Comparative Study on Gender Income Gap of Residents and Its Causes in Urban and Rural Areas

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Abstract: In order to explore the gender income gap between urban and rural residents and its causes, the data of China General Social Survey in 2013 and 2018 were used to analyze and decompose the degree of gender discrimination at each income quintile of urban and rural residents by unconditional quantile regression based on the regression of decentralization impact function (RIF). The results show that gender discrimination is the main cause of the gender income gap between urban and rural residents, and the same variable has a great difference on the gender income gap in different fractions. In different groups, there are two opposite effects on gender discrimination: reduction and increase. Education helps to narrow the gender income gap of urban residents, but increases the gender discrimination of rural residents.

Keywords: Income Disparity; Gender Discrimination; Oaxaca-Blinder Decomposition; RIF Regression Decomposition

1. Introduction

Common prosperity is people's yearning for a better life. Gender equality is part of the theme of common prosperity, and gender income gap is an important indicator to measure gender equality. Since reform and opening up, the degree of gender inequality in education has been decreasing gradually, but the gender income gap in the labor market has been expanding unceasingly. At present, many scholars have made in-depth research on this problem, but some conclusions are not uniform. For example, Wu Yuxiao and Wu Xiaogang believed that education narrowed the gender pay gap[1], while Yang Poloniang and Cheng Fei believed that the gender pay gap became larger when the education level increased[2]. There are many reasons for the discrepancy in research conclusions, such as the different data used, the selection of samples, the measurement of variables, and the use of models. At the same time, rural areas are deeply influenced by traditional gender role concepts[3], but recently, there are few literatures on the gender income gap between urban and rural areas. In addition, researchers usually look at the impact of factors on earnings from an average perspective, but the gender wage gap can vary across income ranges.Therefore, based on the household registration, the sample was divided into rural household registration and urban household registration for comparative study. The Recentered Influence Function regression, which was recently developed, was adopted to analyze and decompose the income difference and its influencing factors at different segments, so as to explore the influencing factors of the gender income gap of residents at different income segments in different regions.

2. Data and methods

2.1 Data sources and descriptive statistical analysis

Based on the data of China's General Social Survey in 2013 and 2018, this paper starts from three aspects: human capital, household registration and family conditions of origin. Human capital includes gender, age, education level, work experience and marital status, wherein: male is set as the reference group, the value of which is 0, female is 1; Set the value to 1 in the married state

and 0 in other states. When dealing with education variables, the value is assigned according to the length of the school year; The question "How many years have you worked? The work experience of the respondent was measured. As for family background, according to the questionnaire "What level do you think your family was in when you were 14 years old? The lowest household rating is 1 and the highest is 10. After excluding the samples with information missing and 0 income, 4135 samples of rural household registration and 3198 samples of urban household registration were obtained.

2.2 Introduction of decomposition method

RIF(Recentered Influence Function) was entered by Firpo et al. [11]. It used the influence function in robust estimation to construct an unconditional quantile regression function. The distribution change of the explained variable was taken as a partial effect of the unconditional quantile, and then the obtained influence function was added back into the original distribution function. That is, the redistribution mapping, whose outstanding role is to decompose the total effect of income gap into each feature vector.

In this paper, the gender income distribution of residents is first recorded as distribution statistics $g_i = g(F_i)$,g is the correlation statistic describing the distribution F. When the statistic is quantile, RIF regression is unconditional quantile regression.i is for the group that compares the income gap, such as different gender, different education, different work experience. $F_i(\cdot)$ is the distribution function defined by the eigenvectors on the basis group, and $g(F_f)$ is the statistic defined on F_f .Then, construct the influence function RIF:

$$RIF(\ln y_i; g) = g(F_i) + IF(\ln y_i; g) \tag{4}$$

Where $IF(\ln y_i; g)$ is the influence function of $\ln y_i$:

$$IF(\ln y_i; g) = \frac{\tau - (\ln y_i \le g)}{f_{\ln y_i(g)}} \tag{5}$$

The linear expression for $RIF(\ln y_i; g)$ is $RIF(\ln y_i; g) = X_i \beta_i^g + \varepsilon$ .Therefore, the gender income gap between urban and rural residents can be decomposed into the following forms:

$$RIF_f^g - RIF_m^g = (\overline{X}_f - \overline{X}_m)\beta_f^g + (\beta_f^g - \beta_m^g)\overline{X}_m \tag{6}$$

In the above equation, $(\overline{X}_f - \overline{X}_m)\beta_f{}^g$ represents the characteristic effect of the gender income gap of residents at the g-quintile, while $(\beta_f{}^g - \beta_m{}^g)\overline{X}_m$ represents the coefficient effect of the gender income gap of residents, that is, the part caused by the difference in the rate of return of the independent variable.Unconditional quantile regression can obtain the partial effect of each specific characteristic variable on each quantile, and the total characteristic effect can be further decomposed into the effect of several specific explanatory variables:

$$(\overline{X}_f - \overline{X}_m)\beta_f^g = \sum (\overline{X}_{fk} - \overline{X}_{mk})\beta_{fk}^g \tag{7}$$

Similarly, the coefficient effect of income difference can also be decomposed into each specific characteristic variable.

3. Analysis and interpretation of empirical results

According to the regression results in Table 1, it can be seen that variables in each quantile have an impact on residents' income,

and there are certain differences in different quantiles. In terms of coefficient symbols, gender and age are basically negative, while education level, marital status, family of origin and work experience are significantly positive. It shows that, on the whole, male income is higher than female income, people with higher education tend to have a higher income, married people have a higher income, good family background has a positive impact on income, rich work experience helps to increase personal income. With the increase of the quantile, the effect of gender on income of rural hukou residents changed from strong to weak and then became strong, the negative effect of age on income gradually decreased, the positive effect of education on income gradually increased, and the positive effect of work experience on income first increased and then decreased. The effect of gender on the income of urban residents decreased, the effect of age and work experience on the income gradually became less significant, and the effect of education on the income did not change much.

Variable\subsite	Rural			Urban		
	0.25	0.5	0.75	0.25	0.5	0.75
Female	-0.391***	-0.410***	-0.302***	-0.310***	-0.239***	-0.239***
Age	-0.026***	-0.021***	-0.012***	-0.014***	-0.004	0.003
Education	0.051***	0.064***	0.070***	0.091***	0.090***	0.117***
Marriage	0.213***	0.188***	0.118***	0.186***	0.082**	0.033
Family background	0.061***	0.044***	0.057***	0.069***	0.063***	0.066***
Work experience	0.020***	0.016***	0.010***	0.010***	0.004*	0.003
Constant	9.852***	10.301***	10.429***	9.037***	9.379***	9.313***

Table 1 Regression results of RIF quantile of resident gender income model

Then, the gender income gap of residents is decomposed first, and the results are shown in Table 2. The second column is the decomposition results of the income deciles of rural residents.The explanation degree of the characteristic effect on the gender income gap is far less than the coefficient effect. Although there are differences in each quantile, the coefficient effect is always greater than the characteristic effect, which indicates that gender discrimination has a great influence. According to the decomposition results of characteristic effects of specific variables at each quantile, the influence coefficients of most variables at the low quantile are larger, and the coefficients will decrease first and then increase with the increase of quantile. From the point of view of specific characteristic variables, the coefficient of age variable changes in the same direction as the increase of quantile, but its contribution to the characteristic effect is gradually decreasing. The symbol of education level is positive, indicating that education has widened the gender income gap to some extent, and the family conditions of origin are significantly negative, with similar values in each quintile. This is because a good family background has equal gender concepts and a good economic foundation, which helps to narrow the wage difference caused by gender discrimination.The third column of Table 2 is the decomposition results of urban residents' income fractions. It is roughly consistent with the decomposition results of rural residents, but the symbol of education level is significantly negative, indicating that education has narrowed the gender income gap of urban hukou residents to a certain extent.

Variable\subsite	Rural			Urban		
	0.25	0.5	0.75	0.25	0.5	0.75
Total difference	0.578***	0.392***	0.290***	0.443***	0.22***	0.21***
Characteristic effect	-0.016	0.001	0.003	-0.0394***	-0.0352***	-0.0422**

Age	-0.051***	-0.041***	-0.025***	-0.026***	-0.007	-0.00485
Education	0.006	0.010	0.012	-0.016*	-0.018*	-0.0255*
Marriage	-0.001	-0.001	-0.001	-9.27E-05	-6.29E-05	-8.48E-05
Family background	-0.014***	-0.013***	-0.014***	-0.013***	-0.016***	-0.022***
Work experience	0.045***	0.046***	0.030***	0.016*	0.006	0.011
Coefficient effect	0.594***	0.391***	0.287***	0.482***	0.255***	0.252***

Table 2 RIF regression decomposition of gender pay gap

4. Conclusion

In this paper, the data of China General Social Survey in 2013 and 2018 are used to analyze the factors affecting the gender wage gap between urban and rural residents, and the decomposition method based on RIF regression is used to estimate and decompose the degree of gender discrimination. The research findings are as follows: Gender discrimination is the main cause of the gender pay gap in the labor force. Different variables have different degrees of influence on the wages of male and female labor force in urban and rural areas. The same variable has opposite effects of increasing and decreasing gender discrimination in different groups. For example, the influence of education level on gender income gap has long been controversial. This study finds that education helps to narrow the gender income gap of urban residents, but increases the gender discrimination of rural residents. Therefore, when addressing issues related to the gender pay gap, the government should divide the labor force according to income level and region, formulate corresponding solutions for groups in different regions and income levels, and avoid "one size fits all" policy.

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