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Chapter 7
EDUCATION IN THE REFORM ERA

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Introduction

Under China's market reforms of the past quarter-century, the process of becoming educated has changed in dramatic ways. China's new wealth and new inequalities are part of the story. However, educational opportunities and attainment are also affected by changes in educational policy. Since the end of the Cultural Revolution in the late 1970s, leaders have moved educational policies in an economically pragmatic direction that supports and reflects marketization, and away from a radical socialist agenda.

Three particularly important changes have occurred. First, reform era educational policies have sought to improve quality to make schooling better serve the needs of the labor market, stimulate the economy, and promote China's global competitiveness. Second, reform-era educational policies have placed a new priority on efficient use of resources, including private resources, to support education. Third, reform era educational policies display a new tolerance for disparities within the system in pursuit of quality and efficiency, but this trend has been tempered recently by significant efforts to guarantee basic access and quality in rural areas.

To illustrate these points, this paper begins by outlining the state of education prior to market transition, under the radical education policies of the Cultural Revolution. Next, we discuss key reform-era changes in the provision

of education, including educational policy, finance, and quality. Finally, we consider the "outcomes" of these shifts, in the form of indicators of educational attainment, participation, and inequality.

Most of our evidence about school provision and educational finance comes from published governmental data. To investigate participation and attainment, we employ descriptive tables and figures derived from unit-record data from a .95 per thousand micro-sample from the 2000 China population census, and from the 1989 and 2000 waves of the China Health and Nutrition Survey (hereafter CHNS). We also refer to secondary sources that have analyzed census data and population surveys conducted through the 1980s and 1990s. We conclude with a discussion of implications of reform-era educational patterns for larger questions of socio-economic change and inequality.

Backdrop: Education During the Cultural Revolution

While many of the educational shifts that have accompanied market reforms in China have global parallels, the starting point was unusual. For over a decade prior to market reforms, China lived through the "Great Proletarian Cultural Revolution," a far-reaching and chaotic social movement that brought a radical leftist political agenda to the forefront in politics and education. In 1966, Mao Zedong proclaimed the start of a new educational era in which political recommendation and class background became the primary means of determining progress through the education system (Unger, 1984).

When schools reopened after the initial chaotic years, the ideological agenda of eliminating class differences, whether urban-rural, worker-peasant, or intellectual-manual, dominated the classroom and the curriculum (Sun and Johnson, 1990; Thomas, 1986). Labor and political loyalty were valued over academic achievement, and the link between education and occupational

achievement was removed (Unger, 1984). Urban students were sent to the countryside for re-education (Tsang, 2000).

In higher education, there were dramatic disruptions: a discontinuation of the national examination system for admissions; complete stoppage of admissions of undergraduates for six years and of graduate students for 12 years from the start of the Cultural Revolution; admission of peasant and working-class students to "attend, manage, and reform universities"; and a 1971 plan to consolidate, close, and reconstruct 106 of 417 institutions of higher education (Tsang, 2000, Table 1.) The Cultural Revolution is widely viewed as a disaster for higher education in general, and for science and technology training in particular (for example, see Beijing University and Zhongshan University, 2005).

Few students traveled abroad during the Cultural Revolution. According to a 1994 report, sending students abroad was halted in the initial chaotic years. Study abroad resumed in 1972, but by 1976, China had sent only 1,629 students to study in 49 countries, mainly to study foreign languages (Beijing University and Zhongshan University, 2005, p. 10).

The structure of primary and secondary education was streamlined. Tracking systems were abolished, as were key-point magnet schools, vocational education, and exam-based progressions (Rosen, 1984). The educational system was unified so that, in principle, all students studied the same ten-year curriculum in a 5-3-2 structure (Thogersen, 1990, p. 27). There are few empirical studies of curriculum during the Cultural Revolution, but it was certainly highly ideological. For example, one scholar who studied the contents of primary language textbooks in the early 1970s concluded that "texts devoted their efforts almost exclusively to inculcating in the young in the right political attitudes and outlook, even to the extent of almost excluding the pedagogical

function of a language text" (Kwong, 1985, p. 207). Vocational and technical schools were shut down, and, for the first six years, so were secondary teacher training schools (Tsang, 2000).

There is little empirical scholarship on educational finance during the Cultural Revolution. However, evidence from policy documents indicates that much of school finance in China during the Cultural Revolution relied on local community support for *minban*, or people-managed, teachers and schools, which are distinct from *gongban*, or state-managed, teachers and schools. As part of this process, many rural primary teachers were forced to work for "work points" instead of salaries, and re-classified as rural residents (Tsang, 2000). *Minban* education grew rapidly during the Cultural Revolution, first in the countryside and then in urban areas, as educational authorities ceded authority over state-managed elementary schools to local production teams or brigades, communes, factories, business enterprises, neighborhood revolutionary committees, etc. (Tsang, 2000; Wang, 2002). During this period, *minban* teachers were paid in grain rations and supplementary cash subsidies by work units based on earned work points, while state teachers received government salaries.

Importantly, under this arrangement, it appears that direct costs of schooling were rarely borne by families, even in rural communities. Dongping Han's study of Jimo County in Shandong Province, the single available empirical study of school finance during the Cultural Revolution, showed that virtually every rural child in the county was able to attend primary school at no cost during the latter years of the Cultural Revolution (Han, 2001).

Some of the impact of the Cultural Revolution on educational inequality has been traced empirically. For example, an essential goal of the Cultural Revolution was to undercut differences between the peasantry and the

remainder of the population, and, at least quantitatively, this appears to have happened. While what passed for education during the Cultural Revolution is widely criticized,[1] new policies were effective in promoting educational access among the rural population. For example, the share of teachers and students in rural areas above the elementary level jumped in the 1970s, before declining subsequently (Hannum, 1999a). Before the Cultural Revolution, in the 1960s, there was about one rural junior high school entrant for every four rural primary school graduates. In contrast, this progression ratio was about one-to-one in cities and towns. Data through the 1970s, during the Cultural Revolution, show that the ratio of rural junior high school entrants to primary school graduates hovered between .78 and .92. Census data also show dramatic increases in access to education for rural cohorts during the Cultural Revolution.

Similarly, cross-cohort analyses of census and survey data, as well as published statistics from the Ministry of Education, suggest that the Cultural Revolution era saw rapid narrowing of gender gaps in primary and secondary education (Hannum and Xie, 1994; Hannum, 2005). There is no empirical research on ethnic disparities during the Cultural Revolution, although a cohort comparison approach such as that used to study gender disparities would be feasible with census data from the post-Cultural Revolution era.

A few studies have addressed socioeconomic disparities in educational attainment during the Cultural Revolution. For data reasons, much of what is available focuses, in one way or another, on urban populations. This limitation

[1] See Han (2005) for a dissent from common wisdom on education during the Cultural Revolution.

is unfortunate, as these studies cannot reveal patterns or trends in disadvantage associated with rural poverty. The rural poor were explicitly targeted by the Cultural Revolution educational agenda, and are unlikely to be well-represented by the poorer urban residents that the authors of these studies were able to include. In addition, extreme data limitations oblige authors to resort to creative approaches to reconstruct information for the years following the Cultural Revolution.

One key study used national 1982 census data on the non-farm population of co-resident fathers and sons (Deng and Treiman, 1997). Co-residence in the same households allowed an investigation of the association between father's socioeconomic status and son's educational attainment across cohorts who would have moved through the school system at different times. Results showed that the advantage of coming from an educated family or an intelligentsia or cadre family was drastically reduced during Cultural Revolution, but reappeared soon thereafter.

Another study modeled entry into different levels of schooling using retrospective life-history reports on the timing of educational experiences of a representative survey of residents of 20 cities in 1993 to 1994 (Zhou, Moen and Tuma, 1998). Zhou and his colleagues found that coming from an "exploiting class" or middle class background had no effect on the probability of entering high school or college during the Cultural Revolution, but significant positive effects in the preceding and subsequent periods. The effects of father's education on entry into these levels of education also varied significantly across historical periods, and were stronger in the models for the post-Cultural Revolution period than during the Cultural Revolution.

These studies, using different perspectives, all suggest at least a short term flattening of rural-urban, gender, and, among more urban populations,

socioeconomic disparities in educational access during the Cultural Revolution.[2] These results are consistent with the overarching educational goal of the Cultural Revolution era: to promote a radical socialist agenda of eradicating social differences.

Educational Provision under Market Reforms: Policies, Finance and Quality

Educational Policies

From the late 1970s, a different agenda guided educational policy, as leaders sought to promote market reforms and economic modernization. In March 1978, Deng Xiaoping delivered the opening address at a National Symposium on Science and Technology in Beijing (Beijing University and Zhongshan University, 2005). He reiterated the importance of science and technology for economic modernization, and stated that "the basis for training science and technology talent rests in education" (p. 11; see also Shen, 1994).

Policy reforms revolved around perceptions that educational quality was a serious problem at all levels, vocational and technical training was insufficient, and central administration of education was too rigid (Lewin et al., 1994, p. 19). Through reforms, leaders sought to align the educational system with the

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[2] See Meng and Gregory (2002) for an opposing view. In a novel approach that employs data from Shanghai, Meng and Gregory use coefficients from models of tertiary degree attainment estimated on cohorts not affected by the Cultural Revolution to obtain predicted rates of degree attainment for cohorts that were affected by the Cultural Revolution. They then compare the result to the observed rates of degree attainment for the Cultural Revolution cohorts. The authors conclude that the largest negative impact of the Cultural Revolution was experienced by children with parents of lower educational achievement and lower occupational status.

newly emerging marketization of the economy (Hawkins, 2000).[3] Reforms in the mid-1980s set standards for compulsory education and emphasized linking education to economic reforms, increasing vocational and technical education, decentralizing finance and management, and increasing the number and quality of teachers (Hawkins, 2000; Ministry of Education, 1986).

Many changes occurred in the early reform years. There was an initial attempt to re-vocationalize education; resumption of the national examination for university entry; decentralization of educational administration and finance; and a greater emphasis on educational quality at all levels, and on developing key educational institutions at various levels (Tsang, 2000, Table 1).

Shutdowns of low quality rural junior secondary schools occurred as part of the upgrade in the early reform years. Higher education, shut down for six years at the start of the Cultural Revolution, was reinvigorated, in recognition of its critical role in supplying the high-level personnel and scientific expertise needed for national development (Tsang, 2000).

Decentralization of administration occurred. While the central government ran and financed certain high-quality institutions of higher education, provincial, county, township and village governments typically took responsibility for schools at the tertiary, upper secondary, lower secondary, and primary levels (Tsang, 2000, p. 13). In 2001, a county-based financial management system was implemented in which the management of teachers' salaries was shifted from village governments to county governments, and the

[3] Compulsory education was first brought out in the 1985 reforms, and passed into law 1986 (Shen, 1994).

central government increased transfer payments for compulsory education in western and central China (Mei and Wang, 2006).

Upgrading of teachers' skills was a priority in the drive to improve the quality of teaching and learning (Shen, 1994; Ministry of Education, 1993). Teaching has moved away from a focus on egalitarianism and class struggle, and back toward more traditional pedagogical goals. For example, Kwong (1985) concludes from her analysis of primary school language texts that the revolutionary ideology present in these materials the early 1970s had yielded, by the late 1970s, to the pragmatic goal of promoting a solid knowledge base (Kwong, 1985, p. 207).

Most recently, the attention of policy makers has turned to molding the educational system to stimulate critical thinking and creativity perceived to be necessary for the new economy. Learner-centered teaching approaches and the so-called "quality education" (*suzhi jiaoyu*) reforms are intended to develop the abilities of the whole child, and to stimulate critical learning (Tsang, 2000). Additional reforms designed to develop locally-relevant curricula are also under way.

Finally, while quality rose in importance as a policy priority after the Cultural Revolution, ongoing concerns with inequality in the school system are evident in policy documents and proclamations. Most importantly, although implementation was tied to regional economic development levels, a set of reforms set out in 1985 and codified in 1986 designated nine years of education, six years of primary school and three years of lower secondary school, as compulsory for all children (Hawkins, 2000; Ministry of Education, 1986).

The Education Law of 1995 affirmed a governmental commitment to equality of educational opportunity regardless of nationality, race, sex, occupation, property conditions or religious belief (Ministry of Education, 1995).

The 1999 Action Plan for Revitalizing Education in the 21st Century confirmed a commitment to implementing compulsory education across the country (Ministry of Education, 1999). A more recent campaign to pour development money into the western interior part of the country, where poverty is concentrated, took education as an important element (State Council, 2000). Most recently, in the early 2000s, significant new policy efforts have emerged to support access to basic education in the countryside. We discuss these initiatives in the conclusion.

Finance

Some of the most important changes in educational opportunity in the reform era can be traced to policies surrounding school finance. Table 7.1 shows that the share of educational outlays in total government expenditures rose from 18.24 percent in 1991 to a peak of 21.06 percent in 1996, and declined to 15.62 percent by 2003. However, total government expenditures themselves rose from just under 16 percent of GDP in 1991 to 21 percent of GDP in 2003. Tsang's (2000) research shows that total educational expenditures increased from 34.63 billion Yuan in 1986 to 90.68 billion Yuan in 1997 in 1986 constant prices, translating to an average annual growth rate of 9.1 percent for this period (p. 14).

[Table 7.1 about here.]

Diversification of finance contributed to the increase in total expenditures on education. Decentralization of educational administration and finance under the 1985 educational reforms were part of a larger reform of public finance dating from the end of the 1970s, which sought to mobilize new resources for education (Hawkins, 2000; Tsang, 2000).

[Table 7.2 about here.]

The objective of mobilizing new resources appears to have been achieved. Tsang (2000: 14) shows that in 1986 constant prices, governmental budgeted funds for education increased from 26.50 billion Yuan in 1986 to 48.63 billion Yuan in 1997, translating to an average annual real growth rate of 5.7 percent. In the same period, extra-budgetary funds grew much faster, from 8.13 billion Yuan in 1986 to 40.25 billion Yuan in 1997, translating to an average annual real growth rate of 15.7 percent. Table 7.2 shows selected statistics on education finance for the years 1991 to 2004. Consistent with the rising importance of funding outside of the government's control, columns 1 and 2 show that the growth rate of total educational funds was higher than the growth rate of government appropriations for education.

Moreover, the percent of total education funds coming from government appropriations for education dropped precipitously from 84.46 percent in 1991 to 61.66 percent in 2004. Among the non-budgetary sources of funds, tuition and fees alone grew from 4.42 percent of educational expenditures in 1991 to about 18.59 percent by 2004. Consistent with this picture, data in Table 7.3 on revenues from tuition and miscellaneous fees by level of school shows dramatic year-on-year increases between 1997 and 2004. These non-government resources are important for school functioning: Tsang and Ding (2005, Table 6) show that, nationwide, government spending did not cover personnel spending at the primary level, and barely covered personnel spending at the lower secondary level.

[Table 7.3 about here.]

While decentralization has successfully mobilized new resources in support of education, it has also enlarged regional disparities in educational

investments. As Tsang and Ding (2005) note, in poor rural areas, the capacity to mobilize non-governmental resources is meager. Figure 7.1 compares total educational expenditures per student with provincial per capita GDP in 1990 and 1997. The dispersion of both variables is greater in 1997 than in 1990. More to the point, the link between the two is stronger, as indicated by the steeper slope of the regression line of expenditure per student on per capita GDP (.12 versus .07, values not shown) and the higher r-squared value (.54 versus .29) in the latter year.

[Figure 7.1 about here.]

Finally, in addition to a rising role of private funding in the state system, the reform era has seen an emergence of private schools, often but not always serving elite populations (Lin, forthcoming; Ross and Lin, 2006).[4] The 1993 "Outline of Chinese Education Reform and Development" officially adopted a new policy that encouraged the development of schools run by social groups and individual citizens (Tsang, 2000).

Non-governmental schools have grown rapidly in recent years. Tsang (2000) reports that in 1994, there were an estimated 500 registered non-governmental schools in urban areas, but the number had reached 4000 by the end of 1997. In 1997, non-government schools enrolled 2.55 percent of general secondary enrollment in the Beijing metropolitan area, 3.17 percent in Shanghai,

[4] While elite schools have garnered much press, some private schools serve at-risk populations. Two kinds of examples are poor rural communities are starting their own schools, and unregistered schools in cities for migrant children (see Ross and Lin, 2006 and Chen and Liang, forthcoming).

8.45 percent in Chongqing, and 11.79 percent in Tianjin[5] (Tsang, 2000: Table 7). Figures are smaller for primary education.

However, a true sense of the scale of private education is difficult to obtain. Tsang (2000) notes that the wide variety of management and financial arrangements makes many schools difficult to categorize. We can illustrate this complexity with anecdotes from 2005 interviews with students and school personnel in Gansu province. Schools, and particularly those with a good reputation, can attract paying students from outside their catchment areas. For example, students in rural Gansu who fail the high school entrance exam often repeat their final lower secondary year at a different school. One private school reported having several state-paid teachers allocated by the local government. Apparently, the local education bureau personnel felt that this arrangement was a better use of resources than building a new government school.

The rising role of private education is not unique to China. In recent decades, many developed and developing countries have undergone efficiency-oriented education reforms—often involving decentralization as well as expansion of private schooling. Sometimes, these reforms have been part of structural adjustment or related policies recommended by international organizations, or as part of a transition strategy for moving from plan to market. With fiscal decentralization, community financing of schooling often has become increasingly important, tightening the links between the regional level of development and quality of educational services (Bray, 1996).

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[5] The Tianjin figure refers to both general and vocational secondary schools.

Quality

It is likely that recent changes in education finance affect the quality of education as well as access to schools. As China progresses in expanding basic education in the more disadvantaged areas, questions of qualitative disparities, which are much harder to assess, become more important. Unfortunately, there are few widely accepted indicators of school quality that can be used to measure quality trends. Often, per pupil expenditures themselves are used as an indicator of quality, and by this measure, as noted in the preceding section, there is a trend of growth and rising inequality.

Another commonly-used dimension of quality is teacher-student ratios or average class size. According to UNESCO estimates, average class size in China was 34.5 for primary level, and 56.7 for lower secondary in 2002. The lower secondary rate rose from 51.8 in 1995 due to expanding enrollments (UNESCO, 2005, Annex A4, Table 2.9). The lower secondary figure places China at the very top of World Education Indicator participants and OECD countries. Rising average class size raises concerns about possible declines in quality. However, class size is not a clean indicator of quality, especially if we wish to focus on cross-regional quality variation within China. Good schools and teachers may attract more students, while very resource-poor schools serving sparsely-populated communities often have small classes.

A key dimension of educational quality, as conceptualized by reformers, has been the human resources in the schools. An important element of quality-oriented reforms has been efforts to enhance the qualifications of teachers. Table 7.4 shows the educational attainment of teachers in cities, towns and counties, calculated from a sample from the 2000 census. While sample size constraints preclude an investigation of disparities across provinces, this data source does permit a look at differences in city, town, and rural areas.

[Table 7.4 about here.]

At the primary level, fewer than five percent of city teachers report qualifications below the senior secondary school level, and nearly 43 percent have some kind of tertiary education. The numbers are somewhat less favorable for townships, and strikingly less favorable for county primary school teachers. Among this latter group, about 15 percent had a junior secondary school or lower education, and just under 14 percent had some kind of tertiary education. Among secondary school teachers (*zhongxue jiaoshi*) in cities, about 16 percent were themselves trained only to the secondary level, while in towns, the corresponding figure was 22 percent, and in counties, 38 percent.[6] These examples suggest a significant degree of disparity in the preparation of teachers, a critical element of school quality, across urban-rural lines. Given the regional dimension to educational investments, it is likely that similar qualitative differences exist between wealthier and poorer areas in China. Unfortunately, outcomes-based measures of quality such as national assessments of student achievement are not available.

[6] The figures for higher education teachers by location of residence show an expected pattern of higher qualifications for teachers in more urban settings. However, these figures are more difficult to interpret, as it seems likely that higher education teachers living in the countryside are not teaching in the countryside. In any case, in higher education, only about 5 percent of city teachers report less than a tertiary level education, but still under one-fourth of university teachers in cities report graduate education, suggesting substantial room for upgrading. For tertiary-level teachers in towns and counties, the situation is much worse, with a substantial minority of these teachers (15 percent in towns and 26 percent in counties) reporting a secondary technical education as their highest attainment, and with five percent or fewer reporting graduate study.

Educational Participation and Attainment

Past Expansions and the Educational Attainment of the Adult Population

To place comments about education in the reform era in context, it is important to highlight what past educational expansions mean for the current population: there are great variations in educational attainment by age. Figure 7.2 shows selected educational attainment rates in 2000 by five-year age cohorts among men and women. At the low end, the figure shows that those without formal education dropped from 51 percent for men and 88 percent for women in the oldest age range of 80 and above to two percent for men and four percent for women in the youngest 25 to 29 year age range (panel A). Rates of lower secondary and above attainment increased from 12 percent of men and two percent of women among the 80+ cohort to 78 percent of men and 68 percent of women in the youngest 25 to 29 year-old cohort. A break in the expansion appears among the 30 to 34 year-old cohorts, who were going through the school system in the early transition period, but a resumption of expansion is evident by the youngest adult cohort.

[Figure 7.2 about here.]

Rates of upper secondary and above attainment, while of course lower, show a similar pattern of dramatic expansion with a temporary break among 30-34 year-olds. For example, about one in one hundred women ages 80 and above report upper secondary educational attainment, compared to about one in five of women in the youngest 25 to 29 age cohort. Tertiary educational attainment rates are much lower, but have also expanded rapidly from one percent among the oldest men to eight percent among the youngest, and from

zero among the oldest women to seven percent among the youngest cohorts of women.

Reform Era Changes in the Level and Composition of Enrollment

[Figure 7.3 about here.]

We turn next to consider indicators of educational participation during the reform era. Figure 7.3 shows gross enrollment ratios (GERs) by level, sex and year for 1980 to 2000.[7] Years marked in gray are total GERs, not broken down by sex. Figure 7.1 shows that primary school GERs have been above 100 for males and females since around the start of market reforms, with a gender gap favoring boys in the 1980s basically eliminated by the mid 1990s. The decline in primary school GERs after 1997 probably reflects that fewer students

[7] China's current levels of enrollment do not stand out relative to those reported by other large countries. Among the nine countries with the largest populations, China is ranked seventh in percentage of GDP spent on education, second in primary GERs, fifth in secondary GERs, and sixth in tertiary GERs (Appendix Table 7.A1). Note that GERs are a very crude indicator of enrollment. GERs are calculated as the total number of students enrolled in a given level of schooling divided by the number of children in the official age range for that level of schooling. The ratios overestimate enrollment rates when, as is the case in many countries, there are enrollees outside of the official age range. Thus, in some cases, declining GERs could be a sign of improved efficiency in the school system. Net enrollment ratios, which count only enrolled children in the specified age range in the numerator, are much preferred but are not widely available over time or across countries, and thus GERs are much more commonly used enrollment indicators. Even net enrollment ratios may be limited indicators of progression towards educational attainment, which is presumably of greater interest than enrollment, because of failure and grade repetition. In Mexico, for example, a recent major reform provides higher scholarships for girls than for boys because in the pre-reform era boys had higher enrollment rates than girls. But in fact in the pre-reform era girls averaged greater educational attainment than boys, but did not fail and repeat grades as much as boys, so their enrollment rates were lower (Behrman, Sengupta and Todd, 2004).

were in primary school who were older than the standard ages for primary school, and thus may indicate an improvement in the functioning of the system. Secondary school GERs dropped from about 54 for males and 37 for females in 1980 to a low of 42 for males and 29 for females in 1983, before starting a steady climb to 74 percent for males and 66 percent for females in 1997, the last year for which sex-specific numbers are available (so the gender gap declined but did not disappear). Subsequent to 1997, secondary school GERs continued to rise. The temporary downturn at the start of market transition is likely attributable in part to quality-related shut-downs of rural secondary schools. Tertiary school gross enrollment ratios have climbed, from 2.5 percent for males and less than one percent for females in 1980 to 7.3 percent for males and 3.9 percent for females in 1998. Subsequent figures, not disaggregated by sex, suggest that the rate of growth in tertiary school GERs accelerated in the late 1990s.

[Figure 7.4 about here.]

As educational provision has expanded, the composition of enrollment has changed. Figure 7.4 shows total enrollments by year and type of school. Proportionally, secondary and tertiary enrollments have risen over time. Notably, in the most recent years, tertiary school enrollments have expanded dramatically. Enrollments in regular institutions of higher education increased from 1.14 million in 1980 to 5.56 million in 2000 to 13.3 million in 2004.

[Table 7.5 about here.]

The compositional changes are clear as well in transition ratios, calculated in Table 7.5 as the number of people starting a higher level of education as a percentage of the number graduating from a lower level of education in the same year. The primary: junior secondary school transition

ratio (column 1) dropped from 76 percent in 1980 to 65 percent in 1984, before rising to a high of 93.6 percent in 2000. The transition ratio comparing entrants to all forms of senior secondary school to junior secondary school graduates (column 6) was 48 percent in 1980 and 47 to 49 percent in the mid-1990s, with some downturns in the intervening years.

Higher educational transitions have also expanded notably since the early market reform period. The ratio of tertiary school entrants to general secondary school graduates, probably the most appropriate ratio for the transition into higher education, shows increases from under 5 percent in 1980 to almost 32 percent in 1985; there was a subsequent downturn and recovery by about 1992, after which time the ratio hovered in the mid 40 percent range until jumping to 61 to 73 percent in 1999 and 2000. If we compare tertiary school entrants to all senior secondary school students, the trend is similar, but the numbers are of course lower, such that by 2000, the ratio reached above one-third. Either comparison suggests dramatic expansion of higher education in the reform period.

The composition by specialization of enrollments in higher education shows both stability and change, in the face of dramatic expansions in numbers. Using UNESCO estimates, Figure 7.5 shows the composition of tertiary education by specialization in 1970, 1980, 1990 and 1994. More than half of students in higher education are in science and engineering. This percentage has remained remarkably stable—between 52 and 61 percent—across the years, despite increases in the size of the student body. After science and engineering, liberal arts is the second most popular category, though its share is down from over one-third in 1970 to under one-fourth in 1994. A significant new development in higher education is that the category of law and business has

grown from insignificance in 1970 to 12 percent by 1994. Unfortunately, we have found no comparable figures after 1994.[8]

[Figure 7.5 about here.]

Overseas study is another element of higher education that has expanded sharply in the reform era. A 1994 report identified overseas study as an important step to scientific modernization, improvement of higher education in China, and international competitiveness (Beijing University and Zhongshan University, 2005). The same source stated that Deng Xiaoping personally made the decision to increase the number of students sent to study abroad for the purpose of learning the advanced science, technology and culture of the developed Western nations. He issued a directive in 1978 increasing the number of students to be sent abroad (Beijing University and Zhongshan University, 2005).

Figure 7.6 shows students studying abroad and students returned by year. The number studying abroad increased, though not monotonically, from 2,124 in 1980 to 38,989 in the year 2000. Returnees are also rising, from 162 in 1980 to 9,121 in the year 2000.

[Figure 7.6 about here.]

[8] More recent tabulations of enrollments in higher education by type are available, but use different categories.

Enrollment and Attainment Disparities in the Reform Era

Despite rapid expansion of enrollments, changes in financing, coupled with the larger societal trend of rising income inequality, invite consideration of whether and to what extent historically disadvantaged groups have "caught up." Historically, important disparities in educational enrollment and attainment have been associated with gender, socio-economic status, location of residence, and ethnicity. Here, we consider inequality with regard to educational attainment and enrollment. We are unable to consider qualitative disparities in schooling.

[Table 7.6 about here.]

Gender

Using 2000 census data, Table 7.6 shows the full distribution of educational attainments for 25 to 34 year-olds, the youngest cohort that could be expected to have completed their formal schooling. While this distribution clearly attests to some continuing lags for women, the gender gap for China as a whole is now moderate. Evidence from a variety of surveys and censuses and from Ministry of Education data, moreover, offers convincing evidence that educational gender gaps have narrowed in recent years (Hannum and Liu, 2005; Hannum, 2005). Figure 7.2 clearly illustrates long-term narrowing of the gender gaps in educational attainment.

Looking at more current measures of educational participation, Tables 7.7 and 7.8 tabulate enrollment and years of schooling among 12 to 18 year-olds in five provinces in the CHNS by year (1989 versus 2000) and by sex. Table 7.9 shows results from multivariate analyses of enrollment and years of schooling using the same data.

[Tables 7.7 to 7.9 about here.]

Consistent with the discussion above, Tables 7.7 and 7.8 show substantial improvements in enrollment rates and years of schooling for girls and for boys in 2000, compared to 1989. For example, in 1989, 57.6 percent of girls and 61 percent of boys were enrolled; the gender gap was statistically significant (Table 7.7). In the year 2000, corresponding figures were 73.9 percent of girls and 76.4 percent of boys, and this difference was not statistically significant. For years of schooling, the 1989 averages for girls were 6.6 and for boys, 7.0; in the year 2000, the girls' average was 8.2, compared to 8.1 for boys (the difference was not significant) (Table 7.8). A multivariate analysis in Table 7.9 suggests that, net of other factors thought to matter for schooling, a small female enrollment disadvantage, but not a years-of-schooling disadvantage, persisted across the years.

Thus, consistent evidence suggests a long-term trend of narrowing gender gaps. Surveys from the 1980s and 1990s that have shown gender gaps indicate that they are concentrated in poor households and communities, and probably exacerbated by credit constraints (Connelly and Zheng, 2003; Hannum, 2003, 2005; Brown and Park, 2004). Our CHNS data are mixed on this issue. For example, in the year 2000 in Tables 7.7 and 7.8, there is a substantial gender gap in enrollment for children in the poorest quartile of households, among which 56.1 percent of girls and 70.4 percent of boys are enrolled, but the years of schooling gap in this sub-sample is not statistically significant. It could be that in this group, boys are allowed to take longer to finish given levels of schooling, leading to higher enrollment but not substantially higher attainment.

Socio-Economic Status

Socio-economic status is another important dimension of educational inequality. Indeed, from the broader perspective of the developing world as a whole, gender gaps in educational attainment have declined substantially, but large gaps related to parental family socio-economic status persist (see Behrman and Sengupta, 2002; NAS-NRC, 2004). Estimates based on data from the late 1980s and early 1990s show significant socio-economic gaps in enrollment in China (Hannum, 2005; Connelly and Zheng, 2003).

Descriptive results from 12-18 year-old children in five provinces in the CHNS show significant disparities in both enrollment and years of schooling attained by household head's education and by quartile of a scale of consumer items in the household (see Tables 7.7 and 7.8). For example, on average, the enrollment gap between girls in the lowest and highest quartiles was 17.5 percentage points in 1989 and 36.3 in 2000. The years of schooling gap between girls in the wealthiest and poorest quartiles was 3.1 years in 1989 and 1.7 years in 2000.

Multivariate analysis in Table 7.9 shows that the odds-ratio of enrollment for being in the highest quartile versus the lowest was 2.19 in 1989 (exp[.785]=2.19), but 5.48 in 2000; a test of interaction between year and consumer item quartile suggests that the effect of wealth was stronger in the latter year. In contrast, household head's education was significant in 1989, but not in 2000. For the years-of-schooling outcome, in contrast, findings suggest a diminishing, but still significant, effect of both consumer goods and head's education. Thus, our evidence suggests that wealth continues to confer significant enrollment and years of schooling advantages, at least among secondary-aged students.

The educational disadvantages of poor households result most directly from inability to pay school fees. For example, about 49 of 100 of village leaders surveyed in Gansu province in 2004 cited high costs as a reason for children leaving junior high school (Hannum and Park, 2005). In a 2004 survey of 2,000 13-17 year olds in rural Gansu province, 41 percent of mothers of out-of-school children reported not being able to afford school as a contributor to children's school-leaving (Hannum and Park, 2005).

However, advantages to wealthy families may also be realized through a myriad of other supports such as more favorable home learning environments, better health and nutrition, and fewer poverty-related distractions such as stress about using scarce household resources, pressure to contribute to household coffers, parental illness, or parental absence due to labor migration (Hannum and Park, forthcoming; Yu and Hannum, 2006; Yu, Kao and Hannum, 2004).

Geography

Poor households in China are disproportionately situated in contexts that are also disadvantaged,[9] and disparities in participation by location of residence remain prominent. For example, data covering the reform period through 1990 show gaps in access to compulsory education across urban-rural lines that showed no signs of narrowing (Hannum, 1999a). In the 2000 census, among the young adult population, there is still significant variation in

[9] For recent evidence on geography and development in China, see Chapter 19, Spatial, in this volume.

attainment of basic compulsory education along the rural-urban continuum. Table 7.4 shows, for example, that 40 percent of village residents report primary or below education, compared to about 17 percent of town residents and just 12 percent of city residents. These figures suggest that schooling attainment through the compulsory levels of education remained a problem in rural areas in the recent past (even though Table 7.4 in a sense overstates the extent to which rural areas lag behind because of post-school selective migration out of rural areas).

The CHNS provides more recent evidence on urban-rural gaps in educational attainment. Analyses suggest a mixed picture of the trend in disadvantage of rural residents in educational attainment, with the urban advantage in enrollment among 12-18 year olds persisting between 1989 and 2000, but some signs of narrowing of the years-of-schooling gap (Table 7.9).

Significant educational disparities appear along other geographic lines. Table 7.6 shows that about 8 percent of young adults in the Northwest and about 7 percent in the Southwest have no formal schooling at all; these figures compare to 2 percent or less for all other regions. At the provincial level, many of the more urbanized and coastal provinces have achieved an important benchmark on the way to universalizing nine years of compulsory education: nearly all primary school graduates go on to secondary school. In contrast, in many of the impoverished western provinces, roughly one in 10 primary school graduates fail to continue on; in Guizhou, the figure is close to 21 percent and in Tibet, a full 45 percent (Hannum and Wang, 2006, Table 1). Perhaps

unsurprising in light of disequalizing school finance trends and rising regional economic inequalities,[10] analyses of the impact of birth province on ultimate educational attainment across cohorts in the 2000 census suggests that educational disadvantage is more geographically concentrated among the most recent cohorts than among earlier cohorts.[11]

Still other evidence highlights the significant impact of local community resources, such as income, on enrollment opportunities, net of a variety of household background characteristics. For example, using data from the 1990 census, Connelly and Zheng showed that county per capita income was positively correlated with the probability of rural youth enrollment in primary school, middle school and secondary school. Similarly, analyses of the rural component of a 1992 national survey of children indicated that junior secondary school provision was linked to village income, and that both village income and junior secondary school provision significantly predicted enrollment among 12 to 14 year-olds, net of household socio-economic status (Hannum, 2003).

More recent data suggest that the impact of communities on educational opportunity may be increasing. For example, multivariate analyses of enrollment and grade-for-age attainment using three waves of the CHNS

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[10] Inter-provincial income inequality increased markedly from the late 1980s at least through the year 2000, and the urban-rural gap in income and living standards remains large (Carter, 1997; Khan and Riskin, 1998; Zhang and Kanbur, 2003). See Chapter 18, Inequality, in this volume for recent evidence on income inequality trends.

[11] Specifically, in a regression of approximate years of schooling calculated from levels of schooling reported the 2000 census, we found that province of birth explained a larger proportion of variation among the most recent cohorts. We also found that indices of dissimilarity assessing the differences in birth province distributions of those with and without each level of education (primary, lower secondary, upper secondary, and tertiary) showed stable or rising trends across more recent cohorts (Hannum and Wang, 2006).

indicated that community per capita income became a significant predictor of educational outcomes in the later years (Adams and Hannum, 2005). On balance, these examples point to a persistent, and perhaps increasing, role of geography as an educational stratifier.

Ethnicity

Tied to, but also distinct from, issues of poverty, rural residence and geography is the problem of educational stratification by ethnicity. As Table 7.4 shows, ethnic minorities as a group are at a substantial educational disadvantage, compared to the ethnic majority Han population. The disparity is most striking at the low end of educational attainment: about one in ten minorities in the young adult population has no formal schooling; this number compares to just two percent among the Han. Among the minority young adult population, 50 percent have a primary or lower level of education, compared to 28 percent of the Han population.[12] Interestingly, at the tertiary level, disparities are moderate: about 7 percent of Han and about 5 percent of minorities report some kind of tertiary educational attainment.[13]

At basic levels of education, much of the disadvantage faced by ethnic minorities stems from their disproportionate representation among rural residents, among the poor, and in disadvantaged western provinces (Hannum,

[12] It is important to acknowledge that there is great variation in educational disparities among minority groups in China, with a few groups, especially those concentrated in the northeast, showing better educational indicators than the Han Chinese (Hannum, 2002).

[13] The much narrower gap at the high end of the educational distribution may be attributable in part to governmental efforts to cultivate minority cadres, and to related special policies designed to bring minorities into higher education.

2002).[14] However, the educational decision-making process differs across individual ethnic groups in a manner that cannot be simply reduced to poverty and geography. Minority groups in China are diverse with regard to cultural practices and experiences with the larger Han society (Mackerras, 1994, 1995; see also Gladney, 1996; Harrell, 1995). Ethnic groups may develop varying attitudes toward education depending on whether they perceive that the school system is compatible with aspects of their own cultures and whether they observe tangible returns to education among members of their own communities (Hansen, 1999; Harrell and Mgebbu, 1999). For example, Hansen's (1999) fieldwork indicates that educational disparities between the Dai, Naxi, Hani, and Jinuo in Yunnan can be traced to ethnic differences in perceptions of the economic benefits of education and the accord or opposition between each group's cultural heritage and the educational system.

Little evidence is available on changes in ethnic disparities over time. Comparisons of primary entrance and junior secondary school transition rates in the 1982 and 1990 censuses showed improvements for most ethnic groups at the primary level, but a compensating deterioration for many groups at the junior secondary school transition (Hannum, 2002). Ministry of Education data from 1978 to 1997 show that minorities increased their presence as a proportion of total enrollment at all levels of schooling between 1978 and 1997 (Hannum,

[14] Minorities' poorer status has been confirmed in recent survey data. Using rural household surveys conducted in 19 provinces, Gustafsson and Li (2003) estimate that in 1995, minorities had an average income per capita less than two-thirds of that of the majority. As in the case of education, much of the income disadvantage is attributed to minority residence in the poor parts of China.

1999b, Table 3).[15] Whether ethnic gaps are narrowing or not, the striking ethnic disparities apparent among young adults in the 2000 census suggest the critical importance of ethnicity as a stratifier in China.

Discussion and Conclusions

China's population bears the marks of phenomenal educational expansion since 1949. Much of this progress occurred prior to market reforms, without the benefit of rapid economic growth. After some faltering in the early 1980s, the long-standing pattern of expansion has re-emerged. The pattern of expansion has been different in the reform period than in the preceding era, as policy makers have sought to mobilize private resources and emphasized links between schooling and economic modernization. Leaders moved away from the radical educational agenda that predated market reforms and toward expanding vocational and higher education.

As a result, China's population is increasingly well educated, and the education system itself is more outward-looking and also more diverse in structure, finance, and content than in the past. These changes have facilitated China's expansion into international markets (both trade and foreign investments), with important feedbacks throughout the economy (see Chapter 16, International). At the same time, greater integration into international markets has increased the returns to education in ways that are likely to increase investments in education but also, at least for near-term future, increase inequalities in education and income.

[15] However, interpretation of this trend is complicated by our inability to obtain figures on the proportion of minorities among the school age population

In terms of educational inequalities, gender disparities appear to be narrowing, suggesting that educational expansion patterns have exerted an equalizing impact on this historically important dimension of social inequality. In contrast, differences in enrollment and attainment by socio-economic status, location of residence, and ethnicity remained striking at the start of the new century. Most disconcerting are the very noticeable disadvantages for minorities and those residing in China's poor regions.

Moreover, while we can measure disparities in access to the system, we know very little about qualitative disparities and their implications. The available evidence suggests that qualitative disparities are likely increasing, even as the system becomes more inclusive. Trends in educational finance raise particular concerns about quality disparities along geographic lines.

Government initiatives in the early 2000s have paid significant attention to finance problems in poor rural areas. For example, in 2005, the national and provincial governments invested RMB7.2 billion in central and western China to expand a policy known as "two frees, one subsidy" (*liang mian yi bu*, 两免一补), which waives fees and provides boarding allowances for poor students during their nine years of compulsory education. Under this program, each beneficiary receives RMB210-320 a year, making school fees and textbooks virtually free; some impoverished students in boarding schools also receive living allowances (Chang 2006).

In 2006, Premier Wen Jiabao pledged that the government would eliminate all charges on rural students receiving a nine-year compulsory education before the end of 2007 (*People's Daily*, March 05, 2006). An amendment to the compulsory education law, which came into effect September 1, 2006, commits to giving children in both cities and the countryside nine years of free compulsory education, though tuition charges will not be

completely waived for a few years, as clauses in the law still have to be approved by the State Council (*People's Daily*, June 30, 2006). Central and local governments will have responsibility for expenditures, and local governments are to place expenditures for compulsory education in their budgets (*People's Daily*, June 30, 2006).

The success of these initiatives will shape social stratification in China into the future. As societies develop and schooling expands, educational credentials typically play an increasingly central role in labor and marriage markets.[16] In urban China, the tightening link between education and labor outcomes is clear: returns to education have increased dramatically over the course of the reform era in urban areas (Zhang and Zhao, forthcoming). In rural areas, a recent review indicates that where rural labor markets have emerged, getting non-farm jobs is increasingly based on human capital attributes, and the greater the extent of the labor market, the higher the returns on human capital (Nee and Matthews, 1996; see also De Brauw and Rozelle, forthcoming).

If educational credentials increasingly matter in the labor market and real opportunities for education are distributed equitably across social groups, this rising role of human capital in the labor market can be equalizing. However, when historically disadvantaged groups have poorer relative access to education, the rising importance of education can serve to reinforce, rather than ameliorate, longstanding inequalities, even when access to education is

[16] To the extent that educational homogamy occurs, returns to education may be realized not only through labor market outcomes for individual graduates, but also through labor market outcomes for their spouses.

expanding, and even if the labor market operates without discriminating on the basis of group membership.[17] As educational credentials rise in importance in the labor market, groups with the least (or lowest quality) education today will be tomorrow's poor. For these reasons, the educational inequality documented here—by socio-economic status, location and ethnicity—provides a forecast of the economic inequalities of the near future.

[17] For example, in the Xinjiang Uygur Autonomous Region, between the 1982 and 1990 censuses, rising ethnic disparities in occupational status could be explained by rising ethnic differences in education. These educational disparities emerged at a time of dramatic improvements in access to schooling for both minorities and ethnic Chinese (Hannum and Xie, 1998).

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Table 7.1. Indicators of Overall Government Investment in Education, 1991-2003 (percent)

Year	Government Appropriation for Education/Total Government Expenditure	Total Government Expenditure/Gross Domestic Product
1991	18.24	15.67
1992	19.47	14.05
1993	18.69	13.40
1994	20.28	12.39
1995	20.69	11.67
1996	21.06	11.69
1997	20.17	12.40
1998	18.82	13.78
1999	17.34	16.07
2000	16.13	17.76
2001	16.17	19.42
2002	15.83	20.97
2003	15.62	21.00

Source: Our calculations using current Yuan; data from *China Statistical Yearbooks*, various years.

Table 7.2. Selected Statistics on Education Finance, 1991-2004

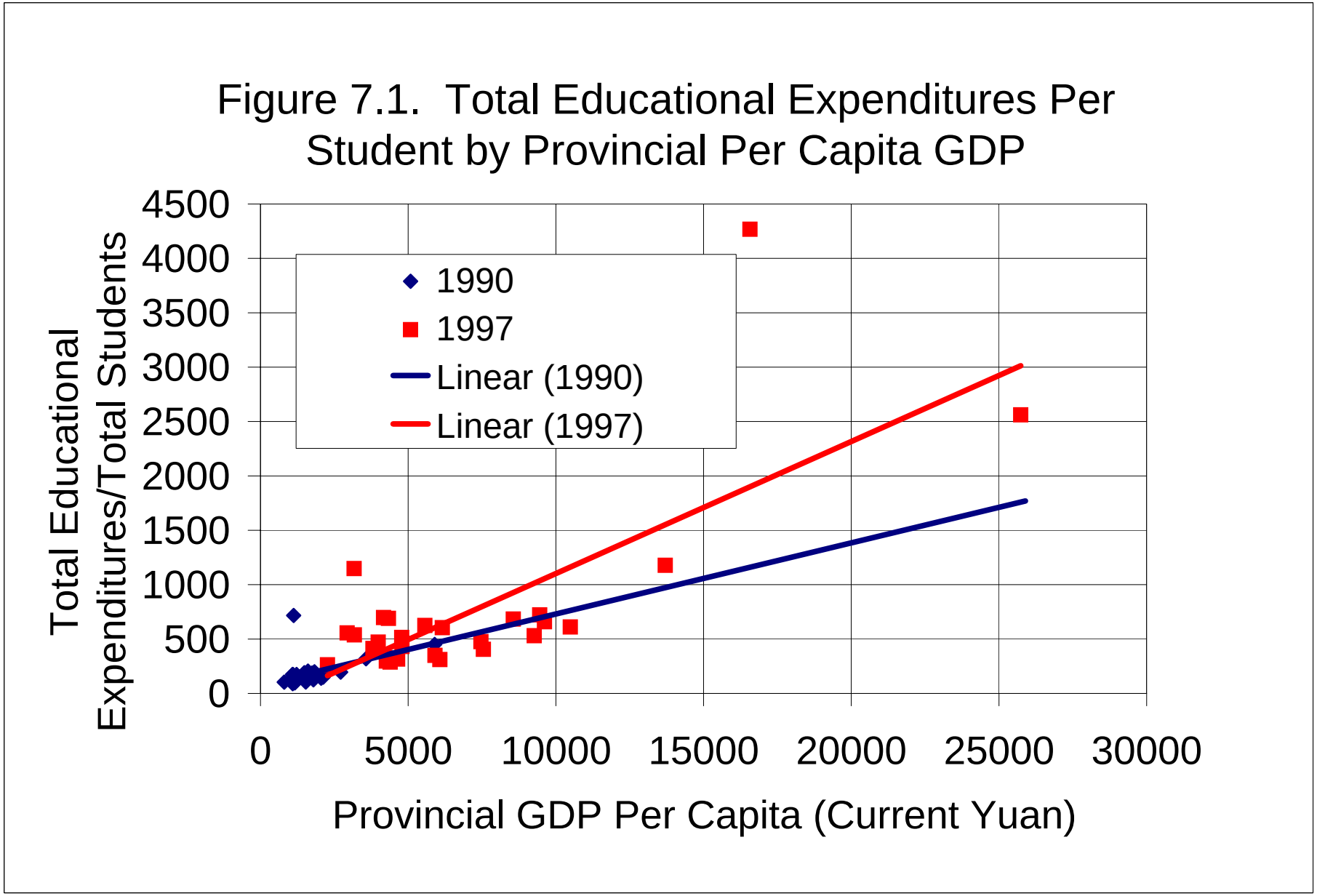
Year	Growth Rate of Spending on Education		Percent of Total Expenditures on Education from					
	All Sources (percent)	Government Appropriation (percent)	Government Appropriation for Education	Budgetary Funds	Funds of Social Organizations and Citizens for Running Schools	Donations and Fund-raising for Running Schools	Tuition and Miscellaneous Fees	Other Educational Funds
1991			84.46	62.85		8.59	4.42	2.53
1992	11.41	10.87	84.05	62.13		8.03	5.07	2.85
1993	6.58	3.81	81.87	60.80	0.31	6.62	8.22	2.97
1994	13.15	9.06	78.91	59.38	0.72	6.55	9.87	3.96
1995	7.74	2.63	75.16	54.76	1.08	8.67	10.72	4.37
1996	11.22	9.34	73.89	53.57	1.16	8.33	11.54	5.08
1997	8.87	8.39	73.57	53.63	1.19	6.74	12.88	5.62
1998	17.41	9.99	68.92	53.09	1.63	4.81	12.54	12.10
1999	15.19	14.15	68.29	54.22	1.88	3.76	13.84	12.23
2000	14.45	11.58	66.58	54.19	2.23	2.96	15.45	12.78
2001	19.66	18.47	65.92	55.68	2.76	2.43	16.08	12.81
2002	19.12	15.13	63.71	56.83	3.15	2.32	16.84	13.98
2003	11.95	8.98	62.02	55.63	4.17	1.68	18.06	14.05
2004	12.28	11.63	61.66	55.61	4.80	1.29	18.59	13.65

Source: Our calculations using 1978 constant prices; data from *China Statistical Yearbooks*, various years. Deflator:

Table 7.3. Growth Rates in Tuition and Miscellaneous Fees by School Type, 1997-2004

Year	Institutions of Higher Education	Secondary Schools	Primary Schools
1997	24.82	24.14	15.22
1998	21.20	15.67	16.01
1999	63.64	24.67	6.91
2000	56.51	28.55	6.63
2001	43.19	28.24	7.11
2002	37.60	24.65	8.73
2003	27.15	18.82	9.72
2004	21.70	12.74	8.71

Source: Our calculations using 1978 constant prices; data from *China Statistical Yearbooks*, various years.



Sources: Calculated from International Food Policy Research Institute (N.D.) and ACMR (N.D.)

Table 7.4. Educational Attainment of Teachers by School Level and Location of Teachers' Residence

	Primary or Less	Junior Sec. School	Senior Sec. School	Secondary Technical School	Tertiary Technical School	Tertiary Academic Institution	Graduate School	Total
City								
Higher Education Teacher	0.00	0.76	1.21	3.18	13.77	57.64	23.45	100
Secondary Vocational Education Teacher	0.00	2.45	4.71	11.30	34.09	46.70	0.75	100
Secondary Teacher	0.48	1.45	4.78	9.07	42.35	41.04	0.83	100
Primary Teacher	0.16	4.08	9.98	43.28	36.76	5.58	0.16	100
Kindergarten Teacher	1.89	15.09	17.40	44.03	19.29	2.31	0.00	100
Special Education Teacher	0.00	0.00	5.56	33.33	55.56	5.56	0.00	100
Other Teaching Staff	4.17	13.89	22.92	11.11	24.31	22.22	1.39	100
Total	*0.53*	*4.02*	*7.61*	*21.87*	*32.73*	*29.39*	*3.85*	100
Town								
Higher Education Teacher	0.00	2.22	0.00	15.56	33.33	46.67	2.22	100
Secondary Vocational Education Teacher	0.00	1.35	5.41	13.51	51.35	28.38	0.00	100
Secondary Teacher	0.37	1.71	4.81	15.48	57.53	19.99	0.12	100
Primary Teacher	0.47	5.87	9.86	56.65	25.51	1.64	0.00	100
Kindergarten Teacher	2.31	20.37	19.91	43.06	14.35	0.00	0.00	100
Special Education Teacher	0.00	0.00	40.00	40.00	20.00	0.00	0.00	100
Other Teaching Staff	3.81	19.05	13.33	30.48	23.81	9.52	0.00	100
Total	*0.61*	*4.94*	*7.91*	*32.93*	*41.24*	*12.27*	*0.09*	100
County								
Higher Education Teacher	0.00	0.00	0.00	26.32	36.84	31.58	5.26	100
Secondary Vocational Education Teacher	1.41	2.82	9.86	25.35	29.58	30.99	0.00	100
Secondary Teacher	0.57	3.27	9.39	24.89	51.71	10.1	0.07	100
Primary Teacher	0.77	14.67	19.55	51.16	12.91	0.94	0.00	100
Kindergarten Teacher	2.54	34.52	27.41	30.46	5.08	0.00	0.00	100
Special Education Teacher	0.00	20.00	20.00	20.00	40.00	0.00	0.00	100
Other Teaching Staff	13.89	19.44	27.78	25.00	13.89	0.00	0.00	100
Total	*0.88*	*12.19*	*16.98*	*42.72*	*23.34*	*3.86*	*0.04*	100

Source: 2000 Census Microsample.

Figure 7.2. Selected Educational Attainment Rates in 2000 by Age Cohort and Gender

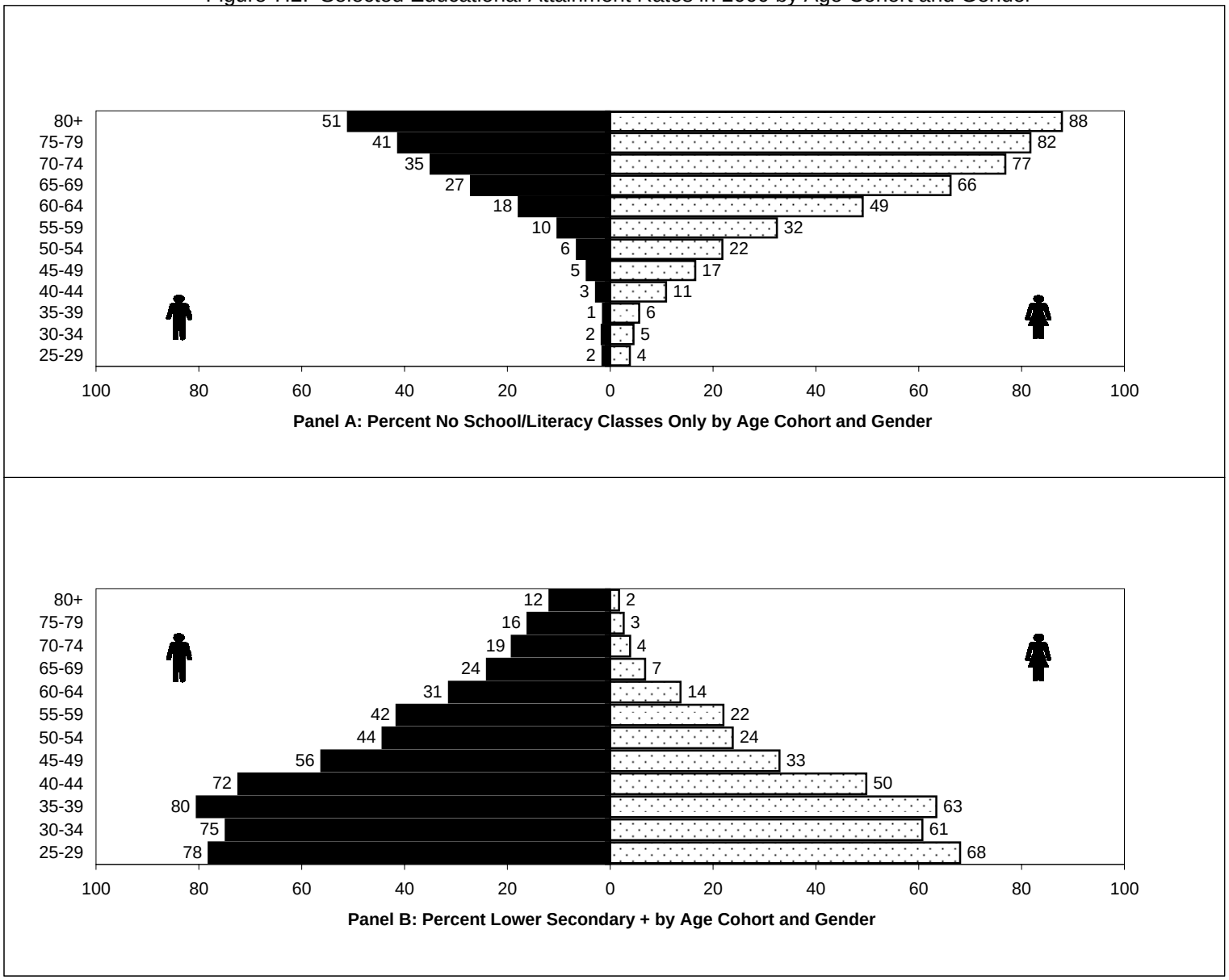
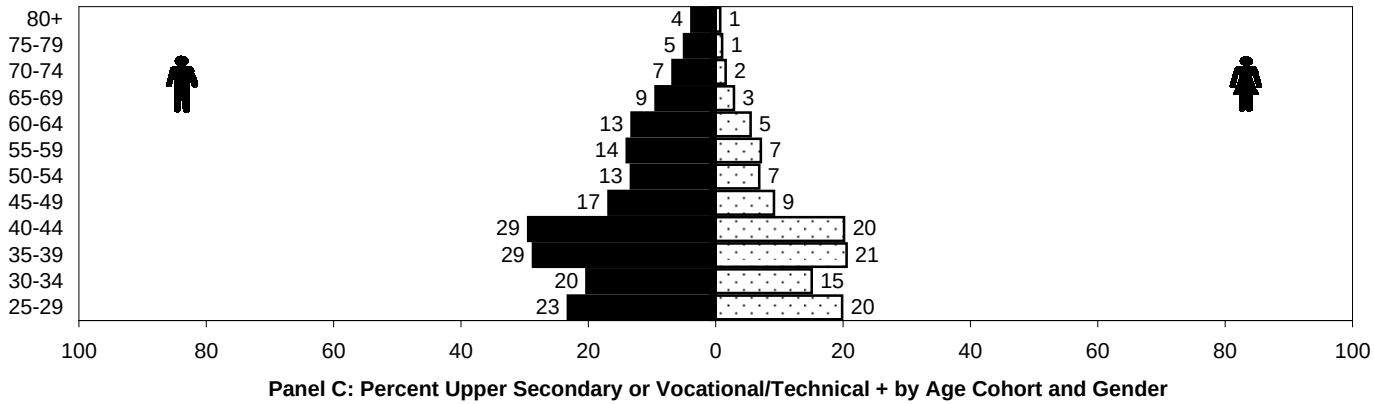
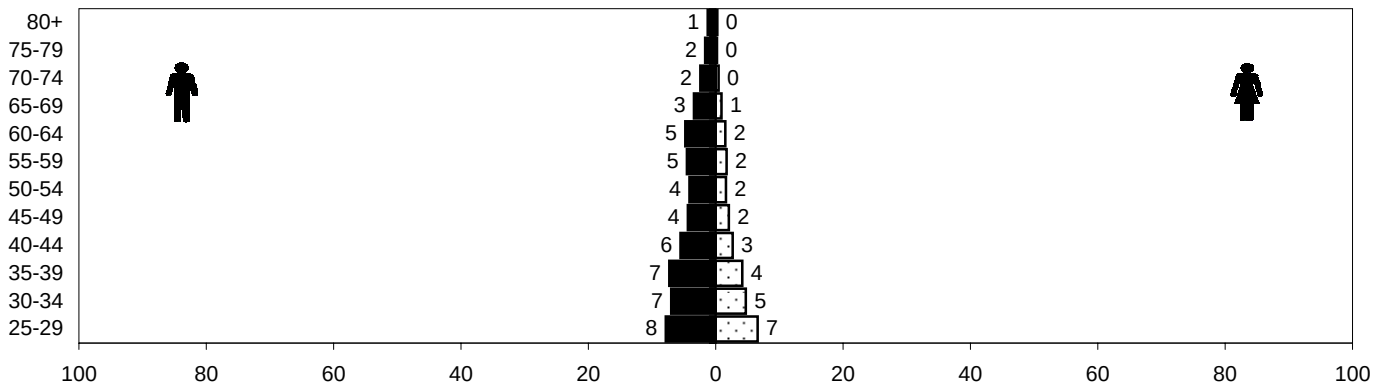


Figure 7.2. Selected Educational Attainment Rates in 2000 by Age Cohort and Gender (Continued)



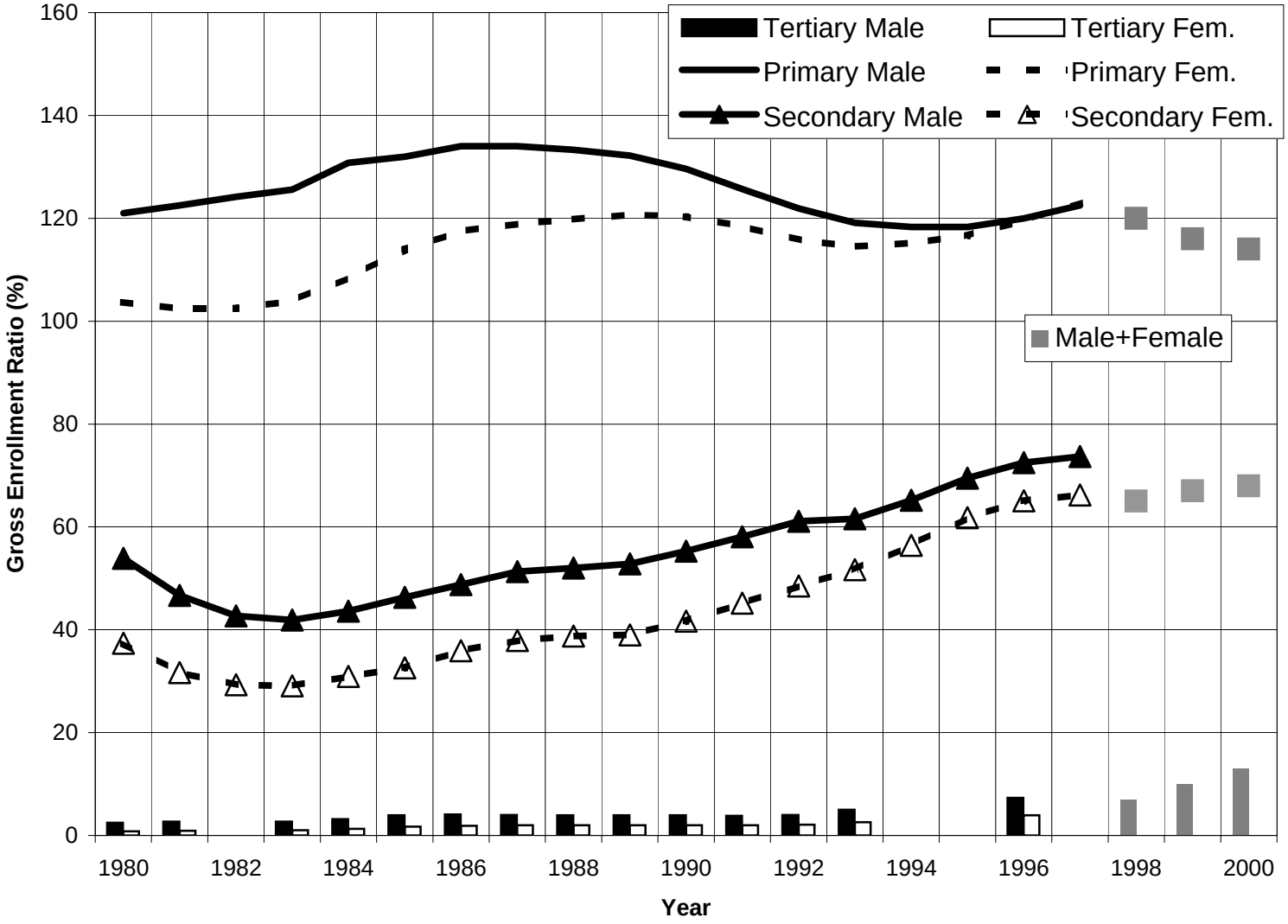
Panel C: Percent Upper Secondary or Vocational/Technical + by Age Cohort and Gender



Panel D: Percent Tertiary by Age Cohort and Gender

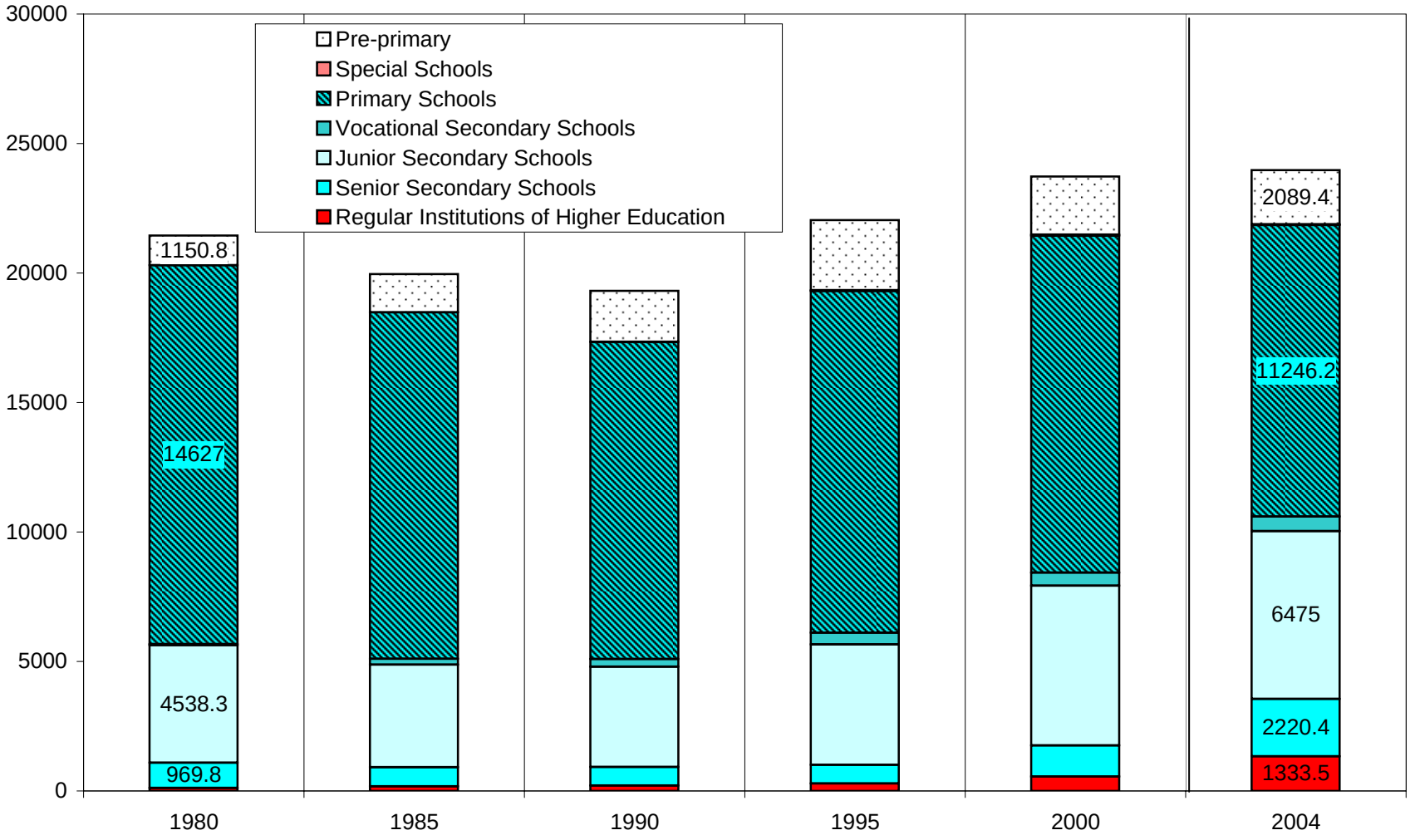
Source: 2000 Census Microsample.

Figure 7.3. Gross Enrollment Ratios by Level, Sex and Year



Sources: Hannum and Liu (2005, Table 2) and UNESCO Institute for Statistics (2004).

Figure 7.4. School Enrollments by Level and Year (10,000s)



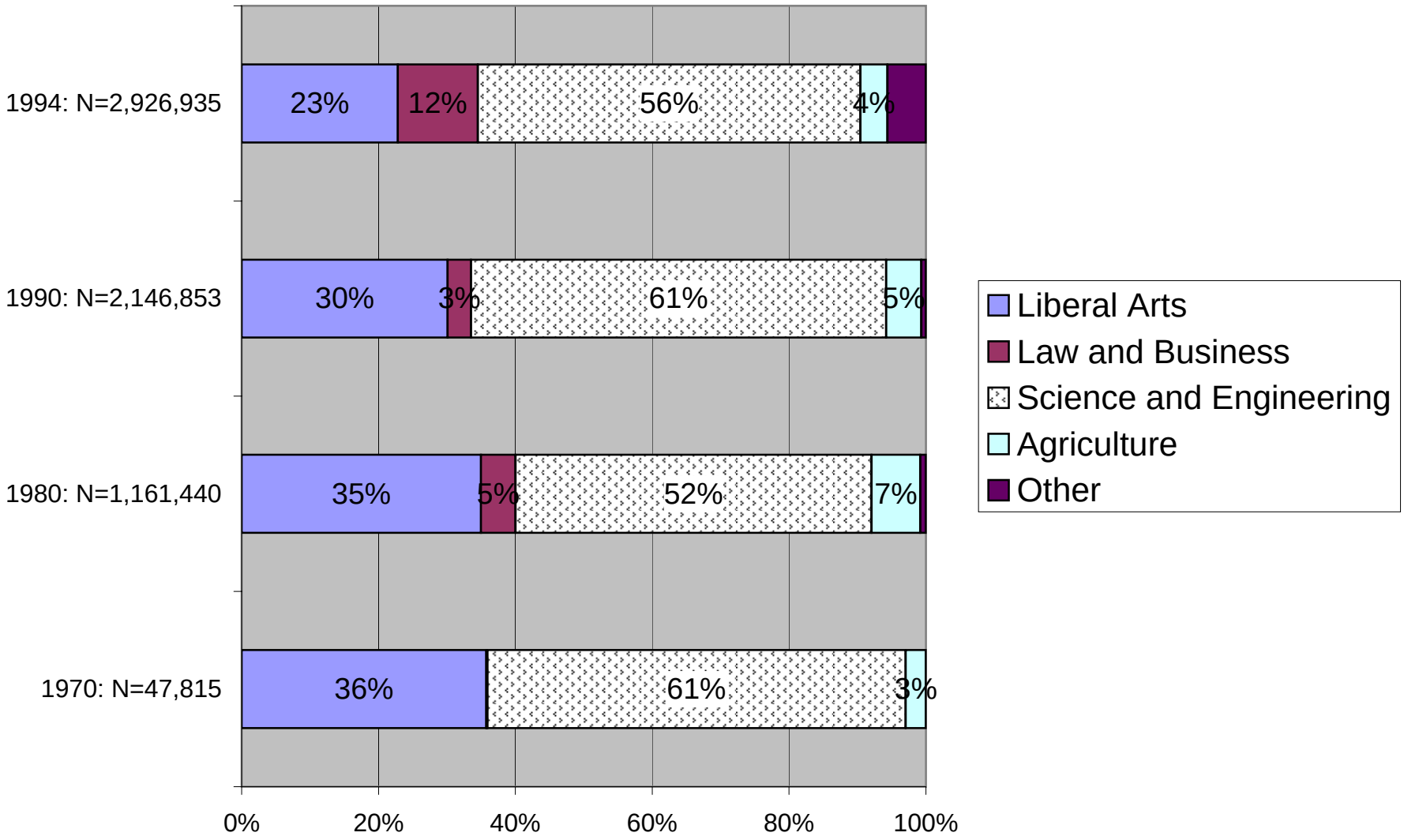
Source: National Bureau of Statistics (2005)

Table 7.5. Level-to-Level Transition Ratios: New Enrollments in A as a Percentage of Graduates from B

	A:	Junior Secondary	General Secondary	Technical Secondary	Teacher Training Secondary	Vocational Training Secondary	General, Technical, Teacher Training or Vocational Secondary	Regular Institutions of Higher Education	Regular Institutions of Higher Education
	B:	Primary	Junior Secondary	Junior Secondary	Junior Secondary	Junior Secondary	Junior Secondary	General Secondary	General, Technical, Teacher Training or Vocational Secondary
Year		1	2	3	4	5	6	7	8
1980		75.5	39.7	2.6	2.2	3.2	47.8	4.6	4.2
1981		68.1	28.4	2.1	1.7	2.3	34.5	5.7	5.0
1982		65.9	27.1	2.3	1.7	4.1	35.2	10.1	8.6
1983		66.5	27.1	3.0	2.0	7.9	39.9	16.6	13.3
1984		65.3	27.6	3.7	2.1	9.9	43.2	25.0	18.6
1985		67.5	25.8	4.5	2.2	11.6	44.1	31.5	22.0
1986		68.8	24.3	4.3	2.1	10.7	41.4	25.5	17.3
1987		68.2	22.8	4.3	2.1	10.1	39.4	25.0	16.3
1988		69.4	21.1	4.7	2.0	10.3	38.2	26.7	17.1
1989		70.5	21.3	4.5	2.0	10.4	38.3	24.5	15.4
1990		73.5	22.5	4.5	2.0	11.1	40.2	26.1	15.7
1991		74.4	22.5	5.1	2.1	12.7	42.3	27.8	15.8
1992		78.2	21.3	5.8	2.2	13.8	43.1	33.3	19.0
1993		80.3	20.1	7.6	2.5	14.2	44.5	39.9	22.7
1994		85.1	21.1	8.1	2.5	15.2	47.0	43.0	23.1
1995		89.3	22.3	8.7	2.5	15.5	49.0	45.9	22.6
1996		91.0	22.1	9.4	2.5	14.8	48.7	47.1	21.6
1997		92.1	22.4	9.0	2.3	14.6	48.2	45.1	20.5
1998		92.6	22.8	8.5	2.0	13.8	47.1	43.1	19.9
1999		92.9	24.9	8.4	1.8	12.2	47.4	60.7	28.0
2000		93.6	29.4	6.9	1.3	11.4	49.0	73.2	35.1

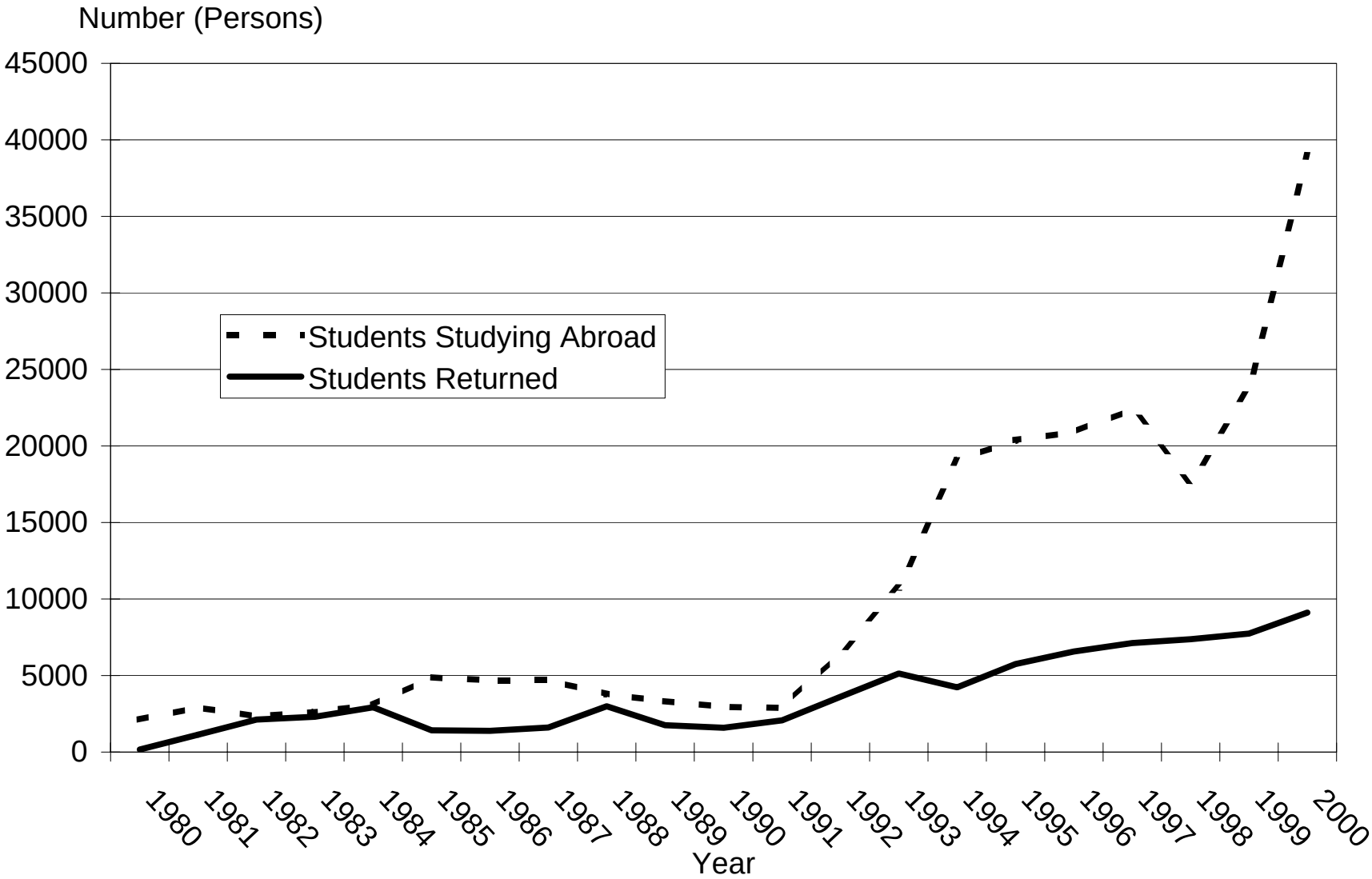
Note: "General Secondary" refers to academic senior high schools.
Source: ACMR (N.D.)

Figure 7.5. Composition of Tertiary Education, Select Years



Source: Calculated from United Nations Statistics Divisions. 2005.
Note: Definitions of higher education are not consistent with Chinese sources.

Figure 7.6. Students Studying Abroad and Returned by Year



Source: ACMR N.D.

Table 7.6. Educational Attainment of the Population Ages 25-34 by Demographic Characteristics

	N	Never Attended School	Only Literacy Classes	Primary	Junior Sec. School	Senior Sec. School	Secondary Technical School	Tertiary Technical School	Tertiary Academic Institution	Graduate School
Gender										
Male	113,020	1.2	0.4	22.1	54.7	10.6	3.8	4.9	2.3	0.2
Female	111,048	3.2	1.0	31.6	46.8	7.9	3.9	4.1	1.4	0.1
Ethnicity										
Han	204,904	1.6	0.5	25.7	52.3	9.5	3.8	4.6	1.9	0.2
Minority	19,035	8.5	2.9	38.3	34.5	6.8	4.0	3.4	1.6	0.1
Residence Status										
City	56,717	0.8	0.1	10.8	44.8	18.4	7.8	11.0	5.8	0.6
Town	32,778	1.0	0.3	16.4	51.2	14.1	7.3	7.9	2.0	0.0
Village	134,573	3.1	1.0	36.1	53.2	4.2	1.3	0.9	0.2	0.0
Region										
North	25,845	1.1	0.2	18.9	57.0	9.9	4.4	5.3	2.8	0.4
Northeast	19,073	0.9	0.0	21.0	52.2	12.3	4.7	6.2	2.7	0.1
East	64,839	1.4	0.6	26.0	53.7	8.6	3.5	4.3	1.9	0.1
Central South	61,597	0.9	0.2	23.8	55.2	9.9	3.7	4.4	1.6	0.2
Southwest	35,250	5.3	2.0	41.6	37.2	6.0	3.5	3.3	1.1	0.1
Northwest	17,464	6.6	1.7	28.5	41.0	11.4	4.1	5.0	1.7	0.1

Source: 2000 Census Microsample.

Table 7.7. Enrollment Rates, Youth Ages 12-18								
	1989				2000			
Characteristic	**N**	**Male**	**Female**	***P-Value***	**N**	**Male**	**Female**	***P-Value***
Total	1,991	61.0	57.6	0.02	1,479	76.4	73.9	NS
Age								
12-13	522	93.1	92.7	NS	468	96.8	92.2	0.03
14-15	582	77.4	68.9	0.02	442	84.9	82.9	NS
16-17	581	38.3	31.3	NS	358	64.7	57.9	NS
18	306	17.2	16.1	NS	211	34.5	40.0	NS
P-Value		0.00	0.00			0.00	0.00	
Urban-rural residence								
Urban	465	68.5	62.6	NS	400	87.4	86.6	NS
Rural	1,525	58.7	53.9	NS	1,079	72.2	69.2	NS
P-Value		0.01	0.02			0.00	0.00	
Household head's education								
None	374	51.1	43.6	NS	99	67.8	75.0	NS
Primary	940	58.5	55.2	NS	386	68.9	60.0	NS
Junior high	509	67.9	61.1	NS	611	79.4	74.8	NS
Senior high+	160	74.7	75.4	NS	353	83.2	85.6	NS
P-Value		0.00	0.00			0.00	0.00	
Number of consumer items owned by the household								
No report	54	83.3	58.3	0.04	NA			
Lowest quartile	409	54.4	49.7	NS	422	70.4	56.1	0.002
2nd quartile	665	56.7	50.2	NS	360	70.9	75.6	NS
3rd quartile	588	64.8	60.6	NS	390	77.3	75.4	NS
Highest quartile	275	70.3	67.2	NS	307	91.3	92.4	NS
P-Value		0.00	0.00			0.00	0.00	
School-age children in the household								
One	361	44.4	48.7	NS	494	75.9	81.2	NS
Two	480	65.0	54.9	0.004	671	76.9	71.5	NS
Three or more	835	65.5	59.3	NS	314	75.8	69.6	NS
P-Value		0.00	NS			NS	0.02	
Province								
Jiangsu	205	62.8	61.3	NS	122	81.7	83.9	NS
Shandong	218	63.1	51.3	NS	179	85.6	76.8	NS
Henan	321	58.7	45.6	0.02	205	74.3	71.9	NS
Hubei	249	67.7	52.8	0.02	259	76.5	72.4	NS
Hunan	249	62.9	66.7	NS	191	80.8	79.3	NS
Guangxi	310	55.9	55.0	NS	286	70.8	76.0	NS
Guizhou	438	59.8	59.8	NS	237	71.7	63.3	NS
P-Value		NS	0.01			NS	0.05	
Relationship to household head								
Own child	1858	60.9	55.7	0.02	1,342	76.4	73.1	NS
Other*	133	62.9	59.2	NS	134	76.5	80.3	NS
P-Value		NS	NS			NS	NS	

Source: China Health and Nutrition Survey

* Others include grandchildren, siblings, other relatives, and other non-relatives (one "spouse" was included in 1989).
Note: P-Values are results from chi-squared tests of independence. NS=Not significant at the .05 level.

Table 7.8. Average Years of School Completed, Youth Ages 12-18										
	1989					2000				
	Male		Female		*P-Value*	Male		Female		*P-Value*
Characteristic	**Mean**	**SD**	**Mean**	**SD**		**Mean**	**SD**	**Mean**	**SD**	
Total	7.0	2.2	6.6	2.6	0.01	8.1	2.0	8.2	2.1	NS
Age										
12-13	5.4	1.6	5.6	1.7	NS	6.6	1.4	6.6	1.5	NS
14-15	7.1	1.7	6.6	2.5	0.01	8.1	1.4	8.2	1.7	NS
16-17	7.9	2.2	7.6	2.5	NS	9.3	1.7	9.4	1.9	NS
18	7.9	2.5	7.4	3.2	NS	9.6	2.2	9.7	1.9	NS
P-Value		0.00		0.00			0.00		0.00	
Urban-rural residence										
Urban	7.9	2.1	8.2	2.1	NS	8.8	2.0	8.7	2.1	NS
Rural	6.7	2.1	6.3	2.5	0.00	7.9	1.9	8.0	2.1	NS
P-Value		0.00		0.00			0.00		0.00	
Household head's education										
None	6.5	2.4	6.2	2.9	NS	7.8	2.2	7.8	2.1	NS
Primary	6.8	2.1	6.6	2.4	NS	7.9	2.1	7.8	2.3	NS
Junior high	7.3	2.0	6.9	2.5	NS	8.2	1.9	8.2	1.8	NS
Senior high+	8.3	2.1	8.2	2.3	NS	8.4	1.9	8.8	2.3	NS
P-Value		0.00		0.00			0.00		0.00	
Number of consumer items owned by the household										
No report	6.8	2.3	6.4	2.2	NS	NA				
Lowest quartile	6.2	2.2	5.2	2.7	0.00	7.5	1.9	7.4	2.1	NS
2nd quartile	6.8	2.0	6.3	2.5	0.00	7.9	2.1	8.0	1.8	NS
3rd quartile	7.5	2.0	7.5	2.2	NS	8.4	1.9	8.5	2.0	NS
Highest quartile	8.2	2.1	8.3	2.0	NS	8.9	2.2	9.1	2.2	NS
P-Value		0.00		0.00			0.00		0.00	
School-age children in the household										
One	7.8	2.3	7.5	2.7	NS	8.8	2.0	8.8	2.1	NS
Two	7.1	2.1	7.1	2.4	NS	7.9	1.9	8.2	2.1	NS
Three or more	6.6	2.1	6.2	2.6	0.02	7.3	1.7	7.7	1.9	0.05
P-Value		0.00		0.00			0.00		0.00	
Province										
Jiangsu	7.8	2.3	7.3	2.8	NS	8.2	2.2	8.6	1.9	NS
Shandong	7.0	2.2	6.4	2.9	NS	8.3	2.1	7.9	1.9	NS
Henan	7.1	1.9	6.8	2.5	NS	8.1	2.1	8.3	1.9	NS
Hubei	7.2	1.9	6.9	2.3	NS	8.1	1.8	8.4	2.2	NS
Hunan	7.2	1.9	7.3	1.8	NS	8.8	2.1	8.7	2.3	NS
Guangxi	7.1	2.3	6.9	2.4	NS	7.9	1.9	8.1	2.1	NS
Guizhou	6.4	2.4	6.1	2.7	NS	7.7	1.8	7.7	2.1	NS
P-Value		0.00		0.00			0.00		0.02	
Relationship to household head										
Own child	7.0	2.2	6.7	2.6	NS	8.1	1.9	8.2	2.1	NS
Other	7.2	1.9	7.2	2.3	NS	7.9	2.4	7.9	2.4	NS
P-Value		NS		NS			NS		NS	

Source: China Health and Nutrition Survey

* Others include grandchildren, siblings, other relatives, and other non-relatives (one "spouse" was included in 1989).

Note: P-Values are results from t-tests or ANOVA tests, in the case of characteristics with more than two categories. NS=not significant at the .05 level.

Table 7.9. Logistic Regressions of Enrollment and Linear Regressions of Years of Education, Youth Ages 12-18, 1989 and 2000

	Enrollment			Years of Education		
	1989	2000	Combined	1989	2000	Combined
Age, in years	-1.452	-0.420	-1.107	3.136	2.793	3.062
	(2.24)**	(0.58)	(2.29)**	(7.90)***	(8.48)***	(11.39)***
Age squared	0.020	-0.010	0.010	-0.090	-0.073	-0.085
	(0.96)	(0.42)	(0.65)	(6.72)***	(6.57)***	(9.39)***
Year indicator (ref: 1989)						
2000			0.853			1.849
			(2.33)**			(6.95)***
Female (ref.: male)	-0.299	-0.260	-0.283	-0.262	0.077	-0.270
	(2.51)**	(1.66)*	(2.49)**	(2.78)***	(0.98)	(2.85)***
Year*female			-0.025			0.356
			(0.13)			(2.86)***
Urban (ref.: rural)	0.458	0.865	0.428	0.795	0.393	0.760
	(2.48)**	(4.11)***	(2.48)**	(6.15)***	(4.00)***	(6.02)***
Year*urban			0.424			-0.386
			(1.60)			(2.48)**
Household head's education (ref.: None)						
Primary	0.329	-0.357	0.333	0.437	0.097	0.473
	(1.88)*	(1.07)	(1.99)**	(2.75)***	(0.43)	(2.96)***
Junior high	0.628	-0.115	0.621	0.722	0.461	0.768
	(2.95)***	(0.34)	(3.02)***	(4.12)***	(2.03)**	(4.39)***
Senior high+	1.132	0.307	1.095	1.089	0.486	1.126
	(4.04)***	(0.84)	(4.04)***	(5.23)***	(2.06)**	(5.46)***
Interaction terms between year and household head's education						
Year*primary			-0.649			-0.466
			(1.71)*			(1.78)*
Year*Junior high			-0.683			-0.454
			(1.73)*			(1.71)*
Year*Senior high			-0.709			-0.755
			(1.55)			(2.57)**
Number of consumer items owned by the household (ref.: lowest quartile)						
Second quartile	0.104	0.629	0.071	0.551	0.303	0.528
	(0.53)	(2.89)***	(0.38)	(3.47)***	(2.45)**	(3.33)***
Third quartile	0.517	0.685	0.467	1.210	0.554	1.195
	(2.41)**	(3.15)***	(2.29)**	(7.15)***	(4.60)***	(7.14)***
Highest quartile	0.785	1.702	0.698	1.685	1.005	1.648
	(2.88)***	(5.27)***	(2.67)***	(8.48)***	(7.21)***	(8.51)***
Interaction terms between year and number of consumer items owned						
Year*second			0.620			-0.230
			(2.20)**			(1.14)
Year*third			0.336			-0.611

			(1.14)			(3.00)***
Year*highest			1.208			-0.598
			(3.10)***			(2.56)**
School-age children in the household (ref.: one)						
Two	0.172	-0.271	-0.049	-0.001	-0.180	-0.098
	(1.01)	(1.50)	(0.40)	(0.01)	(1.81)*	(1.17)
Three or more	0.276	-0.216	0.076	-0.405	-0.415	-0.426
	(1.47)	(0.93)	(0.52)	(2.54)**	(3.16)***	(4.00)***
Relationship to household head (ref.: Other)						
Own child	0.095	0.319	0.214	0.093	-0.330	-0.063
	(0.36)	(0.98)	(1.07)	(0.53)	(1.77)*	(0.49)
Province (ref: Jiangsu)						
Shandong	-0.407	-0.293	-0.318	-0.707	-0.201	-0.496
	(1.50)	(0.80)	(1.52)	(2.98)***	(1.09)	(3.12)***
Henan	-0.378	-0.713	-0.484	-0.284	0.048	-0.167
	(1.66)*	(2.10)**	(2.66)***	(1.43)	(0.27)	(1.19)
Hubei	-0.221	-0.558	-0.320	-0.143	0.079	-0.048
	(0.88)	(1.69)*	(1.69)*	(0.72)	(0.48)	(0.35)
Hunan	0.015	-0.310	-0.084	-0.008	0.089	0.038
	(0.06)	(0.87)	(0.42)	(0.04)	(0.48)	(0.27)
Guangxi	-0.362	-0.765	-0.491	-0.161	-0.338	-0.265
	(1.46)	(2.35)**	(2.61)***	(0.75)	(1.94)*	(1.82)*
Guizhou	-0.049	-0.628	-0.212	-0.547	-0.524	-0.527
	(0.21)	(1.79)*	(1.11)	(2.65)***	(2.77)***	(3.56)***
Constant	17.125	9.838	14.357	-20.540	-17.206	-20.386
	(3.44)***	(1.77)*	(3.87)***	(7.06)***	(7.06)***	(10.23)***
Observations	1929	1446	3375	1924	1429	3353
R-square				0.32	0.47	0.41

Source: China Health and Nutrition Survey

Robust z-statistics in parentheses

Appendix Table 7-A1. Percent of GDP Spent on Education and Gross Enrollment Ratios, 10 Largest Countries, 1998-2000

Country	Population (2004) Millions	Percent Spent on Education (1998) GNP/GNI	GDP	Gross Enrollment Ratios (2000) Primary	Secondary	Tertiary
China	1299	2.2	2.2	114	68	13
India	1065	3.2	3.2	99	48	11
United States	293	5.0	5.0	100	94	71
Indonesia	238	1.6^^	1.5^^	110	57	15
Brazil	184	5.1^	4.9^	151	105	16
Pakistan	159	1.9	1.8	73	24	...
Russia	144	3.7	3.5	109	92	64
Bangladesh	141	2.3	2.4	99	46	7
Japan	127	3.4	3.5	101	102	48

Sources: United States Census Bureau (2004) and UNESCO Institute for Statistics (2004).
^1999 data
^^2000 data