

Analysis of the Economic Growth Influence on the Urban-Rural Income Gap: An Empirical Study Based on 31 Provincial Regions

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Abstract. The relationship between economic growth and the urban-rural income gap is intertwined with the formulation of economic development policies. It is the goal of every country to control the urban-rural income gap within a reasonable range while ensuring economic growth. Studying how economic growth influences the urban-rural income gap, this paper explores its influence direction and mechanism by using the two-way fixed effect model. It is found that economic growth will narrow the urban-rural income gap by improving local spiritual and cultural construction and fiscal expenditure. Finally, the paper puts forward some policy suggestions that we should strengthen the governmental guiding role, actively carry out the rural spiritual and cultural construction, and boost fiscal expenditure to help farmers.

Keywords: Economic Growth; Income Gap; Common Prosperity.

1. Introduction

Since the 21st century, all countries in the world have made great progress in economic development. Economic growth has also led to the increasing per capita income in various countries. In 2010, the per capita disposable income of Chinese residents was 12,500 yuan and that of US residents was 38,281 dollars [1]. In 2019, the per capita disposable income of Chinese residents was 30,700 yuan and that of US residents was 45,105 dollars, up by 146% and 17.8% respectively compared with 2010.

It is all countries' goal to achieve economic growth and narrow the urban-rural income gap. However, there are controversies in academia about the influence direction of economic growth on the urban-rural income gap. When economic development drives the increasing per capita income, is the urban-rural income growing in a balanced way? Has the gap been narrowed? What is its influence mechanism?

In the literature related to the impact of economic growth on the urban-rural income gap, scholars divide on the role of economic growth in the urban-rural income gap. Chai Jian et al. (2023) believe that economic growth will widen China's income gap [2], while Cheng Mingwang et al. (2022) hold that economic growth not only brings efficiency improvement and more wealth, but also narrows the urban-rural income gap, achieving a win-win situation of efficiency and fairness [3]. Some scholars, represented by Chen and Lin (2014) [4], think that the impact of economic growth on the urban-rural income gap shows a U-shaped law of declining before rising.

In the literature related to the impact of the urban-rural income gap on economic growth, B. Ren and X. Chao (2018) believe that an excessive income gap will affect the foundation, operation, and results of economic growth. The main reason is that the expanding urban-rural income gap restricts the education of rural families and reduces the enrollment rate of education at all levels, ultimately affecting the per capita education of the whole society and limiting the economic growth quality [5]. D. H. Vo et al. (2019) also believe that income inequality negatively affects the economic growth of middle-income countries during the study period [6]. Therefore, when studying how economic growth influences the urban-rural income gap, the reaction of the urban-rural income gap to economic growth must be considered.

To sum up, the existing literature mainly has the following limitations. Firstly, the existing literature has different conclusions on the role of economic growth in the urban-rural income gap. Secondly, most of the existing literature only considers the influence of one party on the other and seldom considers the endogenous influence caused by mutual causality, which leads to the possibility of a wrong model conclusion. Thirdly, empirical tests of most literature only use the single country data and rarely extend the model to other countries, thus the universality is limited.

The marginal contributions of this paper are as followed. Firstly, empirical research methods will be used to clarify the direction of economic growth on the urban-rural income gap. Secondly, the interaction between economic growth and the urban-rural income gap is considered simultaneously, which reduces the influence caused by endogeneity and makes the conclusion more correct. Thirdly, the robustness test of the model is carried out with American data, which makes the conclusion more applicable.

2. Research Hypotheses

Because infrastructure, labor level, and economic resources between urban and rural areas vary, economic growth may lead to inconsistent urban-rural income growth rates when affecting per capita disposable income, which will lead to changes in the urban-rural income gap.

According to Lewis' model, the labor market is divided into two sectors, that is, the modern sector and the traditional sector, with the labor productivity of the modern sector often higher than that of the traditional sector. In current society, modern departments are mostly concentrated in cities, while rural areas are mostly traditional departments. Thus, their regional distribution differences will trigger the labor productivity of rural departments to be often lower than that of urban departments, which is consistent with the current social situation in China. Due to the uneven distribution of educational resources between urban and rural areas, cities have higher education levels and labor quality than rural areas. Meanwhile, in the current situation where cities have formed economic circles, capital investment tends to favor cities and capital investment also improves the labor productivity of cities. Therefore, economic growth is indeed more beneficial to cities, so the income of urban residents will increase faster than that of rural residents with a larger urban-rural income gap.

However, Lu Ming, Chen Zhao et al. (2005) found that a significant negative correlation exists between economic growth and the urban-rural income gap. Besides, Jing Binqiang (2019) who supports this view concluded that sustained economic growth will narrow the urban-rural income gap in the long run after empirical analysis. One of the reasons is that economic growth will create more jobs in cities. Up against the constant labor supply, the increasing labor demand will enable growing incomes and these new jobs will be filled by rural surplus labor, which will raise the per capita disposable income in rural areas, thus reducing the urban-rural income gap.

In the above two cases, the effect direction of economic growth on the urban-rural income gap is contradictory, so this influence direction cannot be clarified. Thus, this paper makes the following hypotheses.

Hypothesis 1a: Economic growth will widen the urban-rural income gap.

Hypothesis 1b: Economic growth will narrow the urban-rural income gap.

According to Li Yining (2011), higher urban human capital results from a higher cultural and educational level, while lower rural human capital results from a lower cultural and educational level. It is their different cultural construction and educational level that triggers the urban-rural income gap. Thus, this paper argues that strengthening the regional public cultural construction can alleviate the low educational level caused by limited rural investment in culture. Meanwhile, consolidating cultural construction can improve the cultural consciousness of rural residents, which makes them more motivated to learn and then affects the urban-rural cultural gap from the collective aspect. Hence, this paper puts forward this hypothesis.

Hypothesis 2: Economic growth affects the urban-rural income gap by affecting local cultural construction.

According to the theory of three fiscal functions put forward by Musgrave, finance can distribute income. In recent years, the Chinese government has come forth with the “rural revitalization strategy” and strengthened its assistance to rural areas. Using agricultural subsidies to rural residents, the region can improve the income of rural residents and reduce the urban-rural income gap, so as to better realize income equity. Economic growth will increase fiscal revenue, so the ability of fiscal expenditure to help rural areas will be higher, thus reducing the urban-rural income gap. Moreover, Zhang Chong and Xiao Yang (2023) also believe that the improvement of financial support for agriculture can narrow the urban-rural income gap in this province. Therefore, this paper puts forward the following hypothesis.

Hypothesis 3: Economic growth affects the urban-rural income gap by increasing local fiscal expenditure.

3. Research Methods

3.1 Data Sources

This paper uses second-hand panel data from the database of the National Bureau of Statistics of China from 2010 to 2019 at the provi [Hong Kong Special Administrative Region, Macao Special Administrative Region, and Taiwan Province are not included in the 31 provinces here.].

This paper uses second-hand panel data from the US Bureau of Statistics database from 2010 to 2019. Because some missing data exist in the United States, this paper eliminates the state individuals with missing data to ensure the panel data integrity. The final sample collected in this paper is at the state level, including 29 States in the United States [Because there are many missing data in some States in the United States, this paper retains the following States with relatively complete data as samples: Alabama, Alaska, Arkansas, California, Colorado, Connecticut, Hawaii, Illinois, Iowa, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Montana, Nebraska, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, Tennessee, Texas, Vermont and Wyoming.].

3.2 Variables

The main dependent variable of this paper is the urban-rural income gap (Diff), which is consistent with the existing literature (Hou & Yuan, 2023; Zhang & Xiao, 2023). This variable is expressed by the ratio of urban per capita disposable income to rural per capita disposable income.

The main independent variable of this paper is the level of economic development (Eco), which is consistent with the existing literature (Cao et al., 2010; Cheng et al., 2019; Zhou et al., 2021), which is expressed by the natural logarithm of regional per capita GDP.

To minimize the endogenous problems caused by missing variables, this paper selects four control variables.

(1) Old-age dependency ratio. The higher the age dependency ratio in a region, the higher the aging rate of its population, and the greater the dependency pressure of its labor force, thus stimulating the current phenomenon that the left-behind elderly live in rural areas and the young labor force work in cities. Besides, the elderly usually rely on savings to live without work, they have no or only less labor income, thus changing the urban-rural income gap with the improvement of population aging [7].

(2) Population (Popu). Provinces or cities with a large population tend to create more employment opportunities, and high-skilled and high-quality talents can find suitable jobs more conveniently in these areas, so these regions are more attractive to high-level and higher-paid talents. Meanwhile, the rising population density will lead to an increase in urban prices, transportation, and other costs, which will stress low-income groups and may push them to live in rural areas with lower living costs, leaving an impact on the urban-rural income gap [8].

(3) Gender ratio (Gender). Based on traditional ideas, rural women may be restricted by factors such as family to stay and work in rural areas more than rural men. Moreover, in some areas, women

have fewer educational opportunities, more limited career choices, and lower incomes than men, which widens the income gap between men and women. As mentioned above, women are more likely to stay in rural areas than men, so the gender distribution gap between urban and rural areas leads to the urban-rural income gap.

(4) Urban-rural employment gap ratio (Emdiff). This indicator is expressed by dividing the urban-rural employment difference by urban employment. In most cases, the more developed a regional economy is, the more employment opportunities can be created. Hence, the income given to urban residents is higher than that of rural residents, which also means that rural laborers flow more to cities to get higher incomes [10].

3.3 3. Model

The model used in this paper is a two-way fixed effect model as follows.

$$Diff_{it} = a + b * Eco_{it} + c * X_{it} + \lambda_t + \mu_i + \varepsilon_{it} \quad (1)$$

Where i stands for province, city, or state, and t stands for time. $Diff$ represents the urban-rural income gap, Eco represents the level of economic development, and X is the control variable. λ_t depicts the time fixed effect, μ_i depicts the individual fixed effect, and ε_{it} is the residual.

4. Empirical Analysis

4.1 Baseline Regression

The regression results of the baseline model are firstly introduced below.

Table 1 Regression Results of the Two-Way Fixed Effect Model

	Diff
Eco	-0.339*** (0.0495)
Emdiff	0.000762 (0.0128)
Gender	0.00137 (0.000813)
Popu	0.0000477* (0.0000194)
Depend	0.00981*** (0.00233)
Individual Fixed Effect	Y
Time Fixed Effect	Y
N	279
R^2	0.840
adj. R^2	0.810

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1 shows the regression results of the model, which proves that the coefficient of Eco is significant and negative at the level of 0.1%, with 0.339 as its absolute value. It is also shown that the ratio of urban per capita annual income to rural per capita annual income in China will decrease by 0.339 for every unit increase in the logarithm of regional per capita GDP, that is, regional economic growth will narrow the urban-rural income gap.

4.2 Robustness Test

To verify the reliability of the benchmark model's analysis, the following robustness tests are carried out in this paper.

Table 2 Robustness Test Results

	Replacement of the Model Diff	Replacement of Independent Variables Diff	Replacement of Samples Diff
Eco	-0.437*** (0.0455)		-0.208* (0.0941)
Eco'		-0.0451** (0.0143)	
Emdiff	-0.218*** (0.0459)	-0.0191 (0.0237)	0.0112 (0.0712)
Gender	-0.000669 (0.00534)	0.000834 (0.00149)	0.824 (1.876)
Popu	-0.0000253*** (0.00000693)	-0.000109** (0.0000338)	1.99e-08* (1.01e-08)
Depend	-0.0135* (0.00582)	-0.0253*** (0.00237)	0.00191 (0.00458)
Individual Fixed Effect	N	Y	Y
Time Fixed Effect	N	N	Y
_cons	7.793*** (0.696)	3.822*** (0.246)	2.903* (1.373)
R^2	0.404	0.430	0.160
adj. R^2	0.393	0.348	0.017

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

(1) Replacement of the model. In this paper, after replacing the model of two-way fixed effect with OLS regression, the coefficient of Eco is still significant at the level of 0.1% with -0.437 as the coefficient, which is the same as the benchmark model. It indicates that economic growth will reduce the urban-rural income gap and confirms the conclusion of the benchmark model.

(2) Replacement of independent variables. In this paper, the logarithm of per capita GDP, which originally measures the economic level, is replaced by the logarithm of per capita annual income. Under the individual fixed effect model, the logarithm coefficient of per capita annual income (i.e. Eco') is -0.0451, which is still negative and significant at the level of 1%, proving that economic growth will narrow the urban-rural income gap.

(3) Replacement of samples. To verify the application of the model, this paper takes the United States as a sample replacement group for the robustness test. Because the United States is the representative of developed countries, while China belongs to developing countries, if the conclusion holds in both countries, it means that the conclusion has universality in a certain range.

After using the two-way fixed effect model, the coefficient of Eco is -0.208, which is the same as that of China and significant at the level of 5%. It proves the universality of the conclusion that economic growth can narrow the urban-rural income gap in both China and the United States.

5. Conclusion

Using the panel data from the database of the National Bureau of Statistics of China from 2010 to 2019, this paper takes 31 provincial regions in China as samples and studies how economic growth affects the urban-rural income gap based on the two-way fixed effect model, and verifies the robustness and endogeneity of the model.

The results are as follows. ① Economic growth has a significant negative effect on the urban-rural income gap. ② Economic growth will narrow the urban-rural income gap by improving the spiritual and cultural construction. ③ Economic growth will narrow the urban-rural income gap by expanding local fiscal expenditure.

According to the research results of this paper, to better narrow the urban-rural income gap in China, this paper provides the following suggestions. Firstly, the government should actively carry out spiritual and cultural construction. For example, we can strive to promote the revitalization of

rural culture by reducing tuition fees and building community book corners. In addition, the government can enhance the construction of rural spiritual civilization through cultural publicity, strengthening scientific and technological cultural training, and carrying out civilized pairing and co-construction^[11]. Second, the government should improve the orientation of fiscal expenditure to help farmers. To narrow the urban-rural income gap more effectively and promote social equity, the government should improve the use efficiency of financial expenditure for supporting agriculture. For example, it should pay more attention to the investment in agricultural science and technology and agricultural talents, so that the capital investment can be effective for a long time. To prevent the stagnation of the rural revitalization project caused by the fluctuation of financial capital supply, a long-term and stable financial capital support mechanism should be established. Meanwhile, a post-evaluation system of fiscal expenditure should be established to ensure its effectiveness^[12].

The limitation of this paper is that some indicators are missing before 2010, and its data time span is short, so the conclusion may be phased and one-sided. Besides, there is no placebo test in this paper, and the conclusion of this model may be unreliable to some extent. In other words, the narrowing of the urban-rural income gap may be caused by other factors rather than economic growth.

In future research, we can improve the article from the following aspects. For one, expand the data range, select more representative developed countries and developing countries, and expand the time span of samples. In this way, the impact of economic growth on the urban-rural income gap can be explored when developed countries and developing countries are in different stages of economic development. For another, based on expanding the data range, the placebo test can be carried out on the model to judge whether the change in the urban-rural income gap is due to economic growth.

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