# The Gender Wage Gap in Bangladesh: An application of Olsen and Walby simulation method[[1]](#footnote-1)

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***Abstract***

*This article examines the gender wage gap in the formal public and private sector in Bangladesh. The traditional Oaxaca method focuses on the explained and unexplained part of the wage gap; in this paper we use the Olsen and Walby (2004) simulation method that emphasises only the explained part of the wage gap. Using the most recent ‘Labour Force Survey 2005-06’, BBS (LFS 2005-06) data show formal sector female employees earn about 32.1 per cent less than their male counterparts. Using the Olsen and Walby (2004) simulation method for the first time in the Bangladeshi context, if the other characteristics of male and female employees were similar, ‘being female’ was sufficient to generate a significantly lower wage than males in the formal sector. If females are treated as males, without considering any other endowment increases, females could increase their income by 4095.3 taka[[2]](#footnote-2) per year. Results also indicate that not only endowments differences in human capital and work experience-related variables were important but discrimination appears to play a significant role in the total wage gap in the Bangladeshi formal sector labour market*.

**Introduction**

The gender wage gap has existed in the labour market over time but the nature and extent of the difference has changed. The gender wage gap exists in developed countries (Oaxaca, 1973, Gunderson, 1979, Neumark, 1988, Blau and Kahn, 1992, Albrecht *et al.*, 2003, Olsen and Walby, 2004, Hubler, 2005, Blau *et al.*, 2006, Daly *et al.*, 2006, Hori, 2009, McGuinness *et al.*, 2009, Addabbo and Favaro, 2011) and developing countries (Siddiqui and Siddiqui, 1998, Ajwad and Kurukulasuriya, 2002, Al-Samarrai, 2007, Adireksombat *et al.*, 2010, Khanna, 2012). Empirical evidence shows that the gender wage gap exists in the Bangladeshi labour market. Males receive, on average, a higher wages than females (Rahman, 2005, Al-Samarrai, 2007, Kapsos, 2008, Ahmed and Maitra, 2011b).

There are few studies that have focussed on the sources of this gap in Bangdesh. Specifically, there is no known study on the gender wage gap of Bangladesh focusing on the public and private sector and application of the Olsen and Walby (2004) method. The aim of this study is to analyse the gender wage gap for formal public and private sector employees in Bangladesh using the Olsen and Walby (2004) simulation method for the first time in the Bangladeshi context. This study also investigates the major factors that affect the gender wage gap for all public and private sector employees.

This study is divided into five sections. Following the introductory section, section two background of this study, section three describes the methodology and data set that is used in the wage equations estimations and the decomposition methods to analyse the gender wage gap in Bangladesh. Section four describes the empirical results Finally, section five presents the conclusion and summarises the results about the gender wage gap in Bangladesh for the formal private and public sector employees.

**Background**

Why do females earn less than males? For more than five decades economists have tried to answer this question. According to human capital theory developed by Becker, earning differentials between individuals differs because of their productivity difference (Becker, 1964). Even with the same level of human capital, female employees could earn less than their male counterpart because of direct or indirect discrimination (Olsen and Walby, 2004). The literature shows the major factors that directly or indirectly account for the raw wage gap are: the stock of human capital including education, work experiences, general and firm specific on-the-job training, career interruption, institutional factors such as working in the public or private sector and occupational and industrial segregation, cultural factors and discrimination in the labour market (Ashraf and Ashraf, 1993, Al-Samarrai, 2007, Kapsos, 2008, Watson, 2009, Blau and Kahn, 2010); Altonji and Blank, 1999; Beblo et al., 2003b; F. D. Blau et al. 2006; Cassells et al., 2010; Olsen et al., 2010). These factors individually and collectively account for substantial portions of the explained part of the wage gap.

Research on the gender wage gap has recently received increased attention in developed and developing countries including Bangladesh (Al-Samarrai, 2007, Kapsos, 2008, Ahmed and Maitra, 2011b, Ahmed and Maitra, 2011a). There are few studies cover the gender wage gap in Bangladesh, but there are a few examples. Al-Samarrai (2007) using the unit records information of the salaried workers from the “Household Income and Expenditure Survey” (HIES), BBS during 2000 and 2005, estimated the gender wage gap as well as major factors that contribute to reducing the wage gap in Bangladesh. In this research, the Oaxaca decomposition method was applied with the male wage used as a non-discriminatory wage structure. The variables used were age, years of education, working in the public sector, marital status and residential location. During this period, the gender wage gap in Bangladesh decreased from 73.4 per cent in 2000 to 45.2 per cent in 2005. During this period, 0 per cent to 31 per cent of the earning gap between males and females was explained by the identifiable human capital and other job related components. The remaining 69 per cent to 100 per cent of the total wage gap was the result of the discrimination component. Most of the pay gap is attributed to the unexplained portion which indicates that there is little difference between male and female endowments; the gap is due to labour market discrimination. In addition, the findings also showed that the productivity related gender wage gap decreased and is mostly attributed to labour market discrimination.

Using the “Wage Survey 2007”, BBS, Kapsos (2008) estimated the gender wage gap for the non-agricultural work force in Bangladesh by using the Oaxaca-Blinder methodology and used Cotton’s method for the non-discriminatory wage structure. Variables used in this study were age, education level, occupation and industries dummy, and geographic location. The results found that females earned 22.5 per cent less than males and only -18.8 per cent of the wage gap was explained by the endowment difference, which is in favour of female employees and implies that female employees should have higher wages due to higher endowments. Major parts of the wage gap are unexplained and account for 118.8 per cent of the wage gap. This could be cause by omitted variables, and the large share of female participation outside the labour market partly due to the time out of work due to child bearing.

Another study conducted by Ahmed and Maitra (2011b) used the unit records information of paid employees of the “Labour Force Survey” (LFS), BBS during 1999 and 2005. They estimated the gender wage gap across different quantiles as well as major factors that contributed to the increase in the wage gap in Bangladesh during this period. In this research, the Oaxaca decomposition method and the Wellington (1993) extended method for two periods, male and female wage structures were used separately as the non-discriminatory wage and the variables used were dummy variables for the age groups, education dummy, marital status, industrials and occupational dummies and residential locations**.** The results showed that the gender wage gap increased during this period from 45.4 per cent in 1999 to 64.9 per cent in 2005 and the adjusted wage gap decreased from 93 per cent to 81 per cent. Even after the selection correction[[3]](#footnote-3) for male and female employees, the major part of the wage gap was attributed to the selection effect and the unexplained part of the wage gap. In addition, female employees received lower wages than males over the entire distribution. The wage gap was lower and the discrimination effect was larger for the high wage earners than for the low wage earners.

In summary, the literature on the gender wage gap in Bangladesh shows that only a small portion of the total wage gap is explained by productivity related characteristics and a larger portion is ‘rewards’ to those endowments (unexplained part). These results also suggest that a significant part of the wage gap is unexplained and could be due to discrimination and unobserved effects. There are other reasons which account for low female wages in Bangladesh such as faster growth in female labour force participation, a higher female unemployment rate and female underemployment, a higher poverty rate in female wage workers, low bargaining power and job segregation (Rahman and Islam, 2003).

In Bangladesh, different data sets have been used to decompose the gender wage gap including the Labour Force Survey (Ahmed and Maitra, 2011a), the Household Income and Expenditure Survey ([Al-Samarrai, 2007](#_ENREF_2)) and the Occupation Survey ([Kapsos, 2008](#_ENREF_11)). Different researchers have imposed different restrictions on their sample with different results for the gender wage gap. Kapsos (2008) reported 23.1 per cent raw wage gap in 2007, Al-Samarri (2007) reported 45.2 per cent in 2005 and Ahmed and Maitra (2011) found 64.9 per cent in 2005 where most of wage gap was made up of the unexplained component. In addition, non of these study address how much female employees lose just because of ‘being female’. This study addresses the following the questions for public and private sector employees in the Bangladeshi context.

* Are there any wage differences between males and females in the formal sector?
* If there is, how much do employees lose in monetary term?

**Research methodology and data**

***Methodology***

There are different approaches described in the literature for comparing the wage differences between two groups; such as between males and females. The most common and basic approach is to include a dummy variable for that variable into the pooled wage equation (Gregory and Borland, 1999). For example, sex (1 for male and 0 for female) is generally included as a dummy variable in the wage equation for the pooled data. However, recent studies (Walby and Olsen, 2002, Olsen and Walby, 2004, Kapsos, 2008, Watson, 2009, Cassells *et al.*, 2010) used female dummy instead of sex (1 for female and 0 for male) to visualise the shift effect. This dummy variable approach estimates the effects on the raw wage gap between males and females. This means it reflects the effect of the wage as an intercept effect. It allows no differences in the coefficient on other variables in the model. Here the pooled wage equation includes the female dummy in the wage equation:

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where, ln*Y* is the log of per hour wages of the employed persons, *X* is the vector of productivity related characteristic, *F* is the dummy for female and β\* and are *δ* coefficients or returns to the employees related to the corresponding characteristics. Here, it is assumed that the wage gap differs due to the intercept effect of the female dummy and the influence of all other human capital and other job related variables is considered to be the same for both males and females across the wage distribution.

There are other methodologies described in the literature that use a separate wage equation for males and females to measure and to decompose the observed wage gap depending on race, gender, and ethnicity. A method for the decomposition of the overall gender wage gap due to human capital and other work related variables or endowment differences (the explained part of the gender wage gap) and differences due to returns to those factors (unexplained part of the gender wage gap sometimes known as discrimination) and its decomposition was independently developed by Oaxaca (1973) and Blinder ((1973).

This Oaxaca (1973) decomposition method is based on mean differences between two groups (such as race, gender) and two separate wage regressions are estimated for different groups. It is assumed that in the absence of discrimination, males and females would receive the same returns for the same endowments and that the observed pay differences are due only to differences in pay-related characteristics such education and experience. It is necessary to choose a non-discriminatory wage structure to evaluate the effect of endowment differences between males and females. Oaxaca used the male wage structure as the non-discriminatory wage that prevails in the absence of labour market discrimination. He decomposed the wage gap into two parts. The first is the difference in human capital endowments and job related characteristics or an individual’s personal characteristics or other endowment difference (characteristics effect) which is the explained part of the gender wage gap that is also known as the ‘endowment effect’. The second part is the difference in estimated coefficients sometimes represented as discrimination (Blinder, 1973, Oaxaca, 1973) or the ‘unexplained part’ of the wage gap. This is also named the ‘treatment effect’ (Fortin *et al.*, 2010), ‘remuneration effects’ (Beblo *et al.*, 2003), coefficient effect (Yun, 2008) or returns to endowment (Cassells *et al.*, 2010). This unexplained part of the gender wage gap may also reflect the impact of model misspecification, mismeasurement or error of calculation (Reiman, 2000); Oaxaca, 1973; Blinder 1973).

The Oaxaca-Blinder method uses a specific wage equation as the non-discriminatory wage which leads to an index number problem (Oaxaca and Ransom, 1994, Yun, 2005). Researchers have argued that using a specific wage equation (male or female) leads to undervaluation of one group and overvaluation to the other group (Cotton, 1988). To overcome this problem Cotton (1988), Neumark (1988), Reimers (1983) introduced a different non-discriminatory wage structure and, finally, Oaxaca and Ransom (1994) summarised other methods and provided a matrix of combinations of both male and female wages in the wage decomposition method. More recently, Olsen and Walby (2004) introduced a different type of methodology which is based on the original Oaxaca decomposition. This section considers Olsen and Walby (2004) decomposition method.

***Olsen and Walby (2004) simulation method***

Recently Olsen and Walby **(**2004**)** used a different method to investigate the gender wage gap in the UK that was also based on the original Oaxaca method. The traditional Oaxaca method used two separate equations to estimate the earning gap. On the other hand, the Walby and Olsen method used a single equation and a simulation decomposition method to identify the portion of the gender wage gap associated with different factors. The most interesting point of this method is that it allows visualisation of the gender wage gap in monetary terms for each factor that affects the wage gap. In addition, the effect of being female which is a direct and indirect effect of discrimination is calculated and leads to policy formulation to reduce the wage gap. Olsen and Walby emphasise the pooled regression rather than separate male or female wage equations in the wage decomposition method.

This method allows decomposition of the total endowment effect and it does not consider the unexplained part of the wage gap which could be affected by unobservable factors other than direct discrimination. Olsen and Walby used the pooled wage equation with a female dummy variable in the wage equation to capture the direct effect of discrimination from being female. The equation used as the simulation effect is:

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where R equals the raw wage gap between males and females, *Xm* and *Xf* are the mean values of endowments for males and females, and β\* is the coefficients of the pooled wage equation that includes a female dummy to capture any direct discrimination (results are provided in Appendix table A1). After that this simulation effect is distributed among different factors according to their weight. indicates the characteristic differences between males and females. This ‘change factor’ (Watson, 2009) is multiplied by the pooled β to get the simulation effect (ΔX\*β) which is expressed in terms of the percentage of the wage gap. Each factor’s simulation effect is used to generate the individual factor’s contribution to the total monetary value of the wage gap. There is considerable debate about choice of the non-discriminatory wage structure . For similar reasons, Olsen and Walby’s (2004) simulation method uses the slope of the coefficient for the pooled data representing the whole population.

According to the Olsen and Walby (2004) simulation method, the total wage gap is justified for overall male and female endowment differences only and the debatable discrimination (coefficient) effect is not calculated separately; however, the direct and indirect effect of discrimination is measured inside the endowment differences. In addition, this method allows us to estimate how much women’s endowment needs change to equalize men’s endowment. As Olsen and Walby mention “simulating the hypothetical changes needed to bring women’s levels….into line with those of men” (p. 24). In addition, the method can be used to estimate how much the wage gap may be reduced if female endowment levels equalled that of males. Furthermore, this simulation method allows the estimation of the change in hourly wages if female’s conditions changed to the average male’s situation. For example, one can examine the simulation effect of any particular variable, how much that particular variable (for example the years of education) accounts for a percentage of the pay gap and the monetary value of any differences. Using British Household Panel Survey data, Olsen and Walby (2004) modelled the gender wage gap for the UK and found that education has a simulation effect of 0.02, which accounts for 8 per cent of the gross wages gap of 0.23. This variable can then be given a monetary value; 18 pence per hour (8 per cent of the £2.28 wages gap). Determination of the relevant factors that contribute to the gender wage gap could lead to policy formulation to reduce wage inequality. This method excludes the effects of factors which are ’female-advantaging’ or the negative wage gap that helps to decrease the wage gap. The method assumes these do not change, are considered to be controls for policy formulation, and is not relevant to changing the gender wage gaps. The removal of these factors could produce biased estimates, or over-estimation of the gender wage gap (Cassells *et al.*, 2010). One of the most interesting aspects of this method is that the method can be applied to all of the variables in the regression, or to just a subset that is relevant to a particular policy (Watson, 2009). Cassells et al. (2010) provide a detailed review of the Olsen and Walby decomposition method and they summarised the advantage of this method as follows (p. 12):

* The gender component is visible enabling the effect of direct discrimination or other aspects related to being a woman to be measured.
* There is the option to bring all of the 'policy relevant' variables into the forefront, and to treat all other variables as controls or irrelevant.
* Offsetting 'female advantaging' aspects are removed;
* The tug-of-war about what component is due to 'rewards' and what is due to 'endowments' is removed.
* Feedback effects (pre-labour market discrimination) are to some extent addressed by giving women the ‘best average situation among men’.

The Olsen and Walby (2004) simulation method is not widely used. This method has been used to estimate the gender wage gap in the UK and in Australia (Walby and Olsen, 2002, Olsen and Walby, 2004, Watson, 2009, Cassells *et al.*, 2010, Olsen *et al.*, 2010). Olsen and Walby (2004) used a British Household Panel Survey sample consisting of 10,000 adults to explore how much of the gender gap is related to different factors. The findings of the research showed that the gender wage gap was £2.28 per hour in 2002 and that this can be segregated into the main factors; life time working patterns (consisting of years of full-time employment, years of part-time work and work interruption due to family care) account for 36 per cent of the pay difference, rigidities in the labour market (such as occupational segregation, size of firm) accounts for 18 per cent of the pay gap, 8 per cent is due to the lower education attainment of females, and 38 per cent is accounted for by ‘being female’. This ‘being female’ measure is the direct discrimination because of different labour market preference for females compared with males. Olsen and Walby have estimated the selection correction term as another single factor but did not include it in the simulation procedure.

Two other studies were conducted by Cassells and her colleagues (2010) and Watson (2009) to estimate the gender wage gap for Australia. Watson (2009) estimated the gender wage gap for managerial employees using seven waves of the Household, Income and Labour Dynamics in Australia (HILDA) Survey data. As a selection effect is not statistically significant, Watson did not include it in the wage equation. Cassells et al. (2010) used wave 7 of HILDA data and their sample consisted of wage earners aged between 21-65 year. Those who were still in school or self-employed were excluded from the sample to estimate the gender wage gap. This means their sample suffers from a sample selection problem and they did not adjust the non-random sampling error for the gender wage gap estimation. Cassells et al. argued for not correcting their results as in Australia more educated women are less likely to be unemployed.. As they mentioned “…..women with lower human capital will be more likely to opt out of the labour force”(p. 14) and their samples were wage earners who might have higher human capital and are less likely to opt out from the labour force. In this connection, this present research is based on the formal private and public sector employees of Bangladesh who have higher human capital. For the Olsen and Walby (2004) simulation method the present study did not correct for sample selection.

###  Data

In this study the ‘Labour Force Survey 2005-06’, BBS (LFS 2005-06) data set covering all of Bangladesh has been used to provide individual level information on labour force status, demographic variables, working status (full-time or part-time) and working in the private or public sector. This present study estimated the wages for the formal sector employees, which includes the public and private sectors, but the non-formal sector, which is mostly agriculture and subsistence level jobs and the self-employed are not considered. This decision was made because in the non-formal sector no formal wage structure exists and workers are mostly unpaid family helpers. If the wage gap is calculated for all employees then the total wage gap might be much higher. In this connection, the sample used in this study was restricted to those who were aged between 15 and 65 years for males and females and were working in the formal private or public sectors. In the formal sector, employees receive a monthly income in Bangladesh. Employed persons who worked on a full-time or part-time basis and received a monthly income are in the sample. Those who worked in the army were not included. Self-employed persons are also not included. The samples was restricted to the public and private sector employees with some specific criterion to estimate the gender wage gap because the restricted sample provide a more accurate result (Weichselbaumer and Winter-Ebmer, 2005). The total sample size was 6351 where 80.6 per cent are male and 19.4 per cent are female employees. In comparison, the labour force participation rate for males was 86.8 per cent and 29.2 per cent for female, where female participation in the formal sector is only 11.5 per cent of total female employed persons (BBS, 2008). Therefore, females are underrepresented in the formal sector but are relatively over represented in the sample.

The main intention of this study was to investigate the gender wage gap in Bangladesh and so the most important variable of this study is the income variable. In the LFS 2005-06 data set, income information is provided in three ways: i) income in cash, ii) income in kind and iii) total income in cash and kind. In this analysis, total income is calculated by adding income in cash (i) and income in kind (ii). In some cases, separate information on cash and kind income were not provided, but total income was provided; for those cases, the total income was extracted from the third way.

In this analysis, instead of real experience or potential experience for the experience variable, age and age squared variables are used to see how much wage changes with the change of age. The educational achievement is given as a categorical variable and four dummy variables generated to capture the educational achievement (Table 1 provides a detailed list of variables).

The work-related variables are crucial to estimate the gender wage gap. To get the job related characteristics, working hours, working full-time or part-time, and working in either the private or public sector are included in the earning equation. Occupation[[4]](#footnote-4) and industry[[5]](#footnote-5) dummies are included to cover gender based segregation in the work place.

To capture wage loss due to job interruption because of family and child care responsibilities, marital status, number of children less than 5 years of age, number of children between 6 and14 years in the household (HH) and number of household members aged between 19 and 24 years were also included in the wages equation.

To cover regional local price differences Reimers (1983) made an adjustment for the local price level. Reimers also argues this could be accounted for by including regional dummy variables in the regression model. These dummies will also capture any differences in how the labour market operates in different regions in Bangladesh. In this present study, it was not possible to collect regional price differences or a regional cost of living index, so the regional dummy variables also control for regional differences in the real wage. To capture the regional variation for location of employed persons an urban dummy (1 for the group otherwise 0 for rural area) was included and residential location was captured by introducing six divisional dummy variables.

The data for this study was extracted from the ‘Labour Force Survey 2005-06’ of Bangladesh Bureau of Statistics information which is the largest data source of the country. The general form of the log-linear human capital earnings equation was used and Table 1 provides the list variables used in this study.

Table : Variable used in this study

| **Variables** | **Description** |
| --- | --- |
| LNWAGE  | Natural log of per hour wage  |
| AGE | Age |
| AGE2 | Age square |
| Primary | Education dummy for Primary schooling which is equivalent to year 1 to year 5, 1 for this category otherwise 0 |
| Secondary | Secondary and Higher schooling education which is equivalent to year 6 to year 12, 1 for this category otherwise 0 |
| Tertiary | Tertiary education such as Bachelor, Masters, Medical and Engineering, 1 for this category otherwise 0 |
| Others\* | Other, 1 for this category otherwise 0 (working as a base category) |
| FEMALE | Dummy Variable for female, 1 for female and 0 for male |
| PUBLIC | Public sector dummy, 1 for this category otherwise 0 |
| TOTHOURS | How many hours work per week for the main job |
| Full\_time | Dummy variable for Working status full-time, 1 for this category otherwise 0 for part-time |
| Professional\_Tech | Dummy variable for occupation Administrative and Managerial and Professional and Technical category, 1 for this category otherwise 0 |
| Clerical | Occupation Clerical Workers, 1 for this category otherwise 0 |
| Sales\_Service\* | Occupation Service and Sales workers, 1 for this category otherwise 0 (working as a base category) |
| Agricul\_trans | Occupation Agriculture, forestry, fisheries and Production and Transport labours, 1 for this category otherwise 0 |
| Others\_Occ | Occupation Others, 1 for this category otherwise 0 |
| Manufacturing | Dummy variable for Industry Manufacturing, 1 for this category otherwise 0 |
| Electricity\_gas | Electricity gas Water supply, construction and Transport storage, 1 for this category otherwise 0 |
| Financial\_Business | Financial Intermediation and Real estate and renting business, 1 for this category otherwise 0 |
| Public\_Defence | Public Administration and defense, 1 for this category otherwise 0 |
| Educations | Education, 1 for this category otherwise 0 |
| Health\_social\* | Health and social worker, 1 for this category otherwise 0 (This one working as a base category) |
| Others\_Indus | Others Industry, 1 for this category otherwise 0 |
| Urban | Dummy variable for location, 1 for urban area and 0 for rural |
| Chittagong | Dummy variable for the District Chittagong, 1 for this category otherwise 0 |
| Dhaka | Dhaka, 1 for this category otherwise 0  |
| Khulna | Khulna District, 1 for this category other wise 0  |
| Rajshahi | Rajshahi District, 1 for this category otherwise 0  |
| Barishazila\* | Barishazila, 1 for this category otherwise 0 ( working as a base category) |
| Sylhet | Sylhet District, 1 for this category otherwise 0  |
| FAMILYINC | Total family income per month |
| SINGLE\* | Marital status dummy, not married, 1 for this category other wise 0 |
| MARRIED | Married dummy, 1 for this category other wise 0 |
| PREMARRIED | Previously married dummy, 1 for this category other wise 0 |
| CHILD005 | No of children age between 0-5 years |
| CHILD0614 | No of children age between 6-14 years |
| CHILD1518 | No of children age between 15-18 years |
| TERAGE1924 | No of household member tertiary age group where age between 19-24 years |

Note: \* dummy variables omitted from the regression equation.

## Results and Discussion

### Average characteristics difference between male and female employees

Descriptive statistics on different characteristics between males and females are presented in Table 2 for the male and female sample. In this sample, the average hourly wage rate for male employees was 22.12 Tk compared to 16.2 Tk for female employees. This indicates that the average male employees earn 6.07 Tk more per hour than female employees (which means females earned, on average, 73 per cent of male earnings). Most gender wage gap analyses focus on an assessment of the wage gap between males and females at the mean wage.

Gender differences exist in human capital acquisition. Due to different levels of human capital, such as education, and labour market experience, employed persons receive different levels of wages. In this sample age is used as a proxy for work experience and, on average, male employees had 6 years more experience than female employees (37.9 years and 31.9 years for the male and female employees respectively).

Table : Descriptive statistics for the public and private sector employees

|  | **Male** | **Female** | **Mean differences** |
| --- | --- | --- | --- |
|  | **Mean** | **Sd** | **Mean** | **Sd** | **(male-female)** |
| WAGE (Tk[[6]](#footnote-6)) | 22.12 | 0.218 | 16.05 | 0.381 | 6.07 |
| LNWAGE (ln) | 3.096 | 0.010 | 2.776 | 0.024 | 0.321[[7]](#footnote-7) |
| AGE | 37.87 | 0.162 | 31.9 | 0.291 | 6.0 |
| AGE2 | 1568.67 | 12.575 | 1121.33 | 20.145 | 447.3 |
| Primary\* | 11.85 | 0.005 | 14.73 | 0.01 | -2.9 |
| Secondary\* | 52.87 | 0.007 | 45.08 | 0.014 | 7.8 |
| Tertiary\* | 28.74 | 0.006 | 26.20 | 0.013 | 2.5 |
| PUBLIC\* | 42.03 | 0.007 | 40.28 | 0.014 | 1.8 |
| TOTHOURS | 50.66 | 0.165 | 47.35 | 0.37 | 3.3 |
| Full\_time\* | 98.50 | 0.002 | 94.96 | 0.006 | 3.5 |
| Professional\_Tech\* | 30.89 | 0.006 | 44.43 | 0.014 | -13.5 |
| Clerical\* | 17.49 | 0.005 | 14.48 | 0.01 | 3.0 |
| Agricul\_trans\* | 20.30 | 0.006 | 21.72 | 0.012 | -1.4 |
| Others\_Occ\* | 14.39 | 0.005 | 14.40 | 0.01 | 0.0 |
| Manufacturing\* | 24.25 | 0.006 | 27.10 | 0.013 | -2.8 |
| Electricity\_gas\* | 9.41 | 0.004 | 2.20 | 0.004 | 7.2 |
| Financial\_Business\* | 9.18 | 0.004 | 9.03 | 0.008 | 0.1 |
| Public\_Defence\* | 19.72 | 0.006 | 12.86 | 0.01 | 6.9 |
| Educations\* | 22.06 | 0.006 | 34.58 | 0.014 | -12.5 |
| Others\_Indus\* | 11.93 | 0.005 | 3.99 | 0.006 | 7.9 |
| URBAN\* | 61.25 | 0.007 | 72.74 | 0.013 | -11.5 |
| Chittagong\* | 18.49 | 0.005 | 16.35 | 0.011 | 2.1 |
| Dhaka\* | 34.56 | 0.007 | 42.47 | 0.014 | -7.9 |
| Khulna\* | 14.49 | 0.005 | 11.23 | 0.009 | 3.3 |
| Rajshahi\* | 18.39 | 0.005 | 16.19 | 0.011 | 2.2 |
| Sylhet\* | 4.26 | 0.003 | 4.96 | 0.006 | -0.7 |
| MARRIED\* | 79.62 | 0.006 | 71.44 | 0.013 | 8.2 |
| PREMARRIED\* | 0.41 | 0.001 | 10.09 | 0.009 | -9.7 |
| CHILD005 | 0.35 | 0.008 | 0.29 | 0.015 | 0.1 |
| CHILD0614 | 0.89 | 0.014 | 0.72 | 0.026 | 0.2 |
| TERAGE1924 | 0.71 | 0.013 | 0.55 | 0.023 | 0.2 |

Note: a) \*provided in percentage term as they are dummy variables. b) Education group: others, Occupation: Sales and service worker, Industries: Health and social worker, Division: Barishal and Marital status: Single used as base category.

A large proportion of males are in the more highly educated category; 11.8 per cent of male employees have primary education compared to 14.7 per cent of females, 52.9 per cent of males had secondary and higher secondary education and 28.7 per cent had tertiary qualifications compared to 45.1 per cent and 26.2 per cent of the female employees for the corresponding category. ‘Others’ educational level[[8]](#footnote-8), used as the base category, is higher for females (it accounts for 14.0 per cent of female employees compared to 6.5 per cent of males).

Among the job-related factors, the gender difference in public sector employment is not as large in this sample. According to this sample, 42.0 per cent of male employees are working in the public sector compared to 40.1 per cent of female employees. This might overestimate the female representation in the public sector because male and female participation in the public sector are 83 and 17 per cent respectively of the total of public sector workers (BBS, 2008).

Gender differences are also found in working status. Working status captures working either full-time or part-time. On average, male employees work 3.3 hours more than females per week, (males work on average 50.7 hours per week compared to 47.4 hours for females). Both male and female employees in the formal sector work more than the weekly full-time requirement (37.5 hours). Almost 99 per cent of the male employees work on a full-time basis. However, part-time employment is higher for female employees (5 per cent of female employment). It could be because the societal norm of the country is for the male to be the main bread winner of the family.

Other work related variables such as occupation segregation affect wages. Due to occupational segregation, females tend to work in low-paid jobs and males in the high-paid jobs. So, gender differences in occupation are one of the critical factors in explaining the gender wage gap. The gender difference in occupation is also present in this sample. Males are mostly engaged in administrative, managerial, professional and technical jobs (30.9 per cent), clerical jobs (17.5 per cent), agriculture, forestry, fisheries and production and transport labours (20.3 per cent). On the other hand, this figure is slightly different for female employees. Female’s representation is higher in administrative, managerial, professional and technical jobs (44.4 per cent), agriculture, forestry, fisheries, production and transport labours (21.7 per cent) and clerical jobs (14.5 per cent). There is no significant difference in employment in other occupational categories.

Another important variable is employment in different industries. Gender difference exists in formal public and private sector employment at the industry level. Male employees are more concentrated in manufacturing (24.3 per cent of total male employees), public administration and defence (19.7 per cent), electricity, gas, water supply, construction and transport storage (9.4 per cent) and the education sector (22.1 per cent). On the other hand, females are mostly concentrated in the manufacturing (27.1 per cent of total female employment) and education industries (34.6 per cent). Employment in education is relatively more important for females. There is no significance difference in the remaining industries.

Male and female employment varies with regional location. The percentage of total male employees located in the urban area is 61.3 per cent compared with 72.7 per cent for female employees. To address the regional variation in detail, geographic location dummies for six divisions were included in the wage equation. The share of female employment is higher in Dhaka compared to males, but in all other division males have a higher representation. This may reflect different social norms in the major urban centres compared other areas and to differences in industry mix.

Most gender wage gap studies do not contain measures of time-out of the workforce because this information is not available in the data set. However, various proxies, such as information on family structure and responsibility, the number of young children and marital status, that are strongly correlated with time-out are often used to account for time-out of the workforce. The literature shows that marriage makes a positive contribution to male earning and has the opposite effect on females. In this sample, more males were married (79.6 per cent of male employees) than females (71.4 per cent of female employees). However, the percentage of previously married women which includes widows, divorced and separated, is higher than for males.

### Research results

This section presents decomposition results using the Olsen-Walby (2004) decomposition approach to quantify the key determinants of the gender wage gap and to quantify the wage gap in monetary terms. According to the Olsen and Walby (2004) simulation method, decomposition of the gender wage gap adjusts for overall male and female endowment differences. In addition, this method showed by equalizing endowment’s differences between males and females (or to bring female’s endowment equal to males) how much the gap would be reduced in percentage terms and how much this would be worth to females in monetary terms (here ‘Taka’ is local currency).

The Olsen and Walby (2004) decomposition results based on OLS with no selection correction. Those who have high skills which are acquired through human capital investment and are highly expensive in Bangladesh, are less likely to opt out from the labour force. The direct and indirect discrimination component of being a woman is measured by the ‘female’ dummy variable that also captures the unobserved factors associated with being a woman. The estimated coefficients of the pooled wage equation were used as a true non-discriminatory wage structure. Full detailed decomposition results are provided in Appendix tables A2 and A3. The emphasis is given to simulated change and those factors positively contributing to the gender wage gap. The results imply that males’ average endowments are higher than for females and are policy relevant factors and the focus for reducing the gender pay gap. In addition, negative values were assumed to be controlled and not reported here. To illustrate the simulation technique, a hypothetical example is presented. The descriptive statistics show that males are on average six years older than females and an increase of six years would be required in order to bring female work age equal to that of males. This extra six years of age is then multiplied by the corresponding coefficient for every extra year of age, which is, say, 0.053. This gives a simulated effect of 0.32 (0.053\*6). This indicates that if females had the same work experience as males then females could increase their wages by 32 per cent, which is 47.5 per cent of the total wage gap. Or 32 per cent of the gender wage gap could be reduced by increasing the average female’s age by six years (proxy working experiences) other things remaining equal.

The unadjusted wage gap shows males earn on average 6.07 Tk more per hour than females with males earning 22.12 Tk per hour on average and females 16.05 Tk per hour. This also indicates that female employees earn, on average, 73 per cent of the male wage. Table 3 demonstrates the simulation effect for formal sector employees in Bangladesh to bring female endowment levels equal to the average male situation. The total wage gap has been derived using selected variables and this is the advantage of this method; it allows decomposition for the full model as well as subset of the model (Watson, 2009).In this summary table those factors which increase the wage gap are included and the negative effects on the wage gap, factors in favour of females, were excluded from the simulation as well as regional differences. The largest effect found is for work experience, followed by being female, education, occupation and industry segregation, work related variables and family related variables. The estimated (Olsen and Walby (2004)) simulation method revealed that there were differences in male and female endowments and some important features of this simulation method are provided in Table 3. As well, a graphical representation of the Olsen-Walby decomposition based on per hour wage loss is provided in Figure 1.

The largest effect found was the effect of age which is responsible for 48 per cent of the total wage gap. If females have the same level of proxy of work experience as males, by increasing six years of age, the gender wage gap would fall by 32 per cent of the wage gap other things remaining the same. From another point of view, females could increase their weekly income by 108 Tk weekly or 5621.5 Tk yearly.

Table : The gender wage gap for the Olsen and Walby (2004) method

|  | **Simulation effect (*β\*Δ*X)** | **Simulation as a % of the wage gap** | **Per hour**  | **Weekly a** | **Yearly** |
| --- | --- | --- | --- | --- | --- |
| **Wage lost in monetary value (in Tk)** |
| Age | 0.32 | 0.48 | 2.88 | 108.11 | 5621.49 |
| Education | 0.04 | 0.06 | 0.35 | 13.00 | 676.26 |
| Work related | 0.02 | 0.04 | 0.22 | 8.08 | 420.16 |
| Occupation  | 0.01 | 0.01 | 0.05 | 1.71 | 88.68 |
| Industry | 0.03 | 0.04 | 0.27 | 10.10 | 525.39 |
| Family related | 0.02 | 0.03 | 0.21 | 7.79 | 405.10 |
| Female | 0.23 | 0.35 | 2.10 | 78.75 | 4095.26 |
|  Total | 0.67 | 1.00 | 6.07 | 227.55 | 11832.35 |

Note: positive values are considered. a Weekly hours 37.5 hours is considered. Appendix tables 2 and 3 provide details.

This method allows quantification of the direct discriminatory effect of being female. If the negative effects of being female were removed then the gender wage gap would decrease by 23 per cent which accounts for 35 per cent of the total wage gap which is equivalent to 2.10 Tk per hour. If a woman worked an average of 37.5 hours per week, then she would lose 78.8 Tk per week and 4095.2 Tk yearly just by being female keeping all other variables constant. Figure 1 also shows that the effects of work experience and being a woman clearly dominate the gender wage gap.

If the female education level rose to male levels, there would be a 4 per cent reduction in the gender wage gap and in the formal sector female employees could earn an extra 13 Tk per week where male and female working hours are 37.5 hours per week. The fourth important factor that affects the gender wage gap is the work related variables which includes dummy variables for employment in the public sector and working full-time. If the representation of females in the public sector and full-time employment increased to the same proportion as males, the gender wage gap would decline by 2 per cent which is equivalent to 4 per cent of the total wage gap.

Figure : Per hour wage loss in monetary term (in Taka)

Occupation and industrial segregation, which are also part of discrimination, were used to measure the wage gap. If females and men were represented equally within occupations and industries, the gender wage gap would reduce by 4 per cent (5 per cent of the total wage gap) and could increase the female wage an extra 11.8 Tk per week.

Female employees earn less due to labour market interruptions when they are out of the labour force due to childcare and family care responsibility. This is not the general case for males. The female hourly wage would increase by 0.21 Tk per hour (3 per cent of the wage gap) if their labour market interruption was equivalent to that of males. Here, the labour market interruption is measured by marital status, number of children in different age groups, household members aged less than 5 years old and between 6 years and 14 years and account for three per cent of the total wage gap.

The summary results are provided below using Olsen and Walby’s (2004) simulation method:

* The unadjusted wage gap shows males earn on average 6.07Tk more per hour than females; males earn 22.12Tk per hour on average and females 16.05Tk.
* The proxy of work experience could be overestimated for females and so if it were adjusted then the wage gap could rise rather than decrease.
* Direct discrimination is significant; ‘being female’ reduced wages by 23.0 per cent compared to males which is equal to 35 per cent of the total wage gap. If a woman worked an average of 37.5 hours per week, then she would lose 78.8 Tk per week and 4095.2 Tk yearly all other variables constant.
* Another type of discrimination is measured by occupation and industry segregation which contributes only 5 per cent to the total wage gap.

The main beauty of the Olsen and Walby (2004) simulation method is that it allows quantification of the gender wage gap in monetary terms and enables direct policy targeting. However, this method is not beyond criticism because it has the omitted variables and other unobserved effects if the selection correction problem is not solved. Accepting the limitation, this method would provide the best policy formulation to reduce the gender wage gap (Cassells *et al.*, 2010).

## Conclusion

Bangladeshi women have made noticeable progress in the labour market and the gender gap in educational achievement has narrowed (Anjum, 2014). Despite the progress, a significant wage gap remains and females are disadvantaged compared to males. The constitution of Bangladesh grants equals rights to males and females in all spheres of public life; however, discrimination against women exists (ADB, 2004). The social norms such as ‘purdah’, limits active labour force participation of females and their participation in politics and other forms of decision making. The social norms affect their life and livelihood and leave them living in poverty. There are other factors that might constrain female labour force participation: lack of suitable transport to workplace, lack of appropriate housing, lack of child care facilities ([Rahman, 2005](#_ENREF_9)).

The existing literature and this present study have identified several factors that contribute to the gender wage gap in Bangladesh. These factors are the level of human capital stock (such as the level of education and proxy working experience), working in the public sector, industry and occupational segregation, regional location, and career interruption due to motherhood or family related responsibilities. These factors disproportionately affect male and female wages and leads to a significant wage gap. Wage adjustments are needed through proper direct/ indirect public policy intervention to reduce the gender difference in human capital, to reduce occupational segregation and to remove direct and indirect discrimination from society. Because of pre-labour market discriminatory behaviour which is affected by the societal norm, families invest less more for their daughters, this leads to less educated, less skilled workers for the job market compared to males. In addition, due to direct or indirect discrimination in the labour market female employees earn less. Policy will be directed to increase wages and finally reduce the poverty level of the country.

There need to be broader changes and more opportunities for women in the formal sector. The government should introduce more positive initiatives leading towards gender development; more child care facilities close to work places, trainings, and improved flexible working hours. Pre labour market discrimination behaviour might effect the formal human capital acquisition of males and females (Altonji and Blank, 1999) and so government policy intervention should continue and extend affirmative action to remove gender difference in human capital and occupational segregation in the labour market. Antidiscrimination policies should be applied to female labour force participation. In addition, social awareness policies should be adopted to increase labour force participation and to change social attitudes toward women working outside the home and family.

“*When mothers live in poverty, so do their children*” (Olsen and Walby, 2004: p-34). The reduction of the gender wage gap will not only increase national income, but also reduce child poverty and lead to improvements for future generations. In the gender wage gap studies, researchers try to investigate the causes of the wage gap but there is no direct model that explains how to solve the problems. However, gender wage gap policy should target removal of the gender difference in education and reduction of skill differences. Improving the level of education for women may increase competition for formal sector jobs in the short run and lead to a reduction in wages but, in the long run, more educated workers could be expected to make the economy more competitive and to reduce poverty. In addition, anti-discriminatory policy should be addressed and enforcement of existing antidiscrimination policy, family-friendly policies (such as flexible working hours and better child care) to enable continued labour market experience for the female employees and more equal distribution of males and females across occupation and industries would be appropriate policy responses to these findings.

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**Appendix**

Table A1: Regression results for the Pooled wage equation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **LNWAGE** | **Coef.** | **Std. Err.** | **t** | **P>t** | **[95% Conf.** | **Interval]** |
| FEMALE | -.2316378 | .0191597 | -12.09 | 0.000 | -.2691974 | -.1940782 |
| AGE | .0532859 | .0045414 | 11.73 | 0.000 | .0443832 | .0621886 |
| AGE2 | -.0005366 | .0000556 | -9.65 | 0.000 | -.0006456 | -.0004276 |
| Primary | .0856776 | .0301669 | 2.84 | 0.005 | .0265403 | .1448149 |
| Secondary | .28001 | .0263836 | 10.61 | 0.000 | .2282891 | .3317308 |
| Tertiary | .6472295 | .0303684 | 21.31 | 0.000 | .5876971 | .7067619 |
| PUBLIC | .2900522 | .0175718 | 16.51 | 0.000 | .2556055 | .3244989 |
| TOTHOURS | -.0140323 | .0006243 | -22.48 | 0.000 | -.0152562 | -.0128084 |
| Full\_time | .5271106 | .0465133 | 11.33 | 0.000 | .4359287 | .6182924 |
| Professional\_Tech | .1959778 | .0272153 | 7.20 | 0.000 | .1426266 | .2493291 |
| Clerical | .1527574 | .0264935 | 5.77 | 0.000 | .1008211 | .2046937 |
| Agricul\_trans | -.0285843 | .0259243 | -1.10 | 0.270 | -.0794047 | .0222362 |
| Others\_Occ | -.0947855 | .0262604 | -3.61 | 0.000 | -.1462649 | -.0433062 |
| Manufacturing | .0510711 | .0376511 | 1.36 | 0.175 | -.0227379 | .1248801 |
| Electricity\_gas | .134748 | .0405242 | 3.33 | 0.001 | .0553068 | .2141892 |
| Financial\_Business | .1304701 | .0380703 | 3.43 | 0.001 | .0558394 | .2051009 |
| Public\_Defence | .009821 | .0367881 | 0.27 | 0.790 | -.0622962 | .0819382 |
| Educations | -.1528463 | .033636 | -4.54 | 0.000 | -.2187843 | -.0869082 |
| Others\_Indus | -.0426312 | .040465 | -1.05 | 0.292 | -.1219563 | .0366938 |
| URBAN | .1278883 | .014546 | 8.79 | 0.000 | .0993732 | .1564034 |
| Chittagong | .0385654 | .0263716 | 1.46 | 0.144 | -.0131319 | .0902627 |
| Dhaka | .0956283 | .0243243 | 3.93 | 0.000 | .0479443 | .1433123 |
| Khulna | -.0989591 | .0278123 | -3.56 | 0.000 | -.1534806 | -.0444375 |
| Rajshahi | -.1055121 | .026371 | -4.00 | 0.000 | -.1572081 | -.0538161 |
| Sylhet | .1612234 | .0382128 | 4.22 | 0.000 | .0863134 | .2361334 |
| MARRIED | .0312899 | .0234697 | 1.33 | 0.183 | -.0147186 | .0772984 |
| PREMARRIED | -.1689697 | .0520172 | -3.25 | 0.001 | -.2709411 | -.0669983 |
| CHILD005 | .0111068 | .0121299 | 0.92 | 0.360 | -.012672 | .0348855 |
| CHILD0614 | -.0012715 | .0071061 | -0.18 | 0.858 | -.0152018 | .0126589 |
| TERAGE1924 | .0207864 | .0082348 | 2.52 | 0.012 | .0046433 | .0369295 |
| \_cons | 1.444584 | .1058892 | 13.64 | 0.000 | 1.237005 | 1.652163 |

Table: A2: The Gender Wage Gap based on the Olsen and Walby simulation method

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Male** | **Female** | **Change X's** | **Pooled *β*** | **β\*ΔX** | **Simulation** | **Simulation effect in Tk\*** |
| AGE | 37.87 | 31.90 | 5.9672 | 0.0533 | 0.32 | 0.99 | 6.02 |
| AGE2 | 1568.67 | 1121.33 | 447.3410 | -0.0005 | -0.24 | -0.75 | -4.54 |
| Primary | 0.12 | 0.15 | -0.0288 | 0.0857 | 0.00 | -0.01 | -0.05 |
| Secondary | 0.53 | 0.45 | 0.0779 | 0.2800 | 0.02 | 0.07 | 0.41 |
| Tertiary | 0.29 | 0.26 | 0.0254 | 0.6472 | 0.02 | 0.05 | 0.31 |
| PUBLIC | 0.42 | 0.40 | 0.0176 | 0.2901 | 0.01 | 0.02 | 0.10 |
| TOTHOURS | 50.66 | 47.35 | 3.3045 | -0.0140 | -0.05 | -0.14 | -0.88 |
| Full\_time | 0.98 | 0.95 | 0.0354 | 0.5271 | 0.02 | 0.06 | 0.35 |
| Professional\_Tech | 0.31 | 0.44 | -0.1354 | 0.1960 | -0.03 | -0.08 | -0.50 |
| Clerical | 0.17 | 0.14 | 0.0301 | 0.1528 | 0.00 | 0.01 | 0.09 |
| Agricul\_trans | 0.20 | 0.22 | -0.0142 | -0.0286 | 0.00 | 0.00 | 0.01 |
| Others\_Occ | 0.14 | 0.14 | -0.0001 | -0.0948 | 0.00 | 0.00 | 0.00 |
| Manufacturing | 0.24 | 0.27 | -0.0285 | 0.0511 | 0.00 | 0.00 | -0.03 |
| Electricity\_gas | 0.09 | 0.02 | 0.0721 | 0.1347 | 0.01 | 0.03 | 0.18 |
| Financial\_Business | 0.09 | 0.09 | 0.0014 | 0.1305 | 0.00 | 0.00 | 0.00 |
| Public\_Defence | 0.20 | 0.13 | 0.0686 | 0.0098 | 0.00 | 0.00 | 0.01 |
| Educations | 0.22 | 0.35 | -0.1252 | -0.1528 | 0.02 | 0.06 | 0.36 |
| Others\_Indus | 0.12 | 0.04 | 0.0794 | -0.0426 | 0.00 | -0.01 | -0.06 |
| URBAN | 0.61 | 0.73 | -0.1150 | 0.1279 | -0.01 | -0.05 | -0.28 |
| Chittagong | 0.18 | 0.16 | 0.0213 | 0.0386 | 0.00 | 0.00 | 0.02 |
| Dhaka | 0.35 | 0.42 | -0.0792 | 0.0956 | -0.01 | -0.02 | -0.14 |
| Khulna | 0.14 | 0.11 | 0.0326 | -0.0990 | 0.00 | -0.01 | -0.06 |
| Rajshahi | 0.18 | 0.16 | 0.0220 | -0.1055 | 0.00 | -0.01 | -0.04 |
| Sylhet | 0.04 | 0.05 | -0.0071 | 0.1612 | 0.00 | 0.00 | -0.02 |
| MARRIED | 0.80 | 0.71 | 0.0818 | 0.0313 | 0.00 | 0.01 | 0.05 |
| PREMARRIED | 0.00 | 0.10 | -0.0968 | -0.1690 | 0.02 | 0.05 | 0.31 |
| CHILD005 | 0.35 | 0.29 | 0.0657 | 0.0111 | 0.00 | 0.00 | 0.01 |
| CHILD0614 | 0.89 | 0.72 | 0.1600 | -0.0013 | 0.00 | 0.00 | 0.00 |
| TERAGE1924 | 0.71 | 0.55 | 0.1573 | 0.0208 | 0.00 | 0.01 | 0.06 |
| FEMALE | 0.00 | 1.00 | -1.0000 | -0.2316 | 0.23 | 0.72 | 4.38 |
| \_cons | 1.00 | 1.00 | 0.0000 | 1.4446 | 0.00 | 0.00 | 0.00 |
| Sum |   |   |   |   | 0.32 | 1.00 | 6.07 |

**Table - A3: The gender wage gap considering only positive values** a

|  | **Male (mean)** | **Female (mean)** | **Change Factor** | **Pooled coefficient (*β’s*)** | **Simulation effect (*β\*Δ*X)** | **Simulation as a % of the wage gap** | **Per hour loss** | **Weekly loss** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AGE | 37.87 | 31.90 | 5.97 | 0.0533 | 0.32 | 0.48 | 2.88 | 108.11 |
| Secondary | 0.53 | 0.45 | 0.08 | 0.2800 | 0.02 | 0.03 | 0.20 | 7.42 |
| Tertiary | 0.29 | 0.26 | 0.03 | 0.6472 | 0.02 | 0.02 | 0.15 | 5.59 |
| PUBLIC | 0.42 | 0.40 | 0.02 | 0.2901 | 0.01 | 0.01 | 0.05 | 1.73 |
| Full\_time | 0.98 | 0.95 | 0.04 | 0.5271 | 0.02 | 0.03 | 0.17 | 6.35 |
| Clerical | 0.17 | 0.14 | 0.03 | 0.1528 | 0.00 | 0.01 | 0.04 | 1.56 |
| Agricul\_trans | 0.20 | 0.22 | -0.01 | -0.0286 | 0.00 | 0.00 | 0.00 | 0.14 |
| Others\_Occ | 0.14 | 0.14 | 0.00 | -0.0948 | 0.00 | 0.00 | 0.00 | 0.00 |
| Electricity\_gas | 0.09 | 0.02 | 0.07 | 0.1347 | 0.01 | 0.01 | 0.09 | 3.30 |
| Financial\_Business | 0.09 | 0.09 | 0.00 | 0.1305 | 0.00 | 0.00 | 0.00 | 0.06 |
| Public\_Defence | 0.20 | 0.13 | 0.07 | 0.0098 | 0.00 | 0.00 | 0.01 | 0.23 |
| Educations | 0.22 | 0.35 | -0.13 | -0.1528 | 0.02 | 0.03 | 0.17 | 6.51 |
| MARRIED | 0.80 | 0.71 | 0.08 | 0.0313 | 0.00 | 0.00 | 0.02 | 0.87 |
| PREMARRIED | 0.00 | 0.10 | -0.10 | -0.1690 | 0.02 | 0.02 | 0.15 | 5.56 |
| CHILD005 | 0.35 | 0.29 | 0.07 | 0.0111 | 0.00 | 0.00 | 0.01 | 0.25 |
| TERAGE1924 | 0.71 | 0.55 | 0.16 | 0.0208 | 0.00 | 0.00 | 0.03 | 1.11 |
| FEMALE | 0.00 | 1.00 | -1.00 | -0.2316 | 0.23 | 0.35 | 2.10 | 78.75 |
| Constant | 1.00 | 1.00 | 0.00 | 1.4446 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sum |   |   |   |   | 0.67 | 1.00 | 6.07 | 227.55 |

aregional dummy excluded

1. Draft paper not for quotation without the auther’s permission. [↑](#footnote-ref-1)
2. Taka (Tk) means Bangladeshi local currency. The exchange rate is US$ 1 = 67.08 Tk in 2005-06, source: Bangladesh Bank, [http://www.bangladesh-bank.org/econdata/index.php](https://www.canberra.edu.au/owa/redir.aspx?C=Wl6dEzqVc0K1K2F9L0rl9iYPQA06D88IUAM-D_E3yKB7EwzKmkruOopq2o47HlBhCskRsUO-zss.&URL=http%3a%2f%2fwww.bangladesh-bank.org%2fecondata%2findex.php) downloaded on dated 01.05.2012 [↑](#footnote-ref-2)
3. If samples are not selected randomly for the Ordinary Least Square estimation then the sample selection problem arises and this problem can be solved by including the contribution of those who are outside the sample. [↑](#footnote-ref-3)
4. LFS 2005-06 used International Standard Classification of Occupation (ISCO-88) for Occupational category. However, this present study used the restricted sample so representative data were not available for each group. Regrouping generated five occupational groups for this study. [↑](#footnote-ref-4)
5. LFS 2005-06 used Bangladesh Standard Industrial Classification (BSIC, Rev-3) for industrial category consisting of 15 categories. Due to the lack of a reliable representative sample size, this study regrouped them and generated seven industrial categories. [↑](#footnote-ref-5)
6. Taka (Tk) means Bangladeshi local currency. The exchange rate is US$ 1 = 67.08 Tk for year 2005-06. Source: Bangladesh Bank, http://www.bangladesh-bank.org/econdata/index.php downloaded on 01.05.2012. [↑](#footnote-ref-6)
7. Raw wage gap = . The raw wage gap interpreted as [exp (Raw wage gap)-1]\*100 in percentage term as per hour wage provided in log form (Oaxaca, R.L. and Ransom, M.R. (1994) but most of the study of the gender wage gap used just equivalent to percentage which is slightly differs with previous one Reimers, C.W. (1983). [↑](#footnote-ref-7)
8. In this sample, ‘Other’s’ education category considers ‘technical and others education’ levels based on LFS 2005-06 questionnaire. [↑](#footnote-ref-8)