Female employment stagnation in Bangladesh

A research paper on
Economic Dialogue on Inclusive Growth in Bangladesh

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Cover Image

ILO: Rabeya Akhter, young female motorcycle mechanic in Dhaka, Bangladesh 2012 (Licence CC BY-NC-ND 2.0)

CONTENTS

LIST OF FIGURES AND TABLES

ABBREVIATIONS

2SLS	Two-Stage Least Square
BBS	Bangladesh Bureau of Statistics
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
HSC	Higher Secondary Certificate
IT	Information Technology
IV	Instrumental Variable
LFS	Labour Force Survey
MNL	Multinomial Logit
OECD	Organisation for Economic Co-operation and Development
PPP	Public–Private Partnership
RMG	Ready-Made Garments
QLFS	Quarterly Labour Force Survey
SANEM	South Asian Network on Economic Modeling
SEZ	Special Economic Zone
SME	Small and Medium-Sized Enterprise
SSC	Secondary School Certificate
TVET	Technical and Vocational Education and Training
WEF	World Economic Forum

1. INTRODUCTION

In a context of growing concern over gender disparities and its resulting adverse impacts on society and the economy, the issue of the contribution of women to the national economy has taken centre stage in development discourse in most countries. There is no denying that integrating women's contribution has become a necessity on equity and efficiency grounds for any economy. It is now widely accepted that women's labour market participation improves their relative economic position, and from a broader perspective also stimulates the efficiency and development potential of the economy. However, traditional gender norms and patriarchal values often restrict women's mobility and constrain their activities in the labour market. This scenario is particularly common in South Asian countries, resulting in much lower participation and in concentration in low-paid activities for women in relation to their male counterparts.

Researchers have found a positive association between female labour force participation and economic growth. Using a 40-year-long panel dataset, Klasen and Lamanna (2008) find a positive impact of a reduced gender gap in employment and education on economic growth. This finding is in line with those of Galor and Weil (1996), who also find a positive relationship between growth and gender equality and argue that, through the channels of reduced fertility and creation of human capital, a lower gender gap contributes towards economic development. Cavalcanti and Tavares (2007) emphasise the fertility-reducing and growth-enhancing effect of female labour market participation. A few other studies (e.g. Blecker and Seguino, 2002) highlight the growth-enhancing effect of export-oriented industrialisation supported by the female labour force.

In a cross-country context, while analysing the relationship between economic development and female labour market participation, some researchers have found a U-shaped pattern (Goldin, 1995; Verick, 2014; Heath and Jayachandran, 2016). Goldin (1995) explains this by the dominance of agricultural activities at low levels of gross domestic product (GDP), followed by a decline in agricultural activities and a fall in female participation. In the later stages of development, higher economic growth, driven primarily by services sector activities, is likely to fuel women's labour market participation with a gradual shift away from home-based activities (Goldin, 1995; Rahman and Islam, 2013). This U-shaped relationship is found not to be consistent across countries, however. In the case of most developing countries, female employment has been found as rising with varying trends (Heath and Jayachandran, 2016).

In Bangladesh, women's contribution to the national economy is much lower than it could be, as a result of their low participation in the labour market. Women make a significant contribution in non-market activities, such as household work and care for children and the elderly at home, but a critical factor in ensuring inclusive growth in the economy lies in ensuring much greater participation of women in market-based productive activities. And it is not only on the grounds of economic efficiency that it is important to have a greater level of engagement of women in mainstream economic activities; it is critical also for the sake of greater equity and from an inclusive growth perspective. The financial empowerment of women can pave the way towards a reduction in poverty (of women as well as children) and greater equity, and as a whole can also empower women in the socio-political arena. Increased and improved participation in the labour market can contribute towards women's greater agency and voice in decision-making.

The level of female employment in Bangladesh has been lower than that for men as a result of both demand- and supply-side issues. On the supply side, women's labour market participation depends on a number of socioeconomic factors, including household income, age, marital status, education, household dependency ratio, etc. In contrast, from a demand-side perspective (i.e. firms' demand for female labour), female employment can depend on factors including firm size, firm nature, technology used, location, etc. There are also some sector-specific issues that can affect the expansion of women's employment in certain economic activities.

It is important to mention that, over the past two decades, Bangladesh's average economic growth rate has been around 5.5%, and in the most recent year (2016/17), the growth rate has been recorded at 7.7%, accompanied by impressive progress on a number of socio-demographic indicators such as the fertility rate, infant and child mortality, maternal mortality, etc. In the case of the labour market, the most noticeable change has been observed with regard to rising participation of women in the labour market, with the rate rising from around 8% in the mid-1980s to almost 36% in 2016/17. Given the patriarchal and conservative social structure of the country, though, we should analyse such trends in female labour force participation more critically, for a number of reasons.

First, despite the increase, the female participation rate is still much lower than the male participation rate, which is similar to that of advanced economies.
Second, the rate of growth of the female labour force and/or the annual average change in the participation rate has slowed over the past decade or so, and as a result the participation rate is still hovering around 36%.

Third, when the question of quality of employment is raised, women are found mostly in low-paid and low-productivity activities, and over time there has not been much progress in their relative position on the occupational ladder. A significant percentage of women are even involved in unpaid activities on family farms, and therefore, despite being included in the labour force, are not in a position to exercise financial agency. In recent years, women's increased participation in agricultural activities and greater concentration in informal sector jobs have also highlighted the inferiority of women's position in the labour market. In this context, recent trends in ready-made garments (RMG) – the key female wage employment sector in Bangladesh – also show a fall in female employment.

Finally, in recent years, there have been growing concerns that female workers are more vulnerable than their male counterparts in the era of technological advancement and increased automation.
Therefore, from both a numerical and a qualitative point of view, it can be argued that women are locked into an inferior position in the labour market. This deserves an in-depth analysis from both the supply and the demand perspectives.

Against this backdrop, the objectives of this research are (i) to explore the factors affecting female labour force participation in Bangladesh; (ii) to examine the effect of technology and automation on female labour demand at firm level; (iii) to explore the opportunities and challenges of expansion of female employment in different potential sectors in the economy; and (iv) to offer strategies and policies for the government as well as the private sector on actions that could address the problems identified.

The overview of the paper is as follows. Section 2 offers a brief review of the literature on both the supply and the demand side. Section 3 provides an overview of the trends and patterns of female

employment in Bangladesh. Section 4 presents an empirical analysis of the supply side of the labour market using recent national-level data. Section 5 then presents a demand-side analysis, particularly emphasising the plausible effect of automation and technological advancement on women's labour market participation behaviour. With the help of a primary survey and key informant interviews (KIIs) of relevant individuals, Section 6 provides a qualitative assessment of potential sectors for female employment. Section 7 reviews the causes of the stagnation in female employment in Bangladesh. Sections 8 and 9 offer policy suggestions and concluding observations, respectively.

2. LITERATURE REVIEW

The literature on female employment vastly emphasises the supply-side perspective – that is, the factors affecting households' female members' decision to participate in the labour market. In terms of methodology and choice of different factors influencing women's labour force participation, researchers have incorporated a number of socio-demographic as well as household-specific variables in their econometric analysis of female labour supply. Blau and Khan (2006) consider the impact on family income of wages of both women participants and their spouses while controlling for income from other sources. Klasen and Pieters (2013) use the share of household income earned in regular salaried employment and also by the number of underemployed men in the household. Mahmud and Bidisha (2018) include variables for household head's education to capture the socioeconomic position of the household, and, while considering that a significant percentage of women are employed in rural farm-based activities as unpaid family workers, include household head's occupational dummy (whether self-employed or not) in the analysis.

In a standard labour supply function, education is often included as a key determinant of labour supply, and most of the literature finds a significant positive impact of education on the labour supply decision of women (Rahman and Islam, 2013; Mahmud and Bidisha, 2018; Raihan and Jahan, 2018). A few studies, such as that of Andrabi et al. (2013), in the context of Pakistan, and Baird et al. (2016), however, do not find a strong association between education and labour market participation. This finding therefore highlights that, to obtain the positive impact of education on labour supply, it is crucial that jobs be such that they reward education (Heath and Jayachandran, 2016).

In order to capture women's care responsibilities as well as their decision-making power, Klasen and Pieters (2013) and Mahmud and Bidisha (2018) include a variable of whether the women is living with her in-laws or not. Huq (2015) stresses the importance of unpaid care work in the context of Bangladesh. Given the reproductive responsibilities and associated gender norms prevailing in Bangladesh, studies like those of Rahman and Islam (2013), Mahmud and Bidisha (2018) and Raihan and Jahan (2018) include a variable of whether there is any child below five years of age in the household. Most studies incorporate regional dummies to capture the difference between rural and urban areas; some (Mahmud and Bidisha, 2018; Rahman and Islam, 2013) include divisional dummies too.

While estimating the determinants of labour force participation, especially in developing countries, one of the key methodological challenges lies in dealing with the fact that a wage is not available for those who are unpaid but are in the labour force. Imputing wages for the unpaid in such cases can lead to the problem of endogeneity. To deal with such issues, researchers have adopted a number of strategies. For example, Heim (2007), in estimating wage elasticity of married women, uses predicted wage and follows the seminal work of Mroz (1987). The study uses the Heckman two-step procedure to get the selection corrected wage, which is later used in the labour supply equation. Based on the concept of the bargaining model, Blau and Kahn (2006) estimate two regression equations, the first using data on wages only for women and the second including the wage of their spouses, to incorporate the impact of spouses' wage on labour force participation. Klasen and Pieters (2013), in the context of India, use predicted wage to incorporate the wage of the unpaid participants and apply two similar specifications. In one specification, they use wage variations across districts; in the other, they use the variation across different states and age and education groups. As these two variations generated very different estimates, it was not possible

for the authors to conclude anything specific regarding the impact of wage on female labour force participation.

Researchers have also particularly emphasised that, because of conventional gender norms and the patriarchal social structure, often dominated through kinship, factors determining female participation in the labour market are much diverse than those affecting men. Meanwhile, the culture of purdah also restricts women in terms of engaging in labour market activities that are outside their usual household domain, and thereby confine them to household chores/reproductive activities and/or other labour market activities that can be carried out from the home (Kabeer et al., 2018). As Cain et al. (1979) argue, gender relations within the household can be explained through the concept of patriarchal risk: they infer that loss (or potential loss) of family support may act as a push factor for women's labour market participation.

While analysing the trends and patterns of female labour market participation in Bangladesh, Mahmud (2003) finds evidence in favour of feminisation of the labour force of the country. Findings in Al-Samarrai (2005) from the first half of the 2000s reveal that women were able to make rapid gains from the labour market, which resulted in a narrowing-down of the gender gap in wages. Kabeer et al. (2018) emphasise the role of a number of policy-driven changes, such as in family planning, education, microcredit opportunities and export-oriented industrialisation, which have played a crucial role in broadening women's socioeconomic horizon and positively affected their work and lives in Bangladesh. Raihan and Jahan (2018) emphasise the positive role of social protection in female labour market participation in Bangladesh. Based on a primary survey in rural Bangladesh, Heintz et al. (2018) stress the role of migration, education, access to electricity and mobile phones, RMG, etc. in increasing the participation of young women in wage and self-employment. Their analysis also points to the significance of cultural norms in restricting women's, especially married women's, participation in such employment.

In comparison with the literature on supply-side factors, the literature on labour demand is relatively scarce. In particular, there is very limited empirical study on firms' demand for female labour. Looking at the structure of labour market in a number of countries, the available literature focuses more on the possible channels through which technology and automation can affect firms' demand for female labour.

A World Economic Forum (WEF) report presented at Davos in January 2018 warns that there is likely to be a measurable gender disparity when it comes to jobs lost to automation. According to this report, the so-called Fourth Industrial Revolution will not affect everyone equally, and women will lose more jobs to automation. Faith (2017), citing the Philippines example, argues that men and women will not experience job losses from automation equally. Reflecting the marked persistence of gender gaps in labour markets in emerging economies, men stand to gain one job for every three jobs lost to technology advances, whereas women are expected to gain one job for every five or more jobs lost.

The Organisation for Economic Co-operation and Development (OECD) (2017) points out that women and men have just as much to gain and fear from new digital technologies. Women may benefit from increased flexibility in work but the unscrupulous use of new atypical work arrangements may also reduce job quality. Automation has so far been most common in sectors like agriculture and manufacturing, where men dominate. But in the future, it is expected to spread, albeit to different degrees, across all sectors and most occupations, including those traditionally dominated by women, such as retail trade and food and beverage services. In addition, jobs are

likely to grow the most in business services, health, education and social services – many of which have been traditionally female-dominated. At the same time, persistent gender differences in economic activities may mean that women will benefit less from the new job opportunities.

3. TRENDS AND PATTERNS OF FEMALE EMPLOYMENT IN BANGLADESH

The Labour Force Surveys (LFS), conducted by the Bangladesh Bureau of Statistics (BBS), are the major source of data related to labour market and employment in the country. There are a number of challenges in using LFS data, as there are concerns with respect to the comparability of data from different survey years, owing to changes in methodology. Keeping in mind these limitations, we here present the figures on labour force participation and employment for the period between 1999/00 and 2016/17.

One of the most noticeable changes to the labour market of Bangladesh over the years has been a persistent rise in female labour market involvement. According to the LFS of various years, from 8.6 million in 1999/00, the size of the female labour force increased to 19.9 million in 2016/17 (Table 1). In comparison, the increase in the male labour force has been less steep: as Table 1 shows, the rate has declined from 84% in 1999/00 and hovered just above 80% in recent years. On the contrary, the female labour force participation rate, from a modest 23.9% in 1999/00, had increased to 36.3% in 2016/17. Despite this, a closer look at the recent data shows that, from 2010, there has not been much change in the rate; in fact, a fall in the participation rate between 2010 and 2013 can be observed.

Table 1: Trends in labour force and employment

	1999/00			2005/06			2010			2013			2015/16			2016/17		
	All areas	Rural	Urban	All areas	Rural	Urban	All areas	Rural	Urban	All areas	Rural	Urban	All areas	Rural	Urban	All areas	Rural	Urban
Labour force (millions)																		
Both	40.7	31.5	9.2	49.5	37.8	11.7	56.7	43.4	13.3	60.7	43.5	17.1	62.1	44.8	17.3	63.5	45.7	17.8
Male	32.2	25.1	7.1	37.3	28.5	8.9	39.5	30.2	9.3	42.5	30.5	12	43.1	30.6	12.5	43.5	30.7	12.8
Female	8.6	6.4	2.2	12.1	9.3	2.8	17.2	13.2	4.0	18.2	13.1	5.1	19.1	14.3	4.8	19.9	14.9	5.01
Employed population (millions)																		
Both	39.0	30.3	8.7	47.4	36.1	11.3	54.1	41.7	12.4	58.1	41.9	16.2	59.5	43	16.5	60.8	43.9	16.9
Male	31.1	24.4	6.7	36.1	27.5	8.6	37.9	29.1	8.8	41.2	29.6	11.6	41.8	29.7	12.1	42.2	29.8	12.4
Female	7.9	5.9	2	11.3	8.6	2.7	16.2	12.5	3.7	16.8	12.3	4.5	17.8	13.3	4.4	18.6	14.1	4.6
Labour force participation rate (%)																		
Both	54.9	54.6	55.8	58.5	59.4	55.7	59.3	60.0	57.3	57.1	57.3	56.7	58.5	59.6	56	58.2	59.3	55.7
Male	84.0	84.0	83.7	86.8	88.0	83.2	82.5	83.3	80.2	81.7	81.6	81.7	81.9	81.9	81.7	80.5	80.3	81
Female	23.9	23.1	26.5	29.2	29.8	27.4	36.0	36.4	34.5	33.5	33.7	32.9	35.6	37.6	30.8	36.3	38.6	31

Source: LFS, various years.

Table 2: Annual average change in labour force and participation rate

	1999/00–2005/06	2005/06–2010	2010–2013	2013–2015/16	2015/16–2016/17
Annual average growth rate in labour force (%)					
Male	2.64	1.47	2.53	0.38	0.96
Female	6.78	10.5	1.94	1.65	4.49
Annual average change in labour force (millions)					
Male	0.85	0.55	1.00	0.20	0.40
Female	0.58	1.23	0.33	0.30	0.80
Annual change in participation rate (percentage point)					
Male	0.47	-1.08	-0.27	0.07	-1.4
Female	0.88	1.70	-0.83	0.7	0.7

Source: LFS, various years.

With regard to the size of labour force, with an exception in the latest data (from 2015/16 to 2016/17), from a more than 10% annual average growth rate (between 2005/06 and 2010), the female labour force has grown annually by less than 2% since 2010 (Table 2). A similar scenario can be observed in terms of the employed work force. Concerning the annual percentage point change in the female labour force participation rate, from 2010 to 2017 there was no observable change. This apparent unchanged rate, combined with a decelerated rate of growth of the labour force, raises question as to whether there has been stagnation in female employment in Bangladesh. Answering this requires a detailed analysis of the country's labour market.

In Bangladesh, given the historical predominance of agricultural activities as a source of livelihood, it is important to analyse the present status and past trends of employment from a sectoral perspective. A gender-segregated analysis can be useful in this respect. Over the past decade or so, an important change has occurred in the sectoral composition of female employment. Despite a reduction in female employment in agricultural activities in the earlier part of this decade (from 2006 to 2013), in recent years (since 2013) we observe a reversal of the trend, and there has rather been a rise in women's participation in low-productivity and low-paid agricultural activities (Table 3). The opposite trend of rising employment of women in agriculture can be observed by means of the corresponding decline in employment in manufacturing jobs. The corresponding figures for men, except for a slight rise between 2010 and 2013, have been more or less consistent with the overall structural change in the economy, which has seen a decline in the agriculture sector's contribution to national income, and a rise in the contribution of industry and services.

With the share of agriculture in GDP declining over time, we might expect that the share of the sector in the country's employment would decline for both men and women over time, while that of industry would increase. However, despite the fall in female employment in agriculture and its rise in industry and services up until 2013, the growing 'feminisation' of agriculture and the corresponding fall in/stagnation of female employment in industry and services after 2013 indicate that the expected benefits of structural change in the economy have not been transmitted to the female labour force in Bangladesh.

The contrasting picture for men and women can be explained in a number of ways. First, because of internal (and external) migration, men are increasingly migrating to urban areas for manufacturing and services sector jobs, and women in the migrant households are taking care of the family farm. Second, after the tragic Rana Plaza incident, the growth of RMG, the key sector for female wage employment, has been rather modest, with consequences on female employment. Third, women's low skill base means they are more affected by automation than their male counterparts (explained in Figure 1 and Section 5).

Table 3: Share of broad economic sectors in employment (%)

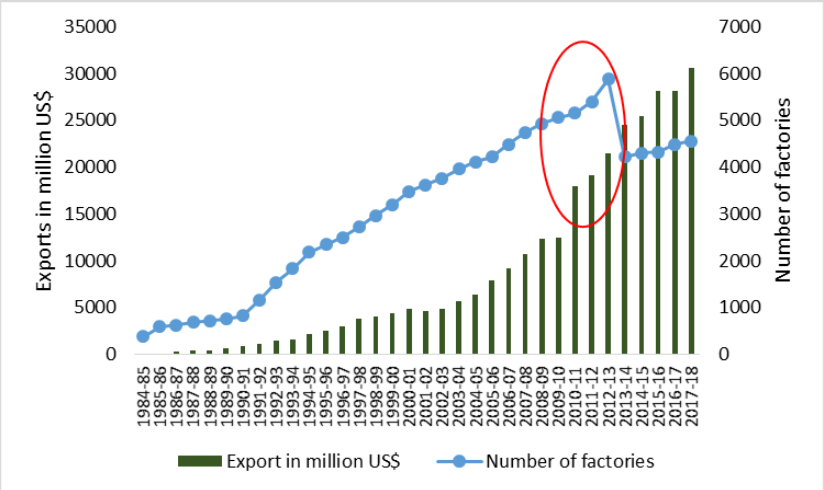
	1999/00	2005/06	2010	2013	2015/16	2016/17
Agriculture	51.3	48.0	47.5	45.1	42.7	40.6
Male	52.2	41.8	40.1	41.7	34.0	32.2
Female	47.6	68.1	64.8	53.5	63.1	59.7
Industry	13.1	14.5	17.7	20.8	20.5	20.4
Male	11.3	15.1	19.6	19.6	22.3	22.0
Female	20.0	12.5	13.3	23.7	16.1	16.8
Manufacturing	9.5	11.0	12.4	16.4	14.4	14.4
Male	7.4	10.8	12.7	13.9	14.2	14.0
Female	17.9	11.5	11.7	22.5	14.9	15.4
Service	35.6	37.4	35.3	34.1	36.9	39.0
Male	36.4	43	41.1	38.7	43.7	45.8
Female	32.2	19.3	21.8	22.8	20.8	23.5

Source: LFS, various years.

One important point to be noted here while explaining the sectoral employment pattern of women is the sharp rise in female employment in the manufacturing sector in 2013: from 11.7% in 2010 the share rose to 22.5% in 2013. This phenomenal rise is consistent with the sharp rise in RMG exports and the corresponding increase in the number of factories in the RMG sector during 2010 and 2013 (Figure 1). Given the high concentration of manufacturing sector job for women in RMG, the aforementioned high rise in the female employment share in manufacturing during 2010–2013 can be linked to the trends of RMG exports and the number of factories depicted in Figure 1.

After the Rana Plaza incident in 2013, the annual average growth of RMG exports slowed, and the number of RMG factories has gone down quite significantly. Between 2010/11 and 2012/13, the annual average growth of RMG exports was 20.9%; this came down to 7.4% between 2013/14 and 2017/18. The number of RMG factories declined sharply, from 5,876 in 2012/13 to 4,222 in 2013/14. [1] Such a slowdown not surprisingly would have important implications for female employment in the manufacturing sector in Bangladesh. Also, interviews with stakeholders in RMG suggested that the major structural change in the RMG industry had been the introduction of labour-saving machineries for the kind of jobs that previously mostly low-skilled female workers carried out.

Figure 1: Trends of RMG exports and number of RMG factories



Source: BGMEA website.

[1] The data source is http://www.bgmea.com.bd/home/pages/TradeInformation

Table 4: Types of employment (% distribution of employment categories of labour force)

	2005/06		2010		2016/17	
Types	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Wage employment	40.0	23.9	46.1	18.5	42.6	31.2
Self-employment	50.4	16.0	47.7	25.3	52.5	39.2
Unpaid family worker	9.7	60.1	7.1	56.3	4.2	29.1

Source: LFS, various years.

There is no denying the fact that the labour market status of an individual is not confined to mere participation. Therefore, in addition to sectoral composition, it is also important to understand the 'quality' of female labour force participation from a broader perspective, specifically through the types of work in which women are involved. As Table 4 shows, a significant proportion of employed women are found to be working as unpaid family workers. Although this proportion has reduced, the latest data of 2016/17 show that still as high as 29% of employed women in the labour market are unpaid family workers.[2] These women, although included in the employed labour force, do not get any remuneration for their work. Therefore, such unpaid family workers in the labour force (mainly women) cannot be considered part of mainstream remunerative economic activities. According to the latest LFS data of 2016/17, these unpaid family workers are engaged mostly in agricultural activities, where the household head in most cases is found to be self-employed (BBS, 2018). The predominance of women in agricultural activities, coupled with their concentration in unpaid work, reflects the lack of dynamism in female employment in terms of quality of work.

Quality of employment of female labours can also be analysed through their position on the occupational ladder. As Table 5 shows, very few employed women (as opposed to around 1–2% of men) are found to be at the top of the occupational ladder and, as expected, more than half of women are engaged in agriculture. In addition to agriculture, where the highest percentage of women is concentrated, a sizable percentage of women are working in crafts and trade-related activities, which includes employment in the RMG sector.

Table 5: Occupational distribution (%) of employed men and women in 2016/17

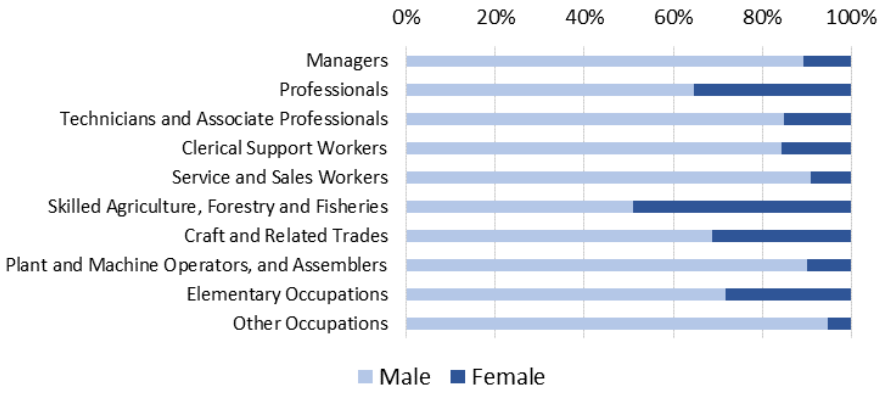
	Male	**Female**
Managers	2.11	0.57
Professionals	4.50	5.55
Technicians and associate professionals	2.30	0.92
Clerical support workers	1.80	0.82
Service and sales workers	21.55	4.92
Skilled agriculture, forestry and fisheries	23.79	51.73
Craft and related trades	16.88	17.45
Plant and machine operators, and assemblers	8.89	2.22
Elementary occupations	17.88	15.82
Other occupations	0.30	0.00
Total	100.00	100.00

Source: BBS (2017).

[2] Raihan et al. (2018) show that a number of socioeconomic factors, in addition to the conventional factors prevailing in the labour market, contribute towards involvement in unpaid activities and constrain participation in the mainstream labour market. As a result, a large number of individuals, particularly women, are compelled to work as unpaid family workers within their household, where their contribution is not duly recognised in either monetary or non-monetary terms. The econometric estimation of Raihan et al. (2018) indicates the importance of a number of socioeconomic factors in the decision to choose unpaid work as opposed to paid activities. For example, occupation of household head (head being self-employed) along with greater landholding has a strong positive effect on the decision to work as an unpaid worker; the opposite holds true for paid work. Having university education although reduces the probability to work as unpaid, primary or secondary education tends to have positive effect on household's decision to work as unpaid. Unpaid work is more prevalent among those who are married and relatively older.

In order to understand the inequality in terms of occupation, Figure 2 presents a gender-segregated occupational distribution. The data from the latest LFS (2016/17) show that women hold only 11% of managerial positions, whereas the corresponding figure for professional jobs is around 35%. There is no exact comparable classification for other years. However, in most of the years, the proportion has been similar, albeit with small differences. The inferior position of women in comparison with their male counterparts on the occupational ladder further exacerbates the stagnant position of the former in the job market.

Figure 2: Gender segregation of workers in major occupations in 2016/17



Source: BBS (2017).

For a better understanding of the position of women in the labour market of Bangladesh, another important yardstick is that of informality. Keeping in mind that the definition of informality in the LFS data is inadequate, and somewhat inconsistent, Table 6 shows that the prevalence of women in informal sector jobs is higher than that of men, and we do not observe much improvement over time. Instead, LFS data reveal that, since 2010, more than 90% of female labour has been in the informal sector, with the corresponding figure(s) for male labour much lower. Slow growth of job opportunities in the formal sectors, as reflected by a stagnant scenario in private sector investment over the past 10 years, can be linked to the rise in informality.[3] Lack of institutional facilities and relatively low payment for informal jobs mean such persistent informality further strengthens the hypothesis of a stagnant and relatively inferior position for women in the labour market of Bangladesh.

Table 6: Informality in employment (% of total employment)

	1999/00	2005/06	2010	2013	2015/16	2016/17
All	75.53	78.48	87.5	87.4	86.2	85.1
Male	72.99	76.18	85.5	86.3	82.3	82.1
Female	84.46	85.84	92.3	90.3	95.4	91.8

Source: LFS, various years.

Based on this analysis of the trends and patterns in key labour market statistics, we can infer that, despite an increase in their participation rate in the 1980s and 1990s, in recent years there has been little improvement in women's position in Bangladesh's labour market. From a quantitative point of view, reflected in the size of the labour force and the participation rate, and in terms of the quality of jobs, it appears women are stuck in an inferior position in comparison with their male counterparts. In general, descriptive statistics therefore reflect a static situation of labour market

[3] See Raihan (2018), which analyses the phenomenon of 'jobless growth' in recent years in Bangladesh.

position for women, at least for the past five years. This points to the need for an in-depth analysis of the labour market in Bangladesh.

4. WHAT FACTORS AFFECT FEMALE LABOUR FORCE PARTICIPATION IN BANGLADESH?

Given that the labour market position of an individual is determined through the interaction of both demand- and supply-side factors, to stimulate the labour market participation of women it is crucial to understand the contributing/impedimentary factors on both sides of the market. This section, using the latest nationally representative labour market data, examines the impact of different socio-demographic as well as household and regional factors on women's labour supply decision. The aim of this exercise is to identify the constraints to women's engagement in the labour market from a supply-side perspective, to aid relevant policy formulation. This exercise is carried out primarily by utilising the latest Quarterly Labour Force Survey (QLFS) of 2016/17 – the most recent nationally representative dataset on the labour market of Bangladesh – and by applying standard econometric methods.[4]

From an empirical point of view, the estimation of female labour supply differs from that for men because of various socioeconomic constraints as well as the reproductive burden that women bear. In particular, the patriarchal social structure sets certain implicit *gender norms* that often act as barriers to women's mobility and empowerment, thereby negatively affecting their participation in the labour market. In order to understand the labour supply decision of females, we estimate the standard supply function while putting the determinants of female labour force participation into certain broad categories:

1. ***Individual factors:*** A number of demographic and educational variables have been included in the analysis – for example age and age-squared of the respondent, education level of the respondent (dummies of below primary, primary and secondary completed, Secondary School Certificate (SSC)/Higher Secondary Certificate (HSC) passed, university passed) and marital status of respondent (dummy variable of married or not).
2. ***Household factors:*** In addition to individual factors, the existing literature argues in favour of incorporating different household factors – for example household's socioeconomic structure – as determinants of labour force participation. Here, we have included variables such as net family income (net income of the household, which excludes respondent's own income) and amount of land owned by the household (in decimals). In addition, two variables related to household head's occupation are included: whether the head is self-employed or not and whether the head is employed in agriculture. The rationale for including these variables is that head's occupation can influence other members' occupational choice, and such factors can be crucial in countries like Bangladesh, where family-based employment is prevalent. For similar reasons, variables representing head's education (primary and secondary completed, SSC/HSC passed, university passed) have been incorporated into the analysis.
3. ***Gender norm variables:*** In addition to the conventional variables used in standard labour economics, relevant literature (e.g. Mahmud and Bidisha, 2018; Raihan and Jahan, 2018) consider variables like whether there are any young (below five years) children in the household as an additional variable reflecting women's reproductive and care burden. Besides this, we

[4] The QLFS is a rotating panel that has interviewed sets of individuals for two consecutive quarters before replacing them with new sets of individuals. We use the dataset as a pooled cross-section and use the data from all four quarters of the year with appropriate yearly weights. Our models have been run for the last quarter as well but no significant difference has been found between quarterly and yearly estimates. As such, we report the annual estimates here.

include total number of children in the household to understand the effect of both gender norms and financial requirements on the household.

4. ***Geographical variables:*** In the absence of supply-side variables, it is a convention to use various regional factors. In this analysis, we include a variable of whether lives in urban area and eight separate variables denoting residence in respective administrative divisions.

This study examines the supply side of the female labour market through three different econometric analyses. In the first step, it estimates labour market participation probability of all women (those within the working-age group) through a probit model. Given that the dependent variable is binary (whether she is in the labour force or not), probit is the most appropriate tool; it has also been applied in most of the relevant literature (e.g. Mahmud and Bidisha, 2018; Rahman and Islam, 2013; Raihan and Jahan, 2018). As marital status can have a significant influence on women's decisions regarding labour market activities, a separate probit for married females is estimated too. For the purpose of comparison, we also estimate similar models for working-age men.

In the next step, to examine any plausible difference in labour market participation based on sector of occupation, we estimate similar sets of probits. This has been done to understand the factors the influence participation in the non-agriculture sector (as opposed to agriculture).

As discussed, to understand women's labour market experience, it is not only mere participation in the labour market but also the mode of participation that should be analysed in greater detail. This is especially important for countries like Bangladesh, where a significant percentage of the labour force is engaged on family farms: though these workers are in the labour force, they do not get any remuneration for their work. This type of work is more prevalent among women in particular: around 29% of the employed female workforce comprises unpaid family workers, according to the latest QLFS of 2016/17.

Given its non-remunerative nature, unpaid family work cannot be considered equivalent to mainstream economic activities such as wage employment or self-employment. Moreover, factors that explain modes of employment and of unemployment should be treated differently for policy purposes. Understanding the relative importance of these factors can be beneficial for effective policy formulation to boost quality employment of women. In this regard, we estimate a multinomial logit (MNL) model of different modes of labour force participation (unemployment, wage employment, self-employment and unpaid family work, where unpaid family work is the base category). In this context, we should, however, keep in mind that the coefficients of the MNL model cannot be interpreted directly, and rather should be compared with a base category. Assuming unpaid family work as the base, this exercise enables us to understand the relative importance of different factors while switching between unpaid work and other paid employment and unemployment.

Annex Table 1 presents the probit estimates for women, men and married women using the 2016/17 QLFS data. A similar exercise, by Mahmud and Bidisha (2018), on female labour force participation, using 2010 LFS data, is presented for comparison. As Annex Table 1 shows, in terms of individual characteristics, age and age-squared come out with expected coefficient estimates for women, men and married women; labour force participation increases with age but at a decreasing rate. The role of marriage is found to be negative for women but positive for men, as reflected by the relevant coefficient estimates. Given the patriarchal social structure and the responsibilities associated with household chores for women as against greater financial responsibility for married

men (as opposed to their unmarried counterparts), the results are consistent with our prior expectations.

The results of the education coefficient for women, however, contradicts our prior expectations: in comparison with the base group (without any education and below primary education), those with primary and secondary education as well as those with the SSC and HSC are found to have a lower participation probability. The coefficient for university education comes in with the expected positive result, however. The reason for the negative education coefficients may relate to the quality of work women are engaged in. According to the 2016/17 QLFS, the majority of women (91.8% as against 82.1% of men) are working in the low-paid, low-productivity informal sector, often as daily labour or domestic help. The role of education with regard to participating in these types of activities is minimal.

The similar exercise carried out by Mahmud and Bidisha (2018) using the 2010 LFS data, however, shows the opposite picture for education coefficients. Such contrasting results in the course of only around six to seven years is a paradox that it is important to take into account. This education paradox points to a possibility that, in recent years, the role of education in boosting women's participation in the labour market has weakened, at least to a certain extent. One explanation for this could be that the more educated aspire to higher-quality work and withhold their labour when such work is not available. This may be linked to the slow growth of job opportunities in the Bangladesh economy in recent years (Raihan, 2018). Alternatively, those who are more educated may have demand higher wages (for a job that can be done by someone with less education), so are less likely to be employed. This may be linked partly to perceived status and marriage prospects, since the significance is not there for married women. Another explanation of the reversal of coefficients may be the change in the income structure of the economy, as argued by Goldin (1995). The increased income of the economy may have moved the country towards the bottom of the U-shaped income participation curve, resulting in a fall in participation.

Annex Table 1 also suggests that, in terms of household factors, household income plays a negative role in men as well as women's participation in the labour market, as does household landholding. Both the coefficients reflect the possibility that labour force participation in Bangladesh is driven primarily by 'push' factors, and therefore individuals from relatively poorer households with less land have a greater probability of participating in the labour market. It is interesting to find that, although occupation of household head (being self-employed or not as well as being in agriculture or not) has a positive role in its members' involvement in the labour market, education of the head has the opposite effect. The latter coefficients are likely to be the reflection of own education coefficients and a similar explanation may hold, whereas the former coefficients may be the result of the high prevalence of family labourers in Bangladesh.

The most interesting finding of the probit estimates (in Annex Table 1) is probably the strong negative impact of the presence of young children on the participation probability of women. Patriarchal gender norms assigning domestic responsibilities to women, in the absence of a proper 'care system', often restrict women from engaging in the labour market. The corresponding insignificant (although negative) coefficient of this variable for men reflects that such care responsibilities do not play a significant role in their labour market participation decision. The importance of the care burden and associated policies has been highlighted in both developed (Bauernschuster and Martin, 2011 for Germany; Bettendorf et al., 2015 for the Netherlands) as well as developing country (Mahmud and Bidisha, 2018 and Raihan and Jahan, 2018, for Bangladesh; Prada et al., 2015 for Chile) literature and supports our finding. However, the coefficient for total

number of children in the household comes out as insignificant for women but positive and significant for men, where the latter coefficient could be related to the financial requirements of the household.

The significance of divisional dummies rightly represents the important role of (the difference in) demand-side factors across regions. Our analysis reflects greater participation probability of women in rural areas and it may be related to the recent 'feminisation' of agriculture in Bangladesh and the prevalence of family labour in rural areas.[5] The opposite, as indicated by its positive and significant coefficient estimate, holds true for men.

There is no denying that, given the patriarchal social structure of Bangladesh, women are often discriminated against in different sectors of the economy and society, including in the labour market. One way to capture such discrimination is to *decompose* the difference in market outcomes (e.g. the labour market participation rate) of men and women into two parts: (i) the difference in outcome that could be the result of differences in characteristics or endowments (age, education, regional factors, etc.) and (ii) the difference in outcome that is generated as a result of the differences in coefficients of regression (returns to coefficients).[6] The latter term is considered as *unexplained* differences, and in labour economics is commonly referred to as a reflection of *discrimination* prevailing in the market. The decomposition analysis of the results of Annex Table 1, as presented in Annex Table 2, shows the dominance of the effect of the unexplained part (generated from coefficients) over that of the explained part (resulting from 'inferior' endowments), which strengthens our prior hypothesis of the prevalence of labour market discrimination against women.

Given the strong prevalence of females in the low-paid agriculture sector, understanding the key determinants of women's participation in the non-agriculture sector would help us attain the *desired* target of raising women's labour market activity in *quality* employment. In this context, Annex Table 3 re-estimates the probit(s) of Annex Table 1 with similar explanatory variables. Here, the dependent variable is a dummy that is 1 if the respondent participates in non-agriculture and 0 if she participates in agriculture. One interesting difference between the coefficient estimates of Annex Table 1 and those of Annex Table 3 is that the coefficients of the education dummies in the latter show a strong positive impact of education in raising women's participation in non-agriculture. This is in contrast with the results of Annex Table 1, where the relevant analysis dealt with labour market participation as a whole without considering the differences. In addition, although household landholding is found to have a negative effect, as in Annex Table 1, net family income is found to have a positive and significant effect. Therefore, although family income acts as a push factor for labour market participation, it works as a positive stimulus when the decision is that of participation in the non-agriculture sector. Moreover, the coefficient estimate of the urban dummy comes with the expected positive sign in the case of participation in non-agriculture. The impact of young children is found to be negative in this set of probit(s) too.

As mentioned earlier, at this stage, we estimated a MNL model, with unemployed, wage employed, self-employed and unpaid family work as different categories (unpaid family work being the base). As Annex Tables 4–6 show, although for the majority of factors we do not observe any significant

[5] The estimate for 2010 was positive, indicating that this feminisation is a relatively recent phenomenon.

[6] In the literature, the most commonly used decomposition analysis is that of the Blinder-Oaxaca Decomposition.

difference between the relative switches (from unpaid to wage employed; unpaid to self-employed; and unpaid to unemployed) across different categories, the importance of some of the factors does change considerably. For example, for women, although family income is found to be negatively significant while choosing self-employment over unpaid family work, it plays a positive role in choosing wage employment over unpaid work (Annex Table 4). The insignificant coefficient estimates of family income of men, on the other hand, further highlight the gendered difference in the relative importance of household factors in the choice of employment (Annex Table 5). Such gender-based difference becomes more pronounced when we compare the effect of household head's occupation: for women, the head being employed in agriculture is found to have a negative effect on the relative choice of wage employment, with the opposite found for men.

In the case of education dummies, although university education is found to have a positive impact on the relative choice of wage employment (in relation to unpaid work), for the relative choice of self-employment (relative to unpaid work) the coefficient estimate contradicts our prior expectation, highlighting that the importance of education is not consistent across occupations. This differential effect of education coefficients indicates the possibility that, at least in recent years, the role of education in accelerating female employment has been confined mostly to relatively more formalised wage employment in the non-agriculture sector, with a low or medium level of education having no significant effect on unpaid family work or self-employment.

In the case of other variables, one interesting result of the MNL is that, although having young children has a negative impact on the relative choice of wage employment over unpaid work, it tends to have no significant effect on the choice of self-employment activities over unpaid work, which could owe to the mobility of the wage employment type of jobs. The impact of marriage is also found to be completely different when we compare the choice between wage employment with self-employment over unpaid work, as marriage is positively associated with self-employment and negatively associated with wage employment. When we compare this with the estimates for men, we can infer that, although the effect of marriage is similar across the sexes when the decision is related to the choice of self-employment, in wage employment marital status does not play a significant role for men. Being in urban areas is found to play positive role in the relative choice of wage employment, with the opposite true for the choice of self-employment. A comparison of the coefficient estimates of Annex Tables 4 and 5 reflects no substantial difference in the case of most of the coefficients – indicating symmetry across both women and men in the case of labour market participation behaviour.

The above exercises highlight a number of important issues on the supply side that need to be taken into account to understand the labour market experience of women in Bangladesh:

- One of the puzzling findings of this analysis is the recent unexpected negative effect of education on female labour force participation. This education paradox indicates the possibility of strong structural change having taken place in the labour market of Bangladesh, with low-paid informal sector jobs requiring no or a very low level of education are becoming predominant for women. Disaggregation in this regard further highlights the contrasting role of education based on type of occupation. Policies in the area of education and labour market linkages should therefore be developed with more care while focusing on market-oriented education and skill development programmes.
- The implication of *gender norms* and gender-based domestic responsibilities (reflected by the coefficient estimates of the dummy of young children and marital status) are found to be

negative in women's labour supply decision. In this context, policies to provide support services – for example day care facilities – are expected to play a crucial role in raising women's labour market participation.

- Our analysis indicates that, in addition to *inferior* endowments, the labour market status of women in Bangladesh is strongly influenced by discrimination prevailing in the market. Changing people's mind-set through effective advocacy programmes and targeting the participation issue through a more holistic approach, covering, for example, prevention of child marriage, may be critical in this context.

5. HOW DO INNOVATION AND TECHNOLOGY AFFECT FIRMS' DEMAND FOR FEMALE LABOUR IN BANGLADESH?

As mentioned before, innovation or technology can have differential impacts on male and female employment at the firm level. As the literature review in Section 2 highlighted, there is the possibility of a gender disparity when it comes to jobs lost owing to technological up-gradation. Also, persistent gender differences in economic activities may mean women will benefit less from the new job opportunities that may emerge out of innovation and technological up-gradation.

In Bangladesh, there is a scarcity of updated nationally representative firm-level data. In this context, to explore how technology and innovation affect firms' demand for female labour in Bangladesh, we use firm-level data from the World Bank's Enterprise Survey.[7,8] These surveys are conducted across different geographic regions of a country, covering firms of all sizes (small, medium and large). They use a stratified random sampling method. The survey questionnaire focuses on the business and investment environment of the country and records responses from business owners and top managers from sampling firms, with the aim of obtaining feedback on the private sector business environment and capturing trends and patterns over time. The questions cover topics including firm characteristics, gender participation, access to finance, annual sales, costs of inputs/labour, workforce composition, bribery, licensing, infrastructure, trade, crime, competition, capacity utilisation, land and permits, taxation, informality, business–government relations, innovation and technology and performance measures.

Table 7: Size, types, location and export orientation of firms surveyed in 2007 and 2013

	2007	2013
Size (% of firms)		
Small	55.1	41.0
Medium	10.3	34.5
Large	34.6	24.5
Total	100.0	100.0
Types of firms (% of firms)		
Manufacturing	83.8	81.9
Services	16.2	18.1
Total	100.0	100.0
Location (% of firms)		
Dhaka	49.1	62.0
Outside Dhaka	50.9	38.0
Total	100.0	100.0
Export orientation (% of firms)		
Engaged in direct export	22.0	19.8
Not engaged in direct export	78.0	80.2
Total	100.0	100.0

Source: World Bank Enterprise Survey 2013.

In Bangladesh, Enterprise Surveys were conducted in 2007, 2011 and 2013. The number of firms surveyed was 1,230 in 2007 and 1,442 in 2013, respectively. In 2011, there was a small survey, of 250 firms. Table 7 presents the distribution of the firms surveyed in 2007 and 2013 in terms of size, type, location and export orientation. It appears that, among the surveyed firms, in both 2007 and

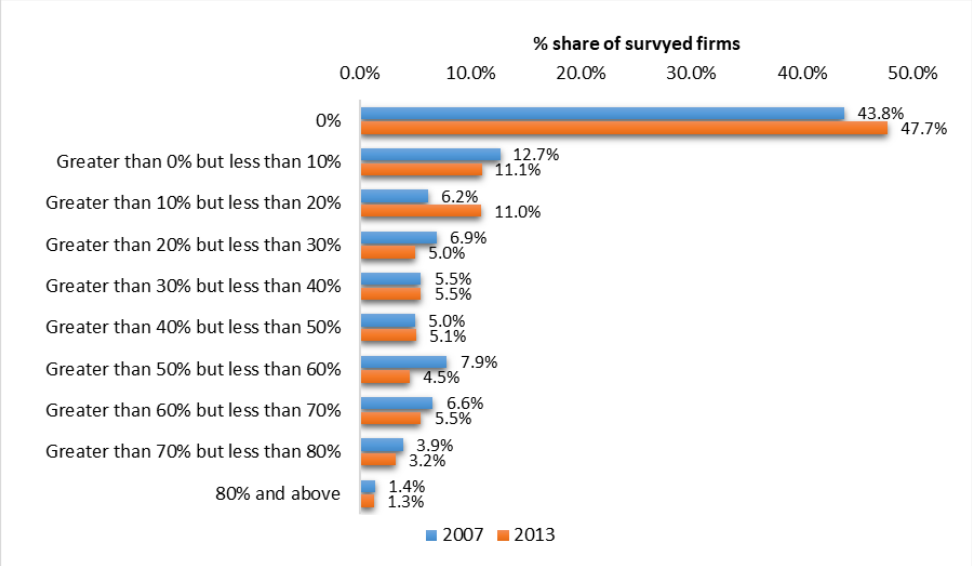
[7] http://www.enterprisesurveys.org/

[8] A shortcoming of these data is that they are not available for the post-Rana Plaza disaster period (since there are indications that this led to substantial innovation and technology change); repeating this analysis when the survey is repeated will have a great value.

2013 the largest proportion was of small-sized firms. Also, more than 80% of surveyed firms in both 2007 and 2013 were in the manufacturing sector. In terms of location, in 2013, 62% of firms were located in Dhaka division and the rest outside of Dhaka. In 2007, 49% of the surveyed firms were in Dhaka. In 2013, around 20% of firms were engaged in direct exports; this figure was 22% in 2007.

Using the firm-level data, we calculate the female employment intensity of the surveyed firms. The female employment intensity is defined as the percentage share of female workers in total workers. A higher value of female employment intensity means the firm is employing more female labour than male labour. Figure 3 presents the distribution of female employment intensity among the surveyed firms in 2007 and 2013: 43.8% of firms in 2007 and 47.7% of firms in 2013 did not employ any female labour and therefore the female employment intensity of these firms is equal to zero. In general, the percentage share of firms in the total number of surveyed firms declines as the female employment intensity of firms increases. Figure 3 also suggests that the percentage shares of firms declined in 2013 compared with 2007 as we move up with respect to firms' female employment intensity.

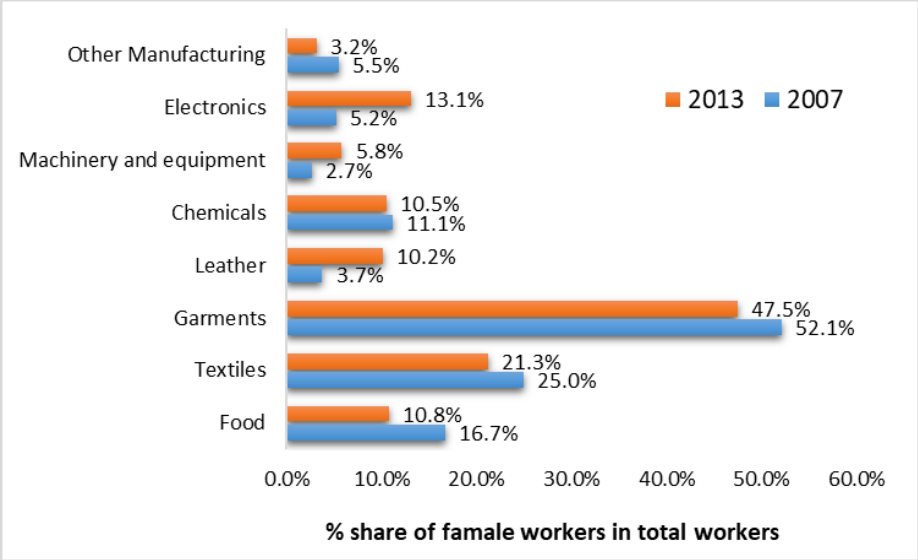
Figure 3: Female employment intensity of firms surveyed in 2007 and 2013



Source: World Bank Enterprise Survey 2013.

Figure 4 presents the female employment intensity of various sectors of the economy in 2007 and 2013. It suggests that, between 2007 and 2013, female employment intensity declined in food, textiles, garments, chemicals and other manufacturing, and increased in leather, machinery and equipment and electronics. All this suggests that the major female labour-employing sectors, like garments, textiles, food and chemicals, observed higher growth in male as opposed to female employment during 2007 and 2013. Overall female employment intensity also declined, from an average of 20.35% in 2007 to 17.67% in 2013.

Figure 4: Sector-wise average percentage share of female workers in 2007 and 2013

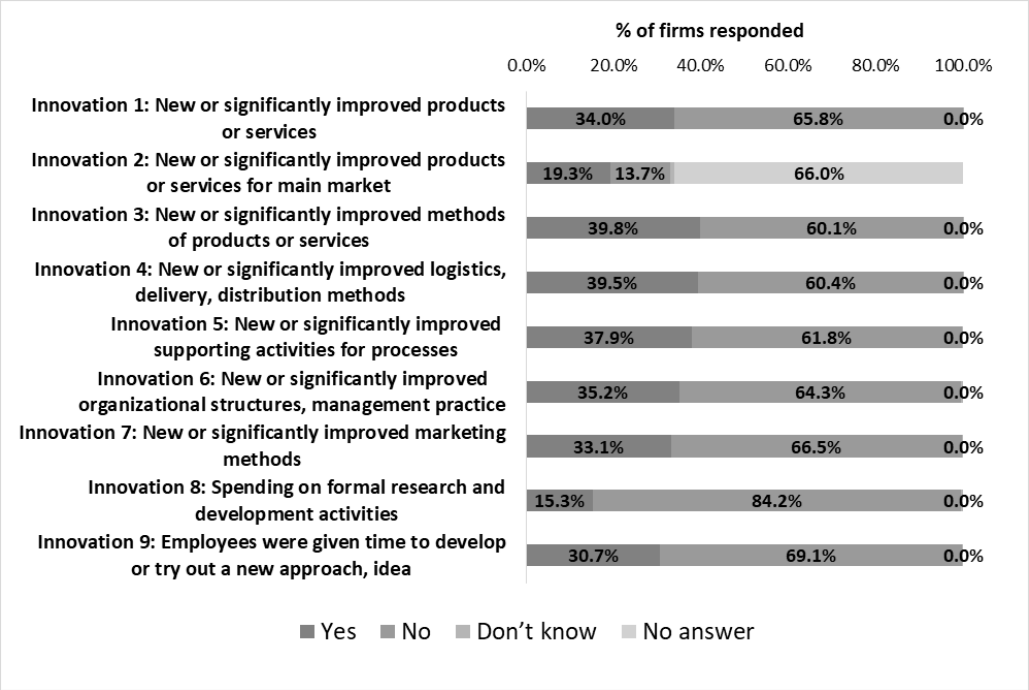


Source: World Bank Enterprise Survey 2013.

In the 2013 questionnaire, there was a specific section on the 'innovation' of firms. There were nine questions related to innovation, as follows:

- Innovation 1: During the past three years, has this establishment introduced new or significantly improved products or services?
- Innovation 2: Were any of the new or significantly improved products or services also new for the establishment's main market?
- Innovation 3: During the past three years, has this establishment introduced any new or significantly improved methods of manufacturing products or offering services?
- Innovation 4: During the past three years, has this establishment introduced any new or significantly improved logistics, delivery or distribution methods for inputs, products or services?
- Innovation 5: During the past three years, has this establishment introduced any new or significantly improved supporting activities for your processes, such as maintenance systems or operations for purchasing, accounting or computing?
- Innovation 6: During the past three years, has this establishment introduced any new or significantly improved organisational structures or management practices?
- Innovation 7: During the past three years, has this establishment introduced new or significantly improved marketing methods?
- Innovation 8: During the past three years, has this establishment spent on formal research and development activities, either in-house or contracted with other companies?
- Innovation 9: During the past three years, has this establishment given employees some time to develop or try out a new approach or new idea about products or services, business process, firm management or marketing?

Figure 5: Response of firms to questions related to innovation (surveyed in 2013)



Source: World Bank Enterprise Survey 2013.

Figure 5 presents the responses of the surveyed firms in 2013 on the aforementioned nine questions related to innovation. On seven out of the nine questions, well above 30% of the firms provided affirmative responses. In particular, on question 3, which is the most direct question related to innovation and technological up-gradation, around 40% of firms provided an affirmative response. However, in the case of questions 2 and 8, less than 20% of the firms provided an affirmative response. All this suggests that, during 2011 and 2013, a large proportion of the surveyed firms in Bangladesh facilitated innovation and introduced upgraded technologies in their businesses.

In order to understand the impact of technological advancement on female employment intensity at the firm level, we run the following labour demand function using the World Bank Enterprise Survey data of 2013.

fei = f (log of sales, log of average wage, export dummy, manufacturing dummy, Dhaka dummy, Innovation) Equation (1)

Where,

fei	= female employment intensity of firm
log of sales	= log of the sales value of firms
log of average wage	= log of the average wage of firms (total wage bill/number of workers)
export dummy	= 1 if the firm exports, 0 otherwise
manufacturing dummy	= 1 if the firm is a manufacturing one, 0 otherwise
Dhaka dummy	= 1 if the firm is located in Dhaka division, 0 otherwise
innovation	= 9 dummy variables related to innovation mentioned above

The log of sales value is an indicator of the size of the firm. Given the high presence of female labour in the RMG, textiles and food sectors (Figure 4), we can hypothesise that larger firms may employ more female than male labour. Similarly, the relationship between the log of average wage of firms

and the female employment intensity of firms is an interesting area of investigation. Given the high concentration of female labour in RMG (with allegations of low pay), there may be a negative association between higher wages and lower female employment intensity. In the case of export and manufacturing dummies, it is also expected that we will see larger female employment intensity among firms that are export-oriented and that are in manufacturing. The Dhaka dummy aims to capture whether firms located in Dhaka are more female employment-intensive than those outside of Dhaka. Finally, the innovation dummies aim to capture the association between the innovation/technological up-gradation and female employment intensity of firms.

There could be a simultaneity bias in the model depicted in Equation (1). Simultaneity bias is a term for the unexpected results that arise when the explanatory variable is correlated with the regression error term, because of simultaneity. One way of correcting this simultaneity bias is through the application of instrumental variables (IV), using a two-stage least square regression (2SLS). A 2SLS regression uses IV that are uncorrelated with the error terms to compute estimated values of the problematic predictor(s) (the first stage), and then uses those computed values to estimate a linear regression model of the dependent variable (the second stage). IV are used to compute the predicted values for the endogenous variables in the first stage of the 2SLS analysis. The same variables may appear in both the Explanatory and the Instrumental list boxes. The number of IV must be at least as many as the number of explanatory variables. Since the computed values are based on variables that are plausibly uncorrelated with the errors, the results of the two-stage model are optimal. In the current exercise, the innovation variable is instrumented with all other explanatory variables listed in Equation (1) and a variable representing average years of education of workers at the firm level. We can assume that the average years of education of workers at the firm level can affect the firm's decision to introduce new technology, but may not be associated with the firm's female employment intensity. The results of the 2SLS regressions are presented in Annex Table 7.

It appears from Annex Table 7 that, except in models 2, 8 and 9, in all the other six models the coefficient estimates come out more or less according to our expectations. In these six models, log of sales appears to be positively associated with female employment intensity with statistical significance, suggesting that bigger firms are more likely to have larger female employment intensity. Log of wage appears to be negatively associated with female employment intensity with statistical significance, indicating that firms with higher average wages tend to be less female employment-intensive. The export dummy is positive and significant, suggesting that export-oriented firms are more female employment-intensive. The manufacturing dummy appears to be statistically significant with a positive sign in only one regression model (model 4). The Dhaka dummy is negative and significant in three models (1, 3 and 7), indicating that firms in Dhaka have lower female employment intensity than firms outside of Dhaka. Out of the nine innovation variables, six turn out to be statistically significant with a negative sign, suggesting the negative impact of innovation on firms' female employment intensity.

The upshots of the aforementioned analyses are as follows:

- Female employment intensity declined between 2007 and 2013 in major manufacturing and services economic activities in Bangladesh.
- The percentage share of firms in total surveyed firms that were highly female employment-intensive (share of female employment in total employment 60% or more) had declined in 2013 compared with 2007, indicating the possibility of a declining number of firms with high female employment intensity.
- Innovation appears to have a negative impact on firms' female employment intensity, suggesting that innovation has a differential impact on female and male labour. In particular, introduction of new or significantly improved products or services; improved methods of manufacturing products or offering services; improved logistics, delivery or distribution methods for inputs, products or services; improved supporting activities in areas of maintenance systems or operations for purchasing, accounting or computing; and improved marketing methods appear to have a negative impact on female employment intensity at the firm level.

6. ANALYSIS OF THE OPPORTUNITIES OF EMPLOYMENT OF FEMALE LABOUR

This section attempts to understand the present status of as well as the expected future scenario for women's position in the labour market through two separate instruments: (i) firm interviews and (ii) KIIs of relevant experts, using a short questionnaire.[9] The first component of our assessment (firm interviews) asked firm owners about their experiences with female labours employed in their units, and for suggestions about relevant policies to aid with labour market participation of women.

Thirty firms from different sectors were chosen for the interviews, with the sectors selected primarily on the basis of female labour force intensity.[10] The sectors included food processing and agro business, leather, garments, wood and furniture, chemicals, pharmaceuticals, machinery and equipment, transport, IT, retail trade and other services (newspaper/ advertising firms). The firm-level interviews covered both export-oriented and non-export-oriented firms. Out of the 30 firms, 16 sell their products only in the domestic market, 3 firms are solely export-oriented and the remaining 11 are involved in both markets. Interviewed firms in garments and leather are fully export-oriented, whereas firms in sectors like machinery and equipment, wood and furniture, retail trade and transport are fully domestic market-oriented. Firms in the IT and pharmaceutical sectors supply both the global and the domestic markets.

Table 8 presents the distribution of interviewed firms according to the proportion of female workers in the total number of workers. The table suggests that, among interviewed firms, except the export-oriented firms in garments and leather and one firm in food processing and agro business, all firms in other manufacturing and services sectors have a less than 50% share of female employees in total employees. Two firms in other services, one in machinery and equipment and one in transport do not have any female employees.

Table 8: Distribution of female employees in interviewed firms across sectors

Sector	Number of surveyed firms					
	No female employees	More than 0% but less than/equal to 10% of total employees	Between 11% and 25% of total employees	Between 26% and 50% of total employees	More than 50% of total employees	Total firms
Food processing and agro business		1		3	1	**5**
Leather					1	**1**
Garments				2	2	**4**
Wood and furniture		1		1		**2**
Chemical			1	2		**3**
Pharmaceutical		1				**1**
Machinery and equipment	1	1	2			**4**
Transport	1					**1**
IT			3			**3**
Retail trade			1	2		**3**
Other services (newspaper/advertising firms)	2	1				**3**
Total number of firms	**3**	**6**	**7**	**10**	**4**	**30**

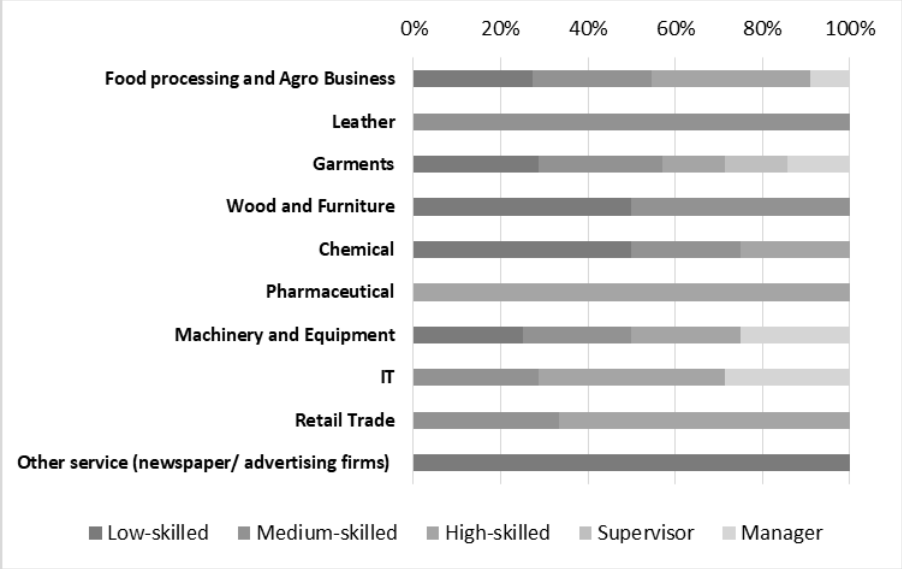
Source: Firm interviews conducted by authors.

[9] The interview questionnaire is presented in Annex 1.

[10] Annex 2 presents the list of firms that participated in the interview.

Figure 6 presents the composition of female employees in terms of skill structure in the interviewed firms. There is a high concentration of low-skilled female employees in firms in food processing and agro business, garments, wood and furniture, chemicals, machinery and equipment and other services. Medium-skilled female employees are found in almost all sectors, except pharmaceuticals and other services. Presence of high-skilled female employees is observed in food processing and agro business, garments, chemicals, pharmaceuticals, machinery and equipment, IT and retail trade. The presence of female supervisors is observed only in the garments sector and the presence of female managers in food processing and agro business, garments, machinery and equipment and IT.

Figure 6: Composition of female employees in terms of skill structure in the interviewed firms



Source: Firm interviews conducted by authors.

The KIIs were conducted with development partners, noted economists and policy-makers, and asked mainly about their views on the present status of women in the labour market, the challenges of female employment and the strategies that can be adopted to raise female labour force participation in Bangladesh.[11]

Figure 7 presents the seven major constraints to employing women as mentioned by firm owners and experts. These constraints include lack of required skill and education, social and work place safety, social norms, lack of women-friendly machines, long working hours/overtime, lack of transport facilities and the care burden.

Though lack of skills is a common constraint to employment generation for both men and women, firm owners, development practitioners and economists considered lack of skill of female workers to be one of the primary reasons for the concentration of women in certain sectors. In addition, experts also believed that social norms like family responsibilities and physical constraints discouraged women from working in high-skill jobs.

[11] Annex 3 presents a list of those who participated in the KIIs.

In the interviews, concerns were raised over the low level of technical knowledge of female workers, and also the limited participation of women in vocational training. Experts pointed out a number of reasons for the low level of skills of female workers and highlighted the mismatch of skills and academic attainment, further aggravated by lack of relevant training, as the primary reason for the inferior position of women on the occupational ladder. Though the mismatch of skills exists for both men and women workers, the low participation of women in the relevant technical and vocational education and training (TVET) means the problem is more acute for them than for their male counterparts. In addition, experts point to several other factors, including the conservative social structure (*purdah* culture, early marriage), as well as more institutional issues such as weak monitoring and implementation of government policies on child marriage, etc. Concerns were also raised over the preference of employers for male workers in managerial positions.

Figure 7: Major constraints to female employment perceived by firms and experts

Source: Firm interviews and KIIs conducted by authors.

While sharing their views about the constraints to female employment in the country as a whole, policy-makers, development practitioners and economists noted issues like lack of technical knowledge, rapid automation of small and medium-sized enterprise (SME)-led industries and reluctance to attain vocational education as factors contributing to female employment stagnation. In addition to direct factors, experts in interviews pointed out certain structural factors that act as indirect constraints to women's engagement in the labour market. Factors like slow rate of job creation, sluggish private sector investment, lack of export diversification and slow growth in manufacturing over the past few years were mentioned as the overall economy-wide issues responsible for slow growth in employment generation in general and stagnation of female employment in particular. Experts also believed that the increase in the working-age population, inadequate investment in human capital formation, especially skills-based education, a lack of safety

and security for women and a shortage of gender-friendly infrastructure act as impediments to female employment.

With respect to the question on the possible effect of automation on employment, 17 out of 30 firms interviewed perceived threats to employment. In particular, firms in food processing and agro business, wood and furniture, leather, garments, chemicals and pharmaceuticals perceived a negative effect of technology on both male and female employment, with a larger negative impact on female employment. KIIs with experts also indicated a possible negative effect of industrial automation on employment. According to these experts, though, relevant TVET can accommodate the automation-induced employment loss within the system.

In the case of the RMG sector in particular, firm-level interviews and KIIs pointed out that the factories that closed down after the Rana Plaza event in 2013 were mostly comparatively female labour-intensive. Furthermore, the introduction of labour-saving machinery was sped up after the disaster for the kind of jobs previously held mostly by low-skilled female workers, which led to employment losses for female labour.

The firm-level interviews and KIIs also looked into which sectors, in addition to garments, have the potential to absorb a large number of female workers. According to the firm interviews, manufacturing sectors like garments, leather, publishing, chemicals, pharmaceuticals and cottage industry and services sectors like IT, catering and restaurants, nursing, teaching, office administration, tourism, banking and fashion design have substantial potential to generate employment for women. KIIs emphasised the importance of RMG once again, and some experts pointed out that RMG should continue to be promoted, as the sector has the capacity to absorb female workers in large volumes. They also pointed that strong community-based bonding in many cases leads women to gather in sectors like RMG and food processing, restricting diversity in terms of employment.

Policy-makers, economists and development practitioners all agreed that special economic zones (SEZs) would create employment opportunities for women. In this context, they emphasised the need for infrastructure, utilities and facilities (e.g. housing, schooling) to attract female workers into such SEZs.

Firm owners were asked what public and private interventions might be conducive to boosting female employment. Table 9 presents a summary of these interventions and the lead actors within these. Vocational/engineering/capacity-building training for women is considered a key policy tool. In addition, several firm representatives highlighted the need for accommodation, social safety measures, transportation, work place safety and labour law implementation.

The KIIs also suggested generating employment through projects with backward linkages. The experts emphasised the importance of skills training programmes to increase female employment, which could also serve as a key policy intervention to accommodate technical innovation/automation-induced changes in the production process. Given the concentration of women in low-skill occupations, policy interventions to attracting more women into skills training programmes were a key recommendation. Several experts highlighted the need for day-care centres in the work place as a key intervention. Concerns were raised regarding the safety and security of female workers; in this context, subsidised accommodation, public–private partnerships (PPPs) in low-cost housing and bus services solely for women were recommended. Experts also underlined

that gender-sensitive policies needed to be designed in a realistic manner otherwise employers might switch away from female employment.

Table 9: Suggested interventions for female employment

Proposed interventions	Lead actor
Government budgetary allocation for the promotion of sectors with the aim of larger employment of female labour	The government.
Work place safety	The private sector. The government has to strictly monitor workplace safety.
Implementation of labour law	The private sector. The government has to strictly monitor implementation of the labour law.
Providing relevant training to female workers	The private sector. There should also be PPPs.
Establishment of training centres	Both the government and the private sector and PPPs. The government can also provide fiscal incentives to the private sector to establish training centres.
Low-cost accommodation	The private sector. The government can also provide fiscal incentives to the private sector to construct low-cost accommodation for workers.
Day care centre	The private sector. The government can also provide fiscal incentives to the private to provide day care centres for female workers.
Transport services	The private sector. The government can provide fiscal incentives to the private sector to run transport services for workers.
Awareness programmes to promote female labour market participation	Non-governmental organisations, the government and the private sector.
Encourage more female in engineering	The government through providing scholarships and other incentives.
Social safely for female workers	The government through law-enforcing agencies.

Source: Firm and expert interviews conducted by authors.

The firm-level interviews and KIIs with experts reflected a number of important issues with regard to female labour participation in Bangladesh:

- Females are employed mostly in low-skill jobs and concentrated in certain sectors.
- Lack of relevant skills is one of the important factors in the stagnation of female employment. The interviews highlighted that there were not enough female workers with relevant training in the labour market to be employed in different diversified sectors. This issue has both demand- and supply-side problems. On the demand side, from the mid-1980s, with the growth of RMG, a major emphasis was on developing the skills of the female labour required for the sector. During this period, lack of economic and export diversification, reflected in the lack of expansion of formal sectors that can employ the large volume of female labour, meant that not much demand was created for different female labour skills. This demand-side problem has become more acute over the past few years, thanks to sluggish private sector investment, the slowdown of RMG and poor performance of non-RMG exports, which have exacerbated the problem of concentration of economic and export activities. On the supply side, given the aforementioned depressed demand situation, fewer women are being encouraged to take part in training to acquire diversified and relevant skills. The KIIs also highlighted that the sluggish nature of private sector investment over the past few years has been responsible for stagnant job creation in the formal sector for women, even those with some education. Even though the general education level of women has increased in Bangladesh over the past decade, lack of job opportunities means their employment is not assured. In addition, socioeconomic factors, set by the traditional patriarchal culture, including those related to care responsibilities, are playing a crucial role

in women's participation in the labour market. Furthermore, more holistic issues, like child marriage and lack of safety and security, are critical impediments. There also exist a number of structural bottlenecks in the economy that have slowed down the rate of growth of job creation, resulting in stagnation in female employment.

- In general, there is a perceived threat of automation to employment, and this affects women disproportionately. Relevant TVET can accommodation the automation-induced employment loss within the system.
- In addition to RMG, a number of sectors, like leather, publishing, chemicals, pharmaceuticals, cottage industry, IT, catering and restaurants, nursing, teaching, office administration, tourism, banking and fashion design, are considered to have the potential to absorb women in large numbers and thus can play significant role in increasing female employment.
- Sector-specific policies are needed to expand production and increase employment.
- As for economy-wide policies, in addition to gender-friendly market-oriented skills development programmes, experts emphasised the need for more holistic strategies of providing day care facilities, low-cost accommodation and transportation. The private sector should lead on these, perhaps with the government providing fiscal incentives.

7. THE CAUSES OF FEMALE EMPLOYMENT STAGNATION

In the case of the labour market in Bangladesh in the past two or three decades, the most noticeable change has been rising participation of women, with the rate rising from around 8% in the mid-1980s to almost 36% in 2016/17. However, since 2010, there has not been much improvement in this rate, and even a decline in 2013. In addition, in terms of quality of work, we observe almost no significant change, with almost a third of women still working as unpaid family workers and the majority of paid employees concentrated on the lower rungs of the occupational ladder.

In this research, we have attempted to utilise both supply- and demand-side data to obtain insights into the recent changes in the labour market experience of women. Combining our micro analysis with an analysis of the macroeconomic environment of the country generates a number of plausible inherent explanations.

First, as Section 3 showed, the static position of female employment can be correlated with the slow pace of growth in RMG, Bangladesh's leading female wage employment sector. Since 2013/14, the industry has gone through a major reform, mainly because of the Rana Plaza tragedy. Such reforms, imposed both nationally and by international organisations, have been reflected in the weaker growth of the sector. Between 2010/11 and 2012/13, annual average growth in RMG exports was 20.9%; this came down to 7.4% between 2013/14 and 2017/18. Meanwhile, the number of RMG factories has declined sharply, from 5,876 in 2012/13 to 4,222 in 2013/14. This means that this crucial sector, which used to absorb around 3.5 million female workers, has reduced its female employment: recent studies reveal that the proportion of female employment in RMG is hovering around 65%. Interviews also suggested that RMG factories that closed down after the Rana Plaza event in 2013 were mostly comparatively female labour-intensive. Furthermore, the introduction of labour-saving machinery sped up after the disaster for the kind of jobs previously carried out mostly by low-skilled female workers, which led to employment losses for women.

Second, from a macro point of view, empirical evidences suggest that the country is going through a phase of jobless growth with very little progress in private investment (Raihan, 2018).[12] Sluggish private investment has constrained the expansion of existing industries, while there has been no notable investment in new industries. As a result, we have not observed any significant alternative sector (in addition to RMG) to absorb potential female entrants into the labour market.

Third, as explained in Section 5, recent technological advancements/automation has affected employment, with women with lower skills and education levels affected more than their male counterparts. We should keep in mind, however, that, in the absence of any recent nationally representative data on labour demand and automation, our analysis does not capture very recent changes.

Fourth, our supply-side analysis in Section 4 revealed that the constraints to female labour market participation (e.g. presence of young children, marital status) have not changed in recent years. In addition, a close comparison of the supply side of 2010 with that of 2016/17 shows that the impact of crucial factors like education on female labour market participation has even been reversed in certain cases, indicating the inability of the market to translate education into labour market outcomes. The growing concentration of economic and export activities over the past few years,

[12] The private investment–GDP ratio increased only from 22.5% in 2011/12 to 23.1% in 2016/17.

along with sluggish private sector investment, a slowdown in growth in RMG and poor performance of non-RMG exports, is also responsible for stagnant job creation in the formal sector for women, despite their having some education. Even though the general education level of women has increased in Bangladesh over the past decade, lack of job opportunities means their employment is not assured. However, education is found to play a strong positive role in the choice of non-agricultural over agricultural activities.

In recent years, the structural transformation of the economy has led to a natural decline in male employment in agriculture. The female employment share in agriculture has increased, on the other hand: with men increasingly migrating to larger towns or abroad and engaging in manufacturing/services jobs, women are being confined to low-paid (or even unpaid) agricultural activities, previously performed by men. As a result, we do not observe a corresponding increase in female representation in manufacturing/services.

One important phenomenon of female employment in South Asian countries is the prevalence of unpaid work. Bangladesh has seen little improvement over time in terms of a shift towards paid employment for women. As a result, there has been little qualitative change: around a third of employed women are still engaged in unpaid activities.

8. POLICY SUGGESTIONS

Gender norm-centric policies:

- Given the importance of the gender norm-centric domestic/care responsibilities of women, as reflected in our empirical analysis as well as in KIIs, an important policy intervention is the establishment of day care facilities. The private sector has to take the lead, and it is in employers' interests to do so. The government can provide support through tax rebates, cheap credit facilities, etc. to the private sector to set up day care centres at the workplace. In addition, strategies like those of extending the provision of maternity and post-maternity leave and introducing flexible and part-time working hours and distance working scheme can be useful in this regard. Again, the private sector should take the lead in introducing innovate part-time and home working schemes targeted primarily at females. In the case of maternity leave, enforcing leave in the private sector should be a key focus area for the government.
- Early marriage and early pregnancy act as critical constraints to female labour market participation. In this regard, stricter and careful implementation of anti-child marriage laws is vital. The government has a direct role here, but non-governmental organisations can also contribute significantly through campaigns to change mind-sets.
- Assuring a gender-friendly environment in education/training institutes (e.g. a separate bus service, toilet facilities, etc.) as well as at the workplace can be instrumental to the greater involvement of girls and young women in secondary and tertiary education. The private sector could take a leading role, with monetary incentives from the government; PPPs can also be useful strategies in this regard.

Skills development and education sector policies:

- With a view to providing women with the necessary skills, support at the initial stage of skills development (e.g. information centres at *upazila* level, support desk in *upazila* financial institutions)[13] and further assistance at the stage of marketing of the products of self-employed women can be of significant importance. Initiatives from both the private and the public sectors and PPPs can be instrumental here.
- As reflected in the primary survey as well as in the KIIs, a low skills level is one of the primary reasons for women's inferior position in the labour market. The issue is one not only of a lack of skills but also of a *mismatch* of skills offered by the traditional education system that is working against quality employment. To deal with the skills mismatch, one crucial issue is to align the curriculum with 'actual' market demand. In this context, a number of policies, like strengthening collaboration between vocational training institutes and industry (as in China and Thailand); involving industry representatives in designing the curriculum (India); and linking secondary education to TVET programmes to existing demand can be useful. The role of the private sector can be particularly important in this regard, as it can assist in modifying the curriculum, coordinate with education institutes in the placement of fresh graduates/trainees, etc.
- In the case of TVET institutes, demand assessment at local level and linking local-level institutions to specific demand for skills is critical, especially when it is about absorbing women, who have less mobility under the patriarchal social structure. Also, lack of TVET institute

[13] For example, in the union council office, there could be a small desk where information on different types of skills development programmes in the relevant *upazila* could be provided. Similarly, there could be a separate desk for female entrepreneurs, where women could obtain information about availability of credit, investment/SME schemes, etc.

performance data acts as a barrier to improving performance and the choices of prospective trainees. This situation can be improved by TVET institutes publishing annual statistics disaggregated by gender on job placement rates and starting salaries of those completing training. An online platform to collate these data and to make them available in an accessible way can be very useful. In this connection, both government and privately run training centres can take the responsibility for placing local youths in relevant jobs after the completion of training, with the help of local government bodies. In the absence of formal job centres, such entities can help in job searches and matching. Involving women in rural areas in non-farm activities, such as the food processing industry and storage and marketing of agro-based products can help in resolving rural unemployment and seasonal unemployment problems.

- As this research indicates, there is a need to strengthen the linkage between education and labour market participation for women, especially by encouraging women to participate in more relevant and technical education. There is also a need for coordination between primary and secondary and technical education providers.

Strategies to adapt to technological change and automation:

- To spread the benefits of technological change and automation more equitably, in the short run different tax incentives and social protection can be useful. In the long term, there is a need to address the weakness in the investment climate so as to remove barriers to the creation of new and higher-productivity jobs with correspondingly higher wages in the sectors that can generate large-scale employment for women.

Institutional strategies/reforms:

- In order to stimulate female labour market participation, a number of institutional reforms are needed. Effective coordination across the relevant ministries (Education, Primary and Mass Education, Youth and Sports, Women and Children Affairs, Expatriates' Welfare and Overseas Employment, Finance) is critical for the timely and efficient implementation of support programmes to the private sector related to various interventions (day care centres, low-cost accommodation, transport facilities, etc.).

Other policies:

- Given the dominance of unpaid work among women, it is important to consider strategies to bring them into mainstream labour market activities. For example, in order to bring unpaid workers into self-employment and to encourage them to enter the agriculture sector through the mainstream labour market, there is a need for government as well as non-government initiatives. Strategies like those of establishing information cells in *upazilas*, providing credit at low interest rates, flexibility in terms of collateral, etc., can be considered in this regard.
- In the context of Bangladesh, complex inheritance law means women's rights with regard to the land are often not clearly defined. This acts as a crucial constraint to their active participation in paid self-employed agricultural activities, and accessing credit in particular: land ownership is important to access credit, and absence of ownership can be a barrier to self-employment activities. The government should put in place specific and flexible policies in this regard to ease credit constraints for women.

- Social protection can help promote female labour force participation (Raihan and Jahan, 2018). Providing social protection directly to women, but also supporting other members of the household, can help them participate in the labour force.
- There is also a need to ensure women can articulate their own obstacles and challenges regarding work, on workplace safety, harassment and public insecurity, low pay and few rights, finding out about opportunities and managing reproductive and paid work.

9. CONCLUSION

Despite commendable progress in Bangladesh on a number of crucial socioeconomic indicators, there remains concern over the position of women in the country's labour market. In the mid-1980s, the female labour force participation rate was only around 8%; this increased to around 35% in 2010 but since then, from both a quantitative and a qualitative point of view, female employment has become somewhat stagnant. Using both supply- and demand-side data, this report has examined the labour market status of women in recent times and has found empirical justification in support of this concern.

Based on trends in key labour market statistics for the past decade or so, our analysis has found that, with certain exceptions, not only have the (annual) change in the rate of participation and in the size of labour force slowed in recent years, but also most women are trapped in unpaid or low-skill occupations. On the supply side, our estimation of the supply function using the latest data reveals that patriarchal gender norm-centric factors and domestic responsibilities act as critical impediment to women's engagement in the labour market. A sectoral polarisation of work, in favour of low-paid and low-productivity agro-based activities, lies in contrast with the structural transformation through which the economy is currently passing.

In addition, our analysis does not find the conventional positive association between education and labour market participation, which points to a concentration of a significant proportion of women with lower levels of education on the lower rungs of the occupational ladder and also in informal jobs. Meanwhile, women with relatively higher levels of education are facing difficulties finding jobs. Our analysis shows that the growing concentration of economic and export activities over the past few years, alongside sluggish private sector investment, a slowdown in growth in the RMG sector and poor performance of non-RMG exports, is also responsible for stagnant job creation in the formal sector for women, despite them having some education. Even though the general education level of women has increased in Bangladesh over the past decade, the lack of job opportunities means that these women are not assured of finding employment.

One common concern with regard to female employment on the demand side is related to technological innovation or automation in the production process. The research has found a significant negative impact of 'innovation in the production process' on the relative share of female employment. Such a finding indicates further obstacles to the expansion of female employment in future. With a view to gaining insights into potential sectors to absorb women, we carried out a small-scale primary survey of firm owners and a number of KIIs with relevant experts. The findings of this reflected that, in addition to RMG, leather, publishing, chemicals, pharmaceuticals and cottage industry, and services sectors like IT, catering and restaurants, nursing, teaching, office administration, tourism, banking and fashion design, can act positively towards the expansion of female employment. In addition, the responses of experts as well as firm representatives highlighted the negative impact of both demand-side bottlenecks and supply-side factors in expanding female employment.

Against the backdrop of a changing socioeconomic context, with Bangladesh attaining lower-middle-income status in 2016 and expected to graduate from least developed country status in year 2027, there have been significant changes in the lives of the country's citizens, including women. In terms of women's socioeconomic status, there has certainly been a positive change, with increased participation in the labour market that is impressive in comparison with the situation in many other South Asian countries, including India. Over the past decade, the country has managed to attain

sustained economic growth of more than 6% per year, which is quite something for a densely populated country with a low level of capital and a limited natural resource base.

However, as this research has documented, this relatively recent growth performance has not been reflected in the female labour market position, with very little change seen in women's participation rate and their concentration in low-paid and low-productivity activities. The reasons lie on both the supply and the demand sides of the market: in a context of inability to cope with increased automation and slowing growth in the RMG sector, women's low levels of skills and education, alongside patriarchal gender norms, have acted as drivers of this 'not so impressive' position for the past eight to 10 years. In addition to these apparently direct factors, there exist certain structural bottlenecks, again on both sides of the market. With the male labour force participation rate already at more than 80%, sluggish investment and the recent 'jobless growth' phenomenon have had an adverse impact on women in particular.[14] On the supply side, more holistic issues, such as child marriage and early pregnancy, coupled with reproductive and domestic responsibilities have not seen much change simultaneously with the economic progress of the country. This has resulted in a much slower pace and even stagnancy in women's labour market outcomes.

Our analysis of both the supply and the demand side, coupled with a primary survey and expert interviews, emphasise a number of constraints prevailing in the labour market of Bangladesh that have resulted in the stagnant position of women in low-skill and low-paid economic activities. Policies directly targeting these bottlenecks, including provision of better care services and gender-friendly infrastructure, investment in market-oriented education and skills development programmes, etc., can play an important role in reversing the trend. Moreover, given the recent challenges of increased automation and skills-based activities and declining trends in female participation in the RMG sector, fresh thinking in the relevant policy arena is needed to increase female employment in Bangladesh. Weak linkages between education and labour market participation also indicate the need to reform conventional policies. One important point to note here is that, although many of the challenges (e.g. quality of education and skills development, institutional weaknesses, etc.) are not gender-specific but rather general, given the low skill base and low representation of women on the higher rungs of the educational ladder, the significance of policies dealing with such challenges is much greater for them than for men.[15]

In terms of operationalising policies and strategies, both the government and the private sector should play an instrumental role. However, given the state of market failure in the country, effective monitoring of such policies by the government is essential. The government needs to play the lead role in education and institutional aspects, while the private sector should be increasingly involved, especially through skills development programmes and capacity-building.

[14] With male employment rates already high, in the past the additional jobs being created were going disproportionately to women. However, over the past few years, with the change in the trend and the slowing down of job creation, it is women who have been hit more than men. For more about 'jobless growth' in Bangladesh, see Raihan (2018).

[15] Among the population over 15 years of age, 5.8% of men have tertiary education; the corresponding figure for women is only 2.6%; only 1.3% of women have received some training; the figure is 2.2% for men; women hold only 11% of managerial jobs (QLFS 2016/17).

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ADDITIONAL TABLES

Annex Table 1: Probit estimates of labour force participation (marginal effects)

Variable	Female	Male	Married female	2010 estimates for female
Age	0.038*** (0.001)	0.039*** (0.001)	0.030*** (0.002)	0.016*** (0.001)
Age-squared	-0.001***(0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.0003*** (0.000)
Primary or secondary passed	-0.024* (0.009)	0.017** (0.007)	-0.015 (0.009)	0.057*** (0.006)
SSC or HSC passed	-0.040** (0.014)	-0.102*** (0.009)	-0.016 (0.013)	0.124*** (0.013)
University passed	0.247***(0.024)	0.090*** (0.011)	0.288*** (0.018)	0.577*** (0.018)
Marital status	-0.033***(0.009)	0.135*** (0.009)		-0.130*** (0.010)
Children	-0.002 (0.003)	0.005* (0.002)	0.003 (0.004)	0.004* (0.002)
Child under 5 years	-0.035*** 0.007)	-0.001 (0.006)	-0.053*** (0.008)	-0.036*** (0.003)
Head primary or secondary passed	-0.004 (0.007)	-0.031*** (0.006)	0.008 (0.008)	0.001 (0.001)
Head SSC or HSC passed	-0.069*** (0.01)	-0.036*** (0.008)	-0.062*** (0.011)	0.005 (0.010)
Head university passed	-0.092*** (0.015)	-0.143*** (0.015)	-0.096*** (0.014)	-0.037** (0.015)
Head employed in agriculture	0.060*** (0.01)	0.077*** (0.005)	0.069*** (0.011)	0.009 (0.005)
Head self employed	0.050*** (0.007)	0.099*** (0.005)	0.041*** (0.008)	0.476*** (0.004)
Net family income (natural log)	-0.017** (0.006)	-0.012** (0.004)	-0.037*** (0.006)	-0.069*** (0.001)
Household landholding	-0.028*** (0.006)	-0.026*** (0.003)	-0.022** (0.007)	7.2E-05*** (0.000)
Urban	-0.044*** (0.013)	0.022*** (0.006)	-0.078*** (0.015)	0.119*** (0.006)
Mymensingh division	-0.019 (0.039)	-0.051 (0.028)	-0.028 (0.042)	
Barisal division	-0.048 (0.028)	-0.003 (0.014)	-0.038 (0.033)	
Chittagong division	0.021 (0.019)	-0.005 (0.008)	0.035 (0.022)	0.051*** (0.009)
Khulna division	-0.033 (0.019)	-0.022* (0.01)	-0.019 (0.022)	0.038*** (0.010)
Rajshahi division	0.104*** (0.018)	-0.022* (0.009)	0.135*** (0.021)	0.042*** (0.009)
Rangpur division	-0.015 (0.022)	-0.005 (0.01)	-0.01 (0.025)	
Sylhet division	-0.151*** (0.025)	-0.022 (0.012)	-0.161*** (0.03)	
N	79,958	54,084	61,206	42,646

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. The figures in parentheses are the standard errors.

Source: Authors' estimation; 2010 estimates are from Mahmud and Bidisha (2018), where 'child under 6' was used instead and the divisional categorisation was different from in the present analysis.

Annex Table 2: Decomposition result based on Annex Table 1

Results	Coefficient	Percentage
Omega = 1		
Characteristics	-0.059	-14.75
Coefficient	0.461	114.75
Omega = 0		
Characteristics	-0.012	-2.93
Coefficient	0.414	102.93
Raw	0.402	100

Source: Authors' estimation.

Annex Table 3: Probit estimates of participation in non-agricultural sector (marginal effects)

Variable	Female	Male	Married female
Age	-0.011*** (0.002)	-0.008*** (0.001)	-0.015*** (0.002)
Age-squared	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Primary or secondary passed	0.045*** (0.009)	0.069*** (0.008)	0.042*** (0.009)
SSC or HSC passed	0.149*** (0.016)	0.117*** (0.012)	0.163*** (0.019)
University passed	0.432*** (0.018)	0.205*** (0.016)	0.491*** (0.019)
Marital status	-0.162*** (0.012)	0.011 (0.008)	
Children	-0.001 (0.004)	0.000 (0.002)	0.001 (0.005)
Child under 5 years	-0.063*** (0.009)	-0.008 (0.006)	-0.062*** (0.009)
Head primary or secondary passed	-0.013 (0.009)	-0.046*** (0.009)	-0.002 (0.009)
Head SSC or HSC passed	-0.040** (0.015)	-0.087*** (0.015)	-0.033* (0.016)
Head university passed	-0.012 (0.021)	-0.138*** (0.026)	-0.003 (0.023)
Head employed in agriculture	-0.189*** (0.012)	-0.583*** (0.01)	-0.170*** (0.013)
Head self employed	0.032*** (0.009)	0.052*** (0.005)	0.031*** (0.009)
Net family income (natural log)	0.023*** (0.007)	0.015*** (0.004)	0.024** (0.008)
Household land	-0.070*** (0.007)	-0.026*** (0.004)	-0.074*** (0.008)
Urban	0.298*** (0.02)	0.078*** (0.007)	0.330*** (0.023)
Mymensingh division	-0.07 (0.037)	-0.019 (0.022)	-0.059 (0.038)
Barisal division	-0.044* (0.018)	-0.027 (0.016)	-0.034 (0.019)
Chittagong division	-0.069*** (0.016)	-0.006 (0.009)	-0.074*** (0.018)
Khulna division	-0.116*** (0.02)	-0.030** (0.01)	-0.124*** (0.021)
Rajshahi division	-0.158*** (0.02)	-0.035** (0.012)	-0.159*** (0.02)
Rangpur division	-0.145*** (0.02)	-0.019 (0.01)	-0.157*** (0.022)
Sylhet division	-0.090*** (0.026)	-0.055*** (0.014)	-0.083** (0.028)
N	24,713	38,711	20,378

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. The figures in parentheses are the standard errors.

Source: Authors' estimation.

Annex Table 4: Multinomial logit estimates of modes of labour market participation of females

Variable	Wage employed	Self employed	Unemployed
Age	-0.008*** (0.002)	0.002 (0.002)	0.006* (0.002)
Age-squared	0.000** (0.000)	0.000 (0.000)	-0.000*** (0.000)
Primary or secondary passed	-0.034** (0.011)	0.022* (0.01)	0.006 (0.007)
SSC or HSC passed	0.007 (0.016)	-0.030* (0.015)	0.061*** (0.01)
University passed	0.272*** (0.027)	-0.207*** (0.018)	0.125*** (0.019)
Marital status	-0.150*** (0.013)	0.051*** (0.012)	-0.019** (0.007)
Children	-0.01 (0.005)	0.015*** (0.004)	-0.008** (0.003)
Child under 5 years	-0.051*** (0.009)	0.008 (0.009)	0.003 (0.006)
Head primary or secondary passed	-0.011 (0.009)	0.005 (0.009)	-0.006 (0.006)
Head SSC or HSC passed	-0.055*** (0.016)	0.036* (0.015)	0.01 (0.007)
Head university passed	-0.008 (0.02)	-0.012 (0.022)	0.019 (0.011)
Head employed in agriculture	-0.052*** (0.015)	0.006 (0.012)	-0.009 (0.007)
Head self employed	-0.074*** (0.012)	0.036*** (0.01)	-0.015* (0.006)
Net family income (natural log)	0.035*** (0.008)	-0.032*** (0.007)	0.000 (0.004)
Household land	-0.081*** (0.008)	0.041*** (0.007)	0.000 (0.004)
Urban	0.206*** (0.02)	-0.047** (0.016)	0.01 (0.009)
Mymensingh division	0.039 (0.053)	-0.198*** (0.03)	-0.054*** (0.013)
Barisal division	-0.069** (0.025)	-0.065 (0.038)	0.069 (0.037)
Chittagong division	-0.042 (0.022)	-0.015 (0.023)	0.009 (0.013)
Khulna division	-0.145*** (0.019)	0.074* (0.03)	0.057*** (0.017)
Rajshahi division	-0.199*** (0.02)	0.305*** (0.025)	0.071*** (0.017)
Rangpur division	-0.111*** (0.022)	-0.014 (0.028)	0.150*** (0.027)
Sylhet division	-0.008 (0.026)	-0.123*** (0.022)	0.043* (0.019)
N	27,399	27,399	27,399

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. The figures in parentheses are the standard errors.

Source: Authors' estimation.

Annex Table 5: Multinomial logit estimates of modes of labour market participation of males

Variable	Wage employed	Self employed	Unemployed
Age	-0.010*** (0.001)	0.018*** (0.001)	-0.004*** (0.001)
Age-squared	0.000*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)
Primary or secondary passed	0.02 (0.011)	-0.018 (0.01)	-0.004 (0.004)
SSC or HSC passed	-0.015 (0.016)	-0.043** (0.014)	0.051*** (0.007)
University passed	0.130*** (0.022)	-0.194*** (0.018)	0.078*** (0.013)
Marital status	0.007 (0.01)	0.034*** (0.01)	-0.037*** (0.004)
Children	0.000 (0.003)	0.003 (0.003)	-0.004** (0.002)
Child under 5 years	-0.020** (0.007)	0.005 (0.006)	0.002 (0.004)
Head primary or secondary passed	-0.026* (0.011)	0.020* (0.01)	-0.001 (0.003)
Head SSC or HSC passed	-0.048** (0.016)	0.029 (0.015)	0.004 (0.005)
Head university passed	-0.088*** (0.021)	0.085*** (0.021)	-0.006 (0.005)
Head employed in agriculture	0.071*** (0.008)	-0.073*** (0.006)	-0.007* (0.003)
Head self employed	-0.578*** (0.008)	0.562*** (0.007)	-0.019*** (0.002)
Net family income (natural log)	-0.002 (0.005)	0.005 (0.004)	0.002 (0.002)
Household land	-0.036*** (0.005)	0.017*** (0.004)	0.008*** (0.002)
Urban	0.011 (0.008)	-0.003 (0.007)	0.002 (0.004)
Mymensingh division	-0.044 (0.029)	0.034 (0.02)	0.025 (0.015)
Barisal division	-0.051** (0.017)	0.032* (0.013)	0.028** (0.008)
Chittagong division	0.006 (0.011)	0.014 (0.009)	-0.008 (0.004)
Khulna division	-0.013 (0.013)	0.009 (0.011)	0.009 (0.005)
Rajshahi division	0.002 (0.012)	-0.006 (0.009)	0.008 (0.006)
Rangpur division	0.017 (0.012)	-0.019* (0.009)	0.011 (0.007)
Sylhet division	-0.044* (0.017)	0.047** (0.015)	-0.002 (0.008)
N	40,560	40,560	40,560

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. The figures in parentheses are the standard errors.

Source: Authors' estimation.

Annex Table 6: Multinomial logit estimates of modes of labour market participation of married females

Variable	Wage employed	Self employed	Unemployed
Age	-0.009** (0.003)	0.002 (0.003)	0.003 (0.003)
Age-squared	0.000** (0.000)	0.000 (0.000)	-0.000*** (0.000)
Primary or secondary passed	-0.024* (0.011)	0.013 (0.011)	0.001 (0.006)
SSC or HSC passed	0.045* (0.018)	-0.042* (0.016)	0.045*** (0.01)
University passed	0.343*** (0.029)	-0.237*** (0.02)	0.115*** (0.021)
Children	-0.008 (0.005)	0.016*** (0.005)	-0.008* (0.003)
Child under 5 years	-0.059*** (0.01)	0.012 (0.01)	0.002 (0.006)
Head primary or secondary passed	-0.006 (0.009)	0.007 (0.01)	-0.006 (0.006)
Head SSC or HSC passed	-0.053** (0.016)	0.044** (0.017)	0.006 (0.007)
Head university passed	-0.013 (0.021)	-0.01 (0.026)	0.018 (0.012)
Head employed in agriculture	-0.044** (0.015)	-0.001 (0.013)	-0.011 (0.007)
Head self employed	-0.056*** (0.012)	-0.001 (0.011)	-0.016* (0.006)
Net family income (natural log)	0.035*** (0.008)	-0.040*** (0.008)	0.001 (0.005)
Household land	-0.079*** (0.008)	0.046*** (0.007)	-0.006 (0.004)
Urban	0.219*** (0.022)	-0.050** (0.018)	0.016 (0.01)
Mymensingh division	0.061 (0.049)	-0.237*** (0.029)	-0.067*** (0.004)
Barisal division	-0.053* (0.024)	-0.069 (0.041)	0.055 (0.034)
Chittagong division	-0.038 (0.023)	-0.035 (0.026)	0.013 (0.015)
Khulna division	-0.156*** (0.018)	0.078* (0.033)	0.056** (0.017)
Rajshahi division	-0.192*** (0.02)	0.325*** (0.028)	0.066*** (0.017)
Rangpur division	-0.116*** (0.023)	-0.018 (0.031)	0.153*** (0.028)
Sylhet division	0.023 (0.028)	-0.141*** (0.025)	0.003 (0.016)
N	22,335	22,335	22,335

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. The figures in parentheses are the standard errors.

Source: Authors' estimation.

Annex Table 7: 2SLS regression results of innovation and female employment intensity of firms

	Dependent variable: female employment intensity								
	1	2	3	4	5	6	7	8	9
Log of sales	3.32*** (0.54)	12.45 (60.16)	5.10*** (0.83)	7.84*** (2.25)	8.04*** (2.41)	9.62* (4.55)	5.78*** (1.18)	-0.58 (6.15)	40.85 (139.3)
Log of average wage	-3.91*** (1.03)	-6.45 (11.89)	-4.54*** (0.95)	-6.58*** (1.74)	-5.32*** (1.48)	-5.68* (2.39)	-3.85*** (1.04)	-1.46 (5.93)	-10.37 (27.54)
Export dummy	21.68*** (2.57)	-8.07 (196.11)	21.11*** (2.19)	21.87*** (3.15)	23.24*** (3.59)	34.10** (10.62)	21.11*** (2.44)	-24.35 (70.72)	60.27 (152.6)
Manufacturing dummy	-14.86 (21.10)	68.39 (348.7)	19.58 (15.84)	45.06* (25.13)	20.52 (22.59)	20.11 (32.92)	15.93 (17.71)	80.13 (131.5)	11.18 (184.1)
Dhaka dummy	-6.74*** (2.02)	-16.95 (110.27)	-4.52*** (1.70)	-3.01 (2.47)	-3.37 (2.50)	0.28 (5.04)	-4.47* (1.91)	-28.68 (39.56)	82.49 (321.4)
Innovation 1	-48.48*** (17.40)								
Innovation 2		-230.69 (1542.45)							
Innovation 3			-37.44*** (11.76)						
Innovation 4				-66.18** (28.95)					
Innovation 5					-69.05** (31.24)				
Innovation 6						-114.11 (74.47)			
Innovation 7							-46.91** (16.87)		
Innovation 8								387.1 (628.97)	
Innovation 9									-705.13 (2580.6)
N	1,131	389	1,130	1,130	1,130	1,125	1,126	1,126	1,128

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. The figures in parentheses are the standard errors.

Instrumented: Innovation variables.

Instruments: Log of sales, log of average wage, export dummy, manufacturing dummy, Dhaka dummy and average years of education of workers at the firm level.

Source: Authors' estimation.

ANNEX 1: INTERVIEW QUESTIONS

Questionnaire for firm owners

Section A: Key information about the firm

1. In which year was the firm established?
2. What type of industry is it?
3. What type of product does it produce?
4. Is it an export-oriented firm or does it mostly sell outputs in the domestic market?
5. Is it a labour-intensive industry or a capital-intensive one? Approximately how many workers does it engage now? What is the proportion in terms of male and female?
6. Does the firm have sufficient tools to confront safety and health issues? Please elaborate.

Section B: Short interview with the owner

7. What percentage of the workforce of your factory is female?
   - ☐ Zero
   - ☐ Less than 10%
   - ☐ Between 11% and 50%
   - ☐ Between 26% and 50%
   - ☐ More than 50%
8. Over time has there been any change in employment pattern in your factory?
   - ☐ Employment has increased for both men and women
   - ☐ Employment has decreased for both men and women
   - ☐ Employment has increased for men only
   - ☐ Employment has decreased for men only
   - ☐ Employment has increased for women only
   - ☐ Employment has decreased for women only
9. Which skills-set female workers are mostly employed in your firm?
   - ☐ Low-skilled
   - ☐ Medium-skilled
   - ☐ High-skilled
   - ☐ Supervisor
   - ☐ Manager
10. What are the major challenges employers in your sector are facing while employing female workers?
11. Do you think technological advancement will eventually affect (or is already affecting) employment of workers in your firm?
    - ☐ It won't affect it
    - ☐ It will affect it to some extent
    - ☐ It will affect it to a great extent
12. In relation to question 11, do you think women in particular will be affected more than men? If yes, then explain how
13. Do you want to propose any relevant government policy that might be beneficial in increasing female employment in your sector?
14. Do you think SEZs might help in accelerating female employment generation? If yes, then how?
15. In your opinion what are the potential sectors (non-agricultural) for future employment of women in Bangladesh? Mention any three sectors.

Questionnaire for development practitioners, economists and policy-maker

1. Although female labour force participation has increased over time, there has not been a significant rise in recent years. What do you think the reasons behind this stagnation are (mention three major reasons)?
2. Women's employment in urban areas seems to be dependent on the RMG industry. What might be the reason for this dependence on RMG?
3. In your opinion, what are the potential sectors (non-agricultural) for future employment of females in Bangladesh? Mention any three sectors.
4. What improvements are needed related to sectoral reform, social norms and environment where there are often barriers to women's employment?
5. Do you consider technological advancement as a barrier to employment generation? If yes, then do you think it may have negative implications for female employment in particular? Please elaborate.
6. Do you think SEZs might help in accelerating female employment generation? If yes, then how (please specify any steps that you may recommend)?
7. How do prevailing discriminatory practices (e.g. gender differential in wages, violation of labour law, working hours, health and safety in the workplace) affect female employment? Please elaborate.
8. Please recommend specific policies and strategies to increase female employment in Bangladesh.

ANNEX 2: LIST OF FIRMS INTERVIEWED

Sectors	Name of firms
Food processing and agro business	M/S Madina Rice Mill
	Danish, Partex Star Group
	Fish Bangla
	ACI Foods Limited
	Pran Group of Industries Limited
Leather	Young one Sport ware (80% female employer)
Garments	Asiar Fashion Limited
	Modest Collection
	Total Fashion Limited
	Topaz Lebel Limited
Wood and furniture	M.S. Wood Furniture
	Regal Furniture
Chemicals	Kohinoor Chemical Company Limited
	Toha Laboratories and Alpine Water Limited
	ACI Chemical Limited
Pharmaceuticals	Beximco Pharmaceutical Limited
Machinery and equipment	A.S Mobile
	Basic Machinery
	Best Electronics Limited
	Best Medical Service
Transport	Sonali Enterprise
IT	Digiton Technologies Limited
	IPvision software limited
	Divine It
Retail trade	Best Buy Super Shop
	Cakes and Dessert Online Retail shop
	Various type of plastic item selling shop
Other services (newspapers and advertising firms)	Banik Barta News Paper
	Media Newspaper
	Alpha Communication and Advertisement Limited

ANNEX 3: LIST OF PEOPLE INTERVIEWED

Sl.	Name	Roles and responsibilities
1	Dr Shamsul Alam	Member (Sr Secretary), General Economic Division, Ministry of Planning, Government of the People's Republic of Bangladesh
2	Ms Tasnova Rahman	Senior Assistant Secretary, Ministry of Primary Education, Government of People's Republic of Bangladesh
3	Mr Al Mamun	Deputy Secretary, Ministry of Agriculture, Government of People's Republic of Bangladesh
4	Ms Saeda Khanom	Deputy General Manager, Bangladesh Bank
5	Ms Maheen Sultan	Visiting Fellow, Brac Institute of Governance and Development
6	Banasree Mitra	Gender Advisor, Manusher Jonno Foundation
7	Ms Shaila Khan	Assistant Country Director and Adviser, Business Development and Partnerships, United Nations Development Programme
8	Mr Khalid Mustafiz Gaffar	Deputy Director, International Trade, British High Commission
9	Shaquib Quoreshi	Research fellow, South Asian Network on Economic Modeling
10	Nandini Shahla Chowdhury	Programme Communications Advisor – Asia & Middle East, Christian Aid
11	Dr Khondokar Golam Moazzem	Research Director, Centre for Policy Dialogue
12	Dr Zahid Hossain	Lead Economist, World Bank, Bangladesh