

Analyzing Wage Gap Based on Gender: Insights from the Bangladesh Labor Force Survey 2016-17

By

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A thesis submitted to the Department of Economics and Social Science in partial
fulfillment of the requirements for the degree of
M.Sc. in Applied Economics

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Approval

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Ethics Statement

Throughout the research process, I have made extensive use of various scholarly sources, including journals, conference publication and reputable websites, in compliance with academic standards. I also utilized assistance from AI based tools like ChatGPT and copilot to aid in the development of ideas and in refining the structure of the report. All sources and tools used have been duly acknowledged, and no part of this work has been copied or plagiarized without proper citation.

Abstract

Bangladesh has one of the lowest gender salary discrepancies in the world, with a deficit of just 2.2% as of the most recent data, according to UN research. This thesis investigates the gender wage gap in Bangladesh using data from the Labor Force Survey (LFS) 2016-17, focusing on non-agricultural workers. The quantitative analysis based on secondary data reveals significant disparities in wages, working hours, education levels, and industry participation between male and female workers, reflecting deep-rooted structural inequalities in the labor market. On average, Men earn more than women. The study also found that female workers have lower levels of education and are more likely to be concentrated in low-paid industries, both of which contribute to the income gaps. To understand how human capital affects wages, mincer regression has been used to examine the causal connection between earnings, experience, and education. The results highlight the necessity of focused governmental initiatives to advance gender parity in schooling and labor market involvement, especially in industries with a preponderance of men.

Keywords: *wage gap, gender, labour economics, Bangladesh;*

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List of Acronyms

GDP	Gross Domestic Product
LFS	Labour Force Survey
BBS	Bangladesh Bureau of Statistics
TVET	Technical and Vocational Education and Training
NEET	Not in Education, Employment, or Training

Chapter 1

Introduction

Wages are a critical determinant of living standards. Understanding the factors influencing wages in different levels is crucial to address the economic inequality across different demographic groups. The gender wage gap has remained a challenge through the years, reflecting broader socioeconomic disparities in the global context. Study shows that between male and female, there exists a 16.5% average global gap in wages, while Asian countries average 21.2%.

UN research estimates that Bangladesh has one of the lowest genders pay gaps in the world, at approximately 2.2%. With limited resources for comprehensive wage surveys, precise information on gender pays disparities remain insufficient. The social structures and cultural norms also play a significant role in determining wages. Since men are traditionally expected to be wage earners, most of the time women end up earning less for the same work. It is further elongated by occupational segregation, funneling females into low-paid sectors like childcare and education.

Critics argue that these patterns reflect society's prejudices rather than capability or productivity differences. Some economists contend that what often appears to be wage gaps reflect differing choices about careers, hours, and job types across genders.

Understanding the factors influencing wage disparity will facilitate effective resource allocation within households. It can also help to break the poverty cycle by encouraging investment in female education and employment. This can also inform policymakers how to frame appropriate and targeted interventions that address overt discrimination, as well as subtle structural barriers to women's economic progress. With Bangladesh's continuing economic growth, addressing these wage disparities becomes more crucial.

Methodology

In this study, a quantitative methodology has been employed using secondary data specifically to investigate the causes of wage disparity between males and females in Bangladesh. The main data source is the Labor Force Survey (LFS) 2016-17, carried out by the Bangladesh Bureau of Statistics (BBS). This nationwide survey offers a standard dataset on various aspects of the

labor market, covering detailed wage information and working hours, education levels and demographic attributes of workers by industries and occupations.

Data cleaning, coding and analysis were performed using Stata 17.0. Data preparation consisted of cleaning the raw data, coding and keeping the relevant variables for this study, and creating new variables for analysis. Some of the statistical methods used in this study to analyze the contribution of factors to the gender wage gap include descriptive statistics and Mincerian wage regressions. This methodological approach allows us to quantify the size of the wage gap and simultaneously control factors that may influence wages.

Chapter 2

Literature review

Determinant of Pay gap

Education, Gender and Income gap

Education has a strong role in shaping labor market outcomes and gender wage disparities. A higher level of education is associated with increased earnings for both male and female. Women usually have more positive returns to education relative to men and often at higher percent levels of schooling. Some studies report returns as high as 13.2% for women versus 6.2% for men (Asadullah, 2005). Despite these higher returns, a persistent gender wage gap exists in women earning on average 21% less per hour than men (Kapsos, 2008). This gap suggests that investment in women's education can be one of the crucial mechanisms of promotion of greater wage equality.

Education and the gender wage gap are related in a complex and diverse way along the wage distribution. Ahmed and Maitra (2015) provide support for the "sticky floor" hypothesis, stating larger gender wage gaps in the lower end of the distribution. According to Kapsos (2008), the highest number of gender wage gap results among workers who have received primary education or less. On the contrary, the lowest number comes out among workers with secondary education. Nordman et al. (2015) explored the role of cognitive and non-cognitive skills in explaining gender wage gaps. They found that cognitive skills, especially reading ability, are positively correlated with wages for both genders. They further mentioned that the inclusion of such skills in wage equations reduces the unexplained gender wage gap. These findings raise the importance of considering multiple factors beyond formal education in analyzing gender wage gaps in Bangladesh. Existing literature also suggests policies aimed at reducing these gaps should focus on increasing access to education, among other things and on developing specific cognitive skills valued in the labor market.

Industry and Occupation as a factor of Wage Gap

Segregation by industry and occupation is one of the most important determinants in explaining the gender wage gap in Bangladesh. Women are overrepresented in low-paying sectors such as agriculture, manufacturing and informal employment. On the other hand, men dominate

industries that pay more, such as construction, telecommunications and financial services (Kapsos, 2008; Nordman et al., 2015). This sectoral segregation is considered to contribute significantly to the overall wage disparity and estimates suggest it accounts for approximately 7 percentage points of the total disparity (Kapsos, 2008). Occupational segregation at the level of industries has perpetuated earnings inequalities. For instance, in the export-oriented garment industry, one of the largest employers of women, female workers are estimated to earn only 58 percent of the female-male earnings differential in this industry. Study shows that the gap has actually been increasing (Paul-Majumder & Begum, 2000).

The impact of industry and occupation on the gender wage gap is not uniform across the wage distribution. Ahmed and Maitra (2015) argued that gender wage gaps are larger at the lower end of the wage distribution. This suggests that women are particularly penalized in terms of wages in low-paying industries and occupations. Nordman et al. (2015) made this picture a little more detailed by analyzing the role of cognitive and non-cognitive skills in wage determination across industries. The evidence showed that Bangladeshi employers place greater emphasis on observable characteristics and cognitive skills compared to personality traits in determining wages. This contrasts with some evidence from developed countries.

While others view export-oriented industries, specifically garments, as generating more employment opportunities for female employment, potentially narrowing the overall gender gap in labor force participation (Paul-Majumder & Begum, 2000). On the other hand, critics note that the emerging industries promote occupational segregation, thereby leading to wage differentials among males and females. In this respect, Bidisha et al., 2020 noted that across many sectors, gender-based segregation was high, with occupations which were considered higher-ranking, thus higher-paying, likely to involve men. Their analysis using the Index of Dissimilarity (D) for horizontal segregation and the Index of Net Differences (ND) for vertical segregation revealed persistent patterns of gender-based occupational segregation. These findings collectively underscore the need for targeted interventions to address both horizontal and vertical occupational segregation, as well as industry-specific barriers to women's advancement and fair compensation.

Rural and Urban Area

It is evident that the gender wage gap has different trends in rural and urban areas, with research showing larger urban gaps than rural ones (Ahmed & Maitra, 2010). In rural parts, the wage

gap between males and females is often smaller. Since most of the jobs are in agriculture, it involves both males and females in low-skilled and low-wage jobs. This smaller gap does not necessarily imply greater gender equality. Rural women face high obstacles to entering the better-paying non-agricultural jobs because of limited education and training opportunities as well as restrictive social norms (Rahman & Islam, 2013).

In contrast, urban areas in Bangladesh are characterized by being more occupational choices and a more diversified labour market. Unfortunately, they show more pronounced gender gaps in wages and opportunities for their workers (Ahmed & Maitra, 2015). Kabeer et al. (2018) observed that women are more likely to be employed in lowly paid informal sector jobs, which have limited career advancement opportunities available to them. Even in formal sector employment, occupational segregation is another factor that alone tends to overrepresent women in very low-paying industries. This, in combination with discriminatory practices, contributes to the persistence of a larger gender wage gap in urban areas (Kapsos, 2008).

The urban-rural difference in wage determinants is further highlighted by differences in returns to education. Asadullah (2005) argued that returns to education were considerably higher in urban areas (8.1%) compared to (5.7%) in rural areas. Rahman and Al-Hasan (2018) further showed that in urban areas, male workers experienced a 9.8% rise in earnings with each additional year of schooling. While in rural areas, the figure stood at a mere 4.9%. For women, the trend was in reverse; returns to education among rural sets were much higher at 13.0 percent as against 7.2 percent of that from urban areas. These findings suggest that while urban areas generally offer higher wages, the relative value of education for women might be greater in rural settings. It may happen due to the scarcity of educated female workers in these areas. This complex interplay between location, gender and education in determining wages underscores the need for further study to address gender wage disparities in Bangladesh.

Relevance of Education, Earnings and Sex

Education has traditionally been playing a vital role in structuring the outcomes of the labor market and gender wage disparities in Bangladesh. Studies have consistently confirmed that higher levels of education translate to increased earnings for both men and women. Despite this confirmation, returns related to education have varied significantly by gender. Women mostly receive higher returns compared to men, especially at higher levels of schooling (Asadullah, 2006; Rahman & Al-Hasan, 2018). Higher levels of education, especially TVET

and tertiary education, generate much better private returns, according to Mia Mohammad and Inaba (2020). Despite these higher returns, women are still suffering from the gender-based wage gap of an average of 21 percent compared to men (Kapsos, 2008). Therefore, this presents a paradox where education, despite being a powerful tool in improving earnings of women, cannot solely eradicate disparities in gender wages.

Education and earnings are closely related, and the relationship also varies within the wage distribution. The analyses of quantile regression usually indicate that the returns to education are higher at the upper percentiles of the wage distribution. Education would have a greater impact on earnings in the highest layer of the income ladder, while the effect diminishes as one moves down the steps (Rahman & Al-Hasan, 2018; Mia Mohammad & Inaba, 2020).

To add another dimension to this discussion, Nordman et al. (2015) investigated the role of cognitive and non-cognitive skills in explaining gender wage gaps. They conclude that cognitive skills. In particular: reading ability-positively affect the wage outcomes for both genders. They further emphasized that including the skills in wage equations reduces the unexplained portion of the gender wage gap. Personality traits also explained little in the mean wages but were important for female wages at higher and lower points of the distribution. Again, these results imply that an investigation into the multiplicity of factors other than formal education is needed to understand the relationships among education, earnings, and gender in Bangladesh. Policies aimed at reducing gender wage gaps should focus not only on providing more access to education but also on developing specific cognitive and non-cognitive skills valued in the labor market.

Chapter 3

Description of Survey and Dataset

Background

The Bangladesh Bureau of Statistics (BBS) undertook a significant shift in labor market analysis with the launch of the first Quarterly Labour Force Survey (LFS) in July 2015. It was a big change from periodic evaluations to a quarterly model for labor market data collecting in terms of both frequency and scope. The LFS 2016–17, the second volume of this innovative method, provides a thorough and insightful look at the economic activities of the Bangladeshi working people. 161.3 million people were inhabitant in Bangladesh as of the 2016–17 survey period, while 80.3 million of these people were female, accounting for 50.4% of the population over the age of 15. The labor force participation rate for those aged 15 or older was 58.2%. Among them men had a significantly higher participation rate, in contrast to a much lower rate of 36.3% women, indicating an undeniable gender disparity in labor market involvement. Geographically, interestingly rural areas show a slightly higher participation rate of 60 percent compared to urban areas it is 55.7%.

Based on employment patterns, 60.8 million people who were above 15 years old are jobholders. The workforce distribution spans across multiple categories, with skilled agricultural workers constituting a significant portion of the labor force. Other substantial occupational categories include sales and service workers, craft and associated trades workers, plant or machine operators, and those engaged in elementary occupations, reflecting the heterogeneous nature of the job market in Bangladesh.

Many young people (ages 15-29) in this country have informal jobs, meaning they work without a contract or benefits. This is more common in rural areas than in cities. Women are especially likely to have informal jobs, especially in rural areas.

There are around 2.7 million people who are unemployed. More men are unemployed than women, but women have a higher unemployment rate. Cities have higher unemployment than rural areas.

Young people consist of a significant portion of the labor force. However, many young women are not involved in education, employment, or training. This may be because of household chores or other barriers. Most people work for themselves or as employees. Many women are involved in family businesses.

LFS also shows that many women work in jobs like sales and customer service. After that, they work in agriculture, skilled trades, and factory jobs. When people get hurt at work, they usually miss one or two days of work. On average, people miss about two days due to injuries. Some workers say they were exposed to dangerous things like broken tools, chemicals, or loud noises. A lot of people work for themselves or help in family businesses. This kind of work is not very secure. More women than men have these kinds of jobs.

Survey Limitations

The Labour Force Survey (LFS) has some key limitations. Firstly, the LFS is conducted quarterly. This creates a limitation in capturing seasonality effects on employment, especially those sectors that are closely related to seasonal factors, such as agriculture. The second one is underemployment, a situation where persons are considered employed but work too few hours or earn too little. Underemployment has remained a major concern for most countries of the world, with Bangladesh being no exception.

Another important constraint of this study, particularly for those in informal sector employment, is not being able or having insufficient capacity to consider qualitative parameters of employment. These qualitative parameters include job satisfaction, working conditions and level of job security. Considering that 85.1% of workers are employed in informal jobs, this insinuates a large knowledge gap on risks and vulnerabilities faced by these workers as a result of lacking comprehensive qualitative indicators. The information provided does not capture specific details on both internal and international labor migration, which is an important element that helps understand the patterns of employment and labor market conditions in Bangladesh.

The LFS falls short in fully exploring the gender disparities in labor force participation. It does not sufficiently address the barriers that hinder women's access to employment. These barriers include childcare responsibilities, household duties, limited access to education and training opportunities. Moreover, the LFS provides limited insight into the prevalence and long-term impact of precarious working conditions on the workforce. It is essential to acknowledge and consider these limitations in future research and policy initiatives.

Summary statistics

The summary statistics presented in Table 1 offer a nuanced perspective on gender disparities within the labor market of Bangladesh and reveals complex patterns across various dimensions.

Contrary to expectations, the data indicates a marginal advantage for women in hourly wages (90.229 vs. 89.519 for men). However, this superficial parity masks underlying structural inequalities that become apparent upon closer examination of other variables.

Table 1: Summary Statistics, full sample

	Male n=25,893		Female n=9,619	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Hourly wage	89.519	105.638	90.229	102.112
Age	34.378	11.571	30.512	10.113
Weekly Hours Worked	54.788	14.125	49.960	14.745
No Education	0.053	0.223	0.126	0.332
Less Than Primary Education	0.042	0.200	0.066	0.249
Primary Education	0.111	0.314	0.156	0.363
Secondary Education	0.289	0.453	0.211	0.408
Tertiary (Diploma)	0.028	0.166	0.022	0.147
Tertiary (Degree)	0.128	0.334	0.103	0.305
Manufacturing	0.352	0.478	0.502	0.500
Electricity Gas Water	0.011	0.103	0.003	0.058
Construction	0.011	0.106	0.007	0.085
Wholesale And Retail Trade	0.151	0.358	0.023	0.149
Hotels and restaurants	0.019	0.138	0.011	0.106
Transport, storage	0.056	0.231	0.013	0.115

Financial intermediation	0.052	0.222	0.023	0.150
Education	0.145	0.352	0.268	0.443
Health Social	0.028	0.165	0.060	0.238
Other Services	0.174	0.379	0.088	0.283

Source: Author's analysis of Labour Force Survey data from BBS

A significant age disparity exists between male and female workers, with men being approximately four years older on average (34.378 vs. 30.512 years). This age gap could be indicative of women's earlier entry into or exit from the workforce, potentially due to societal expectations or familial responsibilities. Such career interruptions or truncations may have long-term implications for women's professional development and earnings trajectory.

Hourly wage refers to the average hourly earnings of the persons or workers, while weekly hours worked refers to the average number of hours worked per week by the persons or workers. These values are derived from the monthly income. The discrepancy in weekly working hours (54.788 for men vs. 49.960 for women) further compounds the complexity of the wage parity observed. This difference of nearly five hours per week suggests that women's seemingly equivalent hourly wages may not translate to comparable overall earnings. The reduced working hours among women could be attributed to a disproportionate burden of unpaid domestic labor or childcare duties, reflecting persistent gender roles in Bangladeshi society.

Perhaps most striking are the disparities in educational attainment. Women are consistently overrepresented in lower educational categories (12.6% vs. 5.3% for no education; 6.6% vs. 4.2% for less than primary education) and underrepresented in higher ones (21.1% vs. 28.9% for secondary education; 10.3% vs. 12.8% for tertiary degrees). This educational gap is likely to have profound implications for women's long-term career prospects, earning potential, and overall economic empowerment.

The data also reveals significant occupational segregation by gender. Women are disproportionately concentrated in sectors such as manufacturing (50.2% vs. 35.2% for men) and education (26.8% vs. 14.5%), while men dominate in wholesale and retail trade (15.1% vs. 2.3%) and transport and storage (5.6% vs. 1.3%). This stark segregation raises questions about

the existence of gender-based barriers in certain industries, potentially limiting women's access to a diverse range of economic opportunities.

Table 2, disaggregated by gender, presents a comprehensive breakdown of labor market statistics across various sectors. This granular view reveals profound disparities and complex patterns that merit careful consideration in the context of gender equality and economic development.

Table 2: Summary statistics, by work sector and sex (gender)

	Observations			Hourly Wage			Hours Worked		Age	
	M	F	% female	M	F	% female	M	F	M	F
Manufacturing	9125	4832	34.6	58.8	43.4	73.8	58.3	57.5	30.6	27.1
Electricity Gas Water	279	32	10.3	126.4	97.3	77.0	50.1	47.7	39.3	37.1
Construction	297	70	19.1	80.1	50.0	62.4	55.7	42.9	36.9	36.7
Wholesale And Retail Trade	3917	218	5.3	55.9	62.6	112.0	62.0	55.6	31.1	32.8
Hotels and restaurants	500	110	18.0	52.5	43.7	83.2	65.1	57.0	32.1	38.8
Transport, storage	1461	129	8.1	78.0	100.1	128.4	57.5	49.2	36.2	34.5
Financial intermediation	1348	223	14.2	163.3	147.3	90.2	48.7	44.4	39.3	34.3
Education	3745	2581	40.8	148.1	162.6	109.8	42.9	37.8	38.6	32.8
Health Social	726	578	44.3	116.1	109.1	93.9	53.4	50.0	37.9	34.3
Other Services	4495	846	15.8	112.2	123.8	110.3	51.5	43.9	38.7	36.2

Source: Author's analysis of Labour Force Survey data from BBS

A striking finding is the pervasive underrepresentation of women across most sectors. The data indicates that women constitute only 34.6% of the total workforce in the sampled industries, suggesting a significant gender gap in overall labor force participation. This disparity is particularly pronounced in certain sectors: women represent merely 5.3% of the workforce in wholesale and retail trade, 8.1% in transport and storage, and 10.3% in the electricity, gas, and water industries. Such stark underrepresentation raises critical questions about the barriers to entry and retention that women face in these male-dominated fields.

Conversely, certain sectors exhibit higher female participation rates. The education and health sectors stand out, with women comprising 40.8% and 44.3% of the workforce, respectively. This concentration of women in traditionally feminized sectors of care and education suggests the persistence of occupational segregation, potentially driven by societal norms and gender role expectations.

The analysis of weekly working hours reveals another layer of gender disparity. Across all sectors, men consistently work longer hours than their female counterparts. This trend is particularly pronounced in the construction industry, where men work an average of 55.7 hours per week compared to 42.9 hours for women. Similar patterns are observed in other sectors, including manufacturing (58.3 vs. 57.5 hours) and wholesale and retail trade (62.0 vs. 55.6 hours). These differences in working hours could partially explain wage disparities and suggest that women may face greater constraints on their time, possibly due to disproportionate domestic responsibilities.

Age demographics across sectors present an intriguing pattern. In most industries, male workers are, on average, older than their female colleagues. This age gap is most pronounced in the education sector (38.6 years for men vs. 32.8 for women) and in hotels and restaurants (32.1 vs. 38.8 years). These age differentials could be indicative of several factors, including later entry of women into certain professions, higher turnover rates among female workers, or potentially discriminatory hiring practices favoring younger women in some sectors.

The wage data presented in the table, while not explicitly analyzed here due to space constraints, likely interacts with these patterns of participation, working hours, and age in complex ways. Future research could fruitfully explore how these factors collectively contribute to overall gender wage gaps within and across sectors.

Chapter 4

Calculating the gender pay gap and wage determinants

When researching wage differentials between men and women, researchers can use the Mincer regression to adjust for education, experience, and other factors, making it an effective tool for analyzing the gender wage gap. This helps to separate out the fraction of the salary disparity that cannot be explained by observed variables and is typically attributed to discrimination or other unquantifiable reasons. So, as a key technique in wage analysis, the Mincer regression has theoretical and empirical value for investigating compensation drivers and the continued female wage disparity. The basic Mincer regression model is a popular econometric tool for determining the relationship between salaries and relevant parameters such as education and experience. The model is commonly used to assess salary differentials and the return on investment in human capital, and it is based on work by Jacob Mincer (1974).

The standard Mincer equation is expressed as:

$$\ln w_i = \alpha + \beta x_i + \varepsilon_i$$

$\ln w_i$ is the natural logarithm of wages or earnings,

x_i accounts for factors such as education, experience, human capital,

ε_i is the error term, capturing other unobserved factors affecting wages.

As this model quantifies the effect of experience and education on earnings, this model is very popular in wage determination research. The coefficients on education and experience can be understood as percentage increases in salaries for every year of schooling or experience by taking the natural logarithm of wages. This provides intuitive insights into the role that human capital plays in pay setting. Table 3 presents the results of a Mincer regression analysis, offering crucial insights into the determinants of wages in Bangladesh's labor market. This econometric approach allows for a nuanced examination of how various factors, including gender, age, education, and industry, influence earnings. The regression results, spanning four models with increasing complexity, reveal multifaceted patterns of wage determination and gender disparities.

Table 3: Mincer regression

	(1) <i>Base model</i>	(2) <i>Eq.1 + age</i>	(3) <i>Eq.2 + education</i>	(4) <i>Eq.3 + industry</i>
Female	-0.133*** (0.007)	-0.062*** (0.006)	0.008 (0.005)	-0.047*** (0.005)
Age		0.057*** (0.001)	0.028*** (0.001)	0.025*** (0.001)
Age Squared		-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
No Education dummy			-0.479*** (0.009)	-0.386*** (0.009)
Less Than Primary education dummy			-0.328*** (0.011)	-0.250*** (0.011)
Primary Education dummy			-0.302*** (0.008)	-0.232*** (0.007)
Secondary Education			0.097*** (0.006)	0.062*** (0.006)
Tertiary education (diploma) dummy			0.397*** (0.014)	0.318*** (0.014)
Tertiary education (degree) dummy			0.667*** (0.008)	0.546*** (0.008)
Madrassah education dummy			0.133*** (0.028)	-0.003 (0.027)
Manufacturing dummy				-0.028 (0.021)
Electricity, gas & water industry dummy				0.231***

				(0.031)
Construction industry dummy				0.000
				(.)
Wholesale & retail trade dummy				-0.110***
				(0.022)
Hotels & restaurants dummy				-0.111***
				(0.027)
Transport, storage & communications dummy				0.073***
				(0.023)
Financial intermediation dummy				0.313***
				(0.024)
Education industry dummy				0.285***
				(0.022)
Health & social work dummy				0.240***
				(0.024)
Other services dummy				0.194***
				(0.022)
Constant	9.634***	8.374***	8.855***	8.906***
	(0.003)	(0.025)	(0.021)	(0.029)
Observations	35512	35512	35512	35512

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Source: Author's analysis of Labour Force Survey data from BBS

In the baseline model (1), the coefficient for the female variable (-0.133) indicates a substantial gender wage gap, with women earning approximately 13.3% less than men, *ceteris paribus*. This finding aligns with the extensive literature on gender wage disparities in developing economies. However, as additional controls are introduced in subsequent models, the

magnitude of this gender effect diminishes, suggesting that a portion of the observed wage gap can be attributed to differences in observable characteristics between men and women.

The inclusion of age and its quadratic term in model (2) reveals a classic concave relationship between age and earnings, consistent with human capital theory. The positive coefficient for age (0.057) and the negative coefficient for age squared (-0.001) indicate that wages increase with age but at a decreasing rate, likely reflecting the accumulation of experience and skills over time, as well as potential obsolescence of human capital in later years.

Educational attainment emerges as a critical determinant of wages, as evidenced in model (3). The progressive increase in coefficients from primary education (-0.302) to tertiary education (0.667 for degree holders) demonstrates substantial returns to education. Notably, the inclusion of education variables reduces the gender coefficient to a statistically insignificant level (0.008), suggesting that a significant portion of the gender wage gap can be explained by differences in educational attainment between men and women.

The final model (4), which incorporates industry controls, provides a comprehensive view of wage determinants. The reemergence of a significant, albeit reduced, gender coefficient (-0.047) indicates persistent unexplained gender wage disparities even after controlling for education and industry. This residual gap may be attributable to unobserved factors such as discrimination or differences in job characteristics not captured in the model.

Industry effects reveal substantial sectoral wage premiums, with financial intermediation (0.313), education (0.285), and health and social work (0.240) sectors offering significantly higher wages compared to the reference category. Conversely, sectors such as wholesale, and retail trade (-0.110) and hotels and restaurants (-0.111) are associated with wage penalties. These industry effects underscore the importance of occupational segregation in understanding overall wage patterns and gender disparities.

Estimating gender gap by Work sector

Table 4 presents an examination of gender wage disparities across various industries in Bangladesh, offering critical insights into the complex nature of labor market inequalities. The data reveals significant variations in the gender wage gap across different sectors, with the magnitude and direction of these gaps shifting notably when controlling for various factors.

The raw gender gaps, as presented in column (1), demonstrate substantial wage disadvantages for women across most sectors. The construction industry exhibits the most pronounced

disparity, with women earning 55.0% less than their male counterparts, representing the largest unadjusted gender wage gap in the study. This is followed by significant gaps in the electricity, gas, and water industry (-26.7%) and manufacturing (-25.4%), suggesting particular challenges for women in these traditionally male-dominated sectors.

Table 4: Estimated gender disparity by work sector or industry

	(1)	(2)		(3)	
	Raw gender gap	Control variables ex-occupation		All controls	
		Gap	R ²	Gap	R ²
Manufacturing	-0.254	-0.131	0.319	-0.084	0.535
Electricity, gas & water industry	-0.267	-0.034	0.424	-0.031	0.732
Construction industry	-0.550	-0.314	0.471	-0.185	0.661
Wholesale & retail trade	-0.076	-0.015	0.354	-0.032	0.586
Hotels & restaurants	-0.205	-0.145	0.272	-0.079	0.487
Transport, storage & communications	0.029	0.020	0.279	0.017	0.509
Financial intermediation	-0.146	0.000	0.451	0.020	0.630
Education industry	-0.034	0.064	0.298	0.014	0.457
Health & social work	-0.095	0.052	0.351	0.001	0.579
Other services	-0.088	-0.014	0.376	-0.015	0.513

Source: Author's analysis of Labour Force Survey data from BBS

When controlling for various factors excluding occupation (column 2), the magnitude of these gaps generally diminishes, though significant disparities persist in several sectors. The construction industry continues to show the largest adjusted gap at -31.4%, followed by hotels and restaurants at -14.5%. Notably, some sectors show a reversal in the gender wage gap after applying these controls. The education sector, for instance, shows a positive adjusted gap of 6.4%, while health and social work demonstrates a 5.2% advantage for women, suggesting that when accounting for observable characteristics, women in these sectors may actually earn more than their male counterparts.

With the inclusion of all controls (column 3), the gaps narrow further across most sectors. The construction industry's gap reduces to -18.5%, while manufacturing shows a gap of -8.4%. Interestingly, some sectors maintain small positive gaps favoring women: financial

intermediation (2.0%), transport and storage (1.7%), and education (1.4%). These findings suggest that when accounting for the full range of observable characteristics, including occupation, the gender wage gap becomes less pronounced and, in some cases, reverses direction.

The R-squared values across models indicate varying levels of explanatory power, with the highest values observed in the electricity, gas, and water industry (0.732) and construction (0.661) when all controls are included. This suggests that the model explains a larger proportion of wage variation in these sectors compared to others, such as hotels and restaurants (0.487) and education (0.457), where additional unobserved factors may play important roles in wage determination.

Estimated gender disparity by educational attainment

Table 5 presents a nuanced examination of gender wage disparities across various educational levels in Bangladesh, offering critical insights into the complex interplay between education, gender, and wage determination. The data reveals a non-linear relationship between educational attainment and the gender wage gap, challenging simplistic narratives about education as a panacea for gender-based wage inequalities.

The raw gender gaps, as presented in the "Raw" column, exhibit a notable pattern of heterogeneity across educational levels. Surprisingly, the gender wage gap is not uniformly reduced with increased education. For instance, illiterate workers show a raw gap of -0.072, indicating that women with no formal education earn 7.2% less than their male counterparts. This gap narrows slightly for those with below primary education (-0.018) but widens again for those with primary education (-0.059).

Intriguingly, the data reveals a reversal of the gender wage gap at the secondary and tertiary diploma levels, with women earning 7.3% and 5.3% more than men, respectively. However, this advantage disappears at the tertiary degree level, where women face a 7.1% wage penalty. The most substantial raw gap is observed in Madrassah education, where women earn 22.6% less than men.

Table 5: Estimated gender disparity by educational attainment

	Raw	Adjusted	R ² (adjusted)	Average age		Average working hours	
				M	F	M	F
Illiterate	-0.072	-0.072	0.053	37.925	36.313	59.226	54.530
Below primary	-0.018	-0.046	0.036	28.943	28.415	60.456	56.594
Primary	-0.059	-0.066	0.091	29.233	27.088	59.599	56.197
Secondary	0.073	0.037	0.250	34.808	29.737	54.107	42.350
Tertiary diploma	0.053	0.091	0.305	35.168	31.268	50.450	45.944
Tertiary degree	-0.071	0.056	0.224	38.980	35.378	47.982	43.196
Madrassah	-0.226	-0.259	0.381	34.009	25.333	46.402	42.333

Source: Author's analysis of Labour Force Survey data from BBS

The adjusted gaps, which account for various control factors, present an even more complex picture. For lower education levels (illiterate to primary), the adjusted gaps remain negative, suggesting persistent wage penalties for women even after controlling for observable characteristics. However, for secondary education and above, the adjusted gaps become positive, indicating a female wage premium when controlling for factors such as age and working hours.

The most striking transformation occurs at the tertiary degree level, where the raw gap of -0.071 becomes an adjusted gap of 0.056, suggesting that highly educated women may actually have a wage advantage when other factors are held constant. Conversely, the Madrassah education category shows a widening of the gender gap after adjustments, from -0.226 to -0.259, highlighting the particularly disadvantaged position of women in this educational track.

The data on average age and working hours provides additional context for these wage disparities. Across all education levels, men are consistently older and work longer hours than women. This age gap is particularly pronounced at higher education levels, potentially reflecting delayed entry or slower progression of women through advanced education. The difference in working hours is most stark at the secondary level (54.107 vs. 42.350 hours), which may partially explain the wage dynamics at this educational stage.

While education generally appears to benefit women in terms of wage equality, particularly at higher levels, the persistence of gaps at lower education levels and the reversal of advantages at the highest level suggest that education alone is insufficient to eliminate gender-based wage

inequalities. The analysis yields several interconnected and compelling arguments that challenge conventional wisdom about the role of education in promoting wage equality. Primarily, the data refutes the simplistic notion that increased education uniformly reduces the gender wage gap, instead revealing a complex, non-linear relationship that demands nuanced interpretation. This complexity is evident in the reversal of the gender wage gap at higher education levels, particularly after controlling for various factors, suggesting that highly educated women may enjoy wage premiums in certain contexts.

However, this advantage is not universal, as demonstrated by the persistent and even widening gaps at lower education levels and in specific educational tracks such as Madrassah education. These findings point to the inadequacy of education alone as a panacea for gender-based wage inequalities and highlight the need for targeted interventions that address the unique challenges faced by women at different educational strata. Furthermore, the consistent patterns of older age and longer working hours for men across all education levels underscore the existence of broader structural issues in the labor market that likely contribute to wage disparities.

Chapter 5: Conclusion

Leveraging data from the Labor Force Survey (LFS) 2016-17, this study provides a comprehensive analysis of the gender wage gap. We found large differences in wages, hours worked, education levels and sectors between male and female workers, indicating deep-seated structural inequalities within the labour market.

While UN research suggests that there is a minimum of 2.2% gender wage gap in Bangladesh, our analysis shows more appreciable differences. Men are very often paid higher wages than women across most industries; their average hourly wage stands at 89.519 for males, while for females, it stands at 90.229. However, this apparent parity masks significant differences in the context of weekly working hours-54.788 for men versus 49.960 for women-suggesting that overall earnings remain skewed toward males.

Higher education levels are generally associated with increased earnings. However, the interaction between education and the gender wage gap is complex and non-linear. Interestingly, the reversal of the gender wage gap for levels of secondary and tertiary diplomas becomes widening at the tertiary degree level. This implies that while education is significant to closing the gender wage gap, it cannot solely guarantee the absence of gender-based wage disparities.

The participation of industries is highly diversified: women are overrepresented in certain industries, including education and health, while underrepresented in industries like construction or wholesale and retail trade. In male-dominant sectors, women do not only earn substantially less but also work fewer hours, pointing to a need for policies that encourage female participation and address specific gender-specific barriers in these industries.

Mincer's regression analysis underlines the fact that the factor of 'being a female' negatively influences wages even after having controlled demographic, educational and industry-related factors. The implication here is that structural inequalities and gender-based discrimination continue to explain labor market outcomes.

These findings go against the belief that Bangladesh has attained virtual parity in gender wages. Instead, they refer to a multi-dimensional topography of wage determinants, where gender interacts with education, industry, and other factors in subtle ways.

In conclusion, even though Bangladesh is making significant progress to bridge the gender wage gap, a lot more challenges still persist. Wage disparity, working hours, education and industry involvement reflect deeply rooted gender disparities, requiring a call for thorough policy responses. A concerted effort and attention have to be brought to these shortcomings if Bangladesh is to realize a more representative and inclusive labor market for all.

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