivery is often paramount in reaching out to remote geographical areas and to under-represented social groups. Great efforts have been made through developing distance learning and e-learning to grapple with these problems, although the quality of the student experience is necessarily extremely variable under these circumstances.

We believe there is a case for examining the extent to which accessibility can be improved by:

i. Focussing the mission of some institutions specifically on this issue;

ii. Improving progression arrangements (articulation) between 'vocational' and 'academic' institutions so that credit accumulation and transfer arrangements are rendered more robust at regional level;

iii. Developing formal 'hub-and-spoke' arrangements between institutions (perhaps modelled on successful examples in the public university systems in the United States) which combine outreach with seamless progression opportunities.

China's recent economic and social development represents an unprecedented achievement but its impact has been uneven across the different regions of the country. In general there is a massive difference in the level of economic development between the east and the west of the country and within each region between the urban metropolitan centres and the surrounding countryside. These differences are deeply-rooted historically, have cultural as well as socio-economic dimensions, and, in some regions are overlaid by ethnic differences. While education policy has a role to play in regional development, it is unrealistic to expect the education system – let alone the tertiary education system – to carry the burden of redressing regional inequalities on their own. Nevertheless the level of development of the regional economy does exert a direct impact on educational standards, financial inputs, staff recruitment and retention, manifest and lateral demand from students and their families, and the level of demand for skills from the regional labour market.

All of this represents a formidable challenge, not only to the development of educational opportunities in the tertiary sector, but also to aligning the sector to the needs of the regional and local economies. To undertake a thorough, evidence-based review of the regional role of tertiary education in China would be well beyond the resources available to the present study team. However, we do recognise the fundamental importance of this issue, which, in our view merits further investigation. This matter deserves more serious consideration, perhaps as a follow-up study to this report.

4. Labour Market Linkages

4.1 Context

Until the late 1980s, university graduates in China were almost invariably assigned to jobs through the "unified job-assignment mechanism" which, for most graduates, determined the whole of their working lives. Personal preferences might influence the course of study applied for, but after that the system took over. Job content and location obviously differed among career ladders, but housing and other determinants of living standards, such as incomes and access to health and education, did not, and indeed were remarkably equal for most graduates, most of whom lived in urban areas. Rural residents tended to be worse off.

During the 1990s, the job assignment system was progressively replaced by one that, as in virtually every other country, is driven by labour market opportunities. By 1997, job assignment had virtually disappeared. This development of the labour market was happening at a time that there was widening dispersion in incomes among different jobs and career ladders, and access to consumer goods, housing and health services was becoming more dependent on income. Therefore, it is now possible to talk of a "labour market" in the sense understood in other countries. It is still, however, a very constrained one, because of severe obstacles that most people face in changing their places of legal residence.

Meanwhile, also during the 1990s, state demand for labour was decreasing. By 2004, the restructuring of state-owned enterprises in China had resulted in a drop from 144 million workers to 76 million, producing, for the first time, high rates of urban unemployment. At the same time, there are growing levels of inequality between the cities and the countryside resulting in massive migration from rural to urban areas.

While the officially reported unemployment rate in 2004 was still low, at 4.2%, survey-based estimates, including the national labour force survey, the China Urban Labour survey and the National Bureau of Statistics of China (NBS) indicate much higher unemployment rates ranging from 5.6%

to a possible high of 8.8% (excluding most migrants). Moreover, the programme of restructuring of state owned enterprises resulted in a decline in labour force participation of 10 percentage points by 2003. Not surprisingly, the unemployment rate was higher among the less educated, younger workers, women, and workers in the northeast and southwest.[9]

In order to prevent unemployment from rising further, very large numbers of new jobs will need to be created (estimates start at about 3 million jobs every year and range up to about 9 million). Besides substantial job creation, the government's goal for 2007 is to relocate about 5 million laid off workers while keeping the registered unemployment rate below 4.6% in urban areas.

The 11th Five-Year Plan articulated a policy of stabilisation of enrolment expansion, involving a total enrolment target by 2010 of 30 million students, of which 1.3 million will be at the postgraduate level. That target translates into annual limits to growth of 5% at the undergraduate level, 6% at the postgraduate coursework level, and 12% at the doctorate level. However, actual enrolment growth at the undergraduate level has been exceeding the target, through the responses of provincial governments to community demand. As a consequence of over-shooting the enrolment targets the rate of graduate output has been expanding at twice the expected rate. Graduate output rose from 2.8 million in 2001 to 5 million in 2007, placing pressure on the absorptive capacity of labour markets. The Review Team was advised that graduate unemployment and under-employment is adversely affecting social stability and harmony.

The state government has offered loans (with a 50% discount on the interest rate) to encourage graduates to enter 'entrepreneurial careers', together with incentives for small and medium sized enterprises to employ graduates. There is now more active monitoring of graduate supply and demand, and steps are being taken to improve labour market information to

9 The World Bank Report: *China's Evolving Poverty Reduction Agenda* (World Bank, forthcoming) discusses a number of surveys, including the China Urban Labour Survey, the Census data in 5 large cities using an internationally standard definition of unemployment. This study reports that the unemployment rate of local residents (excluding migrants) increased from 6.8% in 1996 to 11.1% in 2002 then declined to 6.7% in 2005. Analysis of the NBS urban survey data (which includes very few migrants) produced an unemployment rate of local residents of 8.8% in 2003. Table 6.63, breaks down the labour force participation rates and unemployment rates by demographic and education groups using the 2003 NBS urban household survey data. Women now have a much lower labour force participation rate than men (70.9% compared to 83.6%), and this difference increases with age.

prospective and current students. A Graduate Employment Service has been established to provide graduates with job-specific training and to offer temporary employment transition assistance.

4.2 Labour market benefits from tertiary education

It is to be expected that rising incomes in a rapidly growing economy would be unequally distributed among occupational groups, since the response to a rising demand for particular skills cannot be instantaneous, especially where geographic mobility is so constrained. There have been several reports of severe skills shortages, especially those requiring high technical levels (World Bank, 2007a, pp.88). Data from the 1990s confirmed that not only did graduates from colleges earn more than those from technical schools, who in turn earned more than those from senior high schools etc, but that these differentials had widened during the decade. Earnings in financial activities grew five times faster than in mining, in scientific research and real estate (four times) and in transport and communications (three times) (World Bank, 2007a, pp. 91).

Graduate unemployment

However, it is not at all clear to what extent these income differentials have persisted in recent years, as graduate numbers have risen sharply. Indeed there is now widespread concern about the capacity of the labour market to absorb new graduates in occupations that require their skills or intellectual abilities. The CBR states that by September 1, 2005, the overall figure for employed graduates was 72.6%, while in March 2007, the magnitude of the problem was described in the English language *China Daily* (March 6, 2007) as follows:

"Every year, about 30% of students cannot get a job they want. They are looking for a management level job."

In the absence of empirical data, it is difficult to establish the real rate of graduate unemployment or under-employment and the degree to which this might be a relatively transitory difficulty in absorbing a very rapid growth in the size of the graduating class. However, some data are available in the CBR which refers to two surveys from September, 2004 and 2005. In September, 2004, 61% of graduates of vocational programmes were employed while comparable figures for bachelors and masters were 84% and 93%. Unsurprisingly, location plays a large part in graduate employment with 55.6%, 24.6% and 19.8% of the employed cohort coming respectively from eastern, middle and western China. The private sector

employed 23.41%, with 2.03% in state agencies, 15.73% in state-owned institutions and 8.65% in state-owned companies. Approximately 11% of these students intended to go on to further studies. However, these surveys appear to be conducted once only, immediately (within three months) following graduation.

The World Bank *China's Evolving Poverty Reduction Agenda* (World Bank, forthcoming) suggests that graduate unemployment in 2003 was on the whole fairly modest, based on NBS urban household survey data. It averaged 3.2 % in urban areas, far below the 8.8% average. Although these data showed that the average for the age group 16-30 was much higher (22.8%) than the overall average, there are no data readily available to distinguish recent graduates from older graduates. If tracer surveys of graduate destinations were conducted at, say, 6 or 9 months after graduation, they might shed more light on supply and demand balances, especially if coupled with information about graduate earnings.

Mismatch of skills

Given: *(i)* the very rapid economic changes and therefore changes in job opportunities; *(ii)* the long time lag between students selecting courses of study and entry into the labour market; *(iii)* institutional inflexibility in changing course content and capacity and, *(iv)* restrictions on labour mobility even for new graduates, it is impossible to expect that there would be a perfect match between graduates and job opportunities. One should therefore expect some periods of unemployment for graduates. Moreover the very rapid growth of the size of the graduating class may have resulted in graduates having unrealistically high job expectations based on patterns of earlier student cohorts, and therefore a reluctance to accept the first job offered.

Data on 2003 and 2004 employment rates by field of study (Table 4.1) show that while engineering and medicine continue to offer the best prospects in the labour market, employment rates for social sciences and humanities graduates improved in 2004.

However, there is considerable anecdotal evidence that students with high expectations of using their qualifications to obtain well paying jobs are frequently disappointed: "*Of the 4.95 million students expected to graduate in June 2007 [an increase of 820 000 more than 2006], 1.4 million are unlikely to find a job befitting their degree*". [10]

10 *China Daily*, March 6, 2007.

Table 4.1 A comparison of employment rates in 11 disciplines for 2003 and 2004

	Phil.	Econ.	Law	Educ.	Lit.	History	Natural Science	Eng.	Agric.	Medical Science	Mgmt
2004	85.59	85.74	79.1	81.4	87.37	89.6	88.68	91.55	91.08	86.92	86.66
2003	79.2	81.14	75.2	81.13	79.16	82.42	85.78	88.05	83.81	91.11	81.3

Note: The abbreviations of disciplines are as follows: Philosophy (Phil.), Economics (Econ.), Law, Education (Educ.), Literature (Lit.), History, Natural Science, Engineering (Eng.), Agriculture (Agric.), Medical Science, Management (Mgmt.)

Source: "Analysis and Forecast on the Employment Situation of College Graduates" by the Department of Student Affairs, Ministry of Education.

This situation implies that graduate unemployment exists in parallel with excess demand for graduates with different skills or for graduates from the technical rather than academic tracks. During briefings for this review the Ministry of Education indicated that China may need a greater volume of specific skills because the job market is soaking up graduates from the vocational education system, especially in Shanghai and Guangzhou where blue collar salaries are higher in some cases than those of white collar workers. If this is true, then the choice on offer may now be for graduates of tertiary education to revise their expectations downwards to less prestigious and less well paying jobs. This in turn suggests that the mechanisms that steer students towards one course of study rather than another (career information, and availability of places or of finance) have not adapted to the very rapid changes in the economy and the labour market. It may also suggest that curricula are outdated or too narrow to enable graduates to adapt easily to changing labour demands, an issue that is discussed further below.

The CBR suggests that "graduates can further their education either at home and abroad, which is none other than an ideal way of alleviating the employment pressure and creating better job opportunities in the long term." Without in any way challenging the need for increased postgraduate training for suitable candidates, it would be disturbing to consider this as a last resort for unsuccessful job seekers. In the first place, these may not be well-suited to postgraduate courses, so this would be a highly expensive way of maintaining the unemployed. Secondly, an indiscriminate expansion of postgraduate courses runs the risk of simply increasing the credentials required for particular jobs without raising productivity in those jobs.

Institutional flexibility and relevance

How well is China's tertiary system preparing its graduates to work in a changing and increasingly competitive economy where the new and desirable jobs are no longer in low-skill industries? How much are institutions learning from the labour market in terms of reappraising curriculum and pedagogy? How flexible and relevant are the course offerings and how much do they encourage creative thinking, problem solving and teamwork, skills increasing demanded by employers in modern economies? A key issue is the absence of a policy framework for the provision of "continuous education" or "lifelong learning" in China.

While the elite level institutions with their Band One enrolments are going much of the way towards delivering the higher level skills that will be needed to move China forward towards a knowledge society, it is not evident that the system as a whole is producing graduates capable of working up to international standards. For example, a 2003 McKinsey study reported that 33% of university graduates study engineering but they "focus more on theory and get little practical experience in projects of teamwork." A worrying conclusion of the study is that "fewer than 10% of Chinese job candidates, on average, would be suitable for work in a foreign company".[11]

The Review Team noted that private TEIs tend to focus on the more labour market relevant areas including business administration, marketing, finance, computer sciences and foreign languages. A number of the private TEIs specialise in training technicians for local enterprises. Steps are necessary for raising the quality of some TEI programmes so that they can function effectively as part of the tertiary education sector. A well-functioning private sector can add to the productivity and innovation of the entire sector, and widen the choices available to students to meet their varying needs and changing labour market circumstances.

In view of the finding that only 61% of graduates from vocational education institutions of the September 2004 cohort had found employment at the time of the Ministry of Education tracer survey, it would be useful to review the nature of vocational training and its responsiveness to labour market needs. Such an evaluation would help to prioritise the State's efforts to expand vocational schools and colleges through an investment of a further RMB 14 billion.

11 McKinsey Quarterly, 2003 (quoted in World Bank, 2007a).

4.3 Pointers for future policy development

On the basis of our very limited observations of the diversity within China's tertiary education and labour markets, we offer a number of high-level suggestions for increasing the effectiveness of the investment in tertiary education:

- Improve labour market information available to education policy makers. In particular, develop a systematic, multi-level approach to consultation over expectations of graduate attributes, through:
  - *i.* National and regional surveys to establish the knowledge and skills required by employers. The methodology developed by the Chinese Radio and TV University (CRTVU) to establish employer satisfaction with their graduates could be utilised more broadly;
  - *ii.* Regular monitoring of graduate supply and labour demand balances. In particular, monitor the labour market destinations of graduates from different disciplines and TEIs on a regional basis, undertake graduate tracer surveys after 6 or 9 (rather than 3) months from graduation, and include data on graduate earnings;
  - *iii.* Obtaining periodic reports from TEIs about employer expectations of graduate capabilities and employer satisfaction with the graduates they employ.
- Improve career guidance and information for upper secondary students along with more timely occupational information for prospective tertiary students and graduates.
- Put more emphasis on general competencies such as problem solving, teamwork, and broad technology and business skills at all levels of education.
- Review the responsiveness of vocational training institutions and strengthen the quality controls over private TEIs as a means of expanding their offerings and widening choices for students relevant to varying labour market circumstances.
- Design bridges and pathways for learners to progress across the different parts of the tertiary education and training sector.
- Review constraints on mobility, such as household registration rules, to improve the efficiency of the labour market, in parallel with interventions to increase access to tertiary education and jobs in less advantaged regions.

5. Learning Effectiveness and Quality

5.1 Context

We have noted in the preceding Sections that the rapid development of tertiary education in China has put pressure on the capacity of the sector, giving rise to the need for far-reaching improvements to be made in curricula, teaching materials and teaching methods, the teaching workforce and the performance of teachers (He, 2007). There have been several policy interventions, especially since 2001, to improve teaching quality, along with measures to improve operational conditions in TEIs (Ji, 2005).

Distance learning continues to be an important delivery channel for China given the scale of demand for learning and vast geographic distance to be covered. In 2007, 2.17 million students were enrolled in courses offered by the China Central Radio and Television University (CRTVU). Along with continuing education offerings, opportunities exist for degree studies. CRTVU's facilities include 500 learning centres hooked up via satellite, with 2700 testing centres and classrooms, video conferencing and other multi-media courseware and monitoring systems. The provision of distance education is considered in more detail in Section 6.

In 2001, the Ministry of Education published a position paper, "Suggestions on Strengthening Teaching of Undergraduate Education and Improving Its Teaching Quality in Regular Higher Education Institutions", outlining measures to improve teaching quality, such as by strengthening financing, requiring instructional performance assessment, and using high-quality teaching materials. These measures reportedly had a positive impact on teaching quality within TEIs.

In 2003, the "Project for Reforming Teaching Practices and Enhancing the Teaching Quality in Higher Education Institutions" was launched. The project gave further impetus to raising teaching quality through a range of initiatives, including revision of curriculum structure and content and teaching methods, developing best practice course materials, equipping

teaching laboratories for foundation courses, establishing mechanisms for information exchange, and rewarding outstanding teachers.

The 2003-2007 Action Plan for Invigorating Education included further measures to strengthen the quality assurance system by: establishing a national quality assessment of instructional performance on a five-year cycle; standardising and improving relevant assessment methodologies and requirements for programmes and majors; and establishing an assessment system of programmes and majors linked to certification and professional licensing.

In October 2004, a "National Assessment Centre for Instructional Performance in TEIs" was set up by the Ministry of Education to oversight the conduct of instructional performance assessment and the assessment of programmes and majors at tertiary level. In January 2005, after reviewing the progress made, a new directive was issued: "Suggestions in Further Strengthening Teaching of Regular Programs with TEIs". Quality improvement of tertiary education is at the core of this new initiative. Additionally, efforts have been taken to address infrastructure deficiencies.

In January 2007, with the approval of the State Council, the Ministry of Finance and the Ministry of Education issued a joint policy on "Suggestions concerning implementing the project of teaching quality and teaching reform of regular programmes within TEIs". This gazette launched "the project of teaching quality and teaching reform of undergraduate programmes within TEIs", also known as the "Quality Enhancement Project", with funding of RMB 2.5 billion over a 5 year period (2005-2010) involving:

- Restructuring the programme mix of undergraduate studies and setting up professional certification systems in order to meet labour market demands and competence requirements;
- Co-development and sharing of courseware, teaching materials and other teaching resources through online instructional platforms;
- Reform and innovation in experiential learning and human resource development models by setting up demonstration centres for experiential and research based learning;
- Development of instructional teams and high quality teaching staff through the identification of "excellent teachers" and the promotion of "communities of practice" to exchange experiences, share knowledge and mentor the younger generation of teaching staff;
- Publication of the findings of instructional assessments and basic data on instructional conditions of TEIs, after developing a

classification scheme of TEIs and corresponding assessment policies and systems;

- Supporting the TEIs in the Western Region by twining in order to harmonise the education development with the Eastern Region.

5.2 Learning effectiveness

The above initiatives indicate how seriously the Chinese authorities appreciate the deficiencies in teaching effectiveness and how determined they are to improve performance. Nevertheless, there is much diversity across the tertiary education sector with great disparity in performance. The Review Team had the opportunity to learn about initiatives in a few universities, the best among them having introduced innovations in curricula, teaching methods and ways of assessing student learning. There are other institutions that lag well behind. The challenge of lifting performance across the whole sector is an immense one.

The Review Team was advised that China is seeking a shift in the dominant mode of tertiary education, from "a knowledge-oriented" model to a "capability oriented" model, and to the expansion of cross-disciplinary approaches to curriculum and learning. This is a far-reaching challenge. Its import was highlighted in remarks made to us about the stalling of economic development in Japan through lack of indigenous innovative capacity. It was suggested that Chinese language learning, being character based, like Japanese required rote learning at the early stages of education. Consequently, classroom practices had evolved from practices conducive to memorisation and learning based on repetition. It was understood that such a passive pedagogy could stifle individual creativity, and given Confucian traditions of respect, an unquestioning approach to learning could fail to develop critical thinking skills. It was put to us that for China to avoid the Japanese dilemma it would be necessary to develop complementary ways and means of learning to that of the classroom.

In a few TEIs we were shown examples of approaches to learning via team-based projects, simulations, case studies, hypotheticals, and practical and work-based learning. Students spoke enthusiastically of their experiences with these diverse modes of learning. However, in the majority of the TEIs we visited we gained the impression that the conventional methods of the traditional classroom prevailed, and the students reinforced that impression. By and large the dominant pedagogy is reliant on teaching as telling, learning as passive absorption of knowledge content, and assessment as tests of memorising through final closed-book written exams and project assignments. Student learning experiences do vary by field of

education, with some fields of professional education tending to more active modes of learning and more interactive modes of teaching. As a general observation, teaching methods vary greatly from traditional lecture style to more hands-on, experiential and interactive modes of learning, including field studies, project work, case methods and computer based simulations. Hence, TEIs deliver very different learning outcomes in terms of fostering students' ability to apply information obtained and develop critical thinking and problem solving capacity and learn to learn.

Ways and means of learning affect learning outcomes and the capabilities of graduates. An international media report, drawn to the attention of the Review Team during the visit, suggested that a number of Chinese students who had scored highly on the national entrance examination failed to gain admission to the University of Hong Kong because at interview they failed to demonstrate knowledge apart from what they had memorised for the exam (Hartmann, 2007).

There are more widespread concerns about the quality of graduates of China's TEIs. A 2006 study identified the following main reasons for employers in China preferring to employ overseas educated graduates over locally educated graduates (Australian Education International, 2006). When asked to select (from a pre-determined list) up to three reasons, over half of the employers interviewed identified (understandably) English language skills, and the ability to liaise and communicate effectively with overseas business people. Also important, however, were the abilities of overseas graduates to be creative and innovative. Just over half (56%) of the employers who were interviewed indicated that they were more likely to place overseas graduates in managerial level positions, while they would place locally educated students in administration, maintenance and factory floor work. The response percentages are shown below (% respondents):

Better English	59.2
Can communicate and liaise with overseas business people	56.6
More creative	38.2
Well-trained	25.0
Better fit with corporate culture	23.7
Good problem solvers	22.4
Shortage of qualified graduates from local institutions	22.4
Quality of education abroad is superior	6.6
Other	6.6

A study published by the McKinsey group (2005) regarding China's looming talent shortage reached a similar conclusion. Multinational companies reported difficulties finding graduates with the necessary skills.

Fewer than 10% of the job candidates, on average, would be suitable for work in a foreign company in the nine occupations studied by the McKinsey research team, namely, engineering, finance, accounting, quantitative analysis, general service, life science, medical services, nursing and office support (Farrell and Grant, 2005).

5.3 Accreditation and quality assurance

China has a well developed regulatory framework for accreditation and award of degrees. Since 1985, the Academic Degree Committee of the State Council has assessed degree qualifications across 22 disciplines and programmes. A set of accreditation criteria and methods has been established based on accumulated know-how. In 1994, responsibility for assessment was transferred to the "Institute of Degree and Graduate Education Association for Higher Education Institutions and Research Institutes", a public organisation. It plays an important role in assuring the quality of academic degrees and developing the administrative capabilities of TEIs.

The China Academic Degrees and Graduate Education Development Centre (CADGEDC) reports to the Academic Degree Committee of the State Council and the National Assessment Centre of Instructional Performance in Higher Education, reports to the Ministry of Education. Both bodies share responsibility for accreditation inspection and assessment for the award of undergraduate and graduate degrees, as well as the overall quality of TEIs. TEIs are assessed on seven criteria, encompassing the philosophy of education, teachers, teaching facilities, disciplines and instructional reform, instructional management, teaching and learning climate, and educational attainment.

For undergraduate education, attention is being given to reforming teaching practices, recognising and rewarding good teaching, showcasing exemplary teaching practices, and undertaking evaluations of teaching quality on a 5-year cycle. Additionally, there is an expectation that professors and associate professors will take on teaching workloads at least every two years. Specific measures have been taken for raising standards of English language proficiency, and reforming medical education.

Since the resumption of graduate enrolment in 1978 and the establishment of the academic degree conferring system in 1981, particular attention has been given to the quality of graduate education (Ding, 2007). Graduate education is being quality assured by various means. Intake quality is managed by tight screening of applicants (400 000 offers were made from 1.4 million applicants in 2006). Expectations of qualifications are specified

in the qualifications framework: Master degree 2-3 years, 1 – 1.5 curriculum and dissertation; PhD 3-5 years. Graduate schools are required to have an Academic Degree Accreditation Committee of the TEI, drawn from leading professors. External quality appraisal occurs every six years as a requirement of certification to offer postgraduate awards, and the evaluations consider the quality of graduates. The MBA and MPA programmes are evaluated periodically by industry accrediting bodies. PhD dissertations are subject to external examination, and PhD dissertations must be published.

Many TEIs have set up inspection offices of instruction and quality assessment and monitoring centres. Inspection offices focus on aspects of the teaching process inside and outside the classroom, and review of student work and records. Quality assessment and monitoring centres focus on the institutional aspect of quality assurance. We were advised that most of the TEIs provide students with opportunities to assess their teaching and to provide feedback on the quality of teaching and course materials.

5.4 Pointers for future policy development

The main area of concern in respect to quality is that of private TEIs, many of which have limited resources of finance, personnel, facilities and administrative capacities. Concerns about the quality of private TEIs are said to be widespread but the Review Team did not have the opportunity firsthand to appreciate the dimensions of the concern. Private TEIs constitute an important part of China's tertiary education supply infrastructure. They cater for students that cannot otherwise access tertiary education through the public system, and they play a particular role in responding to new areas of labour market demand. It is important, therefore, that private TEIs develop the capacity to deliver an acceptable quality tertiary education provision and take their place as an integral element of China's tertiary education system. Accreditation requirements could be strengthened by requiring that private TEIs after an initial probationary period be subject to regular quality assessments as a condition of continuing accredited status. Consideration might also be given to government funding of a programme of quality enhancement in a selected number of private TEIs.

The public TEIs do not appear generally to be as responsive to China's changing circumstances as they should be. For the tertiary sector broadly, the current focus of quality assurance processes on the basic requirements for offering degree programmes should be widened to give a greater emphasis to learning outcome standards. Here we see the need for three main initiatives. First, we believe the Chinese education authorities need to

include new constituencies in the processes of clarifying expectations of graduate capabilities and evaluating the success of educational programmes in developing those capabilities. Second, and as a product of the first, we believe a new statement of educational objectives is required to meet the changing realities of Chinese society, and we see that statement being expressed through the development of a National Qualifications Framework.

We gained the strong impression that there is a growing recognition of the need for tertiary education to develop not only discipline-specific knowledge and understanding but also generic skills of critical inquiry, problem solving, communication and team work. A number of educators indicated to us that they see the need to move beyond a "passive knowledge-oriented approach" to a more "active capability-development approach", and they appreciate how profound a change that involves in terms of culture and practice. However, we formed the view that discussions about this transformation are at early stages and that there are only a few places where serious efforts are being made to promote learning modes that complement conventional classroom practices that will help students to develop broader skill sets. In our view, there is need for a more systematic approach to reform of curricula, pedagogy and educational evaluation.

A National Qualifications Framework could be a vehicle for specifying for each level of qualification the expected attributes of graduates, and could help to focus thinking about curriculum design, pedagogy and evaluation on learning outcomes. Such a framework could serve as a reference point for TEIs in designing and evaluating their programmes, and also indicate the links and pathways between different qualifications. In our view, a qualifications framework for China should be comprehensive of school and all post-school qualifications, including vocational education and training in the secondary and post-secondary sectors.

Third, at the level of individual TEIs we see much scope for institutional leaders to engage more actively with employers of their graduates in the design of educational programmes and evaluation of their effectiveness. It is particularly important that educational authorities and TEIs engage more directly with employers of graduates, in identifying changing job requirements and monitoring changes in employers' expectations of graduates and their satisfaction with those whom they have employed.

6. Student Access and Equity of Opportunity

6.1 Context

Access to tertiary education in China is by competitive national level examination (supplemented by some institution-specific arrangements discussed below). While transparent and superficially fair, this arrangement favours students from wealthier families who are able to afford to attend good primary and secondary schools, alongside supplementary coaching, which prepare them specifically for the examination. Notwithstanding a range of government-sponsored student support programmes for more needy students, individuals from those urban areas, where the choice of secondary schools is greater and where incomes are already substantially higher than incomes in other areas, are inevitably the winners.

In imperial China, mandarins were traditionally selected by examination. Children studied from very young ages to be able to compete. While this system was meritocratic in some respects, it was also highly elitist as relatively few individuals had an opportunity to enter the competition. During the Cultural Revolution the academic traditions of China were threatened and many universities and academically oriented secondary education institutions were closed. However, when the universities reopened after the Cultural Revolution ended, there was a renewed national emphasis on academic quality and educational incentives.

With the start of the Cultural Revolution in 1966, the National College Entrance Examination was abolished with a view to expanding opportunities for students from underprivileged backgrounds. In 1968, the reformed school curriculum was typically characterised by less academic study and more practical experience. In 1977 Deng Xiaoping, seeing the need for China to catch up internationally, and giving emphasis to science and education, restored the National College Entrance Examination and sought to rebuild the formal education that had been abandoned during the Cultural Revolution.

By 2007, competition and academic excellence are once again highly valued, as is discussed elsewhere in this report, but there is a growing Government awareness of the need to spread resources beyond the currently key institutions at upper secondary and university levels.

Student admission

Students in China are admitted to tertiary education by examination (the *Gaokao*) which is administered on a national basis once a year in Chinese, mathematics, a foreign language and one optional subject. Since 2004, in an effort to improve the quality and relevance of the *Gaokao*, eleven provinces and some major cities such as Beijing, Shanghai and Jiangsu have developed their own examinations. In some cases, exceptionally gifted students can, be directly admitted to TEIs without sitting the *Gaokao*. A range of positive discrimination measures target students with special needs and ethnic minorities from rural areas while special programmes ensure adequate enrolment in key disciplines deemed necessary for national interests.

On a national basis, intending students apply to universities in advance of sitting the examination while, in their examination application, they specify three universities, aiming to be as realistic as possible in their choice. The top 20% of the examination cohort is admitted to what is called the "Band One" category of tertiary institutions[12]. The elite universities specify what marks in the examination they will accept as their entry standard; admission to these universities represents the top 5% of Band One grades. The next 40% of the cohort is admitted to "Band Two" institutions while the final 40% of the cohort is admitted to "Band Three" institutions.

In addition to the national system, 25 pilot TEIs (including Fudan University in Shanghai and Tsinghua in Beijing which were visited as part of this Review) are experimenting with modifications to the general admission system, through a process of university administered general aptitude tests and interviews for a selected 5% of their applicants before the mandatory *Gaokao*. Effectively, this means that they admit students from the top 1% of the top 20% of the cohort, thus ensuring the academic excellence of their future graduates.

Student aid

As discussed in the next Section, tuition fees are universally charged for tertiary education in China with some limited exceptions, notably a recently announced initiative whereby free instruction is offered to students enrolled

12 It should be noted that the Band lines and the total points differ from region to region.

in the teacher training colleges and universities under direct leadership of the Ministry of Education. Tuition fees can range from € 400 to almost €700 per annum in TEIs and from about €230 to €570 in public vocational education schools and colleges while the better equipped private institutions charge up to about €900 (World Bank, 2007b). All these fees exclude dormitory and subsistence expenses.

Because of the substantial cost of studying, student support schemes form a very important part of the tertiary education landscape in China. The student loan programme is designed for students who are able to undertake borrowing from a commercial bank. There is a comprehensive system of merit, discipline and area targeted scholarships, work study programmes, including assistantships and other academic related jobs, subsidies and fee waivers to assist poor students (the "Green Light" programme). With the problems of these students in mind, in March 2007, the Prime Minister proposed a further extension of the State Scholarship scheme to four year colleges and certain advanced vocational education schools, together with increased special measures for students with a disability. The CBR also details the special initiatives for the expansion of tertiary education for minorities and in western areas, which have the objective of ensuring that no intellectually able student will be excluded on the basis of financial need, ethnic background or geographical location from tertiary education.

Gender

Between 1996 and 2004, in response to a series of positive discrimination measures, the proportion of women enrolled in tertiary education increased from 36% to 46%. A further 3.5 million women study in correspondence courses, evening studies and other parts of the non-formal system. Moreover, women are no longer confined to the more traditional disciplines (foreign languages, medical and teacher education) but increasingly participate in mathematics and engineering disciplines.

Distance education

China has a well developed system of distance education initiatives including correspondence, satellite television and on-line open education which is of especial value in improving access in such a vast country. Coupled with the ongoing expansion of internet access to educational services which will minimise the risk of digital divide, these are a source of improved learning opportunities for different population groups in China's central and western regions.

The Open University, China Central Radio and TV University (CRTVU), which the Review Team visited, is linked to the Ministry of

Education and operates through a network of 44 provincial TV Universities (RTVUs), 930 branch schools and 22 000 local centres. With a focus on rural and remote areas, and on minority nationality regions, CRTVU aims to provide all learners with access to tertiary education, especially in situations where no other opportunities exist. By 2005 CRTVU accounted for about 70% of distance education in China and had 4.5 million tertiary education graduates and almost 3 million registered tertiary education students.[13] CRTVU employs leading academics and experts from national universities such as Tsinghua and Beijing to act as lecturers and subject matter experts, while teaching materials from Western institutions are also being made available electronically. CRTVU offers bachelor level degrees in about 25 disciplines, including the humanities, social sciences and engineering. Other diploma programmes are aimed at skills upgrading for students with secondary or vocational high school education and cover tailored financial training for the banking sector, agricultural extension programmes for millions of farmers and teacher education programs. Because there are no age limits on participation, these flexible programmes contribute to lifelong learning (as discussed in Section 4).

6.2 Major issues

Income inequality

Increasing income inequality has been a result of a development strategy designed to create incentives for individuals and concentrate public resources on areas (in the east) of the country with the best potential for export-oriented manufacturing development. Now, as outlined in Section 1, the level of personal income inequality has risen to a level that is higher than any other country in Asia except Malaysia and approaches that common in Latin America. This situation is further exacerbated by the failure of fiscal system to redistribute tax yields adequately, which means that the most remote and poorest areas have the least public resources for education at all levels. The net effect of this is that in determining access to education, incomes matter much more than they used to and that even at primary school level, fees are being charged that represent a high proportion of a poor farmer's or urban worker's income (World Bank, forthcoming).

A major reform of the funding of compulsory education was initiated during the course of this Review, with nine years of compulsory education being extended on a tuition-free basis in rural areas all over the country and,

13 China Central Radio and TV University, *www.crtvu.edu.cn* and Open University, *www.open.edu.cn*

from the spring semester of 2008, the removal of incidental expenses for compulsory education in urban areas. The State Council called for local governments to take greater responsibility for compulsory education in order to promote balanced development of compulsory education in urban areas and to raise the school attendance rates of children of farmer-workers.

Regional inequality

There are major differences in access to education among and within Regions, with considerable inequality of opportunity even at the level of basic education. In China in 2005, 744.71 million people or 57.01% of the population lived in rural areas. In 2000, participation in tertiary education, per 100 000 was 18 times greater in urban areas than in rural areas while at secondary level, the level was 4 times more (World Bank, 2007a). Students of technical and vocational education in the central and western regions have less access than those in the coastal areas (World Bank, 2007b). The average education of the rural labour force in 2002 was 7.3 years compared with 10.2 for the urban workforce.

It is not surprising that the Knowledge Development Indicator of the World Bank, shows vast differences in knowledge across Chinese provinces (World Bank, 2001). By 1998, Beijing and Shanghai were the most knowledge-intensive areas in China and had knowledge intensities 6.1 and 5.3 times the national average respectively, while Guizhou province reached only 32% of the national average.

A major inequity is that there are many more degree places available in the richer provinces (notably Shanghai and Beijing). Therefore a higher proportion of Shanghai students obtain access to degree programmes than, for example, Yunnan students, even though the abilities of students attending non-degree institutions in Yunnan may surpass those of the Shanghai students undertaking degree courses. Moreover, the quality of some of these degree programmes is not as high as some of the vocational institutes. The outcomes can be unfair for individuals. The team met one graduate who had trained to teach English in secondary school but upon graduation was under-qualified because of a change to the professional entry requirement. She has the option of teaching at primary level although she has not been trained for primary teaching. There appear to be no programmes available to her to undertake the additional year to obtain the degree, not even a 'grandfathering' provision given that the rules were changed after she had commenced her studies. At the very least, there should be provisions to enable such diploma holders to upgrade their qualifications.

The Government has begun developing policies to extend the benefits of tertiary education beyond the more affluent coastal areas. The twinning arrangements, discussed in Section 3, are a good example of a policy to extend the expertise of the high quality eastern TEIs to more distant western universities where faculty and facilities are less well resourced. Graduate students of central or western universities have opportunities to do post graduate work in eastern TEIs; and staff exchanges take place in both directions. The Review Team met some postgraduate students from central regions who had transferred to elite universities after doing well in their primary degrees. However, for first degrees, there remain major inter-regional access impediments.

Admission policies

Success in the *Gaokao* examination is strongly influenced by the combined factors of stimulation and support from the family and from school. The "backwash" effect of this high stakes examination on secondary education is a source of concern because of the advantage enjoyed by the more prestigious city schools which can often establish special preparatory programmes and seminars through linkages with TEIs. The winners in this competitive situation are the candidates who come from the more affluent families with a tradition of attending tertiary education. Moreover, if, at examination, a student does not achieve Band One level in one of the universities of his/her choice, no offer of a university place is made and the only other option is for that student to apply to a private TEI. If a student does not anticipate that he or she will be successful at Band One level, they choose Band Two universities.

Student support

There are also distortions in how fairly the student support system functions. In discussion with students in the more academic TEIs (*i.e.* Fudan and Yunnan) who are likely to come from more affluent backgrounds and to be financed, at least in part, by their parents, few were obliged to take part time jobs in order to pay for tuition and accommodation, although some were able to avail of some scholarships and loans. However, the team was struck by the number of students in Band Two public institutions, many of whom came from rural backgrounds and were using a combination of loans and part time work to cover their tuition and living expenses. In the one vocational college we visited, almost all students interviewed seemed to have taken out loans and to be working part time.

Moreover, many poor students are paying tuition fees in private TEIs. This is a difficult issue for two reasons: *(i)* no Government grants or scholarships may be applied to private TEIs; and *(ii)* the perceived absence

of quality assurance mechanisms in private TEIs could mean that less well off students are doubly disadvantaged because they take loans to pay for education of a poorer quality.

The State Council's Opinion on Establishing and Perfecting Financial Policy System to Assist the Students from Poor Families Enrolled in Regular Higher Education Institutions, Advanced Vocational Schools and Secondary Vocational Schools was issued in 2007 by the Central Government. This new policy system of financial assistance will benefit about 4 million students in 1 800 TEIs and 16 million students in 15 000 secondary vocational schools. A diversified set of financial assistance measures has been developed including: National Scholarships, National Encouragement Scholarships, National Stipend Scheme, Student Loan Scheme and Part-Work and Part-Study System. The new Student Loan Scheme focuses on helping students from poor families with their tuition fee and accommodation expenses. The National Stipend Scheme focuses on helping students from poor families with living costs. In secondary vocational education the National Scholarship will be the main measure for helping students. Based on the Opinion, the Central Government will continue the National Scholarship offering 50 000 of the top achieving students 8 000 Yuan each year. National Encouragement Scholarships (5 000 Yuan per student per year) are directed to high-achieving full-time students from poor families in regular TEIs and advanced vocational institutions, covering about 3% of the college students in the country. The National Stipend Scheme (2 000 Yuan per student per year on average) covers 20% of the enrolments on average in regular TEIs and advanced vocational institutions.

System articulation

Progression pathways between local and regional TEIs and between regional and national TEIs are poorly defined or non-existent. In theory, a system of "ladders and bridges" is in place whereby access to tertiary education is possible from the vocational colleges to university level, but in practice many students do not appear to achieve this progression. During discussions with students in Kunming college of Metallurgy, ranked among the six best vocational colleges in the country, with labour market specific courses and excellent placement rates, we were informed that transfer to a university is quite difficult and that only some 2% of students could transfer successfully from a two or three year course to the 3rd year of a university course. Moreover, the perception is that universities look down on college students – so the ladders and bridges, while in place notionally, are not readily traversed. However, improvement has been made in providing pathways horizontally between general and vocational education, and

vertically between secondary and post-secondary education for vocational students.

6.3 Pointers for future policy development

Policy should be directed to ensuring that all students of equivalent ability can have commensurate access to educational programmes of equivalent standard. Equity of opportunity in tertiary education requires a framework of fiscal equalisation for creating a level playing field on a regional basis in China.

In order to ensure fair access to tertiary education, the best policy is one that admits all students based on intellectual ability only and without any reference to their ability to pay. After offers of enrolment are made according to this principle, scholarships or income-contingent loans should be available for those who demonstrate need so that they are not deterred from participating by up-front costs.

We believe there is a case for examining the extent to which accessibility can be improved by focussing the mission of some institutions on meeting the needs of under-represented groups; improving articulation between 'vocational' and 'academic' institutions so that credit accumulation and transfer arrangements are rendered more robust at a regional level; and developing formal 'hub-and-spoke' arrangements between institutions (perhaps modelled on successful examples in the public university systems in the United States) which combine outreach with seamless progression opportunities.

The current national examination system offers advantages of merit-based transparency in admissions, and the high level of selectivity brings efficiency benefits through high rates of tertiary progression. However, the single system reinforces the second-best status of vocational-applied learning relative to academic-theoretical learning. Considerable pressure is put on young people in their years of secondary and upper-secondary schooling to achieve in the national ranking, and the options available for those who are seen to have 'failed', by not scoring the marks needed for entry to academic study, deny them many life chances. Vocational education ought to be seen as a worthwhile pursuit in its own right rather than a fallback when other options are closed off. Students who start out on one track should also have the chance to transfer to another track according to their needs and abilities. In this context, consideration might be given to the following matters:

- Relaxing the national examination Band system, to make it possible for students who do not achieve a Band One preference to be considered automatically for other places;
- Relaxing the current policy whereby the children of migrant workers can only take the national examination in their own home towns;
- Targeting the provision of scholarships and incentives for highly talented students in circumstances of financial need;
- Developing formal 'hub-and-spoke' arrangements between institutions (perhaps modelled on successful examples in the public university systems in the United States) which combine outreach with seamless progression opportunities;
- Improving progression arrangements (articulation) between 'vocational' and 'academic' institutions so that credit accumulation and transfer arrangements are rendered more robust at regional level;
- Implementing a national credit transfer system in order to encourage mobility.

7. Tertiary Education Financing

7.1 Context

In 1999 (curiously the latest period for which comprehensive statistics are available) China was spending 0.4% of GDP on tertiary education, compared with an OECD average of 1.4%. China's GDP has more than doubled since, but we do not know how much the tertiary education expenditure share of GDP has grown, and how much the balance of public and private spending has shifted. Public expenditure on all sub-sectors of education rose as a proportion of GDP from 2.79% in 1999 to 3.28% in 2003. Much of that growth in public outlays appears to have been directed to improving school access and retention. In the tertiary education sub-sector, China has pursued a policy of diversifying the sources of income of publicly-funded TEIs while promoting expansion of private TEIs.

For public degree-granting TEIs, in 1997, revenue sources were shared as follows: central government 11%; provincial governments 36%; local governments 4%; tuition fees 19%; sales and services 22%; other sources 8% (Hu and Guoliang, 2002). Total expenditure on publicly-funded Regular and Adult TEIs increased fourfold between 1997 and 2004. Over that period, the Government contribution increased by 62% (RMB 540 million) but the government share of expenditure fell from 77% to 47%. Revenue from tuition fees and charges for student accommodation grew by RMB 3 210 million, from 15% to 30% of total TEI income.

In 1999 the State government set the goal of trebling university enrolments by asking TEIs to increase their student intakes by 50% for three years over 1999- 2001 (Shen and Li, 2003). This expansion was partly funded by growth in tuition fees. Tuition costs rose rapidly from 2500 Yuan in 1998 before the expansion, to around 3200 Yuan in 1999, then to around 3550 Yuan in 2001. Tuition cost as a proportion of disposable income per urban resident was 80.5% while tuition cost as a proportion of disposable income per urban resident was 47.3%, while tuition cost as a proportion of net income per rural resident reached 171.2%. Rising tuition prices and

living costs are seen to be placing disproportionate burdens on some students and their families.[14]

International comparisons of tuition fees (see Table 7.1) suggest that China is obtaining contributions from students to the costs of tertiary education at a level that is towards the mid range of costs borne by students in those developed economies where tuition fees are charged. Our reading of this situation is that any future addition to the burden of costs on students should at least be matched by increases in general taxpayer contributions through government investment in tertiary education expansion and enhancement.

Table 7.1 Tuition fees for first degrees in selected countries
(national currencies converted to US dollars by Purchasing Power Parities)

Country	Year	Low	Medium	High
Australia	2005	$3 500	$5 000	$5 850
Austria	2002-03	$800	$800	$800
Canada	2003-04	$1 460	$3 170	$4 375
China	2004-05	$1 640	$2 960	$3 820
China (Hong Kong)	2002-03	$6 060	$6 060	$6 060
India	2001-02	$20	$85	$37
Japan	2005	$4 060	$4 060	$4 500
South Korea	2000-01	$195	$1 404	$2 927
Netherlands	2002-03	$1 520	$1 520	$1 520
Scotland	2004-05	$3 485	$3 485	$3 485
United States	2004-05	$4 350	$9 000	$12 400

Source: Marcucci and Johnstone (2005).

The combined increases in government and private spending in respect of Regular TEIs more than kept pace with the growth in student enrolments over 1998-2004, with the average total expenditure per student rising by RMB 5 507 or 58%. In overall terms this increase should have enabled qualitative improvements. However, the distribution of the additional

14 According to the survey report published by the China Youth Research Centre, the tuition of TEIs increased by 25 times compared to the value of 1990, representing 10 times of the average income increase. The educational expenditure of families has surpassed the housing expense and pension savings and ranked number 1 of the household expenditures (in Sohu News at: *http://news.sohu.com/20070227/n248376242.shtm1*, 27/02/07).

government spending has been skewed in favour of the universities targeted for special investment under the 211 and 985 projects affecting 100 and 36 universities respectively.

These trends suggest a considered approach on the part of Chinese authorities to the various trade-offs required in a period of economic transition challenges that place an imperative on the quality of graduate supply to the labour market, alongside demands for quantitative expansion of tertiary participation, in a context of constrained public expenditure capacity.

7.2 Main issues

Institutional financing

Public universities and colleges are funded through four income streams: *(i)* annual recurrent block funds through a per capita payment to the institution from either the central or provincial government in respect of a quota of student enrolments; *(ii)* supplementary non-recurrent funds for selected institutions under the 985 and 211 initiatives; *(iii)* tuition fee income reflecting prices set by provincial governments (typically some 25% of estimated delivery costs); *(iv)* additional income generated by institutions from contracted work and other activities.

With regard to the per capita block fund there appears to be no policy of consistency across TEIs in the funding rates per student per course of study. In practice there are wide variations between funding rates per student per course within as well as between centrally-funded and provincially-funded TEIs. The 'elite' institutions receive the highest unit of resource. Inter-provincial variance is particularly wide, with adverse consequences for quality and equity.

It is not clear to what extent the current policy emphases, including incentives that are implicit to the structure of institutional arrangements, reflect deliberate policy purposes. For instance, a survey of 15 000 students undertaken by the Economics of Education Institute at Beijing University in 2004 indicates that private tuition costs vary little across different classes of students. Tuition expenses (5900 Yuan) for the students from the top quintile of family income were only 23% greater than the tuition expenses (4800 Yuan) for students from the bottom quintile (Li, 2005). The inference is that there are only relatively small differences in tuition prices across TEIs and that those TEIs with the more expensive cost structures are more heavily subsidised through public funds.

From a policy perspective this apparent vertical inequity may be justified if the graduates of those institutions in receipt of grants from the public purse produce externalities above their private benefits, such as by the spill-over of a stronger innovation and productivity impetus to economic growth. That is, the social dividend justifies higher public investment in the most talented students undertaking their studies in the best resourced institutions, notwithstanding the opportunity cost of foregone additional graduate output for the same level of expenditure.

Arguably the justification, in both efficiency and equity grounds, for preferential investment through higher levels of public grants per capita for first degree students enrolled in selected TEIs is greater for an economy at the early stages of development, with an 'elite' level (less than 15%) of tertiary education participation, than it is for an economy that has pushed beyond developing status and whose tertiary education system, including its public TEI component, has grown from 'elite' to 'mass' participation. The opportunity costs of such an approach, in respect of first degree students, become more burdensome for a more advanced economy with wider participation. The productivity-related grounds for skewed public investment in that environment shift in favour of graduate students who have the wherewithal to contribute to national innovation. On equity grounds, the rationale for skewing public investment to certain first degree students is challenged by the problem of social reproduction, whereby achievement of the highest scores in the national examination reflects relative 'preparedness' enabled by family support but not necessarily relative individual 'ability' to succeed.

Student financing

Eligibility for income support by way of grants is determined on a regional basis with reference to living standards in the region. Each TEI identifies student circumstances in relation to the lowest living standard in the region and family capacity to meet tuition and accommodation costs. There is no state support for students in private TEIs, but the state encourages private TEIs to provide support for needy students. Most private tertiary education expenses are financed directly from savings. Chinese families pay on average around 65% of student costs from savings (Li, 2005). As mentioned in Section 6.2, a number of new initiatives were introduced in 2007. A diversified set of financial assistance measures has been developed including: National Scholarships, National Encouragement Scholarships, National Stipend Scheme, Student Loan Scheme and Part-Work and Part-Study System. The new Student Loan Scheme focuses on helping students from poor families with their tuition fee and accommodation expenses. The National Stipend Scheme focuses on helping

students from poor families with living costs. In secondary vocational education the National Scholarship will be the main measure for helping students. Based on the 2007 *Opinion,* the Central Government will continue the National Scholarship offering 50 000 of the top achieving students 8 000 Yuan each year. National Encouragement Scholarships (5 000 Yuan per student per year) are directed to high-achieving full-time students from poor families in regular TEIs and advanced vocational institutions, covering about 3% of the college students in the country.

Students can access commercial loans through banks. Over the first five years of operation of the Student Loan Scheme fewer than 1.5 million students borrowed to finance their education (Bangyang, 2005). Between 2004 and 2006 it is reported that the Bank of China loans scheme has advanced 4.35 billion Yuan to some 322 000 students in 115 TEIs (Mok and Lo, 2007).

While there seem to be no official collateral requirements for obtaining a loan, nor insurance for lenders, the banks typically obtain undertakings from families to make good in the event of student default. Banks are reported to be more willing to lend to students who have strongest job prospects, and the status of a student applicant's TEI is often used as a proxy. Consideration is being given to a "credit evaluation system" for tracking graduate repayments and financial capacity. The TEIs are being encouraged to follow up graduates with outstanding debts, and various methods of debt collection are being developed.

There are apparent access anomalies with the current loan arrangements. Commercial loan approvals naturally depend on a bank's assessment of the risk of lending, and students from poorer backgrounds and in lower status TEIs are less likely to gain approval to borrow than those from more advantaged backgrounds in higher status TEIs. Horizontal inequities arise in that students studying in less developed regions have less chance of obtaining a loan, students in centrally-funded institutions can obtain loan finance much more readily than students in locally-funded TEIs, and students in four-year institutions can access loan finance more readily than students in three-year TEIs. Additionally, loan amounts do not vary according to different majors, so students taking more expensive majors have to bridge the gap from other sources of finance.

There are also difficulties in relation to graduate debt. Students who have borrowed are required typically to begin repayments within 2 years of graduation and to have fully repaid the amount within six to eight years of graduation. Application may be made for deferral. Graduates who secure full-time employment repay around 30% of their earnings over four years. There are problems for graduates who cannot get full-time jobs or jobs with

good pay, as they have to start and maintain repayments regardless of their income. This problem extends beyond the difficulties for individual graduates, in that prospective students from disadvantaged backgrounds may be deterred by the prospect of debt on graduation beyond their means.

7.3 Pointers for future policy development

The time has come for China to reappraise its approaches to institutional and student financing: (a) its direction of funding for overall development of the tertiary education sphere, and (b) its allocation of public subsidies among different categories of first degree students through direct and indirect grants and through loans.

One policy option for China to consider is a phasing-in of normative funding rates to bring greater transparency and predictability to resource allocation, and to promote greater diversity in tuition prices as broader labour market conditions mature. For example, a national exercise might be undertaken to identify teaching cost relativities by field of study, to impute a notional allocation for each TEI according to its profile of student enrolments across fields, and to identify the range of funding discrepancies between the notional and actual allocations. Over time, the unevenness in allocations could be brought within a tolerance band through a mix of adjustments to enrolments and funding levels for each TEI.

Normative funding approaches can have the disadvantage of promoting sameness within a tertiary education system. Another, or a complementary, option is to develop a more deliberate mission-driven approach to the funding of TEIs, building on the 211 and 985 approaches but also clarifying the roles of the other TEIs whose mission is not primarily oriented to basic research.

The regulatory side of financing policy, accountability for the effective use of resources, should be governed by the principle of 'proportionately to risk'. Those TEIs that can demonstrate good stewardships and good performance should be permitted greater degrees of discretion over their use of public-allocated resources, such as through block funding rather than stipulated funding, and carryover capacity year on year rather than annualised budgets.

Consideration ought to be given to the development of an income-contingent loan scheme for all students admitted to tertiary studies. The absence of collateral on the part of students seeking to invest in their human capital makes reliance on commercial bank lending necessarily regressive. An important consequence is that the nation loses the benefit of talent development of those students who lack the financial means of access or are

deterred by high graduate debt. There are many variants to the structure of income-contingent loans schemes, including subsidies during studies, subsidies following studies, threshold income levels for triggering repayments, amortisation periods and debt waivers (Usher, 2005). The options could be explored through an international workshop involving practitioners from countries with operating schemes.

8. The Role of Tertiary Education in Research and Innovation

8.1 Context

This Section reviews the Chinese research, development and innovation (RDI) system, and the role tertiary education institutions (TEIs) play in it.[15] The Section begins with a snapshot of the current (or most recent) situation in Section 8.2. Chinese RDI policies have gone through major changes over the last three decades. These policy developments and the impact they have had on the RDI system are treated in 8.3. Section 8.4 concludes with an assessment of system performance in the context of developments in the OECD countries and identifies pointers for policy.

As Section 2 sets out, China is a society in rapid transition. Any assessment of the Chinese RDI scene must take this cardinal feature into account. A system in rapid transition implies that its various components may not be moving at coherent rates. Account should be taken of the several waves of reform and the fact that many reforms have not had the time to play themselves out and that, before they do, there is the likelihood of yet more reforms being introduced.

Two features of this transition have had a profound impact on the country's RDI system. First, the country has undergone an enormous range of social and institutional reforms, especially since the 1980s, basically in moving from a centralised planned economy to progressive decentralisation that allows a growing role for the non-public sector. Major reforms for private sector activity started with the rural sector in 1979 and also created special economic zones to attract foreign investment. Pursuing the line of greater private sector activity, new reforms were introduced in 1984-1985, a

15 For the purposes of this Section, the TEIs will include the universities and colleges that provide tertiary level instruction and training. The case of publicly owned research institutes (PRIs) is a peculiar one in China as it is in part government (for example, when run directly by the ministries), part enterprise (for example, in the form state owned enterprises) and part academia (for example, when owned and operated by the Chinese Academy of Sciences).

decade later in 1995, and there have been continuing changes since. As an indication of their large impact, ownership of economic activities changed from 99% in government hands in 1978 to 76% in 1997. In 2005, the non-public sector accounted for 65% of GDP (Su and Zhou, 2006), even though the state sector maintains its dominant position in strategic sectors such as energy and infrastructure. To a large extent, these developments have generated major changes on the structure of supply side of the RDI system.

Second, the Chinese economy has grown at close to two-digit rates over the last two decades, which, in turn, has produced rapid change in the structure of the economy. For example, in 2005, the sectoral distribution of Chinese GDP was 13% for agriculture, 46% for industry and 41% for services (World Bank, 2007c). The service sector share in 2005 shows a remarkable increase from its 1978 value of 24%. The agriculture sector, contrariwise, experienced a sharp decline. These rapid sectoral shifts in the economy have major implications for the demand-pull forces operating on a country's RDI system. They have changed the RDI system structure and its inner dynamics. The rapid economic growth has made it feasible to change both the scale and structure of the RDI system on the supply side and it has also brought in changes from the demand side.

8.2 The size and structure of China's RDI system

The relatively large overall size of China's RDI system is visible in a number of quantitative depictions of the system. Its S&T personnel, for example, numbered 3.48 million in 2004, of which 2.25 million were science and engineering graduates. The personnel engaged in R&D numbered 1.15 million. Table 8.1 gives a comparative picture with other countries/regions of the world in terms of different measures of HRST (Human Resources in Science and Technology), that is people who are actually engaged in or have the relevant training to be engaged in the production, development, diffusion, application and maintenance of systematic scientific and technological knowledge (OECD, 2008).

In 2003, China's Gross Expenditure on R&D (GERD) was 84.6 billion RMB. China produced 111 356 cited publications, the fifth largest in the world. Total tertiary enrolment has reached 23 million students, while total public expenditure on tertiary education amounted to RMB 187 billion in 2003.

Table 8.1 S&T Indicators, selected countries (2004)

	Human Resources in S&T	R&D personnel (full-time equivalent)	Researchers (full-time equivalent)
China	70 336 000	1 364 799	1 118 698
United States	63 021 902	Not available	1 394 682
European Union (EU-15)	51 770 011	1 912 355	1 088 206
Japan	32 790 000	921 173	704 949
Russia	42 238 000	919 716	464 577
OECD	191 729 858	Not available	3 865 77

Source: OECD, 2008.

These are large numbers but unsurprising given the large size of China's economy and population. Viewed in per capita terms Chinese RDI is still modest in comparison to the more advanced industrialised nations. For example, the 1.15 million figure for R&D work in China was lower than the 1.26 million figure for the United States, which has a much smaller population. The number engaged in R&D in China is only 15 per 10 thousand of the workforce as compared with over 100 in OECD countries. The GERD *per capita* in China is only US$PPP 65, which is small when compared with not only the United States but also with South Korea (US$ 480) and Poland (US$ 63) (Martin, 2007). Researchers per thousand employed workforce, in 2005, was 0.7%, a percentage well below that of Japan (11%), United States (9.8%), Russia (6.9%) and the EU-27 (5.8%). In terms of S&T publications, China accounts for 6.32% of the world output compared with the United States (30%), Japan (7.9%), the United Kingdom (7.7%), Germany (7%), France (4.7%), Russia (2.3%), and India (2%).[16] The share of population aged 25-64 that had attained tertiary education was only 9.5% in China (2004 figures) compared with the EU average of 22% and for the United States (38%), Russia (55%), and India (11.4%).

Even though China has some distance to go in catching up with the OECD average in key RDI indicators, the rate at which China is doing so is impressive. As a percentage of GDP, gross domestic expenditure on research and development more than doubled in the course of seven years, from 0.6% in 1996 to 1.31% in 2003, even though compared with the OECD mean of 2.24%, China ranks 14 out of the 19 countries (for which data were available). Expenditure rose at a phenomenal 23% rate per annum over the

16 SCI, ISTP and EI indexes, Figure 2.8, Xue Zhou (2007).

1996 - 2003 period. The total GERD, $PPP 84.6 billion in 2003, rose more than four-fold from 19.9 billion in 1996.[17] The number of S&T personnel, 3.48 million in 2004, and scientists and engineers, 2.25 million, represented an increase of 42% and 65% respectively over 1993. Figures for graduate entrants for Masters' degree and above (364 831 in 2005) were 2.8 times higher than the 2000 figure, while such degree holders (189 728 in 2005), grew at the rate of 24% per annum since 2000.

Structure and composition of the system

Enterprises account for the largest percentage (45.4%) of the employed S&T personnel, followed by the higher education sector (37.0%) and the Government (17.1%). In terms of full-time equivalent R&D personnel, the share of the business sector was 59.9% (2003 figures) compared with that of the Government (22.8%) and the higher education sector (17.0%).[18]

Data on sectoral shares of GERD financing (2003), as well, show the predominance of the business sector (62.4%), relative to the contributions from the Government (26.3%), the university (10.5%), and the private non-profit sector (2.5%). A comparison with the OECD averages (67.3%, 10.9%, 18.7% and 3.1% respectively) show that the university and the enterprises are financing a lower proportion, and government a higher proportion, than the average for the OECD countries. The university share is also lower in comparison to the OECD average in terms of GERD performed by a sector, while the share of the industrial sector is quite comparable to the OECD average: 68.3% came from the industrial sector (OECD average 68.0%), 21.8% from the Government (OECD average 12.1%) and 9.9% from the academia (OECD average 17.3%).[19]

A very large majority of the R&D personnel are engaged in developmental work in China, with 70% of the personnel engaged in this type of activity, while only 8% are involved in basic research, and 22% in applied research (Xue and Zhou, 2007). Within basic research itself, most of the R&D personnel (68%) come from the higher education sector, with (24%) belonging to the Public Research Institutes (PRIs) and a very small share coming from the enterprises (8%). The issue of regional inequity in the distribution of RDI resources was considered in Section 2.

17 UNESCO and OECD statistics.

18 UNESCO statistics.

19 Table 3.3 of OECD, 2006b.

8.3 Policy development and evolution of RDI system

Behind these figures on sectoral and activity shares lies a history of legislative changes and programme implementations over the past two decades that has transformed the nature and size of China's RDI system and the roles of different sectors and actors within it. To understand the breadth of this, it is worth recalling that in the early years of PRC (1950-55), universities had a limited research role. The centrally directed policy of the Government emphasized its teaching role and the main function of the universities was deemed to train personnel for other sectors. Most if not all R&D was housed in Public Research Institutes (PRIs) under the umbrella of China's Academy of Sciences (CAS) and various central ministries, as private enterprises did not exist. This configuration changed dramatically with the Government's decision to encourage the development of non-public economic sector in 1978. China's national innovation system entered a new era with a series of institutional reforms, the setting up of a technology market with a range of laws on patents and technology contracts. 1979 marked the formal entrance of universities into China's national science research system, when a regulation explicitly prescribed universities as the centre for both teaching and scientific research (Li and Zeng, 2000). The Patent Office (CPO) was established in 1980 to protect intellectual property and encourage invention (which was later transformed into the State Intellectual Property Office or SIPO). Chinese patent law was established in 1985 (with subsequent amendments in 1992 and 2000).

The Education Reform of 1985 brought further large changes with its decentralisation and diversification of the higher education system. Decentralisation was primarily a transfer of responsibilities to the provinces, some day to day management responsibilities to the universities, and overall, greater autonomy was granted to the universities in terms of what was taught, how they competed for students, and engaged with the enterprises. Universities were tasked with developing closer ties with industry, particularly in disciplines such as engineering. Universities were given the option of using extra-budgetary funds flexibly. With regard to the PRIs, the 1985 resolution changed their internal governance and fostered horizontal linkages with other sectors of the economy. The "iron rice bowl" policy of assured employment for researchers was replaced with the opportunity to win funding through research projects and technology contracts.

Beginning in the late 1980s, Chinese universities entered the era of large-scale restructuring, co-operative arrangements and mergers. Government affiliated research institutes (PRIs) ceased to be the only major player in the nation's research system; both universities and industrial sector also became significant partners. The Torch Programme was launched in

1988 to commercialise research results and develop new, close to market, technologies emerging from the research base, and to contribute to China's high technology industry.

The 1990s saw a concerted effort to enhance the research capacity within the university sector. A major wave of restructuring and mergers of universities occurred during 1993 and 1998. Two key steps for building up the national innovation system were introduced in 1998: the Knowledge and Innovation Programme (KIP) was launched at the same time as the State Council decided to abolish ten ministries (such as the Ministry of Machine Building) and gave the PRIs attached to these ministries several options and supporting incentives for transforming into private sector and independent enterprises. New reforms came in 1999, which gave greater strategic decision making authority to the universities over their development in the medium to long term. This was followed by radical mergers and restructuring of universities (excluding those that were under the direct control of the ministries) and policies were introduced to encourage linkages (knowledge transfer) between academia and industry. Through these measures, by 2002, 637 universities were merged to create 270 new universities and China's universities became a major force in knowledge production activities (Xue and Zhou, 2007).

The flexibility given to universities in the use of extra budgetary resources allowed them to develop closer relationship with industry as a means of overcoming funding limitations. This spawned a range of university-industry agreements including informal consulting, technology contracts, technology transfer, licensing, joint research centres, university based science parks and university run enterprises. Of these the most unusual are the university run enterprises, which are firms active in production managed and operated by universities. There were 4 563 such university run enterprises in 2004 providing 1.75 billion Yuan in revenues to the universities. In recent years, the Government has encouraged universities to allow these firms to integrate more effectively in the international markets and to protect the universities from wider commercial risks. In parallel with the direct participation of universities in economic activities, industries are setting up their own universities (*e.g.*, the Jili University in Beijing). Recently a new phenomenon has emerged: both non-profit and private research institutes restructured on the basis of the former government-affiliated research institutes (Xue and Zhou, 2007).

The foregoing outlines the main reforms that have transformed the role of different actors in the RDI system and the nature of their interaction. A key point to note is that both industrial policy and science and technology policy have been seen very deliberately as instruments of a wider strategic plan for the economic growth of the country. The most recent example of

this is the Government's *Medium and Long-term S&T Plan,* which aims ambitiously at reducing the "knowledge gaps" between the S&T community in China and the rest of the world and to encourage indigenous innovation as part of promoting economic growth. The plan is composed of a three-tier strategy. The first tier is the "main battlefield" – mobilising two-thirds of all S&T capabilities and resources in the service of economic growth. The second-tier refers to developing frontier areas of technology. The third and the smallest tier consists of developing basic science.

The strategic policy directions have been well supported by a large number of programmes, some of them already mentioned above. In the first category – main battlefield – fall such programmes as the Key Technologies R&D programme (initiated in 1982), the Spark Programme (initiated in 1986), the National S&T Achievement Diffusion Programme (introduced in 1990), and the Innovation Fund for Small and Medium-Sized Enterprises (introduced in 1999). In the second category – support for high-tech industry – come such programmes as the High-Tech R&D Programme (863 Programme introduced in 1986) and the Torch Programme (initiated in 1988). In the third category – support for basic research – fall such programmes as the State Key Laboratory Programme (initiated in 1984), the National Natural Science Foundation of China (initiated in 1986) and the National Basic Research Priorities Programme ("Climbing Programme", started in 1992).

RDI system: an international perspective

The evolution of RDI systems in the advanced industrialised nations provides a useful background for reviewing the Chinese situation. In the former countries, the role of TEIs has evolved significantly in the post-war period, which has well captured how RDI systems have been conceptualised. In the 1960s the TEI role was conceptualised in a "linear model" of innovation, where the universities created knowledge, whose application for developing products and processes for the market rested with the enterprise. Developments since then have given way to a "spiral model" in which there is a triangle of the actors: government, the universities and the enterprise. The defining feature of this model, also dubbed as the "Triple Helix" of university-industry-government (Leydersdorf and Etzkowitz, 1996), is the multi-directional interaction between the three actors through networking connections. The changed conceptualisation attempts to take into account the increased blurring of the boundaries between the domains of basic, applied and developmental work and in the overlap in the ownership of these activities. Research is no longer the sole preserve of the universities, and innovation activities are no longer the province of the enterprises alone. The role of government has become increasingly one of

steering rather than direct intervention, orchestrated through a system of facilitative legislation and incentives.

A well-functioning RDI system

Seen in this perspective, a well-functioning RDI system can be said to exhibit the right balance between the three types of activities (basic research, applied research and developmental work related to innovation and marketing) and one in which the three sets of actors (academia, industry and government) are performing their particular roles, pulling their weight in tandem such that each sector is equally strong in complementing the other two. The financial sector could also be considered as a separate actor in the system, or included as part of the government's role in providing the right regulatory and financial framework.

8.4 Pointers for future policy development

The foregoing has documented that economic and other related reforms in China, especially since 1979, have changed the overall environment in which universities, the market and the government interact. China has made significant investment in building up research expertise and infrastructure in universities and research institutes, in larger enterprises and in science and technology parks. However, there is need for further action in a number of areas if the "Triple Helix" model of RDI is to function successfully in China.[20]

Reforms directed specifically at the PRIs, the universities and enterprises have changed their respective roles and contribution. The role of universities has expanded significantly. However, the university sector is still not as large as in the OECD countries, and the capacity for basic research is rather limited. The availability of quality personnel, and not the availability of funding, was identified to the Review Team at one of the elite universities as a major constraint in promoting quality basic research in the universities. The Review Team also heard widespread concerns about the quality of the pool of young S&T workers being produced by Chinese universities. Promoting basic research in China would require addressing these concerns in a long-term strategy.

In the area of university-industry co-operation, the focus has been mainly on short-term commercialisation. Quite apart from the limitations on the side of the universities, the very limited absorptive capacity in the

20 More detailed analysis and recommendations are available from OECD (2008).

industry is a major constraint. The legal framework for university-industry contracts has also come under the criticism of being ambiguous, often exposing the universities to commercial risks. On the other hand, the ownership of production enterprises by the universities has also exposed the universities to a variety of market related risks, which the Government is attempting to address.

Within the university sector, there needs to be a sharper degree of mission differentiation. Research funds should be concentrated in those universities that can legitimately expect to act as centres of excellence while most universities could concentrate in providing teaching excellence. While there is greater use of the peer review process in allocating research funding, it is not clear to what degree this is applied to all research, including those carried out by the PRIs. Overall, the universities have been under more stringent government controls than the production units and this degree of control is still in evidence (Xue and Zhou, 2007). Further progress would require granting greater operational autonomy to universities.

The role of PRIs has diminished under a series of reforms. However, a significant number of such institutions still exist. They are now competing for funds on a competitive basis but their role and mandate remains ambiguous. With their focus on applied research, these institutes could play a very effective role in networking with the industry, but there has been limited success in this regard. Major effort would be needed to bring their capacity for applied research closer to the market and meet the market test.

The industrial sector is now contributing financially to the R&D effort on a scale comparable to the OECD average in percentage terms. However, as noted earlier, its own capacity of basic research is extremely limited, which means that its absorption capacity of advanced R&D is also limited. This is a weak link in the RDI chain as described earlier. Consideration would need to be given to providing new incentives for industries to engage to develop their basic R&D capacity.

With the disinvestments of many PRIs, the role of Government in RDI has diminished over the last two decades. However, it is still very large compared to the OECD average. As noted earlier, the criteria of funding such research is not transparent and there may not be sufficient competition in allocation of such funds. The more effective role of Government should be to provide the right infrastructure to encourage science and innovation (such as markets for technology, incubators and other support services), improving the innovation environment through favourable tax and financial terms and generally supporting industrial development (Xue and Zhou, 2007). While China has made considerable progress in this direction further action in this direction is warranted.

To summarise, China needs to continue further development of its RDI system within a broader strategy of economic and social development. With regard to the governance framework, Government needs to make further progress in reducing its intervention in universities, and especially in PRIs, to give them greater autonomy in making choices within an overall framework of transparent funding. With regard to quality, China may consider adopting a two-pronged approach, taking a long-term perspective into account. On the one hand, the pool of young S&T graduates needs to be expanded to meet future demand and the quality of S&T teaching needs to be improved across the board to strengthen, so to speak, the base of the R&D pyramid. On the other hand, top quality research needs to be strengthened through greater concentration of research in universities and centres that can legitimately compete in quality terms internationally. This is essential for retaining achieving scale and efficiency in the use of research money. With regard to establishing an effective innovation system, China will need to strengthen its processes of knowledge exchange. The prevailing science-push approach to innovation needs to be complemented more by market-pull approaches and the research-intensive universities and other technology-intensive TEIs will need to be open to greater co-operation and interaction with enterprises. This will require expanding R&D absorptive capacity in the industrial sector and reform of the legal and contractual infrastructure for university industry co-operation.

9. Internationalisation

9.1 Context

Tertiary education in China faces opportunities and challenges, as the country grows in importance in the international arena. As noted in earlier Sections, China has made substantial efforts at the national and regional levels to modernise the tertiary education system and improve its quality and relevance. Initial efforts in this direction began as early as the 1970s when Deng Xiaoping decreed that study abroad should be encouraged. From the outset, the Chinese authorities have maintained a policy of supporting study in other countries and encouraging return on a voluntary basis with programmes which include the selection of personnel to study abroad, establishing support groups while away and assistance upon return. The principal example of this is the CEAIE (China Education Association for International Exchange) which has close links with the Ministry of Education.

Internationalisation of tertiary education is more than just the exchange of students and signing of co-operation agreements. It involves integrating an international dimension in all aspects of teaching and research, at both national policy and institutional levels. Internationalisation has been defined as "a process that prepares a community for successful participation in an increasingly interdependent world. The process should infuse all facets of a post-secondary education system and include an active involvement of government agencies and the employers sector, aimed at fostering global understanding and developing skills for effective living in a diverse and competitive world."[21]

21 In contrast with traditional definitions of internationalisation of tertiary education, which are confined to the mere institutional scope, the definition used by A. Francis (1993), is a comprehensive one which considers internationalisation in the framework of a regional policy (OECD and World Bank, 2007).

For China, this means, among other things, effectively equipping graduates with the wide range of skills, knowledge and competences required in the global economy; conducting internationally competitive research; using international experience and international providers to help increase the quality of tertiary education in China; and attracting international students and professors. Because of the importance of tertiary education to the internal and international economic success of a nation, efforts in this area cannot be seen as secondary. Faced with the challenges and opportunities presented by globalisation, any country's internationalisation strategy should be central to the overall strategic planning for its tertiary education development.

The pattern of internationalisation has been similar to that of most countries resulting in an ever increasing number of students studying abroad and coming to learn in China. As in other aspects of tertiary education, growth in numbers has been very rapid and China, due to the importance and dynamic nature of its economy, has the rather enviable position of being able to attract students as well as making its students and academics particularly welcome for study abroad.

Within this context, this Section analyses the important steps taken by China in recent years and what remains to be done.

Internationalisation of tertiary education in China:

The following is a chronicle of relevant developments:

1950 – China receives 33 students from Eastern Europe.

1978 – Deng Xiaoping promotes international study to promote the "four modernisations" (of agriculture, industry, defence and science and technology).

1981 – State Council approved the establishment of the China Education Association for International Exchange (CEAIE).

1983 – China signed the Regional Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in Asia and the Pacific (followed over the years with similar agreements with 28 countries).

1994 – State Council approved the establishment of the China Scholarship Council (CSC).

1995 – Ministry of Education Regulation on the Operation of Higher Education Institutions in Co-operation with Foreign Partners.

1997 – State Council Decree on Strengthening Degree Granting Management for the Operation of Institutions in Co-operation with Foreign Partners.

2001 – Entry of China in the World Trade Organization.

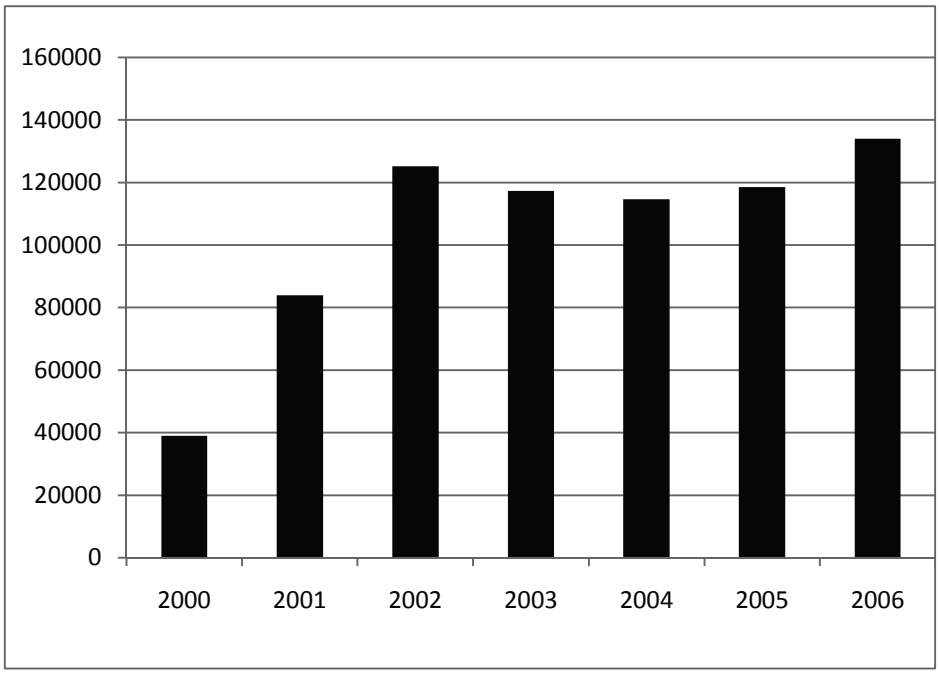
2003 – Revised Ministry of Education Regulation on Chinese-Foreign Co-operation for Running Schools (curriculum development, teaching methods, etc.).

2005 – more than 1 000 international agreements (13 times the number of those in 1995) and more than 170 joint programmes leading to a degree (MoE, 2005) with 118 000 Chinese studying abroad and 78 323 foreigners studying in China (Digest of China Statistics 2007.

Preparing students abroad

The Chinese government recognised in the 1970s that there were too few specialists with 'advanced Western' education, and, in order to implement the 'four modernisations' (of agriculture, industry, defence and science and technology), in 1978 decided to prepare new cadres abroad through a government run scholarship programme at both graduate and undergraduate level. An additional impetus for this was to help modernise the tertiary education system's teaching methods, curriculum and relevance to the needs of the economy. Participants in these early programmes were principally faculty and students of the leading universities. A government decree in 1981 allowed for students to go abroad at their own expense, but the number of self-financed students remained relatively small until the early 1990s. In 1991 of the 7 647 students studying abroad almost all were financed by central or local government (China Education Yearbook Editorial Board, 1991). By 2003, however, there were over 117 000 students studying abroad of which 93% were privately financed (China Education Yearbook Editorial Board, 2004). Figure 9.1 shows the number of Chinese tertiary students abroad in the last few years. China's share of foreign tertiary students now represents approximately 4.5% of the total worldwide (UNESCO, 2006).

Figure 9.1 Chinese studying abroad



Source: Ministry of Education, 2007.

China has also become a destination for study. In the early years, study was principally linked to Chinese language, but in the past decade an increasing number of students (61 000 in 2001 and 78 000 in 2005) has chosen China for their study (UNESCO, 2006). China has also established programmes overseas for promoting Chinese language and culture: 'Chinese Bridge Project' and 'Confucius Chinese Colleges'.

In 1981 the State Council approved the establishment of the China Education Association for International Exchange (CEAIE) as an NGO, with the mission of:

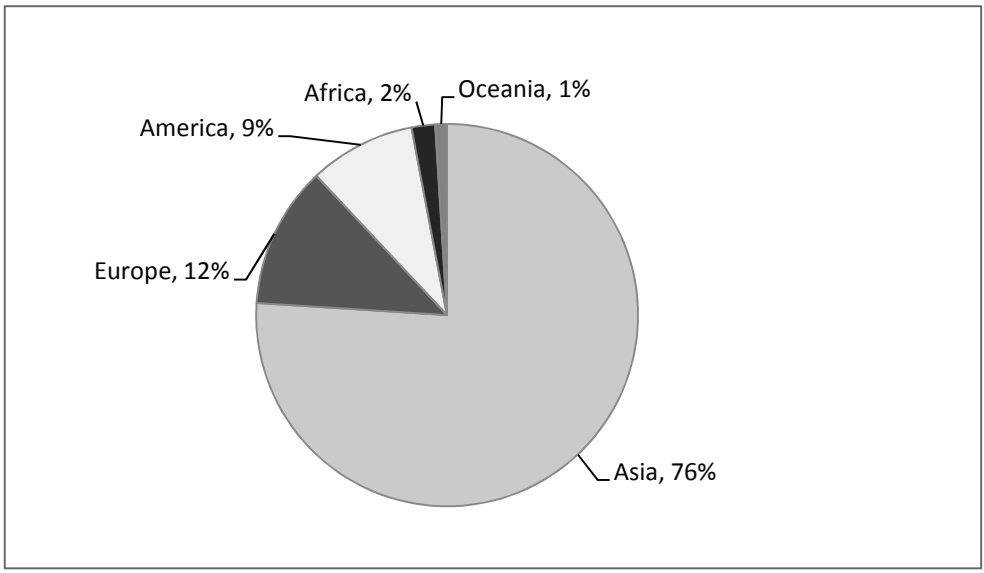
- Initiating and developing exchanges and co-operation between the Chinese education community and education institutions abroad;
- Promoting the advancement of education, culture, science and technology; and
- Strengthening understanding and friendship among peoples of all countries and regions.

The China Scholarship Council (CSC) was set up as a non-profit organisation affiliated to the Ministry of Education by the State Council in 1994 to administer scholarships both for Chinese studying abroad and foreigners coming to China. It has a secretariat dealing with all day-to-day aspects of international study and a committee made up of representatives of relevant ministries (Education, Finance, Foreign Affairs, Personnel, Public Security and the Development and Planning Commission) and academics are responsible for consultation and examination of candidates. The CSA's mission is to 'provide, in accordance with current legislation, financial assistance to the Chinese citizens wishing to study abroad and foreign citizens wishing to study in China in order to develop the educational, scientific and technological, and cultural exchanges and economic and trade co-operation between China and other countries, and to promote world peace and the socialist modernisation drive in China. The CSA is state financed, but also has a fund raising role both internally and abroad.

China has been growing in importance as a destination for study. In 2003 there were 67 672 foreign students in China and by 2005 the number had risen to 141 087 from 179 countries enrolled in 464 TEIs with the majority coming from Asia (South Korea, Japan, Vietnam and Indonesia). Also in the top 5 countries is the United States. The Russian Federation, India, France and Germany follow with the numbers of students for 2005 (Figure 9.2). Only 5.12% were on scholarships provided by the Chinese government and the vast majority (approximately 71%) were studying social sciences.[22] This growth is partly due to policies of increasing the number of courses offered in languages other than Chinese, widening the possibilities of scholarships from central and regional governments, domestic and foreign companies, foundations and TEIs, improving quality assurance and social systems, and widening the possibilities for students to be employed outside of their TEI in a number of regions.

22 Data from the China Scholarship Council, 2005.

Figure 9.2 International Students in China's tertiary education



Source: Data from the China Scholarship Council, 2005

Liberalisation of tertiary education: space for international providers

As noted above, China is a leader for the opening of its tertiary education system to outside providers. It has also made possible the establishment of TEIs by international providers in partnership with Chinese universities. There is an ever increasing number of this type of institution in the country.

In theory, by opening the country to international universities the tertiary education system becomes internationalised to a certain extent. However, full internationalisation makes alternative academic offerings available to students by including joint degree programmes, dual degree programmes, greater emphasis in the teaching/learning of other languages and exposing students to international academic staff (see Box 9.1).

Box 9.1. HEC in China

The French Business School, HEC (Hautes Études Commerciales), is actively pursuing an international growth strategy, with a strong focus on China (Kobb and Neymarc, 2007). Its recent achievements point to the new global nature of management education.

Ranked as the No.1 Business School in Europe by the Financial Times (2006), over the past five years the number of double-degree programmes, exchange programmes and new degree programmes delivered entirely outside of France has quadrupled. HEC -- a full-range university with a Master of Science in Management (MSc, Grande Ecole), French and English MBA programmes, Ph.D programme and part and full time specialised Masters programmes -- now has more than 110 academic partners world-wide.

In China, partnership with the prestigious Tsinghua University has been reinforced over the last two years by the launch of the AXA-HEC-Tsinghua initiative for joint research and faculty development in the areas of management and finance; a new dual-degree programme between its School of Economics and Management and the HEC MBA; and the creation of a new programme in the field of fashion and luxury brand management.

However, the sharpest growth -- in terms of number of people enrolled -- is evident in the area of executive education with HEC now offering its Executive MBA degree programme in Beijing since 2006. More than 150 senior-level executives are currently enrolled, with 90% coming from the state-owned sector (*e.g.* China National Coal Group, China National Aviation, and China National Petrol Company). Only a very small percentage of participants have English-language skills or professional experience outside of China. Held entirely in Beijing, there is simultaneous interpretation of courses from English into Chinese and systematic translation of all teaching material. HEC professors specialised in finance, accounting, strategy, etc. fly to Beijing for four days of intensive classes each month over a 14-month period. HEC teaching faculty is accompanied by a team of local teaching assistants, who help bridge the cultural and linguistic gap that may exist. These local assistants, who are most often PhD students, receive training from HEC for their support role in the classroom. This aspect of the programme is also noteworthy, as it allows HEC to identify academic talent and to foster international exposure within young Chinese faculty.

The HEC programme offered in China is seen as innovative because it is a fully-recognised degree programme reflecting international industry standards delivered to a non-international population. Most other international programmes require English as an admissions criterion.

The programme was launched by HEC under the auspices of the SASAC -- the State-owned Assets Supervision and Administration Commission of the State Council -- in response to a clear need for more internationally trained leaders in China (McKinsey Global Institute, 2005). The state-owned sector in China is responsible for roughly 40% of China's GDP and consists of 159 central state-owned enterprises, 12 trillion Yuan in assets and over 10 million employees.

9.2 Main issues and pointers for policy development

Appreciable efforts to internationalise tertiary education have been made by China, but with a total enrolment of 25 million the number of Chinese abroad and foreigners studying in China remain marginal and well under the OECD average of 4% and important challenges remain. Based on the observations made during the OECD review visit and the analysis of the documentation provided, the following issues deserve the further attention of policy makers and institutional leaders.

Uneven internationalisation of tertiary education institutions

Despite an impressive number of viable projects and programmes, there remains a traditional pattern which assumes that internationalisation is equal to the signing of memoranda of understanding or agreements for collaboration with institutions in other countries which in many cases do not go beyond ceremonial and public relations and have little effect on the main functions of participating universities. This is, of course, not only the case in China; institutional leaders in TEIs all over the world talk proudly about the many collaborative agreements they have signed.

The number of foreign students in China's best universities has progressed rapidly as mentioned above, but as a percentage of the student body remains below the average of universities such as Harvard (17.6%) or MIT (23%). At Peking University, which has by the largest number, foreign students represent 10% and at Tsinghua there are less than 5% (UNESCO, 2006).

Another issue is the financial imbalance in trade in educational services especially for those studying in the United States or the United Kingdom. The average annual tuition for foreigners studying in China is between RMB 21 000 and 27 000 which is 5 times less than the tuition for Chinese studying in those two countries. Consequently, with twice the number of Chinese students it is a costly enterprise for China.

The more prestigious universities have programmes that can compete with similar universities in OECD countries, but these programmes remain out of reach for the vast majority of Chinese students because of the level required for entrance and financial barriers. The Review Team visited one technical college in Kunming which has had a joint instructor training programme with a college in Shanghai and German GTZ to introduce an advanced German concept of teaching. This level of international co-operation, however, remains exceptional and is an endeavour that should be encouraged.

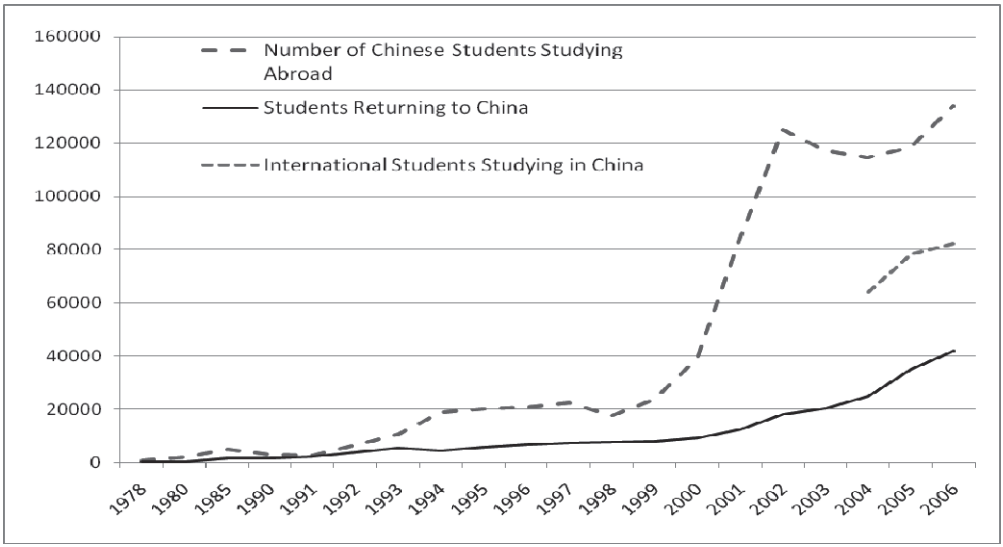
Most institutions have developed mission statements and some even have strategic plans in which reference is made to the importance of global issues and their role in preparing students for the global economy and a number of institutions have developed links with employers with the specific aim of producing internationally competitive graduates. However, more and wider concrete action is needed.

A notable point is that all of the TEIs visited by the Review Team have an office in charge of international co-operation which is relatively well staffed and in regular contact with the regional education authority. It would, however, be useful to establish an association at national level of directors of these international co-operation departments where members could share ideas and experiences and foster mutual professional development.

Brain drain

Of the more than 1 million Chinese students and academics who have gone overseas since 1978 approximately 200 000 have returned to China. Although a serious gap exists, the rate of return appears to be increasing (Figure 9.3) and the government has initiated a number of programmes to attract returnees such as salary bonuses and setting up 21 business parks for this group under the auspices of the Ministries of Education, Science and Technology, Personnel and the State Bureau for Foreign Experts.

Figure 9.3 Chinese tertiary students abroad, returnees and foreign students in China



Source: Yearbook of China Educational Statistics, 2007.

Instruction in English

The Chinese tertiary education sector fully recognises the importance of foreign languages, especially English, for being competitive in the international arena and global economy. The Review Team was impressed by the number of courses taught in English in all of the TEIs visited for the review. For the vast majority of students, however, contact with a foreign language only begins at the tertiary level and serious consideration should be given to improving the level of language instruction at all levels of education with a concerted effort at all levels of the education system to prepare and train teachers and develop the requisite curriculum and infrastructure.

An international dimension in the curriculum

When Deng Xiaoping initiated policies of sending Chinese to study abroad in 1978, the primary purpose was to facilitate the modernisation of the tertiary education system to make China competitive on the world stage. Over the years, the influence of Western type curricula has increased as the numbers of students studying abroad has grown. The growing number of exchanges and agreements with foreign universities leading to joint venture programmes of various descriptions has had an important impact on the curriculum and will probably continue to influence tertiary education in China. In addition, the establishment of *minban*, frequently with capital and technical assistance provided by expatriate Chinese has also promoted new teaching methods and more 'marketable' curricula. The intake of large numbers of foreign students (*e.g.* Laotians, Vietnamese and Thais in Yunnan province) has also had an effect of transforming the curriculum in better TEIs and more forward looking and well-connected technical 'universities'. It is less certain what has changed in more remote parts of China, however.

10. Concluding Remarks

In view of the scale, diversity and dynamism of China's social and economic development, our observations in this Country Note on Tertiary Education are necessarily tentative. Gaps in the availability of reliable and timely data, and our limited ability to converse with those outside the education and training sector who might provide valuable insights into the drivers of change, give us further cause to surround our views with caveats. Nonetheless, we have been tasked to analyse the situation as we find it and to exercise our best judgement in identifying policy challenges for the future, and we have a responsibility, however daunting, to try to add value through our commentary beyond what is already well understood within China.

At the broadest level, the Review Team gained the impression that China is on the cusp of passing through a major transition from the most difficult challenges associated with large labour surpluses resulting from structural change in the economic base. The demographically-driven demand for tertiary education from the traditional participating age cohort has peaked, and considerable progress has been made in accommodating displacements from rural sector activities and lay-offs from state owned enterprises (SOEs). Whilst there remains a sizeable labour surplus in the rural sector (estimated about 150 million persons) (Brooks and Tao, 2003) and SOEs (around 10 million), the future may not pose as great a challenge as it has in the past, in quantitative terms, for absorbing high rates of growth of new entrants to the labour force concurrently with large numbers of people being displaced from unviable agricultural and industrial functions, and inefficient state-owned urban, rural and village enterprises. Significant challenges remain in terms of improving the competitiveness of enterprises and developing the service sector of the economy, not the least being the need to improve skills formation. The major challenge for tertiary education is to accommodate more equitable growth with enhanced quality.

Of particular interest to future policy considerations are the trade-offs to be made between the public and private shares of tertiary education expenditure, the relative size of publicly and private institutions, the sharing

of costs between students and general taxpayers, and the emphasis given to qualitative enhancement and enlargement of participation.

Assuming the medium term best option for China is to continue to compete internationally on the basis of low-wage manufactures, while gradually building up its capacities for hi-tech products and services for longer-term comparative advantage, it seems to us that China has sufficient room for managing a gradual enlargement of its skills base, including increased participation in tertiary education by young people and adults. The social pressures to expand tertiary education participation may not only exceed the ability to accommodate it but also they may push in directions of expanded acquisition of qualifications that have limited economic utility. The pace of expansion should be guided primarily by assessments of the capacity to supply quality tertiary education and the capacity of the labour market to absorb additional graduates. This may involve guiding parental and student expectations through better information about employment opportunities, promoting the value of vocational education, and encouraging expansion for technician and paraprofessional occupations.

It seems reasonably possible for China to finance the necessary future growth in tertiary education participation, through a balance of contributions by individuals, general taxpayers, and employers. Some re-assignment of intergovernmental revenue and expenditure responsibilities will be needed to achieve the growth with equity and quality. A deliberate effort to build up the capacity and quality of the private tertiary education sector will be required. Further liberalisation of the *hukou* system of residency permits will be necessary for increasing social mobility and addressing urban-rural inequalities.

If we are correct in this reading of the contemporary situation then we believe that the policy issues and options to which we have pointed merit further consideration by the Chinese authorities. We may be only partially correct, and China may well face further adjustment challenges that we have failed to comprehend.

Consideration might be given to a joint workshop to discuss policy issues and options for the post-transition future.

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Appendix 3: Programme of the Review Visit

Monday 5 March, Beijing

Chair: Mr. Zhang Li, Director-General of National Centre for Education Development Research (NCEDR)

09:00 – 10:15 Policy of higher education development since expansion
Mr. Lou Xuqing, Director, Department of Development and Plan;
Graduates' employment policy since expansion
Mr. Wang Hui, Director, Instruction Center for Graduates Employment
Representatives from NCEDR

10:30 – 11:45 Financing policy of higher education since expansion
Mr. Guopeng, Director, Department of Finance;
Policy of funding college students since expansion
Mr. He Guangcai, Director, China National Center for Student Assistance Administration
Representatives from NCEDR

14:00 – 15:15 Development trends of higher education till 2010
Ms. Wang Fengling, Director, Social Department, National Commission of Development and Reform
National People's Congress and development of higher education
Mr. Lu Ganqi, Deputy Director-General, National People's Commission for Education, Science, Culture and Health
Representatives from NCEDR

15:30 – 16:45 TEIs' Roles in research of basic sciences
Mr. Wang Changrui, Director, National Foundation of Natural Sciences
Administrative system of graduate education
Mr. Xu Boliang, Director, Academic Degrees Office of State Council
Representatives from NCEDR

Tuesday 6 March, Beijing

Chair: Mr. Fan Wenyao, Deputy Director-General of NCEDR

09:00 – 10:15 Personnel system reform in state-owned universities
Mr. Wang Guangyan, Director, Department of Personnel;
Management models of non-governmental universities
Prof. Yan Fengqiao, Peking University
Representatives from NCEDR

10:30 – 11:45 Multiple models of tertiary education development
Mr. Ma Luting, NCEDR
The quality assurance system of graduate education
Prof. Ding Xuemei, Harbin Institute of Technology

14:00 – 15:15 Policy of international cooperation in higher education
Mr. Zhang Yun, Director, Department of International Cooperation and Exchange
The quality assurance system of higher education
Prof. He Qixin, Beijing Foreign Studies University
Representatives from NCEDR

15:30 – 16:45 Independent agencies for higher education governance
Mr. Zhang Wei, NCEDR
Discussion of China's Background Report
Mr. Wang Yingjie, Beijing Normal University

Wednesday 7 March, Shanghai

Morning Shanghai municipal Commission of Education
Higher education administration by local authority, contribution of tertiary education to economy and society

Afternoon Songjiang University
Local development plan of higher education, multiple resources of higher education
Shanghai University of Engineering Science

Thursday 8 March, Shanghai

Morning	China Europe International Business School (CEIBS) Internationalisation of higher education, continuous education
Afternoon	Sanda University

Friday 9 March, Shanghai

Morning	Fudan University Visit to institution, Science and Technology, Innovation, Internal Management of TEIs
Afternoon	Human Resources Department of Baoshan Steel Group Higher education, labour Market and post-secondary industrial training

Monday 12 March, Kunming, Yunnan Province

Morning	Education Commission of Yunnan Province Higher education administration by local authority, contribution of tertiary education to economy and society
Afternoon	Yunnan University Serving local development, internal management of institution

Tuesday 13 March, Kunming

Morning	Kunming Metallurgy College Higher education, labour market, internal management of institution
Afternoon	Yunnan Agriculture University Serving local development, internal management of institution

Wednesday 14 March, Kunming

Morning	A tertiary Vocational College Higher education, labour market, internal management of institution

Thursday 15 March, Beijing

Morning	China Central Radio and TV University Multiple models of tertiary education, development and quality assurance
Afternoon	Tsinghua University Higher education and Scientific Research Innovation, internal management of institution

Friday 16 March, Beijing

Morning	Meeting with Beijing Academy of Educational Sciences (BAES)
Afternoon	Summary Meeting OECD Experts, Department of International Cooperation and Exchange

Appendix 4: Comparative Indicators on Tertiary Education

	China	OECD mean[1]	China's rank[2]	China as % of OECD mean[3]
PARTICIPATION				
Gross enrolment ratio into tertiary education, total tertiary programmes[4]				
2003				
Male +Female	15	57.9	-	26
Male	17	52.5	-	32
Female	14	63.5	-	22
1999				
Male +Female	6	49.1	-	12
Male	-	45.6	-	-
Female	-	52.7	-	-
Distribution of students, by type of programmes				
2003				
Tertiary-type 5A programmes	51	80.1	-	64
Tertiary-type 5B programmes	48	17.4	-	276
Tertiary type 6 programmes	1	3.3	-	30
1999				
Tertiary-type 5A programmes	49	77.7	-	63
Tertiary-type 5B programmes	50	20.2	-	248
Tertiary type 6 programmes	1	3.2	-	31
Gender distribution of students (2003)				
Females as a per cent of students in total tertiary programmes	44	53.2	27/29	83
Females as a per cent of students in tertiary type-5A programmes	44	53.2	26/29	83
Females as a per cent of students in tertiary type-5B programmes	44	55.0	24/29	80
Females as a per cent of students in tertiary type-6 programmes	28	44.0	28/28	64
School life expectancy[5] (2003)				
ISCED 1 – 6	10.8	17.1	-	63
ISCED 5 and 6	0.8	2.8	-	29

	China	OECD mean[1]	China's rank[2]	China as % of OECD mean[3]
EXPENDITURE				
Expenditure on educational institutions and educational administrations as a % of GDP, public sources (1999)[i]				
All levels of education	2.1	5.3	-	40
Tertiary education	0.4	1.4	28/28	35
Educational expenditure in tertiary as a percentage of total educational expenditure (1999)[i]	21	24.1	-	9
Ratio of students to teaching staff in tertiary education (2003)[ii] Based on full-time equivalents, Public and private institutions.				
Type B	-	14.4	-	-
Type A and advanced research programmes	-	15.7	-	-
Tertiary education all	17.9	14.9	5/23	120
RESEARCH AND DEVELOPMENT				
Gross domestic expenditure on Research and Development (R&D) as a percentage of GDP Source: OECD (2005)				
2003	1.31	2.24	14/19	58
1991	0.74	2.21	23/26	33
Higher education expenditure on R&D as a percentage of GDP Source: OECD (2005)				
2003	0.14	0.42	18/19	33
1991	0.06	0.36	22/23	17
Percentage of gross domestic expenditure on R&D by sector of performance (2003) Source: OECD (2005)				
higher education	10.5	18.7	18/18	56
(higher education in 1991)	8.6	16.3	22/23	53
business enterprise	62.4	67.3	9/18	93
government	27.1	10.9	5/18	249
private non-profit sector	2.5	3.1	4/14	81

	China	OECD mean[1]	China's rank[2]	China as % of OECD mean[3]
Percentage of higher education expenditure on R&D financed by industry Source: OECD (2005)				
2003	35.9	5.6	1/15	641
2000	32.4	6.2	-	523
Total researchers per thousand total employment Source: OECD (2005)				
2003	1.2	7.4	11/11	16
1991	0.7	5.7	19/19	12
Researchers as a percentage of national total (full time equivalent) (2003) Source: OECD (2005)				
higher education	21.6	37.0	1/11	58
(higher education in 1991)	28.2	23.8	18/20	118
business enterprise	56.2	45.4	5/11	124
Government	22.3	17.1	4/11	130

Notes for the Tables

Sources:

All data are from the UNESCO "Global Education Digest 2005" and "Statistics on research and development", UNESCO Institute for Statistics, *www.uis.unesco.org*, unless indicated otherwise in the table.

Notes:

1. "OECD mean" is calculated as the unweighted mean of the data values of all OECD countries for which data are available from the UNESCO Global Education Digest 2005 and UNESCO Statistics on research and development. China is not included in the calculation. Calculation is done by the OECD Secretariat.
2. In case of OECD member countries, "country's rank" indicates the position of indicated country among OECD countries when countries are ranked in descending order from the highest to lowest value on the indicator concerned. But, in case of non OECD countries like China, China's rank means the same rank of OECD country whose data is closest to China's data.
3. "% to OECD mean" indicates China's value as a per cent of the OECD value. For example, on the first indicator *"Gross enrolment ratio into tertiary education, total tertiary programmes, 2002/2003, Male+Female",* the percentage *"68"* indicates that China's value is equivalent to 68% of the OECD mean.

4. Gross enrolment ratio means number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the population of the theoretical age group for the same level of education. For tertiary level, the population used is the five-year age group following on from the secondary school leaving age.

5. School life expectancy is the number of years a person of school entrance age can expect to spend within the specified levels. To compensate the lack of reliable data by age for tertiary the gross enrolment ratio for tertiary is multiplied by 5 and used as a proxy for the age-specific enrolment rates. At all other ISCED levels enrolment that is not distributed by age is divided by the school-age population and multiplied by the duration of the given level before being added to the sum of the age-specific enrolments rates.

Country specific notes:

[i] China's date is as of 1999, but OECD mean is as of 2002.

[ii] Ratio is from calculation of B/A.

A - Total teaching staff in tertiary (Public and private, full and part time, all programmes): 850 227.

B - Total enrolment in tertiary (Public and private, full and part time, all programmes): 15 186 217.

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OECD Reviews of Tertiary Education

CHINA

In many OECD countries, tertiary education systems have experienced rapid growth over the last decade. With tertiary education increasingly seen as a fundamental pillar for economic growth, these systems must now address the pressures of a globalising economy and labour market. Within governance frameworks that encourage institutions, individually and collectively, to fulfil multiple missions, tertiary education systems must aim for the broad objectives of growth, full employment and social cohesion.

In this context, the OECD launched a major review of tertiary education with the participation of 24 nations. The principal objective of the review is to assist countries in understanding how the organisation, management and delivery of tertiary education can help them achieve their economic and social goals. China is one of 14 countries which opted to host a Country Review, in which a team of external reviewers carried out an in-depth analysis of tertiary education policies. This report includes:

- an overview of China's tertiary education system;
- an account of trends and developments in tertiary education in China;
- an analysis of the strengths and challenges in tertiary education in China; and
- recommendations for future policy development.

This Review of Tertiary Education in China forms part of the *OECD Thematic Review of Tertiary Education*, a project conducted between 2004 and 2008 (***www.oecd.org/edu/tertiary/review***).

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