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Evidence from HIES 2016

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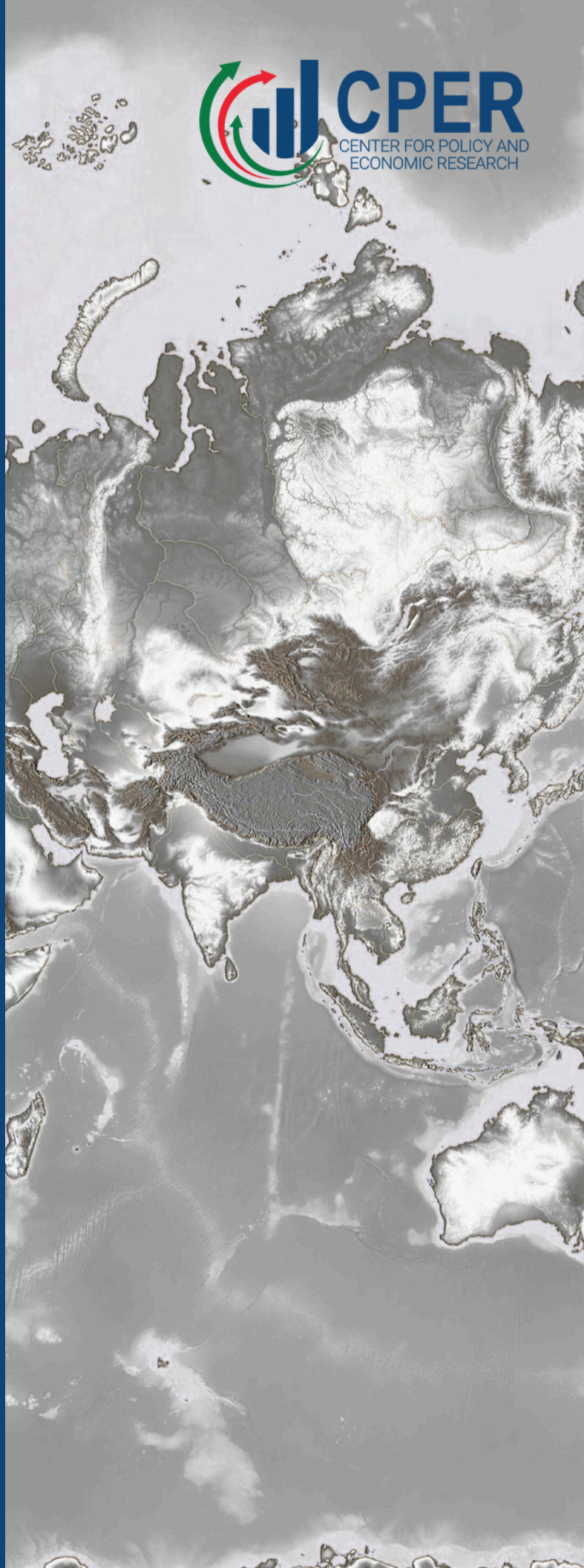

Exploring Wage Determinants and the Gender Wage Gap in Bangladesh's Daily Labor Market: Evidence from HIES 2016

Al Mamun*

December 2023

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Abstract

This study examines wage determination and gender-based wage disparities in Bangladesh's daily labor market, utilizing data from the 2016 Household Income and Expenditure Survey (HIES) and employing Ordinary Least Squares (OLS) and Quantile Regression techniques. The findings reveal a pronounced gender wage gap, with females earning on average 62.2% less than males. Although the disparity narrows across the wage distribution, the persistence of a "sticky floor" effect underscores structural inequalities at the lower end of the labor market. Wage outcomes are shaped by both human capital and socio-demographic factors, with their effects varying across different quantiles. The study highlights several policy implications, including the enforcement of equal pay regulations, promoting shared household responsibilities, and extending targeted labor market interventions, particularly within the informal sector. By offering a nuanced understanding of the determinants and dynamics of wage inequality, this research provides critical insights for designing policies that foster a more equitable daily labor market in Bangladesh.

Keywords: Wage determinants, Gender wage gap, Quantile regression, Daily labor market, Income inequality, Bangladesh

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Exploring Wage Determinants and the Gender Wage Gap in Bangladesh's Daily Labor Market: Evidence from HIES 2016

1. Introduction

Bangladesh has experienced remarkable economic growth over the past two decades, consistently exceeding 6% annually, even amidst episodes of global uncertainty. Several pivotal factors have driven this trajectory, including a robust demographic dividend, a dynamic export sector dominated by ready-made garments (RMG), resilient remittance inflows, and a relatively stable macroeconomic environment (World Bank, 2023). Alongside these achievements, the country has made substantial progress in reducing poverty and enhancing human development. Since gaining independence in 1971, Bangladesh has transformed from one of the world's poorest nations into a lower-middle-income country. Moreover, it is on course to graduate from the United Nations' list of Least Developed Countries (LDCs) by 2026 (World Bank, 2023).

The poverty rate has declined sharply, from 11.8% in 2010 to 5.0% in 2022. Per capita income has also shown a steady upward trend, rising from USD 2,462 in 2021 to USD 2,687 in 2022. Despite the economic setback triggered by the COVID-19 pandemic, which reduced growth to 3.45% in 2020, Bangladesh demonstrated a swift recovery, achieving a growth rate of 7.10% in 2022 (World Bank, 2023). Government stimulus packages, strong remittance inflows, robust export performance, increased agricultural productivity, and expansion in manufacturing, services, and infrastructure development supported this rebound.

However, despite these economic gains, the country continues to face pressing challenges. Persistent issues include high unemployment, income inequality, gender-based wage disparities, limited access to decent work, weak labor rights protections, rising living costs, corruption, insufficient access to essential services for low-income households, and relatively slow progress in innovation and technological development (Mamun, Arfanuzzaman, et al., 2023). Addressing these challenges requires a comprehensive understanding of the factors influencing wages. In particular, it is essential to examine the combined effects of human capital variables—such as education and experience—and social factors—including gender, religion, occupation, and economic activities—on individual earnings.

Against this backdrop, the primary objective of this study is to analyze the determinants of wages and the gender wage gap in Bangladesh's daily labor market. This research fills a critical gap in the existing literature by applying robust econometric methods to nationally representative data from the 2016 Household Income and Expenditure Survey (HIES). Specifically, the study seeks to answer the following research questions:

1. What are the primary determinants influencing wages in Bangladesh's daily labor market?
2. How do wages differ across social characteristics such as gender, age, marital status, religion, and the rural–urban divide, as well as human capital attributes such as education, working hours, work location, and regional context?
3. To what extent have human capital and social characteristics contributed to wage growth and inclusiveness in Bangladesh?
4. Is the gender wage gap shaped by differences in human capital and social factors, and how does this gap vary across the wage distribution?

The study contributes to a deeper understanding of income inequality, poverty, and gender wage disparities in Bangladesh, which continue to persist despite the country's rising per capita income. By generating rigorous empirical evidence on the drivers of wages and wage gaps, the findings aim to inform policies that promote equitable income distribution and foster inclusive economic growth.

The remainder of this paper is structured as follows: Section 2 reviews the relevant literature, Section 3 outlines the methodology, Section 4 describes the dataset, Section 5 presents and discusses the results, and Section 6 concludes with policy recommendations.

2. Literature review

Understanding the determinants of wages, including human capital and social factors, and addressing wage inequality in the labor markets of less developed countries has been the focus of extensive research in economic literature. Numerous studies consistently demonstrate a robust positive relationship between education and income, indicating that investments in education yield substantial economic returns (Asadullah, 2006b; Horie & Iwasaki, 2023; Mamun et al., 2021; Rahman et al., 2017). Bhutoria (2016) provided a nuanced analysis, revealing that formal education consistently generates higher individual economic returns compared to alternative pathways, with variability depending on factors such as qualification, field of study, age, experience, and gender. Psacharopoulos and Patrinos (2018) corroborated these findings, emphasizing the rising global private returns to higher education, while social returns remain significant. Notably, women continue to experience higher average returns from educational investments.

Human capital development has emerged as a critical driver of economic growth in Bangladesh, a relationship substantiated by several empirical studies (Chowdhury et al., 2018; Mamun, Arfanuzzaman, et al., 2023; Sharif et al., 2013). Education, as a key component of human capital, plays a significant role in driving economic growth (Collin & Weil, 2020; Cram, 2017). Furthermore, augmenting human and physical capital can help reduce gender wage gaps, diminish income inequality, and facilitate more equitable income distribution (Ruzik & Rokicka, 2010; Sehrawat & Singh, 2019; Shahpari & Davoudi, 2014; United Nations, 2016). For instance, in urban China, household income levels are primarily influenced by education and occupation (Su & Heshmati, 2013). In contrast, studies from the UK and Germany indicate that income disparities persist across genders even among individuals with similar educational attainment, highlighting the complex interplay between education and labor wages (Caliendo & Wittbrodt, 2022; Machin & Puhani, 2003; Theodoropoulos et al., 2022). In addition to formal education, workplace training has been shown to enhance labor productivity and wages (Acemoglu & Pischke, 1999; Blundell et al., 1999). While some studies report weak or no correlation between education and income (Földvári & van Leeuwen, 2011; Ning, 2010), these instances are relatively rare and generally considered outliers.

Beyond human capital, social and spatial factors—such as gender, rural-urban residence, and regional disparities—also contribute significantly to wage inequality across countries (Gharehgozli & Atal, 2020; Herrera et al., 2019; Liu et al., 2019; Mamun & Arfanuzzaman, 2020; Sauer et al., 2020; Zhang et al., 2016). Investment in human capital can enhance GDP growth and reduce inequality, while attention to social factors can improve overall well-being and dignity (Levchenko et al., 2018; Saygili et al., 2018; United Nations, 2016). Accordingly, Bangladesh requires a strategic transformation in human capital development alongside inclusive socio-economic progress (General Economics Division, 2021).

National development plans underscore this emphasis. The Seventh Five-Year Plan (2016–2020) prioritized citizen empowerment as the core of its development strategy, while the Eighth Five-Year Plan (2021–2026) continues to focus on human and physical capital development, poverty reduction, innovation, and economic governance to achieve the developmental transformation envisioned in Perspective Plan 2041. Complementing these initiatives, the National Education Policy (2010) aims to expand access to general, technical, vocational, and ICT education across rural and urban areas (Ministry of Education, 2010).

Recent progress in Bangladesh's education system has resulted in rising literacy rates and a growing proportion of the workforce attaining secondary, higher secondary, and tertiary education levels. This context underscores the significance of examining the impact of education and its associated social factors on household income, as well as identifying the determinants that influence income levels. While numerous studies have examined the relationship between education, wage gaps, and income inequality in Bangladesh and other countries (Ferdous, 2023; Hossain et al., 2015; Polacko, 2021; Rahman & Islam, 2013), relatively few have integrated human capital (education, working hours) and social factors (age, gender, religion, occupation, location, economic activity) in a comprehensive empirical analysis using nationally representative Household Income and Expenditure Survey (HIES) data. Addressing this gap is crucial for developing evidence-based policies in the domains of social welfare, human capital development, and labor market reform. Therefore, a rigorous investigation of wage determinants and wage gaps in Bangladesh's labor market is both timely and necessary.

3. Methodology

3.1 OLS Regression

This study aims to measure the unknown impact of a change in one variable on another variable using the ordinary least squares (OLS) regression method, a common technique in econometrics (Stock & Watson, 2003). The OLS method estimates the parameters of a linear function from a set of covariates by minimizing the sum of squared errors, $\sum_i \varepsilon_i^2$. The wage equation is derived from the Mincerian earnings function (Mincer, 1958), which relates income to human capital and other factors. The following Equation represents the general wage function that is used in this study:

$$\ln W_i = X'_i \beta_i + \varepsilon_i, \qquad i = 1,2,3,\dots,n, \qquad E(\varepsilon_{il}) = 0 \tag{1}$$

where $\ln W_i$ denotes the natural logarithm of daily wages, and i denotes individuals. X is the vector of predictors, which include individual characteristics such as age (a proxy for experience), education, daily working hours, daily others' income, religion, marital status, chronic illness, field of economic activity, occupation, area, and region. The constant β encompasses both the intercept and slope parameters. The error term ε has a zero mean and a constant variance. However, Equation 1 can be rewritten for the gender to examine the predictors' parameters separately, which can be expressed as follows:

$$\ln W_{il} = X'_{il} \beta_{il} + \varepsilon_{il}, \quad i = 1,2,3,\dots,n, \quad l \in \{M, F\}, \quad E(\varepsilon_{il}) = 0 \tag{2}$$

where l denotes gender (male (M) or female (F)). In other words, the Equation for males is $\ln W_{iM} = X'_{iM} \beta_{iM} + \varepsilon_{iM}$, and for females is $\ln W_{iF} = X'_{il} \beta_{iF} + \varepsilon_{iF}$. Equation (1) can be further reformulated by introducing a slope dummy variable to elucidate disparities in predictor slopes between genders:

$$\ln W_i = X'_i\beta_i + X'_i\beta_{iF} + \varepsilon_i \quad (3)$$

Here, the intercept and slope parameters for males are contained in β_i, while the intercept and slope parameters for females are contained in β_{iF}. By comparing the regression coefficients of males with those of females, Equation (3) determines the differences between the coefficients for each predictor level and identifies whether the wage gaps significantly differ.

3.2 Quantile Regression (QR)

The Ordinary Least Squares (OLS) regression method is frequently employed to estimate an explained variable's conditional mean value based on the provided values of the predictors. In contrast, quantile regression is used to calculate the conditional values of various quantiles of interest for the explained variable. Quantile regression can be considered an extended version of the OLS regression method. The daily wage equation model in the form of quantile regression, which has been developed based on the work of Koenker and Bassett (1978) and Buchinsky (1998), can be expressed as:

$$Q_q(\ln w_i|X_i) = X'_i\,\beta_q + \varepsilon_i \quad \text{for each } q \in (0,1) \quad (4)$$

The conditional quantile of $\ln w_i$ at the q^{th} quantile is denoted as $Q_q(\ln w_i|X_i)$, where X_i is a vector of n*1 regressors or a set of covariates for each i. The log of daily wages is represented by $\ln w_i$, and β_q is the coefficient vector of unknown parameters needed to estimate the different q^{th} quantiles, and ε_i represents the error term. However, the gender-specific conditional QR model can also be written as follows, from equation 4:

$$Q_q(\ln w_{il}|X_{il}) = X'_{il}\,\beta_{lq} + \varepsilon_{il} \quad \text{for each } q \in (0,1),\ l \in \{M,F\} \quad (5)$$

where l is used to denote gender as either Male (M) or Female (F). In other words, the Equation for males is $Q_q(\ln w_{iM}|X_{iM}) = X'_{iM}\,\beta_{Mq} + \varepsilon_{iM}$, and for the females is $Q_q(\ln w_{iF}|X_{iF}) = X'_{iF}\,\beta_{lF} + \varepsilon_{iF}$. In quantile regression, standard errors can be obtained using bootstrapping methods. This study estimates the quantiles at q = 0.10, 0.25, 0.50, 0.75, and 0.90, where q = 0.50 represents the median or the Least Absolute Deviations (LAD) regression. Additionally, the conditional quantile log wage function incorporating a slope dummy variable can be expressed as:

$$Q_q(\ln w_i|X_i) = X'_i\,\beta_q + X'_i\beta_{qF} + \varepsilon_i \quad (6)$$

The parameter vector β_q comprises intercept and slope parameters for males at various quantiles, while the parameter vector βqF includes intercept and slope parameters for females at the same quantiles. Equation (6) presents the estimated differences in coefficients between males and females at different quantiles for each predictor level, determining whether the wage gaps are significantly different. However, the estimation of the β_q parameter at the q^{th} quantile is obtained by solving the minimization problem:

$$Q(\beta_q) = \min \beta \sum_{i:w_i \geq x'_i\beta}^{N} q|\ln w_i - x'_i\beta_q| + \sum_{i:w_i<x'_i\beta}^{N} (1-q)|\ln w_i - x'_i\beta_q| \quad (7)$$

Where $0 < q < 1$

Quantile regression is preferred over least squares regression due to its robustness against heteroskedastic errors and outliers. Moreover, it is considered semiparametric as it avoids making assumptions about the parametric distribution of the error process. Hence, it provides an efficient means of characterizing the entire distribution and adds considerable value if the relationship between the regressand and regressors evolves across its conditional distribution (Martins & Pereira, 2004).

4. Data

4.1 Data and Variables

The data for this study were sourced from the 2016 Household Income and Expenditure Survey (HIES), conducted by the Bangladesh Bureau of Statistics (BBS). The HIES 2016 surveyed 186,075 individuals from 46,080 households, with a gender distribution of 49.73% male and 50.27% female. The survey employed a two-stage stratified random sampling method (BBS, 2016). For this analysis, the focus was on individuals engaged in daily labor activities, aged 5–70 years, excluding cases with missing values for the selected variables.[2] The final analytical sample consisted of 14,384 valid observations, of which 94.07% were male and 5.93% female.

The dependent variable in this study was the daily wage. In contrast, the independent variables included age (as a proxy for experience), additional income sources, daily working hours, gender, education level, religion, marital status, chronic illness, geographical area, economic activity sector, region, and occupation. It is noteworthy that the dataset did not include certain potentially relevant variables, such as the number of children, detailed work experience, or tenure in the current occupation. Despite these limitations, the HIES 2016 dataset is nationally representative and well-suited for analyzing wage disparities among daily laborers in Bangladesh.

Table 1 presents summary statistics for the selected variables, highlighting gender disparities in the daily labor market. In 2016, the mean daily wage was Tk. 346.51 (Tk. 353.42 for males and Tk. 236.84 for females), yielding a raw gender wage gap of Tk. 116.57, significant at the 1% level.[3] Laborers also received additional income from other sources, with an average of Tk. 217.90 (Tk. 219.35 for males and Tk. 194.90 for females), reflecting a gender gap of Tk. 24.45.

The data indicate that the average daily working time was 8.36 hours, with males working approximately one hour more than females, contributing to higher earnings. The average age of the sample was 34 years, with males being slightly older (33.89 years) than females, suggesting greater labor market experience.

Education exhibited a negative relationship with labor participation rates in the daily labor market, beginning at the primary level. Participation rates for both genders decreased with higher educational attainment, although males consistently demonstrated higher participation rates than females, except at the high school level. Over 90% of participants had an education level below 'above high school', indicating limited higher education among daily laborers.

Religious affiliation also influenced participation. Among Muslim respondents, male labor force participation exceeded that of females by approximately 12%, reflecting the predominant role of Islam in societal norms. Conversely, among non-Muslims (including Hindus, Buddhists, Christianity, and

[2] The HIES 2016 dataset considered individuals who were five years or older for the analysis of economic activities.
[3] The daily wage is the sum of all forms of daily earnings that they received in cash and in-kind.

other faiths), females exhibited a 12% higher participation rate. Notably, females with chronic illnesses participated at higher rates than males, whereas males had an advantage when chronic illness was absent.

Marital status was a significant determinant of labor participation. Most married males (79.4%) and married females (75.9%) were active in the daily labor market, compared to 20% of unmarried males and 10.2% of unmarried females, with the gender difference significant at the 1% level. Interestingly, among widowed, divorced, or separated individuals, female participation exceeded that of males by 13.3 percentage points, suggesting that marital status interacts with economic incentives and social roles (Mamun & Arfanuzzaman, 2020; Mamun, Arfanuzzaman, et al., 2022).

Sectoral and regional variations further highlighted gender disparities. In 2016, both genders had higher participation in non-agricultural sectors than in agricultural sectors. Female participation was slightly higher in non-agricultural sectors (1%), whereas males dominated agricultural work (0.6%). Geographically, females had higher participation in rural areas (5.7%), while males were more active in urban areas (5.7%). Occupational segregation indicated higher male participation in the service sector (7.6%) and the agricultural sector (2.1%), whereas females dominated in the industrial sector (9.6%). Regionally, female participation was higher in Chittagong, Rajshahi, and Rangpur, while male participation was higher in Barisal, Dhaka, Khulna, Mymensingh, and Sylhet. Overall, gender gaps in participation rates, although generally modest, were statistically significant across sectors and regions.

Table 1. Summary Statistics and Raw Gender Wage Gap

	Full	**Male**	**Female**	**Difference (Male-Female) t-test**
Daily Wage	346.512 (302.141)	353.416 (276.053)	236.843 (564.312)	116.573***
Age	33.801 (11.993)	33.880 (12.030)	32.554 (11.341)	1.326***
Daily Working Hours	8.343 (1.928)	8.414 (1.888)	7.216 (2.191)	1.198***
Daily Other Income	217.902 (999.012)	219.351 (1005.941)	194.897 (881.881)	24.454***
Gender				
Male	0.941 (0.236)	… …	… …	…
Female	0.059 (0.236)	… …	… …	…
Education:				
No classes passed	0.011 (0.106)	0.012 (0.107)	0.009 (0.096)	0.003
Primary	0.603 (0.489)	0.605 (0.489)	0.573 (0.495)	0.032
High School	0.312 (0.463)	0.310 (0.462)	0.351 (0.478)	-0.04
Above High School	0.073 (0.260)	0.073 (0.261)	0.067 (0.250)	0.006
Religion:				

Muslim	0.839 (0.368)	0.846 (0.361)	0.724 (0.447)	0.122***
Non-Muslim	0.161 (0.368)	0.154 (0.361)	0.276 (0.447)	-0.122***
Marital Status:				
Married	0.792 (0.406)	0.794 (0.404)	0.759 (0.428)	0.035
Unmarried	0.194 (0.395)	0.200 (0.400)	0.102 (0.303)	0.098***
Widowed/ Divorced/ Separated	0.014 (0.117)	0.006 (0.078)	0.139 (0.347)	-0.133***
Chronic Illness:				
Have a Chronic Illness	0.190 (0.392)	0.187 (0.390)	0.233 (0.423)	-0.046*
No Chronic Illness	0.810 (0.392)	0.813 (0.390)	0.767 (0.423)	0.046*
Field of Economic Activity:				
Agriculture	0.425 (0.494)	0.425 (0.494)	0.419 (0.494)	0.006
Non-Agriculture	0.575 (0.494)	0.575 (0.494)	0.581 (0.494)	-0.01
Occupation:				
Service Sector	0.374 (0.484)	0.379 (0.485)	0.303 (0.460)	0.076**
Agricultural Sector	0.427 (0.495)	0.428 (0.495)	0.407 (0.492)	0.021
Industrial Sector	0.199 (0.399)	0.193 (0.395)	0.289 (0.454)	-0.096***
Area:				
Rural Area	0.738 (0.439)	0.735 (0.441)	0.792 (0.406)	-0.057*
Urban Area	0.262 (0.440)	0.265 (0.441)	0.208 (0.406)	0.057*
Region:				
Barisal	0.089 (0.285)	0.090 (0.286)	0.069 (0.254)	0.021
Chittagong	0.157 (0.364)	0.155 (0.362)	0.194 (0.396)	-0.04
Dhaka	0.154 (0.361)	0.158 (0.365)	0.090 (0.287)	0.068***
Khulna	0.210 (0.407)	0.210 (0.408)	0.198 (0.399)	0.012
Mymensingh	0.045 (0.208)	0.046 (0.209)	0.037 (0.190)	0.009
Rajshahi	0.128 (0.334)	0.125 (0.331)	0.173 (0.379)	-0.05
Rangpur	0.146 (0.353)	0.144 (0.351)	0.178 (0.383)	-0.034*

Sylhet	0.071 (0.256)	0.071 (0.257)	0.060 (0.237)	0.011
Observations	14,383	13,529	854	14,383

Note: The difference is calculated as $\bar{X}_M - \bar{X}_F$, where $\bar{X}_M$ denotes the mean values of males and $\bar{X}_F$ denotes the mean value of females.

4.2 Description of the Gender Wage Gap

Figure 1 presents the kernel density estimates of the logarithm of daily wages, illustrating the distribution of wages by gender. The figure reveals apparent differences in the wage distribution patterns between men and women. Consistent with these visual observations, the two-sample Kolmogorov–Smirnov test rejects the null hypothesis, indicating that the distributions of logarithmic daily wages for males and females are statistically distinct and do not follow a normal distribution (p-value = 0.000).

The analysis of logarithmic daily wages is presented in Table 2, highlighting the male–female wage gap across key quantiles. The results indicate that males consistently earn higher daily log wages than females at all quantiles and at the mean. The wage gap is particularly pronounced at the lower end of the distribution, gradually narrowing as it progresses from the lower to the upper quartiles, reflecting a persistent "sticky floor" phenomenon. The mean wage gap is estimated at 0.704 log points, while the gaps at the 10^{th}, 25^{th}, 50^{th}, 75^{th}, and 90^{th} quantiles are 1.386, 0.916, 0.568, 0.470, and 0.357 log points, respectively. These findings highlight a substantial gender wage disparity in Bangladesh's daily labor market, with males consistently earning more than females across all wage levels. Notably, the wage gap widened in 2016 relative to 2010, coinciding with an overall increase in wage levels (Mamun, 2017).

5. Results and Discussion

5.1 Estimates of OLS and Quantile Regression

Table 3 presents the results of the OLS and quantile regression analyses. The OLS model demonstrates a reasonable fit, with an R-squared value of 0.28 (O'Brien, 2007), and the majority of predictors are statistically significant at the 1% level. The analysis reveals a substantial gender wage gap, with females earning approximately 62.2% less per day than males. This gap persists across all quantiles, although it decreases from the lower to upper quantiles, supporting the study's hypothesis of a "sticky floor" effect in the labor market. Figure 2 illustrates this declining trend, highlighting the concentration of lower wages among female laborers.

Notably, the unexplained portion of the wage differentials in the regression analysis is primarily attributed to gender, indicating that observable predictors alone cannot account for the entire disparity. These findings are consistent with earlier studies, including Rahman and Islam (2003), who analyzed HIES datasets from 1989, 1995, and 2000, and Mamun (2017), who examined HIES 2010 data, both of which report similar evidence of persistent gender wage gaps in Bangladesh's labor market.

The coefficients for age and age-squared are statistically significant at the 1% level across the mean and all quantiles of the wage distribution. However, the overall impact of age on wages is modest. The

mean return on an additional year of age is 2.64%, with returns declining from the lower to the upper quantiles. Positive age coefficients coupled with negative age-squared coefficients indicate that while wages initially increase with age, the marginal effect diminishes as workers grow older. Similarly, the coefficient for working hours is statistically significant at the 1% level across the mean (2.90%) and all quantiles, with the return on additional hours diminishing as one moves toward the upper quantiles, indicating decreasing marginal returns. The effect of other income is positive but relatively small, reaching statistical significance at the mean and the 25th quantile, and extending toward the upper quantiles.

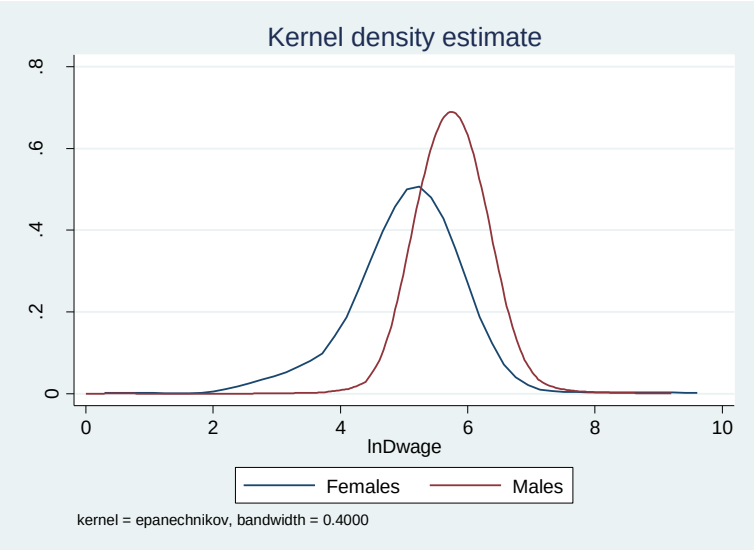

Figure 1. Kernel Density Estimates of Log Daily Wage Distribution by Gender

Table 2. Log Daily Wage and Male-Female Wage Gap in Different Quantiles

Quantile	Males	Females	Male-Female Wage Gap
0.10	5.298	3.912	1.386
0.25	5.521	4.605	0.916
0.50	5.704	5.136	0.568
0.75	5.991	5.521	0.470
0.90	6.215	5.858	0.357
Mean	5.752	5.047	0.704
Observations	13,529	854	14,383

Education emerges as a critical determinant of wages, consistent with previous research (Asadullah, 2006b; Barmon et al., 2012; Mamun et al., 2018, 2019; Mamun & Arfanuzzaman, 2020). The regression results indicate that only individuals with education above the high school level earn significantly higher wages at the mean and across quantiles. Although employees with primary and high school education earn more than those without formal education, these differences are generally not

statistically significant, except for high school graduates at the 75th quantile. Employees with above-high-school education earn 15.3% more on average and significantly higher wages at the 75th and 90th percentiles. At the 75th quantile, high school graduates earn 6.79% more than the no-education group, indicating a modest but significant advantage.

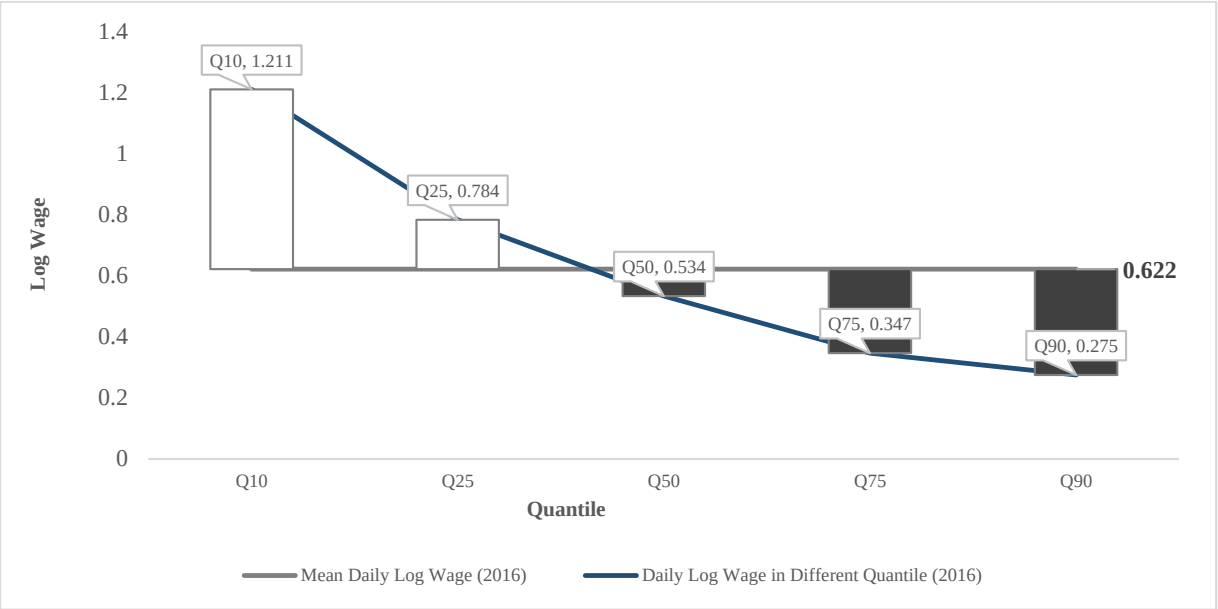

Figure 2. Distribution of Log Wage at the Mean and Different Quantiles

Religious affiliation also affects wages. Non-Muslim employees earn significantly less than their Muslim counterparts at the mean (7.37%) and across all quantiles at the 1% significance level. Compared to 2010, the earnings gap between non-Muslims and Muslims narrowed in 2016, potentially due to lower participation of non-Muslims in the daily labor market (Mamun, 2017), consistent with observations by Al-Samarrai (2006).

Marital status is another significant factor in determining wage distribution. Married employees earn higher wages than their unmarried or otherwise categorized peers (widowed, divorced, or separated). On average, unmarried employees earn 7.37% less, and employees with other marital statuses earn 9.03% less than married employees. This disparity persists across quantiles, although for unmarried employees, the wage gap decreases from lower to upper quantiles. Employees with other marital statuses exhibit significant differences from the median to upper quantiles, reflecting some variation in wage distribution.

The presence of chronic disease also influences wages. Employees without chronic conditions earn more than those with chronic illnesses across the mean and all quantiles, suggesting that workers with chronic conditions may require additional resources to meet healthcare needs and family obligations, particularly at the higher end of the wage distribution.

Economic activity and occupational sector significantly shape wage outcomes. Employees in the non-agricultural sector earn higher wages than those in agriculture, with significant differences observed at the mean and across the 25th to 90th quantiles, indicating that non-agricultural activities offer better remuneration for skilled and experienced workers. Conversely, the service sector exhibits

Table 3. OLS and Quantile Regression of Log Daily Wage

	OLS	Q10	Q25	Q50	Q75	Q90
Female	-0.622***	-1.211***	-0.784***	-0.534***	-0.347***	-0.275***
	(0.0280)	(0.0294)	(0.0178)	(0.0144)	(0.0153)	(0.0250)
Age	0.0264***	0.0347***	0.0238***	0.0188***	0.0203***	0.0180***
	(0.00222)	(0.00363)	(0.00220)	(0.00178)	(0.00188)	(0.00309)
Age Square	-0.0298***	-0.0417***	-0.0279***	-0.0211***	-0.0219***	-0.0194***
	(0.00264)	(0.00440)	(0.00267)	(0.00216)	(0.00228)	(0.00374)
Daily Working Hours	0.0290***	0.0236***	0.0194***	0.0177***	0.0183***	0.0185***
	(0.00270)	(0.00367)	(0.00222)	(0.00180)	(0.00190)	(0.00312)
Daily Other Income	0.0000166**	-0.00000546	0.00000811*	0.0000182***	0.0000222***	0.0000382***
	(0.00000520)	(0.00000670)	(0.00000406)	(0.00000328)	(0.00000347)	(0.00000570)
Education:						
Primary	0.0197	-0.00811	-0.0254	-0.00475	0.0258	0.0388
	(0.0256)	(0.0620)	(0.0376)	(0.0304)	(0.0321)	(0.0528)
High School	0.0477	0.0160	-0.00116	0.0205	0.0679*	0.0896
	(0.0261)	(0.0626)	(0.0379)	(0.0307)	(0.0324)	(0.0532)
Above High School	0.153***	0.0218	0.0394	0.0623	0.125***	0.264***
	(0.0305)	(0.0661)	(0.0400)	(0.0324)	(0.0342)	(0.0562)
Religion:						
Non-Muslim	-0.0737***	-0.137***	-0.0948***	-0.0655***	-0.0626***	-0.0356*
	(0.0105)	(0.0183)	(0.0111)	(0.00899)	(0.00950)	(0.0156)
Marital Status:						
Unmarried	-0.0737***	-0.137***	-0.0948***	-0.0655***	-0.0626***	-0.0356*
	(0.0105)	(0.0183)	(0.0111)	(0.00899)	(0.00950)	(0.0156)
Widowed/ Divorced/ Separated	-0.0903*	-0.00894	-0.0399	-0.0953***	-0.165***	-0.129**
	(0.0429)	(0.0580)	(0.0351)	(0.0284)	(0.0300)	(0.0493)
Chronic Illness:						
No Chronic Illness	0.0614***	0.0483**	0.0588***	0.0465***	0.0427***	0.0325*
	(0.00997)	(0.0175)	(0.0106)	(0.00857)	(0.00905)	(0.0149)
Field of Economic Activity:						
Non Agriculture	0.0739***	0.0111	0.0536**	0.0998***	0.155***	0.158***
	(0.0158)	(0.0297)	(0.0180)	(0.0146)	(0.0154)	(0.0253)
Occupation:						
Agricultural Sector	-0.0706***	-0.0297	-0.0517**	-0.0625***	-0.0804***	-0.134***
	(0.0161)	(0.0300)	(0.0182)	(0.0147)	(0.0155)	(0.0255)
Industrial Sector	-0.0452***	0.0243	0.0191	-0.0177*	-0.0613***	-0.102***

	(0.0109)	(0.0184)	(0.0111)	(0.00901)	(0.00952)	(0.0156)
Area:						
Urban Area	0.0863***	0.0240	0.0576***	0.0812***	0.0942***	0.116***
	(0.0101)	(0.0170)	(0.0103)	(0.00836)	(0.00883)	(0.0145)
Region:						
Chittagong	0.0861***	-0.0563*	0.0129	0.0745***	0.117***	0.144***
	(0.0152)	(0.0280)	(0.0169)	(0.0137)	(0.0145)	(0.0238)
Dhaka	0.0333*	-0.0792**	-0.0370*	0.0307*	0.0603***	0.0905***
	(0.0138)	(0.0279)	(0.0169)	(0.0137)	(0.0144)	(0.0237)
Khulna	-0.239***	-0.369***	-0.297***	-0.221***	-0.175***	-0.174***
	(0.0139)	(0.0266)	(0.0161)	(0.0130)	(0.0138)	(0.0226)
Mymensingh	0.0635**	-0.158***	-0.0682**	0.0275	0.111***	0.248***
	(0.0217)	(0.0382)	(0.0231)	(0.0187)	(0.0198)	(0.0324)
Rajshahi	-0.238***	-0.377***	-0.331***	-0.256***	-0.190***	-0.106***
	(0.0165)	(0.0288)	(0.0175)	(0.0141)	(0.0149)	(0.0245)
Rangpur	-0.287***	-0.357***	-0.335***	-0.280***	-0.263***	-0.233***
	(0.0141)	(0.0283)	(0.0171)	(0.0139)	(0.0147)	(0.0241)
Sylhet	-0.0843***	-0.298***	-0.137***	-0.0720***	0.0121	0.00828
	(0.0183)	(0.0335)	(0.0203)	(0.0164)	(0.0174)	(0.0285)
Constant	5.006***	4.725***	5.071***	5.265***	5.317***	5.530***
	(0.0569)	(0.107)	(0.0649)	(0.0526)	(0.0556)	(0.0912)
N	14383	14383	14383	14383	14383	14383
R-squared	0.279	...	...	...	...	...
Adjusted R-squared	0.277	...	...	...	...	...
Root MSE	0.439	...	...	...	...	...

Note: Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001
OLS and quantile regression coefficients have been estimated using Equations 1 and 4.

Table 4. Gender-Specific OLS and Quantile Regression of Log Daily Wage and Gender Wage Gap

	OLS			Q10			Q25		
	Male	Female	Gap	Male	Female	Gap	Male	Female	Gap
Age	0.0287***	0.00281	-0.0259*	0.0347***	0.00290	-0.0318*	0.0246***	0.0115	-0.0131
	(0.00215)	(0.0132)	(0.0132)	(0.00332)	(0.0288)	(0.0143)	(0.00207)	(0.0204)	(0.00911)
Age Square	-0.0329***	0.00375	0.0366*	-0.0423***	0.00152	0.0438*	-0.0288***	-0.00992	0.0189
	(0.00256)	(0.0171)	(0.0171)	(0.00402)	(0.0368)	(0.0182)	(0.00250)	(0.0261)	(0.0116)
Daily Working Hours	0.0164***	0.128***	0.112***	0.0147***	0.146***	0.131***	0.0103***	0.133***	0.123***
	(0.00250)	(0.0152)	(0.0153)	(0.00340)	(0.0259)	(0.0130)	(0.00211)	(0.0184)	(0.00826)
Daily Other Income	0.0000137**	0.0000915**	0.0000778*	-0.00000523	0.0000697	0.0000749*	0.00000741*	0.0000725	0.0000651***
	(0.00000472)	(0.0000306)	(0.0000306)	(0.00000605)	(0.0000627)	(0.0000308)	(0.00000377)	(0.0000445)	(0.0000196)
Education:									
Primary	0.0178	-0.0589	-0.0767	-0.00714	0.117	0.124	-0.00333	-0.225	-0.222
	(0.0233)	(0.214)	(0.213)	(0.0561)	(0.556)	(0.273)	(0.0349)	(0.394)	(0.174)
High School	0.0473*	-0.0330	-0.0803	0.0180	0.0403	0.0223	0.0218	-0.185	-0.206
	(0.0238)	(0.217)	(0.216)	(0.0566)	(0.562)	(0.277)	(0.0352)	(0.398)	(0.176)
Above High School	0.145***	0.244	0.0988	0.0109	0.212	0.201	0.0602	-0.0500	-0.110
	(0.0286)	(0.232)	(0.231)	(0.0598)	(0.592)	(0.291)	(0.0372)	(0.419)	(0.185)
Religion:									
Non-Muslim	-0.0819***	-0.114*	-0.0318	-0.154***	-0.164	-0.0101	-0.0954***	-0.179	-0.0839*
	(0.0102)	(0.0554)	(0.0556)	(0.0169)	(0.133)	(0.0663)	(0.0105)	(0.0942)	(0.0423)
Marital Status:									
Unmarried	-0.0416**	-0.0609	-0.0194	-0.0671**	-0.0701	-0.00304	-0.0423**	0.0589	0.101
	(0.0137)	(0.100)	(0.0998)	(0.0224)	(0.229)	(0.113)	(0.0139)	(0.163)	(0.0718)
Widowed/ Divorced/ Separated	-0.0828*	-0.0839	-0.00117	-0.0829	0.0212	0.104	-0.0756	-0.00993	0.0657
	(0.0400)	(0.0728)	(0.0823)	(0.0768)	(0.161)	(0.113)	(0.0478)	(0.114)	(0.0718)
Chronic Illness:									
No Chronic Illness	0.0544***	0.109	0.0545	0.0477**	-0.0184	-0.0661	0.0583***	0.0669	0.00861
	(0.00935)	(0.0710)	(0.0707)	(0.0160)	(0.138)	(0.0682)	(0.00993)	(0.0975)	(0.0435)
Field of Economic Activity:									
Non Agriculture	0.0913***	-0.0301	-0.121	0.0353	-0.149	-0.184	0.0628***	-0.131	-0.194*
	(0.0144)	(0.132)	(0.131)	(0.0271)	(0.244)	(0.121)	(0.0168)	(0.173)	(0.0770)
Occupation:									
Agricultural Sector	-0.0898***	0.125	0.215	-0.0254	0.488	0.514***	-0.0617***	0.175	0.237**
	(0.0145)	(0.131)	(0.130)	(0.0273)	(0.250)	(0.124)	(0.0170)	(0.177)	(0.0788)
Industrial Sector	-0.0234*	-0.109	-0.0857	0.0496**	-0.0713	-0.121	0.0294**	-0.0398	-0.0692
	(0.0101)	(0.0716)	(0.0714)	(0.0168)	(0.145)	(0.0720)	(0.0105)	(0.103)	(0.0459)
Area:									
Urban Area	0.0718***	0.286***	0.214**	0.0142	0.301*	0.287***	0.0604***	0.308**	0.247***
	(0.00975)	(0.0696)	(0.0694)	(0.0155)	(0.147)	(0.0723)	(0.00963)	(0.104)	(0.0461)
Region:									
Chittagong	0.0693***	0.186	0.116	-0.0584*	0.537*	0.596***	-0.00781	0.334	0.342***
	(0.0137)	(0.153)	(0.152)	(0.0254)	(0.249)	(0.122)	(0.0158)	(0.176)	(0.0780)
Dhaka	0.0281*	0.0318	0.00363	-0.0822**	0.250	0.333*	-0.0446**	0.246	0.290***

	(0.0121)	(0.155)	(0.153)	(0.0251)	(0.277)	(0.136)	(0.0156)	(0.196)	(0.0865)
Khulna	-0.229***	-0.443**	-0.215	-0.368***	-0.284	0.0841	-0.296***	-0.247	0.0488
	(0.0120)	(0.151)	(0.150)	(0.0241)	(0.239)	(0.117)	(0.0150)	(0.169)	(0.0748)
Mymensingh	0.0595**	0.0704	0.0109	-0.173***	0.273	0.446**	-0.0715***	-0.0251	0.0415
	(0.0202)	(0.199)	(0.197)	(0.0345)	(0.346)	(0.170)	(0.0215)	(0.245)	(0.108)
Rajshahi	-0.219***	-0.382*	-0.163	-0.367***	-0.348	0.0195	-0.325***	-0.247	0.0776
	(0.0145)	(0.152)	(0.151)	(0.0263)	(0.243)	(0.120)	(0.0163)	(0.172)	(0.0765)
Rangpur	-0.281***	-0.345*	-0.0640	-0.349***	0.0147	0.364**	-0.337***	-0.174	0.163*
	(0.0123)	(0.150)	(0.149)	(0.0257)	(0.246)	(0.121)	(0.0160)	(0.174)	(0.0772)
Sylhet	-0.0922***	-0.113	-0.0205	-0.314***	-0.0283	0.285	-0.146***	-0.118	0.0275
	(0.0172)	(0.156)	(0.155)	(0.0303)	(0.310)	(0.152)	(0.0189)	(0.220)	(0.0970)
Constant	5.080***	4.080***	5.080***	4.793***	2.774**	4.793***	5.115***	3.590***	5.115***
	(0.0533)	(0.396)	(0.0534)	(0.0980)	(0.858)	(0.105)	(0.0610)	(0.608)	(0.0667)
N	13529	854	14383	13529	854	14383	13529	854	14383
R-sq	0.213	0.291	0.307	…	…	…	…	…	…
adj. R-sq	0.212	0.272	0.305	…	…	…	…	…	…
rmse	0.406	0.720	0.431	…	…	…	…	…	…

Note: Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001
The coefficients of gender-specific OLS and quantile regression have been estimated using Equations 2 and 5.
Similarly, the coefficients of the slope dummy variable for OLS and quantile regression have been estimated using Equations 3 and 6.

Table A4 (Continued)

	Q50			**Q75**			**Q90**		
	Male	Female	Gap	Male	Female	Gap	Male	Female	Gap
Age	0.0191***	0.00285	-0.0162*	0.0218***	0.00257	-0.0192*	0.0201***	-0.000727	-0.0209
	(0.00171)	(0.0147)	(0.00751)	(0.00181)	(0.0109)	(0.00758)	(0.00308)	(0.0165)	(0.0124)
Age Square	-0.0215***	-0.00200	0.0195*	-0.0239***	-0.00135	0.0225*	-0.0221***	0.0116	0.0337*
	(0.00207)	(0.0188)	(0.00954)	(0.00218)	(0.0139)	(0.00964)	(0.00373)	(0.0210)	(0.0158)
Daily Working Hours	0.0116***	0.141***	0.129***	0.0140***	0.0980***	0.0840***	0.0151***	0.0773***	0.0622***
	(0.00175)	(0.0132)	(0.00680)	(0.00185)	(0.00977)	(0.00687)	(0.00315)	(0.0148)	(0.0112)
Daily Other Income	0.0000156***	0.0000730*	0.0000574***	0.0000204***	0.000117***	0.0000966***	0.0000276***	0.000113**	0.0000855**
	(0.00000311)	(0.0000320)	(0.0000162)	(0.00000329)	(0.0000237)	(0.0000163)	(0.00000561)	(0.0000358)	(0.0000267)
Education:									
Primary	0.00790	-0.235	-0.0931	0.0263	0.0637	0.0374	0.0285	0.330	0.302
	(0.0289)	(0.284)	(0.144)	(0.0305)	(0.210)	(0.145)	(0.0520)	(0.317)	(0.237)
High School	0.0294	-0.0950	0.0258	0.0638*	0.128	0.0641	0.0809	0.411	0.330
	(0.0291)	(0.287)	(0.145)	(0.0308)	(0.212)	(0.147)	(0.0525)	(0.321)	(0.240)
Above High School	0.0695*	0.0100	0.0907	0.121***	0.217	0.0958	0.272***	0.489	0.217
	(0.0308)	(0.302)	(0.153)	(0.0325)	(0.223)	(0.154)	(0.0554)	(0.338)	(0.252)
Religion:									
Non-Muslim	-0.0647***	-0.153*	-0.0881*	-0.0535***	-0.188***	-0.135***	-0.0341*	-0.216**	-0.182**
	(0.00869)	(0.0679)	(0.0348)	(0.00918)	(0.0502)	(0.0352)	(0.0157)	(0.0759)	(0.0575)

Marital Status:									
Unmarried	-0.0374**	-0.191	-0.154**	-0.00635	-0.109	-0.103	-0.0293	-0.0357	-0.00637
	(0.0115)	(0.117)	(0.0592)	(0.0122)	(0.0865)	(0.0597)	(0.0207)	(0.131)	(0.0976)
Widowed/ Divorced/ Separated	-0.0725	-0.158	-0.0768	-0.0756	-0.182**	-0.107	-0.0418	-0.155	-0.114
	(0.0395)	(0.0822)	(0.0592)	(0.0418)	(0.0607)	(0.0598)	(0.0712)	(0.0918)	(0.0977)
Chronic Illness:									
No Chronic Illness	0.0371***	0.0513	0.0142	0.0359***	0.0582	0.0223	0.0257	0.0755	0.0498
	(0.00821)	(0.0703)	(0.0358)	(0.00867)	(0.0519)	(0.0362)	(0.0148)	(0.0785)	(0.0591)
Field of Economic Activity:									
Non Agriculture	0.108***	0.0591	-0.0490	0.159***	-0.0426	-0.201**	0.172***	-0.179	-0.351***
	(0.0139)	(0.125)	(0.0634)	(0.0147)	(0.0922)	(0.0641)	(0.0251)	(0.139)	(0.105)
Occupation:									
Agricultural Sector	-0.0664***	0.00286	0.0693	-0.0847***	-0.176	-0.0915	-0.124***	-0.322*	-0.197
	(0.0140)	(0.128)	(0.0649)	(0.0148)	(0.0944)	(0.0655)	(0.0253)	(0.143)	(0.107)
Industrial Sector	-0.00574	-0.155*	-0.149***	-0.0483***	-0.173**	-0.125**	-0.0943***	-0.229**	-0.135*
	(0.00865)	(0.0743)	(0.0378)	(0.00914)	(0.0548)	(0.0382)	(0.0156)	(0.0829)	(0.0624)
Area:									
Urban Area	0.0746***	0.138	0.0631	0.0847***	0.246***	0.161***	0.115***	0.245**	0.129*
	(0.00796)	(0.0750)	(0.0380)	(0.00841)	(0.0554)	(0.0384)	(0.0143)	(0.0838)	(0.0627)
Region:									
Chittagong	0.0626***	0.259*	0.197**	0.116***	0.252**	0.136*	0.142***	0.221	0.0794
	(0.0130)	(0.127)	(0.0643)	(0.0138)	(0.0938)	(0.0649)	(0.0235)	(0.142)	(0.106)
Dhaka	0.0213	0.243	0.221**	0.0627***	0.105	0.0421	0.0978***	0.0238	-0.0740
	(0.0129)	(0.142)	(0.0712)	(0.0137)	(0.105)	(0.0719)	(0.0233)	(0.158)	(0.118)
Khulna	-0.221***	-0.157	0.0649	-0.167***	-0.268**	-0.101	-0.170***	-0.339*	-0.169
	(0.0124)	(0.122)	(0.0616)	(0.0131)	(0.0900)	(0.0622)	(0.0223)	(0.136)	(0.102)
Mymensingh	0.0177	0.301	0.283**	0.115***	0.158	0.0435	0.237***	0.216	-0.0202
	(0.0178)	(0.177)	(0.0894)	(0.0188)	(0.131)	(0.0902)	(0.0320)	(0.198)	(0.148)
Rajshahi	-0.257***	-0.246*	0.0111	-0.177***	-0.177	0.0000403	-0.102***	-0.133	-0.0315
	(0.0135)	(0.124)	(0.0631)	(0.0143)	(0.0918)	(0.0637)	(0.0243)	(0.139)	(0.104)
Rangpur	-0.281***	-0.198	0.0832	-0.255***	-0.213*	0.0410	-0.235***	-0.304*	-0.0694
	(0.0132)	(0.126)	(0.0636)	(0.0140)	(0.0928)	(0.0643)	(0.0238)	(0.140)	(0.105)
Sylhet	-0.0815***	-0.140	-0.0587	0.0109	0.0899	0.0790	0.00599	-0.0508	-0.0568
	(0.0156)	(0.158)	(0.0800)	(0.0165)	(0.117)	(0.0807)	(0.0281)	(0.177)	(0.132)
Constant	5.312***	4.243***	5.312***	5.328***	4.766***	5.328***	5.522***	5.070***	5.522***
	(0.0504)	(0.438)	(0.0550)	(0.0533)	(0.324)	(0.0555)	(0.0908)	(0.490)	(0.0908)
N	13529	854	14383	13529	854	14383	13529	854	14383
R-sq	…	…	…	…	…	…	…	…	…
adj. R-sq	…	…	…	…	…	…	…	…	…
rmse	…	…	…	…	…	…	…	…	…

Note: Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001
The coefficients of gender-specific OLS and quantile regression have been estimated using Equations 2 and 5.
Similarly, the coefficients of the slope dummy variable for OLS and quantile regression have been estimated using Equations 3 and 6.

higher wages compared to the agricultural and industrial sectors at the mean and across most quantiles. In contrast, the industrial sector shows lower wages from the mean to the 90th quantile. Overall, the service sector provides more opportunities for higher wages across the wage distribution.

Urban-rural disparities are evident, with urban employees earning 8.63% more than rural employees at the mean and across all quantiles except the 10th, confirming a persistent urban-rural wage gap (Asadullah, 2006b; Mamun, Arfanuzzaman, et al., 2023; Mamun & Arfanuzzaman, 2020). Regional effects are also significant; employees in Chittagong, Dhaka, and Mymensingh earned more than those in Barisal, with statistical significance at the mean and nearly all quantiles, although Al-Samarrai (2006) reported contrasting results for regional effects.

5.2 Estimates of Gender-Specific OLS, Quantile Regression, and Gender Wage Gap

This study employs OLS and quantile regression models to estimate wage equations separately for males and females, enabling a detailed understanding of wage determinants. Additionally, slope dummy variable OLS and quantile regression models were used to examine the gender wage gap, with a binary indicator (1 for females, 0 for males). Wage gaps were assessed by comparing the coefficients of explanatory variables between males and females. Table 4 presents the results of these analyses alongside the estimated wage gaps, with R-squared values indicating satisfactory model fits for the OLS models (O'Brien, 2007).

Age, serving as a proxy for experience, has a positive and statistically significant effect on wages for males across all quantiles, but not for females. The difference in age coefficients between genders indicates a significant negative bias against females, observed at the mean (2.59%) and across most quantiles. This gap decreases from lower to upper quantiles, reflecting Bangladesh's socio-cultural context, where women increasingly assume household and family responsibilities as they age, thereby limiting their career progression (ADB, 2013). Including age-squared in the regression highlights a diminishing effect of age on male wages, whereas the effect for females is mixed and mostly insignificant, suggesting that other factors increasingly shape wage outcomes over time.

Additional working hours have a positive and significant influence on wages for both genders across the mean and all quantiles, with a more substantial effect for females, indicating a relative advantage in returns to labor input. Similarly, additional daily income from other sources consistently benefits females across all quantiles, highlighting positive bias in these returns.

Education remains a critical determinant of income, as established in prior research (Barmon et al., 2012; Mamun et al., 2018, 2023; Mamun & Arfanuzzaman, 2020). Individuals with primary, high school, and post-high school education earn higher wages than those without education across most quantiles, with powerful effects for those with post-high school education. Education also contributes to mitigating wage disparities: wage gaps show harmful discrimination against females at primary and high school levels, but positive discrimination at post-high-school levels. Overall, the estimated gender wage gaps are largely statistically insignificant at the mean and across quantiles, aligning with findings from Martins and Pereira (2004) in developed countries.

Religious affiliation influences wage distribution. Male Muslims consistently earn higher wages than non-Muslims at the mean (8.19%) and across all quantiles, with 1% significance. The same trend essentially holds for females, though not always statistically significant. Non-Muslim females experience harmful discrimination, evident at the mean and from the 25th to the upper quantiles.

Marital status has a significant impact on wages for both genders. Married individuals earn higher wages than their unmarried or otherwise categorized peers (i.e., widowed, divorced, or separated) across the mean and most quantiles. Although females experience slightly more negative discrimination in some cases, these differences are generally not statistically significant.

Chronic illness also impacts wages. Males without chronic illness earn significantly more than the reference group at the mean and all quantiles except the 90th. Females follow a similar pattern, except at the 10th quantile, where the effect is insignificant. Wage gaps indicate positive discrimination in favor of females, except at the 10th quantile.

Sectoral effects reveal that employees in the non-agricultural sector generally earn higher wages than those in agriculture. While this positive effect applies to males, females experience negative discrimination across all quantiles, particularly at the 25th, 75th, and 90th quantiles. Males in agriculture earn less than those in the service sector, except at the 10th percentile, whereas females show the opposite trend, except at the 90th percentile. In the industrial sector, males earn more than their service-sector counterparts at the 10th and 25th percentiles but significantly less at the 75th and 90th percentiles. Females consistently earn less than service-sector employees across all quantiles, with significant gaps at the median and 90th quantile.

Urban-rural disparities are confirmed, with urban employees earning higher wages than rural employees across most quantiles. Urban females, in particular, appear to benefit more than males, resulting in positive and significant gender wage gaps, which may reflect higher education levels and a greater demand for female labor in urban markets.

Regional wage variation is non-uniform. Employees in Chittagong, Dhaka, and Mymensingh earn more than those in the Barisal reference region, contrasting with Al-Samarrai's (2006) findings. Gender-specific gaps across regions reveal both positive and negative discrimination against females, although most differences are statistically insignificant. This indicates that regional wage disparities are influenced by factors such as education, occupation, and sectoral engagement rather than gender alone.

6. Conclusion and Policy Implications

This study examines the determinants of wages and the gender wage gap in Bangladesh's daily labor market in 2016, with a particular focus on gender disparities across the wage distribution and the mean. Using data from HIES 2016, the study employs OLS and quantile regression techniques to estimate wage determinants and assess the effects of various predictors on wage differences between males and females. It contributes to the literature by providing a comprehensive analysis of wage determinants and gender-based wage inequality in Bangladesh's daily labor market. This area has often been underexplored in previous studies.

The key findings are as follows. First, wage determinants, including human capital and social factors, significantly influenced daily wages in 2016, affecting both the mean and the quantiles of the wage distribution. Factors such as education, age (as a proxy for experience), working hours, other income sources, occupational sector (particularly the service sector), and engagement in non-agricultural activities are positively correlated with wages. Conversely, marital status (unmarried and other categories) and religion (non-Muslim) are negatively associated with wages. Second, the study highlights the substantial and persistent gender wage gap in the daily labor market, with females

consistently earning less than males across nearly all predictors, both at the mean and throughout the wage distribution. The raw gender wage gap was estimated at 62.2%, declining slightly from lower to upper quantiles, reflecting a persistent "sticky floor" effect. Third, the wage gap varies across different levels of predictors, indicating that some factors exert greater influence on wage inequality depending on the wage quantile. For instance, education and working hours exhibit smaller gaps at lower quantiles but larger ones at higher quantiles, while age displays the opposite trend. Finally, the study identifies factors that could mitigate the wage gap, including adequate working hours, higher educational attainment, and reforms to minimum wage policies, which could strengthen women's bargaining power and productivity in the labor market.

Based on these findings, several policy implications emerge to promote gender equality in the daily labor market. First, implementing affirmative action policies to ensure equal pay and working conditions for males and females could reduce discrimination, increase female participation, and improve representation. Second, promoting shared family responsibilities, particularly among males, could reduce the opportunity costs faced by women who balance work and household duties. Third, extending minimum wage reforms beyond the ready-made garment (RMG) sector to other sectors, especially the informal sector where most daily laborers are employed, could improve wages and welfare for both genders and reduce inequality driven by labor market segmentation. Collectively, these interventions could create a more equitable labor market with broader implications for Bangladesh's socioeconomic development.

Despite its contributions, this study has several limitations. The analysis relies solely on HIES 2016 data, which may constrain insights into current wage dynamics. Future research could benefit from more recent or longitudinal data to validate and expand these findings. Additionally, this study primarily focuses on the informal sector and may not fully capture wage disparities in the formal economy. Future studies could investigate the role of formal employment in shaping overall income inequality. Finally, the study's scope is limited to specific time periods and regions within Bangladesh, which may constrain the generalizability of its conclusions.

Several avenues for future research are promising. Longitudinal studies could explore the long-term effects of educational interventions on income mobility and the intergenerational transmission of human capital. Evaluating the effectiveness of targeted policy measures, such as scholarships or vocational training programs, could provide actionable insights for policymakers. Moreover, investigating the intersectionality of education, gender, and income inequality could reveal nuanced dynamics affecting wage disparities across diverse populations. Finally, analyzing the impact of policy interventions, such as minimum wage regulations or social protection programs, would offer a deeper understanding of strategies to reduce income inequality in Bangladesh.

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