

Analysis on the Influencing Factors of Female Employment Rate

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Abstract: With the development of economy and the national ideology, the social status of women has begun to get attention. According to present situation, female employment rate in Chinese labor market is gradually increasing. Along with the promotion, there are two backgrounds which are the development of Chinese economy and the improvement of the overall female education level influenced by the one-child policy in China .Which of the two is the stronger effect factor of female employ rate in China? After having collected the data of 8 Chinese municipalities and provinces during 2012-2016 and analyze them, this paper finally draw a conclusion that the female education rate is the one that gives more obvious positive influence, and at the same time, more reliable.

1. Introduction

Recently, as people's thoughts are constantly changing, publics' concern about the women employment is increasing in China. At contemporary society, facing with the increasing women employment rate, one holds that people in the developed areas will naturally accept the transfer of women social identity with the economic growth and cultural constant exchange, and enhance their recognition on women's employment. Namely, the thought of people in the developed area will be more open. Therefore, the recent growth of women's right in China is owing to the China's well-developed economic and the leading role of the developed areas.

Another hypothesis is that the rise in women's status is the result of the one-child policy in China over the past four decades. It is statistics show that women tend to be more likely than men to choose higher education beyond a bachelor's degree. Women with higher education are more likely to enter the workforce as modern companies place emphasis greater on qualifications than that in the past.

There has been someone done different degrees of researches on the specific factors impacting women's employment rate theoretically and practically. After a brief analysis of factors influencing women career participation in China, Wang Xiaobo (2004) basically explained in theory how and why factors like labor market, income, marriage and family, and women self-status impact on women's employment. Zhang Lili (2009) made a study of the relationship between the factors like professional level, profession structure and family income, etc. and women employment options in her paper, showing the relationship between women employment quality and industrial structure (The majority of women employed are in the service industry).Based on the data related to women employment in Zhejiang Province, Ai Jia and Wang Yida (2005) empirically analyzed and illustrated the 4 possible influencing factor, the impact of women age, marital status, training and degree of education on women employment rate. On the basis of the date related to women employment in Gansu Province, through mathematically modeling, Chao Jianping and Fan Wen (2007) explained the different influence of the 2 personal factors, age and the degree of education,on women employment rate. However, Hao Ran (2009) divided the different factors which impact on women employment into the possible social factor and personal factor, empirically analyzed and explained the main factors influencing women employment and the positive or negative relationship between the two.

Among the above researches and studies, only in the regression study of Hap Ran (2009) both variables--economic development level and women's degree of education--are included. But the 2 variables are not intuitively compared in her paper.

Which has a greater influence on women employment rate, economic development level or

women's degree of education? The related data in China's 8 different provinces and municipalities from 2012-2016 were collected in this paper, so as to find partial answer to the above question.

2. Empirical Research

2.1 Data Resource

Table 1 Descriptive Statistics

Variable	n	Mean	Std.Dev.	Min	Max
Female Employment Rate	40	20.128	3.888	14.71	32.03
GDP/100	40	24.18	26.435	1.88	80.85
Women's Education Level	40	23.227	15.896	9.87	59.38
Total Fertility Rate	40	1.61	0.009	1.6	1.62
Women's demographic structure	40	48.778	0.04	48.7	48.8
Third Industry	40	40.22	2.702	36.1	43.5
City	40	4.5	2.32	1	8

The data that is used in this paper are all from the first part of the 2012-- 2016 edition of China Labor Statistics Yearbook. In this paper, 8 Chinese municipalities and provinces such as Beijing, Shanghai, Guangdong, Jiangsu, Gansu, Qinghai, Ningxia and Hainan were selected to remark the annual female employment rate, GDP and female labor force education level from 2012 to 2016. Wherein, the four regions of Beijing, Shanghai, Guangdong and Jiangsu are the regions with developed economy (proceeding GDP in China over the years), however the four regions of Gansu, Qinghai, Ningxia and Hainan are the least developed regions of China (ranking the last of GDP over the years).

2.2 Variable Selecting

The main study object of this paper is the different influence of regional economic and women's degree of education on women employment rate. Regarding the dependent variable, the ratio of female employees in the total employees was taken as an observable variable. While in terms of independent variables, GDP of provinces (municipalities) was taken as observable variable of economic development level, and women labor's degree of education was taken as the observable variable of the degree of education.

In addition, female employment Rate is also related to fertility rate and prosperity of tertiary industry according to previous documents. Indeed, it is used as a control variable. Among them, the fertility rate is represented by the total fertility rate, and the prosperity degree of the tertiary industry is represented by the proportion of the employed tertiary industry personnel in the total employed population. Since in the regression model, women employment rate is showed as the proportion of female employees in the total number of employees, this value will be affected by the proportion of local female population. Therefore, the total number of female employees is also taken as a control variable.

Among that, fea is Female Employment Rate; GDP is the region's GDP data in that year. In order to reduce the fluctuation of the equation, and the data is processed as $GDP = GDP/1000$. We indicates the Educational Level of the female labor force in the province or municipality directly under the central government, that is, the proportion of female labor force with college education or above in the total female labor force. Wd indicates the demographic structure of the year, that is, Women's demographic structure; TFR indicates the total fertility rate of the whole country in that year. Ti is the prosperity of the third industry in that year, which is expressed by the proportion of employed population in the tertiary industry in the total labor force.

2.3 Empirical Regression

All selected elements were made into panel data according to region and time. Mixed regression,

fixed effect regression and random effect regression models were respectively established based on these data. After several experiments and robustness tests, it was found that the optimal fitted equation of this group regression could be obtained by using the random effects model, so the random effects model regression was chosen as the main regression model of this experiment. The other two regressions were used as auxiliaries to test the rigor of the master model. The regression results are shown in the following table.

Table 2 Regression Results

Variable	Pooled OLS	LSDV	REM(1)	REM(2)
	Female employment rate			
GDP/100	-0.033 (0.034)	0.033 (0.141)	-0.031 (0.033)	-0.033** (0.015)
Women's Education Level	0.155*** (0.024)	0.206 (0.265)	0.157*** (0.024)	0.155*** (0.024)
Total Fertility Rate	141.661 (235.106)	165.405 (238.429)	142.480 (234.534)	141.661*** (22.926)
Women's demographic structure	42.893*** (17.721)	46.709* (26.039)	43.028*** (17.765)	42.893*** (2.293)
Third Industry	-1.16 (0.82)	-1.383 (1.058)	-1.168 (0.817)	-1.160*** (0.115)
constant	-2256.317** (1059.831)	-2475.415 (1554.452)	-2263.987** (1059.974)	-2256.317** (140.507)
R-squared	0.510	0.68	z	z
Bei Jing				
Shang Hai		0.955 (15.339)		
Guang Dong		2.969 (11.374)		
Jiang Su		4.071 (11.326)		
Gan Su		-4.219 (14.283)		
Qing Hai		0.801 (10.143)		
Ning Xia		3.138 (9.978)		
He Nan		-0.494 (4.641)		

Note: Standard errors are in parenthesis : *** p<0.01, ** p<0.05, * p<0.1. Values in the “()” are the t value of the result.

In table 2, Pooled OLS indicates the mixed regression results. LSDV is the regression result of fixed effect model of LSDV method. REM is the regression result of random effect. REM (1) is the regression result of individual random effects, and REM (2) is the regression result of time random effects.

2.3.1. Main Regression

The result of individual effect model is

$$fea_3 = -0.31 \text{ gdp} + 0.157 \text{ we} + 43.028 \text{ wd} + 142.480 \text{ tfr} - 1.168 \text{ ti} - 2263.987 + u$$

The result of time effect model is

$$fea_4 = -0.33 \text{ gdp} + 0.155 \text{ we} + 42.893 \text{ wd} + 141.661 \text{ tfr} - 1.160 \text{ ti} - 2256.317 + u$$

The Hausmann test results of individual effect and time effect model are $p = 0.9918$ and $p = 0.8493$ respectively, which could not disprove the null hypothesis that u_i is not related to explanatory variables. Therefore, random effect model should be considered to use for analysis.

Due to the lack of total fertility rate, population structure, and industrial employment in the third year of each city in the total employment level, national values are used in the final statistics. If the time random effect model is used for regression analysis, then it will generate the multicollinearity problem. Therefore, the regression results of the individual random effects model are mainly used.

According to the random effects model of regression result, and the time rate of women by the level of education and work on a 5% significance level. Each unit of the female by the education level can cause the change of women work rate is 0.157 (individual) random effects model unit changes. However, the regression coefficient between the economic development level and the female work rate is not significant, and the change of each unit of economic development level only causes the change of the female work rate of -0.031 (the absolute value is only 0.031).

2.3.2. Auxiliary Regression

2.3.2.1 Mixed Regression

Mixed regression uses robustness regression with city or provincial individual as cluster variables, and the regression equation obtained is:

$$fea_2 = -0.33 \text{ gdp} + 0.155 \text{ we} + 42.893 \text{ wd} + 141.661 \text{ tfr} - 1.16 \text{ ti} - 2256.317 + u$$

As is shown in the regression result, the two explanatory variables, female education rate and female population in the total population, are significantly correlated with female employment rate to different degrees. However, the correlation between other variables in this regression and the explained variable is still weak, and when $R^2=0.510$, it shows that the fitness of the model is still not satisfactory. Otherwise, the joint test results showed that the overall small significance of the model was preferable, with a P value of 0.0003, suggesting that the model had a strong significance. It can be seen that the coefficient of female education level is 0.15 at the significance level of 0.01 in the auxiliary regression of mixed regression, and the variation range of female employment rate that is led by it is obviously larger than the economic development level of -0.033.

2.3.2.2 Fixed Effect Regression

The result of LSDV model is

$$fea_2 = 0.33 \text{ gdp} + 0.206 \text{ we} + 46.709 \text{ wd} + 165.405 \text{ tfr} - 1.383 \text{ ti} - 2475.415 + u$$

The analysis results of LR test show $P = 0.0167$, which proves that at the significance level of 5%, the use of fixed-effect model is more acceptable for analysis than the mixed regression model.

The regression results of LSDV individual fixed effect shows that the significance between each explanatory variable, control variable and explained variable is still low, and the significance of female education degree and female population in the total population are even lower than that of mixed regression results. However, in the individual fixed-effect model $R^2= 0.68$, which was significantly better than in the mixed regression model.

In the regression, the corresponding coefficient of female education level is 0.206, which still has a greater impact on Female Employment Rate than 0.033 that is caused by the level of economic development.

3. Conclusion

As is shown in the panel data experiment, the positive influence of women's education degree on women employment rate is significantly greater than that of economic development level, and the influence of the former is also more reliable. Therefore, merely according to the regression results, it can be concluded that the degree of education has a greater effect on the improvement of women employment rate. After studying and analyzing the social situation in China, the possible reasons for this situation are as follows:

1) Modern enterprises tend to emphasize more on education and experience, while gender is an auxiliary influencing factor. Therefore, the more educated the female employees are, the more likely they are to be hired by such enterprises.

2) Education will broaden one's horizon. It is easier for women to cultivate their sense of independence consciousness and self-consciousness and forward on the road of professionalism after receiving higher education.

3) As is shown in a research, male managers generally prefer to hire and promote male employees, while female managers have no obvious preference for the gender of employees. Therefore, after more and more women with higher education are in the management positions of companies, more female employees can be treated more equally, thus improving the female employment rate.

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