Master's Thesis

Gender wage gap in the USA

Ioanna A. Antoniou

Department of Economic

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University of Cyprus

Department of Economics

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By Ioanna A. Antoniou

Supervisor: Dr. Michaelides Marios

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Abstract

The main purpose of this paper is to analyses the gender wage gap in the USA and how this gap changes if the education level, the family status, the occupations and industry categories are taken into account. Collecting data from the American Community Survey (ACS) and especially from the IPUMS USA for the year 2019 I try to figure out if there are differences in the distribution of men and women regarding the above-mentioned characteristics mainly. Then I observe the mean wage of the two genders and finally I create a regression model that examines the characteristics that affect the wage, and they are correlated with the gender. The results from the analysis show that when I control for the education level, the gender wage gap increases. This is because, women increase their investment on human capital factors – they are more educated than men. Significantly, the wage declines in regards to the occupations, and it declines ever more if there is an interaction between occupations and industry. This is due to the fact that women prefer to work at low paying occupations and they are more likely to be part-time workers.

Acknowledgements

On the very outset of this report, I am extremely grateful to my family and mainly to my lovely parents for their love, support, sacrifices, their encouragement throughout this journey and preparing me for the future. Thank you both for teaching me how to not give up and chase my dreams.

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To all my friends, I would like to express my gratitude for their support, understanding, encouragement in this journey and for always being there for me.

Marino, thank you for always being there for me.

This dissertation is dedicated to my family and especially to my parents.

For their endless love, encouragement and support in my life.

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1 Introduction

Undoubtedly, in the last few decades a growing interest has been observed and many surveys have been done about the gender wage gap. All countries have a difference in wage between men and women, but it is remarkable that some countries have small percentage and other, have higher. For instance, from the 37 member countries of OECD[1], Korean has the highest percentage of the gender wage gap for employees, which shall be at a rate of 32.48% and Colombia has the lowest (4%). The USA, which is the country that I am interested in, is confronted with the rate of 18.47% in regard to the gender wage gap which exceeds the rate of this gap about the OECD countries in total (13.01%). As we know, equal pay between men and women is a history without end and always a theme for research. Although men and women can be treated equally according to the Constitution of the USA, women face inequalities about the issue of wages.

It is important mentioning that the gender wage gap in the USA decreases subsequently from 1980 to 1989 but in the 1990s there was a slow convergence in wage gap. During the 1980s in the USA, relative wages of women increased, a phenomenon that was also observed in 1990. There is evidence that proves that the labor market experience is a significant factor in explaining the gender wage gap *(Mincer and Polachek, 1974).* As the level of education and experience[2] between men and women converge, wage gap shrinks. Also, there is an increase in women's participation in the labor force and on working hours; this is due to the change in qualifications and experience that women gain over the years *(Blau and Kahn, 2005).* But at the same time, although the wage gap declines, it remains that men take higher wage than women. The main reason for this is the occupational segregation. Although the women's labor force participation increases and they also work at occupations in which the male gender dominates, there is a discrimination against women within each occupation. The distribution of workers within each occupation and industry is mainly on gender but also based on races, ethnicities as well as family status too. Women prefer to work at white-collar occupations such as education, healthcare, nurse, office and administrative support; these occupations offer lower wage and have more flexible schedules. Generally, a large proportion of women are less likely to work at jobs which require long work hours (*Williams, 2000*) and they are less likely to stay at such occupations and jobs *(Cha, 2013).* Women are responsible for the higher portion of the family care and responsibilities than men and this can explain the under representation of women across overworkers *(Blair-Loy, 2003).*

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[1] The Organisation for Economic Co-operation and Development is an intergovernmental economic organisation.

[2] Investments on human capital factors.

Furthermore, women are more willing to take unpaid jobs such as childcare and family responsibilities compared to men. Significant role to the gender wage gap owns the motherhood penalty. This tells that the mother who has a child encounters disadvantages in wage and benefits relative to the women without child. Moreover, married, or single women with child spent more time for child-care than married male parents. Maternity makes women less productive so there is a negative effect on their wage. In the case where there is a combination between work, family and children's responsibilities, the single female parents have low levels of well-being and are at risk for high job family role strain and working parents waste more time at work than non-parents.

Taking into consideration the main factors which affect the gender wage gap either positively or negatively, and that men gain higher wage than women, I have created a model which mainly controls for education, family status, occupations and industry choices of workers. This analysis was performed in order to examine which factors have the highest effect on wage gap. It has been found that when I control for education, the gender wage gap increases. This is because women increase their investments in human capital – they are more educated than men. It is significant to mention that as I control for the occupations and industry categories, the gap decreases even more because there is a difference in wage within each occupation between men and women and moreover, the family status has a small effect on the wage gap.

The rest of this dissertation is organized as follow. Section 2 reports a brief overview of the gender wage gap and the factors that affect it. Section 3 explains the theoretical framework at which this study is based on and the reasons for selection specific features to examine. Moreover, section 4 describes our sample, and the main socioeconomic characteristics of the workers. Also, it presents differences in means of wage between the two-gender based on their family status, education level and their occupations and industry choices. Section 5 provides the methodology that I used to find out my results and section 6 summarizes the results from the analysis. Finally, section 7 contains a summary of this dissertation.

2 Literature Review

This section presents a review of recent literature on the gender wage gap in the USA. There is vast literature examining the pay gap. Some of them focusing on how the human capital model can explain the slow convergence of the gap, others using job matching framework to find explanations about the gap, others examine factors which

affect it. Most of the literature uses decomposition of wage in order to examine the gender wage gap.

One possible explanation about the gender wage gap is the discrimination that women face on labor market because of their race, religion, ethnicities as *Bergamnm (1974)* reports in his paper. Furthermore, there is an occupational segregation[3] that is based on the gender, races and ethnicities of workers. As there is an occupations difference between men and women and the gender wage, there is also a relationship between these two. *Edgeworth (1922)* mentioned about this relationship, which is known as occupational segregation. A study by *Polachek (1987)* concluded that the occupational segregation has a less important role of explaining the gender wage gap and it showed that the occupational segregation explains only 5% of this gap and on the other hand, the human capital theory explains 50%. This finding comes in contrast with *Blau and Kahn (2007),* who mentioned that it is one of the major factors regarding the gender wage gap. *Hegewisch and Hartmann (2014),* choose to analyse the occupational segregation and using different data found the important fact. Occupational segregation and gender wage have an inversely relationship. As occupational segregation declines, the gender wage gap increases and vice versa. Moreover, using data from the 1960 and following, showed that in 1960, 15% of managers were women, a percentage which increases up to 38% in 2000.

Becker (1973) said that as women expect to have shorter lifetime labor participation because of being mothers, they invest less in human capital compared to men. Consequently, they gain lower earnings. Some authors also believe that the parenthood, motherhood and the housework time that workers spent in the house are possible explanations about the remaining of gender wage gap. *Hersch and Stratton (1997)*, used panel data for married workers from PSID[4], in order to examine how the housework time affects the gender wage gap between married workers. They used cross sectional wage regression and then estimated the wage equation, which include the housework time. There are two possible cases. On the one hand, the housework time is uncorrelated with unobserved individual's characteristics, so the OLS regression found that the housework and wages have negative relationship. On the other hand, the housework time being correlated with the unobserved characteristics, so if this exists, then, they use IV and fixed effect regression. By these regressions, again there is a negative relationship between housework time and wage, but for men this effect is smaller compared to those of women.

Lundberg and Rose (2000) using fixed and random effect conclude that in a household at which the women do not have a continuous labor force participation because of being mothers, their wage declines and men's wage increase. According

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[3] Occupational segregation is the distribution of workers across and within each occupation.
[4] The Panel Study of Income Dynamics is a longitudinal panel survey of American families, which measures economic, social, and health factors over the life course of families over multiple generations.

to *Hersch and Stratton (1997)* the housework time makes the women be less productive in labor market, and similar findings can be found in the paper of *Lundberg and Rose (2000)*. If there is a child in a household, this means that the gender wage gap increases because women are less productive, so they invest less in their human capital factors and gain lower earnings. *Hegewisch and Hartmann (2014)* showed that in 1963, the women tend to be married and being mothers, so they had fewer incentives to enter the labor force. As women increase their labor force participation over the years, the gap of the labor force participation between the two gender declines and was at 11,7% in 2010.

Furthermore, *Blau and Kahn (2005)* make an overview about the possible explanations for the gender wage gap in the USA and they focus on the gender specific factors.[5] This study suggests that one of the important factors about the gender wage gap is the gender difference in human capital factors. As women tend to have less labor market experience because of the family responsibilities or childbirth they do not want to invest more in education and jobs training. So, as they invest less in human capital factors, they will have lower lifetime wages. Although the women expect to have shorter lifetime participation *Becker (1973)* because of childbearing, they increase the labor market participation. This is because they increase the work hours and they work in gender male dominated occupations, *Blau and Kahn (2005)*.

Langdon and Klomegah (2013) using logistic regression analysis try to find the best predictors about the gender wage gap and to examine if the traditional gender ideology and feminine beliefs associate with the wages. An interesting finding is that the marital status of workers cannot predict the wage gap in contract to the education level, age, race and occupations. On the other hand, it has been found that the wage gap still remains in all educational levels between men and women and as *Lips (2011)* says that "although the women are more educated than men and according to the human capital theory which tells that as the education level increases, increases the wage, there is no evidence which shows that as the education level increases the gender wage gap declines".

While many papers examine how the gender wage gap changes based on labor force participation, investment on human capital factors and discrimination against women, *Meara, Pastore & Webste (2019)*, on the other hand, focus on how the wage gap interacts with other characteristics such as gender segregation, part-time working and low female unionization using a matching framework. They examine the gender wage gap in the USA using two separated cross-sections and different matching techniques. The data collected from the Current Population Survey (CPS) was from October 2017 until March 2018.

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[5] It includes the gender differences in qualifications and gender discriminations in labor market.

The results from the IPWRA[6] analysis show that the part-time types of workers have significant results on the gender wage gap. The wage gap between part-time and full-time workers is 27%. Moreover, when there is gender segregation, the gender wage gap increases. Moreover, the unionized workers face a higher gender wage gap than the non-unionized workers.

Another possible way to examine the gender wage gap is by using decomposition of the wage. The most standard approach in the literature to examine the gender wage gap is to estimate the gap by the *Oaxaca-Blinder decomposition (1973).* Studies based on this decomposition have found that gender distinct labour force participation patterns have an important role to the explanation of the gender pay gap. *Jingyo Suh (2010)* try to examine the determinants and characteristics of the changes in gender wage gap in the USA between two years – 1989 and 2005. In order to achieve this, he used decomposition of the change in the gender wage gap. The methods of decomposition applied include those of *Oaxaca-Blinder (1973)* and *Neumark (1988).* The data collected from the March Current Population Surveys show that the wages of women who work as full-time workers represents the 74% of men's wages in 1989 and it increases to 80.4% in 2005. *Polachek (2004),* by human capital model, find that the women earn 80% of what men gain in 2001, which is very close to the result that *Jingyo (2010)* found as well. The results from the decomposition show that the gender wage gap narrowed more the 2005 because there is less discrimination against women during this period. There is less discrimination because over the years, women take better positions within each occupation and they increase their human capital factors such as their education level, working hours and their experience and job training. Moreover, he found that women gain from the increasing in their human capital investment, so they start to move from low paying jobs to high paying occupations *(Jingyo Suh, 2010).*

Moreover, the JMP[7] decomposition method, which extends the Oaxaca decomposition, takes into account the residual distribution. Most of the time, JMP decomposition decomposes the unexplained (residuals) portion. It has been used in a number of articles and for instance, *Blau and Kahn (1994)* and *(1996)* using this method analyse the gender and international comparisons of wage inequality.

Although women become more educated than men and they increase their labor force participation, which means that the gender wage gap must decline even more, there is a slow convergence on gender gap in the1990s.

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[6] inverse probability weighted regression adjustment (IPWRA) matching estimator.
[7] Wage decomposition method which suggested and used by Juhn, Murphy and Pierce (1993).

One possible explanation is the overwork which *Cha and Weeden (2014)* reported. *Blau and Kahn (2006)* report that the slow convergence associated with the occupational upgrading affects even more the women's wages in the 1980s than 1990s. *Cha and Weeden (2014)* collected data from the Merged Outgoing Rotation Groups of the CPS from 1979 until 2009 and using OLS wage regression and creating wage decomposition (JMP) they try to analyse the overwork effect on trend of wage gap. The results show that the there is a very strong relationship between the overwork and gender wage gap. Moreover, it is shown that convergence of gender wage gap declines as the overwork increases.

Blau and Kahn (2006) in order to examine the slowing convergence regarding the gender wage gap in 1990 compared to 1980, they use PSID data and then decomposed the slowdown into two parts: changes in women's human capital level and other characteristics. Also, they used two specifications: human capital and full specification which includes human capital, occupations, industry and bargaining. The decomposition analysis shows that women increase the relative human capital, and their relative wage increases more in 1980 than the 1990 because of the upgrading of occupations. Moreover, they show that the deunionization also explains the slow convergence. In 1980s, the unionization rate of men fell more than women, so, the decline of gender wage gap is better explained *(Blau and Kahn, 1997).*

O'Neill, June and Polachek (1993), using three different sets of data (CPS[8], PSID[8] and NLS[8]), analyse the possible reason of the narrowing of the gender wage gap in the 1980s. They found that the one half of the narrowing is associated with the convergence of the schooling and work experience.

Blau and Kahn (2017) present a review of the existing literature on the gender pay gap in the USA. Report factors that have been offered and examine new factors such as non-cognitive skills and psychological attributes. They show that the gap declines but still remains. Also, they find that the gender segregation by occupations and industry are important factors to the gender wage gap. The gap was between 18 and 21% in the 2010s. They also examined whether there are differences between the two gender in mathematics tests, occupations and industry choices. They found that the gender division in labor market and occupations and industry, is still important over the years. They illustrated that as men and women tend to have similar human capital factors, mainly their education and experience level, has an important effect on the narrowing of the gender wage gap in USA.

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[8] Current Population Survey, Panel Stude of Income Dynamics and National Longitudial Survey.

Polachek (2004), analysed how the human capital model explain the narrowing of the gender wage gap. As women expect to increase their labor force participation and men to decrease it, their lifetime work is similar. Also, according to the human capital theory, as the women increase their labor force participation, they invest more in human capital factors, so they gain more compared to men, and as a consequence, the gender wage gap narrows. Moreover, it has been found that the presence of child in a household, is an important factor in relation to the wage gap.

3 Theoretical Framework

This research focuses on wage gap between men and women in the USA. In this section, I will explain the reasons of choosing specific variables to control for. I try to examine how the educational level, family status and mainly the occupations affect the wage gap. There are many factors that affect the wage and are correlated with the gender. Mainly, the educational level of workers affects their wage. One justification in relation to the wage gap has been explained by the Human Capital Theory[9]. (*Blau and Kahn, 2017*). The human capital theory focuses on the time that people spend on improving their educational level, skills and training jobs in order to increase their earnings over the years. Also, this theory tells that as the educational level increases, the wages increase, so, first of all, I will take into my model the worker's educational level. In this way, I want to find out the relationship between education and gender and how this relationship affects the wage. Moreover, this theory suggests that, if the earnings from a job are not high enough, women will be not in the labor force for a long time compared to men, so their human capital investment will be lower. As a consequence, their wage will be lower (*Polachek and Blau, 2003).* But it is known that women are more educated than men over the years.

Human capital theory mentions that incentives in human capital factors are related to the expected lifetime labor work. Someone, motivated by human capital factors (such as education, training jobs), if he/she is expected to work for many years.

In addition, their Family Status has an important role about their occupational choices and consequently, on their wage. Women are more likely to be married with children, to have unpaid jobs like childcare and have household responsibilities than men. They must have a balance between job and family responsibilities.

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[9] explains the individual's decision to invest in their human capital (education and training).

Human capital theory suggests that these women prefer occupations that allow them to have sufficient time for their house responsibilities and child-care, but these occupations offer low wages. Most of the time, single workers with children prefer to work at occupations which offer flexible schedule, fewer responsibilities, have low risk and work as part-time workers. Furthermore, as we know women have increased their participation in labor force over the year *(Blau and Kahn, 2017)* but still take lower wage than men. Moreover, women have increased their participation in male gender dominated occupations. However, they still choose occupations from white-collar occupations categories that offer lower wage. On the other hand, men prefer occupations that offer higher wage. So, I take into my model the 23 occupations categories in order to examine how occupations affect the wage. In addition, I will control for all states and not for regions because regions include all states. If I will control only for the region, we assume that there are not differences in wage between men and women in each state. This is not true. So, since there is wage gap across all states, and there is a correlation between states and the gender, I prefer to control for all states in order to eliminate this correlation.

Moreover, the age is also included in my model. As the age of workers increases, the wage also increases. This is due to the fact that as the workers are older, they gain more experience, training and education. They are more productive, and their skills are more valuable. So, they take higher wage. There is not a linear relationship between all values of age and wage; if this existed all values of age for all the years that people worked, they would gain the same wage. This is not true! So, I created a subgroup for age to find out the relationship between wage and age and how age affects the wage.

Furthermore, I will observe at descriptive statistics, men and women prefer to work at different occupations and industry. So, I control for the 23 major categories of occupations. Does, the different occupation choices really affect the wage between men and women? Next, I will control both for occupations and industry categories in order to examine if the industry has the same effect on the gap as the occupations. Men and women tend to work at different occupations and industry in a labor market. The differences in wages between the two genders are true across all industries and at most occupations. A large number of women prefer to work at healthcare, child-care, office and administrative support occupations. Historically, the female gender dominates at these occupations. On the other hand, men work at construction and production. We know that there is a difference in wage between men and women who work at different occupations and industry and if some people work at the same occupations but at different industry. For this reason, I will control for the interaction between occupations and industry.

Finally, I will control for some other characteristics that are available which affect the wage. The races and ethnicities are also included in my sample because there is

an occupational segregation by ethnicities and races. Furthermore, there is a discrimination against workers based on their religion, races and ethnicities. Also, I included the veteran status, cognitive and vision difficulties and the relationship of household head.

4 Describe Data

In this section, I will describe my sample, listing the main features that will be useful for this research. The following analysis focuses on data from American Community Survey (IPUMS USA) and I have chosen the most recent year – 2019. I chose this source because it gives us a representative sample of the population of America and moreover, it offers many characteristics of individuals which can affect their wage. First of all, I examine the distribution of men and women across some socioeconomics characteristics[10], occupations and industry categories. Then, I will observe at which characteristics they have the huge differences and I will analyse their mean wage across these characteristics.

My analysis pays attention to 25-65 years old individuals who are employed and work for wages. So, firstly I use the variables *sex* (gender) because I want to focus on gender wage gap. Moreover, in my sample I mention the variable *age*, which I have split into six sub-categories, and I drop the first and the last one (age1=0-24 years old and age6=66-96 years old). Secondly, my sample conflicts only by full-time workers who work for wages as I said above. So, using the variables *labforce, empstat, classwrk and classwrkd* I take out the people who are not in labor force, those who are unemployed and self-employed workers, and therefore I only have the people who work for the salary. In addition, I combine the variables *wkswork1*[11] and *uhrswork*[11a] to define the full-time workers. I define them as the individuals who work 35 hours and above per week and 52 weeks during the previous year.

As I mentioned above, I want to examine if the two genders have differences in some socioeconomic characteristics. So, I used the education (*educd*) which I categorize it in the five mainly categories as it observable in the Table below. Moreover, I take into my sample the variables *race* and *hispan* (ethnicities), which I split into four groups, "White", "Black", "Asian[12]" and "Other" and two groups, "Not Hispanic" and "Hispanic[13]" respectively.

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[10] Education level, age, family status, races and ethnicities.

[11], [11a] It shows us the number of weeks that individuals worked during the previous year, including the paid vacations and other paid absences. Show us the hours per week that the workers work at the previous year.

[12] Asian category includes the Chinese, Japanese and other Asian or pacific islander.

[13] Not Hispanic ethnicities include the Mexican, Puerto Rican, Cuban and other origin.

I will also mention Family Status of workers. Family Status is an interaction between the marital status of men and women and their choice to have a child or not. So, using the variables *marst* (marital status) which I divided into two meaningful categories, "Married" and "Single" and *nchild[14]* (number of children which residing with each individual) which I split it into two groups, "Not having child" and "Having child" I define their Family Status. Furthermore, I separated the Family status into four main categories. Married workers with children or married workers without children and into single workers with children or single workers without children. In this way, on the one hand, there are the married workers (couples). Although in this household there are more responsibilities, more expenses, there are two salaries because both men and women work, the responsibilities are divided into two and on the other hand, there are the single workers (either divorced, or widowed, or separated, there is one wage). Generally, the choices about Family Status may affect their occupational choices and consequently their wage. Using the above variables, I create the *Table 1*, which describes the distribution of the two genders in each characteristic.

Furthermore, I must define the occupations and industry in an economy because I want to observe if the two genders choose to work at different occupations and industries. Then, I try to examine how their choices in labor market (occupations and industry choices), affect their wage and as a result the gender wage gap. So, I use the variables *occsoc* and *indnaics* respectively. The variable *occsoc* is a six-digit string variable, which I converted to numeric variable. I used only the first two digits to generate the 23 major occupation categories according to the Standard Occupational Classification System 2018 from the U.S.A Bureau of Labor Statistics[15]. Also, the variable *indnaics* is an eight – digit string variable, so I had to convert it to numeric variable like *occsoc*. Using the two first digits and the North American Industry Classification System from the NAICS Association[16], I define the 20 categories of industries.

4.1 Descriptive Statistics

According to the above and knowing that I want to examine the characteristics that affect the gender wage gap, the table below is presented. The description with the distribution of some socioeconomic characteristics about men and women is mentioned and then I will figure out if there are differences on these.

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[14] Includes step-children and adopted children as well as biological children.
[15] To define the 23 major categories for occupations, use the site: www.bls.gov/oes/current/oes_stru.htm
[16] www.naics.com. Using this site to define the 20 major categories for industry.

Table 1: Distribution of socioeconomic characteristics between men and women, USA 2019

Total workers	Men	Women
789,721	448,822	340,899
Age		
25-34 years old	24.92%	24.64%
35-44 years old	25.21%	24.22%
45-54 years old	25.67%	26.28%
55-65 years old	24.20%	24.86%
Education level		
No High School Diploma	7.39%	4.68%
High School Diploma	25.44%	19.77%
Associate Degree	29.10%	31.15%
Bachelor's Degree	24.45%	26.75%
Post-Graduated Degree	13.62%	17.65%
Family Status		
Married with child	41.63%	33.33%
Married without child	24.29%	24.71%
Single with child	6.58%	15.29%
Single without child	27.49%	26.66%
Races		
White	79.25%	75.82%
Black	7.22%	10.47%
Asian	6.47%	7.01%
Other	7.06%	6.70%
Hispanic Ethnicities		
Not Hispanic	85.40%	86.36%
Hispanic	14.60%	13.64%

Source: American Community Survey (IPUMS USA), 2019. Available at https://usa.ipums.org/usa/

First of all, our sample includes 789,721 workers (observations) who are salary workers, and they are between 25 years old to 65 years old. As we observe from *Table 1*, both men and women are more likely to become at the age group of 45-54 years old. Generally, both men and women are uniformly distributed across the four categories of age. In spite of the fact that the men are more likely to not have a high school diploma or to have high school diploma compared to women, we observe that both men and women, have high probabilities to acquire an associate degree. Both men and women are less likely to not have high school diploma. Moreover, women are more likely to have associate degree, bachelor's degree and post-graduate degree in comparison to men. It is an obvious fact because the women increase their education level over the years. Although the women increase their human capital investment (higher education level than men), there is not significant evidence that show that gender wage gap declines (Lips 2011).

Furthermore, as I mentioned above, I separated the workers into married workers with children or not and into single workers with children or not. Single workers include the separated, divorced and widowed workers. It is remarkable that the two genders have higher probabilities to be married with children. On the other hand, they have low probabilities to be single parents with children, but the female gender dominates. This is because there is evidence that proves that the single female family form has become the main form of family structure in the late 20th century in America. Also, I observe that, the probabilities to being married or single without children are very close for both men and women! The Family Status distribution of men in my sample is skewed to both left and right but mainly to the right in contrast of the distribution of women which is skewed both to left and right.

As shown from *Table 1* above, my sample mainly consists of white workers; the White race category has the highest percentage for both men and women in comparison to the other races. Also, the percentage for both men and women is roughly the same in the Asian and other race category. One more thing that is important to mention, is that women have a higher percentage in the Black race category than men. In addition, most workers do not have Hispanic Ethnicity. Both the races and ethnicities distribution of the two genders is skewed to the right, with a rate 79.25% for men and 75.82% of women being White. Note that men have 85.40% and women 86.36% percentage to not have Hispanic Ethnicities.

Generally, it can be observed that there are no remarkable differences in age between men and women. However, men and women are identically distributed across different categories of races, ethnicities and education level but they have differences in their education and Family Status.

Moreover, one argument that cannot be ignored, is the fact that the difference in wage between men and women, is mainly due to the different choice in occupations and to the different industry that they choose to work. Let us turn our attention to the distribution of occupations and industries between men and women.

*Figure 1: Occupations distribution for men and women in USA, 2019*
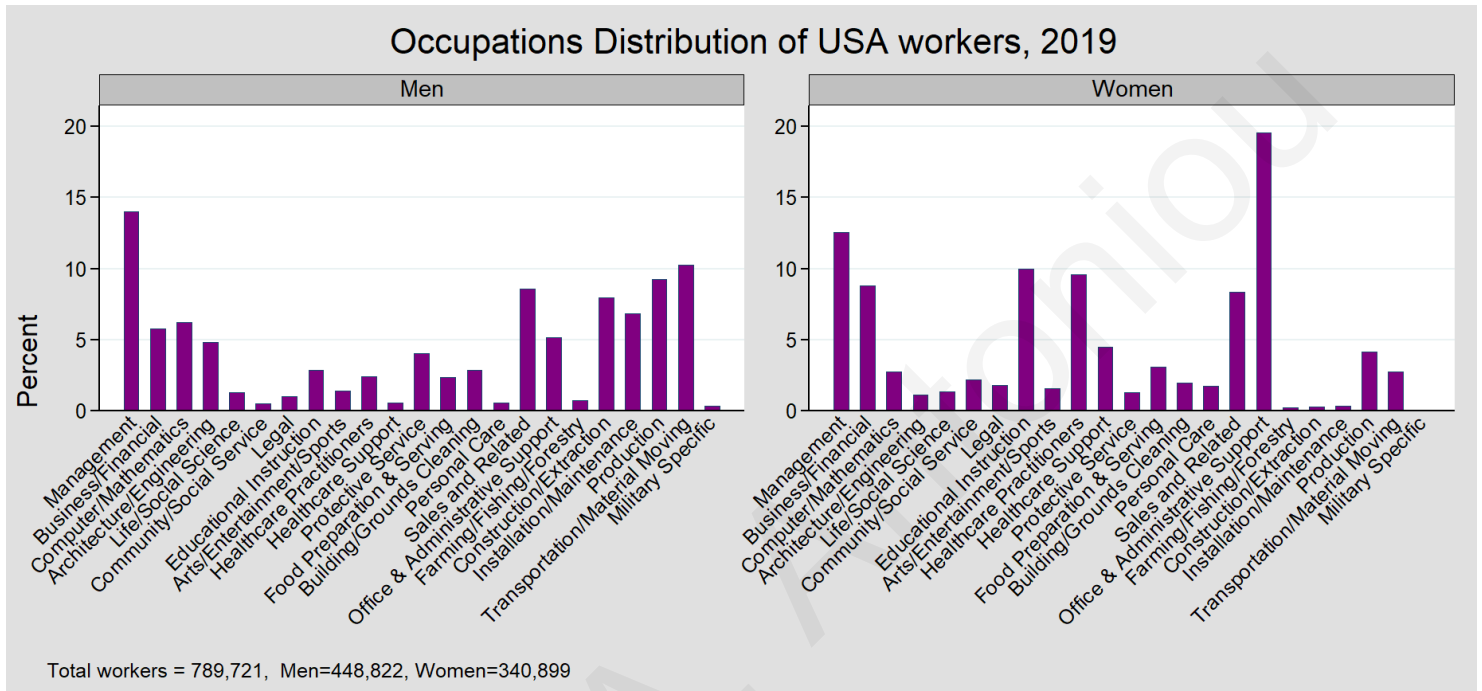
Figure 1 represents the occupations distribution of men and women. From this figure, it can be seen that the two genders choose to work at different occupations. Both men and women, have low probabilities to work in life/social science occupations, legal occupations, military, art and design occupations, farming and fishing (*Blau and Kahn, 2005*). The women prefer to work at office and administrative support occupations, educational instruction, management occupations, healthcare practitioner occupations and business occupations, which are part of the white-collar occupations group. On the other hand, men are more likely to work at management, transportation and material moving, production, construction, installation, architecture and engineering; most of these occupations are called blue-collar occupations. Also, both men and women, have similar high probabilities to work at Sales and Related occupations. It worth mentioning that female gender exceeds the male gender at Business/ Financial Occupations. Men are more likely to work at Computer/Mathematics occupations compared to women. A table in the Appendix part can be found which presents the distribution of men and women at blue-collar and white-collar occupations more clearly. Over the years, women are increasingly more involved in occupations that the male gender dominates (Blau and Kahn, 2000)

which is observed in my sample. Women have high probabilities to work at Managements, which is a male-gender dominated occupation. Similar findings can be seen in the Hegewisch and Hartmann (2014) report. Using data from 1960 and following, it has been shown that 15% of managers were women in 1960, a percentage that increased up to 38% in 2000.

Men and women choose to work at different occupations because of different wages, different characteristics of occupations as well as different hours. The different occupational choices maybe due to the fact that women are more educated than men, as I mentioned above, so they choose occupations that offer higher investment in human capital. The people who work at these occupations perform professional, desk, managerial or administrative work. These jobs do not need manual labor. This comes in contrast to men, who work at jobs that need manual labor, may involve skilled or unskilled labor; these jobs are called blue-collar occupations. Moreover, they offer higher wage, and they have higher risk than the white-collar occupations. Incidentally, men and women work at different industry also. This fact can be observed in *Figure 2* below.

Figure 2: *Industry distribution for men and women in USA, 2019*
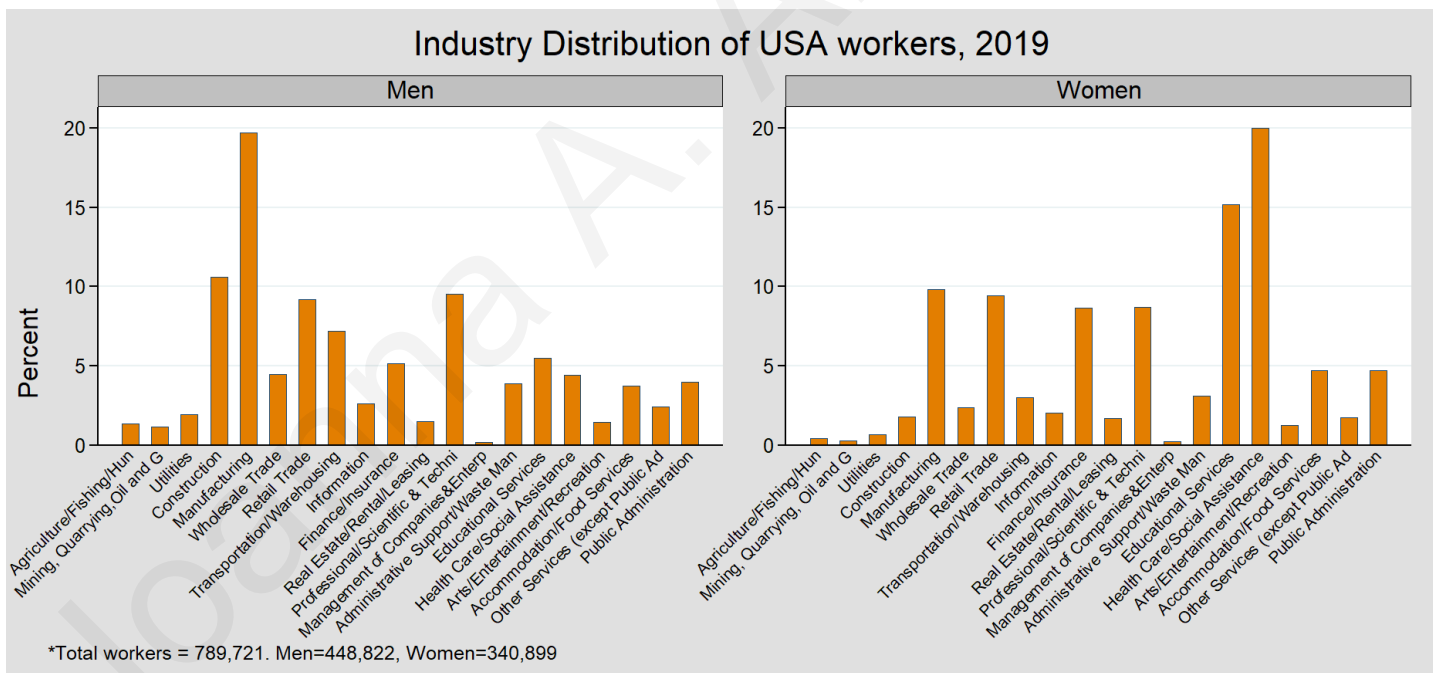
Source: American Community Survey (IPUMS USA), 2019. Available at https://usa.ipums.org/usa/ and www.naics.com.

As *Figure 2* illustrates, men and women also work at different industries in labor market. Men prefer to mainly work at Manufacturing industry. They also choose to work at construction, professional, retail trade industry. On the other hand, women have the highest probabilities to work at Healthcare/ Social Assistance. At these

occupations, men are less likely to enter. Furthermore, women work at educational services, manufacturing, retail trade, finance and professional industries. An impressive fact is that women have high probabilities to work at manufacturing industry, an industry, which is male gender, dominated! Generally, in most economical industries the male gender dominates, and, in few industries the female gender dominates. This fact is also observable from the occupation distribution. Men and women have similarly low probabilities to work at some industries like Real Estate and Rental, Management of companies, Arts and Entertainment and Public Administration. Both genders have the lowest probabilities to work at Management of Companies.

There are differences between men and women in their educational level and Family Status. Moreover, remarkable differences can be seen in occupational and industry distribution. As *Blau and Kahn (2005),* reported, the human capital model suggests that the two genders have different level of lifetime experiences and they prefer to work at different occupations and industries. Another fact, which cannot be ignored, is that there is a difference in their mean wage that is related to the different choices of workers in labor market. Following this study, I present how their mean wage differs by their educational level, family status and the choices that they do in labor market. Firstly, let us describe the distribution of wage between the two genders and then, we will analyse how much their wage differs by family status.

Figure 3: Present the wage distribution of USA men and women, 2019
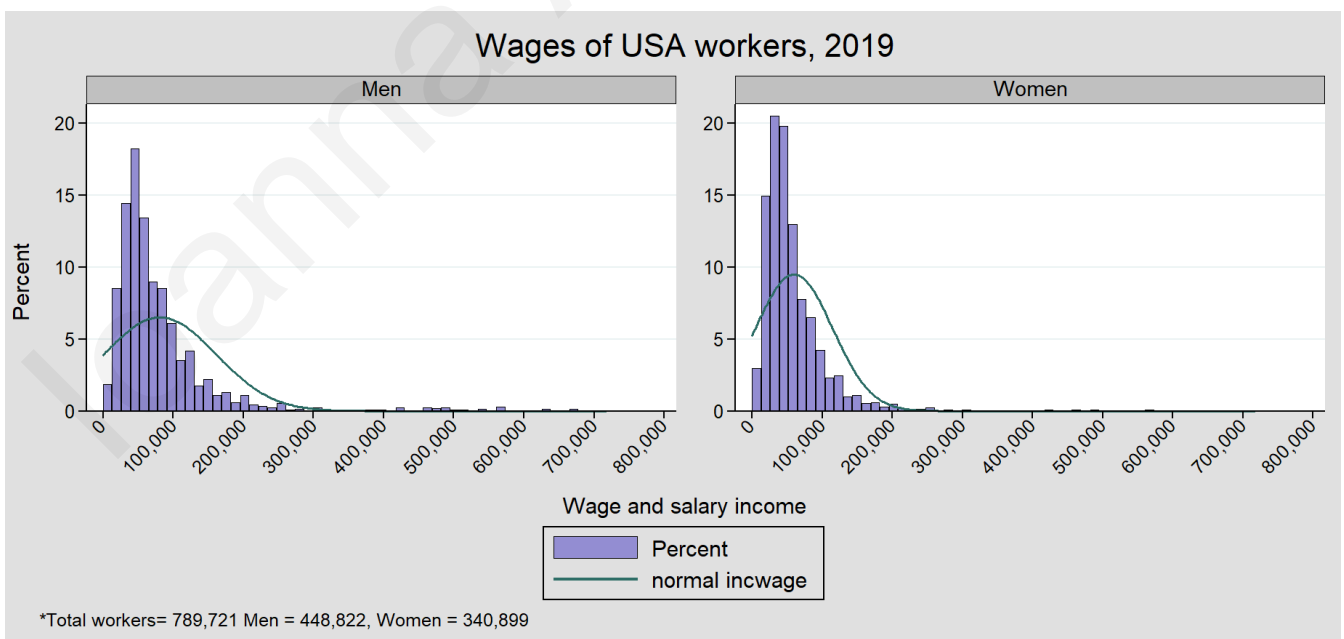
Source: American Community Survey (IPUMS USA), 2019. Available at https://usa.ipums.org/usa/

As we can observe from Figure 3, men and women gain different wages. The distribution of men and women in relation to their wage is skewed to the right. I observe that a large portion of women, gain wage up to 50,000$. Moreover, a few women take wage over the 200,000$ in contrast to men who gain wage higher than 200,000$. The percentage of men who take wage up to 50,000$ is lower than this of women. This is because men prefer to work at high-paying occupations. Furthermore, the portion of men who gain wage between 50,000$-100,000$ is higher than this of women.

Table 2: Present the mean of income wage and Standard Division in parenthesis both for men and women and for their family status, USA, 2019.

Mean of income wage (S.D.)	Men	Women
	81,028$ (79824)	59,904$ (54817)
Family Status		
Married with child	94,137$ (90616)	66,147$ (62400)
Married without child	87,550$ (83028)	62,790$ (55618)
Single with child	61,594$ (56912)	48,551$ (42388)
Single without child	60,067$ (55210)	55,937$ (48565)

Source: American Community Survey (IPUMS USA), 2019. Available at https://usa.ipums.org/usa/

Although the gender wage gap decreases over the years, it is true that men still take higher wage than women. This fact is shown in my sample, where the men take 21,124$ mean wage higher than women. I can observe from *Table 2* that married men with child have the highest mean wage in our sample. There are significant differences about mean wage between men and women. Moreover, I observe that single women with child and single men without child take the lowest mean wage. The single parents may have financial assistance from the government or from their family or friendship environment. Also, they are provided with state benefits. Because of these reasons, the single women may prefer to work at occupations that offer flexible schedule, lower responsibilities, or have low risk, and consequently they offer low wage. On the other hand, married men with child take even more than men who are single without child. There is a huge gender wage gap between married men and women and smaller wage gap between single workers. But the highest difference in mean wage between the two genders is across the married workers with child while the smallest difference, is between single workers without child. Furthermore, in the USA in 2019, we notice that the married women with child gain higher wage than married women without child. *Polachek, (2004)*, found opposite results. Married women with children take less wage than the married women without

children. Since the differences in mean wage between men and women across their family status have been analysed, it is now time to shift our attention to figure out their mean wage compared to their education level, occupations, and industry choices.

Figure 4: *Mean of income wage by education level by gender in USA, 2019.*
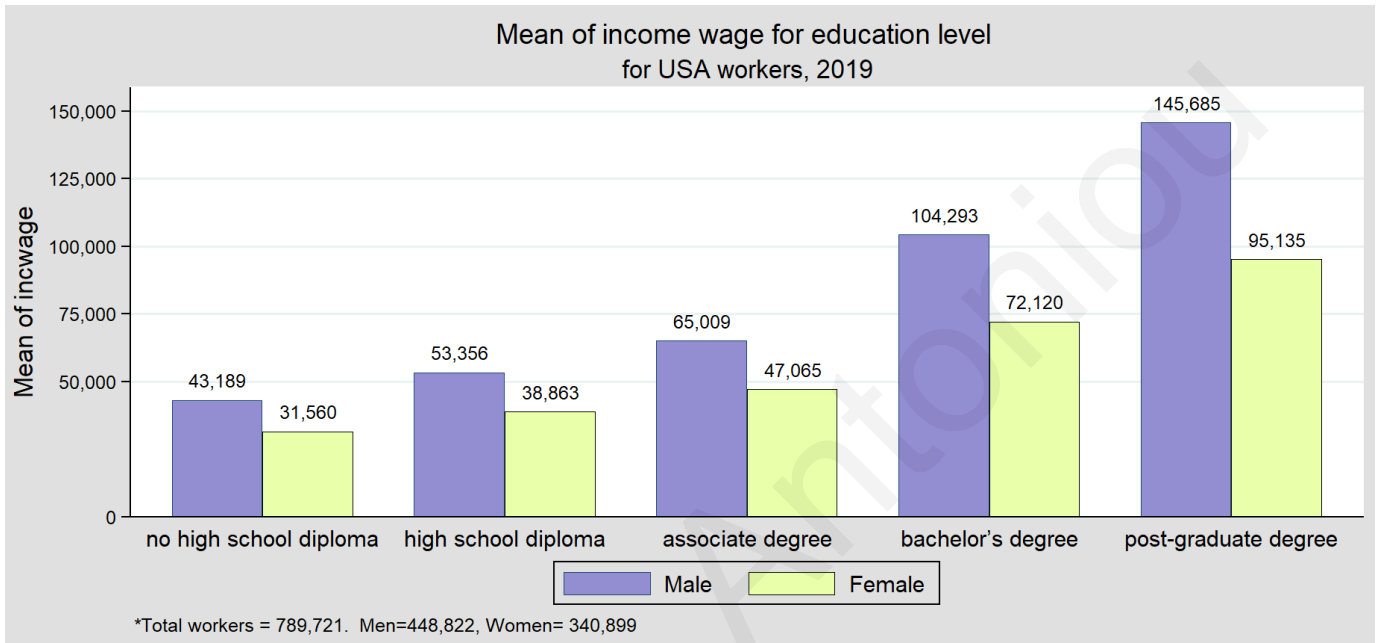
We observe that as the educational level increases the mean of wage also increases. The mean wage of women increases both, but the mean wage of men increases even more. Although, the women have increased their educational level over the years, they still take lower mean wage than men. We are impressed by the fact that, although the percentage of women in Post-Graduated Degree in education level exceeds that of men, men have 50,550$ higher mean wage than women. Although the women are more educated than men, they still take lower wages. Moreover, an interesting observation from *Figure 4* is that as the education level increases, the mean of income wage also increases for both men and women, but as the mean of income wage increases, the gender wage gap also increases!

Does the mean wage of workers differ by their occupations and industry choices? This is evident from *Figure 5* and *6* below.
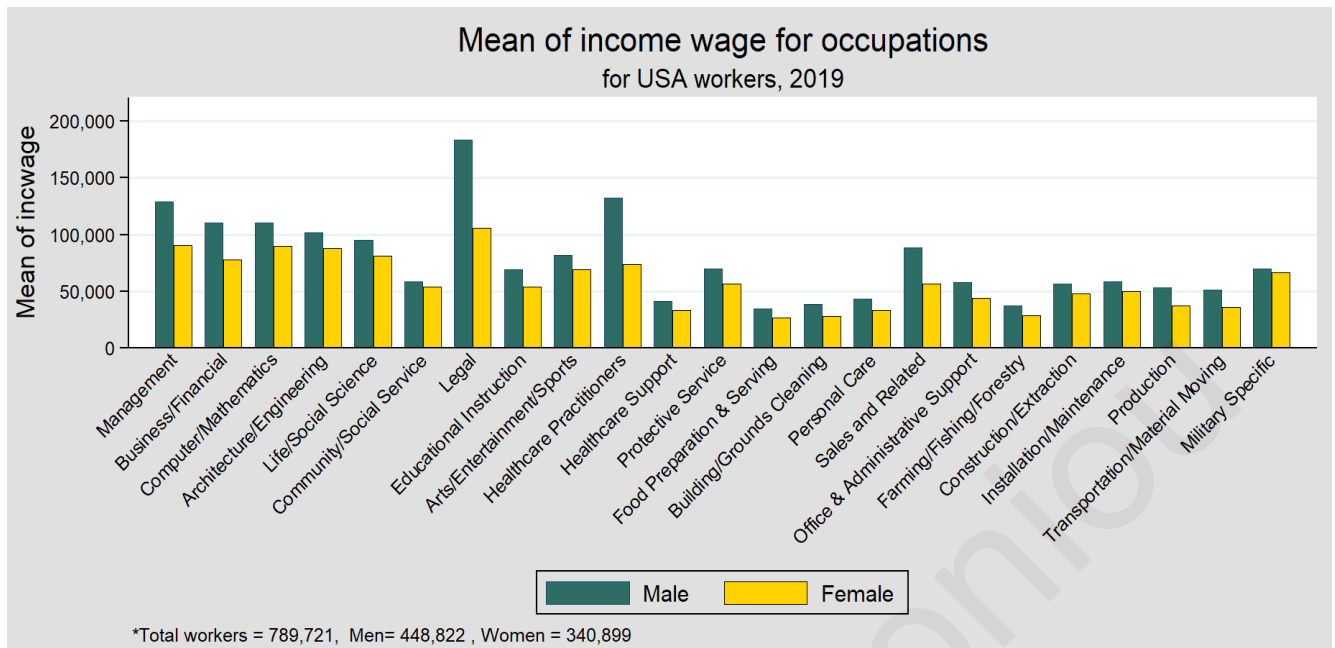
Source: American Community Survey (IPUMS USA), 2019. Available at https://usa.ipums.org/usa/ and www.bls.gov/oes/current/oes_stru.htm.

Moreover, the differences in their wage can be explained by their choices in labor market. In labor market, according to the *Figure 1* and *Figure 2*, both men and women, choose to work at different occupations and industries, so their wage will be different. *Figures 5* and *6* show that men have higher wage than women both in occupations and in industry. Men and women have similar wage in Community/Social Service and Military occupations, but in most men gain much more than women. Remarkable is the fact that although the two genders are less likely to work at Legal occupations, they have the highest wage in our sample. Although the women are more likely to work as Healthcare Practitioners than men, they have lower wage than men. This may be due to the fact that women, have higher probabilities to become part-time workers at this occupation. Although the Office and Administrative Support is an occupation, which is female, gender dominated, men still take higher wage. (*Langdon and Klomegah, 2013*). The occupations at which women prefer to work, offer lower wage than those of male gender dominates. The highest wage gap between men and women is at Legal and Healthcare Practitioners occupations, with men receiving higher wage compared to women. This is because, most of the time, men have more responsibilities and take better positions than women at jobs.

Figure 6: Mean of income wage for all industry by gender in USA 2019.

Mean of income wage for industry
for USA workers, 2019

Total workers = 789,721, Men= 448,822 , Women = 340,899
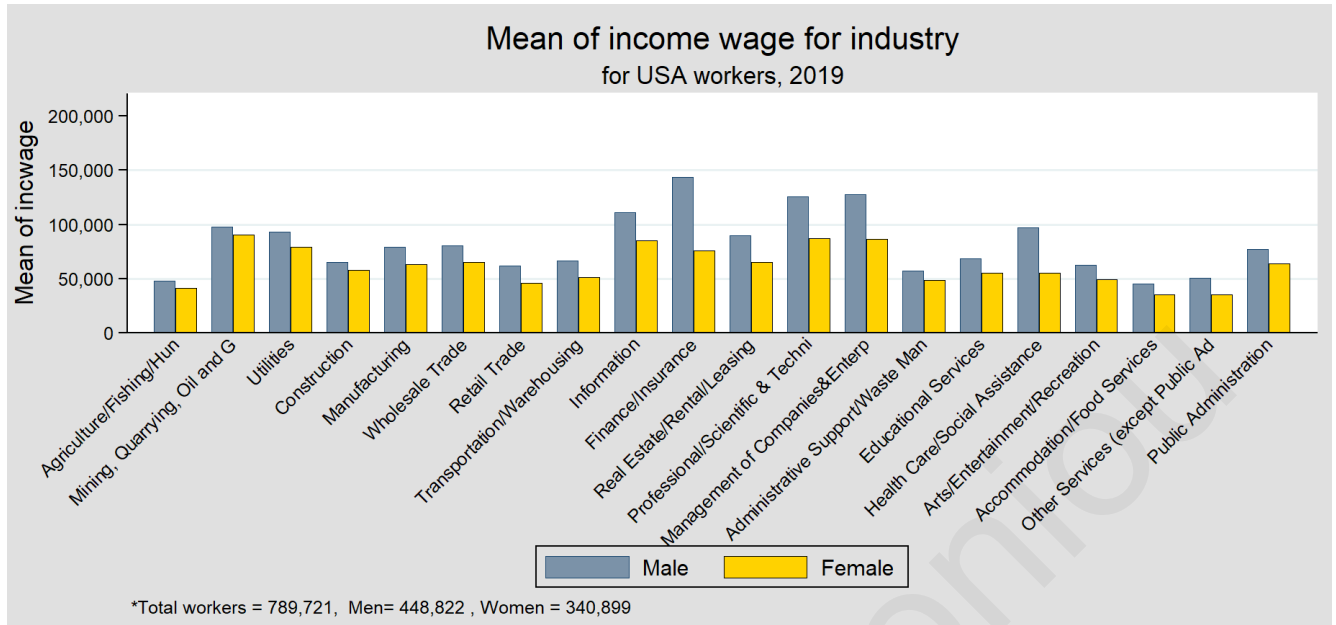
Source: American Community Survey (IPUMS USA), 2019. Available at https://usa.ipums.org/usa/ and www.naics.com.

Generally, women prefer to work at occupations like Health Practitioners, Office and Administrative Support, Educational Instruction; these occupations, however, offer low wage. On the other hand, men choose to work at occupations with higher wages. I have also observed that men have higher wage than women in all industries in economy. Men who work at Finance and Insurance, Professional, Management of Companies industries gain higher earnings than men who work at other industries. The highest difference in mean wage between the two genders is in Financial/ Insurance Industry. Even though both men and women are less likely to work in the Management of Companies industry, they take high wage. It is noteworthy that despite the fact that the male gender dominates Construction industry, the two genders receive similar wages.

Through our sample, I find out that there are differences between men and women both in characteristics - mainly in their educational level and family status and in their occupations and industry choices. Also, there is a difference in their wage; the wage is actually affected not only by the educational level and family status of workers, but also by occupations and industry choices. Men are more likely to work at occupations and industry which offer higher wage and women choose to work at low paying occupations, which are more likely to have more attractive characteristics for women. Do the differences at labor and at some characteristics as described above, affect the gender wage gap?

5 Empirical Methodology

In this section I will describe the methodology that I used to found out my results. For this study, I analysed the data collected from the American Community Survey (ACS), especially the IPUMS USA because I want to focus on the USA and this source gives representative sample of the USA. Furthermore, it contains information about income wage that I want to focus on. Moreover, it gives us characteristics that can affect the wage and they are maybe correlated with the gender and I chose the most recent year, 2019. Also, as I mentioned in the introduction, I want to focus on gender wage gap, so I defined the income wage of full-time workers as dependent variable. The minimum value for the income wage is 4$ and the maximum is 717,000$. I did not categorize it, but I preferred to generate the ln(wage) because most of the time, log transformation generates the desires linearity. The minimum value for ln(wage) is 1.39$ and the maximum is 13.48$.

According to descriptive statistic, I observed that women are more likely to work at Office and Administrative Support and generally, men and women work at different occupations and industries. Moreover, the women are more educated, and they are more likely to be single with child compared to men. To find out if there are differences on wage between the two genders, I want to do an analysis that examines for characteristics, which affect the wage and are probably correlated with the gender. So, I created one model which controls for such characteristics. My regression model with full specifications includes as dependent variable the ln(wage) and as independent all states, cognitive and vision difficulty, veteran status, relationship with the household head and the 23 and 20 mainly categories of occupations and industry respectively. Also, other independent variables include the gender (the women are included in my model), education level, age, family status, races and ethnicities, which are entered as dummy variables in order to eliminate the possible non-linearity which may exist between the dependent and these independent variables.

The **Equation 1** presents the OLS[17] general regression model with full specifications.

lwage = a + b*X   (**Equation 1**)

where X includes the independent variables that I mentioned above.

Based on the **Equation 1**, I will estimate different variations of this model to show the importance of individual characteristics to explain the gender wage gap. In *Table 3*, the most important regression models are presented.

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[17] Ordinary Least Square

The first model includes the variables women, some socioeconomic characteristics such as education, age, races, ethnicities, some other characteristics like veteran status, cognitive and vision difficulty, relationship with the household head and control for all states[18]. The second regression includes the variables which are included in the first one and the family status of workers. The family status[19] is an interaction between the variable marital status and child. I created it because I want to find out if the decision to being married with child or not, or being single with child or not, can affect the wage gap. As descriptive statistics show, women are more likely to become single with child compared to men and both men and women have high probabilities to being married with child. So, I want to control for their family status because their decision about this, maybe affect their choices about occupations, and consequently their wage.

The 3rd model includes all the socioeconomic characteristics that I mentioned above, the family status, states and the 23 occupations categories. As we observed from the descriptive statistics both men and women prefer to work at different occupations and men work at occupations that offer higher wages. Therefore, I want to find out if the different choices about occupations, affect the wage gap.

The two final models include both the occupations and industry. The fourth model includes all the independent variables, as I said above, and the 20 categories of industry.

Both men and women choose to work at different industries, so I want to find out the effect of industry on the wage gap compared to the effect of occupations. The last regression model includes the characteristics and states as the previous models, exclude the 23 categories of occupations and 20 categories of industry but include the interaction between the main categories of occupations and industry. The overall measurement results are summarized in *Table 3*.

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[18]I control for the states because there is a difference in wage in each state. Also, the wage of men and women are correlated with the states where they leave, so I want to control for all states in order to eliminate this correlation. I drop the state District of Columbia, because it does not belong into 50 states of United States of America.

[19]Family Status is an interaction between marital status and the choice to have child or not. Is not the decision to being married or not and separately the decision to have child or not.

6 Results

To observe the results from the regression analysis more clearly, I quote at the end of this section, the *Table 3* which presents the OLS coefficients and the Robust Standard Error in parenthesis. The results are for all workers, both men and women, I do not make separate regression model for men and women.

Firstly, when I take into my model the other characteristics, as I mentioned above, gender and education level I noticed that the women take 30.9% lower wage than men. The fact that arises from this result and needs to be reported is the following. After, controlling for education, the wage gap increases compared to the regression at which the educational level is not included. In other words, the negative difference in wages between men and women is going to appears higher when I include the education level. This is because, the education is positively correlated with the wage and also the correlation between education and being women is positive. Also, I found out that all workers in each educational category take higher wage than the workers who do not have high school diploma (omitted category). This is because there is a positive correlation between educational level and income wage. As the educational level increases, the wage also increases (Mincer and Polachek 1974).

In addition, as I found out, both men and women are more likely to be married with child, however, there are differences in relation to the Family Status distribution between the two genders, which maybe affect their occupational choices and consequently their wages. So, I decided to control for Family Status and I found from the analysis that women workers take 29.8% lower wage than men. Even though the coefficients are statistically significant, the effect on wage between the two genders, is small! Since the gender wage gap decreases, I can say that women are more likely to become married with child! Also, I observed that married workers without child gain only 3.3% lower wage than married workers with child. However, the wage gap between married workers with child and single workers without child is high (14.3%). In general, I came to the conclusion that when I control for their family status, the gender wage gap decreases but it is close enough to the previous result (30.9%) and moreover, the wage gap between the workers with different educational level compared to the previous results (1st regression), is similar. This is related to the fact that family status has small effect on the gender wage gap. Furthermore, although the family status does not have significant effect on the wage gap between the two genders, I observed that all OLS coefficients both for educational level and family status are statistically significant.

Moreover, the gap between the workers with High School diploma or Associate Degree and omitted category increases. This comes in contrast to the wage gap between the workers who have a bachelor or post-graduate degree, as it declines. So, we concluded that the family status does not have an important effect on wage gap.

Polachek, (2004) had a different opinion, though. "The wage gap varies more by marital status and children".

Furthermore, I believe that occupations affect wages and related with gender. Most of the times, women prefer to work at occupations that offer lower wage but do offer more attractive characteristics for women. So, I included the 23 occupations categories into my model, and I ended up realising that the gender wage gap decreases. Women workers now take 25.3% lower wage than men. There is a huge correlation between gender and the choices of occupations. As the wage gap declines, the correlation between women and occupations will be negative; this tells us that women choose occupations that offer lower wage! Moreover, married workers with child take 3.7% higher wage than married workers without child which is close to the OLS coefficient of the previous results (3.3%). In general, married workers with child take higher wage than the other worker. This is because married workers with child must support their family, they have more responsibilities than the others, so they put more effort at jobs, work harder and more hours. As consequently, they gain higher wage. Controlling for occupations has a large effect on wages; gender wage gap decreases and all occupations are statistically significant at the level of 5%, 1% and 10%.

In accordance with the descriptive statistics in section 4, both men and women choose to work in different industries also. Because of that, I examine how both occupations and industry affect the wage gap. The way that I decided to create this regression model, is by assuming that there are wage's differences only between the 23 general categories and between the 20 industry categories (this is not true). The wage gap declines; women take 23.5% lower wage than men. In addition, I observed that at some occupations the wage gap increases and at some others it declines compared to the results from the regression when I controlled only for occupations (3rd regression model). For example, the gender wage gap between the workers at Healthcare Practitioners and at Office and Administrative Support is 30.7% and being 40.2% after controlling for industry and occupations. From the table below, I noticed that the people who work at Community and Social Services take 8.1% lower wage than the workers at Office and Administrative Support (if all the characteristics which I mentioned above and the occupations are included in my regression model). At regression model where I control both for occupations and industry, all industry categories are statistically significant at the level of 1%, 5% and 10%, except two categories; retail trade and Educational Instruction, which are not statistically significant.

The last regression includes interaction between the 23 categories of occupations and 20 categories of industries. An evident and significant fact is that the gender wage gap decreases even more compared to the first regression model where only educational level was examined. When I control for the interaction, women take

22.2% lower wage than men. Here, there is the lowest wage gap compared to all other regressions. Again, we observe that as the educational level increases, the wages increase. But, as the wages increase, the wage gap between each educational category and the omitted group rises as well (No high school diploma).

The fact which impresses us is that the wage gap between the married workers with child and without child, is similar for all regression models. This is based on the fact that those workers may work at the same occupations and industry. In general, the occupations and industry can explain better the gender wage gap that the family status and this is observable from the R-square. The R-square of the 4th regression model, which control for occupations and industry categories, is equal to 43,80% compared to the 2nd regression model, at which the R-square is equal to 0.3410. This means, that the independent variables which included in the regression model and family status, can explain only 34,10% of the gender wage gap.

After all, I concluded to the fact that workers without high school diploma take the lowest wage. This fact can be explained from the human capital theory as many research papers conclude, which tells that as the investment in human capital increases – increases in educational level –the wage also increases. Furthermore, I cannot omit the fact that, as I control for as many available characteristics as I have at my disposal, the highest wage gap is between the single workers without child and married with child. Furthermore, the gender wage gap declines and the most coefficients are statistically significant. This means that the variables that I include into my model, can explain a part of the gap. Generally, I observed that after controlling for more characteristics, the wage gap between the educational level categories and omitted group, the family status categories and omitted group declines. The most important conclusion is that the gender wage gap decreases.

Furthermore, *Table 3* below, includes the R-squared which measures how strong is the relationship between the dependent variables and the control variables. The first regression model has R-squares equal to 0.3365. This means that 33.65% of the variance of the l(wage) is explained by the variance of the independent variables which are included in the model. In addition, as more independent variables are taken into account, it is significant to mention that the R-squared increases and most of the coefficients are statistically significant, so the control variables that I use for the regression model, can explain the dependent variable.

Table 3: Present the OLS coefficients and the robust standard error in parenthesis.

	(1)	(2)	(3)	(4)	(5)
Women	-0.309 (0.001)***	-0.298 (0.001)***	-0.253 (0.001)***	-0.235 (0.001)***	-0.227 (0.002)***
Education					
No High Scholl Diploma	-	-	-	-	-
High School diploma	0.186 (0.003)***	0.190 (0.003)***	0.142 (0.003)***	0.131 (0.003)***	0.130 (0.003)***
Associate Degree	0.354 (0.003)***	0.355 (0.003)***	0.240 (0.003)***	0.222 (0.003)***	0.214 (0.003)***
Bachelor's Degree	0.725 (0.003)***	0.724 (0.003)***	0.525 (0.003)***	0.492 (0.003)***	0.473 (0.003)***
Post-graduate degree	0.970 (0.003)***	0.964 (0.003)***	0.770 (0.003)***	0.747 (0.004)***	0.733 (0.004)***
Family Status					
Married with child	-	-	-	-	-
Married with no child	-	-0.033 (0.002)***	-0.037 (0.002)***	-0.037 (0.002)***	-0.036 (0.002)***
Single with child	-	-0.116 (0.003)***	-0.098 (0.002)***	-0.093 (0.002)***	-0.089 (0.002)***
Single with no child	-	-0.143 (0.002)***	-0.127 (0.002)***	-0.120 (0.002)***	-0.116 (0.002)***
Occupations					
Management	-	-	0.429 (0.003)***	0.440 (0.003)***	-
Business/Financial	-	-	0.311 (0.003)***	0.275 (0.003)***	-
Computer/Mathematics	-	-	0.390 (0.003)***	0.346 (0.003)***	-
Architecture/Engineering	-	-	0.341 (0.004)***	0.277 (0.004)***	-
Life/Social Science	-	-	0.176 (0.006)***	0.170 (0.005)***	-
Community/Social Service	-	-	-0.081 (0.005)***	0.007 (0.005)	-
Legal	-	-	0.451 (0.006)***	0.384 (0.007)***	-
Educational Instruction	-	-	-0.147 (0.003)***	0.031 (0.004)***	-
Arts/Sports	-	-	0.134 (0.006)***	0.121 (0.006)***	-
Healthcare Practitioners	-	-	0.307 (0.003)***	0.402 (0.004)***	-
Healthcare Support	-	-	-0.181 (0.004)***	-0.096 (0.005)***	-
Protective Service	-	-	0.148 (0.004)***	0.187 (0.004)*,**	-
Food Preparation	-	-	-0.325 (0.004)***	-0.127 (0.005)***	-
Building/Grounds cleaning	-	-	-0.255 (0.004)***	-0.144 (0.004)***	-
Personal Care	-	-	-0.240 (0.007)***	-0.120 (0.007)***	-
Sales & Related	-	-	0.137 (0.003)***	0.204 (0.003)***	-

Office/Administrative Support	-	-	-	-	-
Farming/Forestry	-	-	-0.228 (0.008)***	-0.077 (0.011)***	-
Construction	-	-	0.103 (0.003)***	0.074 (0.004)***	-
Installation	-	-	0.124 (0.003)***	0.139 (0.003)***	-
Production	-	-	0.020 (0.003)***	-0.037 (0.003)***	-
Transportation	-	-	-0.040 (0.003)***	-0.046 (0.003)***	-
Military Specific	-	-	0.133 (0.010)***	0.153 (0.010)***	-
State Fixed Effect	√	√	√	√	√
Industry Fixed Effect	-	-	-	√	-
Other characteristics[20]	√	√	√	√	√
Interaction between occupations and industry	-	-	-	-	√
R-squared	0.3365	0.3410	0.4167	0.4380	0.4482

***OLS coefficients are statistically significant at p<0.01 and p<0.05 and p<0.1

*,**OLS coefficient is statistically significant at p<0.01 and p<0.05.

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[20] Other characteristics include the veteran status, cognitive and vision difficulties, the relationship of the household head and the categories of age, races, ethnicities.

7 Summary and Conclusion

As we know, equal pay between men and women is a history without end and although men and women can be treated equally according to the Constitution of the USA, women are not treated equally regarding the issue of wages. But at the same time, although the wage gap declines, it remains that men take higher wage than women. The purpose of this dissertation was to examine how the educational level, family status, the occupations and industry choices affect the wage gap between men and women.

Using data from the American Community Survey from 2019 I restricted my sample on workers who work for salary and are 25-65 years old. Also, I examined if men and women have differences in the characteristics that I mentioned in descriptive statistics. I found out that the two genders have significant differences at educational level, family status, occupations and industry in an economy. According to the main factors which affect the gender wage gap either positively or negatively, and that men gain higher wage than women, I created a full specification model which includes the gender, categories for educational level, family status, occupations and industry, other characteristics and all states. Based on this model, I estimated different variation of this model to show the importance of individual characteristics to explain the gender wage gap. The results from the analysis show that when I control for education, the gender wage gap increases. This means that women increase their investments in human capital – they are more educated than men. It is significant to mention that as I control for occupations and industries categories, the gap decreases even more because there is a difference in wage within each occupation between men and women. Also, women prefer to work at white-collar occupations, which offer lower wages. Furthermore, the family status has a small effect on the wage gap. The gap declines but not much and as consequently women are more likely to be married with child. Based on this study and on a vast literature regarding the gender wage gap in the USA, it has been shown that although the gender wage gap declines, it still remains. Although I examine some factors that can affect the gender wage gap, there are many possible reasons for this. For instance, occupations segregation plays an important role explaining the gender wage gap. Men and women choose to work at different occupations and industry, and moreover, the men work at high paying occupations related to women. As some authors showed, human capital model explains why this gap narrowed over the years. Maybe, it can be explained by women's labor force participation, which has increased over the years.

Also, motherhood penalty has a significant effect on gender pay gap. Generally, there are always differences in wage between the two genders. There will always be discrimination against women. The differences in wage are not only based on what has been examine in this study, but also based on the responsibilities that the workers have and the position.

Mainly, if someone has a better position at some job, they will take higher wage. Another issue which has a huge effect on the gender wage gap, is the type of workers and mainly, the part-time workers. Although this fact is not considered in this study, there are papers that show that part-time work attracts lower hourly rates of pay and has often been identified as an important contributor to the gender wage gap. Generally, men and women will always be treated unequally regarding the issue of wage.

8 Appendix

Wages of USA workers, 2019

Total workers= 789,721 Men = 448,822, Women = 340,899

Source: American Community Survey (IPUMS USA), 2019. Available at https://usa.ipums.org/usa/
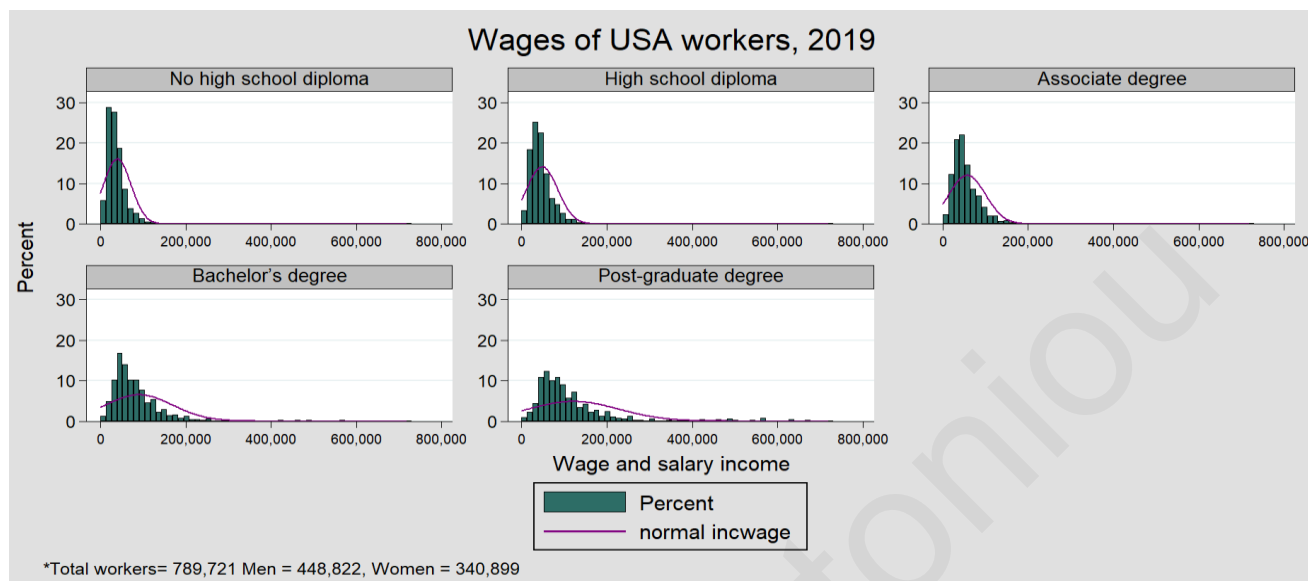
As we can observe from *Figure 7*, as the educational level increases, the wage of workers also increases. As workers become more educated, by having a bachelor or post-graduate degree, there are more workers who gain higher wage than 200,000$. Moreover, as people have higher educational level, there are low probabilities of someone taking a wage lower than 100,000$.

Table 4: Figure out the distribution of men and women across blue-collar and white-collar occupations.

	Men	Women
Blue-Collar Occupations	46.8%	17.5%
Construction	7.98%	0.31%
Farming, fishing, forestry	0.75%	0.23%
Service- related[21]	11.31%	9.66%
Other blue collar[22]	26.72%	7.33%

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[21] Arts and entertainment, protective, food preparation, building cleaning, personal care services.
[22] Production, transportation, military and installation.

White-collar occupations	53.2%	82.5%
Sales	8.57%	8.34%
Office and administrative	5.18%	19.55%
Engineers and scientists[23]	11.02%	3.90%
Professional speciality[24]	6.77%	10.62%
Health care[25]	3.01%	14.03%
CEOs and managers	13.99%	12.54%
Teachers and social[26]	4.69%	13.52%

As it is mentioned in descriptive statistics, men and women prefer to work at different occupations and industry in a labor market. Also, women choose to work at white-collar occupations compared to men. As it is evident from *Table 4* figure, male-gender dominates at blue-collar and female-gender dominates at white-collar occupations. The highest gap at blue-collar can be found at the category "other blue-collar" occupations and at white-collar it can be found at the "Office and Administrative Support" with women having higher probabilities to work.

Figure 8: Present the distribution of ln(wage) of USA workers, 2019

Source: American Community Survey (IPUMS USA), 2019. Available at https://usa.ipums.org/usa/

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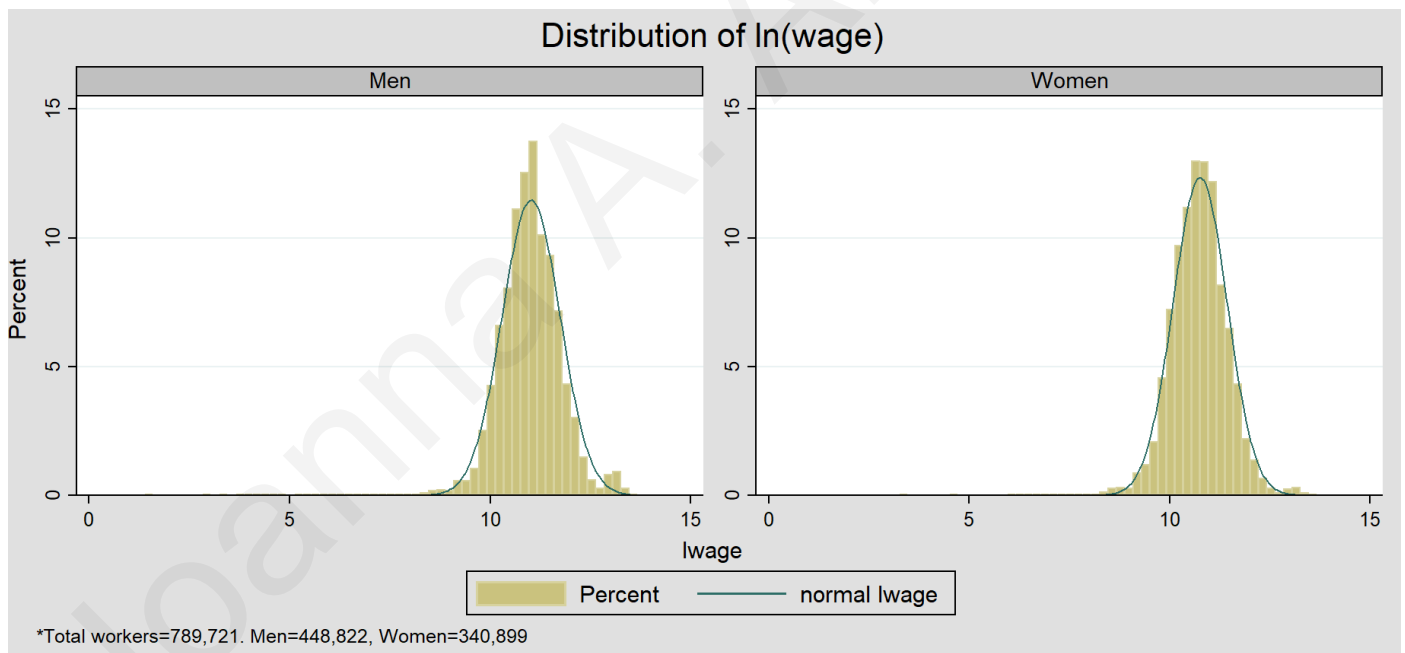
[23] Architecture, engineers, computer and mathematics.
[24] Legal, business/financial.
[25] Healthcare practitioners and healthcare support.
[26] Education, life/social sciences and community/social services.

	(1)	(2)	(3)	(4)	(5)	(6)[27]
Age						
25-34						
35-44	0.191(0.002)***	0.172(0.002)***	0.163(0.002)***	0.161(0.002)***	0.160(0.002)***	0.170(0.002)***
45-54	0.257(0.002)***	0.241(0.002)***	0.235(0.002)***	0.231(0.002)***	0.230(0.002)***	0.240(0.002)***
55-65	0.245(0.002)***	0.239(0.002)***	0.235(0.002)***	0.231(0.002)***	0.233(0.002)***	0.238(0.002)***
Races						
White						
Black	-0.198(0.002)***	-0.185(0.002)***	-0.137(0.002)***	-0.133(0.002)***	-0.124(0.002)***	-0.170(0.002)***
Asian	-0.070(0.003)***	-0.079(0.003)***	-0.091(0.003)***	-0.095(0.003)***	-0.094(0.003)***	-0.103(0.003)***
Other	-0.078(0.003)***	-0.076(0.003)***	-0.063(0.003)***	-0.060(0.003)***	-0.056(0.003)***	-0.070(0.003)***
Ethnicities						
Not Hispanic						
Hispanic	-0.165(0.002)***	-0.169(0.002)***	-0.127(0.002)***	-0.120(0.002)***	-0.116(0.002)***	-0.152(0.002)***
Industry						
Agriculture						
Mining, Oil and Gas	-	-	-	0.529(0.012)***	-	0.570(0.010)***
Utilities	-	-	-	0.436(0.010)***	-	0.460(0.008)***
Construction	-	-	-	0.198(0.009)***	-	0.263(0.007)***
Manufacturing	-	-	-	0.267(0.009)***	-	0.283(0.007)***
Wholesale Trade	-	-	-	0.229(0.010)***	-	0.271(0.007)***
Retail Trade	-	-	-	0.009(0.009)	-	0.075(0.007)***
Transportation	-	-	-	0.269(0.009)***	-	0.232(0.007)***
Information	-	-	-	0.303(0.010)***	-	0.382(0.008)***
Finance/Insurance	-	-	-	0.321(0.009)***	-	0.426(0.007)***
Real Estate /Rental	-	-	-	0.115(0.011)***	-	0.232(0.009)***
Professional/Scientific	-	-	-	0.300(0.009)***	-	0.414(0.007)***
Management of Companies	-	-	-	0.351(0.017)***	-	0.461(0.016)***
Administrative Support	-	-	-	0.063(0.010)***	-	0.068(0.008)***
Educational Services	-	-	-	-0.004(0.009)	-	-0.082(0.007)***
Healthcare/Social Assistance	-	-	-	0.087(0.009)***	-	0.157(0.007)***
Arts/Entertainment	-	-	-	0.046(0.011)***	-	0.035(0.009)***

[27] This regression model includes the age, education, races, ethnicities, family status, gender, veteran status, vision and cognitive difficulty, relationship with the household head, the 20 industry categories and the states.

Accommodation /Food preparation	-	-	-	-0.049(0.010)***	-	-0.073(0.007)***
Other Services	-	-	-	0.047(0.010)***	-	0.030(0.008)***
Public Administration	-	-	-	0.176(0.009)***	-	0.227(0.007)***
Relationship with the household head						
Head						
Spouse	-0.007(0.002)***	-0.057(0.002)***	-0.042(0.002)	-0.037(0.002)***	-0.036(0.002)***	-0.045(0.002)***
Child	-0.337(0.003)***	-0.281(0.003)***	-0.237(0.003)	-0.221(0.003)***	-0.214(0.003)***	-0.250(0.003)***
Child – in- law	-0.266(0.008)***	-0.308(0.008)***	-0.255(0.008)	-0.239(0.008)***	-0.230(0.008)***	-0.276(0.008)***
Parent	-0.292(0.010)***	-0.296(0.010)***	-0.233(0.009)	-0.220(0.009)***	-0.214(0.009)***	-0.265(0.010)***
Parent-in-law	-0.329(0.025)***	-0.329(0.025)***	-0.256(0.023)	-0.242(0.023)***	-0.236(0.022)***	-0.288(0.025)***
Sibling	-0.284(0.006)***	-0.227(0.006)***	-0.178(0.006)	-0.165(0.006)***	-0.160(0.006)***	-0.196(0.006)***
Sibling-in-law	-0.304(0.014)***	-0.277(0.015)***	-0.223(0.014)	-0.210(0.013)***	-0.202(0.013)***	-0.243(0.014)***
Grandchild	-0.345(0.012)***	-0.289(0.012)***	-0.239(0.012)	-0.222(0.011)***	-0.213(0.011)***	-0.251(0.012)***
Other relatives	-0.291(0.009)***	-0.249(0.009)***	-0.195(0.008)	-0.184(0.008)***	-0.179(0.008)***	-0.216(0.009)***
Partner, friend, visitor	-0.194(0.003)***	-0.129(0.003)***	-0.106(0.003)	-0.098(0.003)***	-0.096(0.003)***	-0.111(0.003)***
Other non-relatives	-0.342(0.007)***	-0.288(0.007)***	-0.235(0.007)	-0.222(0.007)***	-0.219(0.007)***	-0.252(0.007)***
Veteran Status						
Not a veteran						
Veteran	0.006(0.003)*	0.005(0.003)	0.000(0.003)	-0.004(0.003)	-0.002(0.003)	-0.002(0.003)
Cognitive difficulty						
No cognitive difficulty						
Has a cognitive difficulty	-0.173(0.007)***	-0.160(0.006)***	-0.140(0.006)	-0.133(0.006)***	-0.128(0.006)***	-0.149(0.006)***
Vision difficulty						
No						
Yes	-0.102(0.007)***	-0.098(0.007)***	-0.083(0.006)	-0.078(0.006)***	-0.074(0.006)***	-0.088(0.006)***
Women	√	√	√	√	√	-0.250(0.001)***
Education						
No high school diploma	√	√	√	√	√	
High school diploma	√	√	√	√	√	0.164(0.003)***
Associate degree	√	√	√	√	√	0.316(0.003)***
Bachelor's Degree	√	√	√	√	√	0.667(0.003)***
Post-graduate degree	√	√	√	√	√	0.954(0.003)***

Family Status						
Married with child	√	√	√	√	√	
Married without child	√	√	√	√	√	-0.038(0.002)***
Single with child	√	√	√	√	√	-0.109(0.002)***
Single without child	√	√	√	√	√	-0.138(0.002)***

*OLS coefficient is statistically significant at p<0.1 and p<0.05.

***OLS coefficient is statistically significant at p<0.01, p<0.05 and p<0.10.

Table 6: Present the mean, median and standard deviation of wage for USA workers, 2019

	Men			Women		
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Education						
No high school diploma	43,189	36,000	33,293	31,560	26,000	28,598
High school diploma	53,356	45,000	38,967	38,863	33,000	30,479
Associate Degree	65,009	55,000	48,024	47,065	40,000	33,521
Bachelor's Degree	104,293	80,000	91,747	72,120	60,000	58,193
Post-Graduate degree	145,685	110,000	124,080	95,135	75,000	78,649
Age						
25-34	59,061	48,000	49,794	49,618	40,000	38,673
35-44	83,820	62,000	80,388	63,744	50,000	58,571
45-54	91,872	67,000	90,197	64,916	50,000	60,963
55-65	89,243	65,000	87,856	61,059	48,000	56,450
Family Status						
Married with child	94,137	70,000	90,616	66,147	50,000	62,400
Married without child	87,550	65,000	83,028	62,790	50,000	55,618
Single with child	61,594	48,000	56,912	48,551	38,000	42,388
Single without child	60,067	47,000	55,210	55,937	45,000	48,565
Races						
White	83,783	60,000	81,811	60,829	48,000	55,035
Black	55,824	45,000	48,336	49,467	40,000	42,519
Asian	101,226	80,000	94,672	77,230	60,000	71,669
Other	57,374	45,000	53,419	47,616	37,400	41,581
Ethnicities						
Not Hispanic	85,160	62,000	82,813	62,089	49,000	56,488
Hispanic	56,857	44,000	53,335	46,068	36,000	40,063

	Men			Women		
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Occupations						
Management	129,047	98,000	113,278	90,679	72,000	77,068
Business/Financial	110,220	80,000	102,121	78,047	65,000	60,650
Computer/Mathematics	110,123	95,000	77,355	89,576	80,000	59,096
Architecture/Engineering	101,811	90,000	64,673	87,978	80,000	53,183
Life/Social Science	94,981	79,000	71,265	81,297	70,000	57,821
Community/Social Service	58,470	52,000	33,800	53,958	50,000	27,452
Legal	183,026	132,000	152,731	105,624	71,000	105,045
Educational Instruction	69,057	60,000	45,133	53,845	50,000	31,186
Arts/Sports	81,811	65,000	74,252	69,037	59,000	53,048
Healthcare Practitioners	132,506	80,000	134,987	74,194	60,000	61,211
Healthcare Support	41,335	35,000	35,973	33,259	30,000	25,979
Protective Service	70,197	61,000	41,788	56,490	48,050	39,753
Food Preparation	34,674	30,000	26,517	26,821	24,000	20,551
Building/Grounds cleaning	38,925	34,000	27,811	28,230	25,000	23,877
Personal Care	43,185	36,000	38,743	33,342	30,000	23,708
Sales & Related	88,383	60,000	92,899	56,621	40,000	59,896
Office/Administrative Support	57,670	48,000	47,085	43,983	39,000	28,348
Farming/Forestry	37,561	34,000	23,512	28,646	24,100	24,043
Construction	56,448	50,000	38,600	47,778	40,000	42,092
Installation	58,710	52,000	32,738	50,148	44,000	29,455
Production	53,138	46,800	33,549	37,315	32,000	29,006
Transportation	51,654	42,550	42,670	35,839	30,000	27,588
Military Specific	69,980	65,000	38,522	66,863	62,500	34,417
Industry						
Agriculture	48,171	40,000	42,961	41,385	32000	38374
Mining, Oil and Gas	98,018	78,000	80,811	90,430	69000	81995
Utilities	93,102	82,000	63,761	79,125	68000	57414
Construction	65,181	52,000	53,661	57,931	49000	44629
Manufacturing	78,875	60,000	70,506	63,043	45000	59102
Wholesale Trade	80,286	60,000	76,599	65,542	50000	59475
Retail Trade	62,015	45,000	63,248	46,270	34000	46077

Transportation/Warehousing	66,921	56,000	55,314	51,209	45000	36359
Information	111,186	80,000	103,192	85,471	65000	80772
Finance/Insurance	143,334	100,000	139,751	75,792	56000	73595
Real Estate /Rental	89,807	54,000	106,650	65,542	50000	65026
Professional/Scientific	125,700	100,000	104,826	87,424	69000	76756
Management of Companies	127,645	95,000	115,392	86,523	65000	77414
Administrative Support	57,258	42,000	57,512	48,997	37000	48164
Educational Services	68,339	58,000	52,621	55,293	50000	35288
Healthcare/Social Assistance	96,806	60,000	112,558	55,055	42000	49860
Arts/Entertainment	62,862	45,000	70,040	49,394	40000	46870
Accommodation /Food preparation	45,490	35,000	47,394	35,470	28000	31678
Other Services	50,720	43,000	39,525	35,457	30000	27402
Public Administration	77,496	70,000	45,473	63,844	55000	40048

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