

Economic Reforms and Income Inequality in Urban China

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Keywords: Asia, China, Income inequality, Economic reform, Education, Urban

JEL classification: D31, J31, P20

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Economic Reforms and Income Inequality in Urban China^{*}

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Abstract

This paper reports the results of an analysis of changes in income inequality, and in its determinants, in urban China since the economic reforms that began in 1978. The intention is to identify new characteristics of economic inequality. It first shows that income differentials across and in provinces widened and that their economic rankings were becoming fixed during the period from 1988 to 1995. Second, age was the major factor in inequality in 1988, while education became the important factor in 1995. Third, education significantly contributed to increasing inequality during the period. Fourth, the higher education-level groups had less within-group inequality. These changes reflect the penetration of the market mechanism into China after the reforms. However, this will be problematic without equality of opportunity.

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1. INTRODUCTION

The recent rapid economic growth of the Chinese economy has attracted world attention. It achieved average annual growth of 9% in the 1990s. Its gross domestic product (GDP) in 2002 was more than 10,000 billion RMB (more than US\$1,200bn), which is over eight times (in real terms) its value in 1978. With the significant improvement of its production capacity, this very large market of 1.3 billion people is of great interest to economists, politicians, and entrepreneurs in developed countries.

Coinciding with this rapid growth rate is a marked increase in income inequality. This is an issue of current importance in China. Income inequality in China, measured by the Gini coefficient, reached 0.403¹ in 1998 and has continued to increase. Inequality in China is greater than in Indonesia (0.365 in 1996), in India (0.378 in 1997), in Japan (0.249 in 1993), and in South Korea (0.316 in 1993). The increase in income inequality is nettling the Chinese people and is regarded by the Chinese authorities as an important matter².

The rapid expansions of the economy and of inequality in China are considered to be among the effects of the economic reforms that began in 1978. These reforms, which were the stimulus for economic development in China, concentrated first on rural areas. Since 1984, their focus has shifted to urban areas. The reforms were introduced gradually. The economic system was shifted cautiously toward market-oriented and the opening of the economy was limited to specific areas, such as special economic zones in coastal regions. The introduction of foreign capital and technology concentrated on such limited regions, and brought rapid economic growth to them. Meanwhile, the other regions, not having such opportunities, faced relative stagnation. After the Southern Tour Lectures by Deng Xiaoping in 1992, the reforms were accelerated to increase the role of the market mechanism. This gave a strong impetus to the transition from redistributive, egalitarian allocation to market-based, meritocratic allocation. This caused a substantial change in the income inequality structure in China.

The reforms set macroeconomic growth as the first priority, even if this sacrificed a degree of equality of income distribution and opportunity. This idea is explicit in Dengist Xianfu theory, which states, "Allow some people and areas to get rich first." Such discriminatory treatment may be justified by the Pareto criterion because low-income people also benefit from economic growth to some extent. However, a large income disparity within the same country might strengthen feelings of unfairness in low-income people—the majority of the country—and might cause political instability. The government mentioned its concern about income

¹ World Bank, World Development Report 2000/2001.

² Alexis de Tocqueville (1969, Chapter 21, part 3, vol. 2) says "Disregarding the secondary causes which have had some effect on the great convulsions in the world, you will almost always find that equality was at the heart of the matter."

differential issues at the National People's Congress in recent years. Considering this, China is being faced with many challenges.

This paper is an analysis of the income inequality structure and its background in urban China, using household survey data for 1988 and 1995. These years are before and after 1992 and, therefore, they might reflect the influence of the gradual and the rapid progress of the economic reforms. As explained below, attention is concentrated on urban employees whose income distribution has been changing dramatically as a result of the reforms.

Section 2 of this paper explains the strategy and data of this study. Section 3 examines inequality for the whole urban area and provinces over the period from 1988 to 1995. Section 4 analyzes the factors of inequality in 1988 and in 1995, and the factor contributions to inequality change during this period. In addition, the important factor—education—is examined in detail. Based on the results, recent changes and problems in the Chinese economy are discussed in Section 5.

2. STRATEGY

Review and Aims

In China, the income distribution of urban employees has been changing substantially along with the accelerating economic reforms. In addition, the number of urban employees is expected to surge in the near future following the urbanization policy and urban problems will become increasingly evident. These situations call for analyses of the inequality structure of urban employees to deepen insights into the current Chinese inequality issues. However, major inequality studies related to China have focused on rural inequality issues (Tsui (1998), Chan and Chan (2000), and Kung and Lee (2001)), and regional inequality, such as inter- and intra-provincial inequality and rural–urban inequality (Hussain, Lanjouw and Stern (1994), Kanbur and Zhang (1999), and Lee (2000)).

Among the studies focusing on urban China, one strand analyzes the influence of various income sources on total income inequality (Hussain, Lanjouw and Stern (1994), Gustafsson and Li (1997), Aaberge and Li (1997), and Coady and Wang (2000)) by applying the factor decomposition method (Shorrocks (1982, 1983)) or the concentration coefficient (Rao (1969)). This approach devotes its attention to income sources to clarify their contributions to total inequality. Thus, it does not deal with individuals' characteristics. Another examines the characteristics of urban individuals and inequality (Coady and Wang (2000), and Gustafsson and Li (2001)) using the sub-population group decomposition method (Bourguignon (1979), Mookherjee and Shorrocks (1982), and Shorrocks (1984)). This approach decomposes total inequality into inequalities of between- and within-groups, and the sub-population group is

based on individuals' characteristics. However, in this approach, the effects of factors (characteristics) on inequality are gross ones not controlling for the effect of any other factor.

This paper focuses on urban employees and analyzes the influence of accelerated economic reform on their income inequality. First, the widening income differentials in urban China between 1988 and 1995 are examined in detail. Second, the relationship between the characteristics of urban employees and the structure of income inequality is investigated. The importance of each factor in accounting for the levels of inequality in 1988 and 1995 is clarified, as well as for the change in inequality over the period, using a new regression-based decomposition approach (Fields and O'Hara (1999), Fields and Yoo (2000), and Morduch and Sicular (1998, 2002)). This approach allows the quantification of the contribution of each factor of inequality while controlling for the effects of others. Therefore, the degree of total inequality explained by each factor can be shown simultaneously. In addition, the factor of education, whose role in the inequality change is significant, is analyzed to examine the relationship between educational attainment and income differentials.

Data

Microdata for China for 1988 and for 1995 are used in this analysis. These data are based on a large household survey, which was conducted by the Institute of Economics, Chinese Academy of Social Science, in 1989 and in 1996 (Griffin and Zhao (1993), and Riskin et al. (2000)). Although this is an important issue, studies on income distribution in China have been restricted by data limitations. Relatively few studies analyze income distribution in detail. Reflecting this situation, the survey was projected with the aim of supplying reliable data covering a large region of China. The data are derived from significantly large samples (about 65,000 rural households and 35,000 urban households) drawn by the State Statistical Bureau.

The dataset used here is prepared from the household survey data to meet the purpose of our analysis. The unit of analysis is an individual urban employee, and all variables in this study are at the individual level. These include various personal characteristics such as age, sex and occupation. Income is defined as employee earnings, including cash income from working and subsidies except housing and ration coupons. The urban areas in the dataset consist of the urban areas of ten provinces, representing various regions and sizes of urban China. The provinces representative of the north are Liaoning and Shanxi, those of the eastern coastal region are Jiangsu and Guangdong, those of the interior are Anhui, Henan and Hubei, those of the west are Gansu and Yunnan, and Beijing represents the three large province-level municipalities.

The number of urban samples in the dataset is 17,459 in 1988 and 9,227 in 1995 (see Appendix 2 for the numbers for each province). The questions for 1988 are not exactly identical to those for 1995, but most of the questions in the 1988 survey are also in the 1995 survey. Our datasets of 1988 and of 1995 are prepared to be consistent and comparable.

3. INEQUALITY OF URBAN AREAS AND PROVINCES

Inequality Trend

FIGURE 3.1
TRANSFORMED LORENZ CURVE

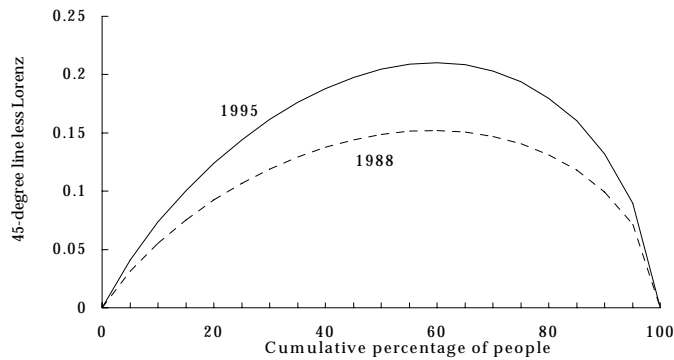
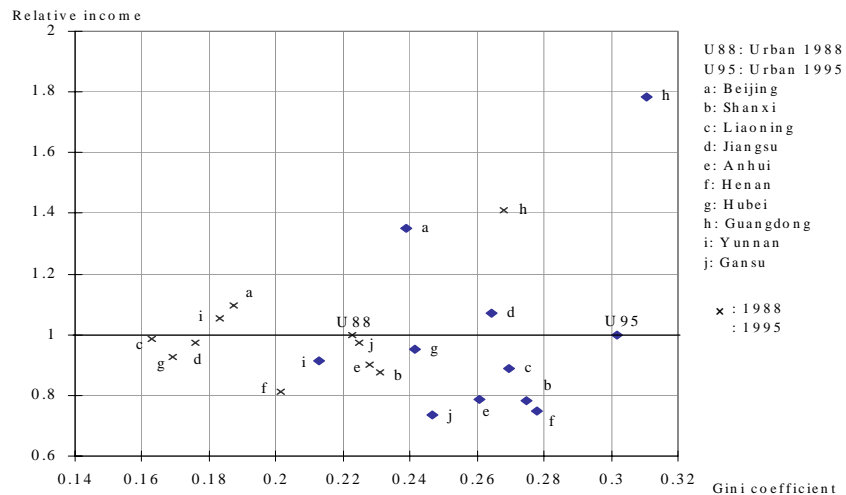


Figure 3.1 shows transformed Lorenz curves for the urban areas³ in 1988 and in 1995, which are the distance of the Lorenz curve from the 45-degree line, so that the higher the curve, the greater the inequality. In this figure, the curve for 1988 lies entirely below the curve for 1995. Therefore, the distribution of 1988 is more equal than that of 1995 (the distribution of 1988 Lorenz-dominates the distribution of 1995).

Inequality across and in Provinces

FIGURE 3.2
RELATIVE INCOME AND INEQUALITY, 1988 AND 1995



Note: Relative income of a province in 1988= (mean income of a province in 88) / (mean income of the urban areas in 88). The same manner is for 1995.

³ The urban areas in this paper are defined as consisting of the urban areas of the ten provinces mentioned in the Data part.

Figure 3.2 shows the level of relative income, which is the ratio of the mean income of each province to the mean income of the urban areas, and the Gini coefficient for 1988 and for 1995.

There is no great difference in the level of relative incomes across provinces, except Guangdong, in 1988. The differentials across provinces, however, widened significantly in 1995, which is shown as the expansion of provinces' positions along the vertical axis in the figure. The differentials across the provinces as well as between the top and the bottom increased in 1995.

The relative income of Guangdong was already high in 1988 and increased further in 1995. However, most provinces whose relative incomes were below the urban mean income in 1988 reduced their positions further in 1995. This indicates that, between 1988 and 1995, the provinces whose relative incomes were already high in 1988 grew more than the urban mean income. However, most provinces whose relative incomes were low in 1988 stagnated over the period. This means not only that the income gap between provinces increased, but also that the relative position of provinces as "rich" or "poor" became fixed.

This figure also shows that the inequality was relatively low in 1988 (about 0.16 to 0.27, as measured by the Gini coefficient). However, the inequality of all provinces increased in 1995, shown by the substantial movement toward the right along the horizontal axis. As is shown, the inequality of the urban areas for 1995 (U95) moves to the right end, and all provinces except Guangdong are to the left of it. This is caused by the increased income gap between provinces. The inequality of each province increased rapidly between 1988 and 1995. In addition, the increase of differentials across provinces made the inequality of the urban areas higher than that of each province.

Income was more equally distributed both within and between provinces in 1988 than in 1995. The distribution in 1995 might be the result of practicing Dengist Xianfu theory, which allowed some people and areas to get rich first. Implementing this theory brought rapid economic growth to China, but at the same time increased the income differentials both within and between provinces. The inequality within provinces increased both in the getting-rich-first provinces and in the relatively stagnant provinces. More notably, some provinces not only became rich first, but their advanced economic positions were becoming fixed. The changes in this period indicated not only the difference in the order of getting rich, but also the fixation of the economic ranks among provinces.

4. INEQUALITY STRUCTURE

Factors of Inequality in 1988 and 1995

In this section, the inequality structures of urban employees in 1988 and in 1995 are analyzed, using the new regression-based approach to inequality decomposition.

The potential factors influencing income examined in this analysis fall into two categories: employees' personal characteristics and the nature of jobs. The personal characteristics include age (age and age squared), sex, education, and CPC (Communist Party of China) membership. Age, sex, and education are included to examine the effects of demographic or individuals' specific characteristics on income inequality, which generally play significant roles in income determination. CPC membership is included to examine the importance of political influence, which is one of the features of Chinese society. The nature of jobs includes enterprises' ownership, sector, and occupation. Ownership reflects the nature of the Chinese economic system. Sector is to examine the compensating differentials across industrial sectors. Also investigated is whether occupation, which represents the position or the responsibility of a job, has a significant influence on income inequality. These factors are listed in Table 4.1.

TABLE 4.1
FACTORS OF INEQUALITY AND THEIR DEFINITION

Factor	Definition	Factor	Definition
<i>Personal characteristics</i>		<i>Sector</i>	
Age (age, age squared)		sec1	forestry, fishing, water conservancy, geological prospecting
Sex	female=1	sec2	manufacturing
CPC Membership	member=1	sec3	construction
Education (academic level, graduation)		sec4	services
edu1	college or above	sec5	party, government or social organs
edu2	community college or professional school	sec6	others
edu3	middle level professional, technical or vocational school	<i>Occupation</i>	
edu4	upper middle school	occ1	owner of private or individual enterprise, owner and manager of private or individual enterprise
edu5	lower middle school	occ2	professional or technical worker
edu6	elementary school or below	occ3	head of institution, division head in institution
<i>Nature of jobs</i>		occ4	office worker
<i>Ownership</i>		occ5	laborer
owner1	state owned		
owner2	local publicity owned		
owner3	urban collective		
owner4	private or individually owned, sino-foreign joint venture, foreign owned		
owner5	others		

Note: Services (sec4) includes transportation, communication, posts and telecommunications, commerce and trade, real estate, public utilities, finance, and insurance.

The income function is estimated both for 1988 and for 1995. The estimated regression coefficients of the factors are reported in Appendix 2. The contribution of a factor to total inequality is calculated from the estimated regression coefficient of the income function:

$$s_k(\ln Y) = \beta_k \sigma(\mathbf{x}_k) \text{cor}[\mathbf{x}_k, \ln Y] / \sigma(\ln Y).$$

\mathbf{x}_k is the k^{th} explanatory variable (factor), s_k is the contribution of the k^{th} factor to the

total inequality, and β_k is the estimated coefficient of the k^{th} factor. $\sigma(\mathbf{x}_k)$ is the standard deviation of the k^{th} factor and $cor[\mathbf{x}_k, \ln \mathbf{Y}]$ is the correlation between the k^{th} factor and the log-income. $\sigma(\ln \mathbf{Y})$ is the standard deviation of the log-income (see Appendix 1 for the derivation).

TABLE 4.2
% CONTRIBUTION OF FACTORS TO INEQUALITY, 1988

	% Contribution						
	Sector	Occupation	Ownership	Education	Membership	Sex	Age
Urban	-0.6	6.9	10.7	3.5	7.5	0.0	72.1
Beijing	5.0	3.3	6.0	4.7	3.2	0.0	77.9
Shanxi	7.5	6.7	15.7	1.0	7.9	0.0	61.1
Liaoning	1.1	4.5	17.9	3.1	10.1	0.0	63.4
Jiangsu	0.2	11.7	11.4	3.1	4.9	0.0	68.8
Anhui	0.2	5.0	21.7	8.6	6.4	0.0	58.2
Henan	-2.2	9.5	12.8	2.9	9.1	0.1	67.7
Hubei	0.3	5.3	9.6	5.5	6.2	0.0	73.2
Guangdong	4.2	15.5	18.7	4.8	7.2	0.0	49.5
Yunnan	8.2	10.0	17.8	4.7	7.8	0.0	51.4
Gansu	-0.2	9.8	13.7	5.1	8.5	0.3	62.8

Note: The contribution is estimated excluding residual.

TABLE 4.3
% CONTRIBUTION OF FACTORS TO INEQUALITY, 1995

	% Contribution						
	Sector	Occupation	Ownership	Education	Membership	Sex	Age
Urban	0.3	12.5	12.5	13.4	8.0	8.1	45.1
Beijing	11.0	10.2	16.8	5.9	13.8	11.9	30.2
Shanxi	0.7	6.2	40.0	9.5	1.4	13.5	28.6
Liaoning	-0.2	11.1	18.6	25.0	5.3	10.9	29.4
Jiangsu	6.5	8.3	9.5	13.1	7.7	5.1	49.7
Anhui	7.4	24.1	25.7	3.9	4.1	10.9	24.0
Henan	-1.3	28.6	17.1	9.9	7.5	11.1	27.1
Hubei	2.2	7.1	19.2	12.5	12.0	1.3	45.7
Guangdong	7.0	26.0	2.0	26.2	8.3	3.5	27.1
Yunnan	3.9	19.8	10.4	8.9	3.4	6.6	47.1
Gansu	10.8	6.5	20.3	10.7	3.3	4.3	44.0

Note: The contribution is estimated in the same manner as Table 4.2.

Table 4.2 and Table 4.3 show the contributions of the factors to the total inequality in 1988 and in 1995. In Table 4.2, the largest contributing factor to the total inequality is age both in the urban areas and in all provinces. The second largest is ownership, and the smallest is sex

in most provinces. These results indicate that the determinants for inequality were uniform across provinces, and income inequality was determined mainly by age in 1988. Turning to Table 4.3, the inequality determinants were diversified with provinces in 1995. The contribution of education became significant. The contribution of sex, which was almost zero in 1988, also increased in 1995.

Before the economic reforms, job placement was controlled by the government (following the unified job assignment system) and wages were also determined centrally (based on the unified standardized wage scale). The wage scale was mainly determined by age, which least was related to labor productivity. Therefore, the significance of age in the determination of earnings was likely to be a demographic characteristic in the Chinese historical context. After the reforms, the government began to change the employment and wage system, such as promoting labor mobility and the enterprises' self-determined wage system. The progress of these reforms, however, was gradual especially for the employment reforms. After the mid-1980s, there was frequent reference to the "labor force market" in China, but it just meant helping people to find jobs. It was after the 1990s that the government explicitly set the aim of employment reform as creating and promoting the labor market⁴. Thus, the income distribution in 1988 might be much affected by the former unified system, though certain wage and employment reforms had already started. The uniformity of inequality determinants and the age-based distribution in 1988 reflect such features of the Chinese economy. By 1995, the importance of age on inequality had decreased, while that of education increased. This change between 1988 and 1995 reflects labor marketization.

Factor Contribution to Inequality Change between 1988 and 1995

Combining the contribution of a factor to the inequality (s_k) with the inequality I , the contribution of the factor to the change in inequality between 1988 and 1995 is given as:

$$\Pi_k(I(\cdot)) = (s_{k95} * I(\cdot)_{95} - s_{k88} * I(\cdot)_{88}) / (I(\cdot)_{95} - I(\cdot)_{88}).$$

$I(\cdot)_{88}$ and $I(\cdot)_{95}$ are the inequality of log-incomes measured by the Gini coefficient for 1988 and for 1995 (see Appendix 1 for the derivation). This study quantifies the extent to which each factor affects the inequality change over the period.

⁴ See Davis-Friedmann (1985), Walder (1986), Xiaojing and Xiao (1987), White (1988), Hu and Li (1993), and Amako et al. (1999) about the transition of the wage and employment system.

TABLE 4.4
% CONTRIBUTION OF FACTORS TO INEQUALITY CHANGE BETWEEN 1988 AND 1995

	% Contribution						
	Sector	Occupation	Ownership	Education	Membership	Sex	Age
Urban	2.2	24.1	16.4	33.8	9.1	24.9	-10.5
Beijing	26.3	27.7	44.2	9.1	40.8	42.0	-90.2
Shanxi	-15.7	4.9	98.9	30.3	-14.4	46.5	-50.5
Liaoning	-1.7	18.5	19.3	49.5	-0.1	23.1	-8.7
Jiangsu	16.0	3.4	6.8	28.0	11.8	12.6	21.4
Anhui	31.7	87.8	39.4	-11.9	-3.8	47.2	-90.4
Henan	0.3	63.7	25.1	22.7	4.5	31.4	-47.8
Hubei	6.0	10.8	38.4	26.6	23.6	3.9	-9.4
Guangdong	18.1	67.2	-64.0	110.4	12.5	17.3	-61.6
Yunnan	-9.3	49.6	-12.4	21.7	-10.2	26.6	34.0
Gansu	49.2	-4.9	43.5	30.3	-14.9	18.4	-21.6

Table 4.4 shows that the contribution of age to the change in inequality between 1988 and 1995 is negative in the urban areas and in most provinces. The contribution of sex is positive. Thus, sex difference positively contributed to the inequality increase over the period. The factor whose contribution is high is education. In summary, the factor of age contributed to the equalizing direction in income inequality along with moderating the age-based allocation system. However, education played the significant role in increasing inequality over the period.

After the Southern Tour Lectures by Deng Xiaoping in 1992, the socialist market economy was officially recognized in China and promoting the market mechanism was confirmed. Since then, economic reform has accelerated. As previously noted, employment reform, whose progress was slow at first, proceeded towards a market-oriented situation in the 1990s. That is, the year of 1992 was the second turning point, following the start of the economic reforms. The years of 1988 and of 1995, analyzed here, are before and after 1992. Therefore, the equalizing effect of age and the unequalizing effect of education on the inequality change over the period reflect the progress of the reforms.

Details of Inequality Determinant: Education

This section examines the factor of education in detail, because it plays the significant role in the change in inequality over the period from 1988 to 1995. It focuses on the share and the relative income of each education-level group, and the inequality within each group.

FIGURE 4.1
% SHARE OF EACH EDUCATION LEVEL, URBAN AREAS

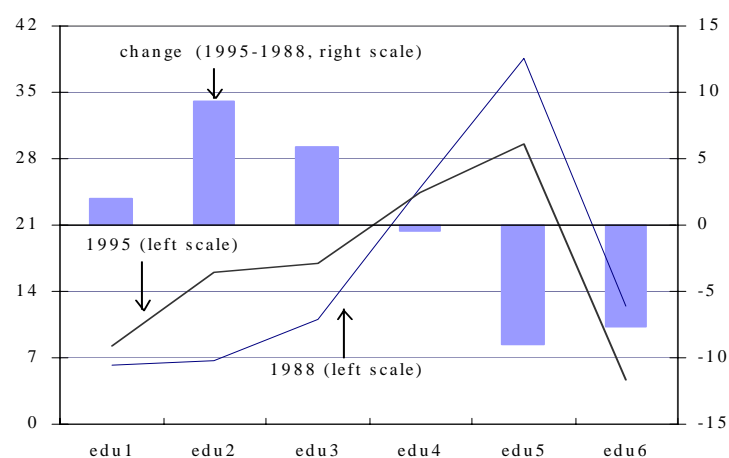


TABLE 4.5
% SHARE OF EACH EDUCATION LEVEL, 1988 AND 1995

	1988						1995					
	edu1	edu2	edu3	edu4	edu5	edu6	edu1	edu2	edu3	edu4	edu5	edu6
Urban	6.2	6.8	11.1	24.9	38.7	12.4	8.2	16.1	17.0	24.5	29.6	4.7
Beijing	11.3	8.5	12.6	29.7	30.7	7.3	11.5	21.4	19.5	20.1	26.9	0.6
Shanxi	5.9	7.0	12.3	23.6	39.4	11.8	9.5	15.6	19.0	24.6	27.9	3.4
Liaoning	6.2	9.6	9.3	18.2	51.5	5.2	7.1	21.3	12.2	18.1	39.0	2.1
Jiangsu	5.4	6.0	9.1	27.2	39.3	13.0	7.1	13.6	14.4	26.8	32.9	5.1
Anhui	5.8	5.9	9.4	22.8	41.0	15.0	6.3	13.8	16.2	23.8	34.7	5.3
Henan	6.3	7.8	10.4	28.5	36.5	10.4	8.4	14.2	16.6	28.0	28.1	4.7
Hubei	5.8	9.8	13.9	25.3	35.7	9.5	8.5	16.4	18.7	28.2	25.2	3.1
Guangdong	6.0	4.9	9.9	30.3	32.9	16.1	7.8	15.1	13.5	28.9	25.8	8.9
Yunnan	4.7	5.3	12.7	17.6	40.5	19.3	6.9	15.3	25.2	17.9	26.6	8.1
Gansu	8.2	2.0	13.6	27.4	34.5	14.4	10.2	13.5	14.0	30.8	25.9	5.6

Note: edu1: college or above, edu2: community college or professional school,
edu3: middle level professional, technical or vocational school,
edu4: upper middle school, edu5: lower middle school, edu6: elementary school or below.

First, the compositional change of the education level is observed. The sum of the share of edu4 (upper middle school) and edu5 (lower middle school) held over half of the total both in 1988 and in 1995, although the share of edu5 decreased in 1995 (Figure 4.1 and Table 4.5). The share of edu1 (college or above), edu2 (community college or professional school) and edu3 (middle level professional, technical or vocational school) increased in 1995.

FIGURE 4.2
RELATIVE INCOME OF EACH EDUCATION LEVEL, URBAN AREAS

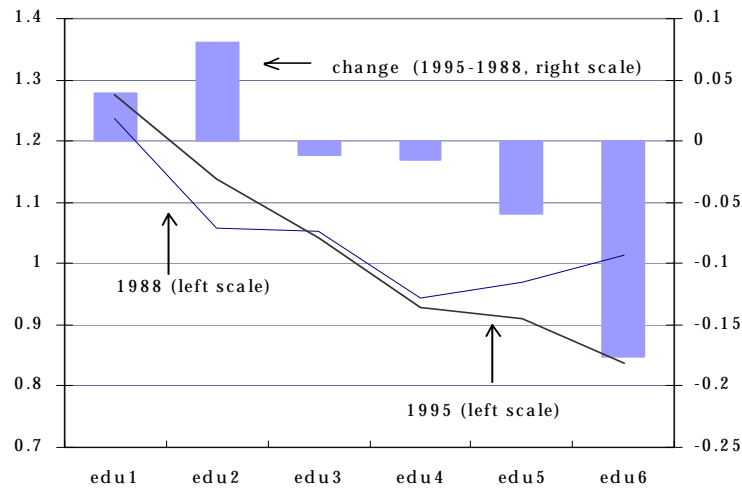


TABLE 4.6
RELATIVE INCOME OF EACH EDUCATION LEVEL, 1988 AND 1995

	1988						1995					
	edu1	edu2	edu3	edu4	edu5	edu6	edu1	edu2	edu3	edu4	edu5	edu6
Urban	1.24	1.06	1.05	0.94	0.97	1.01	1.28	1.14	1.04	0.93	0.91	0.84
Beijing	1.16	1.03	1.00	0.87	1.05	1.06	1.23	1.09	0.91	0.94	0.95	0.75
Shanxi	1.21	1.03	1.11	0.92	0.97	1.03	1.29	1.03	1.06	0.93	0.92	0.85
Liaoning	1.16	1.08	1.06	0.95	0.97	1.07	1.26	1.11	1.09	0.90	0.92	0.81
Jiangsu	1.24	1.07	1.09	0.93	0.99	0.97	1.25	1.19	1.09	0.98	0.89	0.76
Anhui	1.32	1.17	1.07	0.93	0.99	0.91	1.32	1.19	1.07	0.96	0.88	0.83
Henan	1.28	1.09	1.07	0.92	0.98	1.00	1.45	1.15	1.06	0.93	0.85	0.84
Hubei	1.23	1.05	1.06	0.96	0.96	0.97	1.32	1.08	1.01	0.94	0.92	0.87
Guangdong	1.24	1.07	0.98	0.98	0.97	1.00	1.23	1.27	1.16	0.85	0.94	0.74
Yunnan	1.17	1.18	1.06	0.93	0.95	1.04	1.20	1.04	1.06	0.92	0.96	0.89
Gansu	1.34	1.02	1.11	0.88	1.00	0.93	1.25	1.09	1.04	0.92	0.98	0.73

Note: Relative income of an education-level group = (mean income of a group) / (mean income of the total).

The decrease in the relative incomes of edu5 (lower middle school) and of edu6 (elementary school or below) and the increase of edu2 (community college or professional school) are prominent (Figure 4.2 and Table 4.6). In addition, the relative income of edu2 becomes explicitly higher than that of edu3 (middle level professional, technical or vocational school) in 1995. This shows the more solid relationship between education levels and relative incomes in 1995.

TABLE 4.7
INEQUALITY (GINI COEFFICIENT) WITHIN EACH EDUCATION-LEVEL GROUP

	1988							1995						
	edu1	edu2	edu3	edu4	edu5	edu6	Total	edu1	edu2	edu3	edu4	edu5	edu6	Total
Urban	0.19	0.19	0.19	0.23	0.22	0.24	0.22	0.26	0.28	0.28	0.31	0.31	0.33	0.30
Beijing	0.18	0.15	0.16	0.19	0.20	0.13	0.19	0.26	0.22	0.23	0.24	0.22	0.19	0.24
Shanxi	0.16	0.18	0.23	0.24	0.24	0.23	0.23	0.22	0.25	0.23	0.28	0.30	0.42	0.27
Liaoning	0.16	0.16	0.16	0.15	0.16	0.19	0.16	0.19	0.21	0.23	0.28	0.30	0.42	0.27
Jiangsu	0.14	0.17	0.13	0.17	0.17	0.20	0.18	0.23	0.21	0.27	0.25	0.26	0.32	0.26
Anhui	0.21	0.20	0.16	0.20	0.25	0.24	0.23	0.18	0.24	0.23	0.26	0.27	0.23	0.26
Henan	0.17	0.16	0.16	0.20	0.21	0.20	0.20	0.21	0.20	0.23	0.30	0.29	0.31	0.28
Hubei	0.14	0.14	0.19	0.19	0.15	0.16	0.17	0.22	0.21	0.24	0.25	0.22	0.24	0.24
Guangdong	0.23	0.18	0.19	0.30	0.27	0.26	0.27	0.24	0.27	0.30	0.30	0.33	0.27	0.31
Yunnan	0.14	0.20	0.15	0.18	0.17	0.22	0.18	0.17	0.16	0.18	0.22	0.25	0.25	0.21
Gansu	0.22	0.19	0.16	0.21	0.24	0.23	0.22	0.17	0.19	0.21	0.27	0.26	0.30	0.25

Table 4.7 shows the inequality within each education-level group. There is an inverse relationship between the order of the education level and that of the inequality level, and the relationship becomes more explicit in 1995. In most provinces, the inequality of the groups whose education levels are above edu3 (middle level professional, technical or vocational school) is lower than the total inequality, and the inequality of edu5 (lower middle school) and of edu6 (elementary school or below) is higher than the total inequality in 1988. In 1995, the situations for the groups above edu3 or below edu5 are the same as in 1988. These results indicate that the income of a person, attaining above an average education level, will be relatively high and equally distributed and the income of a person attaining an education level below this will be relatively low and unevenly distributed.

The Human Capital theory proposed by Schultz (1960, 1962), Becker (1962), and Mincer (1974) is regarded as one of the key theories that explain the relationship between earnings and education. In this theory, education is looked on as investment in human capital because educational attainment can raise income through improving ability and skills as a worker. From this perspective, education is an important element in income inequality. As previously mentioned, the change in income distribution in urban China can be recognized as a change to a distribution more reflecting workers' ability and skills through the emerging labor market. Therefore, it is now more likely to enable the Human Capital theory to be applied to the relationship between education and income in the Chinese economy.

However, that the income disparity in urban China is justified only by a meritocracy is perhaps too simple a conclusion. Although the Human Capital theory assumes that the amount of educational investment in each person is the result of her/his rational decision, it is doubtful whether people in China can freely or rationally choose the amounts of educational investment in themselves⁵. This draws attention to the opportunity for educational attainment in China.

⁵ Ishikawa (1991, Chapter 4) also points out that the Human Capital theory neglects the difference of

There is significant inequality of opportunity for education among regions and social classes in China (Lin (1993, 1999), and Kojima and Zheng (2001)). Particularly, access to higher education, which, as has been shown, is likely to lead to opportunities for higher income, has been limited and unevenly distributed⁶. This indicates that income distribution has become increasingly unequal with less equality of opportunity in China. The situation is problematic and awaits solution.

5. DISCUSSION

How has the Chinese economy been affected by the progress of economic reform and the opening up to the world? This paper focused on urban employees in China, and analyzed the structure of their income inequality and its change to identify the new features underlying it.

The inequality within provinces increased in all provinces between 1988 and 1995. In addition, the increase in income differentials across provinces raised the total urban inequality. Moreover, economic ranking among provinces was becoming fixed through the accelerative growth of provinces whose relative incomes were already high, and the stagnant growth of provinces whose relative incomes were low.

The inequality structure was uniform in 1988; income distribution was mainly age-based. The structure, however, changed in 1995, and the role of education in inequality became significant. Education was also the major factor contributing to the inequality increase over the period.

These changes reflect the penetration of the market mechanism into the Chinese economy, which was induced by the reform policy. After the Southern Tour Lectures in 1992, China identified itself as a socialist market economy and focused on making its economy more market-oriented through accelerating economic reform. The income differentials within and between provinces increased as Dengist Xianfu theory implied. The emerging labor market encouraged workers' incomes to be determined more on the basis of their working ability and skills than before. Marketization has increased inequality and made the Chinese economy more meritocratic.

However, it is not necessarily appropriate that the income disparity between workers is totally justified by a meritocracy, especially in China. To justify it, opportunities for upward income mobility need to be widely available. However, people's opportunities for advancement

people's opportunity for investment.

⁶ Some studies analyze the role of people's family background on their educational attainment, using the Chinese urban household data (Knight and Song (1993), and Yan (2001)). They find that family background, such as a family's social class or parents' educational attainment, influences children's educational attainment.

have been unevenly distributed among regions and among social classes. The reform policy, shown exactly in Dengist Xianfu theory, treated people and provinces unevenly. Some regions were given priority to have the opportunity to connect with the world economy and foreign capital. In addition, marketization might open up avenues to upward income mobility for Chinese people through educational attainment, one of the most important factors on income inequality in our analysis. Nevertheless, access to higher education was limited and unevenly distributed. Moreover, there is much less freedom of job choice in China than in developed countries (Yan (2001)). To summarize, China seems to have become a more market-oriented and meritocratic economy with less equality of opportunity. Hereafter, equality of opportunity needs to be promoted along with marketization.

Finally, some political implications of the inequality increase in China are discussed. The rapid increase in income inequality means that the Chinese people are being separated into a large number of low-income people and a small number of high-income people. The CPC intends to incorporate these new rich people, who have come to have power recently, into its political base. At the 16th National Congress of CPC in 2002, the Three Represents (San ge Daibiao) Thought was stipulated in the CPC constitution entitling people with non-state economic sectors, such as owners of private enterprises, to join the CPC. However, these changes might raise dissatisfaction among low-income people, the original support base for the CPC and estrange them from the CPC. This situation, therefore, might cause political instability.

A large proportion of the Chinese people still have low incomes and are therefore likely to favor policies that are egalitarian and attach importance to redistribution. That is reasonable from their perspective of self-interest. Nevertheless, the actual policies seem to reflect more the interests of the minority—the new rich, such as private entrepreneurs—because the Chinese government has set the market-oriented economic reform as the first priority for economic growth. Anthony Downs (1957, Chapter 10, page 16) says, “Democratic governments tend to redistribute income from the rich to the poor.” The Chinese government is not a democratic government in the Western sense and, hence, his statement cannot wholly be applied to the Chinese case. Nonetheless, it must be difficult for any government to continue to go against the interests of the majority of people.

Considering these problems, China is now faced with many challenges to overcome. The Chinese government needs to establish some kind of income redistribution system, as developed countries did in the 20th century, and reconstruct the social security system in the new market-oriented economy, furthermore promoting equality of opportunity among people.

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APPENDIX 1. Regression-Based Approach to Inequality Decomposition

We start with the income (earnings) function as follows:

$$\ln Y_i = \alpha + \sum_k \beta_k x_{ik} + \varepsilon, \quad (1)$$

where Y_i : income (earnings) of worker i ,

x_{ik} : k th explanatory variable of worker i .

As Fields and O'Hara (1999) and Fields and Yoo (2000) indicated, given the income function (1), and using the theorem 3 by Shorrocks (1982, p. 204), the decomposition rule of income inequality is given by:

$$s_k = \text{cov}[\beta_k \mathbf{x}_k, \ln \mathbf{Y}] / \sigma^2(\ln \mathbf{Y}) = \beta_k \sigma(\mathbf{x}_k) \text{cor}[\mathbf{x}_k, \ln \mathbf{Y}] / \sigma(\ln \mathbf{Y}), \quad (2)$$

where s_k : proportion of total inequality contributed by factor k .

This decomposition rule (2) holds for any inequality index, such as Gini, variance and CV, which satisfies the six assumptions proposed by Shorrocks (1982). As indicated by the formula, the characteristic of this decomposition rule (2) is to produce a zero inequality contribution of a factor k which is not correlated to total income (Shorrocks (1982, 1983), and Morduch and Sicular (1998, 2002)).

Combining s_k of (2) with inequality estimated by an arbitrary inequality index, the relationship between the change of the inequality and the factor between two years is given:

$$I(\cdot)_t - I(\cdot)_0 = \sum_k [s_{kt} * I(\cdot)_t - s_{k0} * I(\cdot)_0], \quad (3)$$

where $I(\cdot)_t$: inequality of log-incomes at the year of t estimated by an inequality index.

The contribution of the k th factor to the change of inequality between two years is given by:

$$\Pi_k(I(\cdot)) = (s_{kt} * I(\cdot)_t - s_{k0} * I(\cdot)_0) / (I(\cdot)_t - I(\cdot)_0). \quad (4)$$

APPENDIX 2. Regression Results

	Urban		Beijing		Shanxi	
	1988	1995	1988	1995	1988	1995
Age						
Age	0.047** (30.4)	0.115** (25.4)	0.034** (5.9)	0.106** (7.0)	0.039** (8.8)	0.096** (8.0)
Age squared	-0.000** (21.1)	-0.001** (22.5)	-0.000** (3.4)	-0.001** (6.9)	-0.000** (5.2)	-0.001** (6.8)
Sex						
Sex	-0.005 (0.9)	-0.138** (10.6)	0.000 (0.0)	-0.174** (3.9)	-0.021 (1.4)	-0.232** (6.4)
Membership						
Membership	0.071** (9.5)	0.109** (6.5)	0.032 (1.2)	0.152** (2.9)	0.091** (3.8)	0.034 (0.7)
Sector						
sec1	0.073** (4.7)	-0.011 (0.3)	0.089 (1.3)	0.430** (3.0)	0.289** (8.2)	0.029 (0.2)
sec2	0.097** (8.8)	0.040 (1.8)	0.132** (3.2)	0.003 (0.0)	0.079* (2.6)	0.009 (0.2)
sec3	0.116** (6.7)	0.087* (2.1)	0.131 (1.9)	0.092 (0.7)	-0.004 (0.1)	-0.152 (0.9)
sec4	0.088** (8.3)	0.075** (3.6)	0.103** (2.7)	0.015 (0.2)	0.046 (1.6)	0.056 (1.0)
sec6	-0.046 (1.4)	-0.087 (1.2)	-0.245** (2.9)	0.342 (1.6)	0.002 (0.0)	0.313 (1.4)
Occupation						
occ1	0.048 (1.7)	-0.348** (6.0)	0.110 (1.3)	0.047 (0.2)	0.014 (0.2)	-0.144 (1.1)
occ3	0.050** (3.8)	0.001 (0.0)	0.057 (1.3)	0.041 (0.5)	0.029 (0.8)	-0.069 (1.0)
occ4	-0.005 (0.5)	-0.082** (4.1)	-0.009 (0.2)	-0.045 (0.6)	-0.063* (2.3)	-0.124* (2.3)
occ5	-0.042** (4.2)	-0.143** (7.1)	-0.007 (0.2)	-0.126 (1.9)	-0.070* (2.5)	-0.130* (2.3)
Ownership						
owner1	-0.202** (7.1)	-0.285** (6.0)	-0.065 (0.8)	-0.204 (1.2)	-0.187 (1.5)	0.327 (1.8)
owner2	-0.233** (8.2)	-0.387** (8.3)	-0.105 (1.3)	-0.233 (1.4)	-0.298* (2.4)	-0.007 (0.0)
owner3	-0.330** (11.5)	-0.538** (11.1)	-0.178* (2.2)	-0.571** (3.0)	-0.382** (3.1)	-0.239 (1.3)
owner5	-0.393** (8.1)	-0.062 (0.5)	-0.226 (0.7)	-0.586 (1.0)	-0.629** (3.7)	-1.015* (2.4)
Education						
edu1	0.174** (11.7)	0.372** (9.4)	0.098 (1.8)	0.258 (0.9)	0.174** (3.9)	0.403** (3.4)
edu2	0.101** (7.1)	0.302** (8.4)	0.086 (1.5)	0.158 (0.5)	0.102* (2.4)	0.338** (3.0)
edu3	0.081** (6.6)	0.273** (7.8)	0.061 (1.1)	0.085 (0.3)	0.114** (3.1)	0.415** (3.8)
edu4	0.088** (8.7)	0.204** (6.3)	0.032 (0.7)	0.155 (0.5)	0.101** (3.2)	0.299** (2.9)
edu5	0.067** (7.4)	0.133** (4.3)	0.089* (2.0)	0.131 (0.5)	0.111** (3.9)	0.222* (2.2)
F value						
F value	278.2**	106.7**	18.6**	6.8**	47.3**	22.2**
Adj. R²						
Adj. R ²	0.259	0.201	0.313	0.152	0.356	0.315
N						
N	17459	9227	851	706	1846	1018

Notes: Absolute value of t-statistics is in parentheses.

Statistical significance at the 0.01 level and 0.05 level are indicated as ** and * respectively.

APPENDIX 2. (continued, 2/4)

	Liaoning		Jiangsu		Anhui	
	1988	1995	1988	1995	1988	1995
Age						
Age	0.027** (7.2)	0.110** (8.8)	0.054** (16.2)	0.163** (14.5)	0.052** (11.2)	0.102** (7.9)
Age squared	-0.000** (3.6)	-0.001** (8.0)	-0.001** (12.1)	-0.002** (13.7)	-0.000** (7.9)	-0.001** (7.4)
Sex	0.006 (0.5)	-0.178** (5.2)	0.004 (0.3)	-0.122** (3.4)	-0.002 (0.1)	-0.167** (4.3)
Membership	0.079** (5.1)	0.102* (2.2)	0.056** (3.3)	0.138** (2.8)	0.080** (3.2)	0.066 (1.3)
Sector						
sec1	0.206** (4.7)	0.049 (0.4)	0.140** (3.8)	0.511** (3.1)	0.052 (1.1)	-0.257* (2.3)
sec2	0.114** (4.6)	0.221** (3.1)	0.082** (3.2)	0.006 (0.1)	0.165** (4.3)	-0.121 (1.8)
sec3	0.229** (6.9)	0.265** (2.8)	0.093 (1.9)	0.287* (2.1)	0.165** (2.9)	-0.155 (1.2)
sec4	0.120** (4.8)	0.181** (2.6)	0.083** (3.3)	0.107 (1.6)	0.089* (2.4)	-0.007 (0.1)
sec6	0.088 (0.9)	0.088 (0.7)	-0.313** (3.2)	-0.046 (0.2)	0.293* (2.3)	-0.018 (0.1)
Occupation						
occ1	0.176* (2.4)	-0.213 (1.4)	0.462** (3.8)	-0.304 (1.6)	-0.168 (1.9)	-0.019 (0.1)
occ3	0.062* (2.3)	0.097 (1.4)	0.134** (3.6)	-0.003 (0.0)	0.036 (0.8)	-0.040 (0.6)
occ4	-0.007 (0.3)	-0.171** (3.2)	0.020 (1.0)	-0.003 (0.1)	0.002 (0.1)	-0.131* (2.2)
occ5	-0.006 (0.3)	-0.061 (1.2)	-0.044* (2.1)	-0.116* (2.0)	-0.041 (1.3)	-0.275** (4.5)
Ownership						
owner1	-0.502** (4.9)	-0.271 (1.8)	0.237* (2.2)	-0.145 (1.3)	-0.088 (0.9)	0.146 (0.8)
owner2	-0.593** (5.8)	-0.422** (2.9)	0.204 (1.9)	-0.203 (1.9)	-0.134 (1.3)	-0.003 (0.0)
owner3	-0.634** (6.2)	-0.625** (4.1)	0.089 (0.8)	-0.377** (3.4)	-0.321** (3.2)	-0.229 (1.3)
owner5	-0.176 (1.0)	-0.250 (0.7)	0.460** (3.6)	-0.135 (0.3)	-0.636** (3.2)	0.621 (1.6)
Education						
edu1	0.135** (3.5)	0.688** (5.1)	0.148** (4.6)	0.47** (4.3)	0.281** (6.0)	0.048 (0.4)
edu2	0.092** (2.6)	0.571** (4.6)	0.106** (3.4)	0.457** (4.6)	0.249** (5.5)	0.065 (0.6)
edu3	0.065 (1.9)	0.541** (4.3)	0.101** (3.7)	0.499** (5.3)	0.148** (3.8)	0.042 (0.4)
edu4	0.062* (2.0)	0.405** (3.3)	0.094** (4.5)	0.393** (4.6)	0.140** (4.7)	0.057 (0.6)
edu5	0.052 (1.9)	0.315** (2.7)	0.089** (4.8)	0.303** (3.8)	0.153** (5.9)	-0.016 (0.2)
F value	44.5**	16.1**	63.9**	19.7**	45**	14.6**
Adj. R ²	0.342	0.229	0.379	0.263	0.362	0.283
N	1848	1120	2267	1151	1704	761

APPENDIX 2. (continued, 3/4)

	Henan		Hubei		Guangdong	
	1988	1995	1988	1995	1988	1995
Age						
Age	0.048** (12.4)	0.083** (6.1)	0.041** (10.7)	0.077** (6.9)	0.060** (10.3)	0.105** (6.6)
Age squared	-0.000** (8.5)	-0.001** (5.3)	-0.000** (7.1)	-0.001** (5.6)	-0.001** (8.4)	-0.001** (6.0)
Sex	-0.015 (1.1)	-0.178** (4.3)	0.002 (0.1)	-0.033 (1.2)	-0.009 (0.5)	-0.099* (2.2)
Membership	0.091** (4.7)	0.104 (1.9)	0.052** (3.2)	0.127** (3.6)	0.085** (2.9)	0.116* (2.1)
Sector						
sec1	0.111* (2.4)	0.043 (0.3)	-0.014 (0.3)	-0.135 (1.3)	-0.095 (1.0)	-0.165 (1.0)
sec2	0.100** (3.7)	0.079 (1.2)	0.089** (3.5)	-0.020 (0.4)	0.044 (1.1)	-0.008 (0.1)
sec3	0.053 (1.1)	-0.088 (0.5)	0.129** (3.7)	-0.175* (2.2)	0.092 (1.4)	0.563** (3.4)
sec4	0.065* (2.5)	0.063 (1.0)	0.059* (2.4)	-0.021 (0.5)	0.098** (2.6)	0.030 (0.4)
sec6	0.049 (0.5)	-	0.100 (1.0)	0.045 (0.1)	-0.107 (1.1)	-0.092 (0.3)
Occupation						
occ1	-0.164* (2.0)	-0.290 (1.5)	0.357** (3.5)	-0.074 (0.6)	0.402** (4.7)	-0.429** (2.6)
occ3	0.008 (0.2)	0.049 (0.6)	0.023 (0.8)	-0.049 (1.0)	0.129* (2.5)	0.093 (1.1)
occ4	-0.047 (1.9)	-0.113 (1.6)	0.000 (0.0)	-0.049 (1.2)	0.050 (1.3)	-0.115 (1.7)
occ5	-0.097** (3.6)	-0.283** (4.1)	-0.022 (1.0)	-0.102* (2.3)	-0.027 (0.7)	-0.228** (3.2)
Ownership						
owner1	-0.014 (0.1)	0.200 (1.0)	0.132 (1.1)	0.133 (1.1)	-0.056 (1.0)	-0.037 (0.3)
owner2	-0.070 (0.8)	-0.019 (0.1)	0.074 (0.6)	-0.008 (0.1)	-0.224** (4.1)	-0.254** (2.7)
owner3	-0.210* (2.3)	-0.137 (0.6)	0.023 (0.2)	-0.193 (1.5)	-0.129* (2.3)	-0.167 (1.7)
owner5	-0.123 (0.4)	-	-0.272 (1.7)	-0.330 (1.0)	-0.419** (4.2)	0.006 (0.0)
Education						
edu1	0.179** (4.6)	0.251 (1.9)	0.186** (5.1)	0.316** (3.3)	0.184** (3.4)	0.348** (2.9)
edu2	0.113** (3.1)	0.229 (1.9)	0.094** (3.0)	0.196* (2.2)	0.141** (2.6)	0.392** (3.8)
edu3	0.091** (2.8)	0.206 (1.8)	0.078** (2.7)	0.156 (1.8)	0.040 (0.9)	0.351** (3.4)
edu4	0.103** (3.8)	0.181 (1.7)	0.089** (3.6)	0.104 (1.2)	0.071* (2.1)	0.086 (1.0)
edu5	0.074** (3.0)	0.087 (0.9)	0.051* (2.2)	0.076 (0.9)	0.039 (1.3)	0.113 (1.3)
F value	56.9**	14.1**	40.0**	16.0**	24.3**	10.6**
Adj. R ²	0.378	0.226	0.310	0.233	0.197	0.193
N	2020	900	1910	1088	2088	887

APPENDIX 2. (continued, 4/4)

	Yunnan				Gansu			
	1988		1995		1988		1995	
Age								
Age	0.016**	(4.0)	0.104**	(8.0)	0.047**	(8.6)	0.122**	(8.1)
Age squared	-0.000	(0.9)	-0.001**	(6.9)	-0.000**	(5.5)	-0.001**	(6.7)
Sex	0.002	(0.2)	-0.094**	(3.0)	0.022	(1.1)	-0.102*	(2.4)
Membership	0.068**	(3.8)	0.048	(1.3)	0.100**	(4.0)	0.067	(1.1)
Sector								
sec1	0.059	(1.6)	-0.211**	(2.6)	-0.050	(1.0)	-0.021	(0.2)
sec2	0.189**	(7.0)	-0.014	(0.3)	0.021	(0.5)	-0.040	(0.6)
sec3	0.103*	(2.2)	-0.044	(0.4)	0.074	(1.3)	0.007	(0.1)
sec4	0.047	(1.8)	-0.057	(1.2)	0.003	(0.1)	0.064	(1.1)
sec6	-0.156	(1.6)	-0.485**	(2.6)	-0.014	(0.2)	-1.113**	(5.5)
Occupation								
occ1	0.010	(0.1)	0.021	(0.1)	0.184	(1.7)	0.083	(0.3)
occ3	0.001	(0.0)	-0.035	(0.7)	-0.018	(0.4)	0.063	(0.8)
occ4	-0.060**	(2.6)	-0.121**	(2.7)	-0.075*	(2.1)	-0.079	(1.2)
occ5	-0.105**	(4.3)	-0.212**	(4.5)	-0.120**	(3.1)	-0.067	(0.9)
Ownership								
owner1	0.163	(1.6)	0.042	(0.2)	0.375**	(2.6)	0.411	(0.9)
owner2	0.112	(1.1)	-0.013	(0.1)	0.330*	(2.2)	0.281	(0.6)
owner3	-0.065	(0.6)	-0.191	(1.1)	0.171	(1.2)	-0.096	(0.2)
owner5	-0.296*	(2.2)	0.381	(1.0)	-0.168	(0.9)	0.219	(0.3)
Education								
edu1	0.100**	(2.6)	0.291**	(3.4)	0.222**	(4.5)	0.549**	(4.4)
edu2	0.116**	(3.2)	0.150*	(2.0)	0.119	(1.5)	0.421**	(3.5)
edu3	0.032	(1.2)	0.204**	(3.0)	0.161**	(3.9)	0.354**	(3.1)
edu4	0.016	(0.7)	0.137*	(2.0)	0.141**	(4.0)	0.281**	(2.8)
edu5	0.016	(0.8)	0.125*	(2.0)	0.144**	(4.4)	0.340**	(3.5)
F value	35.6**		13.5**		37.2**		18.0**	
Adj. R ²	0.298		0.212		0.415		0.396	
N	1799		1025		1126		571	