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Recent Trends in Graduate Unemployment and Higher Education in China

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Abstract

This paper reviews the policy debate over urban graduate unemployment in China, and how it is related to the expansion of the higher education sector. Several possible explanations for this phenomenon are discussed. Policy implications are drawn especially the possible strategies for improving the quality of education provided by universities.

Keywords: *graduate unemployment, urban unemployment, university reform*

JEL classification: *J60, I21*

1. Introduction

The objective of this paper is to discuss the recent trends in Chinese higher education. The present paper builds on a previous paper (Soo, 2008), updating that paper's data to reflect more recent trends. The main

focus of the paper remains the relationship between the expansion of the university sector and the rise in graduate unemployment.

The accumulation of human capital is widely perceived to be a key ingredient for increasing per capita income. As workers become more educated and more skilled, their productivity improves, hence raising income levels. It is this line of thought that has led to the rapid expansion of higher education across the developing world. Since most developing countries are relatively scarce in skilled labour, their marginal product should be high, given diminishing returns to factors of production. It would therefore be very costly to a developing country if many of its educated workers (who are educated at considerable expense) are unemployed. However, this is exactly what we see in many developing countries today, including China and India.[1]

The Chinese university sector has been expanding rapidly since the late 1990s. This rapid expansion was due to government policy implemented in 1999 to accelerate the expansion of the sector. This policy was introduced primarily as a result of the Asian financial crisis of the late 1990s, which had depressed domestic consumption and increased urban unemployment. It was hoped that expanding the university sector would increase domestic demand and absorb some of the unemployed workers. Expansion of the sector would also create a larger pool of highly skilled workers who would be able to compete in the increasingly knowledge-based economy.

The results of the policy were quite spectacular. Figures 1 and 2 graph the basic statistics of the university sector in China from the 1980s to the present.[2] The 1990s generally saw a slow growth in student numbers with approximately the same number of universities. Starting in 1999, new student enrolment increased by almost 50 per cent from the 1998 new student enrolment, with a further 45 per cent increase in 2000 (and more increases subsequently). There has also been a (much slower)

Figure 1 China: Student Numbers in Regular Institutions of Higher Education, 1985-2013

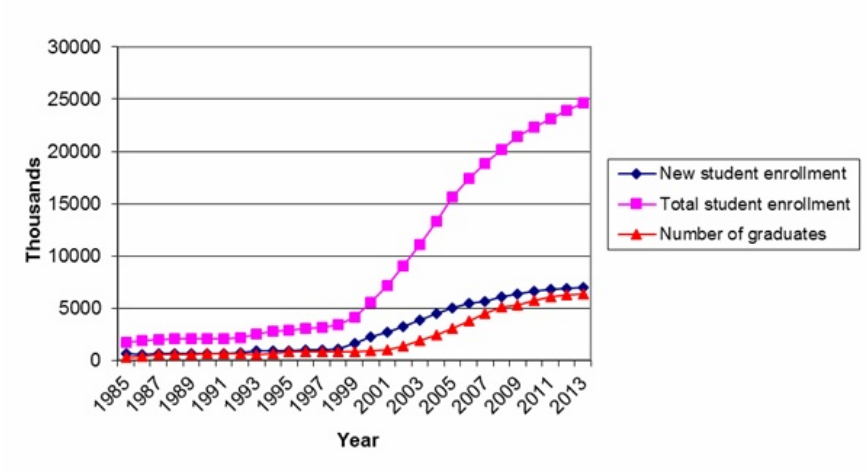


Figure 2 China: Number of Institutions and Teachers in Regular Institutions of Higher Education, 1985-2013

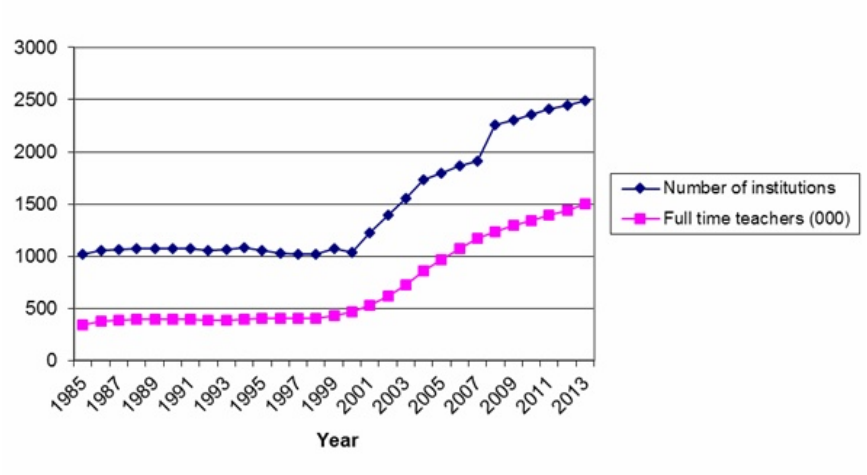
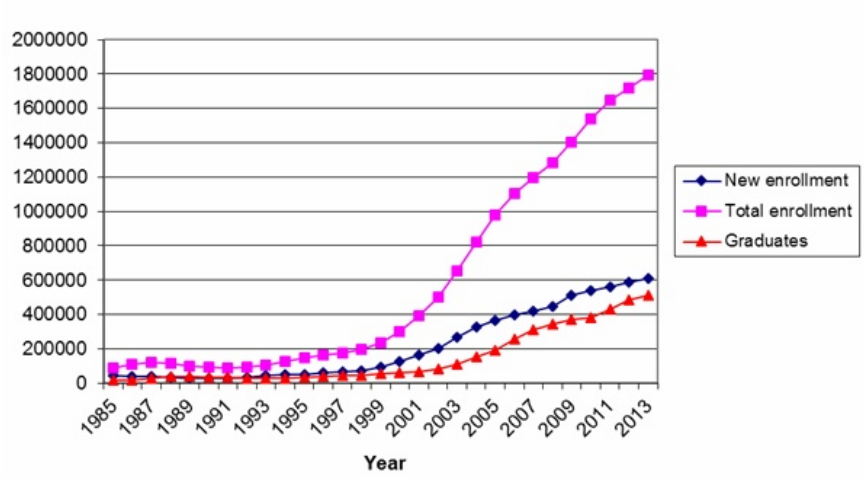


Figure 3 China: Number of Postgraduates, 1985-2013



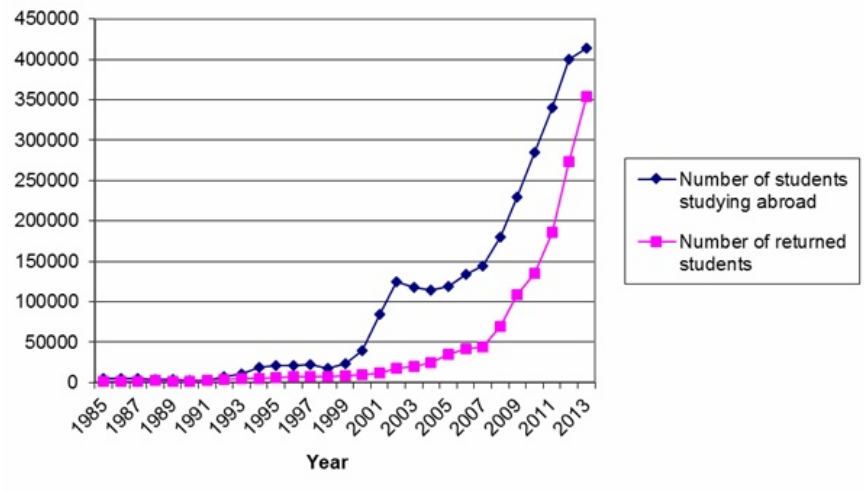
increase in the number of universities, and what appears to be a lagged increase in the number of university teachers, after a slow initial increase in 1999. As a result of this expansion, by 2013 the number of universities had more than doubled from 1998, to over 2,400 institutions, the number of university teachers had increased by over 3.5 times, to almost 1.5 million, and student numbers and the number of graduates by over seven times, to almost 7 million new students, 25 million students in total, and 6.4 million graduates.

Figure 3 shows that the number of postgraduate students in universities has expanded in tandem with overall student numbers. New enrolment and total enrolment have increased by six times since the start of the reform in 1999, to over 600,000 and 1.8 million respectively, while the number of graduates from postgraduate programmes has increased by nine times, to over 500,000. Figures 1 to 3 also suggest that the growth rates are decreasing, which in turn suggests that the market

for higher education in China is approaching maturity.

One area which does not appear to have reached maturity is the number of students studying abroad, as shown in Figure 4. Whereas the beginning of the 21st century saw a stagnation of the number of students studying abroad, the upward trend has subsequently returned, so that, by 2013, there were over 400,000 Chinese students studying abroad, representing a 250 per cent increase over the number in 2005. Even more dramatically, the number of students returning from abroad, which had been less than one third of the number of students studying abroad in 2005, is now over 80 per cent. This may have been partly due to the Great Recession of 2008, which (along with increasingly restrictive student visas issued by host nations) substantially reduced the job market prospects of Chinese students abroad, as well as rising wages and better job opportunities becoming available in China.

Figure 4 China: Number of Students Studying Abroad, 1985-2013



We have thus far described the rapid expansion of the university sector in China. What then of the evidence regarding graduate unemployment? Unfortunately, unemployment data are less easily available. Figures from the China Statistical Yearbook suggest that urban unemployment rates are in the region of 4 to 5 per cent, and that these figures have been fairly constant over time. However, Knight and Xue (2006) have argued that the official definition of unemployment is too restrictive, and using ILO (International Labour Organisation) definitions results in an estimated urban unemployment rate of 11.5 per cent in 2000, a figure which has been rising since the early 1990s. Bai (2006) reports that graduate unemployment has reached 690,000 in 2004, and was projected to increase to 790,000 in 2005. This represents a high percentage of university graduates (see Figure 1). The issue of the definition of unemployment has returned in the more recent literature on urban graduate unemployment in China. The claim (Lee, 2014; *China Labour Bulletin*, 2013) is that the definition of unemployment is too narrow, and as a result, the actual unemployment rate is much higher than the official statistics.

The remainder of this paper is set out as follows. In the next section, we discuss possible explanations for the increase in urban graduate unemployment in China and its relationship with the expansion of the university sector. Then in Section 3 we discuss the possibility of reform in the higher education system in order to overcome this rising graduate unemployment. Section 4 concludes.

2. Possible Explanations for Urban Graduate Unemployment

Bai (2006) considers several arguments why university graduates might be blamed for graduate unemployment. First, in a country where traditionally university education was only for the elite, there are high

expectations of good employment prospects for university graduates. Yet with university enrolment quadrupling in less than a decade, the increased supply of university graduates means that a university degree no longer guarantees a good job. Education is also viewed as an investment by the Chinese, and so graduates from rural areas have tended to migrate to the urban areas – especially large cities like Shanghai and Beijing – where wages are higher, to maximise the return on their investment. Such migration is facilitated by the strong extended family network in China, whereby having relatives in urban areas reduces the cost of rural-urban migration, as these relatives may provide information, temporary housing or even employment for the new migrants.

Knight and Xue (2006) propose two explanations for the increasing urban unemployment, both of which require that the urban wage is not competitively determined and so fails to clear the labour market. Their first explanation is the state sector redundancy programme starting in the early 1990s which led to the retrenchment of 11 per cent of the urban labour force. Some 53 per cent of those who had been retrenched since 1992 were still unemployed in 2000, and a worker who has been made redundant can expect to remain unemployed for almost four years (see also Appleton *et al.*, 2002). This big increase in unemployment may be one explanation for the increase in graduate unemployment. Their second explanation concerns the rate of rural-urban migration, which may exceed the rate of new job creation in the urban areas.

There has also been a steady stream of academic articles on urban graduate unemployment in China. Liu (2013) develops a model of labour market search and matching to explain the simultaneous development of unemployment and worker shortages in firms. She finds that the efficiency of matching decreased in the late 1990s and early 2000s, and attributes this decline to the rapid growth and structural

change in the Chinese economy. Li *et al.* (2014) find that the expansion of higher education in China has led to an increase in unemployment among university graduates. They find evidence of a locational mismatch: graduate unemployment is higher in the central and western regions, and lower in the coastal regions. This suggests that relaxing the restrictions on regional migration may reduce the overall graduate unemployment rate. Liu (2012) documents decreasing labour force participation for both men and women in the 1990s, with the gap in participation rates widening over time. She attributes the major part of the participation gap to differences in coefficients between men and women, suggesting possible labour market discrimination.

Consider what role rural-urban migration can play in increasing urban unemployment. The Harris-Todaro (1970) model[3] shows that, in the presence of an urban wage that is fixed above the market-clearing rate, workers from rural areas have an incentive to migrate to the urban areas in search of these higher-paying urban jobs. Since it is not guaranteed that a migrant will be able to secure an urban job, risk-neutral migrants from rural areas will set their expected urban wage equal to the rural wage (which they can get with certainty), thus creating a pool of unemployed workers in the urban sector. If university graduates are paid much more in urban areas than they are in rural areas, then this model provides an explanation not only for why university graduates have a tendency to migrate from rural to urban areas, but also for why there are large numbers of unemployed graduates in urban areas. If this is compounded by rapid expansion of the university sector, the increased supply of graduates would further exacerbate the problem as the urban sector cannot expand sufficiently rapidly to employ them.

There has been significant evidence that urban-rural wage gaps have been an important reason for the massive migration that has occurred in China. Zhao (1999) documents that urban income exceeded rural income

by about three-fold in 1993, that rural-to-urban migrants were typically young, single males with higher education than non-migrants, and that migrant workers typically earn more than non-migrants. Zhao (1997) also finds that education allows migrants to overcome barriers to migration as they seek higher-paying urban jobs. That the urban-rural wage gap is a major consideration in the migration decision has also been found by Zhu (2002) and Wu and Yao (2003). Park *et al.* (2003) present evidence that the skill premium has been increasing in urban labour markets, which suggests an explanation for the increasing demand for university education.

An alternative explanation for increasing graduate unemployment relates to the implications of the expansion of higher education on the labour market. If students have differing levels of ability, then expansion of higher education means that students of lower ability are now entering higher education. As a result, the average university graduate is of lower ability, and therefore employers need to implement screening mechanisms to separate the more-able from the less-able workers.[4] This may take the form of special requirements (good honours as opposed to just a pass degree, communications and computing skills, etc.). As a result, students who exhibit these skills are employed, while those who do not, are not. Note that graduate unemployment primarily refers to graduates of local universities. Graduates of foreign universities are generally perceived to have better communication and computing skills, which they have developed whilst abroad. Employers are also increasingly seeking university graduates to fill vacancies where they previously did not.[5] This may be attributable to the larger pool of university graduates from which to hire. On the supply side, with the increasing number of university graduates as a result of the expansion of universities, it becomes individually rational for economic agents to obtain a university degree, since otherwise they will be pushed out of the

job market by those who have a university degree.

Another popular explanation of the high levels of graduate unemployment is that there is a mismatch between the skills that graduates have, and the skills demanded by employers. The blame is often placed on universities for this mismatch; universities are accused of offering degrees that are too theoretical and not sufficiently tailored to the needs of the labour market. This is in large part due to the rapid growth and structural change of the Chinese economy, and the university system has been unable to keep up with this change. We will explore possible ways of overcoming this perceived problem in the next section.

3. Reform of the University System

The rapid expansion of the Chinese university system since the late 1990s has been very expensive both financially and because of the large numbers of unemployed graduates that has been created. In this section we document ongoing policy changes in the university sector and offer some suggestions as to other policy changes that might be implemented to improve the performance of the system.

Commentators on urban unemployment in China have offered their views on what policy reforms might be required to overcome the problem. Bai (2006) argues that China's university system was insufficiently flexible to accommodate the rapid expansion of the early 21st century, and that as a result, graduates were trained only to pass examinations and are unprepared for the labour market. She recommends that the government changes its focus from expanding higher education to improving the quality of education provided. This would include changing the curriculum, providing broader education, and emphasising relevant research.

The Chinese government appears to be aware of the difficulties facing its university sector, and recent public documents have provided suggestions as to the direction of future reforms (Ministry of Education, undated). The previous centrally planned university system had resulted in little flexibility and autonomy being given to universities to provide education according to the needs of society. There were too many single-discipline and professional universities, which resulted in very low efficiency. The main objective of the ongoing reform of the university sector is to smooth the relationship among government, society, and universities. Under the reformed system, the government will be responsible for overall planning and macro management while the universities follow the laws and enjoy the autonomy to provide education according to the needs of society.

The funding of the university system has also been changed from a system almost entirely dependent on government funding, to one in which finance is obtained from diverse sources. Students are expected to pay a proportion of the cost of higher education, and a loan and scholarship system put in place to ensure that fewer students drop out for economic reasons. University employees are also given incentives for personal achievements to help encourage better performance in both teaching and research.

Table 1 shows how the sources of university funding in China have changed in the past two decades. In 1996, out of total university funding of about 37 billion yuan[6], about 80 per cent was from government allocations, with tuition and research fees making up another 15 per cent, and other sources contributing much smaller percentages. By 2011, total university funding had reached 702 billion yuan, of which only about 58 per cent was from government funding, while the contribution of tuition and research fees had reached 35 per cent. This in fact hides the policy shift that occurred around 2007 (see Figure 5) which has to

Table 1 China: Basic Statistics on Educational Funds, 1996-2011 (million yuan)

Year	Institution	Total	Government appropriation	Social organisations and citizens
1996	IHE	36790	28904	145
	RIHE	32679	26255	57
	IHEA	4111	2648	88
1999	IHE	76465	47283	391
	RIHE	70873	44316	326
	IHEA	5592	2967	65
2001	IHE	124755	66599	2538
	RIHE	116658	63280	1819
	IHEA	8097	3320	718
2003	IHE	187368	87687	7763
	RIHE	175435	84058	6030
	IHEA	11933	3630	1733
2005	IHE	265786	112853	18149
	RIHE	255024	109084	18013
	IHEA	10762	3770	136
2007	IHE	376230	164812	3192
	RIHE	363419	159832	3188
	IHEA	12811	4980	4
2009	IHE	478277	232738	3309
	RIHE	464501	226451	3309
	IHEA	13777	6288	0
2011	IHE	702087	409633	3329
	RIHE	688023	402350	3329
	IHEA	14064	7283	0

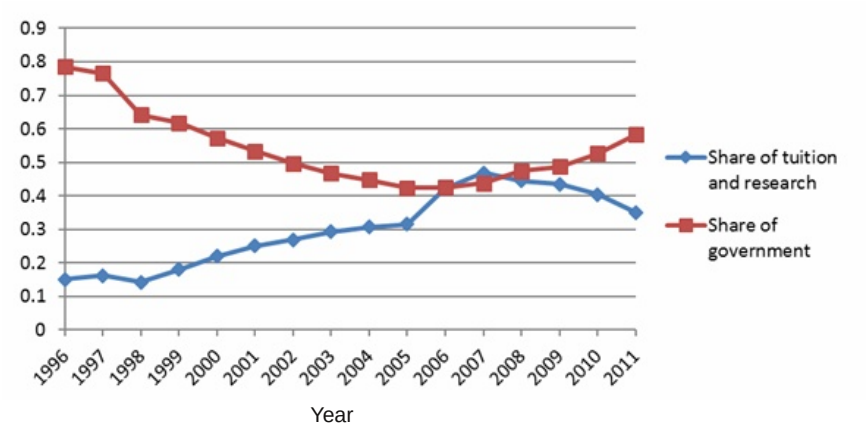
Notes: IHE – Institutions of higher education *(Continued on next page)*
RIHE – Regular institutions of higher education
IHEA – Institutions of higher education for adults

Table 1 (Continued)

Year	Institution	Donations and fund-raising	Teaching, research and other activities	Other funds
1996	IHE	392	5540	1809
	RIHE	370	4462	1535
	IHEA	23	1077	274
1999	IHE	1639	13788	13363
	RIHE	1617	12078	12536
	IHEA	22	1710	827
2001	IHE	1743	31243	22631
	RIHE	1727	28244	21586
	IHEA	15	2999	1045
2003	IHE	2574	54875	34469
	RIHE	2564	50573	32210
	IHEA	10	4302	2259
2005	IHE	2119	83791	48873
	RIHE	2108	79192	46626
	IHEA	12	4599	2246
2007	IHE	2747	176616	28864
	RIHE	2718	169870	27810
	IHEA	3	6745	1053
2009	IHE	2639	208366	31225
	RIHE	2618	201889	30234
	IHEA	21	6476	991
2011	IHE	4345	246200	38580
	RIHE	4319	240072	37954
	IHEA	27	6128	626

Notes: IHE – Institutions of higher education
RIHE – Regular institutions of higher education
IHEA – Institutions of higher education for adults

Figure 5 China: Share of Government, Tuition and Research Fees in University Funding, 1996-2011



some extent reversed the trend towards universities obtaining income from sources other than the government. Despite this apparent U-turn, it is clear that the government policy of encouraging the use of other sources of funding has proved to be successful in reducing the dependence of the university sector on government funding. One additional benefit of this may be that the universities are now more accountable to these other sources of funding and may therefore have more incentive to perform well.

Also evident from Table 1 has been the relative decline in the share of university funding going to institutions of higher education for adults. Adult education is especially important in China since its rapidly growing economy is undergoing massive structural change, so that existing skills need to be upgraded and new skills learned as new sectors emerge and old sectors close down. However, the total funding for adult education has fallen from about 11 per cent of total funding for higher

education in 1996, down to about 2 per cent in 2011. The World Bank (Dahlman, Zeng and Wang, 2007) report *Enhancing China's competitiveness through lifelong learning* argues for the need for China to expand the entire spectrum of education provision, from preschool education through to higher education and adult education. The rapid growth and structural change of the Chinese economy, together with the reform of the state-owned enterprises, means that structural unemployment will increase as workers' existing skills are not required in the new economy. Therefore adult re-training is needed for the unemployed to get new jobs. The current de-emphasis of adult re-training needs to be reversed.

The World Bank report also suggests that many university graduates cannot find jobs because of a mismatch between university education and the demands of the labour market; university education needs to be adjusted in terms of teaching methods, curriculum, and pedagogy to respond to the new demands of the knowledge economy. The report suggests that the main problem is the shortage of investment in adult education and training, which concurs with the evidence presented in Table 1. The report's recommendation is that the role of the government needs to shift from that of key decision-maker and sole provider of education and training to that of system architect, rule-maker, and promoter – which is exactly what the Ministry of Education is seeking to do. Planning, coordination and management that are integrated across sectors are required to build a lifelong learning system, which has as its own pre-requisite a national consensus on the importance and urgency of establishing such a system.

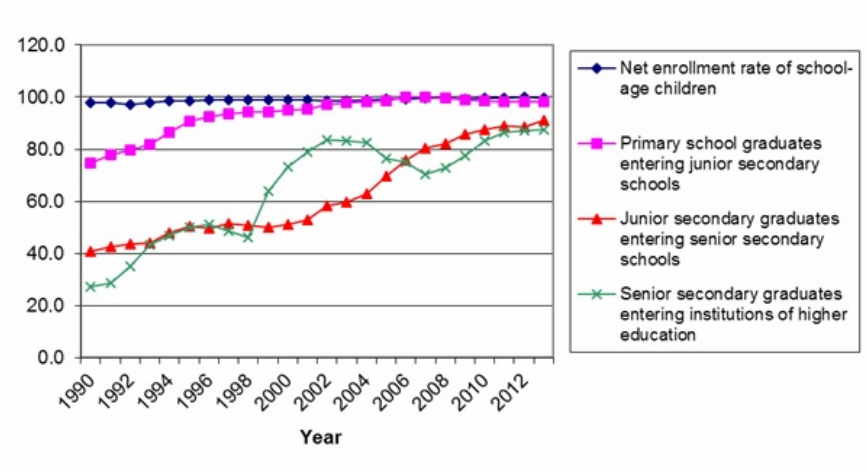
Another World Bank report, *China and the knowledge economy* (Dahlman and Aubert, 2001), argues that China needs to respond to the knowledge economy by, among other things, upgrading its education system. Their recommendations on education include adapting students'

learning to the requirements of the knowledge economy, establishing regulations to facilitate the integration of the private education sector with the formal education system, and exploiting the opportunities for learning based on information and communication technologies. Such reforms will enable the university sector to remain relevant to the needs of the labour market and to continue to produce the highly skilled labour force that is required in the knowledge economy.

In considering the expansion of the education sector in order to raise the skill level of the workforce, a key practical question is: at which level of education should the expansion focus on? The answer to this question depends on the existing structure of the education system. Figure 6 shows the proportion of students entering schools of higher grade. From this figure it is clear that China has achieved virtually universal primary school enrolment since the early 1990s, and by the mid-2000s had achieved almost 100 per cent primary school graduates continuing their education in junior secondary schools. Education to the level of junior secondary schools (9 years of schooling) has been compulsory since a law was passed in 1986, but it was only in the past decade that this objective had been achieved.

Beyond junior secondary education, the percentage of junior secondary graduates entering (non-compulsory) senior secondary education has increased over time, as has the percentage of senior secondary graduates entering higher education. At the beginning of the 21st century, the increase in the latter was much more rapid than in the former, suggesting that the higher education sector has expanded more rapidly than the senior secondary education sector. More recently this trend has been reversed, with a higher percentage of junior secondary graduates entering senior secondary, than senior secondary graduates entering higher education. In both cases the percentage is over 80 per cent, which is over twice that in 1990.

Figure 6 China: Enrolment Rate of School-age Children and Proportion of Students Entering Schools of Higher Grade, 1990-2012



Another important practical question in the expansion of the education sector is what form this expansion should take: expansion of existing institutions, or the establishment of new institutions? The answer to this question depends on the presence of scale and scope economies; if there are unexhausted economies of scale, then expanding existing institutions would lead to lower average costs. Similarly, if scope economies are present, then there are benefits to having multi-disciplinary institutions as opposed to specialised ones. A detailed exploration of these issues is beyond the scope of the present paper, but some comparisons can be made relative to the comparatively more mature higher education sector in the United Kingdom (UK).

To guide our discussion, consider Figures 7 and 8, which are calculated from Figures 1 and 2. While Figures 1 and 2 show that the number of institutions has increased by about 2.5 times since 1985, the

Figure 7 China: Students per Regular Institutions of Higher Education, 1985-2011

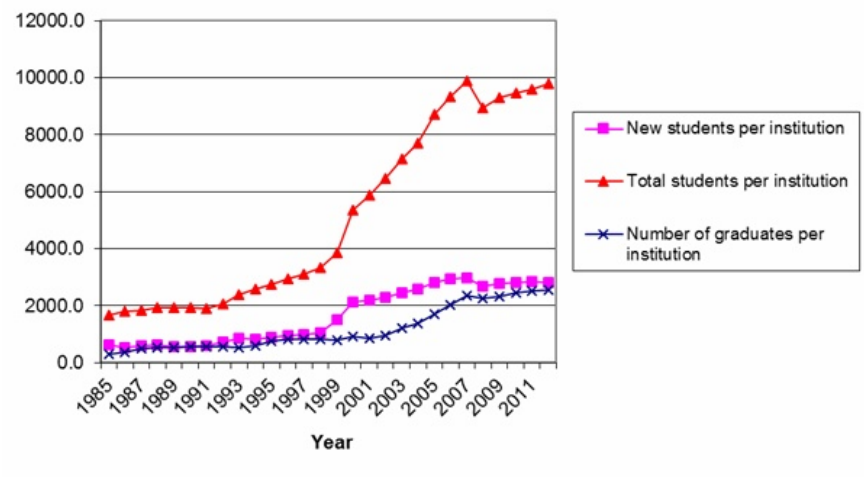
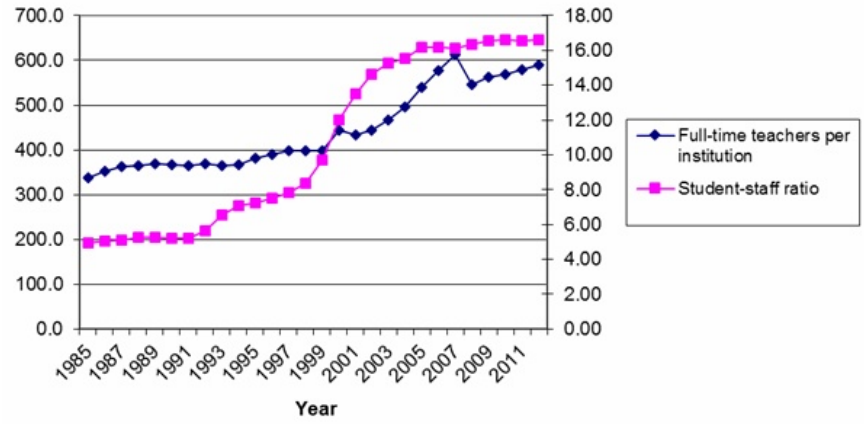


Figure 8 China: Teachers and Staff-Student Ratio in Regular Institutions of Higher Education, 1985-2011



institutions themselves have expanded more rapidly than that. Average new student enrolment has increased about five-fold since the mid-1980s, as has the total number of students per institution. As might be expected, the number of graduates per institution lags new student enrolment by several years. However, the number of teachers per institution has not increased as rapidly as student numbers have. The average number of teachers remained fairly constant throughout the 1980s and 1990s, and it has only been in the past few years that the average number of teachers has increased significantly. As a result, the student-staff ratio has more than trebled, from about 5 students per teacher in the mid-1980s to about 16 students per teacher in 2011. However, what is also clear from Figures 7 and 8 is that the trends are changing once again. It is evident that in the past five years the growth rate of universities has decreased dramatically.

How do these values compare with those of the UK higher education system? Johnes *et al.* (2005) have performed an analysis of the cost structure of higher education in England, for the time period 2000/01 to 2002/03. They report that the average number of students across all higher education institutions is about 8000, including undergraduates and postgraduates. They find the existence of scale and scope economies at the average institution size, and also for hypothetical institutions which are half and twice the size of the average institution. Their conclusion is that, given the presence of scale and scope economies, expansion of the university sector through expansion of existing universities is more cost-effective than the alternative of expanding the number of institutions.

Elsewhere, Johnes (2008) presents descriptive statistics of English universities where the average number of (undergraduate and postgraduate) students was about 9600 in 1996/97 and 11400 in 2004/05,

while the average number of full-time equivalent academic staff was about 850 in 1996/97 and 1330 in 2004/05. This suggests a student-staff ratio of about 11.3 in 1996/97 and 8.6 in 2004/05. In this paper Johnes (2008) finds that whilst English universities have experienced overall productivity increases from 1996/97 to 2004/05, there was also evidence that technical efficiency was falling. She suggests that this may be caused by adjustment costs faced by universities in adapting to the rapid changes in the sector, both in terms of student numbers and in terms of technological change.

Comparing the results from studies on UK universities with the data we have on Chinese universities, we can make the following policy recommendations (with the caveat that the results from UK universities may not apply perfectly to Chinese universities). First, continued expansion of the Chinese university sector should include both the expansion of existing universities and the establishment of new universities; at the average size of Chinese universities, evidence from the UK suggests the existence of both scale and scope economies. Second, the existing government policy of de-emphasising single-discipline universities should continue, in view of the existence of scope economies in this sector. Third, the rapid expansion of the sector has resulted in a rapid increase in the student-staff ratio, which should be carefully monitored as this may result in deterioration in the quality of education provided.[7]

4. Conclusions

Urban graduate unemployment has recently received much coverage in the media. This has been especially true in developing countries, but more recently in developed countries as well, as the Great Recession has led to widespread youth unemployment in many European countries.

This paper discusses this phenomenon as it pertains to China. We propose several possible explanations for graduate unemployment, and present data on the rapid expansion of the Chinese university system especially since the reform of 1999. This expansion may be an important cause of the rise in graduate unemployment. Government policies are already in place to address this problem, and we discuss some additional proposals for future reform of the system.

There are many other aspects of the higher education system in China which we have not touched on. One of the key findings in the research literature discussed above is that there is decreasing labour force participation over time in China, especially for women, which may be attributable to labour market discrimination. This may be of some concern to policymakers. In 1999, women represented 38 per cent of university graduates in China. By 2011 they represented 46 per cent of university graduates. That discrimination against women continues to persist in modern-day China represents a source of inefficiency in the economy. China's economic growth since the start of the reform in 1978 has been amazing, transforming China from one of the poorest countries in the world to a middle-income country in just over a generation. But whilst income may grow rapidly, it appears that social attitudes and cultural norms may take longer to catch up.

Notes

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1. For China, see Bai (2006). For India, see Ray and Chand (undated).
2. Unless otherwise stated, all data used in this paper are from the *China Statistical Yearbook* (various editions).
3. See also Todaro (1969) and the survey by Lall *et al.* (2006).
4. This mechanism was first described in Spence (1973) in his famous "job market signalling" paper.
5. This phenomenon, known as "filtering down", was discussed in Knight (1979).
6. A "yuan" of China's currency *reminbi* ("people's currency") is equivalent to about US$0.157.
7. Not included in the discussion is the impact of university expansion on research performance. Johnes and Yu (2008) find evidence that Chinese universities exhibit significant heterogeneity in terms of their research efficiency.

References

Appleton, Simon, John Knight, Lina Song and Qingjie Xue (2002). Labour retrenchment in China: Determinants and consequences. *China Economic Review*, Vol. 13, pp. 252-275.

Bai, Limin (2006). Graduate unemployment: Dilemmas and challenges in China's move to mass higher education. *The China Quarterly*, Vol. 185, pp. 128-144.

Dahlman, Carl, Douglas Zhihua Zeng and Shuilin Wang (eds) (2007). *Enhancing China's competitiveness through lifelong learning*. Washington: World Bank.

Dahlman, Carl J. and Jean-Eric Aubert (2001). *China and the knowledge economy*. Washington: World Bank.

Employment in China. *China Labour Bulletin* [online], 2013. Available at: *http://www.clb.org.hk/en/content/employment-china* (accessed 11 February 2015).

Harris, John R. and Michael P. Todaro (1970). Migration, unemployment and development: A two-sector analysis. *American Economic Review*, Vol. 60, No. 1, pp. 126-142.

Johnes, Geraint, Jill Johnes, Emmanuel Thanassoulis, Pam Lenton and Ali Emrouznejad (2005). An exploratory analysis of the cost structure of higher education in England. Department of Education and Skills Research Report 641.

Johnes, Jill (2008). Efficiency and productivity change in the English higher education sector from 1996/97 to 2004/05. *Manchester School*, Vol. 76, No. 6, pp. 653-674.

Johnes, Jill and Li Yu (2008). Measuring the research performance of Chinese higher education institutions using data envelopment analysis. *China Economic Review*, Vol. 19, No. 4, pp. 679-696. .

Knight, J.B. (1979). Job competition, occupational production functions, and filtering down. *Oxford Economic Papers*, Vol. 31, No. 2, pp. 187-204.

Knight, John and Jinjun Xue (2006). How high is urban unemployment in China? *Journal of Chinese Economic and Business Studies*, Vol. 4, No. 2, pp. 91-107.

Lall, Somik V., Harris Selod and Zmarak Shalizi (2006). Rural-urban migration in developing countries: A survey of theoretical predictions and empirical findings. World Bank Policy Research Working Paper 3915.

Lee, Xin En (2014). Unemployment in China: Degree to nowhere? [online]. Available at: *http://knowledge.ckgsb.edu.cn/2014/07/21/employment/unemployment-in-china-degree-to-nowhere/* (accessed 11 February 2015).

Li, Shi, John Whalley and Chunbing Xing (2014). China's higher education expansion and unemployment of college graduates. *China Economic Review*, Vol. 30, pp. 567-582.

Liu, Qian (2012). Unemployment and labor force participation in urban China. *China Economic Review*, Vol. 23, pp. 18-33.

Liu, Yang (2013). Labor market matching and unemployment in urban China. *China Economic Review*, Vol. 24, pp. 108-128.

Ministry of Education of the People's Republic of China (undated). *The 9th 5-year plan for China's educational development and the development outline by 2010* [online]. Available at: *http://www.moe.edu.cn/publicfiles/business/htmlfiles/moe/moe_2807/200906/48868.html* (accessed 11 February 2015).

Park, Albert, Xiaoqing Song, Junsen Zhang and Yaohui Zhao (2003). The growth of wage inequality in urban China, 1988 to 1999. Mimeo. University of Michigan.

Ray, S. and Rattan Chand (undated). Socio-economic dimensions of unemployment in India. Mimeo. Central Statistical Organisation, India.

Soo, Kwok-Tong (2008). Urban graduate unemployment and university reform in China. In: Emile Kok-Kheng Yeoh (ed.), *Facets of a transforming China: Resource, trade and equity.* Kuala Lumpur: Institute of China Studies, University of Malaya, pp. 133-148.

Spence, Michael (1973). Job market signalling. *Quarterly Journal of Economics*, Vol. 87, No. 3, pp. 355-374.

Todaro, Michael P. (1969). A model of labor migration and urban unemployment in less developed countries. *American Economic Review*, Vol. 59, No. 1, pp. 138-148.

Wu, Zhongmin and Shujie Yao (2003). Intermigration and intramigration in China: A theoretical and empirical analysis. *China Economic Review*, Vol. 14, pp. 371-385.

Zhao, Yaohui (1997). Labor migration and returns to rural education in China. *American Journal of Agricultural Economics*, Vol. 79, No. 4, pp. 1278-1287.

Zhao, Yaohui (1999). Labor migration and earnings differences: The case of China. *Economic Development and Cultural Change*, Vol. 47, No. 4, pp. 767-782.

Zhu, Nong (2002). The impacts of income gaps on migration decisions in China. *China Economic Review*, Vol. 13, pp. 213-230.