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Investigation and Analysis on the impact of financial development on urban-rural income gap

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Abstract: With the improvement of China's economic system, the economic level is increasing day by day. At the same time, it also injects vitality into the development of the financial industry. However, at the same time, the disadvantages of China's urban-rural dual structure are still very prominent, and the gap between urban and rural rich and poor is still a gap worthy of attention. With the further recovery and steady development of Finance in the future, how will the urban-rural dual structure be affected? Can financial development assist national policies to narrow the income gap between urban and rural areas, or will financial development further widen the income gap between urban and rural areas? With the help of Stata software, this paper will build a model according to the data on the official website of the National Bureau of statistics of China, and explore whether the three explanatory variables selected by the author, including financial development indicators, have an impact on the explained variable - the income gap between urban and rural residents in China, and to what extent. This paper will report in the order of model construction, regression estimation, model test and adjustment, empirical result analysis and economic conclusion analysis. The key research object is the explanatory effect and influence of the explained variable financial development index FIR on the explanatory variable.

1. Model building

1.1 Variable selection

This paper takes the per capita income gap between urban and rural areas in China as the explanatory variable and uses DIS as the data. Explanatory variables include ① indicators reflecting China's financial development from 2011 to 2020. This paper selects financial correlation ratio (FIR) as the data indicator and uses FIR as the data representation; ② The contribution of China's primary industry (Agriculture) to GDP from 2011 to 2020 is expressed by COA; ③ The proportion of China's urbanized population from 2011 to 2020 is expressed by popu. in addition α 0 is a constant term, ε Is a random error term. The subscript y indicates the year. The initial expression is 1:

$$dis_y = \alpha_0 + \alpha_1 FIR_y + \alpha_2 CoA_y + \alpha_3 popu_y + \varepsilon_y \quad (1)$$

1.2 Data source and sample list

All data in this paper are from the official website of the National Bureau of statistics of China. The data span is 2011-2020, and the data description object is China. Next, the calculation method and meaning of variables are described:

The explained variable is the gap between urban and rural per capita income in China. The data are obtained according to the difference between China's urban per capita income and China's rural per capita income in the same year.

Explanatory variable ① financial correlation ratio (FIR) is defined as the ratio between the value of all financial assets and the total amount of economic activities over a period of time. This paper calculates the rough fir value in the form of China's Quasi money M2 supply / gross domestic product (GDP) in the same year.

Explanatory variable ② the contribution ratio of China's primary industry (Agriculture) to China's GDP in a single year. After 2008, although the proportion of primary industry in China's rural household income also fell below 80%, it is still an important source of rural household income. The proportion of agriculture in GDP has a significant impact on Farmers' income, which is positively correlated with farmers' income and inversely correlated with the income gap between urban and rural areas. Therefore, it is selected as the explanatory variable. The data is obtained directly from the website query.

Explanatory variable ③ the proportion of urbanization population is an important indicator of urban-rural population transfer, and with labor migration, it must have an impact on regional economic development. The calculation method of this indicator is the ratio of China's urban population to the national total population in the same year.

2. Regression estimation test and adjustment

Firstly, for the selected explanatory variables and explained variables, the author uses Stata software to carry out simple benchmark regression. After completion, the model index shall be tested.

2.1 Overall significance test: F test

After checking that the data entry is correct, the output results of Stata software are shown in Figure 1, Indicating that at least one explanatory variable of the regression coefficient is significant, and the model as a whole passes the significance F test.

Figure 1: F test

2.2 Individual significance test: t-test

The results of t-test are shown in Figure 2. The data show that except popu, the other two variables failed the significance test. The test conclusion is that the significance of FIR and COA is low, and the significance of popu is high.

dis	Coef.	Std. Err.	t	P>|t|
FIR	8.945349	2029.805	0.00	0.997
CoA	-68.73433	61.9629	-1.11	0.310
popu	108277.9	5587.195	19.38	0.000
_cons	-41756.84	1575.844	-26.50	0.000

Figure 2: t test

2.3 Goodness of fit test

According to the goodness of fit test results, as shown in Figure 3, the goodness of fit test results of the model before and after adjustment are high, and the fitting effect is good.

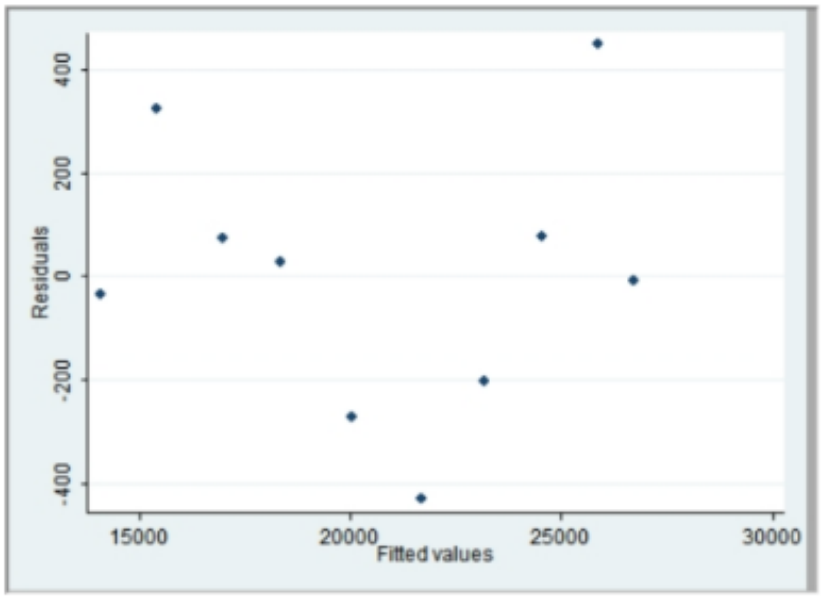
R-squared = 0.9965
Adj R-squared = 0.9947

Figure 3: Goodness of fit test

2.4 Heteroscedasticity test

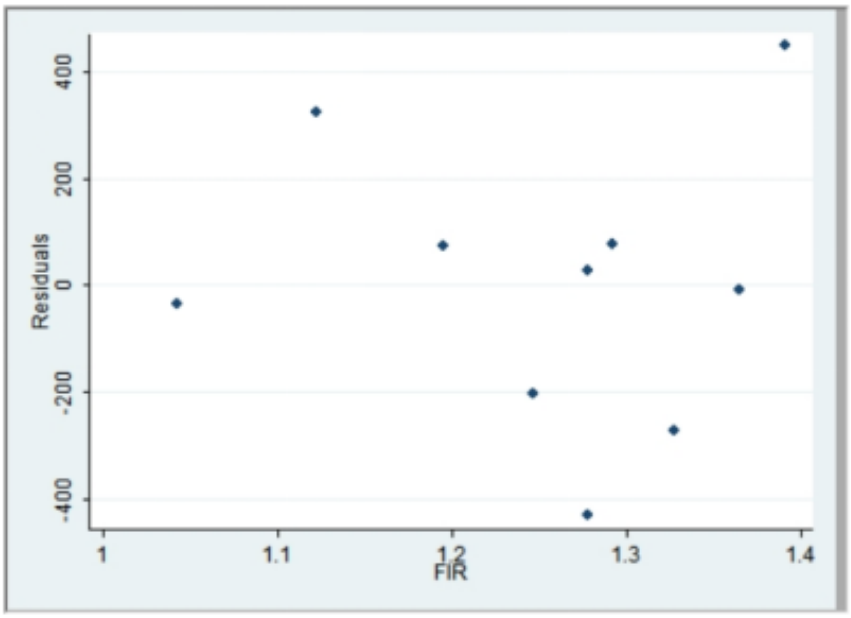
① Scatter observation

Scatter plots of residuals and fitting values, residuals and variables are drawn respectively, as shown in figure 4-7. The image shows that the scatter points are evenly distributed at both ends of the 0 scale line, and it is preliminarily judged that there is no heteroscedasticity.



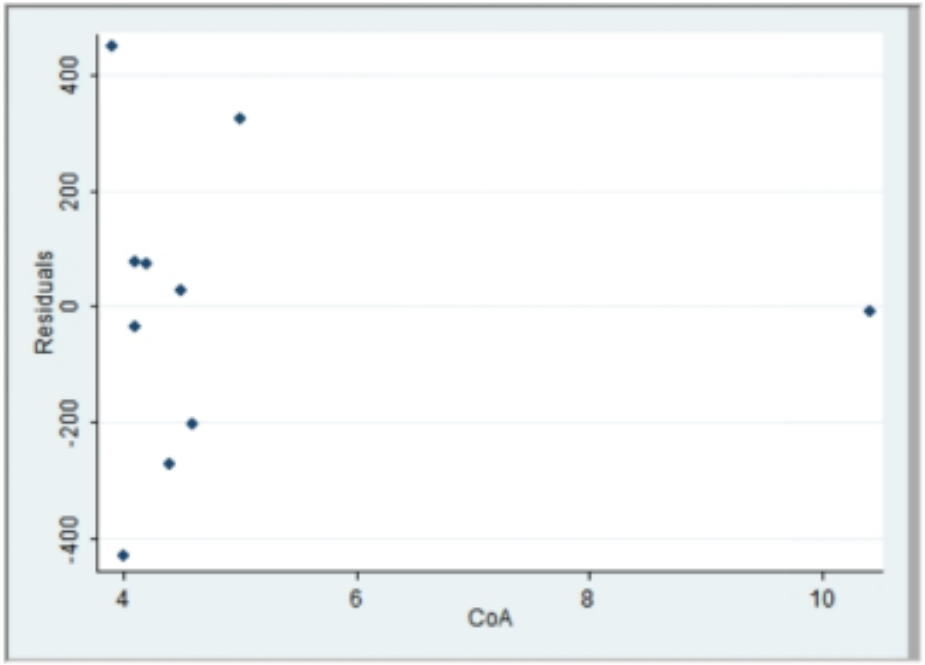
Scatter observation 1

Figure 4:



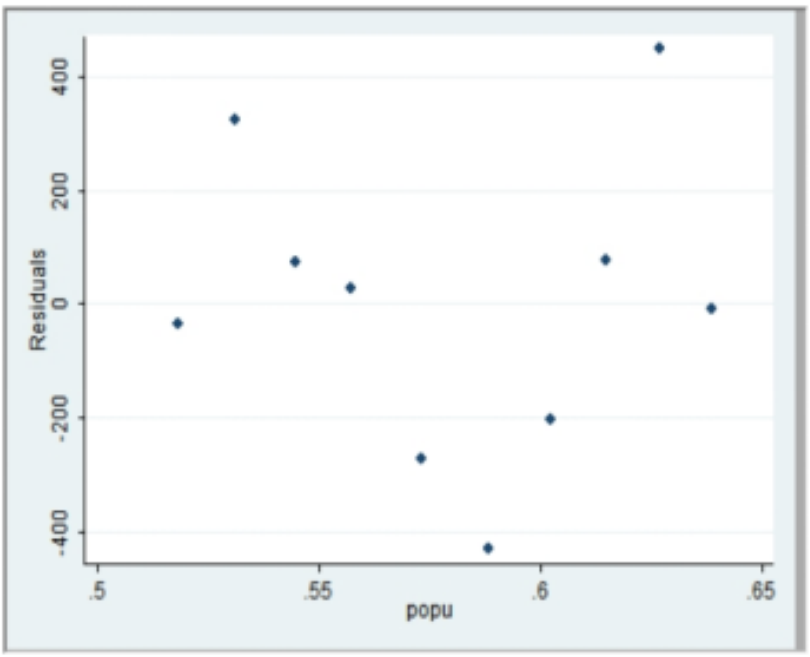
Scatter observation 2

Figure 5:



Scatter observation 3

Figure 6:



Scatter observation 4

Figure 7:

② White test

The test results of white program operation are shown in figure 8. Because the p value is large, the probability of rejecting the original hypothesis is high, so the original hypothesis cannot be rejected. It shows that the model does not have heteroscedasticity.

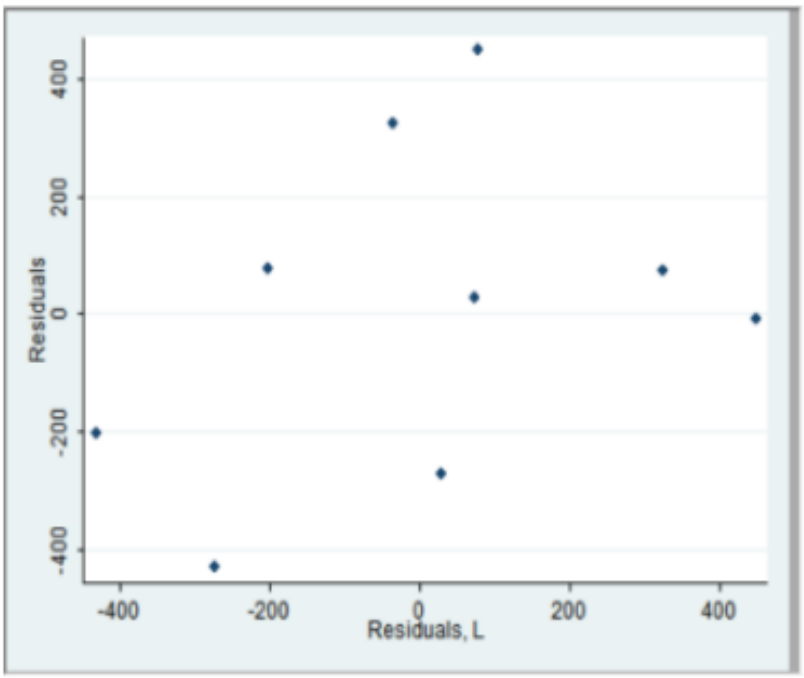
```
chi2(9)      =    10.00
Prob > chi2  =   0.3505
```

Figure 8: White test

2.5 Autocorrelation test

① Scatter observation

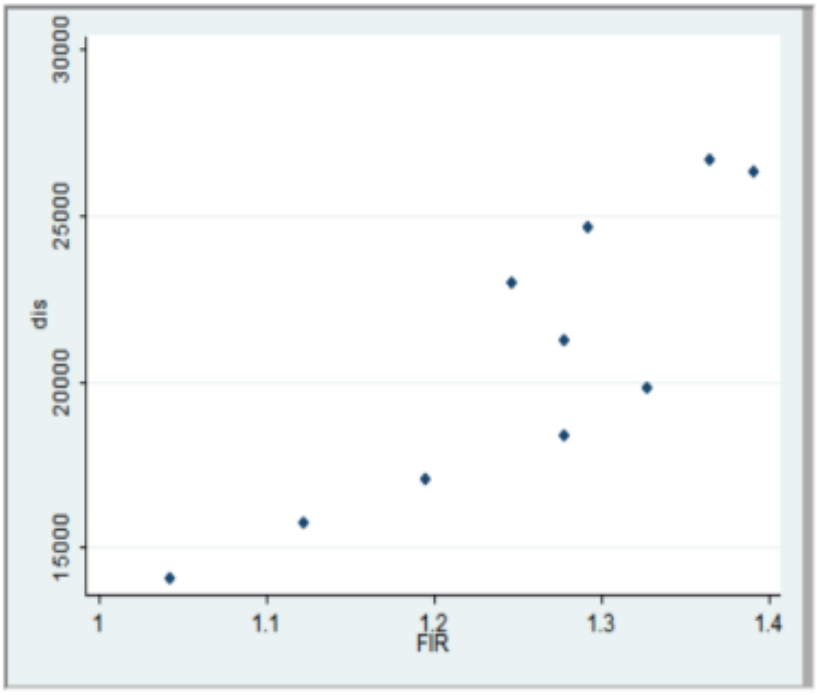
Firstly, the autocorrelation is judged by the residual sequence graph. According to figure 9, it is preliminarily judged that there is no autocorrelation.



Scatter observation 1

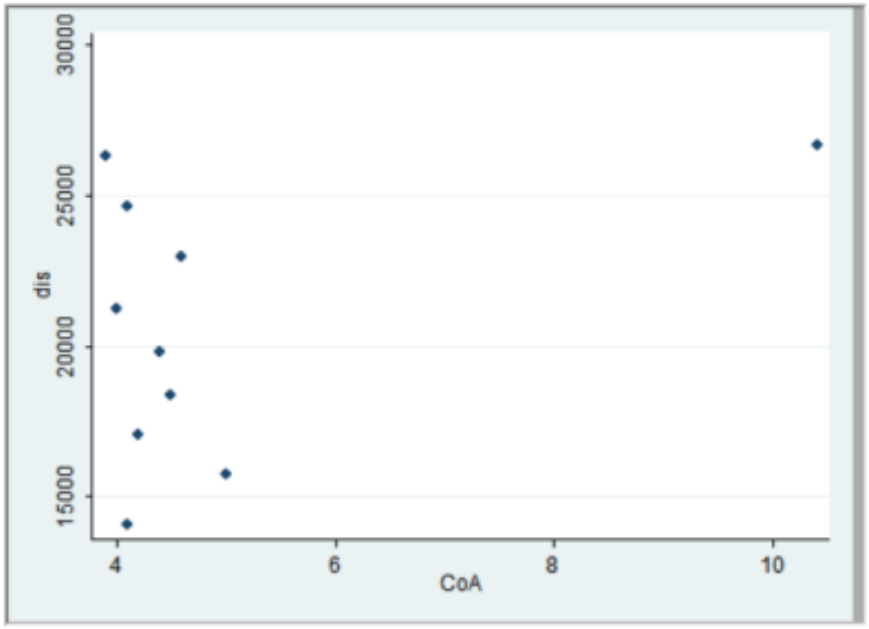
Figure 9:

Plot the scatter diagram of dis and fir (Figure 10), dis and COA (Figure 11), DIS and popu (Figure 12) respectively. According to the scatter diagram, it can be preliminarily judged that the variable fir and the variable popu conform to the linear characteristics, but the variable COA has nonlinear characteristics, so the square term can be considered for specific analysis.



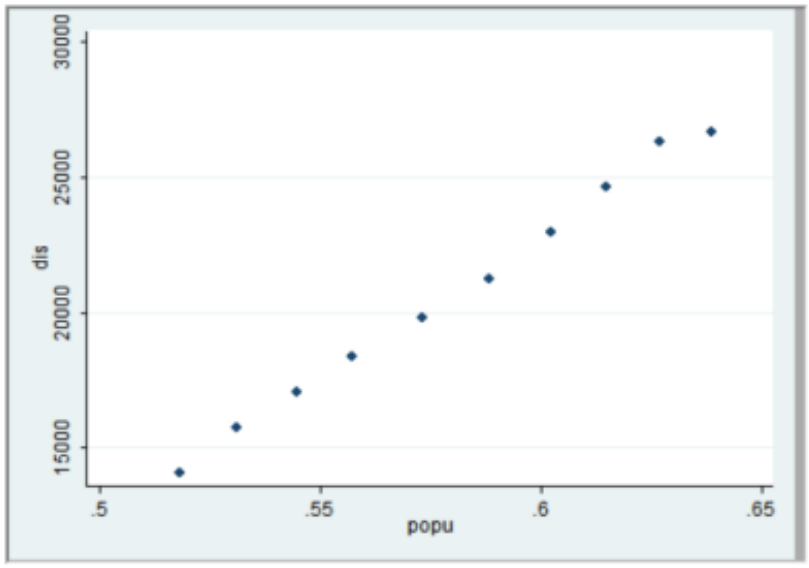
Scatter observation 2

Figure 10:



Scatter observation 3

Figure 11:



Scatter observation 4

Figure 12:

② DW test first-order autocorrelation

Based on image observation, the explanatory variable COA was corrected to COA2 (the square of COA), and then DW test was performed. The results are shown in figure 13, indicating that there is still some degree of positive autocorrelation.

Figure 13: DW test

③ BG test high order autocorrelation

According to the software operation results, the p value is large, the original hypothesis cannot be rejected, and there is no second-order autocorrelation in the error term. As shown in figure 14.

Breusch-Godfrey LM test for autocorrelation

lags(p)	chi2	df	Prob > chi2
2	3.902	2	0.1421

H0: no serial correlation

Figure 14: BG test

2.6 Autocorrelation processing

Adopt robust standard deviation for treatment. The final adjustment result is shown in Figure 15. The significance of the explanatory variable on the explained variable is slightly improved.

Regression with Newey-West standard errors
maximum lag: 2

Number of obs = 10
F(3, 6) = 3030.63
Prob > F = 0.0000

dis	Coef.	Newey-West Std. Err.	t	P>|t|	[95% Conf.	Interval]
FIR	-5.943046	1090.749	-0.01	0.996	-2674.91	2663.023
CoA2	-4.865092	3.427348	-1.42	0.206	-13.25151	3.521326
popu	108450.1	2892.415	37.49	0.000	101372.6	115527.6
_cons	-42041.68	1727.705	-24.33	0.000	-46269.22	-37814.14

Figure 15: Final result

3. Empirical results and analysis of economic phenomena

According to the analysis of the adjusted operation data results, the financial related ratio and the square of the contribution of the primary industry (Agriculture) to GDP have less influence and explanation; The proportion of urbanized population has a great impact on the urban-rural income gap, and the explanation is strong.

From an economic perspective, the increase of financial related ratio means that the proportion of residents' property income will increase, the proportion of household operating income will decrease, and the coincidence degree of main income sources of urban and rural residents will increase, so the income gap will decrease.

The higher the contribution of primary industry (Agriculture) to GDP, it means that the main families in villages and towns still come from labor income, so there are less property and transfer income, the coincidence rate of main income sources in urban and rural areas is low, and the corresponding income source gap between urban and rural areas is large.

The higher the urbanization population ratio, the more serious the urbanization of rural residents and the more obvious the loss of rural productivity. Therefore, it is also close to further increasing the income gap between urban and rural areas.

4. Policy recommendations

1) Encourage township residents to invest in assets

According to the above analysis, although the impact is not significant, the increase of financial

related proportion can narrow the income gap between urban and rural areas. If we can popularize financial knowledge in villages and towns, including insurance purchase, securities trading and other knowledge, it will further increase the financial related proportion in China. Therefore, it is still of practical significance to encourage villages and towns to expand the scale of financial investment and popularize relevant knowledge.

2) Increase the contribution of agricultural output value to China's GDP

In addition to increasing the overlap of urban and rural income modes, we can also increase agricultural output by means of science and technology, which will further improve the output value of agricultural production and narrow the income gap between urban and rural areas.

3) Policy support to control rural population outflow

Nowadays, more and more rural people go out to work. In order to obtain high remuneration, in the long run, the massive outflow of rural productivity will increase the differentiation between urban and rural rich and poor. Therefore, rural areas should introduce relevant policies to encourage productivity to stay in rural areas, help rural areas improve output value and narrow the gap between rural areas and cities.

5. Conclusion

With the help of official data and Stata software, this paper obtains a simple regression model. Conduct systematic research and analysis through multi-step measures of model construction, test and correction. However, the error caused by improper processing method is not excluded, which is only for data reference. In addition, based on the data analysis, this paper puts forward policy suggestions, hoping to provide ideas for narrowing the income gap between urban and rural residents with the help of the author's rough analysis. It is also believed that China will adjust policies in the near future, narrow the urban income gap and live a well-off life together.

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