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Millennials and the gender wage gap: Do millennial women face a glass ceiling?

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Abstract

This study aims to measure the gender wage gap among millennial workers in Colombia and determine if there is a marked wage difference between millennial women and men. Further, this study analyzes whether millennial women face a glass ceiling, that is, if there is a larger gender wage gap among workers earning relatively high wages. The study data included a sample of 2,144 millennial workers employed in 11 organizations located in the five main cities of Colombia. Oaxaca–Blinder econometric methods of wage decomposition were used to calculate both raw and adjusted gender wage gaps. The latter results in estimating the gender wage gap while controlling for observable characteristics related to individual, family, and labor. The results show that millennial workers in Colombia face gender inequality in the labor market and that professional millennial women experience a distinct glass ceiling. The adjusted gender wage gap is 9.5 percent, and this gap increases with education level, increasing to nearly 14 percent among college-educated workers. This paper contributes to the literature on workplace discrimination and gender wage inequality for younger workers, and it is original in reviewing the gender pay gap in Colombia using a primary dataset. Most of the work in this area has been done mainly in the developed countries and this research add to the findings which had focused on those nations.

Keywords: gender wage gap, glass ceiling, millennial workers, wage decomposition, Colombia
JEL Classification: J16, J31, C21, M12, M54

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1. Introduction

The wage differential between men and women has narrowed, but a significant gender wage gap still exists (Blau and Kahn, 2007, 2017). Numbers from the OECD indicate that women earned 18 percent less than men in 2017, whereas the difference was 37 percent in 1980 (OECD, 2019). The narrowing of the gender wage gap is largely attributable to the fact that younger women are more educated and more likely to participate in the workforce than prior generations. This change has led to women being exposed to a greater range of career opportunities and to more progressive norms regarding working women (Blau and Kahn, 2000, 2006; DiPrete and Buchmann, 2006; Beck-Domzalska, 2007; OECD, 2017). However, other factors, such as changes in labor market selectivity, changes in gender differences in unmeasured characteristics, institutional factors (i.e., gender discrimination and social norms), and less favorable supply and demand shifts, may contribute to the ongoing gender difference in pay (Blau and Kahn, 2006; Rubery and Koukiadaki, 2016).

After the Great Recession, young workers, particularly those who had recently entered the workforce (such as millennial workers, also known as Generation Y, or those born between 1980 and 1999 (Strauss and Howe, 1992; Zemke et al., 2000; Lancaster and Stillman, 2002; Costanza et al., 2012)), faced a changing labor market. Unemployment and informality rates were especially high for these younger workers, and wages were mostly flat (Fares, et al., 2006; Görlich, et al., 2013; Novella, et al., 2018). These economic and labor conditions impacted the financial well-being of millennial workers; they also sharpened the differential in wages between men and women and between those who had high levels of education and those who did not (Bialik and Fry, 2019).

There are several reasons to worry about the gender wage gap in general and among millennial workers in particular. From an economic point of view, women's relative underpayment in organizations can be regarded as inefficient. Women may be equally or better educated than their male counterparts; therefore, when women are not paid equally to men, this disparity can lead to lower productivity among women. This effect may occur if women feel undervalued by the organization, engendering lower self-efficacy perceptions and emotional distress, and reduced work motivation and commitment (Ragins and Cornwell, 2001; Palumbo and Manna, 2019). This effect may also be relevant to millennial workers. Since the millennial generation dominates today's workforce and plays vital roles in organizations (Gursoy et al., 2013; Laird et al., 2015; Stillman and Stillman, 2017; Dechawatanapaisal, 2019), managers and practitioners need strategies to positively motivate these employees and retain them to stay with their employers longer. Therefore, whether millennial workers have high expectations of gender equality in pay at their workplace can increase job satisfaction, decrease turnover rates and absenteeism, and increase organizational commitment, all of which are critical variables to retain and attract millennial workers (Freeman, 1978; Miller, 1998; Campione, 2014; Muskat and Reitsamer, 2020).

From an organizational slant, it is also essential to study the gender wage gap because organizations can implement strategies to create an environment of gender equality. In this respect, several studies highlight that millennial workers tend to focus more on work values, such as strong ethics, honesty, integrity, and equality (Twenge, 2010; Lyons et al., 2012; Lyons and Kuron, 2014; Costanza and Finkelstein, 2015; García et al., 2019; Gonzales-Miranda et al., 2019). Thus, a work environment that is balanced between men and women

could lead to more attractive and satisfying jobs for the millennial generation (Muskat and Reitsamer, 2020). For economic reasons and to manage new generations of workers, it is therefore important to measure the extent of the gender discrimination facing millennial workers and determine if gender wage inequality is more pronounced among the most qualified workers, i.e., whether the so-called glass ceiling exists. In this sense, two research questions inspired the design and development of this paper:

RQ1. What is the extent of gender wage inequality among millennial workers?
RQ2: Do millennial women face a glass ceiling? That is, is there a large gender wage gap among workers earning relatively high wages?

To answer these research questions, we use a primary data from millennials workers collected of organizations located in Colombia, which is a middle-income country in South America, and present an interesting case study for millennials' gender inequality in developing countries. We use the Oaxaca–Blinder decomposition technique to compute gender wage inequality. This econometric technique allows us to calculate the gender wage gap by controlling differences in characteristics between men and women, which is a good approximation of the extent of gender discrimination in the labor market (Fortin, 2008; Fortin, et al., 2011). This adjusted wage gap is compared to the raw gap to understand how the gender differences in observable characteristics shape gender wage inequality. Additionally, we compute the adjusted wage gap by levels of education to determine if the gender wage inequality is higher among those workers who are more qualified, thus determining the existence of a glass ceiling among millennial women workers.

This paper provides new evidence on the gender wage gap among millennial workers in developing countries. The millennial generation is believed to be significantly distinct in the workplace with respect to other generations in terms of perspectives, preferences, and work values (Lyons et al., 2012; Lyons and Kuron, 2014; Kuron et al., 2014; Gonzales-Miranda et al., 2019). In addition, the existing literature on the millennial generation has focused on developed countries, and the literature on this generation in developing countries is scarce; therefore, this study attempts to fill this gap.

Following this introduction, Section 2 contains a brief review of the literature; Section 3 describes the data sources used in the analysis and the descriptive evidence; in Section 4, we present the empirical model used; Section 5 presents the empirical findings, and conclusions and the discussion are presented in Section 6.

2. Related literature
This study draws upon and contributes to two related literatures. First, it relates to the workplace discrimination literature. Discrimination in the workplace can occur in different forms and affects the functioning of organizations (Becker, 1971; Rodger, 2006). For instance, iniquitous treatment at work occurs when there are prejudiced job designs and discriminatory task allocations in the organization, which leads to lower job satisfaction, greater job-related stress and higher risks of psychological withdrawal among discriminated workers (Volpone and Avery, 2013). Another form of workplace discrimination, which is one of the most common forms, is the wage differential based on the personal characteristics of individuals (Gunderson and Lee, 2016). This form of discrimination produces a perception

of inequality and injustice in the workplace, generating feelings of organizational cynicism and emotional distress among discriminated workers (Jena-Crottet, 2017).

Second, this paper is related to the literature studying the gender wage gap. The literature here is extensive and considers several dimensions in terms of measuring and explaining the gender wage gap (Olivetti and Petrongolo, 2016; Bishu and Alkadry, 2017; Kunze, 2018). Ñopo et al. (2012) calculated the gender wage gap for 64 countries of different regions of the world using decomposition techniques and they found that Sub-Saharan Africa region present the greatest earning gaps after controlling for demographic variables, where women earned around 35 percent less than men. The authors also found that in Western Europa this gap is 23 percent and the educational differences by gender explain very little. In the case of Latin American countries, Atal et al. (2009) and Hoyos and Ñopo (2010) carried out gender gaps decompositions and found that the gender wage gap is around of 20 percent. Nicaragua, Brazil, Dominican Republic, and Uruguay are the countries with the highest gaps, around 25 percent, while Ecuador, Paraguay and Colombia present the lowest gender wages gaps, with 5.6, 6.9 and 7.3 percent, respectively.

It is important to note that few studies have tried to provide a comprehensive overview of the gender wage gap among young workers, and there are far fewer papers focused on millennial workers. Manning and Swaffield (2008) studied the gender wage gap among early-career workers using data from the UK in the period 1991-2002. They found that although the gender wage gap is zero at the time of labor market entry, after ten years of experience, the gap is nearly 25 percent, which is explained mainly by the difference in human capital between men and women. Fortin (2008) analyzed the evolution and determinants of the gender wage gap by comparing cohorts of workers in the U.S. The findings showed that the gender wage gap among workers in their mid-twenties in 2000 was approximately 18 percent, with human capital, cognitive and noncognitive differences between men and women being the main determinants of this gap. For the Canadian case, Boudarbat and Connolly (2013) found that for recent postsecondary graduates, female graduates earn, on average, 6–14 percent less than males during the period two to five years after graduation.

Among the few studies that have explored the gender wage gap among millennial workers, we note those by Simon and McDonald (2015 and 2016) and Roche (2017). In general, the first authors explore the gender pay gap of millennial workers in the United States based on the National Longitudinal Survey of Youth 1997 (NLSY 97), which is a panel dataset between 1997 and 2010 on younger workers. Simon and McDonald (2016) measured the gender pay gap and analyzed whether it could be attributed to individual characteristics, business characteristics, or factors related to household formation, such as marriage and parenthood. They found that, on average, millennial women earn approximately 6 percent lower salaries than millennial men, and the gender pay difference among the self-employed is significantly higher at 46 percent. However, when they controlled for observable characteristics, the gender pay gap disappeared.

Simon and McDonald (2015) then compared home-based and nonhome-based work to determine how these types of jobs affect the gender differences among the millennial self-employed. They ran regression analysis on a sample of 245 millennial workers and found that, on average, self-employed, home-based women earn significantly less than their male

counterparts, and the pay gap is approximately 55 percent. However, when the adjusted gender pay gap was measured, the result was not statistically significant; this result was due mainly to the relatively small sample used in the regression.

Roche (2017) analyses the temporal change in the U.S. gender wage gap and its determinants, comparing two cohorts of young workers in the early 1960s and early 1980s. The results showed that after controlling by different individual, occupational and regional characteristics, women in the early birth cohort earn approximately 18 percent less than men, while millennial women, that is, those born in the early 1980s, earn approximately 14 percent less than millennial men. This decrease of four percentage points in the gender wage gap between cohorts shows that millennial workers in the U.S. face a less unequal labor market than previous generations. According to the author, the narrowing of the gap remains unexplained and could be due to relative improvements in unobservable institutional factors or heterogeneity for females, for instance, a labor market that has become more progressive and female-friendly; or, it could be that millennial women are more ambitious and competitive than women of previous generations.

It is worth noting that the empirical evidence reported on the gender wage gap among millennial workers is inconclusive and difficult to generalize. Additionally, to date, there have been no investigations on the extent of gender wage inequality among millennial workers in developing countries. Most studies seem to stereotype millennial workers, assuming that all they possess the same traits, behaviors and values regardless of their origin or socioeconomic status. However, this perception largely ignores any potential heterogeneity among members within the same generation (Weber and Urick, 2017). As mentioned by Begazo and Fernandez (2016) and Gonzales-Miranda et al. (2019), there are important differences between millennial workers in developing countries and those in developed countries. These authors show that depending on the economic and social context, young workers in the current labor market present important differences in attitudes, outlooks, preferences and work values, and these differences should be taken into account by organizations in their strategies for effectively managing this generation in the workplace. This study seeks to extend this line of research by analyzing the gender wage gap among millennial workers in the Colombian context.

3. Data and descriptive evidence
This study uses data from employees working in organizations located in Colombia, a middle-income South American country. Table 1 presents some economic and social indicators of Colombia and other countries. Colombia is characterized by positive economic growth alongside high levels of poverty and inequality and poor labor conditions: the annual GDP growth rate was 2.7 percent, but the percentage of people living below the poverty line was 4.5 percent, and the Gini coefficient was approximately 51 percent. These are very high values compared to those of neighboring countries. The millennial population (using as a proxy the population aged 20–34) is very similar to that in other countries. According to Table 1, millennials in Colombia represent between 20 percent and 25 percent of the total population (Erickson, 2008; Fry, 2018).

In terms of labor market variables, Table 1 shows that Colombia is characterized by one of the highest levels of informality and unemployment in Latin America, at 56 percent and 9

percent, respectively. Observing the unemployment levels of younger workers, we find an unemployment rate of 19 percent, more than double the national unemployment rate, and it was much higher for young women than young men: 24.5 percent versus 15 percent.[1] With regard to the gender pay gap in Colombia, women earn approximately 8 percent less than men, which is a moderate gap compared to developed countries that present a gender pay gap of more than 10 percent. These figures show that millennial workers are facing a challenging job market, not only in Colombia but also in other countries.

Table 1. Economic and social indicators in Colombia and other countries

	Colombia	Ecuador	Perú	Brazil	Chile	Argentina	México	US	UK
GDP per capita (2011 PPP $)[a]	13,332	10,412	12,794	14,282	22,873	18,282	18,101	55,681	40,158
GDP growth (annual, %)[a]	2.7	1.4	4.0	1.1	4.0	−2.5	2.0	2.9	1.4
Population (thousand)[b]	47,521	16,212	30,471	204,472	17,969	43075	121,858	320,878	65,860
Population aged 20–34 (thousand)[b]	11,936	4,026	7,476	51,847	4,267	10,008	30,038	66,983	13,278
Gini coefficient[c]	50.8	45.0	43.8	51.3	47.7	42.4	43.4	41.5	33.2
Population living below US$1.90 PPP per day (%)[d]	4.5	3.6	3.5	3.4	-	-	2.5	-	-
Unemployment rate (%)[e]	9.1	5.4	2.8	12.5	7.2	6.6	3.3	3.9	4.0
Unemployment rate, youth total (% of total labor force ages 15-24)[e]	19.0	8.9	5.6	28.6	18.1	25.2	6.8	8.2	11.2
Unemployment rate, youth female (% of female labor force ages 15-24)[e]	24.5	11.8	6.4	32.5	20.1	29.8	7.2	6.9	10.3
Unemployment rate, youth male (% of male labor force ages 15-24)[e]	15.0	7.2	4.9	25.7	16.7	22.2	6.6	9.3	12.0
Informal employment (% of total non-agricultural employment) (%)[f]	56.3	64.8	59.0	38.3	27.7	47.9	60.7	-	-
Mean gender pay gap (%)[g]	7.6	−4.3	9.2	10.2	12.7	−2.9	4.8	16.0	23.2

Notes: PPP: purchasing power parity. [a] Data refer to 2018 (World Bank data); [b] Refer to 2015 (World Populations Prospects: The 2019 Revision (United Nations)); [c] Data refer to the most recent year available during the period 2010–2017 (Human Development Data (1990–2017)); [d] Data refer to the most recent year available during the period 2006–2016 (Human Development Data (1990–2017)); [e] Data refer to 2018 (Word Bank data); [f] Data refer to the most recent year available during the period 2014–2018 (ILOSTAT); [g] Using hourly wages (Global Wage Report 2018/19), data for Colombia was taken from Tenjo and Bernat (2019).

Data for this study come from an online survey conducted in early 2017 in 11 organizations located in the five main cities of Colombia. The cities included were Bogotá, Medellín, Cali, Barranquilla and Bucaramanga.[2] These 11 organizations are in various economic sectors: five are in the manufacturing sector, one each in the commerce sector and construction sector, and four in the service sector. The online survey gathered information on individual characteristics (i.e., age, gender, education, marital status, parents' education and if they currently live with their parents), labor characteristics (i.e., wages, years in the current job, occupation, job satisfaction. and stability), and attitudes and behaviors toward employment (i.e., intention to leave the company, manager feedback, behavioral empowerment, psychological empowerment and work–life balance).

The online questionnaire was sent to 3,113 employees, and 2,516 participants voluntarily responded (i.e., approximately an 81 percent response rate). This high response rate was

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[1] A more detailed descriptive statistics of the labor market in Colombia can be found in García (2017), Bernal, et al. (2018), and Ham, et al. (2019).

[2] These cities are the most urbanized and developed cities in Colombia. According to García (2017) and Galvis (2007), approximately 45 percent of the urban population is concentrated in these cities and they account for 80 percent the total economic activity of the country. A more detailed description of Colombia can be found in Royuela and García (2015) and García and Badillo (2018).

achieved because workers were coded and the human resources department of the organizations sent e-mail reminders; nonrespondents were sent personal reminders. The respondents included both millennial (≤37 years old) and nonmillennial (>37 years old) workers, but the number of millennial respondents (2,157; 88.5 percent) was more than that of nonmillennials (279; 11.5 percent). The target population of this study was the sample of millennial workers and excluded those observations with missing values in any of the variables of interest; ultimately, the final sample in the study included 2,144 millennial workers.

Tables 2 and 3 present the demographic, household, and labor characteristics of millennial men and women. In the study sample, 45 percent of millennial workers are women, while the remaining 55 percent are men. Table 2 shows that men typically have similar years of education as women (i.e., nearly 15 years: completion of secondary and some years of tertiary education). However, when education levels are disaggregated (see Table 3), there appears to be a higher percentage (29 percent) of college-educated women than men (23 percent), and the difference is statistically significant, which confirms that millennial women tend to be more educated than millennial men. In terms of age and marital status, women are typically younger than men (29 years for men compared to 27 years for women), and there is a higher proportion of married men (54 percent) than women (42 percent). In terms of family characteristics, millennial women are more likely to live with their parents and to live in larger households than millennial men, and there are no major gender differences associated with having children.

With regard to job characteristics, Table 2 shows that millennial women typically earn lower hourly wages than men; however, they work similar hours. Men typically present longer tenure in the current job than women, which confirms that millennial women could have higher job turnover and thus lower tenure. With regard to the type of work, data show that millennial women remain concentrated in female-dominated, low-paying occupations. Millennial women are more likely to work in administrative and sales positions than millennial men (74 percent of women compared to 51 percent of men), and there is a slightly higher proportion of millennial men working in top management positions than millennial women.

Table 2. Descriptive statistics by gender

	Men		Women		Diff in	Total	
	Mean	SD	Mean	SD	means	Mean	SD
Demographic							
Education (years)	15.11	0.10	15.07	0.09	0.04	15.09	0.07
Age (years)	29.31	0.14	27.75	0.14	1.56***	28.45	0.10
Married	0.54	0.02	0.42	0.01	0.12***	0.47	0.01
Family							
Have children	0.50	0.02	0.47	0.01	0.03	0.48	0.01
Living with parents	0.34	0.01	0.43	0.01	−0.09***	0.39	0.01
Size of household	2.69	0.05	2.98	0.05	−0.29***	2.85	0.04
Job related variables							
Hourly wage $	4.13	0.13	3.34	0.09	0.79***	3.70	0.07
Log hourly wage	1.13	0.02	0.95	0.02	0.18***	1.03	0.01
Hours work (weekly)	47.04	0.07	47.35	0.08	−0.31***	47.21	0.05
Tenure (years)	3.61	0.11	3.00	0.10	0.61***	3.26	0.07
General management	0.02	0.01	0.01	0.01	0.01*	0.01	0.01
Skilled white-collar workers	0.04	0.01	0.06	0.01	−0.02	0.06	0.01
Administrative worker	0.42	0.02	0.50	0.01	−0.08***	0.46	0.01
Sales worker	0.09	0.01	0.24	0.01	−0.15***	0.17	0.01
Skilled manual worker	0.17	0.01	0.04	0.01	0.13***	0.10	0.01
Unskilled manual worker	0.26	0.01	0.15	0.01	0.11***	0.20	0.01
City							
Cali	0.34	0.02	0.35	0.01	−0.01	0.34	0.01
Bogotá	0.25	0.01	0.25	0.01	0.00	0.25	0.01
Barranquilla	0.18	0.01	0.11	0.01	0.07***	0.14	0.01
Medellín	0.15	0.01	0.16	0.01	−0.01	0.15	0.02
Bucaramanga	0.08	0.01	0.13	0.01	−0.05***	0.12	0.01
N	964 (45%)		1180 (55%)			2144 (100%)	

Notes: *** represents that the difference in mean is statistical significance at 1% level, ** at 5% level and * at 10% level

Table 3. Education levels by gender

	Men	Women	Difference	Total
Secondary	25.10	22.88	2.22	23.88
	(270)	(242)		(512)
Technical-technological	33.30	33.47	−0.17	33.40
	(321)	(395)		(716)
College	22.82	28.90	−6.08***	26.17
	(220)	(341)		(561)
Postgraduate	18.78	14.75	4.03**	16.56
	(181)	(174)		(355)

Notes: *** represents that the difference is statistical significance at 1% level, ** at 5% level and * at 10% level. All numbers are in percentage. The second line in each cell in parentheses indicates the number of observations.

4. Estimation procedure

This section presents the econometric model used to decompose the gender wage gap among millennial workers. The raw wage gaps are first computed, and then the wage gaps are adjusted for observable characteristics. By comparing the raw and the adjusted wage gaps, we determine how the gender differences in observable characteristics shape gender wage inequality.

The raw gender wage gap is computed from an equation that regresses the log hourly wage ($\ln W_i$) on a constant and a dummy variable of gender alone:

$$\ln W_i = \beta_0 + \beta_1 DM_i + u_i, \tag{1}$$

where $DM_i = 1$ if employee i is a man. The raw gender wage gap is calculated as $E(\ln W_i | male) - E(\ln W_i | female) = \hat{\beta}_1$.

To estimate the adjusted gender wage gap, the wage gap decomposition developed by Oaxaca (1973) and Blinder (1973) and discussed widely in Oaxaca and Ransom (1994, 1999), Fortin (2008) and Fortin, et al. (2011) is used. The typical objective of the decomposition method is to divide the total average wage gap between men and women into a component that can be attributed to differences in the observed characteristics of workers, or the composition effect, and one associated with the differences in the returns to those characteristics, or the wage structure effect. This study uses the Oaxaca–Blinder decomposition version that considers the reference wage structure from a pooled model of both men and women as the reference coefficients. Therefore, this version of the decomposition is not sensitive to the choice of the reference wage structure and considers the male advantage as equal to the female disadvantage with regard to the reference (Fortin, 2008).

The decomposition consists of first estimating the following three equations:
1. A pooled wage equation (p), including a gender dummy variable DM_i

$$\ln W_i = \beta_0 + \beta_1 DM_i + \mathbf{X}_i\boldsymbol{\beta}_p + u_i, \tag{2}$$

2. A wage equation for men (m)

$$\ln W_{im} = \beta_{0m} + \mathbf{X}_i\beta_m + u_{im}, \tag{3}$$

3. An equation for women (f)

$$\ln W_{if} = \beta_{0f} + \mathbf{X}_i\beta_f + u_{if}, \tag{4}$$

where $\mathbf{X}$ is a vector of exogenous control variables that contain the measures of a standard set of individual, family, and labor characteristics. Demographic characteristics included years of education, age and its square, and marital status. Family attributes included the presence of children at home, the individual living with his or her parents, and the size of the household where the individual lives. Job-related variables included the number of years in the current job and its square and occupation dummy variables. To control for demand-side effects and local characteristics that could affect wages, city dummies were included.

In a second step following the previous equation, the total average wage gap is decomposed into three terms:

$$\overline{TGWG} = \ln\overline{W}_m - \ln\overline{W}_f = \left(\overline{\mathbf{X}}'_m - \overline{\mathbf{X}}'_f\right)\hat{\beta}_p + \overline{\mathbf{X}}'_m\left(\hat{\beta}_m - \hat{\beta}_p\right) + \overline{\mathbf{X}}'_f\left(\hat{\beta}_p - \hat{\beta}_f\right), \tag{5}$$

where the first term on the right-hand side of the equation represents the gender differences in wages related to differences in characteristics between men and women, while the other two terms account for gender differences in the returns associated with the given characteristics. In this study, the wage structure is decomposed into male advantage and female disadvantage with respect to the reference coefficients or returns. In other words, the wage structure effect represents the adjusted gender wage gap that considers the male advantage and the female disadvantage following the differences in characteristics. The adjusted gender wage gap is represented as follows:

$$\overline{AGWG} = \overline{\mathbf{X}}'_m\left(\hat{\beta}_m - \hat{\beta}_p\right) + \overline{\mathbf{X}}'_f\left(\hat{\beta}_p - \hat{\beta}_f\right) \tag{6}$$

Equations (1) and (6) are also assessed by levels of education separately to understand how the gender wage gap varies across education and justify the differences in productive characteristics. The next section addresses the estimates of the raw and adjusted wage gap.

5. Results
Table 4 shows the estimated gender wage gaps for the entire population as well as for different education levels. Column (1) in panel A indicates that the total or raw average gender wage gap among millennial workers is positive and statistically significant (19 percent). This implies that millennial women earn 19 percent lower wages than millennial

men do.[3] Table 1 shows that this gender wage gap of 19 percent among millennial workers is higher than the general gender wage gap of around 8 percent found in Colombia. This gap is similar to that found in developed countries, which suggests that millennial workers face significant gender wage inequality.

Table 4. Gender wage gap decomposition

		Level of education			
	Total	Secondary	Technical-technological	College	Postgraduate
	(1)	(2)	(3)	(4)	(5)
A. *Raw gender wage gap*	0.1764***	0.0612***	0.1671***	0.2467***	0.1637***
$\overline{TGWG} = \overline{\ln W_m} - \overline{\ln W_f}$	(0.0292)	(0.0227)	(0.0283)	(0.0523)	(0.0529)
B. *Adjusted gender wage gap*					
Controlling for observables	0.0908***	0.0754***	0.0677***	0.1291***	0.0984**
$\overline{AGWG} = \overline{\mathbf{X}}'_m(\hat{\beta}_m - \hat{\beta}_p) + \overline{\mathbf{X}}'_f(\hat{\beta}_p - \hat{\beta}_f)$	(0.0195)	(0.0216)	(0.0247)	(0.0421)	(0.0472)
N	2144	512	716	561	355

Notes: *** p<0.01, ** p<0.05, * p<0.1. Bootstrapped standard errors with 200 repetitions are given in parentheses. The results are expressed on the logarithmic scale, so that to interpret these values in terms of difference in percentage points we calculate: $(\exp(GWG) - 1)$ x 100.

The estimation of the gender wage gap for different education levels reveals that the gap is also positive and significant and increases with education level (columns (2) to (5) in panel A of Table 4). Among workers with secondary education, the wage gap is 6 percent; among those with technical-technological education, it increases to 18 percent; then, it further increases to 28 percent among those with college education, and it is 18 percent among workers with postgraduate education. Nearly 30 percent of women are college-educated, which is 6 percent higher than men. However, this population earns 28 percent less than men with a similar education level, which suggests the existence of a glass ceiling for women.

Panel B of Table 4 displays the estimated gender wage gaps controlling for observable characteristics related to individual, family, and labor aspects. The results show that the gender wage gap decreases. This is expected because typically women and men present similar years of education, and men tend to have more experience (age and tenure) in the labor market than women do in this sample of millennials. Column (1) in panel B indicates that the average wage gap is 0.09 log points, which amounts to a difference in wages of 9.5 percent between millennial men and women. In terms of the wage gaps for different education levels, when women´s returns are adjusted to the returns obtained by men, women's wages would increase by 7.8 percent among millennial female employees with secondary education. This would increase wages by 7 percent among millennial female employees with technical and technological education. For high-skilled workers, the gender wage gap is significantly large among employees with college education at 13.8 percent compared to 10.3 percent among employees with postgraduate education.

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[3] Given results in Table 4 are represented on a logarithmic scale, the difference in percentage points is obtained as $(\exp(GWG) - 1)$ x 100.

These findings show that there is a significant gender wage inequality among millennial workers in the urban labor market in Colombia. It is elucidated that statistical discrimination induces employers to pay lower wages to women because they believe that women are more likely to leave the job and therefore result in higher average labor costs. This so-called glass ceiling effect is stronger among high-skilled workers, where women present higher participation than men, and particularly among millennial college-educated women.

6. Discussion and conclusions

This paper investigates gender wage inequality among millennial workers in Colombia. The results show that the raw gender wage gap is positive and significant: on average, millennial women are paid 19 percent less than millennial men. This gap is much higher than the general raw gender wage gap found in Colombia (7.6 percent), which suggests that a millennial worker faces a higher degree of gender wage inequality than a non-millennial worker. The raw gender wage gap for different education levels shows that this gap increases with education level: among college-educated millennial workers, the raw gender wage gap is 28 percent.

When observable characteristics related to personal, household, and labor aspects are considered, the gender wage gap remains positive and significant but decreases to 9.5 percent, which confirms that both millennial women and millennial men present, on average, similar years of education. Looking at different education levels, the adjusted gender wage gap is significantly large among high-skilled workers. The results show that among college-educated millennial workers, women earn approximately 14 percent less than men do, despite women having a higher share of employment at this education level than men. These findings suggest that millennial workers in Colombia face important gender inequality in the labor market and that there is evidence of a marked glass ceiling for professional women.

The results of this research have strong practical implications. First, we provide useful information on the existence of significant gender wage inequality among young workers born in the 1980s. These results should encourage Colombian organizations to promote an environment of greater gender pay equality, which could be a key element in organizations' strategies to attract, cultivate, manage and retain members of the millennial generation now and into the future (Dechawatanapaisal, 2019). Second, the findings of this paper contribute to a better understanding of the extent of workplace discrimination facing millennial workers. The results show that younger workers are entering a less inclusive and gender equitable labor market than previous generations. This persistence in the undervaluation of women's work, particularly among the highest educated women, should be combated not only through organizations but also through public policies. For instance, the governments could ensure stronger enforcement of employment rights, the setting of minimum wages in line with the idea of decent pay for decent work, or the promotion of a general principle of equal pay for work of equal value within organizations (Rubery and Koukiadki, 2016).

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