



Employment Analysis of female During the COVID-19 Epidemic

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Abstract. The COVID-19 pandemic has disproportionately impacted the labor market, particularly affecting women's employment. While fiscal and monetary policies have aimed to mitigate economic turmoil, few research has specifically analyzed how the pandemic exacerbated employment challenges for women in the U.S., especially concerning race, education, age, and work experience. This study explores the employment difficulties faced by women during the COVID-19 epidemic by analyzing data from 2019 to 2021. Using OLS regression models, the study investigates the impact of these variables on women's employment rates before and during the pandemic. The results reveal that race, education level, age, and previous work experience significantly influenced employment opportunities for females during this period. Additionally, although the epidemic substantially impacted employment rates, the wage gap between males and females was not impacted. This study emphasizes the necessity of specific policies that provide equitable chances for job progression, childcare assistance, and vocational training to empower women.

Keywords: COVID-19, Female employment, Regression analysis, Gender disparity, Labor market

1 Introduction

As COVID-19 started to strike with full force, governments around the world forthwith implemented programs to slash interest rates so the pandemic could not hit hard and shrink economic activities [1]. If that rate decline proved not to be sufficient in supplementing the recession dampener, quantitative easing came along as an ultra-unconventional approach. In the following weeks, monetary policy continued to firm up after the Federal Reserve announced its decision to revive quantitative easing with zero percent interest rates and 700 billion U.S. dollars in circulation, while an aggressive fiscal policy discussed the largest-ever economic stimulus package worth 2 trillion dollars [2].

The COVID-19 epidemic had a major impact on the job economy, especially on the employment of women. However, governments attempt to use emergency monetary and fiscal policies to lessen the effects on the economy. The dire need of the United States to alleviate the current turmoil in the markets and to lessen the economic pain is

reflected by the adoption of far-reaching quantitative easing along with a robust fiscal policy [3]. Overall, the global spread of COVID-19 has amply disrupted supply and demand, determining the epidemic effect on U.S. jobs and the actual factors involved becomes relevant.

Several researchers have built on equality and opportunity for women in the workplace. The COVID-19 pandemic brought negative impacts on many businesses in the United States and on many workers [4]. In some cases, it has led to people losing their jobs, being laid off, or working from home temporarily because of the policy. It is the most fundamental, key social issue in a country; it also has a tight relationship with the stability of a country and even its way of life [5]. Therefore, employment can be seen as the most fundamental issue of social concern. Along with the development of modern cities and towns came, for the first time, the mass involvement of women in the workforce in an effort to earn an income big enough to maintain the standard of life. There were many difficulties and twists in the employment situation of urban women during the economic crisis; highly educated elite women began to work in government departments and proposed some policies that met the original intention of the feminist movement, which means significant steps forward in the fight for rights [6]. Even with these gains, urban women's employment status remained fraught with considerable hardship. The interplay between many factors resulted in the trend toward an occupational status that was uniquely meaningful for urban women.

This development took place along with the development of urban women. The economy needed a substantial workforce; the government's policies for women's protection were improving with each passing year; and the feminist movement was also widening its horizon of participation in public affairs to bring more women into its fold. All these aspects combined to raise the demand for an adequate workforce [7]. The variable job market is but a part of the greater growth of society; hence, the view from women's employment offers a more objective and whole understanding of the development of the United States [8]. That this would be so is a demonstration that opportunities and platforms available for women to seek employment are of utmost importance to any nation.

Even with all of the different feminist acts that have taken place throughout America's history, discrimination and prejudice remain in American society today [9]. Most businesses will more than likely not provide opportunities for a female employee to join a corporation simply based on the fact that they are a female. The aspect of whether or not they are hard to recruit as compared to males in the general perspective of a public emergency like COVID-19 and whether or not companies will discriminate against them because of their gender status has been covered by few studies [10]. The comparison between women and men in regard to difference, for instance, was done in isolation without considering the moderating influence of ethnicity, age, work experience, or education during the COVID-19 epidemic.

Based on this study examines the impact of the COVID-19 pandemic on female employment by analyzing the primary factors of race, education, age, and experience. Data from 2019 to 2021 will be used to compare employment rates before and after the outbreak.

2 Data

This study finds the relationship between wage and gender based on a dataset of Current Population Survey Annual Social and Economic Supplement data, 2019 to 2021. The survey data can be accessed through the United States Census Bureau, a reliable source for national socio-economic datasets. The survey is a national survey carried out by the United States. The data collected through the survey falls into three broad segments, namely: the household record, the family record, and the person record. The person's records fall under the purview of this article and satisfy the preconditions of the investigation. The construction of variables is made in conformation with instructions using Table 1.

Table 1. Variable Construction

Variable	Variable in survey	Survey Description
employment	premier	Major labor force recode, only the following values are kept: 1 = Employed - at work 2 = Employed - absent 3 = Unemployed - on layoff 4 = Unemployed - looking
wage	wsal_val	Total wage and salary earnings
age	a_age	Age
experienced	a_explf	Experienced labor force employment status Values: 0 = Not inexperienced labor force
gender	a_sex	Sex, Values: 1 = Male 2 = Female
race	spm_hrace	Race, Values: 1 = White alone 2 = Black alone 3 = Asian alone 4 = Other (American Indian, Alaska Native, Pacific Islander, Multiracial)
degree	a_hga	Educational attainment
organization	prcow1	Type of employer: State government or Private (incl. self-employed incorporation) and so on.
industry	a_mjind	Major industry code

In Table 1, variable employment is a dummy variable indicating whether a respondent is employed or not. 0 means the respondent is not employed, while 1 means that they are employed. It could be anything from 0 to 100, as can be seen in Table 2 of the descriptive statistics. For the variable age, the difference used is between the year in which the survey was carried out, 2009, and the year in which each company started operating in its respective country. The variable age can take values between 1 and 197. The variable sale is the natural log value of the annual sales of each company, excluding less than one. This value is the variable sale. The other numbers are either 1 or 2, where 0= negative and 1= positive. Taking the example of theft loss, the value of theft loss is 1 if the company has sustained losses during the fiscal year as a result of theft, robbery, vandalism, or arson. If the firm has not had losses, then the value of theft loss is 2. The employment variable equals one if the value of peer is one or two, and it is zero if the

value of peer is three or four. The natural log of `wsal_val` plus one gives the value of the variable `wage` and could be elaborated as $\text{wage} = \ln(\text{wsal_val} + 1)$. The natural log of `an_age` will give the value to the variable `age`. If `a_explf`=0 then the variable `experienced`=0 otherwise `experienced`=1. The gender variable = `a_sex`-1. The `spm_hracc` and the variable `race` take the same value. There are three possible values for the variable `degree`: 0, if the person did not enter college or university; 1, if they did enter but had a degree that was lower than master's; and 2, if they had a degree that was on par with masters. Similar to `prcow1` and `a_mjind`, each has its value, and the variable `organization` and `industry` do too in the same manner.

Table 2. Descriptive Statistics

Variable	Min	p50	Max	N	Mean	SD
employment	0	1	1	242294	0.951	0.215
wage	0	10.60	14.56	242294	9.606	3.157
age	2.708	3.738	4.443	242294	3.685	0.364
experienced	0	1	1	242294	0.997	0.0560
gender	0	0	1	242294	0.480	0.500
race	1	1	4	242294	1.356	0.768
degree	0	1	2	242294	1.035	0.852
organization	0	4	6	242294	3.800	0.774
industry	0	9	14	242294	7.868	3.153

3 Approach

This study will use the OLS regression model.

$$\text{Employment}_{it} = \beta_1 \text{gender}_{it} + \beta_2 \text{race}_{it} + \beta_3 \text{degree}_{it} + \beta_4 \text{age}_{it} + \beta_5 \text{experienced}_{it} + \text{did} + \varepsilon_{it} \quad (1)$$

The independent variable is an analysis of how the COVID-19 pandemic affected work opportunities for females. The degree of gender affects work opportunities, and this relationship is also considered as a dependent variable in the analysis. A dependent variable deals with how either the presence or absence of the female race would affect employment. It would be the dependent variable since this is answering the question of how the degree of a woman affects work opportunities. It refers to the dependent variable- which is answering the question of how the age of the female affects employment. It would be the dependent variable and that refers to the way in which the presence of female working experience influences employment. It has been used to analyze the employment analysis of women before and after the epidemic, and to locate whether disparity exists in work opportunities between the male and female groups. This model tested, from five different perspectives, the probabilities and types of jobs available to women during the epidemic.

4 Main results

To estimate the relationship between gender and employment, this study did a linear regression of the following form, where all the variables take the same meaning as they are in Table 1, while stands for residual error.

$$\text{Employment}_{it} = \beta_1 \text{gender}_{it} + \beta_2 \text{race}_{it} + \beta_3 \text{degree}_{it} + \beta_4 \text{age}_{it} + \beta_5 \text{experienced}_{it} + \varepsilon_{it} \quad (2)$$

The result of the regression analysis is presented in Table 3: Employment and Gender. Not only did It incorporate all the data that pertains to gender into the regression that appears in Table 3 and 4, but it did so not only for females; rather, it compared and summarized the data for all genders. Looking at Table 3, column 1 shows that gender increases from 1 to 2-that is, male 1 change to female 2 in gender, causing employment to increase by 0.00418. From this column, one may reach such a realization. It follows, therefore that gender plays a major factor in the employment process. Column 2 shows that after controlling for industry effects, gender's impact on employment becomes insignificant. From column 3, if they consider the data set forth, they will realize that this relationship and the impact it has are still positive, even if they are only considering the organization and not the industry wide. Nevertheless, when organization and industry are controlled, column 4 shows that the gender increase from 1 to 2-that is, from male to female-results in 0.00072 decline in employment. That this is so indicates that gender has no positive influence in selecting an employee.

Table 3. Employment and Gender

	(1)	(2)	(3)	(4)
VARIABLES	employment	employment	employment	employment
gender	0.00418*** (0.001)	-0.00076 (0.001)	0.00328*** (0.001)	-0.00072 (0.001)
race	-0.00963*** (0.001)	-0.00979*** (0.001)	-0.00962*** (0.001)	-0.00973*** (0.001)
degree	0.01841*** (0.001)	0.01443*** (0.001)	0.01742*** (0.001)	0.01430*** (0.001)
age	0.03009*** (0.002)	0.02418*** (0.002)	0.02882*** (0.002)	0.02344*** (0.002)
experienced	0.91855*** (0.002)	-0.01106** (0.005)	0.93992*** (0.020)	0.01514 (0.021)
Constant	-0.08606*** (0.005)	-0.06400*** (0.005)	-0.08141*** (0.005)	-0.06181*** (0.005)
Observations	242,294	242,294	242,294	242,294
R-squared	0.068	0.074	0.069	0.074
Organization FE	No	No	Yes	Yes
Industry FE	No	Yes	No	Yes

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Once this was set as a starting point, Table 4: Wage and Gender was developed in order to consider the relationship that does exist between gender and wage. It should be reiterated that the output of this regression also resulted in a negative correlation of wage and gender without the consideration of organization and industry. That this is something that should be brought to your attention: people can notice that in case they increase their gender from one to two, the wage will drop 0.26456, and that the coefficient of gender in the regression of wage and gender is negative. The reason why is because the shift in gender from one to two means there is a change in gender from male to female. This, together with the fact that the sum of both male and female genders equates to one, demonstrates that females are not at a better advantage in terms of work versus their male counterparts.

Table 4. Wage and Gender

VARIABLES	(1)	(2)	(3)	(4)
	wage	wage	wage	wage
gender	-0.26456*** (0.015)	-0.34418*** (0.015)	-0.40598*** (0.011)	-0.35244*** (0.011)
race	0.01797* (0.009)	0.00074 (0.009)	-0.04805*** (0.007)	-0.04496*** (0.007)
degree	0.61201*** (0.009)	0.49785*** (0.009)	0.52821*** (0.006)	0.48234*** (0.007)
age	0.44935*** (0.022)	0.34335*** (0.022)	1.11870*** (0.017)	1.00244*** (0.017)
experienced	8.50857*** (0.089)	7.62600*** (0.973)	2.31722*** (0.470)	1.04297 (1.099)
Constant	-1.06140*** (0.110)	-0.63107*** (0.110)	-2.90053*** (0.102)	-2.55734*** (0.102)
Observations	242,294	242,294	242,294	242,294
R-squared	0.059	0.090	0.527	0.534
Organization FE	No	No	Yes	Yes
Industry FE	No	Yes	No	Yes

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The study constructed regression summaries for only females, which may be found in Table 5 and 6. It also make a shift in my observations from all genders to only females and conduct regressions based on the race of the females, the degree they have earned, their age, and whether or not they have had previous work experience. The final conclusion is that it will affect female employment in those cases where only race, education level, age, and quantity of previous work experience of females are taken into consideration, and no attention is paid to the differences between the groups of males and females. The first column in Table 5 shows that for females, with an increment in the race number, meaning changes from White to Black, Black to Asian, and Asian to the other races, there will be a decrease in employment by -0.00901, while for females' education, higher educations will bring an increase of 0.01784 in employment. The results can be seen from the second column of Table 5 below. For every extra percentage point that woman gets older increases her likelihood to have a job by 0.02556 percentage points. This is a relationship between the two variables. From the column, one

can see that the amount of work experiences a woman has plays an essential role in whether she is working.

This means that for every additional work experience, their employability will increase by 0.92577. Last but not least, these are the results without taking into consideration either the organization or the sector involved. Looking at organization rather than industry, it sees from column 3 that the values of race, education, age and presence of work experience do not differ significantly by individual gender. Again, this is true whether or not it controls for presence of prior work experience. On the other hand, when one looks at column 4, one finds that when organization and industry are controlled for, the values of race, education, and age of females do not change much, while the value of work experience becomes 0.01634. One may therefore infer from this that the proportion of employment which increases with every percent increase in work experience is only 0.01634.

Table 5. Women and Race, Degree, Age and Experienced with Employment

	(1)	(2)	(3)	(4)
VARIABLES	employment	employment	employment	employment
race	-0.00901*** (0.001)	-0.00910*** (0.001)	-0.00898*** (0.001)	-0.00903*** (0.001)
degree	0.01784*** (0.001)	0.01315*** (0.001)	0.01663*** (0.001)	0.01290*** (0.001)
age	0.02556*** (0.002)	0.01828*** (0.002)	0.02400*** (0.002)	0.01754*** (0.002)
experienced	0.92577*** (0.002)	0.00019 (0.009)	0.93241*** (0.029)	0.01634 (0.030)
Constant	-0.07260*** (0.007)	-0.04793*** (0.007)	-0.06732*** (0.007)	-0.04564*** (0.007)
Observations	116,281	116,281	116,281	116,281
R-squared	0.068	0.075	0.069	0.075
Organization FE	No	No	Yes	Yes
Industry FE	No	Yes	No	Yes

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6, female and Race, Degree, Age and Experienced with Wage, to study the association of race in females, the amount of schooling completed, age, and whether or not they have previous work experience to their wage. This is in order to learn more about the association between these factors. It is of greater importance to note that, in column 1 in Table 6, there was an enormously positive effect of having job experiences, therefore making the earnings for each female increase by 8.37019 with more experiences than those who do not have any. Moreover, this is so even without considering organization and industry in this regard; it states that the wage increased by 0.03376 as the race number increases, which means the race shifts from White to Black, Black to Asian, and Asian to other races. People who look in column 4 will actually realize that

the effect of race and job experience is taken to be unfavorable again. This means profits rise by 0.03402 for every increase in the race number, showing that a race moves from White to Black, Black to Asian, and Asian to other races. The impact is, therefore, bigger, considering the organization and the industry; the wage increases only by 0.02373 for people with greater work experience.

Table 6. Women and Race, Degree, Age and Experienced with Wage

	(1)	(2)	(3)	(4)
VARIABLES	wage	wage	wage	wage
race	0.03376*** (0.013)	0.02078 (0.013)	-0.03243*** (0.010)	-0.03402*** (0.010)
degree	0.60136*** (0.012)	0.49723*** (0.013)	0.57623*** (0.009)	0.51679*** (0.010)
age	0.52394*** (0.030)	0.39152*** (0.030)	1.04906*** (0.024)	0.93256*** (0.024)
experienced	8.37019*** (0.121)	6.52364*** (2.170)	2.12296*** (0.611)	-0.02373 (2.330)
Constant	-1.47139*** (0.150)	-0.99627*** (0.151)	-2.97479*** (0.141)	-2.58662*** (0.141)
Observations	116,281	116,281	116,281	116,281
R-squared	0.061	0.092	0.478	0.486
Organization FE	No	No	Yes	Yes
Industry FE	No	Yes	No	Yes

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

5 Conclusion

In most cases, the industry and the organization demand more years of work experience from women. Women's employment would rise by 0.91855 if they had previous job experience, as shown in Table 3. This is the case even if ignore factors such as industry and organization. This study investigates the influence that the COVID-19 epidemic has on women's employment.

Some key findings from a study conducted on the job condition of women during the COVID-19 epidemic really call for the attention and action that governments, enterprises, and all walks of life should give. Another important thing governments and policy makers could do during the epidemic is to establish some kind of assistance that targets more suitable help for women who have lost their jobs, or whose jobs have been more greatly affected-especially ethnic minorities. This is particularly essential in the case of women who have lost their jobs. Such activities organized to facilitate re-entry or job advancement include vocational training, childcare support, and job placement services. This will not only relieve job difficulties in the near future but, when

combined, would contribute to the long-term development of careers and the economic recovery of society.

The process also highly involves businesses and companies as well. They also have to come up with the strengthening of their policies concerning diversity and inclusion so as to ensure women are accorded equal opportunities during the process of recruitment and promotion. These would encompass evaluation and enhancement of recruitment methods, mentorship programs, and equal pay for all employees to work their way toward elimination of wage disparity between men and women. In addition, it is also worth considering how companies could create an environment that would favor the rise and success of women within their corporate culture and atmosphere at work.

Moreover, the pandemic has identified that there is a need for continuous study and monitoring of labor market developments concerning women. In essence, the effect of the pandemic on women's employment can be understood through the periodic collection and evaluation of data. This will ensure the adaptation and development of targeted interventions based on findings. This will also help in coming up with policies and measures that are effective. This kind of study also ensures that the policymakers, as well as all sections of society, are rightly geared to respond appropriately to the prevailing situation.

One of the most feasible ways to reduce the negative effects of women unemployment is to actively encourage and support those women who wish to establish their own enterprises. Governments and the private sector will be able to support women entrepreneurs by facilitating women entrepreneurs' access to start-up capital, training, and other inputs which can enable them to establish and expand their firms. This not only gives a new impetus to the economy but also fosters much-needed diversity and inclusion in society.

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