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Gender Earnings Gap among Urban Youth Adults in Bangladesh: A Comparative Static Analysis

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Abstract

Despite the importance and recognition of young women's engagement in income-generating activities for socio-economic development, the gender earnings gap still persists across countries, especially in developing countries like Bangladesh. This study presents two datasets from the most recent past to provide fresh evidence for Bangladesh's urban labor market that has yet to be closely studied. Using individual-level data from the BBS's (Bangladesh Bureau of Statistics) Labour Force Surveys (LFS) conducted in 2010 and 2015, we have explored the gender earnings gap among the youth (aged 18 to 35 as per Bangladesh's National Youth Policy 2017) working and earning in the urban labor markets of Bangladesh by applying the three approaches: Mincerian regression, Oaxaca-Blinder decomposition and Quantile regression. The first approach confirms that young women earn significantly less than young men in the urban labor markets after controlling the influences of the covariates. The detailed decomposition results of the second approach indicate that gender differences in hours worked, education, firm characteristics and locations also contribute to the gender earnings gap and the market discrimination against the youth women's earnings remain the same over the years. The third approach using the lens of distribution perspective shows that earnings gaps persist up to the 25th percentile of distribution in 2010 though it persists across the entire earnings distribution in 2015. The results suggest that engaging more women in income-generating

activities, increasing the number of hours worked, improving access to higher education and creating enabling working environment for women might reduce the gender earnings gap.

Keywords: Earnings Gap, Urban Labor Market, Youth Male, Youth Female, Bangladesh

1. Introduction

Bangladesh has become a great success story to the world in terms of socio-economic performance, which is reflected in feats such as – the achievement of per capita income of USD 2,227, consistently maintained high GDP growth rate, success in meeting the LDC-graduation criteria, and fulfilling the major Millennium Development Goals (MDG). However, this does not necessarily mean that the scenario is beyond any criticism. Most of the critiques are centered on the distributional factors of growth and overall gender sensitivity from economic and socio-political perspectives. If gender sensitivity is focused upon and the labor market is discussed specifically in that spectrum, the first thing that comes up is the gender earnings gap which is an often-cited indicator of gender bias in labor markets. Evidence shows that the gender earnings gap favors the male labor force and the gap worsens in developing countries. Moreover, in developing countries, women, in general, lag behind men in different dimensions and thus gender differences are noticeable in several domains in terms of access to and control over resources, work opportunities, participation, and rewards. The neo-classical view in the context of a labor market free of discrimination of any sort suggests that the wage differential is the resultant outcome of differences in productivity. But evidence shows the existence of a gender-specific pay gap without any difference in observable characteristics between males and females. So, the uneven distribution of the benefits might hinder the potential sustainable economic development. Development in recent times has been focusing more on inclusion and sustainability and the latest, the Sustainable Development Goals (SDG) have a dedicated goal focused on Gender inequality (Goal 5).

The share of females in the labor market across the world has increased significantly since the 1970s and this process can be defined as the feminization of the labor force (Standing, 1989). Over time, increase in female labor force participation in Bangladesh has created a significant contribution to the labor market and thus, has played a major role in the rapid economic growth. The structural adjustment policies, export-led growth, and long-term economic development were considered as the main driving factors for the active participation of women in labor markets across the world (Cagatay and Ozler, 1995). The government of Bangladesh has taken up multifarious gender-sensitive interventions (e.g. *Upabritti*) for the youth, adolescents, and children over the years and the quantity of such interventions has increased in the recent past. Most of the children of the recent past are youth participants in the labor force today. The interventions might have helped the beneficiaries in reducing the gap in human capital and thus, the wage gap.

Bangladesh's economy is passing through a phase of demographic dividend. However, even though around a quarter of the annual national budget is assigned to sectors that are critical to youth development (e.g. education, skills and employment, healthcare, social care), it is yet to exploit the benefits of this dividend. Bangladesh is currently facing the youth employment challenge in the context of achieving SDGs (United Nations, 2015) by 2030 (4 targets under SDG Goal 4 and Goal 8 focus precisely on youth and youth affairs). Even though the United Nations classify youth to be between 18-24 years of age, according to the National Youth Policy (2003), people from ages 18-35 are considered as youth in Bangladesh. The youth labor force in our country is now stronger in numbers than ever before and it is crucial for Bangladesh to have the right policies for youth development to reap the benefits of demographic dividends for upcoming years and a key factor to be considered in this spectrum is gender sensitivity. Issues, such as the severity of the gender earnings gap among the youth of the country, the way it is affecting the skilled female labor force from entering the market etc. and potential solutions to these are very important and significant topics to ponder about.

Bangladesh has ranked 50th out of 153 countries in the Global Gender Gap Report 2020 and has been reported as a top performer in both the South Asian region and the lower-middle-income country group. Even though the situation is improving over the years, in-depth analysis is required in order to assess the scenarios of the gender earnings gap among youth. With this aim, this study attempts to explore the gender earnings gap situation among youth in the urban labor market of Bangladesh from a dynamic perspective.

2. Literature Review

Most of the countries face challenges in providing employment to the labor force, especially the youth labor force (Anyanwu, 2013). The discrimination in the early period of employment not only affects their short-term quality of life through lower income and employment but also affects the future prospect of the youth workers and their lifetime incomes (Nilsson, 2019; Weisshaar & Cabello-Hutt, 2020). From the viewpoint of labor market discrimination, which is a common scenario in all countries with some variations, there exist many studies that have explored the gender earnings or pay gap from different perspectives. Evidence shows that women with fewer educational opportunities, lower payments, and narrowed access to decent jobs are relatively in a disadvantaged position (Anyanwu, 2016; Totouom, Mboutchouang, & Kaffo Fotio, 2018). Oaxaca-Blinder (1973) developed a decomposition approach of the wage gap with a view to estimating the labor market discrimination in terms of gender, race, and age. Blau and Kahn (2006) conducted a panel study conducted in 2006 to compare the female and male wages among youth during the 1980s and 1990s in the United States. They found that the slowdown in the convergence of female and male wages was not causally related to the change in human capital as women improved their relative human capital to a comparable extent during the same period. However, the ‘unexplained earnings gap’, which includes labor force selectivity, gender differences in unobserved characteristics, discriminations in the labor market, and biased shifts in supply and demand account for the slowing of wage convergence.

In Bangladesh, Ahmed and Maitra (2015) examined the gender wage gap during 2005 and 2000 applying the unconditional quantile regression models, and found that men are paid higher than women throughout the distribution of wages. However, the wage gap is lower at the higher end of the wage distribution and vice versa. Siddiquee and Hossain (2018) examined the gender wage gap among urban labor forces and explored how it varies over the wage distribution using the LFS 2010 and applying the Mincerian OLS regression and Blinder-Oaxaca decomposition approaches. Quantile counterfactual decomposition results based on data from Bangladesh Labour Force Survey (LFS) 2016, show that the wage gap varies across different deciles of wage. Women at lower deciles face higher wage penalty than those from higher deciles and the wage gap variation ranges from 8.3 percent to 19.4 percent (Rahman & Al-Hasan, 2019). According to the findings of the International Trade Union Confederation report (2008), the global gender pay gap is on average 15.6 percent but the value is 21.2 percent for Asian countries. In developing countries, women lag behind men in most of the possible dimesnions the genders compete against each other. Despite having improvements over time, the earning gap is present and significant in developing countries as women are in a relatively disadvantaged position in terms of lower income and livelihood (Weichselbaumer & Winter-Ebmer, 2005).

Using longitudinal data (1983 and 1999-2000) for India, Jacob (2006) explored the gender pay gap between gender and caste where the result shows that a significant unexplained portion accounted for 55 percent of the pay gap. In Bangladesh, discrimination within jobs is liable for 70 percent of the wage gap (Akter, 2005). Pastore and Marcinkowska (2004) used pooled data to explore the gender wage gap among young people using Oaxaca and Ransom (1994) decomposition of the unconditional gender wage gap where the result shows that the unexplained overall gap is 70 percent which is higher than that of the amount found among the adults. The result also shows that regional variability in the wage gap among young people is also present.

It is also evident that types of sectors are associated with the gender pay gap. In this regard, Hossain and Tisdell (2005) showed that although the gender pay gaps have been narrowing down over time in Bangladesh, the earning gaps are still quite large in the manufacturing sector. Kapsos (2008) used the Mincerian regression model and the Oaxaca-Blinder decomposition approach to measure the gender wage gap in Bangladesh. Their results show that women, on average, earn 21 percent less than men and going higher in terms of educational attainment significantly reduces the gender wage gap. Gunewardena (2010) used basic Blinder-Oaxaca decomposition to examine gender and ethnic wage differentials among youth in Sri Lanka, where he found for all sectors and all ethnic groups, women are paid less compared to men.

Even though all these papers have analyzed the gender pay gap in different countries using different datasets and samples, the urban youth workers of Bangladesh have not been explored before. Due to the importance of the youth labor force of Bangladesh at the moment, we use pooled data in this study to analyze the gender wage gap among the urban youth of Bangladesh.

3. Data and Methodology

The dataset used in this analysis is a nationally representative (cross-sectional) random sample from the Bangladesh Labor Force Survey (LFS), administered by Bangladesh Bureau of Statistics (BBS). The data contains information on a wide range of individual characteristics such as age, sex, marital status, educational attainment, occupational status, hours worked, wage earned etc. Many household level characteristics like household size and composition, religion, landholding, location, and asset ownership are also incorporated here. The LFS data is updated through new survey rounds after an interval of 2 to 5 years on average. For this study, we use pooled data from the 2010 and 2015 rounds of the LFS. All the variables with monetary values from the 2015 data was deflated using the Consumer Price Index (CPI) to generate real values directly comparable to the 2010 data.

The sample for the LFS 2010 dataset consists of 199,704 individuals of which 159,296 individuals are from rural and 40,408 are from urban areas. Of the 40,408, weekly wage data are available only for 10,764 individuals. Since the objective of this study is to observe the wage gap among the youth (age 18 to 35 years) of the urban sector, from the 10,764 urban individuals, 5,020 youths were found from this age range. Following identical criteria, from the 2015 LFS, 2,117 observations out of 503,756 observations were relevant for our analysis and thus, were kept for the analysis.

Of the 5,020 youth workers in the LFS 2010 survey round, around 80.2 percent were male. This reflects the very low labor force participation rates and employment rates as well among the youth female labor force in the urban labor market of Bangladesh. However, in LFS 2015 survey round, out of the 2,117 youth sample, the percentage of male workers was 62.4 percent. This change in distribution indicates the increase in labor force participation by the urban youth females and implies that younger female labor force is more in terms of access to employment than their predecessors in the urban labor market.

The OLS regression for hourly wage of the individuals is:

$$lnw_{ijt} = X'_{ijt}\beta_{ijt} + \epsilon_{ijt} \quad ; \qquad i=1, 2, \ldots\ldots n; j= male, female ; t= 2010, 2015$$

Where i denotes the youth individuals; j denotes the gender of the youth individual and finally t denotes data for the years 2010 and 2015. lnw_{ijt} is the log of hourly wages of the youth individuals; X'_{ijt} is the vector of regressors that affect the wages of the youths such as youth female dummy, age, age squared, weekly hours worked, education dummies, occupation dummies, industry dummies, and the location dummies. ; β_{ijt} is the vector of slope coefficients of the regressors ϵ_{ijt} is the random error term ($\epsilon_{ijt} \sim N(0, \sigma^2)$).

Mincer (1974) used the following wage equation to estimate the gender wage gap. This regression estimates the economic returns of various factors after controlling some variables such as age, age-squared, occupation, education, industry and geographical location etc.

$lnw_{ijt} = X'_{ijt}\beta_{ijt} + \Upsilon_{it}D_{it} + \epsilon_{ijt}$, Here D_{it}=1 if female and 0 if male.

The conventional Mincerian wage function figures out the gender wage gap, the coefficient Υ_{it} is the gender wage gap.

We can also write the wage function for males and females separately-

$lnw_{it}^{m} = X_{it}^{\prime m} \beta_{it}^{m} + \epsilon_{it}^{m}$ …………………….. (a), for male

$lnw_{it}^{f} = X_{it}^{\prime f} \beta_{it}^{f} + \epsilon_{it}^{f}$ ……………………… (b), for female

Here, m refers to males and f refers females. Subtracting equation (b) from equation (a) gives us following equation-

$$lnw_{it}^{m} - lnw_{it}^{f} = X_{it}^{\prime m} \beta_{it}^{m} - X_{it}^{\prime f} \beta_{it}^{f} + \mu_t \qquad \text{, where} \quad \mu_t = \epsilon_{it}^{m} - \epsilon_{it}^{f}$$

The decomposition approach developed by Blinder (1973) and Oaxaca (1973) shows the factor analysis of reasons behind the gender wage gap. This is one of the most commonly used methods for measuring gender discrimination against women in terms of wage payment. This decomposition of wage gap is explained by two parts: explained and unexplained. Explained part of wage differential is explained by the differences of observed individual characteristics and the unexplained part attributes to discrimination.

$lnw_{it}^{m} - lnw_{it}^{f} = (X_{it}^{\prime m} - X_{it}^{\prime f})\beta_{it}^{m} + (\beta_{it}^{m} - \beta_{it}^{f}) X_{it}^{\prime f} + \mu_t$ ……… Male is the reference group or

$lnw_{it}^{m} - lnw_{it}^{f} = (X_{it}^{\prime m} - X_{it}^{\prime f})\beta_{it}^{f} + (\beta_{it}^{m} - \beta_{it}^{f}) X_{it}^{\prime m} + \mu_t$ ……….. Female is the reference group

In the right-hand side of the above equation, the first term explains the gender wage gap caused by the differences in observed characteristics between males and females. The second term measures the unexplained differences in the coefficients which is defined as the ‘gender discrimination’.

4. Descriptive Statistics

Descriptive statistics and the mean differences of the characteristics between men and women are reported in Appendix Tables A1 and A2 respectively. The average weekly wage among male youth workers in the 2010 sample was approximately BDT 1,875, as opposed to BDT 1,563 for female youth workers. On the contrary, male youth worked on an average of 54.7 hours per week compared to 52.8 hours for female youth. In 2015, the weekly average wage increased to around BDT 2,744 and BDT 2,408 for male and female youth respectively, implying the persistence of a significant gender earnings gap among youths. In fact, the absolute gap increased from around BDT 312 in 2010 to around BDT 336 in 2015 (both are statistically significant). However, compared to 2010, the weekly hours increased for the males and decreased for the females in 2015. The standard deviation of weekly wages for women have was relatively low for women in 2010 as opposed to 2015 when it increased and got quite close to that of the males. This can be attributed to the fact that, as time has progressed, more opportunities have arrived and the fields of employment have diversified for women and hence the variation in income (as shown by the standard deviation) has also increased. The standard deviation for weekly working hours has also increased from 2010 to 2015 probably indicating to the fact that over the years, the implementation of labor laws and the consequent formalization of working hours in some sectors.

Table A3 in the appendix shows us the difference in weekly wages between males and females across different age groups. It shows that in both 2010 and 2015, the wage difference is insignificant for those aged 18 to 24 years. But for the 25 to 35 years age group, the male wages are significantly higher. This can be due to the fact that 25 to 35 is the age where women generally give birth. After getting married and having children, women in Bangladesh fail to put in as much effort as before and that might attribute to the increase in wage gap.

The average age for youth women in the sample is slightly lower for both the years as compared to men. For 2010, the average ages were 27.4 years and 25.9 years respectively for men and women while for 2015, the average ages were 28.5 years and 27.1 years. This reflects the lower participation rates of relatively older youth female workers in the country. The average age of the working urban youth, in general, has increased in 2015 compared to 2010. This can be attributed to the fact that, with the passage of time, more people with educational qualifications are entering the labor force. Because of this, the frictional unemployment phase now lasts for a longer duration for youths who have just completed their studies and are awaiting placements – resulting in an overall higher average wage for employed youths.

Looking into labor force participation by literacy and education, in the 2010 sample, 74 percent of men have literacy whereas it is only 63 percent for women. The literacy rate among the urban youth went up quite a bit after that which can be observed from the literacy rates of 94 percent and 85 percent for males and females respectively in the 2015 sample. For the 2010 sample, there is no significant difference in participation between males and females up to class five (i.e., five years of schooling). Similar results are obtained in the cases of bachelor and master degree of educational attainment. For the 2015 sample, a statistically insignificant difference between the males and females in participation can be observed only for the levels – class six to eight, and masters. For all other categories, statistically, significant differences can be observed for both the years. The participation of males is higher across all the education categories with significant differences over the two years. Only for the category of class one to five, for the year 2015, the female participation is higher than that of males and this seems rational because, with the passage of time, achieving higher levels of education has become a necessity and it applies to the males more than females in our socio-economic context.

There are differences in labor force participation across different occupations in our sample as well. For example, in cases of professionals and plant, machine operators, and assembling, women's participation is significantly higher than that of men for the sample of 2010. However, for the 2015 sample, even though the significantly higher numbers of participants are there for the professional category, the plant, machine operators, and assembling category has seen a decrease in a relative number of females. A significantly higher number of females are seen in the craft and related trade worker, and elementary occupations categories. This might be due to the gradual emphasis of government policies on women's entrepreneurship. All the other categories have higher participation of male workers with the difference either statistically significant or insignificant across the two samples.

A similar picture is evident in youth labor force participation across different industries in 2010 and 2015 respectively. The highest female youth labor force participation is found in manufacturing and it is significantly higher compared to its counterpart, the youth male labor force. Categorizing the samples with respect to geographical proximity, it can be observed that, in Dhaka (for the 2010 sample) and Chattogram (for the 2015 sample), women's participation rate is significantly higher than that of the males. However, the reverse situation is found in Khulna (both years), Rajshahi (2015), and Sylhet (2015) divisions.

5. Results and Discussion

5.1 Measuring Gender Earnings Gap: Mincer Regression

In this section, we analyze the estimates from Mincerian regressions of 5 different specifications for the years 2010 and 2015 separately. Table 1 contains the estimates using 2010 data while Table 2 contains that of 2015. In the tables, specification (1) includes only the female dummy and thus, provides the unadjusted gender earnings gap. Each of the subsequent regressions adds additional explanatory variables including age, age squared, and hours worked per week, education dummies, occupation, and industry dummies.

The unadjusted gender earnings gap among the youth in urban Bangladesh, given in specification (1), is 11 percent and the exact unadjusted earnings gap stands at 11.6 percent [i.e., {exp(0.110)-1}*100] in 2010. In 2015, the unadjusted earnings gap increased as per the estimate of specification (1). The unadjusted exact gender earnings gap increased to 13.6 percent in 2015 from 11.6 percent in 2010. However, when we add all the relevant explanatory variables in the specification (5), the exact earnings gap goes to 6 and 5 percent in 2010 and 2015 respectively. It implies that the overall earnings gap between male and female youth labor force participants in the urban market has remained similar over the 5 years. Controlling for differences in hours worked, education, occupations, industries, marital status, and geographical variations have only a minor effect on the estimated earnings gap for the year 2010. The large reduction in the estimated gender gap in earnings for 2010 is found after the inclusion of age, which is a surrogate for work experience in this study.

The introduction of occupation, industry, and geographical dummies have an impact of higher magnitude for the year 2015 compared to 2010. Another important factor that can explain the gender earnings gap is education. It can be observed from specification (4) of both Tables that incorporating education in the model has a higher impact on reducing the gender earnings gap. This is because a large proportion of working youth women have less education compared to their male counterparts.

Overall, even though the coefficients are different across specifications for the years, the specifications incorporating all the relevant variables show us a similar picture indicating that the gender earnings gap has remained the same in 2015 as it was in 2010.

Table 1. Mincer Regression Results from Different Specifications (2010)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Female	-0.110***	-0.0674***	-0.0687***	-0.0490**	-0.0607***
	(0.0220)	(0.0222)	(0.0223)	(0.0210)	(0.0222)
Age		0.100***	0.101***	0.0805***	0.0811***
		(0.0206)	(0.0206)	(0.0194)	(0.0189)
Age squared		-0.00139***	-0.00139***	-0.00115***	-0.00119***
		(0.000389)	(0.000389)	(0.000363)	(0.000353)
Hours per week			-0.000672	0.00255***	0.00135*
			(0.000804)	(0.000761)	(0.000759)
Education dummies (Base category: No education)					
Class one – Class five				0.114***	0.0877***
				(0.0216)	(0.0209)
Class six – Class eight				0.161***	0.117***
				(0.0243)	(0.0241)
Class nine – Class ten				0.265***	0.210***
				(0.0312)	(0.0308)
SSC				0.368***	0.268***
				(0.0346)	(0.0351)
HSC				0.517***	0.411***
				(0.0419)	(0.0441)
Bachelor’s/equivalent				0.751***	0.616***
				(0.0441)	(0.0479)
Master’s/equivalent				0.884***	0.742***
				(0.0510)	(0.0528)
Unmarried Dummy				No	Yes
Occupation dummies				No	Yes
Industry dummies				No	Yes
Divisional dummies				No	Yes
Constant	7.270***	5.594***	5.627***	5.601***	5.938***
	(0.00998)	(0.266)	(0.270)	(0.256)	(0.299)
Observations	5,020	5,020	5,020	5,020	5,020
R-squared	0.005	0.051	0.051	0.178	0.246

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

Table 2. Mincer Regression Results from Different Specifications (2015)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Female	-0.128***	-0.0903***	-0.107***	-0.0717***	-0.0503***
	(0.0200)	(0.0198)	(0.0198)	(0.0167)	(0.0168)
Age		-0.00159	9.10e-05	-0.0385**	-0.0397**
		(0.0200)	(0.0199)	(0.0172)	(0.0165)
Age squared		0.000481	0.000440	0.000863***	0.000915***
		(0.000374)	(0.000373)	(0.000317)	(0.000303)
Hours per week			-0.00289***	0.000369	0.00115*
			(0.000710)	(0.000642)	(0.000597)
Education dummies (Base category: No education)					
Class one – Class five				-0.0315	0.00716
				(0.0277)	(0.0249)
Class six – Class eight				0.0226	0.0297
				(0.0283)	(0.0264)
Class nine – Class ten				0.0222	0.0117
				(0.0343)	(0.0324)
SSC				0.104***	0.0550*
				(0.0331)	(0.0311)
HSC				0.294***	0.199***
				(0.0372)	(0.0370)
Bachelor's/equivalent				0.486***	0.308***
				(0.0422)	(0.0430)
Master's/equivalent				0.671***	0.473***
				(0.0372)	(0.0415)
Unmarried Dummy				No	Yes
Occupation dummies				No	Yes
Industry dummies				No	Yes
Divisional dummies				No	Yes
Constant	7.809***	7.450***	7.597***	7.980***	7.856***
	(0.0123)	(0.260)	(0.258)	(0.230)	(0.257)
Observations	2,117	2,117	2,117	2,117	2,117
R-squared	0.019	0.088	0.097	0.364	0.462

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

5.2 Measuring Gender Earnings Gap: Oaxaca-Blinder Decomposition

This section analyzes the gender earnings gap using the Blinder-Oaxaca decomposition. The standard application of the Blinder-Oaxaca technique is to divide the gender earnings gap into a part that can be explained by differences in determinants of earnings, such as age, education, industry etc. and a part that cannot be explained by such group differences. This unexplained difference is the difference due to discrimination. Tables 3 and 4 report the twofold decompositions for the years 2010 and 2015 respectively, where the option 'pooled' determines the choice of the reference coefficients, using the Blinder-Oaxaca decomposition technique.

The first column in both Tables reports the average predictions by groups and their differences reported by the decomposition outputs. From Table 3 in 2010, it is observed that the mean of log wages (lnwage) is 7.27 for youth males and 7.16 for youth females, yielding a wage gap of 0.11. This gap is divided into two parts: explained and unexplained. The first part reflects the mean increase in youth female's wages if they had the same characteristics as youth males. The value of 0.0657 indicates that differences in age, weekly hours worked, education, occupation, industry, and location account for more than half of the earnings gap between youth males and females. The second part quantifies the change in women's wages when applying the men's coefficients to the women's characteristics.

Since the results from Blinder-Oaxaca decomposition in Column 1 are expressed in the logarithmic scale, it is sensible to transform the results to the original scale (Column 2). It shows that the mean wages are BDT 1,436.24 and 1,286.57 for youth males and females respectively and hence, the wage gap is 11.6 percent. Adjusting women's endowment levels to the levels of men increase women's wage by 6.8 percent and therefore, a gap of 4.8 percent remains unexplained.

Panel B of Table 3 shows that the differences in age, education, and occupation can explain the differentials in earnings between youth males and females by 2.9 percent, 1.9 percent, and 3.6 percent respectively. This might have serious policy imperatives. Though the differences in hours worked per week and the division plays significant roles, the magnitudes are not large enough. Finally, this study finds that industrial segregation based on 21 major groups of the international standard classification of basic industries in Bangladesh does not explain the differentials in earnings between youth males and females in the urban labor market of Bangladesh.

Table 3. Results Using Blinder-Oaxaca Decomposition (2010)

VARIABLES	(1) Coefficients (Robust standard errors)	(2) Exponentiated coefficients (Robust standard errors)
Panel A: Overall		
Men	7.270***	1436.238***
	(0.00998)	(14.33387)
Women	7.160***	1286.569***
	(0.0196)	(25.23981)
Difference	0.110***	1.116332***
	(0.0220)	(0.024571)
Explained	0.0657***	1.067893***
	(0.0151)	(0.016129)
Unexplained	0.0444**	1.045359**
	(0.0219)	(0.022945)
Panel B: Endowments		
Age	0.0291***	1.02954***
	(0.00435)	(0.004475)
Hours	0.00256*	1.002565*
	(0.00152)	(0.001528)
Education	0.0187**	1.018831**
	(0.00738)	(0.007521)
Occupation	0.0362***	1.036884***
	(0.00989)	(0.010252)
Industry	-0.00739	0.9926351
	(0.0119)	(0.011861)
Division	-0.0135***	0.986623***
	(0.00432)	(0.004263)

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

Similarly, Table 4 reports the situation gender earnings gap among the youth labor force in 2015. The first column reports the results in the form of logarithmic, which requires transformation (see Column 2) in order have the results of the gender earnings gap in the original scale. The mean of log wages (lnwage) is 7.81 for youth males and 7.68 for youth females in 2015, giving an earnings gap of 0.13, which is split into explained and unexplained parts. Out of the earnings gap of 0.13, it is about 0.0849 (more than half) can be explained by differences in age, weekly hours worked, education, occupation, and industry. Looking into the results in the original scale (Column 2), it is found that the mean wages are BDT 2,461.63 and BDT 2,166.80 for youth male and female workers respectively, implying an earnings gap of 13.61 percent in 2015. Therefore, the earnings gap has increased compared to 2010. Similar to 2010, the difference in age, education, and occupation can explain 1.5 percent, 2.5 percent, and 3.6 percent of the earnings gap respectively. The other variables also have a similar impact to 2010.

Table 4. Results using Blinder-Oaxaca Decomposition (2015)

VARIABLES	(1) Coefficients (Robust standard errors)	(2) Exponentiated coefficients (Robust standard errors)
Panel A: Overall		
Men	7.809***	2461.63***
	(0.0123)	(30.2169)
Women	7.681***	2166.802***
	(0.0158)	(34.2007)
Difference	0.128***	1.13607***
	(0.0200)	(0.02272)
Explained	0.0849***	1.08866***
	(0.0165)	(0.01794)
Unexplained	0.0426***	1.043547***
	(0.0165)	(0.017166)
Panel B: Endowments		
Age	0.0147***	1.014796***
	(0.00341)	(0.003464)
Hours	0.00621*	1.006228**
	(0.00326)	(0.003285)
Education	0.0247***	1.024964***
	(0.00826)	(0.008461)
Occupation	0.0106	1.010706
	(0.00882)	(0.008912)
Industry	0.0356***	1.03626***
	(0.00890)	(0.009224)
Division	-0.00688**	0.993148***
	(0.00302)	(0.003001)

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

5.3 Measuring Gender Earnings Gap: Quantile Regression Approach

The quantile regression outputs for the different quantiles are reported in Tables 5 & 6 for the years 2010 and 2015 respectively. The coefficients vary across quantiles. For 2010 data, the female coefficients are found highly statistically significant at the two lower conditional quantiles of earnings (Q10 and Q25). For 2015 the female coefficients are statistically significant at the 4 higher conditional quantiles (Q25, Q50, Q75, and Q90).

The ordinary least square (OLS) coefficient, reported in specification 5 of Tables 1 and 2, differs considerably from the QR coefficients, even those for median regression. This is the rationale behind using quantile regression. This study uses bootstrapped standard errors from 20 replications. One reason for coefficients differing across quantiles is the presence of heteroscedastic errors, which is evident in our study, and hence, the use of quantile regression is justified. For the hypothesis test of equality of the regression coefficient of females at different conditional quantiles, this study uses simultaneous quantile regression with specified values in the previous quantile regressions. It shows that the estimated value of $F(4, 4975)$ is 21.76 for 2010, and $F(4, 2072)$ is 2.70 for 2015, which rejects the null hypothesis of coefficient equality.

Table 5. Quantile Regression Output (2010)

VARIABLES	(1) Q10	(2) Q25	(3) Q50	(4) Q75	(5) Q90
Female	-0.197***	-0.158***	0.0304	0.0657	0.0392
	(0.0346)	(0.0329)	(0.0353)	(0.0226)	(0.0303)
Age	0.143***	0.0812***	0.0857***	0.0471**	0.0574*
	(0.0302)	(0.0232)	(0.0242)	(0.0221)	(0.0338)
Age squared	-0.0023***	-0.00118***	-0.00124***	-0.000592	-0.000852
	(0.000554)	(0.000430)	(0.000450)	(0.000416)	(0.000637)
Hours	0.00315***	0.00204**	4.24e-05	-0.000389	0.00206
	(0.00107)	(0.000885)	(0.000911)	(0.000932)	(0.00132)
Education Dummies	Yes	Yes	Yes	Yes	Yes
Occupation Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Division Dummies	Yes	Yes	Yes	Yes	Yes
Constant	4.803***	5.774***	6.023***	6.809***	6.913***
	(0.442)	(0.335)	(0.340)	(0.299)	(0.499)
Observations	5,020	5,020	5,020	5,020	5,020
R-squared	0.207	0.224	0.236	0.230	0.211

Note: Bootstrapped standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6. Quantile Regression Output (2015)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	**Q10**	**Q25**	**Q50**	**Q75**	**Q90**
Female	0.00514	-0.0393*	-0.0705***	-0.0364**	-0.0592***
	(0.0260)	(0.0224)	(0.0186)	(0.0180)	(0.0220)
Age	-0.0692***	-0.0438**	-0.0115	-0.0254	-0.0614***
	(0.0260)	(0.0212)	(0.0175)	(0.0170)	(0.0222)
Age squared	0.00146***	0.001000**	0.000333	0.000536*	0.00118***
	(0.000476)	(0.000389)	(0.000323)	(0.000318)	(0.000416)
Hours	0.00274***	0.00144	0.00120**	0.000527	0.000120
	(0.000904)	(0.000880)	(0.000603)	(0.000636)	(0.000885)
Education Dummies	Yes	Yes	Yes	Yes	Yes
Occupation Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Division Dummies	Yes	Yes	Yes	Yes	Yes
Constant	7.882***	7.672***	7.461***	7.990***	8.604***
	(0.418)	(0.326)	(0.282)	(0.278)	(0.292)
Observations	2,117	2,117	2,117	2,117	2,117
R-squared	0.390	0.435	0.454	0.439	0.423

Note: Bootstrapped standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

6. Concluding Remarks and Policy Implications

With the aim to examine the pattern of gender earnings gap among the urban youth in Bangladesh, we explore the gender earnings gap among youth over time, factors contributing to it, and whether the gender earnings gap varies across the distributions by applying the three approaches: Mincerian regression, Oaxaca-Blinder decomposition, and Quantile regression. The Mincerian regression results show that the gender earnings gap among the youth laborers increased in 2015 compared to 2010. In 2010 the exact earnings gap was 11.6 percent and it increased to 13.6 percent in 2015. However, the exact earnings gap reduced to 6 percent and 5 percent in 2010 and 2015 respectively after controlling for the influence of the relevant explanatory variables. This implies that the gender earnings gap among youth remained stagnant over the periods considered. Therefore, the first approach confirms that young women earn significantly less than young men in the urban labor markets after controlling for the influences of the covariates.

The Oaxaca-Blinder decomposition could explain 6.8 percent of the earnings difference of 11.6 percent in 2010 and 8.9 percent of the 13.6 percent in 2015. Therefore, the remaining unexplained gaps stand at 4.8 percent and 4.7 percent in 2010 and 2015 respectively. The detailed decomposition results of the second approach indicate that gender differences in work experience, hours worked, education and firm characteristics and locations also contribute to the gender earnings gap and the market discrimination against women's earnings remains the same over the years.

The ordinary least square (OLS) coefficients differ considerably from the quantile regression (QR) coefficients, even those for median regression. Hence, we used the quantile regression as well in our study. The quantile regression output also confirms the presence of heteroscedastic errors in the OLS earnings regression. For 2010 data, the female coefficients are found highly statistically significant at the two lower conditional quantiles of earnings (Q10 and Q25). The 2010 regression had a higher coefficient for Q10 compared to Q25, implying the higher earnings gap among youth at the lower end of their earnings distribution. For 2015 the coefficients are statistically significant at the four higher conditional quantiles (Q25, Q50, Q75, and Q90). Here no particular pattern is found. But the earnings gap was the highest at Q50. The gap in Q10 disappeared while gaps in Q50, Q75, and Q90 appeared in 2015 as opposed to 2010. This might be due to the fact that the minimum wage law for the RMG sector was in effect in 2015 but it was yet to be implemented in 2010. A significant part of the youth labor from the lower tail of the wage distribution of the Bangladeshi urban sector are RMG workers and so, in 2015, the gender wage gap at the lower end of the distribution went away in 2015. Therefore, the third approach using the lens of distribution perspective shows that earnings gaps persist up to the 25th percentile of distribution in 2010 though it persists across the entire earnings distribution in 2015.

Looking into the gap across different age groups, we found that, the wage gap is almost nonexistent among those aged 18-24 and quite high for males as opposed to females aged 25-35. These results suggest that providing equal opportunities especially to working mothers might help mitigate the wage gap discussed above.

A drawback of this paper is that the dataset did not allow us to factor in the impacts of having children. Even though we used marital status, the information on having children might have potentially provided us with more precise estimates.

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Declaration

We confirm that we do not have any competing interest.

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Appendix

Table A1: Descriptive Statistics

Characteristics	2010				2015			
	Male		Female		Male		Female	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Wage (Weekly)	1875.5	2293.7	1563.1	985.2	2744.9	1543.2	2408.1	1326.4
Age	27.38	4.95	25.86	5.08	28.53	4.69	27.06	4.97
Hours Worked (Weekly)	54.73	10.92	52.82	11.03	57.54	16.35	51.73	16.87
Literacy and Education								
Literacy	0.74	0.44	0.63	0.48	0.94	0.24	0.85	0.36
Class i-v	0.23	0.42	0.32	0.47	0.11	0.31	0.19	0.39
Class vi-viii	0.25	0.43	0.27	0.44	0.19	0.39	0.25	0.43
Class ix-x	0.19	0.39	0.16	0.36	0.16	0.36	0.17	0.38
SSC	0.10	0.30	0.06	0.24	0.07	0.25	0.04	0.20
HSC	0.08	0.27	0.05	0.22	0.12	0.33	0.07	0.26
Bachelors	0.06	0.24	0.05	0.21	0.10	0.30	0.06	0.25
Masters	0.05	0.21	0.05	0.21	0.10	0.30	0.05	0.23
Occupation								
Armed forces	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.05
Legislators, senior officials and managers	0.03	0.16	0.01	0.09	0.01	0.09	0.04	0.21
Professionals	0.04	0.20	0.12	0.33	0.12	0.33	0.22	0.41
Technician	0.03	0.18	0.03	0.18	0.03	0.18	0.04	0.19
Clerks	0.04	0.19	0.03	0.16	0.03	0.16	0.02	0.15
Service workers and shop and market sales	0.22	0.41	0.06	0.24	0.06	0.24	0.04	0.19
Skilled agricultural and fishery worker	0.03	0.18	0.00	0.06	0.00	0.06	0.01	0.08
Craft and related trade workers	0.15	0.36	0.16	0.37	0.16	0.37	0.37	0.48
Plant and machine operators and assembling	0.16	0.37	0.37	0.48	0.37	0.48	0.12	0.32
Elementary occupations	0.30	0.46	0.22	0.41	0.22	0.41	0.13	0.34
Division								
Barisal	0.05	0.22	0.03	0.18	0.02	0.13	0.02	0.15
Chattogram	0.22	0.41	0.22	0.41	0.17	0.37	0.23	0.42
Dhaka	0.43	0.50	0.49	0.50	0.57	0.49	0.60	0.49
Khulna	0.11	0.32	0.07	0.26	0.08	0.26	0.05	0.22
Rajshahi	0.13	0.34	0.14	0.34	0.10	0.30	0.07	0.26
Sylhet	0.06	0.24	0.05	0.23	0.06	0.25	0.02	0.15

Table A2: Mean Differences of Characteristics

Characteristics	Male 2010	Female 2010	Difference 2010	Male 2015	Female 2015	Difference 2015
Wage (Weekly)	1875.49	1563.06	312.44***	2744.98	2408.14	336.84***
Age	27.38	25.86	1.52***	28.53	27.06	1.47***
Hours Worked (Weekly)	54.73	52.82	1.91***	57.54	51.73	5.81***
Literacy and Education						
Literacy	0.23	0.32	-0.09***	0.11	0.19	-0.08***
Class i-v	0.25	0.27	-0.02	0.19	0.25	-0.06***
Class vi-viii	0.19	0.16	0.03***	0.16	0.17	-0.02
Class ix-x	0.10	0.06	0.04***	0.07	0.04	0.03***
SSC	0.08	0.05	0.03***	0.12	0.07	0.05***
HSC	0.06	0.05	0.01*	0.10	0.06	0.03***
Bachelors	0.05	0.05	0.00	0.10	0.05	0.05***
Masters	0.04	0.05	-0.01	0.13	0.12	0.01
Occupation						
Armed forces	0.00	0.00	0.00	0.02	0.00	0.02***
Legislators, senior officials and managers	0.03	0.01	0.02***	0.11	0.04	0.07***
Professionals	0.04	0.12	-0.08***	0.13	0.22	-0.08***
Technician	0.03	0.03	0.00	0.07	0.04	0.03***
Clerks	0.04	0.03	0.01	0.05	0.02	0.02***
Service workers and shop and market sales	0.22	0.06	0.16***	0.13	0.04	0.09***
Skilled agricultural and fishery worker	0.03	0.00	0.03***	0.00	0.01	0.00
Craft and related trade workers	0.15	0.16	-0.01	0.26	0.37	-0.11***
Plant and machine operators and assembling	0.16	0.37	-0.21***	0.14	0.12	0.02
Elementary occupations	0.30	0.22	0.08***	0.07	0.13	-0.06***
Division						
Barisal	0.05	-0.04	0.02**	0.02	0.03	-0.01
Chattogram	0.22	-0.05	0.00	0.17	0.22	-0.06***
Dhaka	0.43	0.14	-0.06***	0.57	0.49	-0.03
Khulna	0.11	-0.04	0.04***	0.08	0.07	0.02**
Rajshahi	0.13	-0.03	-0.01	0.10	0.14	0.03**
Sylhet	0.06	0.00	0.01	0.06	0.05	0.04***

Characteristics	Male 2010	Female 2010	Difference 2010	Male 2015	Female 2015	Difference 2015
Industry Classification						
Agriculture, forestry and fishing	0.11	0.04	0.07***	0.02	0.01	0.00
Mining and quarrying	0.00	0.00	0.00	0.00	0.00	0.00
Manufacturing	0.23	0.52	-0.3***	0.39	0.53	-0.14***
Electricity, gas, steam and air condition	0.01	0.00	0.01*	0.01	0.00	0.01*
Water supply; sewerage, waste management	0.00	0.00	0.00	0.00	0.00	0.00
Construction	0.10	0.03	0.07***	0.07	0.01	0.06***
Wholesale and retail trade; repair of m	0.18	0.02	0.16***	0.11	0.02	0.09***
Transportation and storage	0.15	0.02	0.13***	0.09	0.01	0.08***
Accommodation and food service activity	0.02	0.01	0.01***	0.01	0.00	0.01*
Information and communication	0.00	0.00	0.00*	0.02	0.01	0.01
Financial and insurance activities	0.02	0.02	0.01	0.04	0.03	0.01
Real estate activities	0.00	0.00	0.00*	0.00	0.00	0.00*
Professional, scientific and technical	0.00	0.00	0.00	0.01	0.01	0.00*
Administrative and support service activities	0.02	0.02	0.01	0.01	0.00	0.00*
Public administration and defense	0.02	0.02	0.01	0.09	0.03	0.06***
Education	0.03	0.11	-0.08***	0.06	0.16	-0.11***
Human health and social work activities	0.01	0.02	-0.01***	0.02	0.04	-0.02***
Arts, entertainment and recreation	0.00	0.00	0.00	0.00	0.00	0.00
Other service activities	0.06	0.08	-0.02*	0.04	0.03	0.01
Activities of households as employers;	0.01	0.10	-0.09***	0.01	0.09	-0.08***

Note: *** p<0.01, ** p<0.05, * p<0.1

Table A3. Wages across Age Groups and Gender

Characteristics	**2010**				
	Male		**Female**		**Difference**
	Mean	**SD**	**Mean**	**SD**	
Weekly Wage (for 18-24 years)	1435.97	1391.42	1484.44	878.43	-48.46
Number of Observations	**1292**		**453**		
Weekly Wage (for 25-35 years)	2035.60	2478.05	1591.92	993.81	443.68***
Number of Observations	**2736**		**539**		
Characteristics	**2015**				
	Male		**Female**		**Difference**
	Mean	**SD**	**Mean**	**SD**	
Weekly Wage (for 18-24 years)	2161.90	813.99	2080.01	782.67	81.89
Number of Observations	**261**		**254**		
Weekly Wage (for 25-35 years)	2892.93	1662.86	2558.60	1389.41	334.33***
Number of Observations	**1060**		**542**		

Note: *** p<0.01, ** p<0.05, * p<0.1