What Role Does Education Play in Improving Gender Equality?

Xiaoyu Wu[1]([✉]), Chunlu Ji[2], Ruhan Xu[3], and Yanting Liu[4]

[1] Qingdao Academy, Qingdao 266000, China
`wxy20060122@163.com`
[2] Social Sciences, University of California, Irvine 92617, USA
[3] Beijing National Day School, Beijing 100039, China
[4] Basis International School Park Lane Harbour, Huizhou 516223, China

Abstract. This paper illustrates how important education's role is in improving gender equality. This work analyzes the phenomenon of gender inequality in the workplace and investigates the gender income gap, female participation ratio, and educational years in urban and rural areas data after 1986. Besides, this research. Hypothesizes that an increase in educational years raises female wages and the female employment rate will shorten the income gap. The controlled variables are the birth rate of males and females. As a result, the employment rate and women's wage growth followed by increasing education years, and the income gap between males and females will decrease at the same time.

Keywords: Education · gender equality · female

1 Introduction

Education is an essential gift to children, whether male or female. Both of them have the same equality to enjoy the right to education because education can affect a child's whole life. In the past, due to social preference for sons, boys have more priority in education rights than girls. While the gender inequality problem in education is not as serious as before, especially in some particular parts of the country. We believe that it makes sense to study China over the past 30 years. China is the country with the largest population in the world, which has made great strides and significant progress. In 1986, the 'Compulsory Education Law of the People's Republic of China' Law come into force. This law required that all citizens obtain at least nine years of education, which is funded by the government [1].

As the number of years of education increases, many females can get more opportunities to get higher education. How is the law being implemented in rural areas? Will the female employment rate increase? If the female labor force participation rate increase, can women be valued as the same as men at work? Will the income gap between females and males decrease? This will be clarified in the following article.

2 Literature Review

2.1 Context of the Gender Inequality, Research Gap, and Hypothesis

The gender ratio in China was considered excessively imbalanced - In 2021, the sex ratio of the total population was 104.9 males to 100 females [2], and this data was even more skewed dating back to 2005 when there were 118.6 males per 100 females. In recent years, gradual relaxation of the family planning policy has mitigated this unbalanced gender distribution, which dropped to 113.5 in 2015 and declined further to 111.9 in 2017. In this case, the usually imbalanced sex ratio still persists. The abnormally high sex ratio reflects the situation in which "girls are denied the right to life" and substantiates deep seated sex discrimination that adversely affected girls' development [3]. In general, there are already plenty of researches that provide various explanations of gender equality. For example, the wage gap and maternity leave extension. Notwithstanding these, the lack of a certain relationship between some variables and the gender gap still curbs the elaborations on the causation of the gender inequality. For instance, the Chinese government passed a 9-year compulsory education law. However, some data is inaccurate and insignificant given that before 1986, the educational system was not mature enough so varieties in students attendance at schools may hinder the relevance of educational years to gender inequality. For this reason, we choose to investigate data of gender income gap, female participation ratio, and educational years in urban and rural areas after 1986 (mainly 1990, 2005, and 2020), and hypothesize that increase in educational years raises female's wage (thereby shortening income gap) and female employment rate.

2.2 Inequality in Work Place

We choose to analyze the phenomenon of gender inequality in the workplace since this trend is most remarkable in China among most of the developing countries. China's "economic reform and opening-up" policy since 1978 gave companies "more latitude in a competitive economic environment to discriminate against women in the workforce and in the pay" [4]. In contrast, other major developed nations - such as the U.S, Japan, and European Union - took a great step in reducing the phenomenon of gender inequality in their labor market [5]. According to the data from World Bank, the female participation rate reveals a plummeting trend, dropping from 73% in 1990 to 63% in 2020 [6]. Also, the government introduced new employer entitlements in 2021, bringing a shift in women's status in their occupations. For instance, maternity leave was increased to 158 calendar days (from previous 128 days) for birth on or after November 26 in Beijing and Shanghai [7]. However, the period of paternity leave was only 15 days. In this case, it would bring a sense of unfairness to men who worked for longer hours [8]. In addition, longer maternity leave might hurt women's careers. Evidence from a variety of countries substantiates that length of leave can be a factor in the perceptions of co-workers as well - women who take longer leaves are often seen as less committed to their jobs than women who take much shorter leaves. Examples such as being less likely to be promoted and receive a pay raise once their leave is over are not casual [9]. Such phenomena in industries in China contributed to the income gap between genders, to which women's average wage dropped to 65% of men's earnings by 2013 [10].

2.3 Education Improves the Gender Wage Gap (in Urban and Rural Areas)

China was facing the issue of unequal gender educational access for a long period of time, and this problem exacerbate in rural areas due to even larger gender income gap and inculcation of traditional views. In fact, China has become one of the countries with the largest urban-rural income gap in the world. In urban areas, returns to education nearly tripled between throughout the 1990s [11]. It should be noted that the extent to which interactions between education and the gender income gap should be evaluated differently in urban and rural areas. In fact, higher welfare services, higher income, is assumed to bring higher return to education system, especially in urban areas [12]. Moreover, fifty percent of families in urban areas chose to embrace the education of their daughter, since she may be their only child due to the effect of the One-child-policy [13]. The disparities in acquiring educational resources are more apparent in advanced academies. A national representative data from 2003 showed that only 43 percent of students who accessed elite Project 211 and 18 percent of students who accessed China's top two colleges were from rural areas (in the case of 60% of the rural population) [14, 15].

3 Methodology

3.1 Research Periods and Reasons

This paper focuses on three periods, which are 1990, 2005, and 2020. There are three reasons for the selection of data. Firstly, the interval of the national population census is ten years. So 1990 is the fourth national population census, and 2020 is the seventh [16]. Secondly, the nine-year compulsory education system was introduced in 1986 [17]. All the research periods are after nine-year compulsory education. So the research allows to see that without a financial burden in primary education, whether women can achieve fair employment chances and wages in their careers. Thirdly, China joined the World Trade Organization (WTO) in December 2001 [18]. So the impact of globalization on the domestic economy also influences the labor market. Whether the increase in jobs resulting from accession to the World Trade Organization will lead to a rise in female employment and a reduction in the gender gap, 2005 is four years after China joined the WTO, enough for seeing the impact.

3.2 Regional Difference

There is also a regional difference this paper needs to consider. Chinese government separates 1–5 city tiers according to criteria, including population, economic impact, and political administrations. Because it could be biased to compare the income of a woman from an urban area and a man from a rural area, as the income and cost and living are higher in urban areas than in rural areas. So, this paper will distinguish between urban and rural areas for a more reasonable comparison. Furthermore, this paper would include the 1–3 tier cities in urban areas and 4–5 tier cities in rural areas.

3.3 Independent Variable

The independent variable analyzed in this article is the years a student has been in education, which can be distinguished paper from their diplomas. This would consider there are two kinds, secondary education, and higher education. Secondary education includes a middle school diploma and a high school diploma. Higher education includes a bachelor's degree, master's degree, and Ph.D. Although the nine-year compulsory education only allows the student to have free education until graduating from the first part of secondary education, the tuition and book fees for public high schools are still acceptable to the public. Take Shanghai as an example. In 2020, the minimum wage in Shanghai was 2480 Yuan and the average high school tuition for the entire school year is 2800 Yuan [19]. Moreover, the scholarships in university can cover the tuition fee and basic living expenses.

3.4 Dependent Variable

The dependent variables analyzed in this article are the average income gap and employment rate for males and females. The income gap will be represented by the average income of males (AIM) and females (AIF). The income gap can directly reflect whether gender discrimination occurs in the job market. We also choose the employment rate or female participation rate as the dependent variable because without being employed, there is no income to compare.

3.5 Controlled Variables

The controlled variables for our research are the birth rate of males and females. According to the literature review, the gender gap in the birth rate is still imbalanced these years. So, to prevent the imbalance between men and women causing the difference in employment rate, the overall employment number of males will be divided by the estimated ratio difference.

3.6 Panel Data Regressions

$$\text{Income Gap} = \text{AIM}_{dt} - \text{AIF}_{dt} = \alpha_d + \beta X_{dt} + \gamma_t + \varepsilon_{dt}$$

So, our main result pertains to panel data regressions of the form [1].

Where AIF_{dt} is the average income of females in district d at time t, α_d is the district-specific effect, β is a vector of coefficients, X_{dt} is the years in education in the district, γ_t is the time dummy, and ε_{dt} is the error term. The employment rate difference will be used as reference data to check the result. Income gap is defined as in the position, the wage gap between the two genders, considering the regional and educational factors.

3.7 Further Calculation

For in-depth research, his paper will use Jacob Mincer's model of earnings to find the impact of working experience on male-female wage gaps [20]. Educational experience may weigh less than working experience when people enter the job market for longer. Moreover, this equation can be used to estimate the rate of return to schooling in the perfect stationary economic condition. Then, this work can apply the regional difference factors in the equation. Because in rural areas, more years of schooling may not show advantages in income. The underemployment conditions may occur and cause the returns in school to reach a maximum in the early stage of schooling and stop increasing. However, this may also appear in specific jobs in urban areas. The over-education situations would occur.

4 Expected Results

4.1 Main Results

This paper expects the main results by considering the data in the years 1990, 2005, and 2020. As educational years increase, the income received by females will subsequently increase, reducing the income gap between men and women in the same working position. However, this paper is projected to find that female labor force participation rates in China will continue to keep a decreasing trend in the next few years. The coefficient between additional educational years and the income gap is highly negative in urban areas (an increase in educational years reduces the income gap between genders to a larger extent) and less negative in rural areas.

4.2 Decreasing Women's Labor Force Participation

To commence with, the expectation of decreasing rate of female labor force participation rates in the next few years may disappoint numerous people. The data rose by approximately 20 percent from 1990 to 2020 among OECD member countries from 40% to 60%, whereas this figure dropped from 73.2% to 60.5% in China during this thirty-year period [21]. This paper is responsible to explain why the ratio of female work participation in China is higher than the ratio in other developed countries from OECD in 1990, but then fell by almost 10%.

In this case, China, as an exception, reflects its educational factors, cultural norms, and changes in family structure for female workers. The relatively higher female participant rate than the world level related to China's economic policy. Since the reforms and opening-up policy in 1978, China's economy showed a new trend of energetic development and resulted in an increase in female employment. More females choose to work in the third industry and the percentage of women in the first industry and the second industry gradually declined and the overall educational levels of women increase enormously [22].

Besides, the female labor participation rate is expected to keep a decreasing trend. After the nine-year compulsory educational policy, more girls under 15 years old are asked to attend schools which improves the enrollment rate. Similarly, as China attaches

importance to education for sustainable development, in the long run, universities allowed more students have the experience of completing higher education. Therefore, more females went to be educated and subsequently the supply of young female labor decreased. So the female labor participant ratio consistently reduced. Other factors like gender stereotypes still hinder women to have a fair competition with men in work. With the outbreak of COVID-19 in China, women still carry a heavier burden and have more losses than men in terms of employment [23]. Women in the labor market have higher unemployment rates than men, they return to work more slowly and are more likely to work from home. Meanwhile, some women are still required to stop working to care for their families, especially for infants and elders, which makes it almost impossible to work at the same time. Similarly, when employers hire workers, it is common to see the job requires women to be married or with children because they will not ask for maternity leave in the future. Although China enacted laws to protect female employers from pregnancy discrimination, there is no data to show if employers follow this law.

4.3 The Reduction of the Income Gap

The female income is predicted to increase and the income gap will reduce in the same position by the higher rate of financial return to schooling for women. In an earlier study, it was found that in a sample of eight middle-income countries, a year of post-secondary schooling increased earnings for women on average across a sample of countries by 18% and by 12% for men [24]. With women's ability and willingness for promotion and the self development, massive women managed to enter the management and receive higher income. As a middle-income country, this trend is expected to occur in China. Another explanation is that in the past, for young women without college degrees who have not had to confront the pressure and hustles of schools, they have to find part-time work in order to satisfy their basic needs for living.

Besides, female workers with appropriate education and over-education can enjoy a more positive return by education in the labor market, and the greater effect will help them to reduce the income gap. Here, over-education means the provision of more education or information than is practical or useful for the work. However, if women lack sufficient education, they will have less wage because their educational levels cannot meet the job requirement.

4.4 Impact in Different Regions

Apart from that, it is expected that the education years have higher positive relevance of gender equality in urban areas. In the past, the notion of son preference, child marriage for young girls, and the old saying "a woman without talent is virtuous" make it harder for government to reduce gender inequality in rural areas. Although in recent decades people's attitudes to these outdated notions have changed to some extent, there is still a long time lag for rural areas to completely eliminate the discrimination against women. Moreover, the poverty cycle happens when a child is born into a poor family, these families often have limited resources to find educational opportunities for children. These families often face financial burdens and do not attach as much importance to

education as families in urban areas, causing low financial returns due to the lack of academic degrees, leaving children stuck in poverty again.

Even though more educational years will improve this situation, it still requires much more time and effort in rural areas than in urban areas. By contrast, people in urban cities often pay much more attention to education, so it will be easier for the government to carry out an educational policy with citizens' support. Apart from that, it is demonstrated that the financial return of additional educational years in urban areas is higher than it in rural areas by using Mincer's model of earning, which benefits women in urban areas particularly [25]. Women can have more income in the working position. Thus, this paper expects the effect of reducing the income gap on the basis of educational improvement is more pronounced in urban areas rather than in rural areas.

5 Conclusion

Female workers with appropriate education and over-education have more opportunities than before, and they can enjoy a more positive return by education in the labor market. In conclusion, women's wages growth followed by increasing in years of education, and the income gap between males and females will decrease at the same time. However, women are likely to stop their work due to various reasons such as marriage, childbearing, and family, they have to stop their work to do this. In addition, with a possible rural preference for sons and child marriage, it is difficult for the government to fully address gender equality in rural areas in China.

Thus, the result is as we assumed that increasing education years will grow the female employment rate, there are many other social factors leading to a decline in the female labor participation rate. Based on our statistics, boys' birth rate is greater than girls. So, the male-to-female ratio may be normal in the workplace. While the young generation will become an important force in promoting gender equality. Even though male and female birth rates are a factor of gender inequality in income, they have a more accurate understanding of gender and are more likely to improve gender equality.

References

1. Girls' education in China more accessible than ever. (2019), Project, B. https://borgenproject.org/girls-education-in-china/ Published by C. Textor, & 27, J. (2022, July 27). China: Sex ratio 1953–2021. Statista. Retrieved September 13, 2022, from https://www.statista.com/statistics/251102/sex-ratio-in-china/
2. Published by C. Textor, & 27, J. (2022). China: Sex ratio 1953–2021. Statista https://www.statista.com/statistics/251102/sex-ratio-in-china/
3. Figure1.9 sex ratio at birth, 1982–2017. UNICEF. (2018). https://www.unicef.cn/en/figure-19-sex-ratio-birth-19822017
4. YenNee_Lee. (2020). Women in China are losing out in the workforce – that's bad news for the economy. CNBC. https://www.cnbc.com/2020/06/23/china-women-are-losing-out-in-the-workforce-its-harmful-for-the-economy.html

5. Reasons for China's changing female labor force ... - Xingxuan Xi. (2017). https://www.atl antis-press.com/article/25879272.pdf

6. Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate) China. Data. (2022) International Labor Organization https://data.worldbank.org/ indicator/SL.TLF.CACT.FE.ZS?locations=CN

7. China: Beijing and Shanghai extend maternity leave by 30 days; Parental Leave Entitlement introduced. Willis Towers Watson. (2021). https://www.wtwco.com/en-CZ/Insights/2021/12/ china-beijing-and-shanghai-extend-maternity-leave-by-30-days-parental-leave-entitlement-introduced

8. Population and Family Planning Law Christina Gigler (2022). https://www.roedl.com/ins ights/china-special-leave-maternity-parental-paternity-nursing-family-planning

9. Do longer maternity leaves Hurt Women's careers? Harvard Business Review. Ivona Hideg, Anja Krstic, Raymond Trau, and Tanya Zarina (2021). https://hbr.org/2018/09/do-longer-mat ernity-leaves-hurt-womens-careers

10. Philipp, J. (2021). Gender wage gap in China. The Borgen Project. https://borgenproject.org/ gender-wage-gap-in-china/

11. Xing Gao, Maishou Li (2022). Differences between returns to education in urban and rural China and its evolution from 1989 to 2019. PLOS ONE. https://journals.plos.org/plosone/art icle?id=10.1371%2Fjournal.pone.0274506

12. Brown. Philip H. & Park, Albert, (2002) "Education and Poverty in Rural China," Economics of Education Review. Page523–541

13. Gender inequality Junxia Zhang, Xiaopeng Pang, Linxiu Zhang, Alexis Medina, Scott rozelle (2012). https://fsi-live.s3.us-west-1.amazonaws.com/s3fs-public/Gender_Inequality__.pdf

14. Urban population % of total population United Nation Population Division (2018). https:// data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=CN

15. Unequal access to college in China: How far have poor, rural students been left behind? HongbinLi, Prashant Loyalka, Scott Rozelle, Binzhen Wu, and Jieyu Xie (2015). https://fsi-live.s3.us-west-1.amazonaws.com/s3fs-public/unequal_access_to_col lege_in_china_how_far_have_poor_rural_students_been_left_behind.pdf

16. National Bureau of Statistics: China Population Census, http://www.stats.gov.cn/ztjc/zdtjgz/ zgrkpc/

17. The eradication of illiteracy in China since the 1990s. 9-year Compulsory Education, http:// www.china.org.cn/english/education/184879.htm

18. World Trade Organization. WTO, https://www.wto.org/english/thewto_e/countries_e/china_ e.htm

19. 2020 Shanghai minimum wage standard announced at a minimum of RMB 2,480 per month-Shanghai Bendibao, http://sh.bendibao.com/news/2020619/225374.shtm

20. Mincer, J., Polacheck, S. Family Investments in Human Capital: Earnings of Women. (1974) Journal of Political Economy 82(2), Part II: 74–110

21. Max Roger, 2019. Women's employment. https://ourworldindata.org/female-labor-supply# female-participation-in-labor-markets-grew-remarkably-in-the-20th-century

22. Dadan. 1993. Reforming and opening up is the guarantee to rapidly improve women's employment level. https://wuxi.cnki.net/kfdproxy/file/kfd/download/single/PDF.action? param=eyJEaXNjTm8iOiJDQ0RMMDYwNiIsIkZpbGVOYW1lIjoiU1pEUzE5OTMwM jAxOSIsIk5vbmNlIjoiOTk4NDc3NjkyIiwiUGFzZSI6IiIsIlJlcXVlc3RRDbGllbnQiOiJTREtf MS4wLjAiLCJSZXNvdXJjZVR5cGUiOiJjamZkZciwiU2VjcmV0SWQiOiIyMDE4MDA yIiwiU2lnbmF0dXJlIjoickhxMHFMRWlVZXlZbWFCTzFndDJ2eG04QXVvPSIsIlRpb WVzdGFtcCI6IjE2NjY0Mjc4NjQiLCJUaXRsZSI6IuaUuemdqeW8gOaUvuaYr$2C$i/hem An$2C$aPkOmrmOWls$2C$aAp$2C$WwseS4muawtOW5s$2C$eahOmHjeimgeS/neivge KAlOKAlOWvuea3seWcs$2C$Wls$2C$aAp$2C$WwseS4mueOsOeKtueahOiwg$2C$afp eWIhuaekCJ9

23. Singh V., Shirazi H., Turetken J. (2022). COVID-19 and gender disparities: Labour market outcomes. Science Direct, Economics 76. (2022), 206–217
24. Dileni Gunewardena, Elizabeth M.King, and Alexandria Valerio. 2019. Schooling and skills ruduce gender wage gaps-but not completely. https://www.brookings.edu/blog/education-plus-development/2019/03/18/schooling-and-skills-reduce-gender-wage-gaps-but-not-completely/
25. Xing C.B, Chen C.F, Cao X.Y. (2021). Difference in urban and rural education returns and their regional distribution characteristics- based on the survey data of China's household income from 1995 to 2018. Educational research. 2021.9. p104–119