

Income Inequality in the People's Republic of China and Its Decomposition: 1990–2004

TUN LIN, JUZHONG ZHUANG, DAMARIS YARCIA, AND FEN LIN

This paper estimates income inequality in the People's Republic of China at the national, regional, and provincial levels using extrapolated unit-level household income data covering urban and rural populations of 23 provinces during 1990–2004. The estimates indicate that income inequality increased significantly during the last two decades, but the extent of the increases was lower than reported in most sources by about 20 percent when regional differences in cost of living are adjusted. The major sources of the increases in inequality were found to be within urban inequality and between urban and rural inequality, with their contribution increasing, respectively, from 15.7 and 12.0 percent in 1990, to 34.0 and 30.4 percent in 2004. The between-region and between-province inequality only accounted for 3.8 and 11.2 percent, respectively, in 2004.

I. INTRODUCTION

The continued high growth in the People's Republic of China (PRC) since it embarked on economic reforms in the late 1970s has been accompanied by rising income inequality. During 1985–2006, the country's real per capita gross domestic product grew at an annual average rate of 8.5 percent. The rapid growth led to an unprecedented reduction in the incidence of poverty, from 32.5 percent in 1990 to 7.1 percent in 2005, measured by the \$1-a-day international poverty line (Ali and Zhuang 2007). However, the Gini coefficient of per capita income also increased, from about 0.30 in the early 1980s to about 0.45 in 2001 at the national level (Ravallion and Chen 2007).

The literature on income inequality in the PRC is extensive. Three types of data have been used by researchers: unit-level household survey data, aggregate income data, and grouped household survey data. Due to the absence of consistent data covering the entire PRC, studies based on unit-level data often focus on a particular segment of the population, such as urban households (Cao and Nee 2005, Meng 2004) or rural households (Gustafsson and Li 2002), for

Tun Lin is Natural Resource Economist at the East Asia Department; Juzhong Zhuang is Assistant Chief Economist at the Economics and Research Department (ERD), ADB; Damaris Yarcia is consultant, Economics and Research Department, Asian Development Bank; and Fen Lin is Ph.D. Candidate of Sociology, University of Chicago.

isolated years.¹ Aggregate data, often at the provincial level, have been used to investigate the spatial dimension of inequality (Hussain and Zhuang 1994, Kanbur and Zhang 2005). More recently, attempts have been made to study the PRC's income inequality by extrapolating unit-level data from grouped household income data. Notable examples are Ravallion and Chen (2007) and Chotikapanich et al. (2007). Despite these efforts, the picture of income inequality in the PRC is still incomplete, and many questions remain unanswered. For instance, although the widening spatial disparity and urban–rural income gap are often highlighted as the key drivers of increases in the national inequality, quantification of their relative contributions using data representative of the entire PRC is still absent.

This paper investigates income inequality in the PRC using data representing more than 85 percent of the country's population. It has two specific objectives. The first is to examine the trends of urban, rural, and overall inequality at the national, regional, and provincial levels during 1990–2004. The second objective is to carry out decomposition analyses to examine and quantify to what extent the increases in the national inequality were driven by rural inequality, urban inequality, inequality between urban and rural populations, and inequalities within and between regions or provinces; including how the relative importance of each of these components has changed over time.

Following Ravallion and Chen (2007) and Chotikapanich et al. (2007), this paper uses the extrapolated unit-level data from grouped household income data. The grouped data, compiled by the authors from provincial statistical yearbooks of 23 provinces for 1990, 1995, 2000, and 2004, are disaggregated by province and by rural and urban population. This data set is the most comprehensive and up-to-date among similar data sets available in the public domain. Chotikapanich et al. (2007) report results based on grouped income data disaggregated only by urban and rural populations, not by province. The grouped data used by Ravallion and Chen (2007), although disaggregated both by province and by rural and urban population, are only up to 2001 and are not available in the public domain.² Neither Chotikapanich et al. nor Ravallion and Chen carried out decomposition analyses to quantify relative contributions of different components of the PRC's overall inequality.

For a country as large as the PRC, it is important to consider cross-region differences in the cost of living (COL) in estimating income inequality, to avoid

¹Although the National Bureau of Statistics of China (NBSC) has conducted household income and expenditure surveys of urban and rural populations in all the provinces annually since the mid-1980s, NBSC has not released all the unit-level survey data officially.

²The data set, made available exclusively to the authors by NBSC, is in the form of tabulations of income distribution following a standardized design in which households are ranked by income per person and all fractiles are population weighted. See Ravallion and Chen (2007).

biases. This issue has often been overlooked in studies on the PRC's income inequality. Both Chotikapanich et al. and Ravallion and Chen tried to eliminate this source of bias by adjusting for urban–rural, but not interprovincial, COL differences. Ravallion and Chen found that the national Gini coefficient in 2001 would be 0.394 when adjusted for COL differences, compared with 0.447 otherwise. In estimating income inequality, this paper adjusts for both urban–rural and interprovincial COL differences, the latter being derived from a study on province-specific poverty lines (ADB 2001).

The rest of this paper is organized as follows. Section II discusses the data and Section III describes the methodology. Section IV examines income inequality in urban and rural areas as well as at national, regional, and provincial levels. Section V presents the results of the decomposition analyses. Finally, Section VI summarizes key findings and discusses policy implications.

II. DATA

This study uses grouped income data of 23 of the PRC's 31 provinces, separated into urban and rural populations. The data are published in the PRC's provincial statistical yearbooks for the years 1990, 1995, 2000, and 2004. The eight provinces not covered are Chongqing, Gansu, Guizhou, Hainan, Jilin, Ningxia, Shandong, and Tibet. Chongqing only gained provincial status in 1997. Data for the other seven provinces are not available either for rural or urban populations, or both. The eight provinces accounted for about 12–15 percent of the total PRC population during the study period. Sichuan was also not included in 1995 and 2000 due to the lack of data on rural population.

A. Income and Distribution Data

The provincial statistical yearbooks provide grouped net income data for rural households and disposable income data for urban households. For rural households, the data are in the form of shares of households corresponding to various ranges of per capita net income in yuan, such as CNY100–200, CNY200–300, and CNY300–500. For urban households, the data are mostly in the form of per capita mean disposable income corresponding to various percentiles of income distribution: 0–10th, 10–20th, 20–40th, 40–60th, 60–80th, 80–90th, and 90–100th of households. In some cases, distributions are presented in quintiles (0–20th, 20–40th, 40–60th, 60–80th, 80–100th) or other percentiles. Since the shares and percentiles both refer to households, to estimate distribution of per capita income, we used the household size of each income group as the weight.

Ravallion and Chen highlighted a number of limitations in the household survey data. One is that the data do not include imputed rents for own-occupied housing. This works toward underestimating income inequality, as richer

households tend to live under better housing conditions. Another is that, for rural households, although the net income captures imputed values from consumption of own-farm production, the imputed values may be underestimated in earlier years. This was especially true before the mid-1990s, when public procurement prices rather than local market prices were used in valuation and the former tended to be lower than the latter. This works toward overestimating urban–rural income gaps. A further limitation, which is commonly associated with income as a welfare indicator, is that the data do not reflect imputed values of various public services, such as health, education, water, and sanitation. Since all of these services tend to be better provided in urban than in rural areas, this works toward underestimating urban–rural welfare gaps. These three sources of bias will cancel each other out to some extent, but maybe not completely. Whether the net effect works toward under- or over-estimating income inequality is unclear.

Apart from these limitations, a number of assumptions were made in estimating income inequality, and these assumptions may also lead to biases. The first is that, for rural households, the highest income range is sometimes defined as “above a certain income level” in the provincial statistical yearbooks, and no upper bound is provided. Datt (1998), in his study of rural inequality in India, assumed that the upper bound is 1.3 times the lower bound when the upper bound is missing for the highest income range. We followed this approach, since after examining cases where both the mean income and income range are presented, this ratio appears applicable to the rural PRC. For the other income ranges, the midpoint is assumed as the mean income unless the actual mean income is indicated. Second, in a few cases, only expenditure data are available. In such cases, income data were inferred from the expenditure-income ratio of the next year when both income and expenditure data are available. Third, in a few cases where data on the household size are not available, the household size was estimated using the following equation:

$$h_{ip} = \alpha_i + \beta_i \bar{h}_p$$

where h_{ip} is the average household size of the i th income group in the p th province; \bar{h}_p is mean household size of the p th province, and α_i and β_i are estimated by applying ordinary least squares (OLS) regression to the grouped income data for each income group, separately for urban and rural populations.

Last, for several provinces included in the study, grouped income data are not available in 1990 or 2004. Under such circumstances, we extrapolated the distribution from the nearest year when grouped income data were available. In particular, income distribution of urban Hebei in 2004 was extrapolated from 2005; rural Inner Mongolia in 1990, from 1985; urban Liaoning in 1990, from

1995; rural Shaanxi in 1990, from 1992; rural Shanghai in 1990, from 1992; rural Xinjiang in 1990, from 1992; and urban Xinjiang in 1990, from 1992.

B. Population Data

Due to the lack of consistent rural and urban population data, this study follows many other studies (such as Wan 2007), and uses “agricultural population” (*nongye renkou*) and “nonagricultural population” (*fei nongye renkou*) to derive rural and urban per capita income for all the provinces. This is justified by the fact that the sample frames used by the National Bureau of Statistics of China (NBSC) in its household surveys are based on the country’s household registration system, which differentiates agricultural from nonagricultural population.

C. Province-specific Rural and Urban Cost-of-Living Data

The provincial statistical yearbooks report nominal incomes. To estimate income inequality—free of biases due to COL differences across provinces as well as between urban and rural areas—this study adjusted nominal incomes by province-specific rural and urban COL indexes. The adjustment involves three steps. The first step is to deflate the nominal incomes by province-specific urban and rural consumer price indexes, obtained from provincial statistical yearbooks, taking 1993 as the base year. The effect of this adjustment (temporal price effect) on inequality proved to be small, consistent with earlier studies (see Liu 2006). The second step is to further adjust both urban and rural incomes by province-specific COL indexes, estimated from province-specific urban poverty lines reported in a study on province-specific poverty lines in the PRC (ADB 2001). In the third step, since province-specific rural poverty lines were not available, following Ravallion, Chen, and Sangraula (2007), we assumed that the urban poverty line was 1.37 times the rural poverty line for all the provinces.

III. METHODOLOGY

To extrapolate unit-level data from the grouped income data, the first step is to estimate a Lorenz curve. To do this, a general quadratic distribution Lorenz curve or a beta distribution Lorenz curve was fitted to province-specific grouped income data for urban and rural populations, respectively, with the aid of a computer program.³ The beta Lorenz curve takes the form

$$L(p) = p - \theta p^\gamma (1 - p)^\delta$$

³The program is a STATA-based version of the World Bank’s POVCAL program.

and the general quadratic Lorenz Curve takes the form

$$L(p) = -\frac{1}{2}[bp + e + (mp^2 + np + e^2)^{\frac{1}{2}}]$$

where $L(p)$ is the share of the bottom p percent of the population in income, and $\theta, \gamma, \delta, b, e, m, n$ are parameters to be estimated. Datt (1998) discusses in detail the conceptual issues and procedures underlying this approach.

With the Lorenz curve, unit-level income data can be extrapolated using the following relationship:

$$L'(p) = x / \mu$$

where x is the unit-level income, and μ is the mean per capita income of each province.⁴ This states that an individual's income is the product of the slope of the Lorenz curve at the point that he or she represents and the mean income of the population. Therefore, in this study, the derivative of an estimated Lorenz curve with respect to each observation is multiplied with the mean income of each province to extrapolate the unit-level income data. Income data are aggregated into national, regional, or provincial data with population as weights. To assess the reliability of the extrapolated unit-level data, we compared levels of inequality estimated from these data with some of those estimated from actual unit-level data and found that the results are close. For example, Dai (2005) shows that the Gini coefficients for urban Beijing were 0.16 in 1989, 0.15 in 1991, 0.20 in 1995, and 0.21 in 2000. In this study, the Gini coefficients for urban Beijing were 0.165 in 1990, 0.209 in 1995, and 0.226 in 2000.

To measure income inequality, we used the Gini coefficient and Theil index—the first because of its wide currency and the second because it allows decomposing the overall income inequality into contributions by inequalities within and between subgroups of the population. The two measures possess the property of population independence and satisfy the transfer principle. The latter requires that transferring income from a richer person to a poorer one, without reversing their ranks in distribution, will lead to a fall in inequality. The expression for the Gini coefficient is

$$Gini = \frac{-(n+1)}{n} + \frac{2}{n^2\mu} \sum_{i=1}^n i \cdot y_i$$

⁴A program developed by the Asian Development Bank was used to generate the synthetic income data.

where y_i is income of individual i , μ is the mean income of the population, and n is the number of individuals in the population. The Theil index (T) can be computed as:

$$T = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\mu} \left(\ln \left(\frac{y_i}{\mu} \right) \right)$$

where y_i is income of individual i , μ is the population mean income, and n is the number of individuals in the population.

Assuming that a population consists of h subgroups and the Theil index of each subgroup is T_g , the overall inequality of the population measured by the Theil index, T , can then be computed as

$$T = \sum_{g=1}^h s_g T_g + \sum_{g=1}^h s_g \left(\ln \left(\frac{s_g}{p_g} \right) \right)$$

where s_g is group g 's income share of the total income and p_g is group g 's population share of the total population. The first summation is the average of the Theil indexes of h subgroups weighted by income shares, and gives the component of overall inequality that is due to inequality within subgroups. The second summation is the Theil index calculated on the mean income of each subgroup, and hence gives the component of overall inequality that is due to between-group inequality.

Unlike the Gini coefficient, which is bounded between 0 (indicating perfect equality) and 1 (indicating perfect inequality), the Theil index only has a lower bound of 0 (indicating perfect equality) but does not have an upper limit. However, it can be shown that the value of the Theil index is 1 for an inequality that is slightly above the equivalent to the frequently cited 80:20 distribution, that is, 80 percent of the wealth is owned by 20 percent of the population.

IV. EMPIRICAL RESULTS

Using the extrapolated unit-level data, we are able to estimate income inequality at national, regional, and provincial levels for 1990–2004. Both nominal income and real income—adjusted by COL differences across provinces and between urban and rural areas—are used in the estimation.

A. Income Inequality: Graphical Representations

We start the analysis by graphically showing shifts in income distribution during 1990–2004. Figure 1 plots the kernel probability density estimates of the nominal and COL-adjusted per capita income of the 23 provinces. Income distribution became more and more dispersed over time, suggesting rising inequality. However, there is a big difference between the probability densities of nominal incomes and of COL-adjusted real incomes. After adjusting for COL differences, the changes in the dispersion of income distributions over time became much less significant. This suggests that if COL differences are not adjusted, income inequality will be overestimated. Figure 2 plots the kernel probability density estimates of COL-adjusted real income for urban and rural populations. Clearly, the changes in dispersion of income distributions over time were more pronounced for urban than for rural population.

Figure 1. Shifts in Income Distribution in the PRC (National Level), 1990–2004

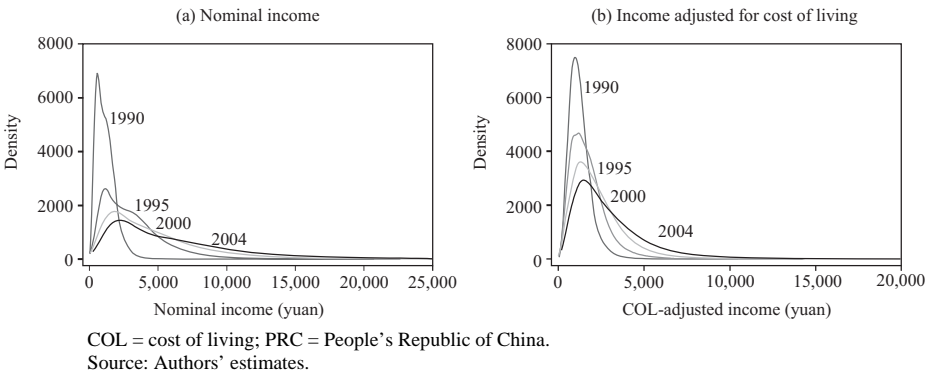
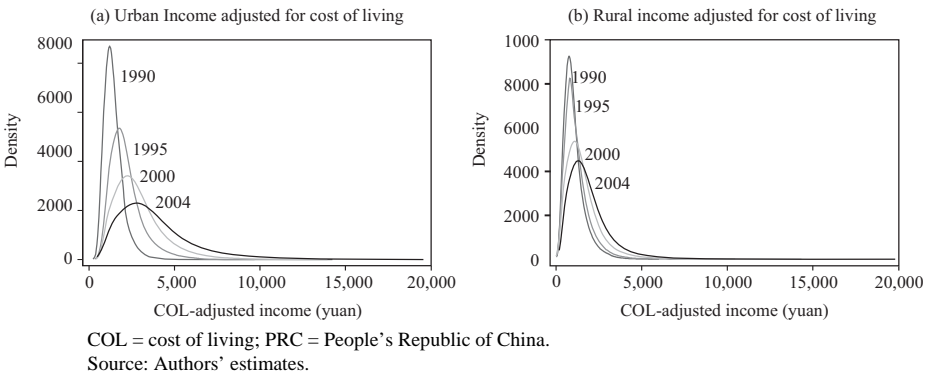


Figure 2. Shifts in Income Distribution in the PRC (Urban and Rural Areas), 1990–2004



B. Gini Coefficients and Theil Indexes

1. National Income Inequality

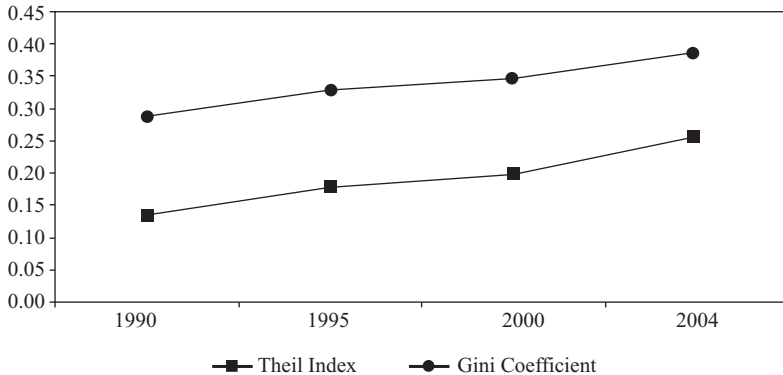
Table 1 reports the national Gini coefficients and Theil indexes of per capita income estimated from the extrapolated unit-level data. In the case of nominal income, the Gini coefficient was 0.345 in 1990 and 0.456 in 2004. In the case of COL-adjusted real incomes, the Gini coefficient was 0.287 in 1990, and increased to 0.387 in 2004. Comparing the results from nominal incomes with those of the COL-adjusted real income, the difference is quite significant. Not allowing for COL differences overestimates the Gini coefficients by about 20 percent. The trend of the Theil index is similar to that of the Gini coefficient—the Theil index was 0.194 in 1990 and increased to 0.365 in 2004. However, after adjusting for COL differences, the Theil index only increased from 0.135 in 1990 to 0.256 in 2004. COL-adjusted national Gini coefficients and Theil indexes are also plotted in Figure 3.

Table 1. The PRC’s National Income Inequality, 1990–2004

	Theil Index		Gini Coefficient	
	Nominal	COL-Adjusted	Nominal	COL-Adjusted
1990	0.194	0.135	0.345	0.287
1995	0.264	0.177	0.397	0.329
2000	0.284	0.199	0.411	0.347
2004	0.365	0.256	0.456	0.387

COL = cost of living; PRC = People’s Republic of China.
Source: Authors’ estimates.

Figure 3. COL-Adjusted National Gini Coefficients and Theil Indexes in the PRC, 1990–2004



COL = cost of living; PRC = People’s Republic of China.
Source: Authors’ estimates.

2. Inequality in Urban and Rural Areas

Table 2 shows that inequality increased in both urban and rural areas during 1990–2004. Rural inequality was greater than urban inequality in 1990, and the difference was quite significant, whether measured by the Gini coefficient or Theil index, and whether using nominal income or COL-adjusted real income. But the pace of increase for urban inequality was much faster than that of rural inequality, resulting in a convergence between the two: in 2004, they were very close, although rural inequality was still slightly higher than urban inequality.

Table 2. Rural and Urban Income Inequality in the PRC, 1990–2004

	Theil Index		Gini Coefficient	
	Rural	Urban	Rural	Urban
Nominal Income				
1990	0.161	0.081	0.307	0.220
1995	0.191	0.120	0.334	0.268
2000	0.200	0.148	0.346	0.300
2004	0.214	0.200	0.349	0.341
COL-Adjusted Real Income				
1990	0.141	0.069	0.290	0.205
1995	0.156	0.086	0.305	0.229
2000	0.170	0.116	0.319	0.268
2004	0.188	0.169	0.329	0.318

COL = cost of living; PRC = People's Republic of China.

Source: Authors' estimates.

3. Inequality by Region

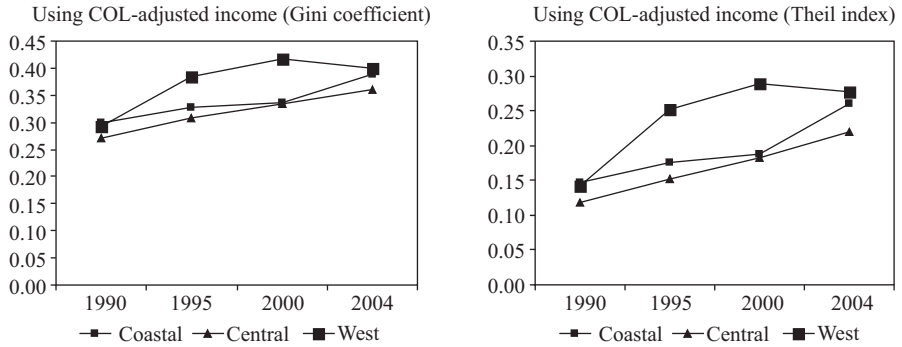
We also looked at the inequality by region. For this purpose, we divided the 23 provinces into three regions:

- (i) the coastal region includes Beijing, Fujian, Guangdong, Guangxi, Hebei, Jiangsu, Liaoning, Shanghai, Tianjin, and Zhejiang;
- (ii) the central region covers Anhui, Heilongjiang, Henan, Hubei, Hunan, Inner Mongolia, Jiangxi, and Shanxi; and
- (iii) the western region consists of Qinghai, Shaanxi, Sichuan, Xinjiang, and Yunnan.

Figure 4 plots the three regions' Gini coefficients and Theil indexes of per capita income, adjusted by COL differences. In 1990, the coastal and western regions had more or less the same level of inequality, and the central region had the lowest level of inequality among the three regions, whether measured by the Gini coefficient or Theil index. During 1990–1995, inequality rose for all the three regions, with that of the western region rising the fastest. During 1995–

2000, inequality continued to rise in all the three regions, but there was a notable reduction in the pace, especially in the western and coastal regions. During 2000–2004, however, the pace of increase in inequality accelerated in the coastal region but was reduced in the western region, while inequality in the central region continued to rise at more or less the same pace as in the past 10 years.

Figure 4. Regional Income Inequality in the PRC, 1990–2004

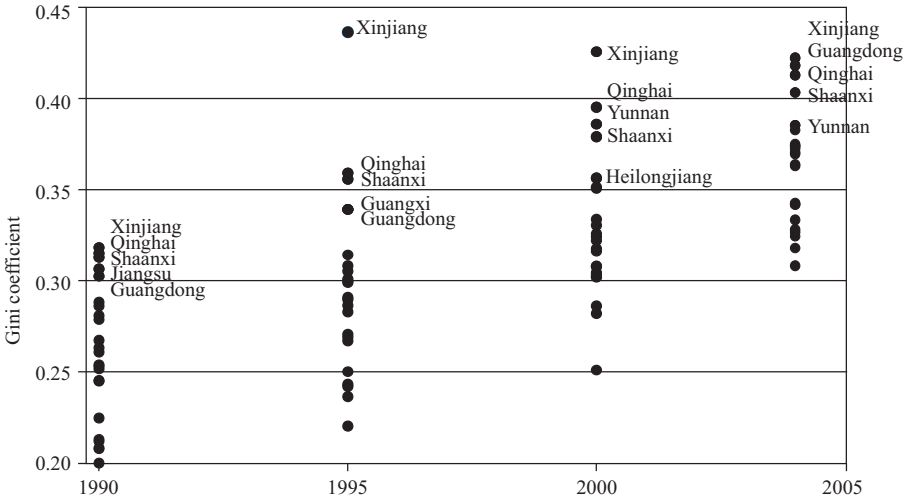


COL = cost of living; PRC = People’s Republic of China.
 Source: Authors’ estimates.

4. Inequality by Province

The province-specific unit-level data extrapolated from the grouped income data also allow us to estimate inequality by province. Figure 5 plots the Gini coefficients and Theil indexes of 23 provinces for 1990, 1995, 2000, and 2004. Xinjiang had the highest level of inequality in all 4 years. Qinghai and Shaanxi were in the top five most unequal provinces in all 4 years.

Figure 5. Inequality by Province Using COL-Adjusted Income (Gini Coefficients), 1990–2004



COL = cost of living; PRC = People's Republic of China.
 Source: Authors' estimates.

5. Comparison with Other Studies

Table 3 compares the Gini coefficient estimates of this study with those of Ravallion and Chen (2007). We found that, in the case of nominal incomes, our estimates are very close to those of Ravallion and Chen (although most were slightly lower), whether we look at national, urban, or rural inequality. For instance, in 1990, our estimates of national, urban, and rural inequality are 0.345, 0.307, and 0.220, respectively, compared to 0.349, 0.299, and 0.234, respectively, as reported in Ravallion and Chen. For 2000, our estimates are 0.411, 0.346, and 0.300, and the corresponding estimates of Ravallion and Chen are 0.438, 0.358, and 0.319. In the case of COL-adjusted incomes, our estimate of national inequality is only 0.347 in 2000, compared with 0.385 of Ravallion and Chen. This difference is largely because Ravallion and Chen only adjusted for urban–rural COL differences, while our adjustment of COL differences also covers the interprovincial dimension.

Table 3. Comparison with the Gini Coefficients Reported in Other Studies

Source	1990	1995	2000	2004
National Inequality				
This study (nominal)	0.345	0.397	0.411	0.456
Ravallion and Chen (nominal)	0.349	0.415	0.438	–
This study (COL-adjusted)	0.287	0.329	0.347	0.387
Ravallion and Chen (COL-adjusted)	0.316	0.365	0.385	–
Rural Inequality				
This study (nominal)	0.307	0.334	0.346	0.349
Ravallion and Chen (nominal)	0.299	0.340	0.358	–
This study (COL-adjusted)	0.290	0.305	0.319	0.329
Urban Inequality				
This study (nominal)	0.220	0.268	0.300	0.341
Ravallion and Chen (nominal)	0.234	0.283	0.319	–
This study (COL-adjusted)	0.205	0.229	0.268	0.317

– means data not available.

COL = cost of living; PRC = People's Republic of China.

Source: Ravallion and Chen (2007) and authors' estimates.

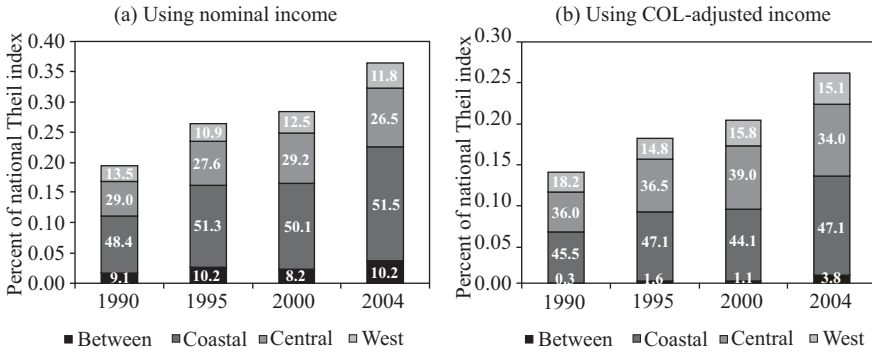
C. Income Inequality: Decomposition

A major advantage of the Theil index as an income inequality measure compared with others such as the Gini coefficient is that it allows one to decompose the income inequality of a population into contributions by subgroups. Assessing each subgroup's contribution to the overall inequality sheds light on where the income inequality comes from, as well as the policies to address it. In the case of inequality in the PRC, we have not seen decomposition analysis using unit-level data covering about 85 percent of the population.

1. Inequalities within and between Regions

One of the commonly cited causes of rising income inequality in the PRC is the widening income gap between coastal and interior regions. However, to what extent the spatial inequality has contributed to the PRC's overall income inequality is still not well understood. Efforts to decompose inequalities into between-region and within-region inequalities often use data in the form of provincial mean incomes, rather than unit-level incomes. Such decomposition cannot assess the importance of the spatial dimension in causing the increases in national income inequality. With the extrapolated unit-level data, we can answer this question. The results are shown in Figure 6.

Figure 6. Decomposition of the PRC's Inequality by Region (Theil Index), 1990–2004



COL = cost of living; PRC = People's Republic of China.
 Source: Authors' estimates.

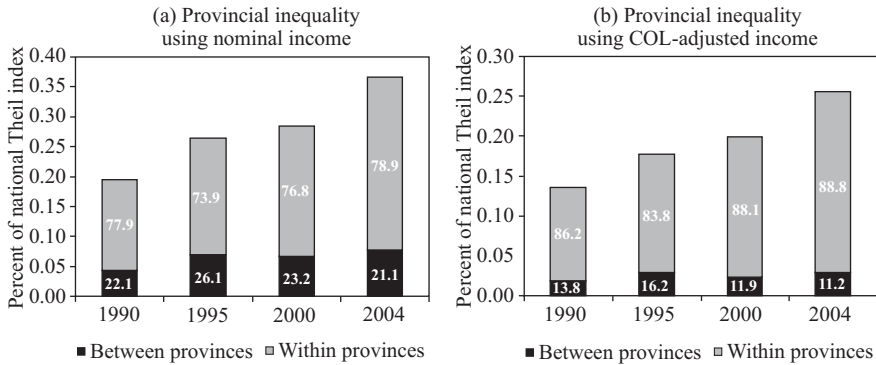
During 1990–2004, the absolute level of income inequality increased both within and between regions, whether measured in nominal incomes or COL-adjusted real incomes. In terms of relative contributions, however, the picture is mixed. In the case of COL-adjusted real incomes, the contribution of the between-region inequality was less than 1 percent in 1990, and only increased to 3.8 percent in 2004; i.e., interregional inequality in the PRC is very insignificant compared with intraregional inequality. This contrasts with the common perception that rising interregional inequality has been a key driver of rising inequality in the PRC during the last two decades. Even if we look at nominal incomes, the contribution of between-region inequality fluctuated around 10 percent during 1990–2004. This result is in stark contrast with earlier studies that concluded that interregional inequality was rising rapidly and accounted for the majority of the PRC's inequality (for example, Wan 2007). Such studies used the provincial mean income data to come up with intraregional inequality, therefore masking the inequality that occurs within each province and understating the magnitude of intraregional inequality and its contribution to overall inequality.

Among the components of intraregional inequalities, the contribution of the coastal region increased from 45.5 percent in 1990 to 47.1 percent in 2004 using COL-adjusted income; and from 48.4 to 51.5 percent in 2004 using nominal income. However, the contributions of both the western and central regions decreased during 1990–2004. In the case of COL-adjusted real income, the contribution of the western region declined from 18.2 percent in 1990 to 15.1 percent in 2004, and for the central region from 36.0 to 34.0 percent.

2. Inequalities between and within Provinces

Decomposition of overall inequality into between- and within-province components also shows that the “within” component has been the driving force of the rising inequality in the PRC (Figure 7). In the case of nominal incomes, contributions of between- and within-province inequality remained quite stable during 1990–2004, at about 21–23 percent and 77–79 percent, respectively, except in 1995 when between-province inequality increased to 26 percent while that of within-province inequality declined to 74 percent. In the case of COL-adjusted real incomes, within-province inequality actually increased, from 86 percent in 1990 to about 89 percent in 2004, while between-province inequality declined from about 14 percent in 1990 to about 11 percent in 2004. Given the relatively small magnitude of the contribution of interprovincial inequality to overall inequality, these results suggest that the rising inequality in the PRC during 1990–2004 was largely driven by inequality within each province. The most important drivers of national inequality were Guangdong, Henan, Hunan, Jiangsu, and Zhejiang.⁵

Figure 7. Decomposition of Inequality by Province (Theil Index), 1990–2004



COL = cost of living; PRC = People’s Republic of China.
 Source: Authors’ estimates.

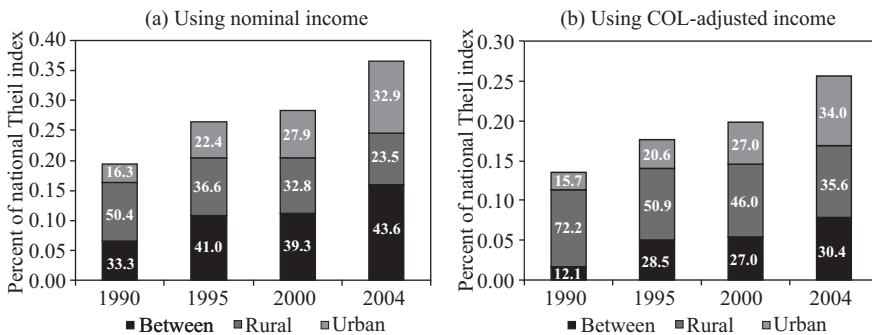
3. Inequalities between and within Urban and Rural Sectors

Figure 8 shows the components of inequality decomposed by between urban–rural inequality, within rural inequality, and within urban inequality. Income inequalities between rural and urban areas and within the urban area were rising fast and together accounted for two thirds of national inequality in 2004. In

⁵Province-specific Theil indexes are not reported in this paper but are available on request.

the past, the rural areas contributed more to total inequality than the urban areas and the rural–urban disparity, but the trend has reversed over time. In 1990, income inequality within the rural areas accounted for 72 percent of national inequality (adjusting for COL), while income inequality within the urban areas and between rural and urban areas together accounted for the rest. In 2004, the contribution of within-rural inequality declined to less than 36 percent; within-urban inequality increased to 34 percent; and between urban–rural inequality sector increased to more than 30 percent.

Figure 8. **Decomposition of Inequality by Urban and Rural Area (Theil Index), 1990–2004**



COL = cost of living; PRC = People’s Republic of China.
 Source: Authors’ estimates.

V. SUMMARY AND CONCLUSIONS

This paper investigates changes in income inequality in the PRC during 1990–2004 using unit-level data that were extrapolated from grouped income data of 23 provinces, covering both rural and urban households and representing more than 85 percent of the PRC population. Key results are summarized as follows.

First, at the national level, the Gini coefficient of per capita nominal income increased from 0.345 in 1990 to 0.456 in 2004. But after adjusting for interprovincial and between urban–rural COL differences, the Gini coefficient increased from 0.287 in 1990 to 0.387 in 2004. These figures suggest that without adjusting for COL differences, the Gini coefficient could be overestimated by almost 20 percent.

Second, income inequality increased in both urban and rural areas, but urban inequality increased at a much faster pace. Nevertheless, in 2004, rural inequality was still higher than urban inequality, with the Gini coefficient of 0.349 and 0.341, respectively, using nominal incomes, and 0.329 and 0.318, respectively, after adjusting for COL differences.

Third, the coastal, central, and western regions all had increases in income inequality during 1990–2004. During 1990–1995, the increase was most pronounced in the western region; during 2000–2004, the increase was largest in the coastal region. In 2004, inequality was the highest in the western region, followed by the coastal region and central region. Across provinces, income distribution was constantly most unequal in Guangdong, Qinghai, Shaanxi, and Xinjiang; and constantly more equal in Beijing, Jiangxi, Shanghai, and Tianjin.

Fourth, from the decomposition analysis, we found that, during 1990–2004, the rising inequalities between urban and rural areas and within the urban sector were the major sources of the increases in national inequality. In 1990, after adjusting for COL differences, the between urban–rural inequality and within-urban inequality accounted for 12.1 and 15.7 percent, respectively, of the national inequality; in 2004, the contribution increased to 30.4 and 34 percent, respectively. While the within-rural inequality also increased, the extent of the increase was smaller and, consequently, its contribution to national inequality declined from more than 70 percent in 1990 to about 36 percent in 2004.

Fifth, decomposing national inequality by region, we found that during 1990–2004, inequality within the coastal region contributed the most to national inequality, and inequality within the western region had the most rapid increase. Compared with intraregional inequalities, interregional inequality (i.e., inequality between the coastal, central, and western regions) contributed little to national inequality: 10 percent in the case of nominal incomes and less than 4 percent after adjusting for COL differences in 2004. This is in sharp contrast to the common perception that rising regional inequality is one of the key drivers of inequality at the national level in the PRC.

Sixth, decomposing national inequality by province, we found that the within-province inequality was the major source of national inequality. After adjusting for COL differences, the contribution of the within-province inequality to national inequality increased from 86 percent in 1990 to 89 percent in 2004, while the contribution of the between-province inequality declined from 14 to 11 percent during the same period. These figures further show that rising regional inequality was not a major driver of the increases in national inequality in the PRC. We also found that the biggest contributors to national inequality in 2004 were Guangdong, Henan, Hunan, Jiangsu, and Zhejiang.

These results suggest that the most effective ways of reducing overall inequality in the PRC are to narrow the income gap between urban and rural areas and to reduce income inequality among the urban population. Regional income disparity (between coastal and western regions and among rich and poor provinces) remains large and needs to be reduced; however, because it is not a major source of inequality, the impact of this reduction on inequality at the national level may be limited. But reducing regional income disparity is very

important for poverty reduction, because the majority of the poor population in the PRC is located in the western region.

REFERENCES

- ADB. 2001. Urban Poverty in the PRC. Asian Development Bank Technical Assistance Report, TAR-PRC 33448. Asian Development Bank, Manila.
- Ali, I., and J. Zhuang. 2007. Inclusive Growth toward a Prosperous Asia: Policy Implications. ERD Working Paper Series No. 97, Economics and Research Department, Asian Development Bank, Manila.
- Cao, Y., and V. Nee. 2005. "Remaking Inequality: Institutional Change and Income Stratification in Urban China." *Journal of the Asia Pacific Economy* 10(4):463–85.
- Chotikapanich D., D. S. P. Rao, and K. K. Tang. 2007. "Estimating Income Inequality in China Using Grouped Data and the Generalized Beta Distribution." *Review of Income and Wealth* 53(1):127–47.
- Dai, E. 2005. Income Inequality in Urban China: A Case Study of Beijing. Working Paper Series Vol. 2005–04, The International Centre for the Study of East Asian Development, Kitakyushu.
- Datt, G. 1998. Computational Tools for Poverty Measurement and Analysis. FCND Discussion Paper No. 50, Food Consumption and Nutrition Division, International Food Policy Research Institute. Washington, DC.
- Gustafsson, B., and S. Li. 2002. "Income Inequality Within and Across Countries in Rural China 1988 and 1995." *Journal of Development Economics* 69(1):179–204
- Hussain, A., and J. Zhuang. 1994. Evolution of Inter-provincial Inequality in China, 1952–1996. Occasional Paper 22, Suntory and Toyota International Centres for Economics and Related Disciplines, London School of Economics, London.
- Kanbur, R., and X. Zhang. 2005. "Fifty Years of Regional Inequality in China: A Journey Through Central Planning, Reform and Openness." *Review of Development Economics* 9(1):87–106.
- Liu, H. 2006. "Changing Regional Rural Inequality in China 1980–2002." *Area* 38(4):377–89.
- Meng, X. 2004. "Economic Restructuring and Income Inequality in Urban China." *Review of Income and Wealth* 50(3):357–79.
- NBSC. Various years. *Provincial Statistical Yearbook*. National Bureau of Statistics of China, Beijing.
- Ravallion, M., and S. Chen. 2007. "China's (Uneven) Progress against Poverty." *Journal of Development Economics* 82:1–42.
- Ravallion, M., S. Chen, and P. Sangraula. 2007. New Evidence on the Urbanization of Global Poverty. World Bank Policy Research Working Paper 4199, The World Bank, Washington, DC.
- Wan, G. 2007. Regional Income Inequality in Rural China, 1985–2002. Research Paper No. 2007/05, World Institute for Development Economics Research, United Nations University, Tokyo.