

# Population Structure and Income Inequality in China 1952--2017

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**Abstract.** In this paper, we provide a totally new opinion about the relationship between Gini Coefficient and Population Structure. We use the data from the paper of Ravi Kanbur and Xiaobo Zhang (2005) and from the website of China National Bureau of Statistics. By means of econometrics, we find that Gini coefficient is related to the income gap between urban and rural areas and the proportion of urban and rural population. Through fixed population ratio, the results reveal that the reform and opening policy does not expand the income gap. By contraries, this policy narrows the income gap. Meanwhile, we find that the Gini coefficient and population structure is independent since 2000s, because the number of people in cities is beyond the number of people in countries.

**Keywords:** Population Structure; Gini Coefficient; Income Inequality.

## 1. Introduction

In Chinese literature, the Gini coefficient of China has been continuously recorded since 1981, and the official data of the National Bureau of Statistics have not been recorded since 2003. Since Ravi Kanbur and Xiaobo Zhang (2005) data are closer to the official data published by the National Bureau of Statistics of China, and the data in another document are far from the official statistics, we choose Ravi Kanbur and Xiaobo Zhang (2005) data. Before the reform and opening up, people often thought that it was a relatively average society. Is that true? This is the question we want to answer in this article. Our study is a purely study of Gini coefficient's influencing factors - urban-rural income gap and urban-rural population ratio, and a simulation analysis of the Gini coefficient before the reform and opening to answer the question "Is it really so rich and poor before the reform and opening up?" .

## 2. What Causes Income Inequality

Using the data from 1952 to 2000, we find that the Gini coefficient, the urban-rural population gap and the urban-rural population proportion are highly correlated, as shown in Fig. 1. Then, we establish a regression equation to simulate the relationship among them, and the regression results well confirm the linear correlation among them. Finally, we replace the urban-rural population proportion in 2017 with the 1952-2000 one in the regression equation. (Data sources: Gini coefficient and urban-rural income gap are calculated in Ravi Kanbur and Zhang Xiaobo (2005) Fifty Years of Regional Inequality in China: A Journey Through Central Planning, Reform, and Openness (the data are closer to the Gini coefficient data published by the National Bureau of Statistics since 2003). Urban-rural population ratio is 65 years since the adoption of the new China. The ratio of urban and rural population is converted into the ratio of the two (this data is highly consistent with the data of urban and rural population ratio published by the United Nations). In view of the availability of data, the data demonstration from 1952 to 2000 is used temporarily).

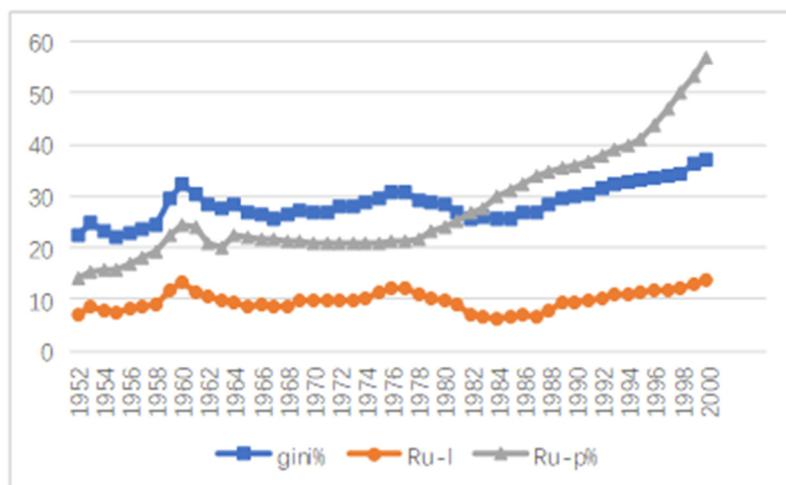


Figure 1. Gini coefficient, urban-rural income gap and population ratio

The bottom red line RU-I is the income gap between urban and rural areas (urban income/rural income), the blue line Gini is the Gini coefficient of national income, and the gray line RU-P is the proportion of urban and rural population (urban population/rural population). From Figure 1, we can see that the income gap between urban and rural areas tends to be consistent with the change trend of the Gini coefficient of national income, while the urban-rural population ratio has shown a rapid growth trend since 1978, that is, the urban population ratio has increased rapidly since 1978, which is inseparable from the reform and opening up. The following is a statistical metrological simulation. The following regression equations are established:

$$GINI = \alpha_0 + \alpha_1 RU\_I + \alpha_2 RU\_P + \varepsilon$$

In the formula, GINI is the Gini coefficient of national income, RU-I is the income gap between urban and rural areas (urban income/rural income), and RU-P is the proportion of urban and rural population (urban population/rural population). The purpose of this study is to explore the relationship among these three variables. Finally, the latest urban-rural population ratio in 2017 is brought into the equation to simulate the change of Gini coefficient of national income brought about by the urban-rural population ratio in 2017.

Dependent Variable: Y  
 Method: Least Squares  
 Date: 02/15/19 Time: 16:09  
 Sample (adjusted): 1953 2000  
 Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.89795	0.582616	20.42159	0.0000
X1	1.168176	0.061795	18.90420	0.0000
X2	0.190880	0.011480	16.62771	0.0000
R-squared	0.954206	Mean dependent var	28.27708	
Adjusted R-squared	0.952171	S.D. dependent var	3.273247	
S.E. of regression	0.715853	Akaike info criterion	2.229779	
Sum squared resid	23.06007	Schwarz criterion	2.346729	
Log likelihood	-50.51469	Hannan-Quinn criter.	2.273974	
F-statistic	468.8344	Durbin-Watson stat	0.514718	
Prob(F-statistic)	0.000000			

The results of measurement fully illustrate the EXPLANABILITY of the regression equation. It can be seen that: urban-rural income gap and urban-rural population ratio are significantly positively correlated with Gini coefficient.

### 3. Income Inequality and Population Structure

So, if the present urban population ratio is replaced by the previous urban population ratio, what will the Gini coefficient be simulated? According to the United Nations, 58.5% of the urban population in 2017, that is, the urban-rural population ratio is 1.4096. We calculated Gini coefficient from 1952 to 2000 according to the current urban-rural population ratio simulation. Compared with the real Gini coefficient, we found that the Gini coefficient from the current population ratio simulation is higher than the real Gini coefficient, and the simulated Gini coefficient before 1978 is significantly higher than the real Gini coefficient. As shown in Figure 2.

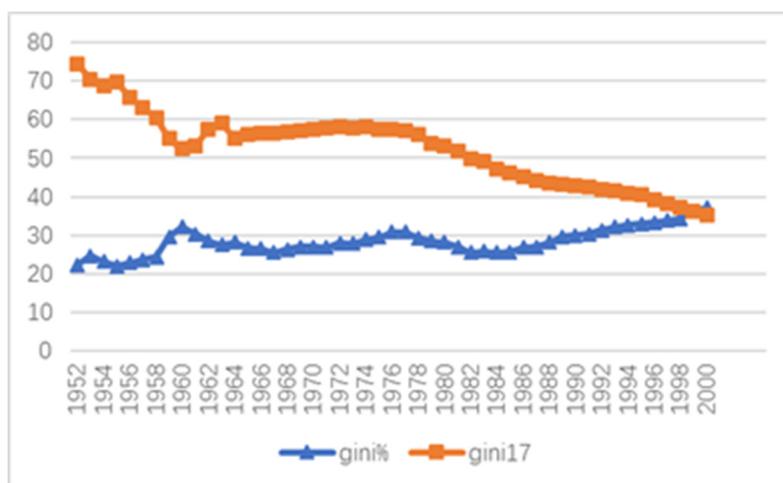


Figure 2. Simulated Gini Coefficient and Real Gini Coefficient

In Figure 2, the red Gini 2017 is the Gini coefficient obtained by bringing the urban-rural population gap data of 2017 into the simulation, and the blue Gini is the actual Gini coefficient. We can see that if the urban-rural population ratio in 2017 is replaced by the urban-rural population ratio in 1952-2000, the simulated Gini coefficient is larger than the actual Gini coefficient. Analyzing the reasons, it is not difficult to understand that the gap between simulated Gini coefficient and actual Gini coefficient decreases year by year, because the proportion of urban and rural population is gradually consistent with the proportion of population in 2017. This shows that the process of reform and opening actually reduces the income inequality in China under the premise of fixing the proportion of urban and rural population.

### 4. Summary

From the income of cadres, workers and peasants, before 1976, the average income of urban cadres was 40-50 yuan, the average income of workers was 30-40 yuan, and the average monthly income of peasants was about 2-5 yuan in terms of division of labor income. Then, before the reform, the income gap between peasants and residents was larger, while the gap between workers and cadres was smaller. Generally speaking, China's reform and opening since 1978 is a process of gradually narrowing the income gap in a sense (the proportion of population is constant). Therefore, we often say that the Chinese society before the reform and opening is a relatively average society between the rich and the poor. At that time, there were very few kinds of Chinese goods compared with the present. It was the low difference in consumption that made people feel relatively average. There are still many studies on Gini coefficient and population ratio that are worth exploring.

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