

**Human Capital Accumulation in China**

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## ABSTRACT

Human capital is the most critical component in any economic environment. In this paper, we take educational attainment as a proxy for human capital stock and present China's human capital accumulation in recent years. First, we do the time series analysis by applying the *School Enrollment Ratios* method and using the data set from year 1990 to 2001. Then, following the *Average Years of Schooling* approach, and adopting the data from year 1996 to 2000, we proceed with the regional analysis and compare the different situations in Western and Eastern China. We find that, although the accumulation of human capital was quite rapid during recent years, the imbalance development between its western and eastern regions is troublesome. The Chinese government can play a very important role in solving this problem, promoting human capital development and hence stimulating economic growth.

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## ***I. INTRODUCTION***

One of the most significant contributions to economic growth is the amount of human capital accumulation. If a country cannot develop the knowledge and skills of its people and utilize them effectively in the national economy, it will be unable to develop anything else. This paper investigates the recent years' human capital accumulation in China.

The first classical economist who included human capital in the definition of capital is Adam Smith (1976). He included the inhabitants' acquired talents into a nation's capital stock, because human skills can increase wealth for the society and individuals (Laroche, Mérette and Ruggeri, 1997). Generally speaking, human capital is represented by the aggregation of investment that enhances human labor productivity, such as education, training, health, nutrition, and other related factors that increase the productivity of the labor force. In this paper, we would use the output-based approach and adopt education as a proxy for human capital stock.

Following Laroche and Mérette (2000), we take *School Enrollment Ratios* and *Average Years of Schooling* as indicators to measure the human capital in China. We find that although the accumulation of human capital has been quite rapid in recent years, there exists an imbalance between Eastern and Western China; the education attainment level in the West is much lower than the East. Moreover, both in the eastern and western regions,

males have more educational opportunities than females.

This paper is organized as follows: Section II reviews China's education history and the structure of its education system; Section III describes the methodology used to measure China's human capital stock; Section IV presents the time series analysis of year 1990 to 2001; Section V presents the regional comparative analysis of the West and the East; Section VI discusses the government role and policy suggestions; and Section VII provides some concluding remarks.

## ***II. BACKGROUND OF CHINA'S HUMAN CAPITAL ACCUMULATION***

### ***2.1. Historical Development of China's Education***

China is one of the areas where civilization developed earliest. It has a recorded history of nearly 5,000 years. Historically speaking, great value has been placed on education in China, and the Confucian emphasis in education is integral to the Chinese culture. Education in traditional China was dominated by the civil service examinations. The only formal schools above the elementary level were the academies, and these were oriented almost exclusively toward the schedules and content of the exams. The academies were famous in direct relation to their students' skills at writing mock examination essays and to the success they ultimately achieved on the actual examinations (Jin, 2001). In modern

China, education has come a long way since the founding of the People's Republic of China (the "New China") in year 1949. Because of the impact of the Civil War, around 70% of the total population had no formal schooling at the end of the 1940s. In the 1950s, the Chinese government took education as a matter of primary importance, and made enhancing the cultural quality of the people the basis of the construction of the nation. There was a widespread campaign to eradicate illiteracy. The education reforms of 1958 were introduced as part of a comprehensive new strategy of mass mobilization for economic development which the Chinese leaders named the Great Leap Forward Movement. Through this movement a new round of educational changes occurred, and the aim was to end the continuing influence of such old "pre-revolutionary" ideas as "education can only be led by experts" and "the separation of mental and manual labor" (Jin, 2001). During the years 1966-1976, the so-called Cultural Revolution was a disaster for Chinese education development. The teachers were at the bottom of the social scale on the basis of the then current maxim: "The more knowledge you have, the more counterrevolutionary you are". In educational institutions, the Cultural Revolution was implemented to break the power of the educational bureaucracy, the professional academics, and any Party leaders who supported them. Higher education almost ground to a halt during that period. Since the initiation of the reform and opening policies in 1978, marked by the restoration of the higher-education examination system, China's education got on the road to accelerated development and became a matter of great concern to the Chinese government. The guiding principle that "Education should be geared to the needs

of modernization, of the world and of the future” (Message written for Jingshan School by Deng Xiaoping on October 1, 1983) has promoted the speedy development of China’s education. In 1980s, 1990s and the beginning of 2000s (see Table 2-1), China attained considerable achievements attracting worldwide attention in education. The educational population increased from 23014 to 33709 (in 10 thousand), and the proportion of educational population has increased more than four percent.

Table 2-1

Size of Education

Unit: 10 thousand

Year	Schools	Enrolment	Teachers, teaching staff & workers	Educational Population	Proportion Of Educational Population (%)
1985	144	21753	1261	23014	22.0
1990	136	23654	1432	25086	22.2
1996	155	30401	1549	31950	26.2
1997	157	31076	1577	32653	26.7
1998	155	31809	1580	33389	27.0
1999	159	32672	1596	34268	27.5
2000	149	32093	1592	33685	26.8
2001	135	32135	1574	33709	26.6

Note: 1. Data source: *China’s Education Statistic Yearbook*.

2. The educational population is the sum of enrolment and teachers, teaching staff & workers

## 2.2. China’s Education System<sup>1</sup>

China has a vast and varied school system. There are preschools, kindergartens, schools

<sup>1</sup> This section draws heavily from Ministry of Education P.R.C <http://www.moe.edu.cn>

for the deaf and blind, key schools, primary schools, secondary schools (comprising junior and senior middle schools, secondary agricultural and vocational schools, regular secondary schools, secondary teachers' schools, secondary technical schools, and secondary professional schools), and various institutions of higher learning (consisting of regular colleges and universities, professional colleges, and short-term vocational universities).

Because the resources allotted to higher education are scarce and the number of students decreased sharply at the higher levels, China's system represented a pyramid in terms of access to education. Even though there were dramatic improvements in primary education after the founding of New China in year 1949, achievements in secondary and higher education were still not great.

The Education Law of People's Republic China also regulates the regular schooling system as: "The State shall implement a Regular Schooling System including primary education, secondary education (Junior and Senior) and higher education. The State shall institute a scientific education system. The establishment, forms of instruction, length of schooling, target groups served, educational goals, etc. of schools in the schooling system and of other types of educational institutions shall be determined by the State Council or by the administrative department of education empowered by the State Council" (Education Law pp. 8). In China, the primary education provides children with basic reading, writing, and



mathematics skills along with an elementary understanding of such subjects as history, geography, natural science, social science, art, and music. The secondary education follows primary education, and is characterized as being subject-oriented with specialized fields of learning. The programs of secondary education level may be vocational or technical in nature, which make the students achieve a full implementation of basic skills. The higher education requires the successful completion of education at the secondary level as a minimum condition of admission, and this level of education is provided at universities, colleges, and higher-level professional schools.

The Chinese government introduced the Compulsory Nine-year Education policy on July 1, 1986. The Compulsory education was divided into two stages: 6-year primary school education and 3-year junior secondary school education. Once primary education has been made, junior middle school education should follow. This policy required that all children who have reached the age of six should enroll in school and receive compulsory education for the prescribed number of years, regardless of sex, nationality or race.

Table 2-2 shows that the implementation of the policy was satisfactory during the past twelve years. The promotion rate of primary school to junior secondary school has increased from 74.6% to 95.5%; China has achieved great improvement in Compulsory Education.

Table 2-2

Year	Promotion Rate of Primary School Graduates		
	No. of Primary School Graduates (10 thousand)	No. of Junior School Entrants (10 thousand)	Promotion Rate (%)
1990	1863.1	1389.2	74.6
1991	1846.7	1435.1	77.7
1992	1872.4	1491.7	79.7
1993	1841.5	1505.6	81.8
1994	1899.6	1644.9	86.6
1995	1961.5	1781.1	90.8
1996	1934.1	1791.4	92.6
1997	1960.1	1836.5	93.7
1998	2117.4	1996.3	94.3
1999	2313.7	2183.4	94.4
2000	2419.2	2295.6	94.9
2001	2396.9	2287.9	95.5

Note: The data come from *China's Education Statistic Yearbook*.

Based on the background of China's education introduced above, we now move to the methodology section.

### **III. METHODOLOGY**

In the economic literature, there are three main approaches used to measure human capital accumulation: cost-based approach, output-based approach, and income-based approach. The cost-based approach estimates the human capital stock by calculating the direct input on educational and other human capital related sectors, which is useful for cost-benefit analyses (Kendrick, 1976). The output-based approach measures the human capital by the

output of the educational system, which includes school enrolment rates, adult literacy, and average years of schooling. The income-based approach considers a worker's remuneration in the labor market as return for his investment in education.

In this paper, as we intend to measure human capital by the output-based approach, we use *school enrolment ratios* and *average years of schooling* as indicators.

### ***3.1. School Enrollment Ratios***

Numerous earlier empirical studies have used school enrollment ratios to capture educational attainment. Barro and Lee (1993) noted that "Enrollment ratios are available for three levels of schooling: primary, secondary, and higher. Gross enrolment ratios relate the total number of students at a given level to the population of the age group that national regulation or custom dictates would be enrolled at that level. Net enrollment ratios modify the numerator of the ratio to count only the students enrolled within the designated age group". We would mainly use gross enrollment ratios for the case of China and apply net enrollment ratio only for primary education level given the availability of the data. According to the definitions, we can get following specific formulas of enrollment ratios for China case and apply them to do time series analysis in Section IV:

$$\text{Gross enrollment ratio of primary level} = \frac{\text{Total enrollment in primary school}}{\text{Total population aged 6–11 years}} \quad (3.1.1)$$

$$\text{Gross enrollment ratio of junior level} = \frac{\text{Total enrollment in junior school}}{\text{Total population aged 12–14 years}} \quad (3.1.2)$$

$$\text{Gross enrollment ratio of senior level} = \frac{\text{Total enrollment in senior school}}{\text{Total population aged 15–17 years}} \quad (3.1.3)$$

$$\text{Gross enrollment ratio of higher level} = \frac{\text{Total enrollment in higher school}}{\text{Total population aged 18–22 years}} \quad (3.1.4)$$

$$\text{Net enrollment ratio of primary level} = \frac{\text{Total enrollment aged 6–11 in primary school}}{\text{Total population aged 6–11 years}} \quad (3.1.5)$$

Obviously, the net enrollment ratio is between zero and one, while the gross enrollment ratio can exceed one.

Although school enrollment ratios are usually taken as a proxy for human capital stock, they have several shortcomings. First, school enrollment ratios are measures of the flow of population's education or access to education, not the stock of human capital. The accumulation of these flows generates the future stocks of human capital and the lag between flows and stocks can be long. Therefore, these measures do not adequately measure the aggregate stock of human capital. Second, net enrollment ratios are more appropriate for estimating accumulation of human capital than gross enrollment ratios, because the gross enrollment ratios usually introduce errors related to dropouts and repetition of grades. However, gross ratios are more often used in developing countries

because of the limitation of data availability for net ratios. Third, the data of total enrollment reported is the registered number of students at the beginning of each school year. The actual number of children that attend school during the year can be substantially lower (Barro and Lee 1993). In China, because of the compulsory nine-year education, the government punishes parents that do not register their children in primary schools. This leads to higher reported school attendance than actual amount, i.e. the reported enrollment rates have an upward bias.

### ***3.2. Average Years of Schooling***

Psacharopoulos and Arriagada (1986) suggested that the proper indicator of human development level is the stock of education attainment defined as average years of schooling. Psacharopoulos and Arriagada (1986) made the effort of collecting the census information on each country's schooling distribution over the entire population, and calculated education attainment. Barro and Lee (1993, 1996) gathered more data and formalized the use of education attainment for growth regressions. Using the perpetual inventory method, Barro and Lee (2000) construct a measure of human capital stock, with a data set that comprises at least one observation for 142 economies, of which 107 have complete information at 5-year intervals from 1960 to 2000. Percentage of population that has successfully completed a given level of schooling is a straightforward way to show the population's attainment of knowledge associated with a particular level of education. Nehru, Swanson, and Dubey (1995) also create a cross-country database for education

attainment, through estimating the schooling distributions over time for various countries.

Average years of schooling can be defined as “the mean years of formal education embodied in the labor force” (Laroche and Mérette 2000, pp. 3). The general algebraic formula is written as:

$$\text{Average years of schooling} = \sum_i Y_i \cdot P_i, \quad (3.2.1)$$

where  $i$  is the education level,  $Y_i$  is the number of years of schooling represented by level  $i$ , and  $P_i$  is the fraction of the population for which the  $i$ th level is the highest value attained.

The categories of education levels and each cycle of schooling duration have significant variation across countries. In Psacharopoulos and Ariagada (1986a, b), the levels of education cover five categories above no school: incomplete primary, complete primary, incomplete secondary, complete secondary and higher. In China, we estimate the number of years of schooling for four categories of education: primary, junior secondary, senior secondary, and higher education. The length of schooling cycles for these categories, which vary across regions and over time, are assumed to be 6, 9, 12, and 15.5 years, respectively. Among them, higher education includes university and college education; it usually takes a total of 16 years to complete a 4-year university and 15 years to complete a 3-year college. Here, we take the average, which is 15.5 years as the schooling years for

people who reported as completed higher education in China.

Based on the perpetual inventory method, we construct current flows of adult population that are added to the stocks of the previous year. According to China's education-level categories, the formulas of various levels of schooling for the total population are as follows:

$$H_{1,t} = (1 - \delta_t)H_{1,t-1} + (PRI_t - JUNIOR_{t+3}) \quad (3.2.2)$$

$$H_{2,t} = (1 - \delta_t)H_{2,t-1} + (JUNIOR_t - SENIOR_{t+3}) \quad (3.2.3)$$

$$H_{3,t} = (1 - \delta_t)H_{3,t-1} + (SENIOR_t - HIGH_{t+3,5}) \quad (3.2.4)$$

$$H_{4,t} = (1 - \delta_t)H_{4,t-1} + HIGH_t \quad (3.2.5)$$

where  $H_{i,t}$  is the number of graduates with  $i$  the highest level of schooling attained in year  $t$ .  $i=1$  for primary level, 2 for junior secondary level, 3 for senior secondary level and 4 for higher education level.  $\delta_t$  is the mortality rate of the population in year  $t$ . We assume that if a person did not finish the enrolled level  $i$  is considered to have completed the lower schooling level  $i-1$ .

The application of these four equations (3.2.2)- (3.2.5) generates our data set (see Appendix 5-1 to 5-5) on educational attainment from year 1996-2000 at the four levels of schooling in Section V. Since the lengths of different schooling cycles are known, we can

obtain the net number of graduates at each schooling level.

Using the general formula of average years of schooling (3.2.1), and the formulas for various levels of schooling (3.2.2)- (3.2.5), the human capital stock in China,  $H_t$ , in year  $t$  is written as:

$$H_t = (6H_{1t} + 9H_{2t} + 12H_{3t} + 15.5H_{4t}) / Population \quad (3.2.6)$$

Although the *average years of schooling* method is more advanced than the *enrollment ratios* approach, it still has several drawbacks. First, this measurement of human capital stock emphasizes quantity over quality. It also does not consider differences in quality of schooling across regions and over time. Second, we may underestimate human capital stock if we only count graduates of each level of schooling, without covering the partial schooling at the level. Third, this method does not take account of the experiences and skills gained by workers after their formal education, which might also lead to underestimation of human capital stock.

Given the methodology above, we go to data analyses in the next two sections.

#### ***IV. DATA AND TIME SERIES ANALYSIS***

In contrast to the existing literature, this paper uses the most newly available data



(1990-2001) to analyze the recent years' human capital accumulation in China. Based on the methodology we introduced in section 3.1, we use the School Enrollment Ratios to do time series analysis.

Enrollment ratios are a useful measure of participation in education. Our serial data come mainly from *China's Education Statistic Yearbook*. Table 4-1 shows the gross enrollment ratios for primary, junior secondary, senior secondary and higher education levels separately. Table 4-2 shows the net enrollment ratio for primary schooling only.

Table 4-1

Gross Enrollment Ratio of Regular Schools by Level

Unit: %

Year	Primary level The age of 6-11	Junior secondary The age of 12-14	Senior secondary The age of 15-17	Higher education (IHEs) The age of 18-22
1990	111.0	66.7	21.9	3.4
1991	109.5	69.7	23.9	3.5
1992	109.4	71.8	22.6	3.9
1993	107.3	73.1	24.1	5.0
1994	108.7	73.8	26.2	6.0
1995	106.6	78.4	28.8	7.2
1996	105.7	82.4	31.4	8.3
1997	104.9	87.1	33.8	9.1
1998	104.3	87.3	34.4	9.8
1999	104.3	88.6	35.8	10.5
2000	104.6	88.6	38.2	12.5
2001	104.5	88.7	38.6	13.3

Note: 1. Junior secondary level includes general junior and vocational junior schools.

2. Senior secondary level includes general senior, vocational senior, Sec. technical schools, and Reg. Specified Sec. Schools.

3. Higher education (IHEs) includes general graduate education, undergraduate education, and higher education for adults .

Table 4-2

Net Enrolment Ratios in Primary Schools

Unit: %

Year	The age 7-11	According to Provincial primary schooling years & entrance age			
		Total	Male	Female	Gender Gap
1990	97.80	96.30	-	-	-
1991	97.90	96.80	-	-	-
1992	98.00	97.20	98.20	96.10	2.10
1993	98.30	97.70	98.50	96.80	1.70
1994	98.70	98.40	99.00	97.70	1.30
1995	98.70	98.50	98.90	98.20	0.70
1996	99.10	98.80	99.00	98.60	0.40
1997	99.20	98.90	99.00	98.80	0.20
1998	99.30	98.90	99.00	98.90	0.10
1999	99.50	99.10	99.10	99.00	0.10
2000	99.50	99.10	99.14	99.07	0.07
2001	99.09	99.05	99.08	99.01	0.07

Note: 1. Net Enrolment Ratio is the rate of the total number of student enrolled within the designated age group at a given level to the population of the age group that national regulation or custom dictates would be enrolled at that level.

2. Net Enrolment Rate of school-age children before 1992 was calculated during the age of 7-11. Since year 1992, the rate varies according to provincial entrance age and primary schooling years.

In these tables, gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Net enrollment ratio is the ratio of the number of children of official school age (as defined by the national education system) who are enrolled in school to the population of the corresponding official school age. The gross enrollment ratio provides an indication of the capacity of each level of the education system, but a high ratio does not necessarily indicate a successful education system as the ratio includes overage and underage enrollments. Net enrollment ratios provide a better indicator of a school system's efficiency, but neither indicator measures the quality of the education provided.

As we can see in Table 4-1, the gross enrollment ratios of primary level are over 100% in all years from 1990 to 2001, due to the inclusion of over-aged and under-aged students. When net (aged-based) enrollment data are not available, gross enrollment can be used as a substitute indicator. This data can also be compared with the net enrollment figures to indicate the extent of over- and under- aged enrollment.

Figure 4-1

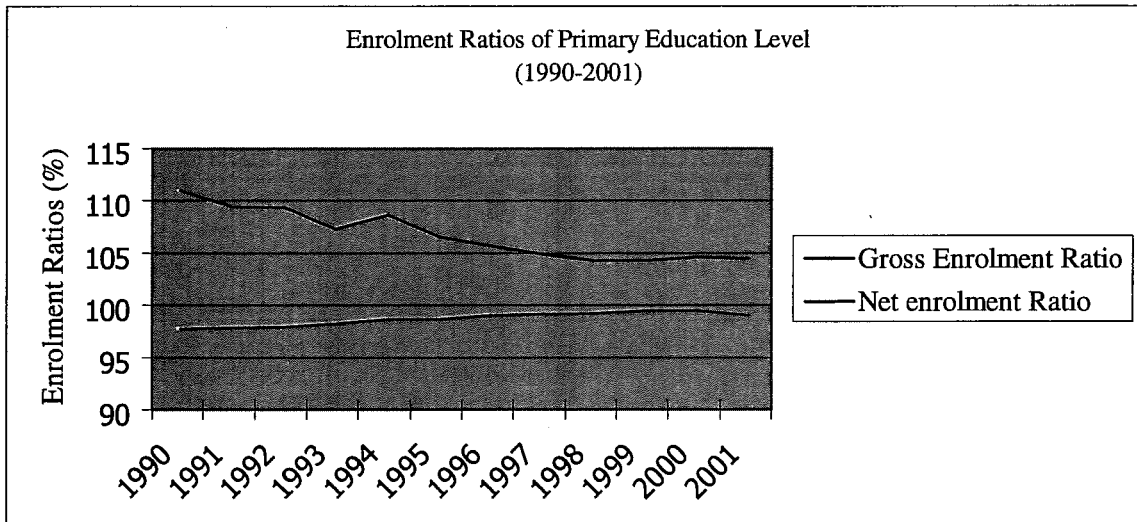
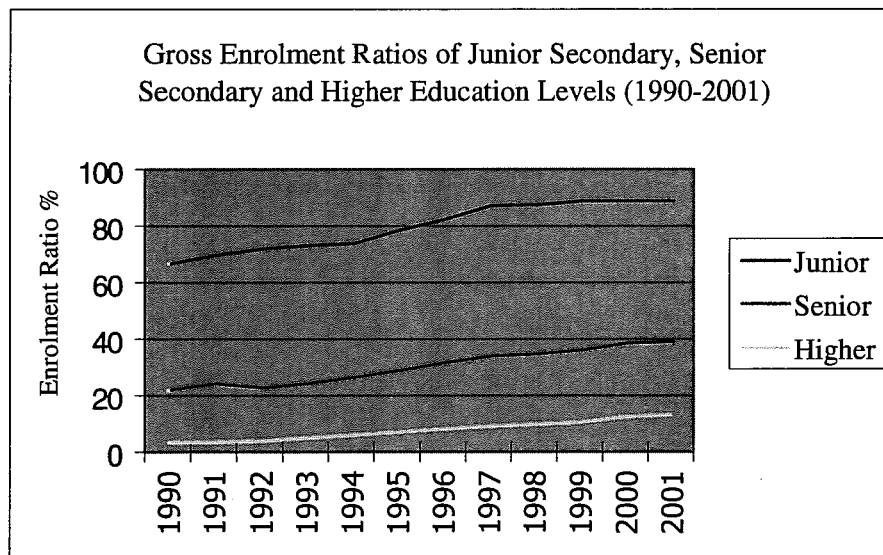


Figure 4-2



In Figure 4-1, the gross enrollment line lies above both the 100% and the net enrollment lines. In principle, gross enrollment ratios of 100% or more indicate that a country is able to accommodate all of its school-age population.<sup>2</sup> Therefore, China's primary education was able to accommodate all population aged 6-11 in the past ten years. The gross enrollment ratio line in Figure 4-1 appears downward trend, which means the number of the pupils who are below or above the official primary school age is decreasing. The net enrollment ratio line is steadily upward, which excludes the over and under aged pupils and captures more accurately the system's coverage and internal efficiency. The difference between gross and net enrollment ratios shows the incidence of overage and underage enrollments. We can find in Fig. 4-1, the gap between gross and net ratios was very big in the early 1990's, and then it contracted year by year, in the beginning of 2000's it was much smaller than 10 years before. This shows that the extent of over- and under- aged enrollment in primary schools was much lower and hence using gross enrollment ratios as a measurement was getting more accurate than before. While we still cannot ignore this over- and under- aged problem, because even in today's China, overage or underage enrollments frequently occur, particularly when parents prefer, for cultural or economic reasons, to have children starting school at other than the official age. Children's age at enrollment may be inaccurately estimated or misstated, especially in communities where registration of births is not strictly enforced. Parents who want to enroll their underage children in primary school may do so by overstating the age of the children.

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<sup>2</sup> According to World Resources Institute, 2003. <http://earthtrends.wri.org>

Figure 4-2 shows the comparison in gross enrollment ratios of Junior Secondary, Senior Secondary and Higher Education levels. All of the three lines appear upward trends, and below the 100 percent level. The three lines approximately parallel to each other, Junior Enrollment Ratios are much higher than the other two and Higher Education Enrollment Ratios are the lowest among them. Therefore, the higher the level of education, the lower the enrollment ratios. In using these gross enrollment data, it is also important to consider repetition rate, which is quite high in some developing countries, including China. It leads to a substantial number of overage students enrolled in each level and raising the gross enrollment ratio. A common error that may also distort enrollment ratios is the lack of distinction between new entrants and repeaters, which, other things equal, leads to underreporting of repeaters and overestimation of dropouts.

Another issue we need to mention is the different net enrollment ratios of males and females in primary schools (see Table 4-2). From the available data (1992-2001) we can see that all the enrollment ratios for males are higher than for females, which indicates that girls have less opportunity than boys do to participate in primary schools. The imbalance of educational opportunities for males and females has existed in China for a long history. The major element underlying the obstacles, such as institutional, family, and personal, is the persistence of traditional social attitudes and patterns that assign an inferior role to females. In explaining gender discrepancies of education, Chinese spokespersons have stressed the “remnant of feudal ideas” argument: that 2,000 years of traditional attitudes

cannot be wiped out in a few decades (Hooper, 1991).

However, in our table, we also find that the gender gap was getting smaller and smaller during recent years. The gender imbalance has been decreased significantly and approached close to equal participation, which shows China has made a great improvement in eliminating inequality of primary education for males and females.

All in all, from the human capital stock series from 1990 to 2001, and the time series analysis in this part, one can see that the accumulation of human capital has been quite rapid over the years. Except the gross enrollment of primary school, all the other enrollment ratios have increased quickly: the junior ratios rise from 66.7% to 88.7%, the senior ratios increase about 20 percent from 21.9% to 38.6%, and the IHEs also have experienced around 10 percent increase in gross enrollment ratios.

## ***V. DATA AND REGIONAL ANALYSIS OF WESTERN & EASTERN CHINA***

In this part, we will adopt *Average Years of Schooling* approach, the most common measure of human capital accumulation, to proceed with our regional analysis. The data on annual number of graduates at different schooling levels come from *National Bureau Statistics of China 1996-2000* (see Appendix 5-1 to 5-5). Applying formula 3.2.6, and using the data combined with relatively stable lengths of schooling cycles, we obtain the human capital

accumulation in average years of schooling at different regions of China from year 1996 to 2000.

From the whole national point of view, as shown in Table 5-1, the accumulation of human capital has increased during the five years. This result is consistent with what we report in Section IV.

Table 5-1

National human capital stock (in average years of schooling)  
(1996- 2000)

Unit: Year

Year	National Total	Male Sub-total	Female Sub-total
1996	6.7829	7.4400	6.1123
1997	6.9955	7.6171	6.3576
1998	7.0738	7.6791	6.4541
1999	7.1639	7.7552	6.5563
2000	7.1949	7.7180	6.6437

In the rest of this section, we focus on the human capital accumulation in the economic underdevelopment region (Western China), and the economic development region (Eastern China).

### ***5.1. Human Capital Accumulation in Western China***

The western part of China is home to one-third of the country's administrative provinces and autonomous regions. It covers an area of 5.4 million square meters and has a combined population of over 280 million, making up 56 percent and 23 percent of the national total



respectively.<sup>3</sup> The region used to be described as "barren, remote, poor, large, valuable and beautiful". It lags behind other parts of the country in terms of development and economy. The GNP per capita here accounts for just half of the average national level. At the end of 1990's the large-scale development of western China was called a "century project", in which improvement of human capital, full support for developing education have been put on a very important position.

Tables 5-2 to 5-4 present the situation of human capital accumulation (in average years of schooling) in western region, including eight provinces: Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai and Ningxia.

Table 5-2

Average Years of Schooling in Western China  
(1996-2000)

Unit: Year

Region \ Year	1996	1997	1998	1999	2000
Sichuan	6.4205	6.5595	6.8159	6.6459	6.7314
Guizhou	5.6772	5.8393	5.7177	6.0644	5.8069
Yunnan	5.6102	5.7609	5.7829	5.8134	5.9678
Tibet	2.9153	3.4981	3.3443	2.9474	3.1500
Shaanxi	6.7954	7.0510	7.0356	7.1276	7.3035
Gansu	5.7195	6.1190	6.0560	6.3385	6.1732
Qinghai	4.8876	4.6825	4.8907	5.9480	5.6814
Ningxia	6.4881	6.4311	6.5232	6.6457	6.5862
Region Total	44.5138	45.9414	46.1663	47.5309	47.4004
Region Average	5.5642	5.7426	5.7707	5.9413	5.9250

<sup>3</sup> Source comes from <http://www.zgxbjw.com>

Table 5-3

Males' average years of schooling in Western China  
(1996-2000)

Unit: Year

Region \ Year	1996	1997	1998	1999	2000
Sichuan	6.9987	7.1420	7.3248	7.1383	7.2040
Guizhou	6.7161	6.6766	6.6216	6.8935	6.6201
Yunnan	6.3728	6.4112	6.4040	6.4155	6.5654
Tibet	3.2443	4.0420	3.8803	3.3761	3.8108
Shaanxi	7.4442	7.6293	7.5716	7.7064	7.8146
Gansu	6.6154	6.9045	6.8898	7.1279	6.9286
Qinghai	5.7340	5.5053	5.7188	6.7550	6.4599
Ningxia	7.2394	7.2001	7.2728	7.3599	7.2436
Region Total	50.3649	51.5110	51.6837	52.7726	52.6470
Region Average	6.2956	6.4389	6.4605	6.5966	6.5809

Table 5-4

Females' average years of schooling in Western China  
(1996-2000)

Unit: Year

Region \ Year	1996	1997	1998	1999	2000
Sichuan	5.8320	5.9658	6.3002	6.1360	6.2281
Guizhou	4.5848	4.9223	4.7145	5.1560	4.9154
Yunnan	4.8144	5.1424	5.1543	5.2053	5.3105
Tibet	2.5954	2.9740	2.8134	2.5269	2.4517
Shaanxi	6.1042	6.4495	6.4790	6.5191	6.7542
Gansu	4.8016	5.3104	5.1925	5.5290	5.3662
Qinghai	4.0117	3.8395	4.0638	5.1098	4.8448
Ningxia	5.7297	5.6427	5.7489	5.9101	5.8880
Region Total	38.4738	40.2466	40.4666	42.0922	41.7589
Region Average	4.8092	5.0308	5.0583	5.2615	5.2198

Several features stand out from the tables. First, on averages the region's education attainments are low during the years 1996 to 2000. From Table 5-2 one can see that the numbers of effective years of schooling per capita are around five, which are much lower than the whole national level listed in Table 5-1 for the corresponding period. Similarly, in Table 5-3 and 5-4, both males' and females' average schooling years are also less than the national levels respectively.

Second, among the eight western provinces, Shaanxi's education attainment was the highest. As we observe in the tables, its average years of schooling even exceeded the national level in some years. Shaanxi is the gateway to northwest China, which links the west with the east and connects the north with the south; in some sense, it is the 'leader' of the western part of the country. Therefore, this province attracts more investment and support for human capital stock than other western provinces. On the contrary, Tibet's human capital accumulation is the lowest. More than half of the population is illiterate because of its terrible natural environment, poor living conditions and limited education institutions.

Third, although the education attainment levels of western region are low, trends seem to be upwards. Each province has made some improvement during the five years. In Qinghai province, the average years of schooling increased from 4.8 to 5.6 years; the accumulation of human capital was quite rapid over the years.

Finally, from the tables, we also find that for all the western provinces, males had more education attainments than females. This result is consistent with what we have mentioned in the latter part of Section IV.

### 5.2. *Human Capital Accumulation in Eastern China*

Most of the eastern provinces are coastal regions, with developed economies, high living standards and advanced education conditions. Using the same calculation method as in section 5.1, we get the following results for the eastern region, including provinces and Municipalities of Beijing, Tianjin, Shanghai, Jiangsu, Zhejiang, Fu jian, Shandong and Guangdong.

Table 5-5

Average Years of Schooling in Eastern China  
(1996-2000)

Unit: Year

Region \ Year	1996	1997	1998	1999	2000
Beijing	9.5032	9.4341	9.6704	9.8859	9.0268
Tianjin	7.9917	8.3392	8.0947	8.6716	7.9221
Shanghai	8.9552	8.8406	8.9240	9.2114	8.3996
Jiangsu	7.0014	6.9002	7.0232	7.2819	7.4646
Zhejiang	6.6993	6.8023	7.0114	7.1320	7.1380
Fu jian	6.2787	6.7210	6.6792	6.7627	7.0293
Shandong	6.4149	6.4956	6.6118	6.8163	7.1113
Guangdong	6.7836	7.4860	7.5316	7.5938	7.6198
Region Total	59.6280	61.0190	61.5463	63.3556	61.7115
Region Average	7.4535	7.6273	7.6932	7.9194	7.7139

Table 5-6

Males' average years of schooling in Eastern China  
(1996-2000)

Unit: Year

Region \ Year	1996	1997	1998	1999	2000
Beijing	9.9123	9.8694	10.0535	10.2404	9.4369
Tianjin	8.4680	8.8126	8.5735	9.0914	8.3526
Shanghai	9.6178	9.5144	9.5851	9.8740	9.0168
Jiangsu	7.8759	7.7245	7.8726	8.1322	8.1147
Zhejiang	7.3138	7.4249	7.5978	7.7654	7.6828
Fu jian	7.2165	7.5611	7.5094	7.5984	7.6609
Shandong	7.2385	7.3230	7.4862	7.6573	7.7617
Guangdong	7.4878	8.1387	8.1419	8.1602	8.1260
Region Total	65.1306	66.3686	66.8200	68.5193	66.1524
Region Average	8.1413	8.2960	8.3525	8.5649	8.2690

Table 5-7

Females' average years of schooling in Eastern China  
(1996-2000)

Unit: Year

Region \ Year	1996	1997	1998	1999	2000
Beijing	9.1096	8.9995	9.2721	9.5267	8.5770
Tianjin	7.5234	7.8780	7.6183	8.2640	7.4709
Shanghai	8.3135	8.1871	8.2761	8.5649	7.7484
Jiangsu	6.1575	6.0935	6.2013	6.4429	6.8046
Zhejiang	6.0774	6.1708	6.4004	6.4842	6.5655
Fu jian	5.3357	5.8758	5.8543	5.9175	6.3640
Shandong	5.5919	5.6655	5.7412	5.9763	6.4490
Guangdong	6.0898	6.8252	6.9239	7.0285	7.1040
Region Total	54.1988	55.6954	56.2876	58.2050	57.0834
Region Average	6.7748	6.9619	7.0359	7.2756	7.1354

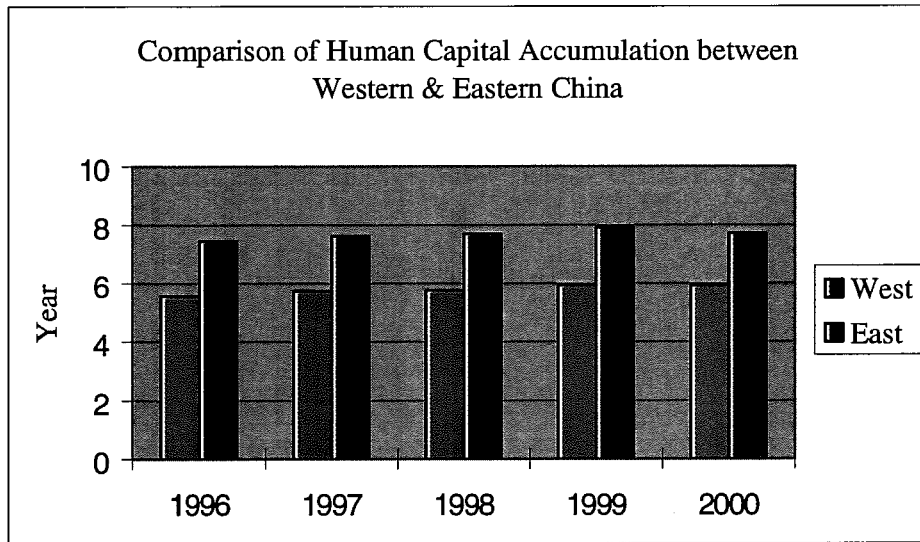
In Eastern China, the numbers of regional average years of schooling are about 7, which are higher than those of the national's by almost one year. In some municipalities, the numbers are even as high as 8 or 9, such as Beijing and Shanghai. This is quite reasonable because Beijing is the capital city and cultural center of China and Shanghai is the most modern city of China. In some provinces, the increases of average years of schooling were very obvious during the five years, such as Guangdong and Fu jian. In addition, there also exist gender imbalances of education attainments in eastern region (Table 5-6 & 5-7): the gap between males and females are on average above one full year of schooling.

### ***5.3. Comparative Analysis of the West and the East***

Based on 5.1 and 5.2, we now investigate further the differences about the situations of human capital accumulation between the West and the East regions.

First, on average, eastern region has higher levels of human capital stock (in average years of schooling) than western region in each of the five years (see Figure 5-1). The average gaps between these two regions are around 2 years.

Figure 5-1



For some particular provinces in the two regions, the gaps are even much higher. For example, Beijing exceeded Tibet by more than 7 years in average years of schooling. However, human capital levels in western provinces are not always lower than in eastern provinces. For instance, in Shaanxi and Ningxia, the levels are a little higher than some eastern provinces, such as Fujian and Shandong.

Furthermore, both the East and the West education attainments have increased steadily over the years. Eastern region went up 0.26 year from 7.4535 to 7.7139, while western region made 0.36 year increase, a little more than the East.

Second, using the data in Appendix 5-1 to 5-5, we calculate the weights of the different education levels covered in the East and the West respectively. Figures 5-2 and 5-3 illustrate this comparison.

Figure 5-2

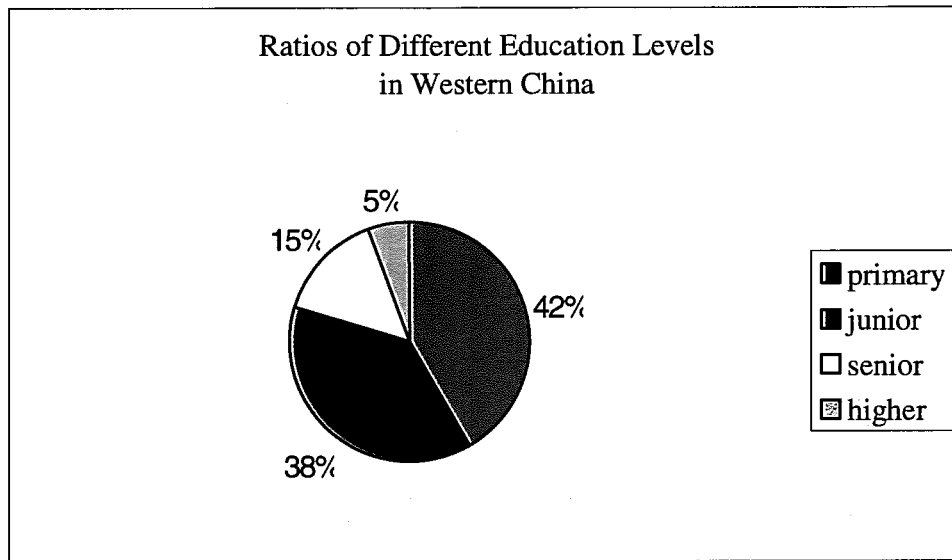
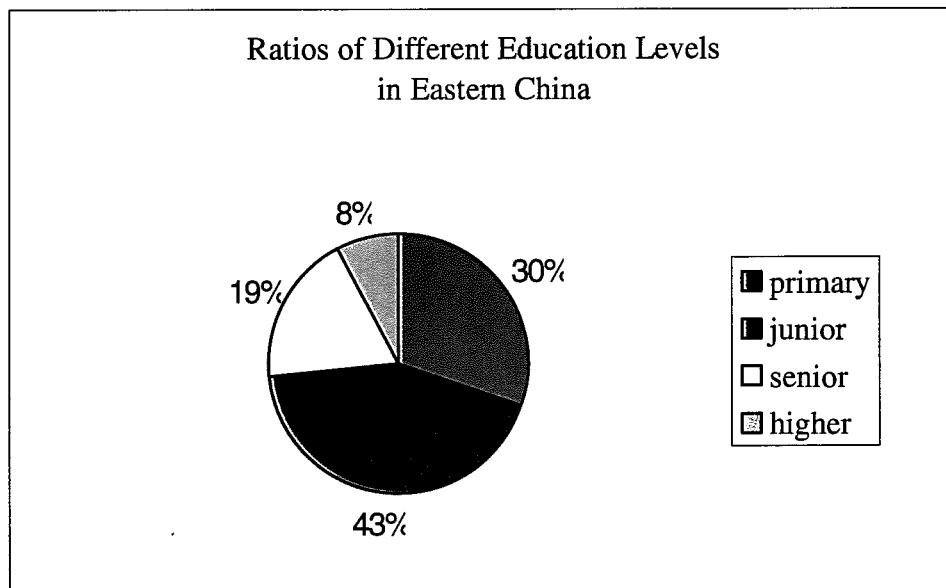


Figure 5-3



- Note: 1. We got the weighted numbers of each education level by multiplying the total educational population at that level and the correspondent schooling cycle.
2. For Western China, the total weighted numbers (year 1996-2000) for primary, junior, senior and higher education levels are 2904408, 2635137, 1029156 and 378804.5 respectively.



3. For Western China, the total weighted numbers (year 1996-2000) for primary, junior, senior and higher education levels are 3580656, 5049945, 2231568 and 918716 respectively.

In both figures, primary and junior secondary education levels cover together more than 70% of the students. On one hand, the high ratio of primary and junior education attainment reflects the high primary school enrollment and the success of the nine-year compulsory education. On the other hand, the higher primary over the junior ratio in Western China means a low-level of education for the population of that region. In Eastern China, instead, junior ratio exceeds primary ratio, indicating more eastern primary graduates than western entered junior schools to reach medium education level. Likewise, on both senior secondary and higher education levels, the ratios of the East are higher than the West. Hence, the eastern region is characterized by a greater proportion of its population with a high-education degree. This explains why Eastern China has a greater stock of human capital than Western China.

Third, even though both the East and West have gender imbalance in education attainments, the gender gaps are different. From Figure 5-4 and Figure 5-5, we can see that the gender bias is against girls in both cases. However, the gap is 8% in Eastern China and is 12% in the Western China. The main reason for the larger gender gap in Western China is because most of the provinces in the West are rural regions, where the people still keep the traditional Confucian ethic "male honorable, female inferior". In western region, women

play a subordinate role and the attitude “an educated woman is bound to cause trouble” is widespread, despite official efforts to eradicate them. On the contrary, most of the eastern provinces are urban regions, the people there are more modern and open-minded.

Figure 5-4

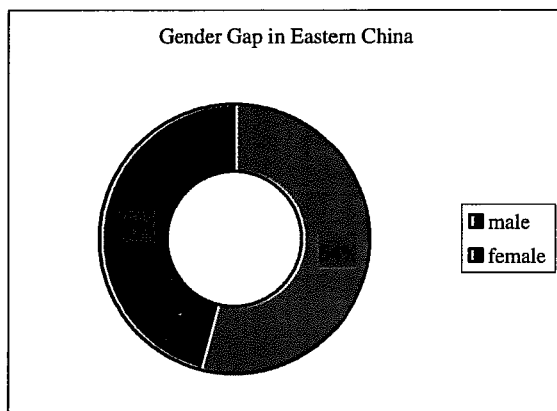
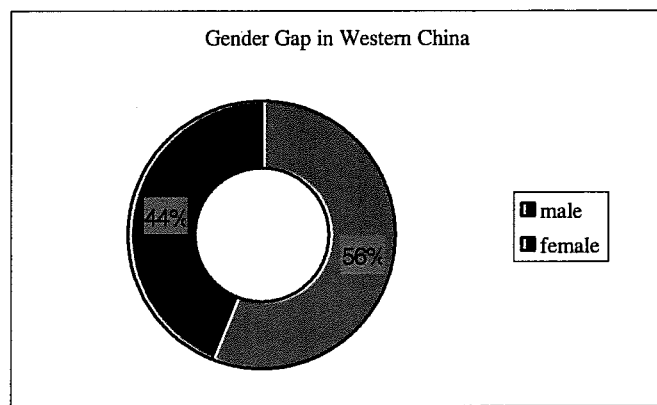


Figure 5-5



## VI. THE GOVERNMENT ROLE AND POLICY SUGGESTIONS

The analyses in Section IV and V reveal that although the accumulation of human capital in China was quite rapid during recent years, the imbalance between Eastern and Western China is troublesome. There are very few people who would deny that the government could play an important role in promoting human capital development and stimulating economic growth. “As China moves to a knowledge-based economy, its competitive edge will be determined by its people’s ability to create, acquire, share, and use knowledge

effectively. The government must continue its efforts to transform its education system into one that is content-rich, comprehensive, and flexible” (Dahlman & Aubert 2001, pp. 69).

First, great investment in education is needed, especially in China’s poorest regions.<sup>4</sup> From 1997 to 2002, China's investment in education maintained a constant and rapid growth with an average annual growth rate of 16.7 percent. In 2002, the allocation on education in the financial budgets of the governments at various levels totaled 311.4 billion yuan and the proportion of financial education funds to China's gross domestic product (GDP) reached 3.41 percent. During 1998 to 2000, the central government had allocated 14.82 billion yuan state treasury bonds to strengthen the educational infrastructure construction and the expansion of higher education enrollment in China's western regions.

Since the year 2001, the Ministry of Education and the Ministry of Finance together with the local governments have carried out some projects to improve the education environment and provide the students of western poverty-stricken regions with living subsidies; such as the "Renovation Project of Rural Middle and Primary School Buildings", the "Project of Compulsory Education in Poverty-stricken Areas",<sup>5</sup> and the "National Assistantship for Compulsory Education of Poor Students".<sup>6</sup>

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<sup>4</sup> In this sub-part, the data is mainly from <http://www.peopledaily.com.cn/>

<sup>5</sup> The central and local governments have allocated almost 20 billion yuan for this project.

<sup>6</sup> Since the year 2001, the central financial department has allocated 100 million yuan every year to establish the special fund for this project. This special fund aims to cut or cancel the incidental expenses of middle and primary school students in the old revolutionary base areas.

Despite this, China's public investment in education is still one of the lowest in the world, and was blamed by the Human Rights Committee of the United Nations on September 20, 2003. The spokesman Katarina Tomasevski pointed out that the proportion of China's education funds to its GDP was only one third of what UN had suggested. Therefore, the Chinese government is still required to increase more of its investment in education. A number of other fund-raising options are advisable, including the issuing of education treasury bonds or education lottery tickets.

Second, traditionally speaking, the Chinese government emphasizes universal access, and has given a high priority, 60% of education spending, to primary and junior secondary education segment (Dahlman & Aubert, 2001). It would be now the time for China to expand compulsory education from 9 years to 12 years. This would equip people for the more demanding intellectual requirements of knowledge economy and enable China to popularize high school education nationwide. Besides raising the whole country's cultural level, the expansion of compulsory education would also reduce labor market tensions by keeping many of the country's youth in schools for three additional years. From year 1994 to 1998, China's annual workforce increased from 5 million to around 8 million people, more than 60 percent of the new workers are the youth who are 18 years old or younger.<sup>7</sup>

One of the main reasons behind this situation, we believe, is that a large number of graduates from middle schools do not have an opportunity to receive further education and

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<sup>7</sup> The proportion is much higher than that of some advanced countries and areas in East Asia, such as Japan, the number is less than 10 percent.

have to become job seekers. Therefore, such an extension of compulsory education years will play an effective role in diminishing the strong employment pressure in the labor market.

When it comes to the implementation procedure of the twelve-year compulsory education program, we may suggest it be adopted first in developed urban regions and some advanced rural areas, and then gradually expanded to the other parts of the country. Moreover, the government should provide more preferential loans to families to help pay for children's tuition fees, and more special fiscal supports to its backward western regions to launch the twelve-year compulsory schooling plan.

Third, since maintaining strong principles of equality is important for social justice and for the efficiency of the economy, the Chinese government also plays a role of fighting gender inequality in education attainment. Although the gender inequality has decreased since the establishment of the PRC in 1949, males still have more priority in education than females in nowadays China. The Education Law of People's Republic of China requires all citizens have equal educational opportunities, "Citizens of the People's Republic of China shall have the right and obligation to receive education" (Article 9);<sup>8</sup> "Educatees shall enjoy equal rights under the law. Schools and administrative departments concerned shall, in accordance with the relevant regulations of the State, ensure the equal rights of women

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<sup>8</sup> Education Law of The People's Republic of China, pp. 5

with men in such matters as school entry, grade promotion, employment, conferment of academic degrees and study abroad” (Article 36).<sup>9</sup> In recent years, several projects have been carried out focusing on educational inputs for poor girls. Some local governments, such as Qinghai and Sichuan, provide tuition fee remission and free textbooks for those girls from low-income families. Moreover, in order to motivate girls to remain in schools, many prevocational skills training programs are provided in the lower secondary curricula, which make schooling more relevant to employment and therefore more attractive to the poor girls. In addition, the problem of household chores that keep girls away from school would be solved by allowing girls more flexible time schedules for attending classes, by providing peer assistance with their housework and help them understand the class work.

Finally, in order to eradicate the human capital imbalance between Eastern and Western China, the Chinese government should pay more attention to promoting the development in western region. The Chinese leader Jiang, Zemin put forward the guidelines for accelerating the development of the west on June 17, 1999, stressing that a coordinated development between the population, resources, environment, economy and society should be achieved by steps through inputs of domestic and overseas capital as well as technical personnel. On March 5, 2000, Premier Zhu, Rongji pointed out in his government work report that to implement the strategy of developing the west is of great significance to expanding domestic demand, promoting sustained growth of the national economy and

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<sup>9</sup> Education Law of The People’s Republic of China, pp. 16

coordinated economic development between various regions, and finally to the achievement of a common prosperity.

In year 2000, the Chinese government called on schools in the eastern regions to help some poor western schools in a bid to improve education in the underdeveloped areas. Nine eastern provinces and municipalities, such as Beijing and Guangdong, have signed agreements to help a number of western schools. According to the Ministry of Education, 135 million yuan of funds have been offered by the eastern regions in aid to schools in the poor western regions. With the help of eastern provinces, more schools are being built in western provinces and the conditions of the western schools have been improved a lot as well; many of them have made use of the financial and material aid to purchase new laboratory facilities and books for their libraries.

In the meanwhile, the country should open Western China wider to the outside world. While continuing to promote the opening up of the coastal regions, the Chinese government has begun to implement the strategy for the wide-ranging development of the Western China. In the past 24 years, according to the “two situations”<sup>10</sup> raised by Deng, Xiaoping in the 1980s, the eastern coastal regions have made some great achievements and the development has become saturated; they are now looking for some new markets.

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<sup>10</sup> The “two situations” are the strategic concept for China’s modernization drive. One situation is that the coastal areas will speed up their opening to the outside world, and the other is that China should concentrate its strength to speed up the development of its central and western regions.

However, the Policies of Reform and the “Open Door” strategy<sup>11</sup> have no obvious effect in Western China, so the wide-ranging development of the West is now extremely urgent. The Chinese government is formulating a series of preferential policies for encouraging more foreign enterprises to invest and participate in the development of the country’s western part. We believe that the implementation of the strategy and policies of opening Western China wider to the outside world will benefit China’s economic development a lot in the 21st century.

## **VII. CONCLUSION**

This paper uses education attainment as a proxy for human capital stock, applies *School Enrollment Ratios* and *Average Years of Schooling* methods to proceed with time series and regional analyses respectively. The most important finding we obtained is that the trends of human capital accumulation in recent years seem to be upward, while the development situations of Eastern and Western China appear imbalanced; the West lags behind the East in education attainment levels. In addition, although the gender gap is getting smaller than before, males still get more education opportunities than females. From these facts, the Chinese government needs to play a key role in eradicating the imbalance, improving both quantity and quality of human capital and thus promoting national economic growth.

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<sup>11</sup> Reference Warner (2001), pp. 23



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Appendix 5-1

Population by Educational level, Region, and Gender in Year 1996

Unit: 1000 person

Region	Population (Age 6 and over)			Primary School			Junior Sec. School			Senior Sec. School			Higer Education		
	Total	Male	Female	total	male	female	total	male	female	total	male	female	total	male	female
National total	1140592	576036	564556	470880	236524	234356	358780	207228	151552	107344	62575	44769	25422	16170	9252
Beijing	12304	6019	6285	2543	1250	1293	4020	2117	1903	3170	1492	1677	1771	981	790
Tianjin	9130	4538	4591	2950	1473	1476	3273	1780	1494	1572	795	777	448	260	188
Shanghai	14060	6917	7143	2953	1441	1512	5189	2694	2495	3254	1643	1611	1448	898	550
Jiangsu	67983	33379	34604	24598	12068	12530	23034	12950	10084	7621	4482	3139	1912	1300	611
Zhejiang	41649	20934	20715	17287	8797	8489	13721	7783	5938	3505	1986	1518	629	416	213
Fu jian	30537	15319	15217	14560	7287	7273	7677	4928	2750	2368	1470	898	443	312	131
Shandong	84574	42272	42302	31318	15507	15811	27752	16296	11456	7323	4591	2732	1096	722	374
Guangdong	62879	31195	31684	29651	14351	15300	19924	11434	8490	4758	3027	1731	789	532	256
Sichuan	106671	53800	52871	48992	25421	23571	29630	16799	12831	8048	4606	3442	1786	1132	654
Guizhou	32447	16624	15822	13903	7823	6081	7015	4571	2443	2363	1449	914	600	399	200
Yunnan	36751	18774	17977	17203	9427	7776	7366	4599	2767	2295	1309	987	589	386	203
Tibet	2216	1064	1152	796	447	349	145	72	74	20	5	14	9	4	4
Shaanxi	32969	17029	15939	12882	6701	6181	9702	5605	4098	3418	1939	1479	1188	829	360
Gansu	22715	11495	11220	8074	4342	3732	5324	3261	2063	2196	1338	858	465	296	169
Qinghai	4412	2235	2177	1374	826	548	841	521	320	354	188	166	97	59	37
Ningxia	4721	2378	2344	1639	857	782	1387	798	589	490	272	218	157	105	53

Appendix 5-2

Population by Educational level, Region, and Gender in Year 1997

Unit: 1000 person

Region	Population (Age 6 and over)			Primary School			Junior Sec. School			Senior Sec. School			Higer Education		
	Total	Male	Female	total	male	female	total	male	female	total	male	female	total	male	female
National total	1143770	579248	564522	465088	232509	232579	366733	210039	156694	118745	68315	50430	31300	19806	11493
Beijing	12264	6116	6148	2412	1213	1199	4260	2268	1991	3112	1502	1610	1648	945	703
Tianjin	9076	4505	4571	2721	1328	1393	3151	1730	1422	1731	869	862	660	370	291
Shanghai	14323	7052	7271	3046	1469	1577	5297	2779	2518	3412	1716	1696	1273	818	455
Jiangsu	67516	33385	34131	23729	11625	12105	23075	12932	10143	7867	4682	3185	1382	1004	377
Zhejiang	42045	21173	20872	16546	8612	7934	13278	7484	5793	4242	2302	1941	1053	681	372
Fu jian	30669	15388	15281	14103	6702	7401	8277	5149	3128	2877	1774	1104	806	549	257
Shandong	83927	42040	41886	31357	15332	16026	27883	16478	11405	7221	4556	2665	1253	832	421
Guangdong	64007	32202	31805	27692	13343	14349	20645	11548	9097	7566	4516	3050	2349	1542	807
Sichuan	78173	39465	38708	35824	18478	17346	21520	12361	9159	6674	3683	2990	1553	1003	551
Guizhou	32548	17021	15526	15677	8755	6922	6968	4613	2356	1929	1119	810	654	398	256
Yunnan	37399	18876	18523	18440	9711	8729	7900	4774	3217	2209	1251	959	465	308	156
Tibet	2193	1059	1135	1042	595	447	107	49	58	29	16	13	7	5	1
Shaanxi	33094	16887	16207	13176	6487	6689	10192	5837	4355	3935	2273	1662	990	652	339
Gansu	22835	11577	11258	8905	4676	4228	5962	3560	2403	2233	1347	885	377	237	140
Qinghai	4479	2255	2225	1413	838	575	820	510	310	310	162	148	90	55	34
Ningxia	4802	2431	2371	1638	879	759	1393	799	594	507	292	215	157	99	58

Appendix 5-3

Population by Educational level, Region, and Gender in Year 1998

Unit: 1000 person

Region	Population (Age 6 and over)		Primary School		Junior Sec. School		Senior Sec. School		Higher Education						
	Total	Male	Female	total	male	female	total	male	female	total	male	female			
National Total	1150370	581911	568460	457703	228997	228707	380066	215343	164723	122741	70340	52401	32114	20158	11956
Beijing	12110	6162	5948	2376	1199	1177	4061	2221	1839	3057	1510	1547	1911	1074	837
Tianjin	9052	4515	4537	2863	1398	1465	3284	1796	1488	1540	791	749	520	301	219
Shanghai	14208	7028	7180	3025	1499	1526	4967	2596	2372	3511	1787	1724	1407	875	531
Jiangsu	68018	33452	34566	23540	11735	11806	22266	12460	9806	8681	4968	3713	2058	1367	691
Zhejiang	42094	21493	20601	16646	8727	7919	13466	7537	5929	4620	2573	2047	1202	789	414
Fu jian	30783	15346	15436	13609	6575	7034	8671	5234	3437	3019	1813	1206	625	447	178
Shandong	83863	41827	42036	29424	14629	14794	29484	17146	12338	7707	4791	2916	1297	874	422
Guangdong	64468	32161	32307	27257	13033	14224	21595	11763	9832	7544	4501	3043	2395	1534	861
Sichuan	78925	39718	39207	36041	18628	17413	22849	12522	10327	7338	3991	3346	1807	1198	609
Guizhou	32938	17329	15610	14626	8336	6289	7507	4913	2594	1985	1207	778	593	389	205
Yunnan	37686	18961	18726	18431	9660	8771	8387	4995	3393	2108	1190	918	424	273	151
Tibet	2287	1132	1155	975	566	409	160	85	76	26	18	8	3	1	1
Shaanxi	33174	16885	16289	13938	6997	6941	10159	5733	4426	3747	2162	1585	863	537	325
Gansu	23149	11784	11365	8860	4645	4215	5845	3535	2310	2254	1380	875	476	319	157
Qinghai	4553	2282	2271	1439	835	604	820	511	309	339	177	163	141	85	56
Ningxia	4841	2456	2386	1587	854	733	1462	840	622	522	292	230	170	108	62

Appendix 5-4

Population by Educational level, Region, and Gender in Year 1999

Unit: 1000 person

Region	Population (Age 6 and over)		Primary School		Junior Sec. School		Senior Sec. School		Higher Education					
	Total	Female	total	female	total	female	total	female	total	female				
	Male	Male	male	male	male	male	male	male	male	male				
National Total	1124495	569900	432927	215597	217331	386057	218032	168025	120422	69126	51296	34748	21568	13181
Beijing	11730	5874	2110	1039	1071	3928	2138	1789	2764	1341	1422	2244	1199	1045
Tianjin	8921	4413	2416	1204	1212	3240	1713	1527	1898	949	949	705	393	313
Shanghai	13930	6881	2689	1272	1416	4975	2585	2391	3628	1864	1764	1540	947	593
Jiangsu	66417	32979	23056	11335	11721	22598	12731	9867	8381	4894	3487	2668	1734	933
Zhejiang	41036	20735	15194	7721	7473	14297	8056	6241	4757	2663	2094	1016	660	355
Fu jian	30151	15156	12726	6196	6529	8951	5404	3547	3036	1822	1214	681	483	198
Shandong	81692	40829	27458	13358	14100	30917	17722	13195	7726	4905	2821	1363	912	452
Guangdong	63651	31800	25628	12183	13445	22289	12018	10271	7720	4612	3108	2345	1477	868
Sichuan	76647	38979	34433	17856	16577	23131	12923	10207	5959	3385	2574	1491	915	575
Guizhou	32150	16803	14647	8098	6549	7606	4849	2757	2282	1365	917	726	466	259
Yunnan	36583	18390	18290	9725	8565	8271	4810	3461	1810	1026	784	437	260	178
Tibet	2209	1094	925	536	389	94	46	48	7	4	3	2	1	1
Shaanxi	32840	16826	11921	6012	5908	10716	6000	4716	4107	2402	1705	1085	695	390
Gansu	22609	11439	8577	4363	4214	6119	3638	2481	2300	1381	918	592	390	202
Qinghai	4465	2268	1557	858	698	973	597	376	475	254	221	178	113	65
Ningxia	4751	2402	1643	852	791	1485	845	639	497	283	215	154	101	52

Appendix 5-5

Population by Educational level, Region, and Gender in Year 2000

Unit: 1000 person

Region	Population (Age 6 and over)				Primary School		Junior Sec. School		Senior Sec. School		Higher Education				
	Total	Male	Female	total	male	female	total	male	female	total	male	female			
					total	male	female	total	male	female	total	male	female		
National Total	1156700	593469	563230	441613	217034	224578	422386	238026	184360	99073	59601	39472	44020	27146	16873
Beijing	13023	6788	6235	2301	1152	1149	4665	2655	2009	2197	1146	1050	2284	1258	1026
Tianjin	9381	4768	4612	2468	1220	1248	3405	1875	1529	1261	658	602	886	499	386
Shanghai	15806	8115	7691	3106	1508	1598	6038	3314	2724	2665	1458	1207	1794	1084	710
Jiangsu	69220	34873	34346	24017	11289	12728	26562	14646	11915	7432	4557	2875	2862	1855	1007
Zhejiang	43119	22085	21034	16833	8528	8305	15319	8580	6738	3848	2251	1597	1467	921	546
Fu jian	32031	16422	15609	12875	5985	6890	11437	6693	4744	2442	1587	854	1011	685	326
Shandong	84523	42634	41888	29469	13644	15825	32973	18744	14228	6750	4242	2507	3000	1900	1100
Guangdong	78197	39446	38751	28224	13342	14881	31261	16520	14740	8181	5150	3031	3031	1936	1095
Sichuan	76182	39265	36917	35379	18179	17200	24193	13728	10464	4268	2532	1736	2038	1281	756
Guizhou	31285	16353	14932	15352	8345	7007	7274	4735	2539	1137	736	400	674	435	239
Yunnan	38226	20001	18225	18979	10201	8777	9018	5538	3479	1657	994	662	852	538	314
Tibet	2310	1171	1139	796	488	307	165	101	64	42	25	17	33	21	11
Shaanxi	33018	17074	15943	12178	6042	6136	11707	6611	5095	3307	1954	1352	1486	918	567
Gansu	23013	11878	11134	9280	4770	4509	6017	3658	2359	1818	1164	653	672	438	234
Qinghai	4360	2249	2111	1489	841	647	1035	634	400	342	192	150	156	95	61
Ningxia	4931	2524	2407	1747	903	843	1528	890	638	426	247	179	202	122	79