Proceedings of the 7th International Conference on Economic Management and Green Development
DOI: 10.54254/2754-1169/43/20232169

The Reasons and Solutions for Economic Inequality in China

Tianli Li[1,a,*], Yu Chen[2,b] and Zhuo Xing[3,c]

[1]*International Business School Suzhou, Xi'an Jiaotong-Liverpool University, Suzhou, 215028, China*
[2]*Pleasant Hill Campus, Diablo Valley College, California, 94523, The United States*
[3]*International College, University of Sheffield, Sheffield, S10 2TN, Great Britain*
a. ntltl2021@163.com, b. chenyu5763@gmail.com, c. Robin034034@gmail.com
**corresponding author*

Abstract: This paper is a discussion of economic inequality in China. We look for the nature of many inequalities by correlating the Gini coefficient with unemployment, education, health care, and transport. By comparing graphs and data, we propose a series of solutions to improve inequality and discuss the effects and problems caused by these inequalities. The conclusion is that unemployment has no significant correlation with Gini Coefficient and that education, health care, and transport are all highly negatively correlated with Gini Coefficient. Therefore, upgrading education, healthcare, and transportation in backward regions is one of the solutions to reduce economic inequality in China.

Keywords: inequality, Gini coefficient, education, health, employment

1. Introduction

Economic inequality can be broken down into three more detailed categories: first, income inequality or income distribution (how the total amount of money paid to people is divided among them). Second, wealth inequality or wealth distribution (how the total amount of wealth people have is divided among owners) and consumption inequality (how the total amount of money people consume is divided among consumers). The globalization of transactions has reduced inequality between countries, and population inequality in most countries has increased [1]. And these 3 classifications only, we intend to discuss the reasons and solutions for economic inequality due to income inequality. Because income inequality can be measured using a method called the Gini coefficient. Among the variables conducted, we have selected 3 possible variables. They are the unemployment rate, health care, and education. These are some of the areas that China is very focused on.

The unemployment rate refers to the percentage of unemployed people in an economy as a percentage of the current labor force. The unemployed population refers to those currently unemployed but actively employed × 100% [2]. These can be very telling in terms of whether or not the human market impacts economic inequality.

Human resources play a very important role in China and contribute significantly to the country's GDP.

The importance of education in China is also obvious. Nowadays, talent is very important in this era, and skill is needed for people who have received higher education. In China, there is a

DOI: 10.54254/2754-1169/43/20232169

requirement of 9 years of compulsory education. Nowadays so professions are preferred or necessary with high education. So, discussing how much China is paying for education is essential.

Health care is also an inevitable factor. All people will have the possibility of needing to go to the hospital or needing medication. This also indicates that a country with good medical care is significant. It brings security to people, and all people want to live in a country with good medical care. So medical care also provides a lot of careers related to it.

All 3 of these reasons are what we think will bring changes to income and eventually trigger economic inequality. We intend to use the Gini coefficient and some of the possible causes we are looking for to illustrate our research.

2. Literature Review

Economic inequality is the inequality between people's assets, income, and consumption. The most obvious is the inequality of income and assets. There are many ways of measuring income inequality, of which the Gini coefficient is often used. The Gini coefficient quantifies income distribution on a scale from 0 to 1, where 0 represents perfect equality (everyone has the same income) and 1 illustrates the most significant inequality (one person or group has all the payment). Moreover, income inequality can be caused by various factors, including inequality in education, transport, access to opportunities, and social and economic structures. It can also be influenced by government policies, tax systems, and market regulations. And leads to a widening of the gap between rich people and poor people. This can lead to poverty and inequality. Poverty is made up of absolute poverty and relative poverty. Absolute poverty compares income to the amount needed to meet basic personal needs such as food, clothing, and shelter. Relative poverty, strongly related to economic inequality, refers to a person's inability to achieve a minimum standard of living compared to others at the same time and place.

As mentioned above, poverty is one of the most important causes of income inequality. This view is shared by Murali and Professor Oyebode [3]. In one of their academic papers from 2004, they suggest that the most important cause of social inequality is poverty. Poverty affects people's lives and mental health in many ways. They will not be able to afford the necessities of life. For China, there is no doubt that the country's economy has been growing in recent years. Still, Lai, Wang & Zhao argued in a 2016 article in the International Review of Economics and Finance January on long-term inequality in China's economic growth that in post-reform China, there is a solid long-run positive correlation between income inequality and growth rates [4]. This implies that although China's economy is growing, the widening gap between rich and poor and increased inequality remains a non-negligible problem. In addition, Zhang& Qian, in their paper also suggest that in China, when people experience COVID-19, the previously existing inequality in access to welfare is exposed [5]. In Guangzhou, for example, people prefer to promote employment policies rather than strengthen existing social assistance programmes. This certainly supports the view of Lai, Wang & Zhao. It also shows that economic inequalities in China need to be addressed.

It is often essential to suggest the causes of the problem to get a solution to economic inequality. In most cases, economic inequality is caused by many factors, such as inequality in education, healthcare, income, transport, etc. For example, Li and DaCosta, in their 2013 paper, discuss how transport is associated with economic inequality in China. They use the Gini coefficient and regression models to conclude that progress in the development of transportation in China also improves income inequality, ultimately leading to higher economic incomes [6]. Furthermore, in education, Chen, Yuan, & Zhang, in their article published in China Economic Review, argue that rising income inequality has led parents to spend more on their children's education, both in and out of school, due to the rising skill premium and the rising value of higher education. Inequality in education, in turn, further exacerbates income inequality, creating a vicious cycle [7].

DOI: 10.54254/2754-1169/43/20232169

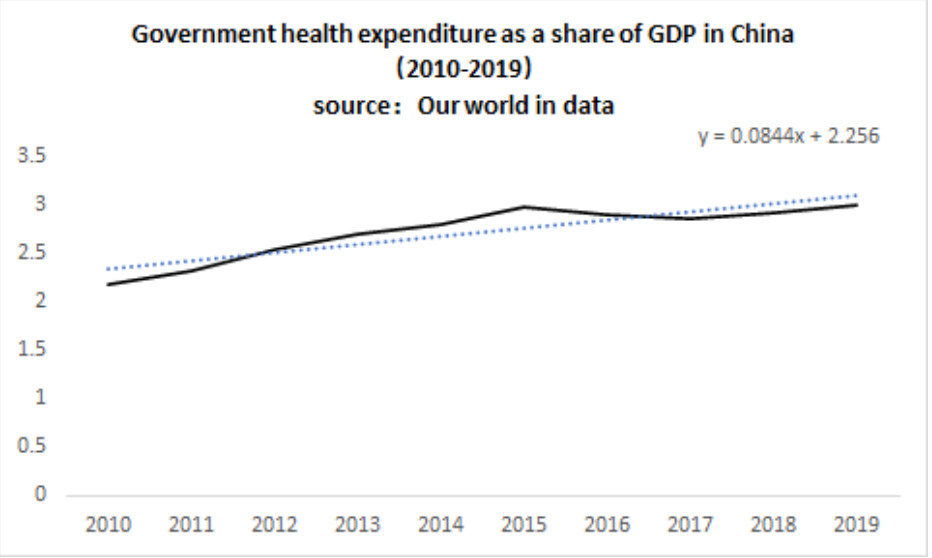
Through the above studies, we found that inequality in China is caused by several factors. So, we decided to examine the Gini coefficient in China in three areas: education, health care, and unemployment. The advantage of this is that, on the one hand, the labor force is often considered to be one of the main causes of income inequality. China is the most populous country in the world, and the distribution of labor is an integral part of the Chinese market economy. On the other hand, education and healthcare are components that make up the New Human Development Index (HDI). This index is often used to measure the development of a society. We assume that health and education are negatively correlated with inequality while unemployment is positively correlated.

3. Methodology

The methodology we use is de-trending. The main purpose of this methodology is to find out the relationship between economic inequality and unemployment, education, and health care. Economic inequality is measured by using the Gini coefficient. In addition, the unemployment rate, Chinese secondary school enrollment rate, and Chinese government health expenditure as a percentage of GDP represent unemployment, education, and health care, respectively. Cyclical makes a line graph to obtain the relationship of all variables. The method to find the Cyclical is as follows:

The trend of each variable is first found.

Example:



Source: Our world in data

Figure 1: Government health expenditure as a share of GDP in China (2010-2019).

Figure 1 shows the Chinese government's health expenditure as a percentage of GDP. This is one of the steps we take to arrive at our conclusions. Excel, this software comes to help us to find out the trend. The line graph is generated by the original data of the variable, and then the trend formula of the variable is obtained.

Then the original data is subtracted from the trend to find the difference.

Example:

$$GDP - Trend = Difference \tag{1}$$

After that, the difference is divided by the trend to obtain the cyclicality of each variable.

Example:

DOI: 10.54254/2754-1169/43/20232169

$$\text{Cyclical} = \frac{\text{Difference}}{\text{Trend}} \times 100 \quad (2)$$

Finally, after obtaining the cyclical of several data sets, we got line graphs of these data to obtain the relationships between them. To clarify the results, we used the formula for the correlation coefficient to find the relationship between the Gini coefficient and these variables.

$$r_{xy} = \frac{\sum x_i y_i - n\bar{x}\bar{y}}{n s_x s_y} = \frac{n\Sigma x_i y_i - \Sigma x_i \Sigma y_i}{\sqrt{n\Sigma x_i^2 - (\Sigma x_i)^2}\sqrt{n\Sigma y_i^2 - (\Sigma y_i)^2}} \quad (3)[\text{ Wikipedia}]$$

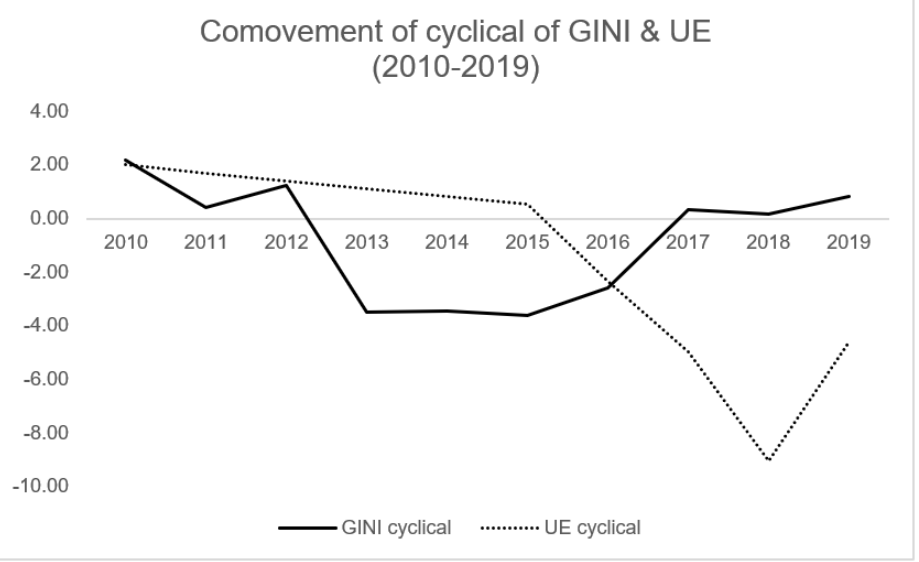
4. Data

We have obtained data from the Federal Reserve Economic Data (FRED) on the Gini coefficient and the unemployment rate in China in recent years. Data on government health expenditure as a share of GDP and enrollment of Chinese secondary schools were obtained from Our World in Data and the National Bureau of Statistics, respectively.

We collected data for China for the last ten years (2010-2019), using percentages as a reference. The years 2010-2019 were selected because the Gini coefficient was missing in the previous data. In addition, this paper focuses more on the changes in economic inequality in China in recent years. FRED was chosen as the source for the Gini coefficient and unemployment rate because it is more comprehensive by comparing several data sites. In contrast, Our World in Data and the National Bureau of Statistics provide more comprehensive data on healthcare and education in China, respectively.

5. Result

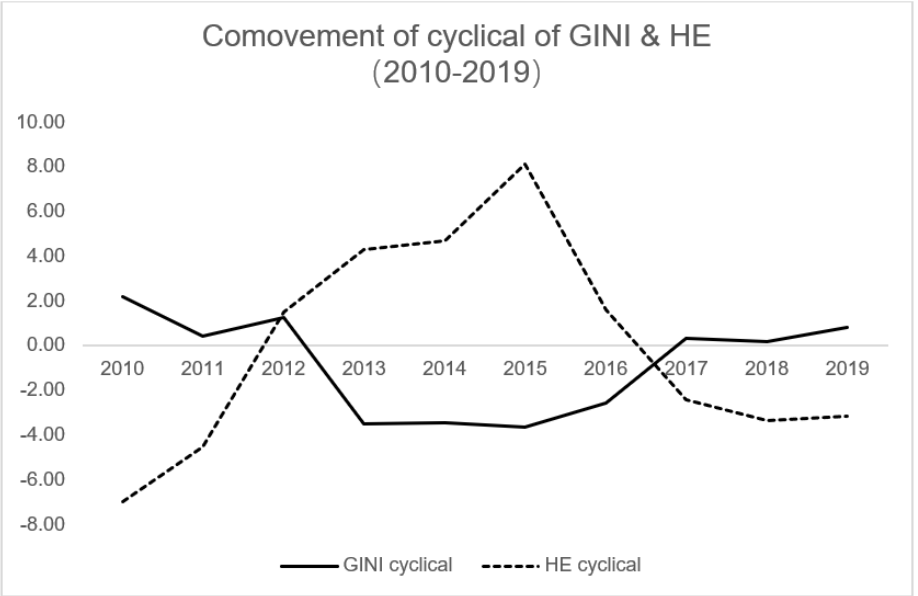
The conclusions drawn from the above methodology are presented in the following diagram. A cyclical line graph of the unemployment rate, education, health care, and the China Gini coefficient was derived using Excel graphing software (Figure 2-4).



Note: GINI: Gini coefficient; UE: unemployment rate. All data above are from China 2010 – 2019.

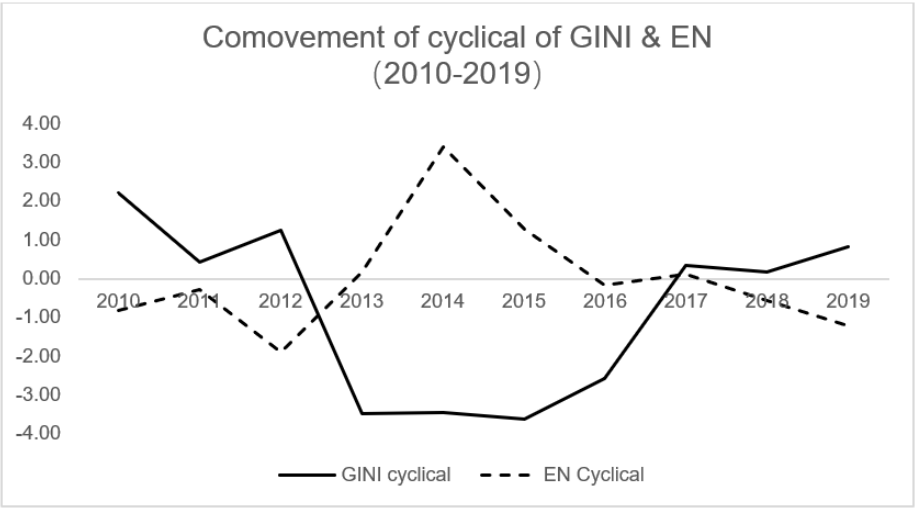
Figure 2: Comovement of cyclical of GINI & UE.

DOI: 10.54254/2754-1169/43/20232169



Note: GINI: Gini coefficient; HE: health expenditure as a share of GDP. All data above are from China 2010 – 2019.

Figure 3: Comovement of cyclical of GINI & HE.



Note: GINI: Gini coefficient; EN: enrollment of Chinese secondary schools. All data above are from China 2010 – 2019.

Figure 4: Comovement of cyclical of GINI & EN.

Figures 2, 3, and 4 take advantage of the cyclical nature of the data to show the relationship between the Gini coefficient and unemployment, health care and education, respectively. Since the linear relationships shown in the graphs are not very clear to the naked eye, we have used correlation calculations to derive the correlation between these factors and the Gini coefficient. Table 1 shows the cyclical for each factor, the raw material for the correlations calculated later.

DOI: 10.54254/2754-1169/43/20232169

Table 1: The cyclical of the variables in this paper on the Gini coefficient, unemployment, health care, education.

Year	GINI cyclical	UE cyclical	HE cyclical	EN Cyclical
2010	2.20	2.02	-6.98	-0.82
2011	0.43	1.71	-4.53	-0.29
2012	1.25	1.41	1.51	-1.89
2013	-3.49	1.11	4.30	0.18
2014	-3.44	0.82	4.71	3.39
2015	-3.63	0.53	8.09	1.27
2016	-2.57	-2.34	1.59	-0.17
2017	0.33	-4.95	-2.43	0.11
2018	0.18	-9.02	-3.37	-0.56
2019	0.82	-4.59	-3.16	-1.22

Note: All data are accurate to two decimal places.

The correlation between the data calculated in Table 1 and the Gini coefficient is presented in Table 2.

Table 2: Comparison of the correlation between the Gini coefficient and the cyclical of unemployment, health care, and education in this paper.

Variables	Correlation
GINI & UE	-0.17624
GINI & HE	-0.87323
GINI & EN	-0.74083

Note: All data are accurate to five decimal places.

These are all the conclusions drawn in the methodology section. What is clear is that the three elements discussed in this paper, namely unemployment, education, and health care, are all negatively related to the Gini coefficient. According to the definition of the Gini coefficient, the smaller the Gini coefficient, the more equal the economy. Therefore, increasing these three factors will reduce economic inequality in China.

In addition, we have observed some interesting phenomena in this result. Firstly, the unemployment rate is negatively correlated with the Gini coefficient. This means the higher the unemployment rate, the more equal the economy. Before the experiment started, we all guessed that the lower the unemployment rate, the lower the Gini coefficient. Usually, this is what most people think. But the results were just the opposite. After confirming that the data were correct, we felt that, on the one hand, this might be an uncertainty due to the small selection of data. On the other hand, Table 2 shows that the correlation between the unemployment rate and the Gini coefficient is very small, at -0.17, which suggests that even if the unemployment rate and the Gini coefficient do have a negative correlation, their correlation is still minimal. Therefore, the effect of the unemployment rate on economic inequality should not be significant. Secondly, we can see from the data that education and health care significantly impact inequality. We suspect this may be because they are both factors in the New Human Development Index (HDI).

In summary, the following conclusions have been drawn from the experiments. Education and health care show a significant negative correlation with the Gini coefficient. In contrast, unemployment shows a non-significant negative correlation with the Gini coefficient. This suggests that education and health care can provide a good entry point if we want to reduce economic

DOI: 10.54254/2754-1169/43/20232169

inequality in China today. Specific suggestions and approaches will be mentioned in the Discussion section.

6. Discussion

Looking at these figures, there are two leading causes of economic inequality. These are education, healthcare, income and transport. Yan Li and Maria N. DaCosta, in their 2013 paper, talk about transport inequality in China [8]. At the same time, the regressive development of transport also affects income inequality.

From these aspects, it is necessary to improve the development of transport in China, create jobs, and ensure a basic income for employed people in many ways. In this way, transportation will not significantly impact the decline in revenue and thus on inequality. At the same time, the Chinese government can also propose some subsidies in transportation, such as offering public transport coupons to the public or opening up some free modes of transport regularly to promote transport development. However, regarding education, the data on secondary school enrolment and the correlation between the Gini coefficient and education show a significant negative correlation of -0.74, indicating that education has a more significant impact on inequality. From the study by Chen, Yuan, & Zhang [7], there are differences in schools, school infrastructure, teachers' competence, and school learning climate, which may lead to disparities and unequal treatment between schools.

In regional and urban terms, some large cities and developed provinces have many high-quality educational resources; for example, many high-quality schools experienced teachers, and excellent educators. To some extent, this may create inequality for students in underdeveloped and poor areas. In this regard, the government could invest a large part of its funds in educational resources in underdeveloped and impoverished regions to ensure that most students have access to a basic and equal education model so that more students have access to primary education. In addition, the correlation of the healthcare Gini coefficient shows a strong negative relationship. This suggests that health care also influences inequality to a large extent. In terms of cities, some developed metropolitan areas have advanced and high quantities of healthcare resources. Better hospitals, doctors, health insurance or coverage, etc. In some remote and underdeveloped regions, on the other hand, there is a severe contrast in the medical situation, with some people not receiving timely treatment for minor illnesses, leading to serious illnesses and eventually death. This is why the government also needs to invest money into health care coverage. Because the health of the people comes first. And there is a need to develop the medical standards in some underdeveloped areas to improve them effectively.

7. Conclusion

This article aims to explore the causes of inequality in China and to suggest ways to mitigate the current state of inequality in China. At the outset of the article, we searched the literature on social inequality in China. After considering various aspects, we selected the study’s objectives and relevant factors: education, health care, and employment. The hypothesis that these factors are negatively related to inequality in China was also formulated. The literature review clarifies the definitions of inequality and Gini coefficient correlation.

We have chosen de-trending as our methodology to conduct this experiment. This is because it reduces the impact of the different units in which we collect data. At the same time, the analysis can be focused on the fluctuations in the data trends themselves. We also identified the variables of interest, using the Gini coefficient to measure inequality, the unemployment rate to measure unemployment, the Enrollment of Chinese secondary schools to measure education, and government health expenditure as a share of GDP to measure healthcare. The cyclical curves for

DOI: 10.54254/2754-1169/43/20232169

each of the data were obtained through Excel. The correlation coefficient between each factor and the Gini coefficient was calculated to get a more accurate relationship.

Based on the methodology and data section findings, we found that education and health care, on the one hand, have a significant negative correlation with inequality among the data observed in the experiment. Therefore, if we want to reduce inequality in China, raising health care and education in the lagging regions is undoubtedly a good way. On the other hand, the unemployment rate, although negatively correlated with inequality, is insignificant and therefore has a smaller impact on inequality. According to the literature reviewed, transport is also essential in reducing inequality.

In conclusion, according to the findings of this paper, improving the level of health care and education in backward areas may be one of the key elements in addressing inequality in modern China.

Acknowledgement

Tianli Li, Yu Chen and Zhuo Xing contributed equally to this work and should be considered co-first authors.

References

[1] *Wikipedia, Economic inequality, https://en.wikipedia.org/wiki/Economic_inequality#Effects*

[2] *Peter. Bondarenko, unemployment rate, Encyclopaedia Britannica, https://www.britannica.com/money/unemployment-rate*

[3] *Advances in Psychiatric Treatment (2004), vol.10, 216-224 Murali V/Oyebode F/ Poverty, social inequality, and mental health*

[4] *Li, T., Lai, J. C., Wang, Y., & Zhao, D. (2016). The long-run relationship between inequality and growth in post-reform China: New evidence from dynamic panel model. International Review of Economics and Finance January, 41, 238–252.*

[5] *He, A. J., Zhang, C., & Qian, J. (2022). COVID-19 and social inequality in China: the local–migrant divide and the limits of social protections in a pandemic. Policy and Society, 41(2), 275-290.*

[6] *Li, Y., & DaCosta, M. N. (2013). Transportation and income inequality in China: 1978–2007. Transportation Research Part A: Policy and Practice, 55, 56-71.*

[7] *Chen, Y., Yuan, M., & Zhang, M. (2023). Income inequality and educational expenditures on children: Evidence from the China Family Panel Studies. China Economic Review, 78, 101932.*

[8] *Yan Li, Maria N. DaCosta. (2013). Transportation and income inequality in China: 1978–2007. Volume 55, September 2013, Pages 56-71*