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**The Impact of Internet Usage on the Gender Wage Gap  
in the Chinese Labor Force -- an Empirical analysis  
based on the moderating effect of education level taken  
into account**

**Jiacheng Gao, Yue Liu**

# The Impact of Internet Usage on the Gender Wage Gap in the Chinese Labor Force

## -- an Empirical analysis based on the moderating effect of education level taken into account

### Abstract

Based on data from a sample of 3163 respondents from the Chinese General Social Survey in 2018, this study constructs a RIF mean regression decomposition model that considers moderating effects to examine the effect of Internet usage on the gender wage gap in the Chinese labor force, and examines the moderating effect of years of education on this effect. The results show that both Internet usage and years of education have stronger premium effects on the wage income of Chinese male labor force compared to female labor force, producing a significant coefficient effect, thus widening the wage gap between Chinese female labor force and male labor force. In addition, years of education have a significant moderating effect on the relationship between Internet usage and the gender wage gap in the Chinese labor force. With the effect of years of education, the gap between the characteristics of Chinese female labor force and male labor force regarding Internet usage will further widen the gender wage gap, and this widening effect increases as the number of years of education increases. Thus, this study tries to make suggestions in terms of accelerating the construction of Internet infrastructure, strengthening the training of Internet usage skills of the labor force, and improving the education level of the labor force and its knowledge reserve in order to contribute to the reduction of the gender wage gap in Chinese labor force.

### Keywords

Internet usage; Years of education; Gender Wage Gap; Moderating effects; RIF mean regression decomposition model

## 1. Introduction

Gender equality is a fundamental human right, and its preservation and realization is not only related to the fate of every Chinese female, but also to the harmony and sustainable development of Chinese society as a whole (Yanfang Dong 2021: 1). Throughout the 70 years since the founding of China, although the political, economic and social status of Chinese females have been improved to varying degrees, and their basic needs for survival have been more obviously improved, there has always been a gap between Chinese females and males in terms of political, economic and social status, especially in the economic aspect, Chinese females' wage are significantly lower than those of males, and even after taking into account the differences in production characteristics, the gender wage gap is still more obvious (Lei Han and Xinwang Hou 2020: 2; Lerong Yu et al. 2022: 2). It is important to note that wage income, as an important part of an individual's economic base, will largely determine whether Chinese females can achieve free and comprehensive development in the future. Narrowing the gender wage gap not only helps to promote the rationality and fairness of China's income distribution system, but also helps to reduce the number of Chinese females in poverty, accelerate the accumulation of Chinese females' human capital and optimize the allocation of factors in Chinese labor market, thus promoting the sustainable development of China's economy and society (Lei Li et al. 2015: 2; Tiantian Cai and Huiling Chen 2022: 2). Therefore, studying the gender wage gap in Chinese labor force is not only a humanistic concern for Chinese females, but also a positive response to China's basic state policy of "gender equality" and the strategic goal of common prosperity, which is of great practical significance.

## 2. Literature Review

To investigate the causes of the gender wage gap, a large number of Chinese social scientists have explored the relationship between these factors and the gender wage gap in the Chinese labor force from traditional research perspectives, such as family work, marital and reproductive behavior, childcare, and education level, and have generally concluded that family work, marital and reproductive behavior, and childcare all have a significant punitive effect on the wage income of Chinese female laborers, thus widening the gender wage gap in the Chinese labor force (Shisong Qin

and Yanfang Tian 2015: 7; Kaiming Guo 2016: 6; Zhaoping Wang and Wenli Wang 2020: 6; Fen Zhang and Wei He 2021: 7). However, findings on the impact of education level on the gender wage gap in Chinese labor force are still highly variable. One view is that the return to education for Chinese female labor force is higher than that for males, thereby reducing the gender wage gap in Chinese labor force, because access to education not only leads to direct wage gains for Chinese female labor force, but also to indirect wage gains by reducing gender discrimination in the labor market (Xiaoyan Yuan 2012: 5; Chunbing Xing 2014: 6; Quan Liu 2014: 6; Qi Yan 2017: 9; Gang Zhang and Shenghui Yang 2019: 9; Yiyong Yang and Lianxin Wang 2021: 6; Yingying Huang and Hailin Ma 2021: 7; Yue Liu 2022: 4). Another view is that the male labor force in China has a higher rate of return to education, thus widening the gender wage gap in the Chinese labor force, due to the "boy preference" phenomenon in Chinese families' educational investment and the apparent gender discrimination in the Chinese labor market (Zhiling Huang and Xianguo Yao 2009: 3; Po Yang 2012: 4; Xiaojuan Xu 2014: 3; Yuanyuan Zhao 2017: 6; Shisong Qin 2019: 7; Jingjing Wang 2020: 9; Yanfang Dong 2021: 7; Xiaoguang Li 2022: 9; Shu Bian and Yuqi Xiong 2022: 7). There is also a view that the return to education for Chinese female labor force will be greater than that for males only after the female labor force has reached the number of years of education required for their jobs, thus narrowing the gender wage gap in Chinese labor force, which would otherwise widen the gap (Lei Han and Xinwang Hou 2020: 5; Qiang Li et al. 2022: 7).

It should be noted that Chinese academia have conducted a series of adequate studies on the gender wage gap in the Chinese labor force from traditional research perspectives such as family work, marital and reproductive behavior, childcare, and education level. However, it is important to note that the society of China has now entered the digital age. According to the *Chinese Digital Economy Development Report*, the scale of China's digital economy has reached 45.5 trillion RMB in 2021, accounting for 39.8% of GDP, and the role of the digital economy in supporting China's national economy is becoming more and more obvious. Along with the vigorous development of the digital economy, new business models and new employment forms are emerging. Especially with the rapid development of a new generation of digital information technology such as 5G, IoT, cloud computing, big data and artificial intelligence, the digital economy has become an important engine driving China's economic growth (Yue Liu et al. 2022: 4). As the underlying technology of the above-mentioned new generation of digital information technology, the Internet has obvious infrastructure spillover characteristics and will inevitably have a profound impact on the economic development model of the society of China, gradually changing the way of life and work of the Chinese people while having an important impact on the level of wage income of the Chinese people and their wage income gap (Agrawal et al. 2019: 9; Yudong Qi and Cuihua Liu 2020: 11). Against this background, Chinese academia have gradually begun to focus on the impact of Internet usage on the overall wage income level of the Chinese labor force and its wage income gap, and have conducted a certain number of studies on this topic and reached more consistent research conclusions. That is, Internet usage helps to increase the overall wage income level of Chinese labor force and reduce the overall wage income gap of Chinese labor force (Yanan Li and Qianyun Xie 2017: 7; Liming Chu 2020: 4; Haoran Hu et al. 2020: 6; Shuaina Li 2021: 7; Xiaohong Wen et al. 2021: 7; Xuguang Song and Jiajia He 2022: 6). However, relatively little research has been done on the relationship between Internet usage and the gender wage gap of the Chinese labor force, and the findings are highly variable. One view is that Internet usage has a stronger wage premium effect on the Chinese female labor force compared to the males, thus reducing the gender wage gap in the Chinese labor force (Yudong Qi and Cuihua Liu 2020: 6; Xiliang Feng et al. 2021: 7; Shulei Ding and Cuihua Liu 2022: 9). Another view is that Internet usage has a stronger wage premium effect on the Chinese male labor force compared to the females, thus widening the gender wage gap in the Chinese labor force (Jiazhi Zhuang et al. 2016: 6; Yufei Mao et al. 2018: 6; Ziqiang Zhang et al. 2020: 7). In this regard, this study argues that the reason for these apparently divergent findings is likely to be that existing studies have ignored the moderating effect of education level on the relationship between Internet usage and the gender wage gap of the Chinese labor force.

Therefore, in order to enrich the existing research results and break through the relative lack of research on the moderating effect of education level on the relationship between Internet usage and the gender wage gap of Chinese labor force in Chinese academia. Based on the Chinese General Social Survey in 2018, this study constructs a RIF mean regression decomposition model that takes into account the moderating effect to test the impact of Internet usage on the gender wage gap of the Chinese labor force, and examines the moderating effect of education level on the relationship

between Internet usage and the gender wage gap of the Chinese labor force, with a view to providing effective suggestions for reducing the gender wage gap and promoting gender economic equality of the Chinese labor force.

### 3. Methodology

#### 1) Data source

The data for this study were obtained from the Chinese General Social Survey (CGSS) in 2018. CGSS is executed by the China Survey and Data Center of Renmin University of China, and the cross-sectional data are collected from more than 10,000 households in all provinces in China mainland by using multi-layer multilayer probability sampling. At present, with over 1000 academic papers have been published in academia based on CGSS data, the data has considerable credibility. In this study, according to the purpose of the study and the selection of variables, after removing the missing data and invalid data, the data of the sample of 3163 respondents were obtained.

#### 2) Variable settings

##### (a) Dependent variable

The dependent variables in this study is Wage Income (WI). In order to eliminate the effect of working hours on wage income and obtain the net wage rate for the respondents, Wage Income (WI) was measured based on the corresponding questions in the questionnaire "How much do you earn from your annual job?" and "How long do you usually work in a week?", which was measured by dividing a respondent's annual job income by the number of hours a respondent works in 52 weeks.

##### (b) Independent variable

The independent variable in this study is Internet Usage (IU), which was measured by the corresponding question in the questionnaire, "How often do you use the Internet?". The question options include "Frequent" and "Infrequent". In this paper, "Frequent" was assigned to 1 and "Infrequent" was assigned to 0.

##### (c) Moderating variable

The moderating variable in this study is Years of Education (YoE), which was measured by the corresponding question in the questionnaire, "What is your highest level of education?". The question options include "No education", "Elementary school", "Middle school", "High school", "Junior college", "Bachelor", and "Master". In this study, "No education" was assigned to 0, "Elementary school" was assigned to 6, "Middle school" was assigned to 9, "High school" was assigned to 12, "Junior college" was assigned to 15, "Bachelor" was assigned to 16, and "Master" was assigned to 19.

##### (d) Control variables

Following the existing studies, referring to related literature (Jiazhi Zhuang et al. 2016: 9; Yufei Mao et al. 2018: 7; Ziqiang Li et al. 2020: 5; Yudong Qi and Cuihua Liu 2020: 5; Xiliang Feng et al. 2021: 5; Jiacheng Gao 2021: 6; Shulei Ding and Cuihua Liu 2022: 6), and incorporating the actual design of CGSS, Age (Actual age of the respondents), Health Status (Respondents' assessment of their own health status, relatively healthy/very healthy = 1; very unhealthy/relatively unhealthy/fair = 0), Household Registration Status (Respondents' household registration status, agricultural household = 1; non-agricultural household/resident household = 0), Marital Status (Respondents' marital status, cohabiting/first married with spouse/remarried with spouse = 1; unmarried/separated not divorced/divorced/widowed = 0), Minor Children (Whether the respondent has minor children at home, yes=1; no=0), Annual Household Income (Actual annual income of the respondent's household), Family Property (Respondents' household property ownership status, with property = 1; without property = 0), Family Car (Respondents' household car ownership status, with household car = 1; without household car = 0), Family Investment (Respondents' household investment activity status, engaged in investment activity = 1; not engaged in investment activity = 0), Father's Years of Education (Years of education of respondent's father, no education = 0; elementary school = 6; middle school = 9; high school = 12; junior college = 15; bachelor = 16; master = 19), and Mother's Years of Education (Years of education of respondent's mother, no education = 0; elementary school = 6; middle school = 9; high school = 12; junior college = 15; bachelor = 16; master = 19) were included as control variables in this study.

#### 3) Model settings

Based on the variable settings, the wage income equation was set in this study as follows:

$$WI_i = \beta_0 + \beta_1 * IU_i + \beta_2 * YoE_i + \beta_3 * IU_i * YoE_i + \sum_{j=4}^k \beta_j Z_{j,i} + \mu_i \quad (1)$$

In equation (1),  $WI_i$ ,  $IU_i$ ,  $YoE_i$ ,  $IU_i * YoE_i$  and  $\sum_{j=4}^k Z_{j,i}$  respectively represent the  $i$ -th respondent's Wage Income (WI), Internet Usage (IU), Years of Education (YoE), the product of Internet Usage and Years of Education ( $IU * YoE$ ), Age, Age<sup>2</sup>, Health Status (HS), Household Registration Status (HRS), Marital Status (MS), Minor Children (MC), Annual Household Income (AHI), Family Property (FP), Family Car (FC), Family Investment (FI), Father's Years of Education (FYoE) and Mother's Years of Education (MYoE).  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  and  $\sum_{j=4}^k \beta_j$  respectively represent the coefficients to be estimated before each variable in equation (1).  $\beta_0$  and  $\mu_i$  respectively represent the constant term and the random perturbation term of equation (1).

Based on the set form of the wage income equation in equation (1), this study calculates the gender wage gap as follows:

$$\Delta_w = E(w_m | X_i = X_m) - E(w_w | X_i = X_w) = \beta_m X_m - \beta_w X_w = \beta_m X_m - \beta_w X_m + \beta_w X_m - \beta_w X_w \quad (2)$$

In equation (2),  $\Delta_w$  represents the gender wage gap of respondents,  $X_m$  and  $X_w$  respectively represent male and female respondents' independent variable Internet Usage (IU), moderating variable Years of Education (YoE), the product of Internet Usage and Years of Education ( $IU * YoE$ ), and a series of control variables Age, Age<sup>2</sup>, Health Status (HS), Household Registration Status (HRS), Marital Status (MS), Minor Children (MC), Annual Household Income (AHI), Family Property (FP), Family Car (FC), Family Investment (FI), Father's Years of Education (FYoE) and Mother's Years of Education (MYoE).  $\beta_m$  and  $\beta_w$  respectively represent the vector matrices of coefficients to be estimated.

After extracting the common factorization of equation (2), this study expresses the gender wage gap as follows:

$$\Delta_w = (\beta_m - \beta_w) X_m + \beta_w (X_m - X_w) \quad (3)$$

In equation (3), the first term on the right side of the equation is the coefficient gap in the gender wage gap of the respondents, representing the gender wage gap of the respondents due to gender discrimination. The second term on the right side of the equation is the characteristic gap in the gender wage gap for respondents, which represents the gender wage gap caused by the difference in characteristic variables between female and male respondents. On this basis, the Recentered Influence Function (RIF) method is introduced, using which the contribution of the  $K$ -th regression variable in the characteristic gap and the coefficient gap under the mean condition can be specifically investigated.

## 4. Empirical Analysis

### 1) Descriptive statistics

Table 1 reports the results of descriptive statistics for each of the above variables when grouped according to the gender of the respondents. The descriptive statistical results show that in terms of the dependent variable, the average wage income of male and female respondents is 32.542 ¥/hour and 18.04 ¥/hour, respectively, and there is a significant gap between the wage income of female and male respondents, and the result of the Levene's variance equivalence test (hereafter referred to as the test result) shows that the gap is statistically significant at the 1% level of significance. In terms of the independent variables, the mean values of Internet Usage for male and female respondents are 0.737 and 0.675, respectively, indicating that 73.7% of male respondents use the Internet frequently, while female respondents only 67.5%, and there is a gap between female respondents and male respondents in using the Internet. In addition, the test result shows that the gap is statistically significant at the 1% level of significance. In terms of the moderating variables, the mean values of years of education for male and female respondents are 11.157 years and 10.551 years, respectively. Although the years of education of female respondents are slightly lower than that of male respondents, both male and female respondents had mainly high school and Middle school education levels, and there is no significant gap between them, and the test result also shows that the gap is not statistically significant.

In terms of the control variables, the test results show that the differences between male and female respondents are statistically significant for the control variables Age, Health Status, Marital Status, Minor Children, Annual Household Income, and Family Investment, while the differences in Household Registration Status, Family Property, Family Car, Father's Years of Education, and Mother's Years of Education are not statistically significant. Overall, compared to female respondents, male respondents are relatively younger, in better health, have a lower rate of being married, have a higher proportion of minor children in the household, have a lower annual household income, and engage in a higher

proportion of household investment activities, while there are no significant differences between male and female respondents in other control variables.

**Table 1 Descriptive statistics of each variable**

Variables	Means of male samples (standard deviations)	Means of female samples (standard deviations)	Difference in means (Male-Female)	Levene's variance equivalence test
WI	32.542 (61.888)	18.040 (55.710)	14.502	24.475***
IU	0.737 (0.440)	0.675 (0.469)	0.062	60.552***
YoE	11.157 (3.323)	10.551 (3.242)	0.606	0.522
Age	39.725 (9.861)	41.925 (10.611)	-2.200	12.956***
HS	0.752 (0.432)	0.703 (0.457)	0.049	38.891***
HRS	0.561 (0.496)	0.549 (0.498)	0.012	1.641
MS	0.785 (0.411)	0.864 (0.343)	-0.079	144.252***
MC	0.495 (0.500)	0.460 (0.499)	0.035	9.489***
AHI	99995.821 (199189.391)	119660.710 (261844.664)	-19,664.889	6.023**
FP	0.893 (0.309)	0.893 (0.310)	0.000	0.001
FC	0.391 (0.488)	0.379 (0.485)	0.012	1.773
FI	0.123 (0.328)	0.104 (0.305)	0.019	11.482***
FYoE	6.597 (4.329)	6.144 (4.309)	0.453	0.672
MYoE	4.808 (4.422)	4.463 (4.249)	0.345	1.256
Sample size	1550	1613	-63.000	-

Note: \*\*\* represents  $p < 0.01$ ; \*\* represents  $p < 0.05$ ; \* represents  $p < 0.1$ . Standard deviations are in parentheses.

## 2) Decomposition analysis

According to the results of the above descriptive statistical analysis, although there is a certain gap between female and male respondents in some personal and family characteristics variables, the gap as a whole does not show a disparity, while the wage income of female respondents ends up being much lower than that of male respondents, and the reasons for such an obvious wage income gap between the female and male respondents deserve deeper consideration. To this end, this study decomposes the gender wage gap to explore how it arises and how Internet Usage (IU) and Years of Education (YoE) affect it. The decomposition results are presented in Table 2.

**Table 2 Decomposition results of gender wage gap**

Mean Value Condition	Variables	Coefficient	Contribution	Standard error	Z-value	P-value
Gender Wage Gap	Male samples	32.542***	-	1.579	20.609	0.000
	Female samples	18.040***	-	1.393	12.950	0.000
	Total Gap	14.502***	100.000%	2.105	6.889	0.000
	Characteristics Gap	3.966***	27.35%	0.942	4.21	0.000
	Coefficient Gap	10.536***	72.65%	2.170	4.86	0.000
Characteristics Gap	IU	-1.731**	-11.94%	0.780	-2.22	0.027
	YoE	0.370	2.55%	0.285	1.30	0.194
	IU*YoE	3.333**	22.98%	1.446	2.31	0.021
	Age	-6.734**	-46.44%	3.094	-2.18	0.030
	Age <sup>2</sup>	6.741*	46.48%	3.759	1.79	0.073
	HS	0.350**	2.41%	0.164	2.14	0.033
	HRS	0.050	0.35%	0.084	0.60	0.550
	MS	0.302	2.08%	0.453	0.67	0.506
	MC	-0.091	-0.63%	0.109	-0.83	0.406
	AHI	0.608	4.19%	0.492	1.24	0.216
	FP	0.001	0.01%	0.052	0.01	0.989
	FC	0.024	0.17%	0.047	0.51	0.612



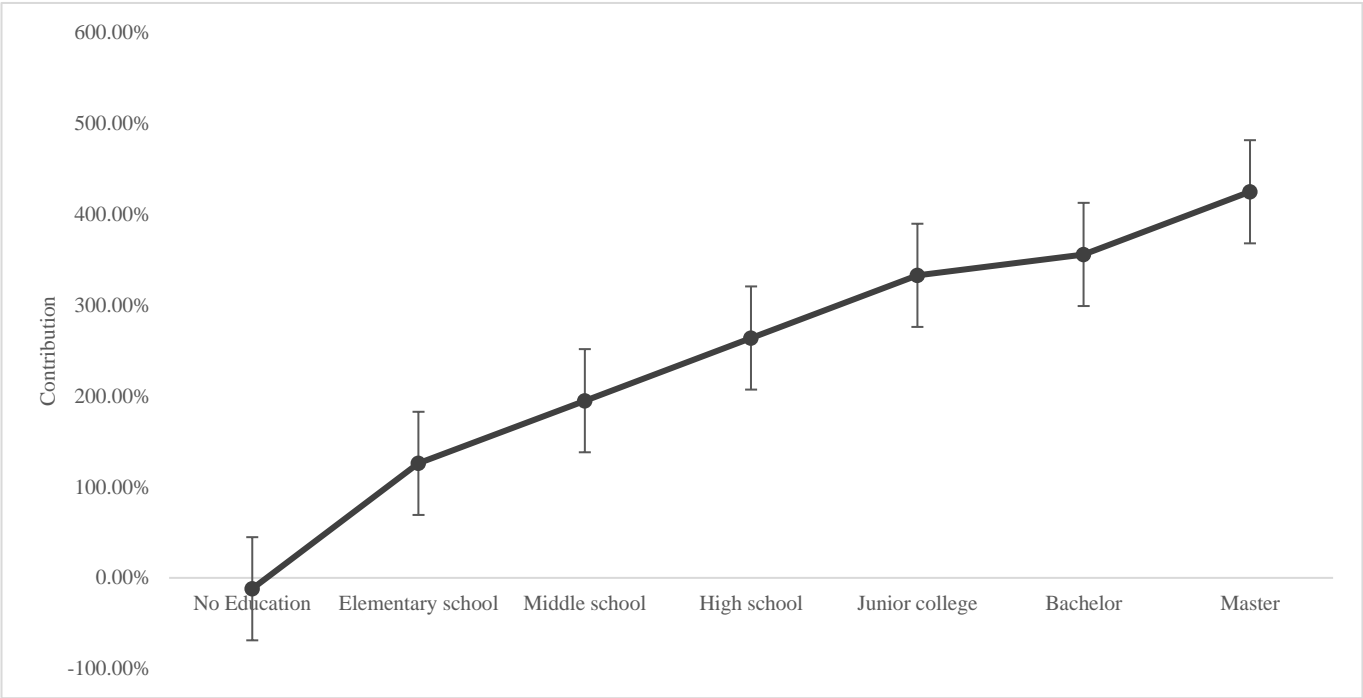
	FI	0.444	3.06%	0.294	1.51	0.131
	FYoE	0.175	1.21%	0.184	0.95	0.343
	MYoE	0.125	0.86%	0.173	0.72	0.470
	Total	3.966***	27.35%	0.942	4.21	0.000
Coefficient Gap	IU	18.046**	124.44%	9.068	1.99	0.047
	YoE	15.961*	110.06%	9.597	1.66	0.096
	IU*YoE	-14.718	-101.49%	12.438	-1.18	0.237
	Age	-3.833	-26.43%	68.214	-0.06	0.955
	Age <sup>2</sup>	-1.497	-10.32%	39.458	-0.04	0.970
	HS	-2.512	-17.32%	2.503	-1.00	0.316
	HRS	-0.082	-0.57%	2.482	-0.03	0.974
	MS	1.954	13.47%	5.200	0.38	0.707
	MC	3.046	21.00%	1.968	1.55	0.122
	AHI	0.769	5.30%	3.689	0.21	0.835
	FP	-5.267	-36.32%	4.299	-1.22	0.221
	FC	4.351**	30.00%	1.816	2.40	0.017
	FI	-0.715	-4.93%	1.110	-0.64	0.519
	FYoE	-7.522	-51.87%	5.523	-1.36	0.173
	MYoE	-0.144	-0.99%	3.556	-0.04	0.968
	Constants	2.696	18.59%	30.674	0.09	0.930
	Total	10.536***	72.65%	2.170	4.86	0.000

Note: \*\*\* represents  $p < 0.01$ ; \*\* represents  $p < 0.05$ ; \* represents  $p < 0.1$ .

Table 2 reports the decomposition results of the gender wage gap. The decomposition results show that the gender wage gap between female and male respondents is 14.502 ¥/hour in the mean condition and the gap is statistically significant at the 1% level of significance, with female respondents earning significantly lower wages than male respondents. Specifically, the characteristics gap is 3.966 ¥/hour and contributes 27.348% (3.966/14.502) to the gender wage gap at the 1% significance level, indicating that 27.348% of the gender wage gap is due to differences in a range of individual as well as household endowment characteristics representing human and social capital between female respondents and male respondents. The coefficient gap is 10.536 ¥/hour and contributes 72.652% (10.536/14.502) to the gender wage gap at the 1% significance level, indicating that 72.652% of the gender wage gap is due to the wage return gap between female respondents and male respondents across a range of personal as well as household endowment characteristics, implying that even if female respondents have the exact same set of personal as well as household endowment characteristics as male respondents except for gender, gender differences can make women earn significantly lower wages than men, and gender discrimination is usually the most important reason for this phenomenon. In summary, while it is true that there is a gap between female respondents and male respondents in terms of personal and family endowment characteristics, it is the gap in wage returns to personal and family endowment characteristics due to gender discrimination that is most responsible for the gender wage gap being so pronounced. So, what role do Internet Usage (IU) and Years of Education (YoE) play in this process? This is subject to further decomposition analysis of the characteristics gap and the coefficient gap.

In terms of the characteristics gap, although the coefficient of Internet Usage (IU) is negative and statistically significant at the 5% level of significance, the product of Internet Usage and Years of Education (IU\*YoE) also has a positive effect on the gender wage gap at the 5% level of significance, indicating that Years of Education (YoE) has a significant positive moderating effect on the relationship between Internet Usage (IU) and the gender wage gap, further widening the gender wage gap. Specifically, under the condition that both female and male respondents have no education, the characteristic gap in Internet Usage (IU) between female and male respondents reduces the gender wage gap by 11.94% (-1.731/14.502). While under the condition that both female and male respondents have only elementary school education, both only have middle school education, both only have high school education, both only have junior college education, both only have bachelor education and both only have master education, the characteristic gap in

Internet Usage (IU) between female and male respondents respectively widens the gender wage gap by 125.93%(18.262/14.502), 194.86%(28.259/14.502), 263.79%(38.255/14.502), 332.73%(48.252/14.502), 355.70%(51.584/14.502) and 424.63% (61.580/14.502).



**Figure 1** The effect of the gap in the characteristics of Internet Usage on the gender wage gap at different levels of education

Plotting Figure 1 based on the results of the above study, it can be observed that as Years of Education (YoE) increases, the characteristic gap in Internet Usage (IU) between female respondents and male respondents contributes to the gender wage gap in an increasing trend. This is most likely because as the Years of Education (YoE) of male respondents and female respondents gradually increase, their knowledge reserve continues to increase, the boosting effect of Internet Usage (IU) on their wage income increases, and the characteristic gap in Internet Usage (IU) between female respondents and male respondents makes female respondents' wage income increase lower than that of male respondents, thus leading to a widening gender wage gap with the increase in Years of Education (YoE).

In terms of the coefficient gap, the coefficients of Internet Usage (IU) and Years of Education (YoE) are 18.046 and 15.961, respectively, and are statistically significant at the 5% and 10% levels of significance, while the product of Internet Usage and Years of Education (YoE) (IU\*YoE) does not have a significant effect on the gender wage gap. This means that under the influence of gender discrimination, even if the characteristics of female respondents' Internet Usage (IU) and Years of Education (YoE) are identical to those of male respondents, the wage returns to Internet Usage (IU) and Years of Education (YoE) are also significantly lower for female respondents than for male respondents, but Years of Education (YoE) does not have a significant moderating effect. Specifically, the gender wage return differences for Internet Usage (IU) and Years of Education (YoE) respectively widen the gender wage gap by 124.44% (18.046/14.502) and 110.06% (15.961/14.502) at the 5% and 10% significance levels.

**5. Conclusions and Recommendations**

Based on the data from the Chinese General Social Survey in 2018, this study examines the effect of Internet usage on the gender wage gap in Chinese labor force and the moderating effect of years of education on this effect by constructing a RIF mean regression decomposition model that takes into account the years of education's moderating effect. The results show that: Firstly, the characteristic gap in Internet usage between the female and male labor force in China has a significant endowment effect, leading to a further widening of the gender wage gap. Secondly, Internet usage has a significant coefficient effect on the wage income of Chinese female labor force and male labor force, and the premium effect of Internet usage on the wage income of Chinese male labor force is significantly stronger than that of female, thus further widening the gender wage gap. Thirdly, the characteristic gap in years of education between Chinese female labor force and male labor force does not have a significant endowment effect on the gender wage gap. Fourthly,



the number of years of education has a significant coefficient effect on the wage income of Chinese female labor force and male labor force, and the return to education of Chinese male labor force is significantly higher than that of female, which leads to a further widening of the gender wage gap. Fifthly, years of education have a significant moderating effect on the relationship between Internet usage and the gender wage gap in the Chinese labor force. With the effect of years of education, the gap between the characteristics of Chinese female and male labor force regarding Internet usage will further widen the gender wage gap, and this widening effect increases as the years of education increase.

The findings of the above study have clear policy implications: Firstly, Chinese government agencies should accelerate the development of Internet infrastructure and strengthen training in Internet usage skills, with a focus on female to bridge the gender divide in Internet technology. Despite the rapid development of Internet technology in China, the Internet penetration and usage rates of China are still below the levels of developed countries. On the one hand, Chinese government departments should continue to promote the construction of Internet infrastructure and increase Internet penetration and usage rates, while lowering the cost of Internet usage as much as possible to lower the barrier of entry to the Internet space, and provide appropriate policy tilts to female groups to effectively bring into play the employment promotion effect of digital empowerment and its wage premium effect. On the other hand, Chinese government departments should strengthen the training of Internet usage skills for labor groups, promote the integration of online and offline Internet usage skills training, organize regular offline training for labor groups in universities and colleges, and actively develop online training courses to better meet the needs of labor groups for Internet usage skills training in a diversified way, with a focus on female groups, so that the labor force can adapt to the employment development needs of the digital economy while preventing gender differences in Internet usage skills from further widening the gender wage gap. Secondly, Chinese government departments should introduce incentives and complementary policies to improve the education level and knowledge reserve of the workforce, with a focus on female groups to bridge the gender gap in education level and knowledge reserve, so that the digital wage dividend of the Internet as a technology can be fully utilized. On the one hand, Chinese government should provide incentives to improve the education level of the Chinese labor force, and provide appropriate policy tilts to female groups to give full play to the role of education in regulating the digital wage dividend generated by Internet usage. On the other hand, Chinese governmental departments should introduce complementary policies to supplement the nine-year compulsory education to improve the knowledge reserve of the workforce, especially the STEM knowledge reserve, with a focus on the female groups, so that the labor force can meet the requirements of employment development in the digital economy while preventing the gender gap in knowledge reserve from further widening the gender wage gap.

## References list

- Yanfang Dong, Zebing Yang, Changfu Luo. A Study of Gender Differences in Educational Returns Based on Living Standards and Their Changes - An Analysis from the Perspective of Shifting Marriage Education Matching Patterns. *Learning and Practice*,2021(10):58-70. [in Chinese]
- Lei Han, Xinwang Hou. Can higher female education reduce the gender wage gap?. *Labor Economics Research*,2020,8(05):47-69. [in Chinese]
- Lerong Yu, Ying Zhang, Fuqiong Yang. Should men get more? --Based on an examination of attitudes toward gender income distribution equity among rural residents. *Journal of China Agricultural University (Social Science Edition)*,2022,39(02):205-218. [in Chinese]
- Lei Li, Xiaojie Wang, Dianchun Jiang. The Impact of Foreign Capital Entry on Gender Employment and Wage Gap in China's Service Sector. *World Economy*,2015,38(10):169-192. [in Chinese]
- Tiantian Cai, Huiling Chen. Impact of trade openness on gender wage gap and mechanism analysis. *Contemporary Economics*,2022,39(04):83-93. [in Chinese]
- Shisong Qin, Yanfang Tian. Does Household Labor Reduce Wage Earnings - Evidence Based on CHNS. *World Economic Digest*,2015(04):77-92. [in Chinese]
- Kaiming Guo, Chunchao Wang, Yiluan He. Rising Female Family Status, Fertility Differences and Wage Inequality. *Southern Economy*,2016(04):45-62. [in Chinese]

- Zhaoping Wang, Wenli Wang. A study of the impact of marriage and childbearing on wages - based on the gender wage gap perspective. *Journal of Demography*,2020,42(01):99-112. [in Chinese]
- Fen Zhang, Wei He. The effect of household factors on gender wage differentials - an empirical analysis based on CFPS data. *Population and Economy*,2021(02):84-102. [in Chinese]
- Xiaoyan Yuan. A Study of Gender Differences in Returns to Education. *Statistics and Information Forum*,2012,27(04):98-102. [in Chinese]
- Chunbing Xing, Shuyan Jia, Shi Li. Technological Progress, Returns to Education, and the Gender Wage Gap in Urban China. *Labor Economics Research*,2014,2(03):42-62. [in Chinese]
- Quan Liu. Theoretical proof that education reduces the gender wage gap. *Chinese Prices*,2014(06):47-50. [in Chinese]
- Qi Yan, Dahu Meng, Yongqiang Sun. Education, Educational Expansion, and the Gender Wage Gap - A Literature Review. *Review of the Economics of Education*,2017,2(06):115-128. [in Chinese]
- Gang Zhang, Shenghui Yang. Trend Analysis of the Effect of Educational Attainment on Income Level of Mobile Population. *Northwest Population*,2019,40(04):12-22. [in Chinese]
- Yiyong Yang, Lingxin Wang. A study on the trend of the return to education of the migrant population. *China Population Science*,2021(02):26-39+126. [in Chinese]
- Yingying Huang, Hailin Ma. A study on the effect of education on income disparity - an exploration based on quantile regression. *Chinese Prices*,2021(09):43-44+63. [in Chinese]
- Yue Liu, Jiacheng Gao, Ruoxuan Wang. The Impact of Internet Use on Gender Wage Gap of Employees in Private Enterprises in the Context of Digital Economy - An Analysis Based on the Differentiated Characteristics of Employees' Education Level. *Technology and Industry*,2022,22(01):97-102. [in Chinese]
- Zhiling Huang, Xianguo Yao. A Study of Gender Differences in Returns to Education. *World Economy*,2009(07):74-83. [in Chinese]
- Po Yang, Fei Cheng. Education, Industry Segmentation, and Gender Earnings Differences - An Analysis Based on the Employment Survey of Chinese College Students. *Peking University Education Review*,2012,10(03):95-113+190. [in Chinese]
- Xiaojuan Xu. Analysis of the factors of the widening gender wage gap in China--Based on dynamic wage decomposition method. *Journal of Shanxi University of Finance and Economics*,2014,36(S2):18-19. [in Chinese]
- Yuanyuan Zhao. A study on the factors influencing gender wage differentials in urban China - based on "employer-employee matching data". *Xinjiang Social Science*,2017(01):128-134+166. [in Chinese]
- Shisong Qin. Socio-Cultural Roots of Gender Income Gap in China - An Empirical Analysis Based on Gender Role Perceptions. *A Sociological Study*,2019,34(01):106-131+244. [in Chinese]
- Jingjing Wang. Why the gender wage gap widened after the expansion of higher education - an analysis based on CHNS data. *Population in the South*,2020,35(05):46-57. [in Chinese]
- Yanfang Dong, Changfu Luo, Minghui Fu. To work overtime or not to work overtime: Migrant workers' choice or no choice at all. *Agricultural Economic Issues*,2018(08):116-127. [in Chinese]
- Xiaoguang Li. Gender Earnings Gap in Urban Labor Market: An Explanation Based on Educational Mismatch. *Educational Research*,2022,43(06):45-57. [in Chinese]
- Shu Bian, Yuqi Xiong. A study of gender differences in the return to education of mobile populations under new employment patterns. *Social Security Research*,2022(04):33-44. [in Chinese]
- Qiang Li, Zhongli Song, Xiaohong Liu, Linxiu Zhang. A study of gender differences in the return to self-employment education among rural migrant population. *Journal of China Agricultural University (Social Science Edition)*,2022,39(02):151-168. [in Chinese]
- Agrawal A, Gans S, Goldfarb A. Artificial intelligence: the ambiguous labor market impact of automating prediction. *Journal of Economic Perspectives*, 2019, 33(2): 31-50.
- Yudong Qi, Cuihua Liu. Does Internet Use Narrow the Gender Wage Gap in the Context of the Digital Economy - An Empirical Analysis Based on a Comprehensive Social Survey in China. *Economic Theory and Economic Management*,2020(09):70-87. [in Chinese]
- Yanan Li, Qianyun Xie. Internet Usage and the Wage Earnings Gap - An Empirical Analysis Based on CHNS Data.

- Economic Theory and Economic Management,2017(07):87-100. [in Chinese]
- Liming Chu. Research on the impact of "Internet+" on workers' wage level--analysis based on the characteristics of different industries. Price Theory and Practice,2020(02):35-38. [in Chinese]
- Haoran Hu, Panpan Zhang, Ruiren Zhang. Internet penetration and the convergence of the provincial wage gap in China. Economic Commentary,2020(01):96-111. [in Chinese]
- Shuaina Li. Digitalization and the service industry wage gap: push or snow? --an analysis based on CFPS and industry-matched data. Industrial Economics Research,2021(06):1-14+28. [in Chinese]
- Xiaohong Wen, Junlong Ma, Xiangjun Wang. Rural-urban differences in the impact of Internet use on income. World Agriculture,2021(07):97-107. [in Chinese]
- Xuguang Song, Jiajia He. A study of the impact of labor inflow on the wages of local residents - based on the perspective of labor skill differentiation. Financial and Economic Research,2022,48(06):19-33+169. [in Chinese]
- Yudong Qi, Cuihua Liu, Shulei Ding. Digital Economy Development, Employment Structure Optimization and Employment Quality Improvement. Economics News,2020(11):17-35. [in Chinese]
- Xiliang Feng, Panpan Gao, Rongbo Luo. The Impact of Internet Use on the Gender Wage Earnings Gap of Migrant Workers. Population and Economy,2021(05):111-124. [in Chinese]
- Shulei Ding, Cuihua Liu. Internet Usage, Income Enhancement and Skill Premium of Youth Groups in the Digital Economy - A Perspective Based on Urban-Rural Differences. Contemporary Economic Management,2022,44(08):64-72. [in Chinese]
- Jiazhi Zhuang, Aiyu Liu, Chao Sun. Reproduction of Gender Inequality in Cyberspace: Gender Differences in the Wage Premium Effect of the Internet The Third Survey on the Status of Women as an Example.Society,2016,36(05):88-106. [in Chinese]
- Yufei Mao, Xiangquan Zeng, Wenxin Hu. Can Internet Use Reduce the Gender Wage Gap? --An empirical analysis based on CFPS data. Financial Research,2018,44(07):33-45. [in Chinese]
- Ziqiang Zhang. Internet Usage and Farm Income Inequality. Economic Economics,2022,39(03):45-54. [in Chinese]
- Jiacheng Gao. The effect of Internet usage on gender wage income distribution--an empirical analysis based on CGSS data. Journal of Fujian Agriculture and Forestry University (Philosophy and Social Science Edition),2021,24(04):81-91. [in Chinese]