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THE GREAT CHINESE INEQUALITY TURN AROUND

Ravi Kanbur, Yue Wang, Xiaobo Zhang

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The Great Chinese Inequality Turnaround*

By

Ravi Kanbur
Cornell University
sk145@cornell.edu

Yue Wang
Cornell University
yw548@cornell.edu

And

Xiaobo Zhang
Peking University and International Food Policy Research Institute
x.zhang@cgiar.org

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Abstract

This paper argues that after a quarter century of sharp and sustained increase, Chinese inequality is now plateauing and even turning down. The argument is made using a range of data sources and a range of measures and perspectives on inequality. The evolution of inequality is further examined through decomposition by income source and population subgroups. Preliminary explanations are provided for these trends in terms of shifts in policy and structural transformation of the Chinese economy. The narrative on Chinese inequality now needs to focus on the reasons for this great turnaround.

Key Words: Chinese Inequality Turnaround, Inequality Data, Inequality Trends, Inequality and Structural Transformation, Harmonious Development and Government Policy

JEL Codes: D31, D63, O15, O53

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1. Introduction

Alongside the spectacular growth and the extraordinary reductions in poverty, perhaps the most dramatic in human history, the evolution of Chinese income inequality since the start of the reform process in 1978 has been a focus of interest among analysts and policy makers. Table A gives a flavor of this interest by summarizing the most significant studies concentrating on the evolution of income inequality. In their study of the evolution of inequality in China focusing on spatial inequality over the long run, from 1952 to 2000, Kanbur and Zhang (2005) identified two phases of inequality change after the start of reforms in 1978. After an initial and short phase of falling inequality as rural incomes rose in the wake of the liberalizations of the personal responsibility system, inequality rose inexorably as China opened out to the world and explosive growth took place in the coastal regions.

This increase in inequality became an integral part of the narrative on Chinese development[1], with some commentators arguing that this was the inevitable price to be paid for the high rates of growth, with others warning of the social consequences of rising gaps. In any event, "harmonious society" was given center stage at the 2005 National People's Congress and among rising policy concerns on inequality. As more data has accumulated, greater attention has turned to an examination of the evolution of inequality in China in the 2000s, including in the present decade--the years after 2010. A number of studies which used data from the mid-2000s onwards began to argue that the rise in inequality was being mitigated, and inequality was possibly plateauing and perhaps even turning down.[2]

This paper attempts to provide a comprehensive assessment of what the data show, a deeper look into the patterns of inequality change, and preliminary explanations for the trends observed. Our basic conclusion is that there does indeed appear to be a turnaround taking place in Chinese inequality, and that the explanations lie in policy changes and in the nature of structural transformation in China.

The plan of the paper is as follows. Section 2 sets out the data sources on Chinese inequality on which any assessment will have to be based. Section 3 then presents the basic trends over a twenty-year period from 1995 to 2014. Section 4 examines the patterns of inequality change by looking, respectively,

[1] See for example, Appleton, Song and Xia (2014); Chi, Li and Yu (2009); Chi (2012); Goh, Luo and Zhu (2009); Kanbur and Zhuang (2013); Knight (2014); Knight, Li and Wan (2016); Mendoza (2016).

[2] Khan and Riskin (2005); Fan, Kanbur and Zhang (2011); Li et.al. (2016); Alvaredo et.al (2017); Chan et.al (2011); Li and Gibson (2013); Lee (2013); Cheong and Wu (2014); Zhang (2015); Xie and Zhou (2014); Xie et al. (2015). Even in Alvaredo et.al (2017), whose argument is that China's inequality is approaching the US and is higher than France, the data shows that in China the top 1% share and the bottom 50% share have been plateauing since 2006. After 2010, the 1% share declined slightly and the bottom 50% share went up a little. In his review Knight (2014), focused on an earlier literature, asked, but did not substantiate, whether inequality had peaked. In Xie and Zhou (2014), the Gini coefficient estimated from various data sources show a plateauing trend from 2010 to 2012 except for the CHFS 2011, which drives the trend to be increasing as an outlier.

at decomposition by income source and by population subgroup. Section 5 presents some preliminary explanation for the observed trends. Section 6 concludes.

2. Data

In this study, we use two kinds of data, household level data from household surveys and provincial level data from the National Bureau of Statistics. Household level data are from two surveys, Chinese Household Income Project (CHIP) and China Family Panel Studies (CFPS). CHIP was carried out as part of a collaborative research project on incomes and inequality in China organized by Chinese and international researchers including Institute of Economics of the Chinese Academy of Social Sciences and School of Economics and Business at Beijing Normal University, with assistance from the National Bureau of Statistics (NBS). There are six waves of cross-sectional data of CHIP, 1988, 1995, 2002, 2007, 2008, and 2013. China Family Panel Studies (CFPS) is a nationally representative, longitudinal survey conducted every two years of Chinese communities, families, and individuals launched in 2010 by the Institute of Social Science Survey (ISSS) of Peking University, China. It covers such topics as economic activities, education outcomes, family dynamics and relationships, migration, and health. Currently, there are three waves of panel data of CFPS, 2010, 2012 and 2014. Our provincial level income per capita and population data is drawn from the National Bureau of Statistics database and multiple provincial statistical year books.

We use household survey data to analyze household income inequality evolution and the attributes from different income sources since it has rich information about different income components in each household. As for the analysis of regional inequality evolution and its decomposition, we make use of the provincial level data. Each data set is described below in greater detail.

The household level data we use covers CHIP 1995, CHIP 2002, and CHIP 2007 (NBS sample), CFPS 2010, CFPS 2012 and CFPS 2014. We did not go back to as early as 1988 because at that time, most places in China were still under a command economy so that the income components in the 1988 survey were quite different conceptually from those in the surveys later. CHIP 2007 and CHIP 2008 are also part of the larger RUMiC (Rural-Urban Migrants in China) survey project. While the public RUMiC part data has a different questionnaire from previous waves of CHIP and has no income component details, CHIP 2007 has a restricted national representative NBS sample data, which is consistent with the previous waves. For this reason, we drop CHIP 2008 in our analysis and use only the NBS sample from CHIP 2007. The detailed questions about income details included in each wave between 1995 and 2007 of the CHIP data are quite

consistent. For CFPS, there are a few differences between CFPS 2010, CFPS2012 and CFPS2014. However, adjusted incomes were provided in CFPS 2012 and CFPS 2014 to make them comparable with CFPS 2010[3].

There are some differences between CHIP and CFPS in the items included in each income source[4]. For example, rental value of housing equity is included in CHIP 1995 but not in other surveys and medical expenses paid by collective or government is included in transfer income in CHIP but not in CFPS, etc. For the purpose of ensuring consistency as much as possible, we broke down the different sources of income in CHIP and reconstructed them with the items that are included in CFPS only. In addition, there is no "other income" in CHIP 2007, but we constructed it following CFPS's definition. Eventually, in our decomposition by income sources, we present two results, one with the original household income from CHIP and CFPS, the other with adjusted income from CHIP which is consistent with CFPS definition.

Another issue we need to address is the missing data in income sources. We assume that there exists a fixed hidden distribution for household income, for both rural and urban categories. We approximate the hidden distribution for rural and urban categories from the existing non-missing data. Then we sample new pseudo value from this approximated distribution to fill the missing entries. The pseudo value is a random number drawn from the sample distribution. This approximation for distribution requires sufficiently large sample size which is a condition not satisfied using county level sample. Provincial distribution is not suitable either since the CFPS is not representative on the province level. Hence we use the national distribution.

In addition to the two issues addressed above, there are some observations for which the sum of each income component does not equal the household net income in CFPS. This is due to the fact that for households who did not report their annual net income, the household net income is estimated according to their consumption. To deal with this issue, we rescale each income source using the proportion $\frac{\text{household net income}}{\text{sum of all the income sources}}$.

Although the two household surveys have rich information about household income, they have different geographical coverage. Moreover, CFPS's sampling are not representative on the provincial level. Because of these limitations, we could not apply regional decomposition to the household survey

[3] For details of the income component adjustment of CFPS, see Xie, Zhang, Xu and Zhang (2015).
[4] For comparison of the two surveys, see Zhang, Xu, Zhou, Zhang and Xie (2014).

data. Therefore, in our analysis of regional inequality, the provincial level income and population data from the NBS is used.

As Li and Gibson (2013) have noted, previously Chinese yearbooks regularly reported provincial population and per capita economic outputs based on households registered, i.e. the Hukou population, but not residential population. This resulted in a distortion of the estimate of provincial per capita statistics in previous research papers. This distortion grew bigger as migrant workers increased since the 1990s. Recently, the NBS updated the provincial consumption per capita data based on residential population for all provinces from 1993 to 2014. We also obtain population based on residential status from both NBS and various Provincial Year Books 2011 and 2005, in which years, many provinces updated their historical population data based on residence. The fact that the starting year of reporting residential based population is different across provinces brings both disadvantages and advantages to our study. On the one hand, the new NBS data is still not perfect though much improved than before. On the other hand, on the aggregate level, there should not be systematic distortion as there does not exist a cut-off year in which the statistical approach changed for all.

This is the data base for our assessment of Chinese inequality trends in the last twenty years. We proceed now to a description of the overall trends and the decomposition patterns in the data.

3. Trends

We estimate various inequality measures using household survey data from CHIP and CFPS for six points of time covering the twenty-year period between 1995 and 2014. Table 1 presents the Gini coefficient and general entropy indices and Table 2 presents income ratios. The CHIP results in Panel A of each table use original income per capita and those in panel B use adjusted income per capita to keep consistent with CFPS. For both income construction methods, we see that the Gini coefficient has an inverted U shape pattern with the turning point at 0.533 in 2010. The general entropy indices show similar trends. For GE(0), the peak appears in 2012 while for GE(1) and GE(2) it is in 2010. The difference of the turning pattern of each index could be a result of the fact that each inequality index captures different characteristics of inequality. For the generalized entropy indices GE(c), the greater c is, the more sensitive it is to the top income groups. That is to say, GE(0) is more sensitive to bottom income groups while GE(2) is more sensitive to the top income groups.

To have a more detailed picture of income distribution, quantile and decile income shares are presented in Figure 1a, 1b, 2a and 2b. The income share of the top group reached the highest point in 2010, which is above 0.4 for the top 10% and above 0.6 for the top 25%, and then declined ever since. 2010 is also the year when the share of the middle group is the lowest. The narrowing inequality measured by Gini coefficient, GE(1) and GE(2) since 2010 could be attributed to the rising middle group income share and falling top group income share. While the top group's income share had not been increasing, the bottom group's share seemed to worsen. We notice that income share of the very bottom (25% in Figure 1a, 1b and 10% in Figure 2a, 3b) went down over the years which could increase income inequality. As a matter of fact, the top-bottom income ratio went up from 1995 to 2012 and declined a little afterwards. As shown in Table 2, the 90-10 ratio was as high as 19.87 in 2012 and then fell to 19.12 in 2014. Meanwhile, the bottom-middle income ratio behaves like a U shape with a small jump in 2010 and reached its lowest point in 2012. The 10-50 ratio fell from 0.259 in 2010 to 0.143 in 2012 and the 25-50 ratio fell from 0.516 in 2010 to 0.451 in 2012. This trend is possibly captured by the turning behavior of GE(0), which peaked in 2012.

The combination of CHIP and CFPS data give us six observations spanning 1995 to 2014, based on household surveys. An alternative data perspective, useful for capturing long term annual trends, was introduced in Kanbur and Zhang (1999, 2005). This method uses NBS data on provincial consumption per capita broken down by rural and urban for each province. Combining this with rural-urban population data for each province (see the discussion on population data in Section 2), we can construct a synthetic national consumption distribution which suppresses inequality within rural areas and urban areas of each province. Clearly, this is an understatement of the level of inequality, but the trend over time may nevertheless convey information on the evolution of inequality.

Column 1 of Table 11 presents the Gini coefficient over time for the synthetic distribution so constructed, while Column 2 presents values for the GE(1), or Theil's T, measure of inequality, for every year from 1978 to 2014. The movements of the regional Gini coefficients and Theil's T index are plotted in Figure 3. The patterns of the two indices are quite similar. They went down a little after 1978 and started to climb up slowly after 1985. In 1996, the regional inequality fell a little and showed a climbing trend until 2004. Of course the values of the Gini and GE(1) in Table 11 are not comparable to the corresponding values in Tables 1 and 2—income is used in one and consumption in another, within rural and within-urban inequality is suppressed in one and not in the other, and the data sources are quite different. However, the broad trends after the mid-1990s are similar from the two very different

perspectives—there appears to be an inequality turn around sometime towards the end of the first decade of the 2000s.

Overall, then, a careful assessment of the best data sources seems to suggest a plateauing of inequality, with a possible turning point around or just before 2010. To begin building an explanation of the trend, we consider decomposition of inequality, first by income source and then by population subgroup.

4. Decompositions

To unpack the patterns of inequality change, we proceed to decompose inequality, first by income source, and then by population subgroup. To understand the role of different income sources in the evolution of overall inequality, we decompose the Gini coefficient by income source following Lerman and Yitzhaki's (1985) rule.

$$\mathrm{G} = \sum_k S_k \sum_i \frac{2}{n^2 \mu_k}\left(i - \frac{n+1}{2}\right) Y_{ki} = \sum_k S_k \bar{G}_k = \sum_k S_k R_k G_k \qquad (1)$$

where $\mathrm{S_k} = \mu_k/\mu$ is the share of kth income component in total income, $\overline{G_k}$ is the "pseudo Gini"[5], $\mathrm{R_k}$ is the Gini correlation of component k with total income, and $\mathrm{G_k}$ is the Gini of income component k. The absolute contribution of income source k to total income inequality is

$$\mathrm{v_k}(G) = S_k R_k G_k \qquad (2)$$

Its proportion of the total inequality is

$$\tilde{v}_k(G) = \frac{S_k R_k G_k}{G} = \frac{\sum_i \left(i - \frac{n+1}{2}\right) Y_{ki}}{\sum_i \left(i - \frac{n+1}{2}\right) Y_i} \qquad (3)$$

where $\mathrm{Y_i}$ is the income of household i and $\mathrm{Y_{ki}}$ is the income from source k of household i[6].

The marginal effect of income source k is

$$\eta_{\mathrm{k}}(G) = S_k\left(\frac{\overline{G_k}}{G} - 1\right) \qquad (4)$$

[5] The pseudo Gini is different from the conventional Gini since the weight attached to $\mathrm{Y_{ki}}$ corresponds to the rank of individual i in the total income distribution which is, in general, not the same as her rank in the distribution of income source k.
[6] We weighted household income by family size in all calculations.

Table 3 shows the income share of each income source and Table 4 presents the Gini coefficients of each income source. Wage income takes the largest share while its Gini coefficient is the smallest. The share of property income has always been small, which is less than 10 percent, while its Gini coefficient has been very high and stayed above 0.96. The proportionate contribution to total Gini coefficient of each income source $\tilde{v}_k(G)$ and their marginal effects $\eta_k(G)$ are reported in Table 5 and 6 respectively. The largest contribution is from wage income, which ranged between 0.7 and 0.8 over the years, followed by transfer income, which ranged between 0.13 and 0.19. The contribution of other incomes are lower than 0.1. In addition to the high contribution to overall Gini coefficient, wage income also has the largest marginal effect.

Given the importance of wage income, the trends shown in Table 4 are central in understanding the forces underlying the overall inequality trend. Inequality of wage income has fallen sharply, as has inequality of transfers. These are the dominant factors in total income, and so their declining inequality is the dominant factor in inequality change and accounts for the fall in inequality.

To see the sensitivity of the results, we also follow Paul (2004)'s extension on the Gini decomposition to decompose Theil's T index[7], i.e. GE(1), by income sources.

$$\mathrm{T} = \sum_k \sum_i \frac{1}{n\mu} \ln(\frac{Y_i}{\mu}) Y_{ki} \quad (5)$$

where μ is the mean of population income.

The absolute contribution to income inequality of income source k is

$$\mathrm{v_k}(T) = \sum_i (lnY_i - ln\mu) Y_{ki} \quad (6)$$

When expressed as a proportion of total inequality, it can be written as

$$\tilde{v}_k(T) = \mathrm{v_k}(T)/T = (\sum_i (lnY_i - ln\mu) Y_{ki}) / \sum_i (lnY_i - ln\mu) Y_i \quad (7)$$

The marginal effect of income source k on Theil's T index is

$$\eta_k(T) = \frac{1}{T\mu n} \sum_i Y_i (S_{ki} - S_k) lnY_i \quad (8)$$

[7] We choose to decompose Theil's T index here because for the general entropy class inequality measures GE(c), only when 0<c<2, the negativity requirement is met as shown in Paul (2004).

where S_{ki} is the share of income source k in the total income of i-th household. The decomposition results for Theil's T index is presented in Table 7 and 8. The results are quite consistent with what we find in the Gini decomposition.

In addition to the level of inequality, the over time change of inequality can also be expressed as a weighted average of over time changes in each income source as stated in Paul et.al. (2012). Define $\dot{G_{t,t+1}} = (G_{t+1} - G_t)/G_t$, which is the proportionate change in household income inequality between year t and year t+1. It could be written as

$$\dot{G}_{t,t+1} = \sum_k \tilde{v}_k\,(G_t)\dot{v}_k(G_{t,t+1}) \tag{9}$$

where $\tilde{v}_k(G_t)$ serves as a weight, and $\dot{v}_k\big(G_{t,t+1}\big) = \frac{v_k(G_{t+1}) - v_k(G_t)}{v_k(G_t)}$. Then the contribution of income source k to the change of Gini coefficient is $\tilde{v}_k(G_t)\dot{v}_k(G_{t,t+1})$. Similarly, the contribution of income source k to the change of the Theil's T index is $\tilde{v}_k(T_t)\dot{v}_k\big(T_{t,t+1}\big)$.

The results for decomposition of the change of inequality are presented in Table 9 and 10. The greatest contribution of the proportionate increase from 1995 to 2012 of the Gini coefficient and the Theil's T index were both from wage income, followed by transfer income. And from 2002 to 2007, property income and operational income were the top two drivers for the proportionate increase of Gini and the Theil's T index. Wage income became the most important contributor to the dynamic change of inequality again in the period between 2007 and 2010 for both inequality measures. When inequality started to turn down from 2010 to 2012, operational income played the most important role. Later from 2012 to 2014, the contribution to the proportionate change of the Gini coefficient from wage income, operational income and property income are quite close to each other. However for the Theil's T index, wage income served as the top inequality reducing component.

Overall, then, these accounting exercises are consistent with the hypothesis that it is the narrowing of the wage distribution and the role of transfers which is important in beginning an understanding of the Chinese inequality turnaround.

An alternative perspective on patterns of inequality change is through decomposition by population subgroup. Unequal income distribution between urban and rural sectors is a feature in developing countries for which China is not an exception. Besides the unequal development between rural and urban regions, the disparity between the coastal areas in the east and inland areas in the middle and west is also enormous (Fan, Kanbur and Zhang, 2011). To understand these components of

inequality, we use the data underlying Table 11, the synthetic distribution constructed from rural and urban per capita consumption and population.

We further decompose the Theil's T index by rural-urban subgroups and coastal-inland subgroups respectively as in equation (10).

$$\mathrm{T} = \mathrm{T_w} + \mathrm{T_b} = \sum_k \left(\frac{N_k}{N}\right)\frac{\mu_k}{\mu}T_k + \sum_k \frac{N_k}{N}\frac{\mu_k}{\mu}\ln\left(\frac{\mu_k}{\mu}\right) = \sum_k \frac{Y_k}{Y}T_k + \sum_k \frac{Y_k}{Y}\ln\left(\frac{Y_k}{Y}/\frac{N_k}{N}\right) \quad (10)$$

where N is the total number of individuals and k is an indicator for groups, for example, rural or urban. The first term is the within-group component of the Theil's T index and the second term is the between-group component.

The rural-urban between component and the coastal-inland between component are reported in Table 11 and graphed in Figure 4. There are three peaks for the rural-urban between component in 1995, 2000 and 2004 respectively. After the third peak, the rural-urban between component kept a declining trend. Notice that 2005 is the year when regional inequality and rural-urban between components turned down. That is the year when, it has been argued, China passed the Lewis Turning Point (Zhang, Yang and Wang, 2011). That is also the year when the agriculture tax was abolished and the New Countryside Project was initiated. The coastal-inland between component fell in 2001 after a high peak in 2000, then jumped again in 2005. It stayed at a relatively high level until 2009 and showed a steady decline after that, contributing to the narrative of tightening labor markets in inland provinces, and government policy to encourage development in the western regions. These explanations are taken up in the next section.

5. Preliminary Explanations

Our main task in this paper has been to establish the key trends in Chinese inequality over the past twenty years. Based on a number of perspectives, it does seem as though there was a turnaround in Chinese inequality about 10 years ago, with inequality plateauing and even declining after a long period of sharp increase. Explanations for this evolution will have to await detailed investigation from researchers focusing on a range of factors in depth. However, in this section we present a broad framework for such explanations.

A simple way to think of the evolution of national income distribution is to divide the economy up into key sectors and to look at inequality within and between sectors. Given the importance of the structural transformation which is underway in China just now we can begin our discussion in terms of two sectors—rural and urban. The national income distribution is a weighted sum of the rural income distribution and the urban income distribution, the weights being the population shares of the two sectors. Overall inequality will then depend on (i) the inequality within each of the two sectors, (ii) the gap between the means of the two sectoral distributions and (iii) the population share of each sector.

As an illustration, for the GE(0) index, also known as the mean log deviation, denoted L, the national inequality can be decomposed as follows:

$$L = x L_1 + (1\text{-}x) L_2 + log\,[x\,k + (1\text{-}x)] - [x\,log\,(k)] \quad (11)$$

where subscripts 1 and 2 denote rural and urban respectively, *x* is the population share of the urban sector, and k is the ratio of the urban mean to the rural mean. The evolution of national inequality is then composed of (i) the evolution of L_1 and L_2 (ii) the evolution of *k* and (iii) evolution of x.

With this framework, we can relate the inequality turnaround to basic economic forces and to policy. First, as Zhang, Yang and Wang (2011) have argued, China has now reached the "Lewis turning point", where rural to urban migration begins to tighten rural labor markets and hereby mitigate the rural-urban wage differential. In addition, heavy government investment in infrastructure in the rural sector and in lagging regions, a feature of Chinese policy from the 2000s onwards (Fan, Kanbur and Zhang, 2011), will also raise economic activity and incomes in these areas. This will surely lower *k* in (11) and hence, ceteris paribus, overall inequality. This is consistent with the evolution of the rural-urban component of inequality shown in Table 11, and it is further consistent with the observed reduction of inequality in the national wage distribution as shown in Table 4.

The narrowing of the wage distribution and the increasing equality of the transfer distribution shown in Table 4 can also be associated with policy changes. For example, in 2004 the Ministry of Labor and Social Security issued a "Minimum Wage Regulations" law and the next decade saw rising minimum wage standards coupled with substantial improvements in compliance (Kanbur, Li and Lin, 2016). Further, a number of social programs were introduced and strengthened from the 2000s onwards. Since 2004 China has introduced new rural cooperative medical insurance, currently covering more than 95% of rural population. Rural social security has also been rolled out since 2009. Although the premiums of

the rural medical insurance and social security are still much lower than the urban counterparts, the programs have provided some cushions to rural residents against health risk and elderly care. A combination of tightening labor markets in rural areas, and inequality mitigating transfer and regulation regimes in urban and rural areas, acted through (i) and (ii) to reduce inequality.

The impact of *x* on *L* as seen through (11) is quite complex. Other factors constant, it can be shown (Kanbur and Zhuang, 2013) that under certain conditions the behavior of L as a function of x has an inverse-U shape as hypothesized by Kuznets (1955). Up to a certain point, urbanization increases inequality, and beyond this point further urbanization will decrease inequality. This "Kuznets turning point" sets out the effect of urbanization pure and simple on inequality. The turning point itself depends on the other inequality parameters, but it is shown by Kanbur and Zhuang (2013) that Chinese urbanization has now crossed the Kuznets turning point—further urbanization will reduce inequality through channel (iii) above.

Of course each of these potential explanations needs to be investigated more fully and in greater depth. But they appear to us to be consistent with underlying economic and policy forces which can explain the inequality turnaround we see in the data.

6. Conclusion

We have argued in this paper that the long period of inequality increase in China is coming to an end. The data, seen from different perspectives, seem to indicate a turnaround towards the latter part of the 2010s. The explanations for this turnaround need to be explored further, but there is prima facie evidence for economic forces and government policy tightening labor markets in rural areas, together with government transfer and social policy mitigating inequality in urban and rural areas, which may explain the observed trends. This of course raises the further question of why government policy changed over a twenty-year period from allowing inequality to increase to mitigating it. The political economy of the Chinese state (Wong, 2005) may provide an explanation, but that takes us beyond our present remit.

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Figures and Tables

Figure 1a Quantile Income Share (Original Income)

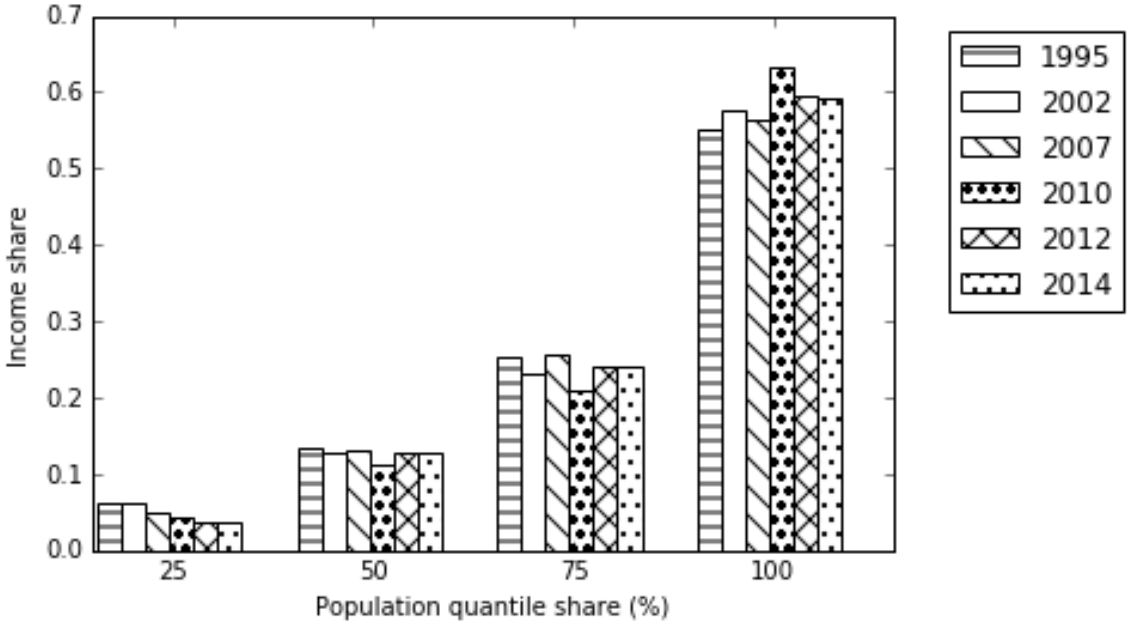

Figure 1b Quantile Income Share (Adjusted Income)

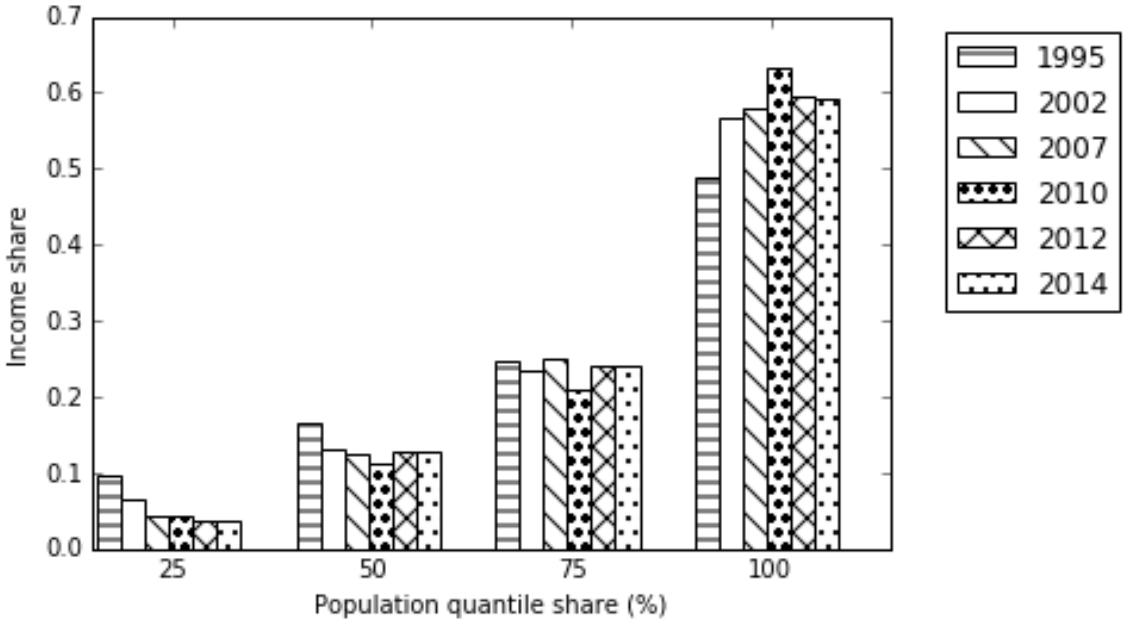

Figure 2a Decile Income Share (Original Income)

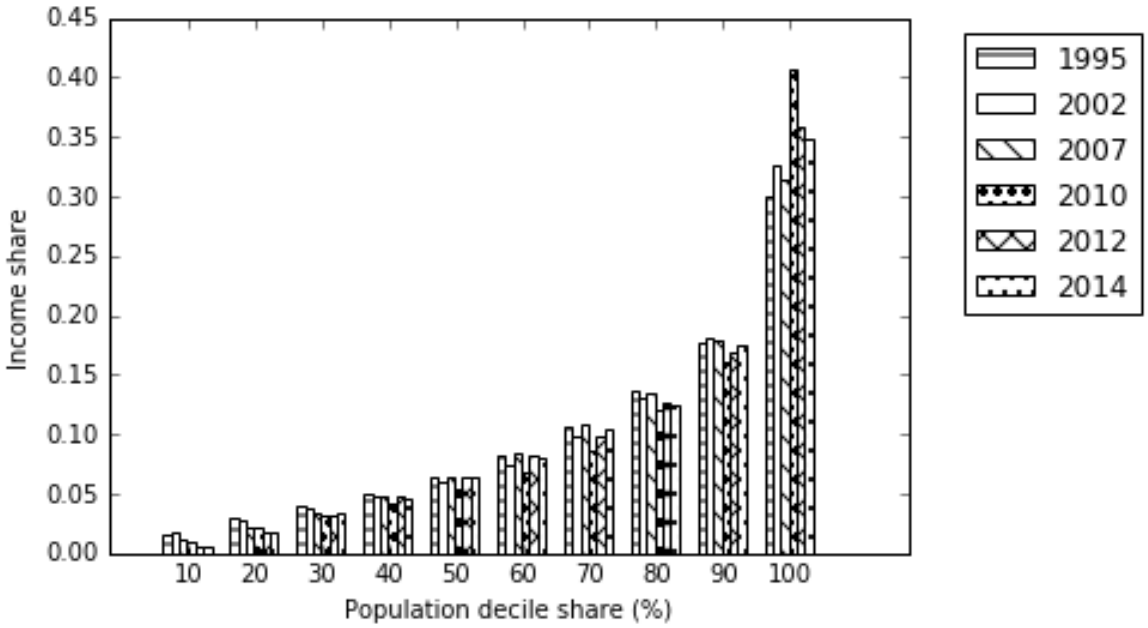

Figure 2b Decile Income Share (Adjusted Income)

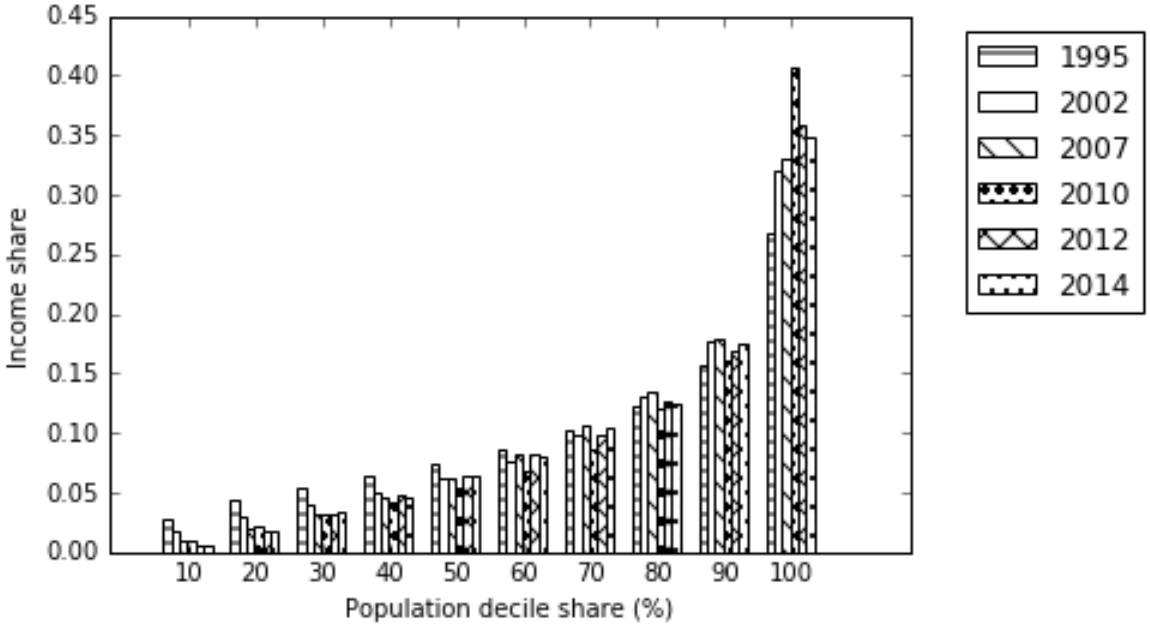

Table 1 Inequality Measures from Household Survey Data

A: Original income					
Year	**Data**	**Gini**	**GE(0)**	**GE(1)**	**GE(2)**
1995	**CHIP**	0.435	0.347	0.320	0.420
2002	**CHIP**	0.458	0.369	0.359	0.486
2007	**CHIP**	0.459	0.409	0.359	0.459
2010	**CFPS**	0.533	0.551	0.571	1.389
2012	**CFPS**	0.504	0.590	0.496	1.319
2014	**CFPS**	0.495	0.566	0.456	0.915
B: Adjusted income					
Year	**Data**	**Gini**	**GE(0)**	**GE(1)**	**GE(2)**
1995	**CHIP**	0.349	0.206	0.215	0.300
2002	**CHIP**	0.445	0.344	0.340	0.466
2007	**CHIP**	0.478	0.446	0.400	0.601
2010	**CFPS**	0.533	0.551	0.571	1.389
2012	**CFPS**	0.504	0.590	0.496	1.319
2014	**CFPS**	0.495	0.566	0.456	0.915

Note1: Panel A uses the original income from each survey. Panel B adjusted CHIP income by excluding the components that are not in CFPS.CHIP 2007 uses the NBS survey data, not RUMiC survey since the latter uses a different questionnaire and sample framework while the former is consistent with previous years.

Table 2 Income Ratio from Household Survey Data

A: Original income							
Year	**Data**	**p90_p10**	**p75_p25**	**p90_p50**	**p75_p50**	**p10_p50**	**p25_p50**
1995	**CHIP**	8.719	3.489	2.876	1.880	0.330	0.539
2002	**CHIP**	9.109	3.450	3.265	1.954	0.358	0.566
2007	**CHIP**	11.968	3.980	2.815	1.805	0.235	0.453
2010	**CFPS**	13.361	3.660	3.466	1.888	0.259	0.516
2012	**CFPS**	19.873	3.895	2.846	1.755	0.143	0.451
2014	**CFPS**	19.122	3.854	2.920	1.765	0.153	0.458
B: Adjusted income							
Year	**Data**	**p90_p10**	**p75_p25**	**p90_p50**	**p75_p50**	**p10_p50**	**p25_p50**
1995	**CHIP**	4.820	2.262	2.266	1.532	0.470	0.677
2002	**CHIP**	8.319	3.296	3.099	1.907	0.372	0.579
2007	**CHIP**	13.192	4.269	2.945	1.849	0.223	0.433
2010	**CFPS**	13.361	3.660	3.466	1.888	0.259	0.516
2012	**CFPS**	19.873	3.895	2.846	1.755	0.143	0.451
2014	**CFPS**	19.122	3.854	2.920	1.765	0.153	0.458

Note1: Panel A uses the original income from each survey. Panel B adjusted CHIP income by excluding the components that are not in CFPS.Note2: CHIP 2007 uses the NBS survey data, not RUMiC survey since the latter uses a different questionnaire and sample framework while the former is consistent with previous years.

Table 3 Share of Income by Source

Year	Wage Income	Operational Income	Property Income	Transfer Income	Other Income
1995	0.503	0.392	0.008	0.068	0.030
2002	0.581	0.242	0.005	0.122	0.051
2007	0.639	0.137	0.032	0.172	0.020
2010	0.680	0.142	0.022	0.111	0.045
2012	0.693	0.106	0.031	0.132	0.038
2014	0.710	0.086	0.025	0.153	0.025

Note: To be as consistent with possible across the two datasets, we excluded some components from CHIP that are not in CFPS. In addition, the income sources are re-calculated in CHIP according to CFPS definition. Table 4-8 follows the same construction of income by source.

Table 4 Gini of Income by Source

Year	Wage Income	Operational Income	Property Income	Transfer Income	Other Income
1995	0.675	0.568	0.965	1.192	0.813
2002	0.659	0.632	0.992	0.900	0.885
2007	0.619	0.815	0.979	0.834	1.128
2010	0.602	0.784	0.981	0.916	0.914
2012	0.609	0.798	0.969	0.886	0.950
2014	0.583	0.834	0.960	0.853	0.963

Table 5 Contribution to Total Gini by Source

Year	Wage Income	Operational Income	Property Income	Transfer Income	Other Income
1995	0.781	0.036	0.015	0.131	0.038
2002	0.737	0.018	0.009	0.181	0.054
2007	0.700	0.048	0.048	0.178	0.026
2010	0.695	0.080	0.032	0.144	0.049
2012	0.727	0.047	0.039	0.149	0.037
2014	0.731	0.039	0.031	0.174	0.025

Table 6 Marginal Effects

Year	Wage Income	Operational Income	Property Income	Transfer Income	Other Income
1995	0.278	-0.357	0.007	0.063	0.009
2002	0.033	-0.048	0.003	0.002	0.010
2007	0.061	-0.089	0.017	0.006	0.006
2010	0.015	-0.062	0.010	0.032	0.004
2012	0.034	-0.059	0.008	0.017	-0.001
2014	0.021	-0.048	0.006	0.021	0.000

Note: Marginal Effect is the impact that a 1% change in the respective income source will have on inequality.

Table 7 Contribution to Theil's T by Source

Year	Wage Income	Operational Income	Property Income	Transfer Income	Other Income
1995	1.013	-0.247	0.024	0.163	0.046
2002	0.887	-0.200	0.014	0.233	0.065
2007	0.720	-0.026	0.113	0.161	0.033
2010	0.664	0.078	0.062	0.143	0.052
2012	0.779	0.000	0.048	0.137	0.034
2014	0.770	-0.008	0.038	0.174	0.026

Table 8 Marginal Effects

Year	Wage Income	Operational Income	Property Income	Transfer Income	Other Income
1995	0.511	-0.442	0.017	0.095	0.016
2002	0.307	-0.163	0.009	0.112	0.015
2007	0.081	-0.063	0.081	-0.011	0.012
2010	-0.015	-0.105	0.040	0.032	0.007
2012	0.086	-0.094	0.018	0.005	-0.003
2014	0.060	-0.094	0.013	0.021	0.001

Table 9 Contribution to The Change of Gini Coefficient by Source (%)

Year	Change	Wage Income	Operational Income	Property Income	Transfer Income	Other Income
1995-2002	27.3	15.8	-1.2	-0.4	10.0	3.0
2002-2007	7.5	1.5	3.3	4.3	1.0	-2.5
2007-2010	11.6	7.6	4.1	-1.2	-1.8	2.8
2010-2012	-5.6	-0.9	-3.6	0.4	-0.3	-1.4
2012-2014	-1.7	-0.8	-0.9	-0.9	2.2	-1.2

Table 10 Contribution to The Change of Theil's T by Source (%)

Year	Change	Wage Income	Operational Income	Property Income	Transfer Income	Other Income
1995-2002	57.6	38.5	-6.9	-0.2	20.5	5.6
2002-2007	17.8	-3.9	17.0	11.8	-4.4	-2.7
2007-2010	42.7	22.9	13.7	-2.4	4.4	4.1
2010-2012	-13.2	1.2	-7.8	-2.0	-2.4	-2.2
2012-2014	-8.1	-7.1	-0.8	-1.4	2.3	-1.0

Table 11 Regional Inequality and Between Components

Year	Gini	GE(1) (Theil's T)	Rural-Urban	Coastal-Inland
1978	0.281	0.162	14.657	0.250
1979	0.273	0.149	13.144	0.258
1980	0.268	0.136	11.556	0.406
1981	0.258	0.120	9.835	0.484
1982	0.236	0.100	7.941	0.436
1983	0.226	0.090	6.920	0.468
1984	0.228	0.090	6.810	0.496
1985	0.236	0.098	7.283	0.538
1986	0.245	0.105	7.549	0.645
1987	0.253	0.113	7.907	0.717
1988	0.261	0.120	8.126	0.843
1989	0.266	0.123	7.703	0.888
1990	0.277	0.136	8.713	0.742
1991	0.282	0.140	9.242	0.547
1992	0.294	0.148	9.638	0.662
1993	0.307	0.164	10.689	0.819
1994	0.311	0.170	10.989	1.141
1995	0.324	0.181	12.037	1.762
1996	0.303	0.158	9.917	1.274
1997	0.308	0.163	10.369	1.341
1998	0.314	0.171	10.925	1.476
1999	0.328	0.186	11.931	1.508
2000	0.342	0.196	12.694	2.000
2001	0.337	0.188	11.618	1.282
2002	0.348	0.202	12.606	1.347
2003	0.354	0.208	13.530	1.358
2004	0.372	0.229	14.575	1.268
2005	0.364	0.213	13.957	2.306
2006	0.362	0.210	13.695	2.328
2007	0.363	0.210	13.619	2.293
2008	0.361	0.207	13.187	2.307
2009	0.357	0.202	12.923	2.400
2010	0.353	0.197	12.359	2.316
2011	0.354	0.199	11.516	2.276
2012	0.344	0.188	10.345	2.163
2013	0.338	0.182	9.548	2.197
2014	0.329	0.172	8.419	2.142

Note: Data is from NBS and various Provincial Statistical Year Books

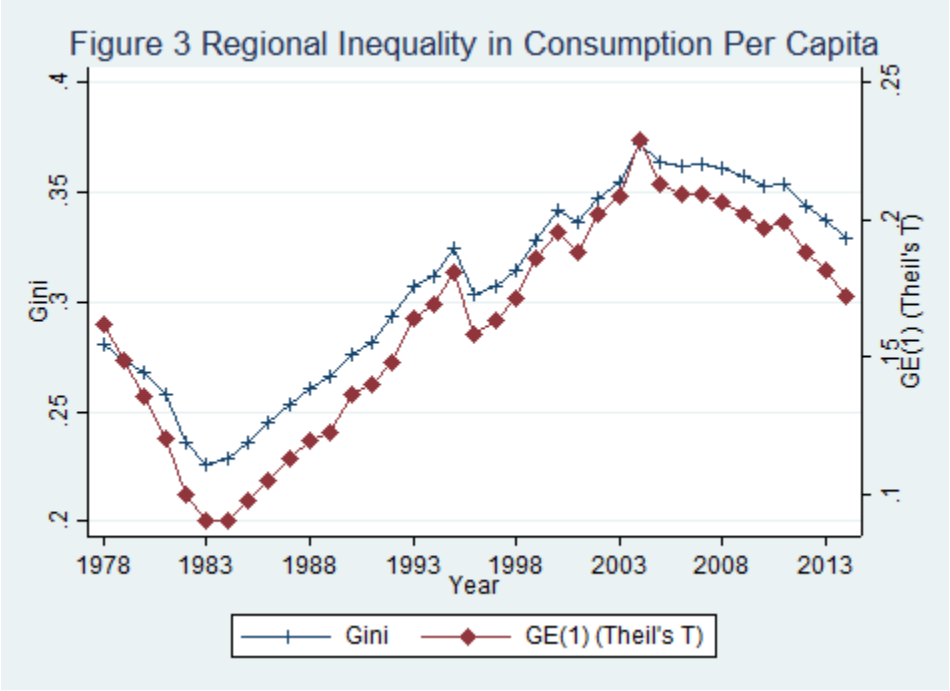
Figure 3 Regional Inequality in Consumption Per Capita
Gini
.2
.25
.3
.35
.4
GE(1) (Theil's T)
.1
.15
.2
.25
1978
1983
1988
1993
1998
2003
2008
2013
Year
Gini
GE(1) (Theil's T)

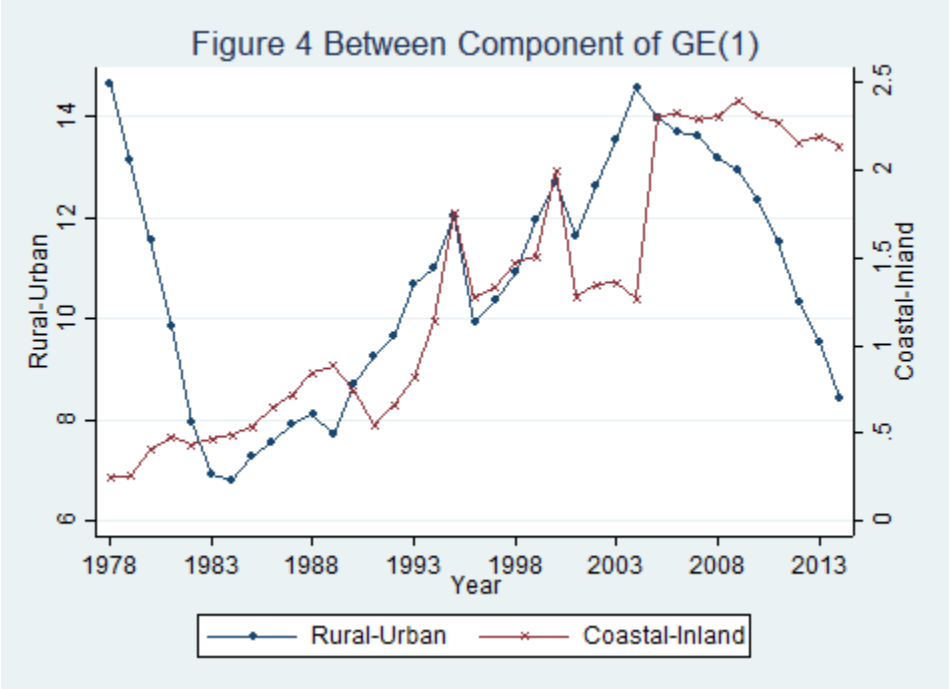
Figure 4 Between Component of GE(1)
Rural-Urban
6
8
10
12
14
Coastal-Inland
0
.5
1
1.5
2
2.5
1978
1983
1988
1993
1998
2003
2008
2013
Year
Rural-Urban
Coastal-Inland

Appendix

Table A: Summary of Studies on China's Inequality Trends

Author & year	Years covered	Data source	Income concept	Inequality measure	Population coverage	Trend of inequality established
Alvaredo et.al 2017	1978-2014	World Wealth and Income Database	Pre-tax national income	Top 1% income share and bottom 50% income share	national	Increased a lot since 1978 and plateaued after 2006
Knight, Li, and Wan 2016	2002, 2013	CHIP	household wealth and household income	Gini	21 in 2002 and 14 in 2013	Increased
Li et.al. 2016	1984-2012	Ravallion and Chen (2007) and NBS 2003-2012	income per capita	Gini, urban rural income ratio	27 provinces	increased from 1984 to 1994, then decreased until 1997, then increased until 2005 and decreased afterwards
Mendoza Graduate, 2016	1988.1995.2002	CHIP	household disposable income per capita	Gini	12-16 provinces	increased from 1988 to 2002
Xie, Zhang, Xu and Zhang, 2015	2000, 2003-2012	CFPS, CGSS, CHFS, CHIP, NBS (from Xie, et al. 2013)	family income per capita	Gini	25 provinces	plateaued since 2003 and declined from 2010 to 2012
Zhang, 2015	2002-2009	Chinese urban household survey by NBS	household disposable income per capita	Gini	186 cities in 16 provinces	peaked in 2005 and 2008, then went down a little in 2009
Appleton, Song and Xia, 2014	1988,1995, 2002,2008	CHIP	household income per capita	Gini; General Entropy Index, Atkinson Index; income ratio	12-16 provinces, urban	sharp increases in inequality largely due to changes in the wage structure

Cheong and Wu, 2014	1997-2010	Provincial Statistical Yearbooks 1998-2011, China Statistical Yearbook for Regional Economy 2004-2008, and China Industrial Economy Statistical Yearbook 1994-2008	Gross Regional Product (GRP) per capita for regional decomposition, value-added per capita for industrial decomposition	Gini	22 provinces	county level GRP per capita Gini increased from 1997 to 2003 and then dropped until 2010; Value-added per capita Gini increased from 1993 to 2003 and then declined slowly until 2007
Xie and Zhou, 2014	2010,2011,2012	NBS Mini-Census 2005, CGSSS, CFPS, CHFS, CLDS, UNU-WIDER, Official Gini, Li et al.(2013)	family income and family income per capita	Gini	national	Increased since 1985, then plateaued 2010-2012 based on official estimates
Kanbur and Zhuang,2013	1990,2008	World Bank's PovcalNet.		Gini, GE(0)	national	Increased from 1990 to 2008
Lee, 2013	2000-2010	Statistical Yearbook of China's Prices, Income and Expenditure Survey in the Urban Households	grouped provincial disposable per capita income of urban households	Gini, L (GE(0))	National, urban	increased since 2000 and peaked in 2005 and 2008, then went down from 2008 to 2010
Li and Gibson. 2013	1990-2010	Provincial Statistical Yearbooks	provincial GDP per capita	Gini, T	national	small peak in 1993 and big peak in 2005
Chi, 2012	1988-2009	urban household survey data by NBS	individual income	Gini	9 provinces, urban	peak in 1998, 2005 and 2008

Chan, Zhou and Pan,2011	1995-2011	China Statistical Yearbook for Regional Economy	grouped income per person from each decile	average adjusted Gini	26 provinces	big peak in 2002 and went down 2009-2011
Fan, Kanbur and Zhang, 2011	1952-2007	Comprehensive Statistical Data and Materials on 50 Years of New China, China Statistical Yearbook	provincial per capita consumption	Gini, GE(1)	national	peaks in 1960, 1975, 2005 and troughs in 1952, 1967
Chi, Li and Yu, 2009	1987,1996,2004	NBS urban household survey	total individual income	Gini, GE(1)	national	increasing
Goh, Luo and Zhu, 2009	1989, 2004	CHNS	per capita household income	Gini	8 provinces	increasing
Wang et al, 2009	1980,1985,1990, 1995-2006	China Rural Household Survey Yearbook	grouped average annual income per capita	Kakwani index, Chakravarty index, Gini	national	peak in 2003 and reduced a little afterwards
Shen and Yao, 2008	1987-2002	National Fixed-point Survey (NFS)	household per-capita income	Gini	national, rural	relative steady before 1994, increased a lot after 1996, a trough in 1996 and a peak in 2001
Ravallion and Chen,2007	1980–2001	Rural Household Surveys (RHS) and the Urban Household Surveys (UHS) of NBS	tabulation of distribution of income per capita	Gini	national	decreasing 1980-1982, increasing 1982-1994, deceasing 1994-1996, increasing 1996-2001
Démurger, Fournier and Li, 2006	1988,1995,2002	CHIP	household total disposable income	Gini, GE(1), GE(0)	Urban	increased 1988-1995, decreased 1995-2002
Khan and Riskin, 2005	1995, 2002	CASS survey of households	household per capita income	Gini	11 provinces in the urban sample and 19 provinces in the	Both rural and urban inequality decreased,

					rural sample for 1995, 21 provinces in the rural sample for 2002	but the national inequality unchanged
Kanbur and Zhang, 2005	1952-2000	Statistical Year Books	real per capita consumption in the rural and urban areas	Gini, GE(0)	28 provinces	Peaks in 1960, 1976, troughs in 1967, 1984, increased 1984-2000
Meng et al, 2005	1986-2000	NBS Urban Household Income and Expenditure Survey (UHIES)	real income and real net expenditure	Gini	national, urban	increased

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