

Research on the Influence of Education Expenditure on the Income Gap between Urban and Rural Residents

Juan Wang

College of Economics, Jinan University, Guangzhou, China

Abstract

This paper uses data from 31 provinces and municipalities in China from 2016 to 2018 and a fixed-effects model to study the impact of education expenditures on income inequality between urban and rural residents. The study found that the increase of the per capita cultural, educational and entertainment expenditure gap between urban and rural residents will aggravate income inequality, and under different levels of government governance, urban and rural residents' educational expenditures have different effects on the urban-rural income gap; the increase in fiscal education expenditures will narrow urban and rural areas. Income gap; under different levels of government governance, the impact of each control variable on urban-rural income inequality is different. Based on empirical results, In order to play the role of education expenditure in narrowing the income gap between urban and rural areas, not only families or individuals need to pay more attention to education, but also the government needs to increase financial investment in education. Only when the level of government governance is effectively improved can education expenditures play a greater role in narrowing the urban-rural income gap.

Keywords

Education expenditure; Income disparity; Government governance level; Fixed effect model.

1. Introduction

With the rapid development of Chinese economy, the income inequality of urban and rural residents has also attracted widespread attention. The widening of the urban-rural income gap has greatly hindered Chinese economy economic construction and destroyed our social stability. How to effectively narrow the urban-rural income gap has also become a hot issue concerned by many scholars. Modern economic growth theory holds that human capital has replaced physical capital as the decisive factor for economic growth, and human capital is the result of investment in labor. Wage income, as one of the most important parts of personal income, is closely related to an individual's education level. The income gap between education expenditure and urban and rural residents is mainly realized through human capital: the increase of education expenditure can accumulate its own human capital and labor skills and qualities, thus affecting the income of laborers.

There are many domestic and foreign research literatures on education expenditure and income inequality, and the research directions also have different focuses. Regarding education expenditure, some scholars have studied the impact of fiscal education expenditure on income inequality. Chen used the dynamic panel data model and the systematic generalized moment method to argue that in the context of fiscal decentralization, only the increase in education expenditure can narrow the gap between urban and rural areas [1]. Some scholars have also studied the impact of household or individual educational expenditure on income inequality. Wei analyzed the dynamic relationship between educational inequality and the widening

income gap between regions in China by selecting panel data and fixed-effect models of 31 provinces and cities in China from 2007 to 2016, and the results showed that the two were positively related [2]. Some scholars have studied the impact of education expenditure and other variables on income distribution [3].

From the domestic research results, it can be divided into two categories: one is the direct and linear impact of fiscal education expenditure on the income gap between urban and rural residents. The other type is that the impact of fiscal education expenditure on the income gap between urban and rural residents is staged, regional and non-linear. Li believes that the impact of education expansion on income distribution depends on the level of economic development. When education develops to a certain stage, the income inequality of residents will gradually narrow, and the relationship between education expansion and income distribution will show an inverted U shape [4]. Gong used a quantile regression model to analyze the provincial panel data in China, and found that education expenditure had a stronger impact on the central region at the low quantile or the eastern and western regions at the high quantile [5]. Zhang used the structural threshold regression method and cross-country data from 105 countries from 1981 to 2016. The study showed that the relationship between education expenditure and income inequality is non-linear, and only at the threshold level of government governance, education expenditure to improve income distribution [6]. It can be seen that most scholars agree that the impact of education expenditure on income inequality is important, but how does it affect income inequality, and whether or how this impact is affected by changes in other conditions. Changes and other issues are still worthy of further study.

2. Situation Analysis of the Income Gap and Education Level of Urban and Rural Residents

2.1. Analysis of the Status Quo of Income Gap

Based on the statistics of urban and rural per capita disposable income according to the new caliber since 2013, it can be seen that the per capita disposable income of rural residents is growing faster than that of urban residents. The issue of equality is becoming more and more prominent.

At present, there are many indicators to measure income inequality, such as Gini coefficient and Theil index, etc. These indicators can better reflect income inequality. It can be seen from the coefficient that compared with the previous ten years, my country's Gini coefficient has declined as a whole, but in recent years, the Gini coefficient has shown an upward trend, and its value has always been greater than 0.4. Internationally, 0.4 is usually regarded as a warning line for the gap between the rich and the poor, and it can also be seen that the seriousness of my country's income inequality problem.

2.2. Analysis of the Current Situation of Education Level

The educational level of residents depends on the family or the individual on the one hand. From 2013, the per capita cultural, educational and recreational expenditures in urban and rural areas according to the new caliber can be seen, the trend of change is similar to that of per capita disposable income. The year-on-year increase in the proportion of per capita education expenditure in per capita disposable income also reflects, to a certain extent, the increasing emphasis on education by families or individuals themselves.

On the other hand, the government's support for education is also a key factor affecting residents' educational level. Limited financial support will cause huge school running costs and other costs to be passed on to residents, which will not only affect the educational environment, but also make education expenditures a burden on residents. my country's current education financial expenditure, whether from the central government or the provinces, focuses on the

developed eastern regions, and there is a problem of unbalanced investment in education finance. And compared with lower and secondary education, my country's investment in higher education is relatively high. As far as each province (city, district) is concerned, taking 2018 as an example, Guangdong Province has the highest financial education expenditure, and Ningxia has the lowest financial education expenditure. Although there is a factor that cannot be ignored, the level of economic development, the gap between the two is as high as 16 times.

3. Model Setting and Result Analysis

3.1. Model Settings

Based on the existing literature research, this paper initially establishes the following econometric model:

$$\ln(\text{COMEJ}_{it}) = \beta_0 + \beta_1 \ln(\text{JYCJ}_{it}) + \beta_2 \text{SGDP}_{it} + \beta_3 \text{CZHSP}_{it} + \beta_4 \text{JJYBZ}_{it} + \beta_5 \text{JKKF}_{it} + \beta_6 \text{WS}_{it} + \beta_7 \text{TM}_{it} + \beta_8 \text{ZF}_{it} + \varepsilon_{it} \quad (1)$$

The explanatory variable (COMEJ) in this paper refers to the difference between per capita disposable income in urban and rural areas, and the explanatory variable (JYCJ) refers to the difference between per capita expenditure on education, culture and entertainment in urban and rural areas. Control variables can be divided into two categories. One is based on the relatively important factors that have been proved by existing research to affect income inequality in an economic sense, including the economic development level (SGDP) of each province and city. The GDP of each province is divided by the domestic GDP. ; Urbanization level (CZHSP), that is, the proportion of the urban population in each province to the total population; the proportion of education expenditure (JYBZ), which is divided by the local fiscal education expenditure of each province by the added value of the tertiary industry; The total import and export of goods by region is divided by the local GDP. The second category is the level of government governance. Combined with the existing literature (Xu Yueqian et al., 2020) and the availability of data, the following three indicators are used to measure: (1) Government Transparency Score (TM). The government transparency score is based on the transparency index evaluation index system of the provincial government. Including the disclosure of normative documents, the disclosure of administrative punishment information, the smoothness of channels and other secondary indicators, it can more comprehensively reflect the disclosure of government website information. (2) Government administrative law enforcement score (ZF). The score of the legal system of government administrative law enforcement is evaluated based on the first-level indicators such as the public satisfaction survey and the institution satisfaction survey, as well as a number of second-level and third-level indicators, reflecting the implementation of the legal government in each province. (3) Online government service capability score (WS). The online government service ability score is based on the corresponding index evaluation system, which is obtained by analyzing and evaluating the government service hall and website data and questionnaire survey data of each province and city.

3.2. Data Source and Preprocessing

This paper uses panel data of 31 provinces (cities, districts) from 2016 to 2018. The government transparency score comes from the 2016-2018 "Chinese Government Transparency Index Report", the government's administrative law enforcement score comes from the 2016-2018 "China Rule of Law Government Evaluation Report", and the online government service capability score comes from the 2017-2019 "Provincial Level" Government and Key Cities Online Government Service Capability Survey and Evaluation Report", other

variable data and the data mentioned in the text are all from the China Statistical Yearbook of each year. Because the "Chinese Government Transparency Index Report" and "China Legal Government Evaluation Report" select some cities in China, this paper selects the provincial capital cities of each city or province to score.

In this paper, the local financial education expenditure, regional GDP, per capita disposable income of urban residents, per capita disposable income of rural residents, added value of the tertiary industry, per capita education, culture and entertainment expenditure of urban residents, per capita education, culture and entertainment expenditure of rural residents and sub-regional The total import and export of goods is based on 2016, eliminating the influence of annual price factors. The government transparency score and online government service ability score are 100 points out of 100, and the government administrative law enforcement legal system score is 1000 out of 100 points. In addition, the logarithmic processing of COMECJ and JYCJ in the formula is to maintain the stationarity of the data structure, which can reduce or eliminate the influence of heteroscedasticity to a certain extent.

Table 1. Descriptive statistics of variables

Variable	Mean	Standard deviation	Minimum value	Maximum value
COMECJ	7.24	0.02	6.57	8.34
YJCJ	0.91	0.07	6.57	8.34
SGDP	3.55	0.20	-1.86	2.56
CZHSP	58.94	6.75	0.15	12.91
JYBZ	9.01	3.03	29.56	88.1
JJKF	23.65	6.08	1.69	105.26
WS	79	0	50	94
TM	68	8	37	88
ZF	68.43	1.94	50.69	80.54

3.3. Model Selection

In eviws9, the F test and Hausman test were performed on the above formula. The P values of the correlation test were all less than 0.05, so the fixed effect model was selected. The results of some literatures are quite different, and their economic implications cannot be explained. Considering the influence of the level of government governance on the explanatory variables and the first type of control variables, this paper sets the three related indicators of the level of government governance as dummy variables:

$$WS1 = \begin{cases} 1 & WS \geq 80 \\ 0 & WS < 80 \end{cases} \quad TM1 = \begin{cases} 1 & TM \geq 70 \\ 0 & TM < 70 \end{cases} \quad ZF1 = \begin{cases} 1 & ZF \geq 70 \\ 0 & ZF < 70 \end{cases} \quad (2)$$

In order not to omit the more important explanatory variables and interaction terms, this paper firstly adds the interaction terms of dummy variables and products of other variables into equation (1). In eview9, mixed model, fixed model and random model are estimated, and the P value of the corresponding coefficient of the variable is screened. Based on the results of the F test and Hausman test, the fixed effect model was selected in this paper. The following model is finally determined:

$$\ln(COMECJ_{it}) = \beta_0 + \beta_1 \ln(JYCJ_{it}) + \beta_2 SGDP_{it}^{+B} + \beta_3 WS1_{it} + \beta_4 TM1_{it} + \beta_5 ZF1_{it} + \alpha_1 WS1_{it} \ln(JYCJ_{it}) + \alpha_2 TM1_{it} \ln(JYCJ_{it})^{+B} + \alpha_3 TM1_{it} JJKF_{it} + \varepsilon_{it} \quad (3)$$

The model results are shown in Table 2, Among them, "****", "***", and "*" indicate significant at the 1%, 5%, and 10% significance levels, respectively.

Table 2. Fixed effects model results

variable	Coefficient	T statistic	P value	variable	Coefficient	T statistic	P value
JYCJ	0.03377	1.88	0.0668*	WS1*JYCJ	-0.02114	-1.81	0.0765*
SGDP	0.01980	4.36	0.0001***	TM1*JYCJ	-0.01859	-1.57	0.1239
CZHSP	-0.00250	-0.72	0.4774	ZF1*JYCJ	0.01337	0.70	0.4901
JYBZ	-0.00377	-3.70	0.0006***	ZF1*SGDP	-0.00291	-1.70	0.0956*
JJKF	0.00028	1.16	0.2509	WS1*CZHSP	0.00136	2.32	0.0248**
WS1	0.06675	0.84	0.4076	WS1*JYBZ	0.00128	1.19	0.2402
TM1	0.13085	1.57	0.1227	WS1*JJKF	-0.00028	-1.17	0.2488
ZF1	-0.08932	-0.66	0.5134	TM1*JJKF	0.00037	2.29	0.0269**

3.4. Model Results

It can be seen from the model results that most of the single variables fail the t-test at the 10% significance level, and only JYCJ, SGDP and JYBZ pass the t-test. It can be seen from the influence coefficient that the impact of JYCJ on COMECJ is positive, that is, a 1% increase in the difference between per capita education, culture and entertainment expenditures in urban and rural areas will cause the difference in per capita disposable income between urban and rural areas to increase by 0.03377%. This paper argues that this is consistent with education as an important factor affecting wage income. The coefficient of the interaction term between WS and JYCJ in the control variable passed the test, and combined with the failure of WS itself, it can be seen that the impact of online government service capacity on urban-rural income inequality is indirect. When the government's online government service capability score is higher than 80 points, which means that the government's online government service capability is better, the difference between per capita education, culture and entertainment expenditures in urban and rural areas will increase by 1%, which will cause additional per capita spending in urban and rural areas. The difference in disposable income decreased by 0.02114%, and although the income gap will widen in general, it will slow down the trend of income inequality. The improvement of online government service capabilities means that more and more services can be performed directly on the Internet. Compared with urban residents, this has a greater impact on rural residents and can effectively improve their efficiency.

Among other control variables, a 1-unit change in the ratio of each province's GDP to domestic GDP will cause the difference between urban and rural per capita disposable income to increase by 0.0198%. From the data in the China Statistical Yearbook over the years, it can be seen that the per capita disposable income gap between urban and rural residents in relatively developed areas such as Beijing, Shanghai and Guangdong will be higher than that in less developed areas. The dummy variable ZF failed the test, but the coefficient of the interaction term between ZF and SGDP passed the test, indicating that when the government's administrative law enforcement score is higher than 70, that is, when the government's ability to rule by law is strong, the proportion of GDP in each province to domestic GDP changes 1 A unit will cause the difference between urban and rural per capita disposable income to drop by an additional 0.00291%, which will slow down the trend of income inequality between urban and rural residents.

The urbanization level and the online government service ability did not pass the test alone, but the interaction between the two passed the t test. It shows that compared with provinces (cities, districts) with weaker government online government service capabilities, the proportion of urban population in the total population of provinces (cities, districts) with stronger

government online government service capabilities changes by 1 unit, which will cause urban and rural areas. The difference in per capita disposable income rose by an additional 0.00136%. There are three main viewpoints on the impact of urbanization on the income gap between urban and rural residents. The first point of view is that urbanization will lead to the transfer of rural surplus labor, an increase in the per capita arable area of agricultural labor, and an increase in the demand for agricultural products, thereby narrowing the income gap between urban and rural residents. The second point of view is that urbanization will lead to the loss of high-quality rural labor, the loss of water and land resources for wealthy residents, etc., which will have a widening effect on the income gap between urban and rural residents. The third point of view is that the impact of urbanization on income inequality is in a "U" shape. The results of this paper support the first view.

A change of 1 unit in the proportion of local fiscal education expenditure divided by the added value of the tertiary industry in each province will cause the difference between urban and rural per capita disposable income to drop by 0.00377%, which shows that fiscal education expenditure plays a positive role in narrowing the urban-rural income gap. effect. At present, my country has basically achieved nine-year compulsory education in an all-round way, and has piloted 12-year compulsory education in economically developed coastal areas such as Shenzhen. Compared with urban residents, rural residents' educational awareness is not high, and many areas are unable to receive education due to economic constraints. With the popularization of compulsory education, rural residents' educational awareness has been effectively improved. In the "Opinions on Further Adjusting and Optimizing the Structure and Improving the Efficiency of the Use of Education Funds" issued by the State Council in 2018, it is clearly proposed that financial education funds should be tilted towards students from economically disadvantaged families such as those in deeply impoverished areas and the establishment of a card. Financial education will be tilted towards rural areas and can effectively narrow the gap between urban and rural education levels.

The interaction between JJKF and TM has passed the t test. If the information disclosure on the government's website is transparent and fair, dividing the total import and export of goods in each province and region by the change of 1 unit of local GDP will cause per capita disposable income in urban and rural areas. The difference in income rose by 0.00037%. Since the reform and opening up, my country's demand and degree of opening to the outside world have gradually expanded. At present, my country has become one of the largest importers of agricultural products in the country. This will have a certain impact on my country's agricultural product market. The degree of openness of my country's agricultural products is not high, which will affect income of rural residents.

4. Conclusion

Based on the empirical research in this paper, it can be seen that the impact of government governance level on income inequality is non-linear. Moreover, the improvement of the government's online government service capability will slow down the trend of urban-rural income inequality caused by the disparity in per capita education, culture and entertainment expenditures between urban and rural areas and the level of urbanization. The improvement of the government's administrative law enforcement capacity will slow down the trend of urban-rural income inequality exacerbated by economic development. The improvement of government transparency and openness will exacerbate the income gap between urban and rural residents brought about by economic opening.

In addition, the educational expenditures of urban and rural residents have a positive impact on income inequality, and at different governance levels, the educational expenditures of urban

and rural residents have different effects on the urban-rural income gap. Conversely, an increase in fiscal education spending will narrow the urban-rural income gap.

Therefore, in order to play the role of education expenditure in narrowing the income gap between urban and rural areas, not only families or individuals need to pay more attention to education, but also the government needs to increase financial investment in education. In view of the current pattern and characteristics of government expenditure on education, the government should increase the proportion of investment in education funds in the central and western regions, increase investment in lower and higher education, and increase investment in continuing education and vocational education on the basis of universal compulsory education. investment in education, etc. Second: attention should be paid to the influence of the government's governance level on the urban-rural income gap. The level of government governance involves corruption, and corruption involves unfair distribution of educational expenditures. Only when the level of government governance is effectively improved can education expenditures play a greater role in narrowing the urban-rural income gap.

References

- [1] A.P. Chen and J.P. Du (2010). China's fiscal expenditure and urban-rural income gap. *Statistical Research*, vol.27, no.11, p.34-39.
- [2] W. Jiang (2019). Analysis of the impact of educational inequality in my country on the urban-rural income gap. *Economic Research Guide*, no.22, p.5-6+15.
- [3] Z.M. Ding and G.H. Yu (2017). Research on the threshold effect of social security and public education expenditure on residents' income. *Journal of Southwest University (Social Science Edition)*, vol.43, no.04, p.55-64+190.
- [4] X. Li(2014). Analysis of the impact of education expansion on income distribution of Chinese residents and policy choices. *Heilongjiang Social Sciences*,no.05, p.86-89.
- [5] X.Q. Gong (2020). Research on the Influence of Fiscal Education Expenditure on the Income Gap between Urban and Rural Residents: Analysis of Stratified Provincial Data Based on Deciles. *Journal of Yunnan University of Finance and Economics*, vol.36, no.04, p.64-71.
- [6] X.F. Zhang, X.Pan, X.D.Chen, P.H. Shi (2020). Educational Public Expenditure and Income Inequality: An Empirical Study Based on Structural Threshold Regression Model. *Macroeconomic Research*, no.01, p.164-175.
- [7] Y.Q. Xu, T. Li (2020). Measurement and Evaluation of the Modernization Level of Provincial Government Governance in my country. *Journal of the Party School of the Hangzhou Municipal Committee of the Communist Party of China*, no.03, p.59-65.