
**MASTERS DISSERTATION**

# Estimating the Correlates of Female Labour Force Participation in Bangladesh: 2005 to 2010

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**Date of Submission: 4th June, 2018**

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**Masters in Development Theory and Policy**

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**List of Abbreviations**

| | |
|---|---|
| BCS | Bangladesh Civil Service (BCS) |
| BDT | Bangladeshi Currency Taka |
| BMET | Bureau of Manpower, Employment, and Training |
| BRAC | Bangladesh Rural Advancement Committee |
| FLFP | Female Labour Force Participation |
| GDP | Gross Domestic Product |
| GNI | Gross National Income |
| H.S.C | Higher Secondary Certificate |
| ILO | International Labour Organization |
| LFS | Labour Force Survey |
| MDGs | Millennium Development Goals |
| MENA | Middle East and North Africa |
| OECD | The Organization for Economic Co-operation and Development |
| RMG | Ready-Made Garments |
| S.S.C | Secondary School Certificate |
| TFP | Total Factor Productivity |
| UK | United Kingdom |
| U.S.A | United States of America |

**Acknowledgments**

There are several people without whom this thesis would not have been possible and whom I would like to thank. First and foremost, I would like to express my deep gratitude to my thesis advisors Professor Dr. Dori Posel, Professor Dr. Friederike Maier, and Professor Dr. Muriel Roger. I would like to thank all of my supervisors for their continuous guidance, motivation, understanding, suggestion, encouragement, patience, and insightful comments and feedback throughout the study.

Second, without Labour Force Survey (LFS) data, this study would not have possible. Hence, I would like to thank my former colleague Faizuddin Ahmed from the World Bank to help me to get government data, and Statistics and Information Division of Bangladesh Bureau of Statistics for sharing LFS data. I would also like to thank Professor Daniela Casale for her guidance in econometrics analysis.

Third, I would also like to acknowledge all my class fellows and professors who attended and provided valuable comments and suggestions while preparing thesis proposal in University of the Witwatersrand, and thesis seminars in Berlin School of Economics and Law. Moreover, I am very grateful to entire Economic Policies in the Age of Globalization (EPOG) master's program for providing me an opportunity to attend their outstanding program.

Lastly, my sincere gratitude and love to my family and friends for the motivation and emotional support during the study. This accomplishment would not have been possible without their love and emotional support.

**Abstract**

The government of Bangladesh has targeted 8 percent gross domestic product (GDP) growth by 2020. To attain this, increasing labour force participation is particularly important as the country has a very large population. Male participation is already high, thus the focus needs to be on increasing female labour force participation, highlighting the importance of studying the factors associated with rising female labour force participation in Bangladesh. In this research report, I investigate both the demand- and supply-side correlates of female labour force participation through descriptive and econometric analysis of Bangladesh labour force survey data. Demand-side analysis found that the economy has increased its capacity to absorb female labour as the economic structure has shifted from agriculture to the manufacturing and service sectors. Supply-side analysis found that individual and household characteristics are both important sets of factors explaining female labour force participation. Individual characteristics that are correlated with female labour supply include education, marital status, training, age, and religion, while household characteristics include the number of children, household income, and household size. Econometrics analysis shows that these variables have a significant relationship with female labour force participation. Non-linear decomposition techniques (Gomulka and Stern, 1990) identified some of the charactertistics of women that have been changed over the years (including the share of women with prior training and the share in middle income households), helping to explain the increase in their labour force participaton. However, changes in women's labour force participation are primarily explained by changes in the relationship between characteristics and labour supply (i.e. changes in the coefficients). For example, women from lower income households, and households with fewer children were significantly more likely to participate in the labour force in 2010 than they had been in 2005.

## Chapter One: Introduction and Overview of Research

Female labour force participation (FLFP) started increasing after World War II, especially in developed countries. Increasing education, declining fertility, and changing social norms are helping to increase FLFP. However, the gender gap still exists in the labour market. According to the *World Employment Social Outlook* report by the International Labour Organization (ILO), globally in 2017, women's participation was 27 percentage point lower than men's participation (ILO, 2017). Most importantly, this gap is higher in developing countries, and especially in Southern Asia. According to the same report, the gender gap in labour force participation in Southern Asia was 50.8 percentage points (ILO, 2017). Socio-economic constraints, such as social norms, marital status, a lack of decision-making power, education, and employment opportunity for women, as well as their involvement in unpaid family work, are obstacles that may inhibit women's ability to participate in the labour market. Studies show that increasing women's participation in labour market can bring economic growth, socio-economic progress as well as improved individual welfare (Klasen and Lamanna 2009; Morrison et al. 2007).

Large gender differences in labour force participation have been observed in Bangladesh's economy specifically. According to the government's labour force survey, there was a 46.3-percentage point gender gap in the labour market in 2015 (Bangladesh Bureau of Statistics, 2017). Bangladesh has set both an ambitious growth target and a target of reducing poverty. As men's participation was already 81.9 percent in 2015-16, there is not much room to increase men's participation in the labour market. Therefore, the country has to increase its FLFP which was 35.6 percent in 2015-16. Increasing women's participation in the labour market will not only enhance economic growth but also help to reduce gender inequality and increase female empowerment. Due to its importance, the study of FLFP has gained considerable attention among researchers, and international organizations.

This dissertation will describe and estimate the correlates of increasing FLFP in Bangladesh. The dissertation is structured as follows. This Chapter One will give overview, outline the importance of the topic, describe the research questions of the study, provide some background about Bangladesh's socio-economic status and the social status of women, and briefly sketch the methodology used in the study.

Chapter Two will provide a literature review on FLFP, outlining both the theoretical approaches that have been adopted as well as empirical studies which have investigated FLFP in Bangladesh and from the global perspective.

Chapter Three will discuss the descriptive analysis of the possible correlates of FLFP in Bangladesh. The chapter will first give the overview of the data. It will then describe patterns and trends in FLFP in Bangladesh from both the demand- and the supply-side, where supply-side factors include both individual and household characteristics.

Chapter Four will conduct an econometric analysis to estimate the correlates of FLFP. Hence, a decomposition analysis will be done to explore changes in this labour force participation over time.

The final chapter will conclude the study and provide a summary of the main findings from the empirical analysis.

### 1.1 Importance of the Topic

With the vision 2021 (the 50th anniversary of Bangladesh's independence), the 7th *Five Year Plan*, the government's medium-term development strategy, documents a targeted 8 percent GDP growth by 2020. It expects an annual average growth at 7.4 percent for the period between Fiscal Year (FY)16 and FY20[1] from the average annual growth of 6.6 percent for the last five years (FY13 to FY17) (General Economics Division, 2015 and The World Bank, 2017a, and 2017b). To attain this growth, the country will need to implement structural reforms, increase investment, raise total factor productivity, diversify labour-intensive exports, and increase labour productivity by increasing the labour force participation rates (The World Bank, 2015). Among these, increasing labour force participation is particularly important as the country has a very large population of 158.5 million people in 2015-16. Out of these, 60.7 million people were in the labour force, comprising 43.1 million men and 19.1 million women. In 2015-16, the labour force participation rates for men was 81.9 percent and 35.6 percent for women (Bangladesh Bureau of Statistics, 2017). There is less room to increase male labour force participation, but considerable scope for

[1] Bangladesh follows the fiscal year (FY) calendar, i.e. FY16 means 1st July 2015 to 30th June 2016

increasing FLFP exists, which will increase growth by expanding the supply of labour (General Economics Division, 2015).

Women's participation in the labour market not only increases the family income but also has a positive growth impact on the economy in a more general sense. According to the World Bank, "higher female labour force participation can boost growth by mitigating the impact of a shrinking workforce growth rate" (World Bank, 2015, pp. 15). Recently, the Bank's long-term growth analysis for Bangladesh has found that, if FLFP rate increases to 45 percent by 2020, this will lead to a one percentage point higher growth until 2020 and 0.1-0.2 percentage points higher growth from 2021 to 2030[2] (The World Bank, 2017b).

Motivated by these findings, this Master's dissertation will explore the correlates of FLFP in Bangladesh. The findings from the study may help policy advocacy, and particularly with respect to policy that seeks to encourage more women to enter the labour force.

To better understand the background of the topic, next two section will provides a brief overview of Bangladesh's economy and the socio-economic position of women.

### 1.2 Economic Overview

Bangladesh is a lower middle-income country and has sustained 6 percent (or higher) GDP growth from 2011 until 2017, with an average annual growth rate of 6.6 percent over the period. Growth is mainly driven by exports which are mostly dominated by the manufacturing sector. Per capita Gross National Income (GNI) has been estimated to $1480 in 2017 (The World Bank, 2017a). According to the United Nation population database, the country has a huge population of 164.6 million in 2017 with a population growth rate of 1.05 percent from 2016. Of the population, just over half (50.4 percent) are men (United Nation, 2017); and 64.2 percent of people live in the rural areas (Central Intelligence Agency, 2018). Though there is no data for net migration, the stock data shows that nearly 10 million people were international migrants in 2017. Hence, remittances

[2] Based on neoclassical labour market models whereas supply creates demand. The equation is as follows,

$$Y_t = A_t K_t^{1-\beta} (h_t l_t)^{\beta}$$

Here, "$Y_t$ output growth, $K_t$ is the aggregate capital stock, $h_t$ is the human capital per worker and $l_t$ is the total number of workers present in the economy. $A_t$ denotes the common total factor productivity (TFP) that captures the productivity of both factors of production. The time invariant parameter $\beta$ represents the aggregate labour share of income" (The World Bank, 2017b, p.34).

form a significant share of total income: in 2017, total remittances equaled $13.5 billion, which represented 5.1 percent of GDP (Bureau of Manpower, Employment, and Training-BMET, 2018). In addition, the country has had considerable success when it comes to achieving the Millennium Development Goals (MDGs), as life expectancy and literacy rates have increased, while child mortality and maternal mortality have declined. Life expectancy increased to 72.5 years in 2016 from 58.4 years in 1990. Literacy rates increased from 35.3 percent (male 44.3 percent and female 25.8 percent) in 1991 to 72.8 percent (male 75.6 percent and female 70 percent) in 2016. The large gender gap in literacy rates has therefore narrowed dramatically as literacy has increased overall. The mortality rates for under five years old declined by 76 percent from 1990 to 2016 (World Development Indicator, 2017). The maternal mortality ratio (per 100000 live birth) fell to 143 in 2015 from 574 in 1990. In addition, the poverty rate also declined. According to the international poverty line ($1.90), poverty has been reduced to 13.8 percent in FY2017 from 44.2 percent in FY1991, where the number of poor decreased by 14 million people, to 28 million from 42 million (The World Bank, 2017a). In terms of religious composition, 89 percent of population are Muslim, 10 percent are Hindu, and 1 percent are others (Central Intelligence Agency, 2018).

### 1.3 The Socio-Economic Position of Women

For gender equality, Bangladesh is still far behind. For example, Bangladesh ranked 119 out of 188 countries in The Gender Inequality Index 2016 (United Nations Development Program, 2016). In Bangladesh, women are mostly dependent on men, both socially and economically due to a patriarchal social structure. The primary role of women is confined to the household and/or domestic work like cooking, cleaning, childbearing and rearing. In addition, women work unpaid on family farms. Women are still mostly fulfilling the roles of mothers, daughters, and wives performing invisible and unpaid domestic work (Sarker, 2015). In the household hierarchy, daughters-in-laws are at the bottom. A good wife always has to obey her husband. Women are also less likely to hold assets and property. For property, Bangladesh follows religious law. In Islam, they follow *Sariah* (Islamic) law, where women inherit one-third of their father's property (whether their father is alive or not), but most the time they give up their property to their brother[3] (Sourav,

[3] After marriage, women leave their father's house and live in husband's house. In most of the cases brothers hide about their paternal land and other properties from their sister. Moreover, women do not know about the parental and husband's property. Most of the time, women are not aware about any land related low (Sourav, 2015).

2015; Khan, 2016). As for Hindu women, they do not get any property from their parents or from their husband (Sourav, 2015).

Women barely have any voice in household decisions (Ahmed, 2014). They are also often victims of domestic violence. According to The Violence against Women Survey 2015, around 72.6 percent of women in Bangladesh suffer some form of violence during their lives from their husband (Bangladesh Bureau of Statistics, 2016). Moreover, the country has the highest rate of early marriage in the world. In 2018, 59 percent women are married by the age of 18 (United Nations Children's Emergency Fund, 2018). Though female education attainment for primary and secondary level increased, it is still low when it comes to tertiary education. Socially, women are considered to be 'physically weaker' than men to join economic activity outside of the home. There is also a lack of social security, unequal access to resources, and verbal and sexual abuse in the workplace obstructing women's ability to participate in the labour market. In 2015, women's labour force participation rate was only 35.6 percent (Bangladesh Bureau of Statistics, 2017). According to Labour Force Survey (LFS), the largest share of female employment was in skilled agriculture, forestry, and fisheries work followed by elementary occupations, and craft and related trade work. Only a very small proportion of women were employed as managers, technicians and associate professionals, and in the service sector. Among high-status occupations, only 12.9 percent of women in employment were chief executives, senior officials and legislators whereas 12.8 percent of women were administrative and commercial managers (Bangladesh Bureau of Statistics, 2017).

### 1.4 Statement of the Research Questions/Hypothesis to Test

The key empirical question this study will address is: What are the correlates of FLFP in Bangladesh?

To answer this question, the study will explore various sub-questions:

1) What are the demand-side factors, which can lead to increase FLFP? This question is important to see if there is a demand for female labour force in the economy and the economic structure absorb the increase of female labour force supply?
2) What is the role of education in explaining the increase in FLFP? This question is important because the government has taken some initiatives to increase female education (such as

the provision of free books, free tuition, and a stipend program) and it is important to evaluate whether this has affected FLFP.

3) Is culture or tradition associated with FLFP and has this changed over time? Here, culture and tradition are connected to religion, attitudes towards marriage, and fertility.
4) What other supply-side factors are associated with an increase in FLFP?

To answer of these questions, following hypothesis will be tested,

i. Economic Structure: With a change in economic activity and the increase in manufacturing and services, the economy has had the scope for employ more women.
ii. Increasing female education: I expect a positive relation between increasing education and increasing FLFP.
iii. Family income: This may show an inverse relationship with FLFP –as family income rises, women do not need to earn income. But there may also be a positive relationship – when family income rises, women can substitute domestic or household work with labour-saving technology (such as washing machines) or other services (such as daycare centers for children), thereby freeing up a woman's time that can be allocated to the labour market.
iv. Fertility/number of children: I expect an inverse relationship - as the number of children increases, women would need to spend more time on child raising and so have less time for employment.
v. Marriage: I expect a negative relationship between marriage and women's participation in the labour force. Due to marriage, women may financially depend on their husbands, lowering their participation in the labour market.
vi. Divorce/separation: Analogously I expect a positive relation between divorce and women's participation in the labour market.
vii. Religion: As religion is considered a proxy of culture, I expect that more religious woman will have more conservative attitudes regarding gender roles, and so they will tend to participate less in the labour market.

## 1.5 Research Methodology

To understand the dynamics of FLFP, the research will use quantitative methods to explore the correlations of women's labour force participation in Bangladesh. Both descriptive and econometrics methods will be used. The descriptive analysis will describe patterns and trends in FLFP, including in both employment and unemployment. It will also describe supply-side characteristics (both individual and household characteristics) that may be correlated with FLFP. The individual characteristics include a woman's age and education, her marital status, location (rural or urban[4], and according to divisions –geographically the country is divided into eight divisions), and her religious status. The household characteristics include household composition, and household (family) income (excluding the income earned by women who are employed), and the number of children household has. The descriptive analysis will also discuss changes in demand-side factors that may influence women's labour force participation –for example, changes in employment in agriculture, manufacturing, and the services sector.

The econometric analysis will estimate the correlates of FLFP and use a decomposition analysis to explore changes in this labour force participation over time. The decomposition technique outlined in Gomulka and Stern (1990) will be used. The decomposition separates the factors accounting for a change in women's labour force participation into changes in the characteristics of women, and changes in the returns to these characteristics (or changes in the coefficients of these variables). More details about the technique will be explained in Chapter Four.

There are various sources of endogeneity that make it difficult empirically to establish whether relationships between supply-side characteristics and female labour force participation are causal. This will be discussed further in Chapters Three.

In conclusion of this chapter, society in Bangladesh is very patriarchal and women are discriminated against not only socially, but also economically. Hence, it is necessary to increase FLFP not only because this would enhance the country's economic growth but also because this is likely to improve women's autonomy and their voice in the household and in marriage. To better

[4] Rural and urban areas are defined by national statistical offices, Bangladesh Bureau of Statistics. Labour Force Survey follows the same definition which used for population census. According to population census report, "the urban areas included city corporations, municipalities, upazila headquarters, growth centers, cantonment and urban agglomerations adjacent to large cities" and rest are such as villages, unions considered as rural areas (Bangladesh Bureau of Statistics, 2014).

understand the dynamics and correlates of FLFP, the next chapter will describe the main theoretical approaches to studying FLFP and then outline some key empirical studies.

## Chapter Two: Literature Review

The literature review will describe the main theories which seek to explain why an individual decides to participate in the labour market, and what factors affect this participation decision. The chapter will also present different empirical studies that investigate the correlates of FLFP at the global level as well as in Bangladesh. The literature review section is therefore divided into three parts: first, it considers the theoretical concepts; second, it briefly reviews international empirical studies on female labour force supply in different countries; and third, literature on female labour force participation in Bangladesh is discussed.

### 2.1 Theories to Understand Female Labour Force Participation (FLFP)

The basic neoclassical analysis of the work-leisure model describes the individual's decision to work and how much time is spent on working. Individuals face a tradeoff between leisure and work due to time constraints. The benefit of allocating time to labour is that the individual receives an income, which is used to buy goods and services. The opportunity cost of each hour spent on working is the leisure given up. The benefit of spending time on leisure is the satisfaction derived from these activities. Here, the opportunity cost is giving up the income from each hour spent in leisure. The decision of how many hours to allocate to each activity is determined by the wage rate, the availability of non-labour income (such as transfer payments or the spouse's income), and the individual's preferences concerning both activities. The model assumes that if the wage rate increases, people will allocate more time to work than to leisure since the opportunity cost of allocating time to leisure will be higher (Lewis and Peterson, 1997).

However, this theory has been criticized as it does not consider the structure of the work (Casale, 2003). For example, in labour market there are typically fixed operating hours where the individual does not have choice to choose preferred working hours. Most importantly, this theory explains the decision of work in the context of men's decision towards labour supply and is not useful in explaining female labour supply because women allocate their time more on childcare, and household work rather than leisure (Dex, 1985).

With the aim of better understanding women's labour supply and their decision making, this study considers Becker's (1965) theory of 'allocation of the time', where he included the idea of non-market work and household production. Instead of individuals, Becker treated the household as

the primary decision-making unit, where the household head holds the decision making power for household. The theory assumes that individuals aim to maximize joint households' utility, and households derive utility from the consumption of market commodities, as well as from the consumption of commodities produced within the household (Becker, 1965). This approach recognizes that individuals spend their non-market time in a variety of activities that are not sufficiently described by the term "leisure" but involve both goods and time which are mostly associated with women such as cleaning, childcare, and others household activities. When wages rise, women substitute market for non-market activities by increasing their consumption of goods-intensive activities (Casale, 2003). Becker's framework also explains the sexual division of labour by arguing that women have a comparative advantage in household production because biological differences make women more productive in the household activities (Becker, 1981). Another important application of Becker's framework is related to the area of fertility. Having children and looking after them is a highly time-intensive activity, wherefore it affects the opportunity costs meaning the earning capacity of the parents, especially of the mother. Thus, women with high potential wage rates have fewer children and participate in the labour market (Becker, 1974). Significantly, Becker's theoretical framework has been used in explaining household's behavior in the areas of marriage, fertility, divorce, and education which are very critical to explain women's decisions to (or *not to*) participate in the labour force.

However, this theory has been criticized for various reasons. For example, as the decisions and goals of the household are set by the household head, these can be dominated by the household head's self-interest. Therefore, the sexual division of labour in which women work in non-market activities at home, and men work in market activities, may not be based on comparative advantage, but rather may reflect men's influence in the decision not to allow their wives to engage in market activities (Evans, 1991; Katz, 1996).

To overcome this criticism, game theory approaches have been used to model bargaining behavior within household (for an early study, see McElory and Horney, 1981). These models assume that individuals in the household bargain to gain their own ends. The bargaining power of each individual depends on the wage, other sources of income, wealth, the individual's rights in property and divorcee. These models have been extended to incorporate individual differences in preferences, budget constraints, and control over resource use (Katz, 1996). However, Sen (1990)

argues that labour supply bargaining models are still dominated by men because of social norms which prevent women from participating in the bargain. This model also difficult to test empirically due to unavailability of the variables in the survey as well as the complexity of variables' measurement (McElroy, 1990).

To understand FLFP, theories about the demand for female labour force participation also need to be considered. Theories about the demand for female labour assume i) there is gender segregation in the labour market, where some jobs are mostly performed by women, ii) female jobs evolve over time, which is associated with technological change, iii) this variation determines the relative autonomy of women in politics, economics, and ideological outcomes (Cotter et al., 1998). Moreover, pointing to the example of the United States of America (U.S.A), Blumberg (1984) argues that most of the time it is demand that leads women to participate in the labour market rather than supply. Chafetz (1984 cited in Cotter et al. 1998) argues that women's participation is higher in the sectors where their work is not replaceable.

The structural approach based on Modernization theory can also help to understand FLFP. According to this approach, economic development is likely to reduce the gender gap in the labour market. Because of increased educational attainment, a decline in fertility rates, and technological changes, women's labour force participation has increased (England and Farkas, 1986; Goldin, 1990; Jackson, 1998). According to this theory, there is a U-shaped[5] relationship between economic development and female labour force participation (Boserup, 1970; Goldin, 1990 and 1994). The argument explains that in less developed economies, women's participation is high especially in agricultural work and family farms. It explains that when society starts to develop, the economy moves more towards industry where there is less job opportunity for women (along with the development of cultural and social restrictions that inhibit women from seeking

[5] According to U hypothesis, at lower level of GDP per capita, women are engaged in family owned unpaid work. Over the time with economic development, manufacturing sectors start to grow thus many options get available for women to work as paid workers in these sectors but they face social barriers. In the process of economic development more opportunities are opened up for women for higher education, and eventually they start securing positions in service sectors. This accelerates female labour force participation. The declining portion of U is dominated by income effect through the reduction of the relative price of home produced goods and by decrease in the demand for female labour in agriculture. Even with higher wages in manufacturing sector, women labour participation will be low due to social barrier. The rising portion of U is explained by substitution effect. Given, income remains constant women get broader access to higher education, and new technologies and they are offered better positions in service sector. This substitution effect is stronger than income effect that induces women to join labour force (Husain, 2016; Goldin, 1994; Gaddis and Klasen, 2014).

employment outside the home). More economic development would enable increased female labour force participation with the increased availability of new jobs, because of societal changes in the attitudes towards women, education attainment levels, and the fertility rates would decline along with development (Boserup, 1970; Gaddis and Klasen, 2014; Goldin, 2006). However, Hakim (2000) explains that increasing education and reducing the fertility rates are not always associated with an increase in FLFP, as evidenced by experiences in the Middle East and North Africa (MENA).

The institution approach helps to understand the role of the welfare state in changing FLFP (Kremer, 2007). Here, the state is considered to be a very important actor by providing different facilities which lead (encourage or help) women to participate in the labour force. For example, the state can create public sector jobs just for women, provide facilities like childcare, which make it possible for women to combine child-rearing and employment. Similarly state can provide old age homes, remove the caring burden of the elderly from women, enforce employment protection legislation, maternal and paternal leave, and support part time employment for women (Del Boca et al., 2008; Dieckhoff et al., 2015; Iversen et al., 2005). However, comparison studies might be difficult because the quality or the facility of the state (and therefore its ability to facilitate women's labour force participation) will vary from country to country (Lalive and Zweimüller, 2009). Most importantly, this approach ignores the ability of cultural factors to influence the state's role or that of other institutions (Hakim, 2000; Pfau-Effinger, 2000 cited in Heyne 2017).

The cultural approach to understanding labour supply recognizes that culture can have a profound effect on FLFP (Pfau-Effinger 2000 cited in Heyne 2017). This approach considers effects of social values and norms on FLFP. According to this approach, low female participation is associated with social norms that affect attitudes toward gender roles. For example, in some cultures women are not allowed to work (Steiber and Haas, 2009). Attitudes and religion are used measurement of culture (Pfau-Effinger 2000 cited in Heyne 2017).

Besides, heterodox feminist economist argues that gender equality can have a positive impact on economic growth not vice versa (Kabeer, 2016; Kabeer and Natali, 2013). The policy should be focused on reducing gender inequality rather than oriented to growth. Kabeer (2016) identified "gender-ascribed constraints" and "geography of gender" to explain FLFP. Here, "gender-ascribed

constraints" are cultural norms, belief, and value. In male dominated society, primary bread earning responsibility goes to men, and unpaid reproductive family work to women hence the gender gap in the labour market in the society. "Geography of gender" describes that there is a regional pattern in FLFP due to similar cultural norms, belief, and value. For example, there is female farming system in developing world like in sub-Saharan Africa, Southeast Asia, and parts of Latin America where most of the women are engage in unpaid reproductive labour at the same time own farms so their participation rate goes higher than average world participation. On the other hand, male farming system have been observed in MENA region and much of South Asia hence lower FLFP because women are responsible for unpaid domestic work and much restriction for their mobility in public. Hence, to diminish "gender-ascribed constraints" and "geography of gender", Kabeer (2016) advocated for the gender equality policy which can contribute more directly to economic growth through their productive activities.

## 2.2 International Empirical Studies on the Correlates of Female Labour Force Participation (FLFP)

In many countries, FLFP has started to increase with World War II due to high demand for labour and it gained increased momentum in the 1970s and 1980s because of the feminist movement (Joseph, 1983). After World War II, women's participation in the labour market increased significantly especially in the United Kingdom (UK) and U.S.A (Oppenheimer, 1967), due to the high demand for labour for reconstruction after the war. In the UK, the female working population increased from 31 percent in 1951 to 37 percent in 1971, and in the U.S.A, the participation rate increased to 41.6 percent in 1968 from 32.7 percent in 1948 (Joseph, 1983). Moreover, women's labour force participation increased in other industrialized countries, including in Australia, Britain, France, Germany, Israel, Italy, Japan, the Netherlands, Spain, Sweden, the U.S.A and Russia, between 1960 and 1980 (Mincer, 1985).

Kalsen and Pieters (2015) highlight the importance of demand-side factors in explaining changing female labour force participation in urban India. The study shows the importance of the different economic sectors in influencing FLFP. For example, female labour participation in India declines as agriculture and manufacturing sectors decrease as a percentage of GDP, because these sectors tend to employ more women. Moreover, if the private sector is not able to create jobs then the increase in female labour supply may be associated with an increase in female unemployment, as

Casale's (2003) study of South Africa highlights. A study of the MENA region shows how, when firms have low turnover and slow productivity growth, they limit or reduce their employment, which affects female labour force participation (Morikawa, 2015).

Over the decades, several supply-side factors have also been found to contribute to increasing FLFP. A key factor is the increase in educational levels. Female education enhances skills, changes attitudes towards marriage and children, and alters women's preferences in favor of market over non-market work (Lewis and Peterson, 1997). For example, Hussain et al. (2012) found that in Pakistan, women with education of a bachelor or master's degree or higher are significantly more likely than less educated women to participate in paid employment. Another study on Fiji found that educated women can fight against social and cultural norms thus to increase their participation in labour market (Naidu, 2016). Considering 141 countries data, Lincove (2008) concluded that women education positively contribute to labour market productivity.

Declining fertility rates have also been significantly associated with increases in the FLFP rate. Child-caring is very time intensive household activity, so declining birth rates reduce the demands on women's non-market time in the household and reduce their comparative advantage in household production (McConnell and Brue, 1995; Mincer, 1985). A study of G7 countries shows an inverse relationship between the fertility rates and the FLFP rate. According to Mishra et al. (2010), a 1 percent increase in the total fertility rates results in a 0.4 percent decrease in the FLFP rate.

Changes in cultural and social attitudes towards women are also crucial factors associated with an increase in women's participation in the labour market. Attitudinal changes have brought women into the labour market in the U.S.A and Britain (Lewis and Peterson, 1997) where women in the labour market were not common in the 1920s and 1930s (McConnell and Brue, 1995). Sidani (2013) pointed out the importance of social and cultural dimensions across 59 nations. Due to the difference in social attitudes between rural and urban areas, the FLFP rates between these areas also differs. Fortin (2005) found a significant relationship between social attitudes and female employment when analyzing 25 OECD (The Organisation for Economic Co-operation and Development) countries. Antecol (2003), using International Social Survey Program (ISSP) data for 23 countries which included European countries, Austraila, Canada, Japan and others, found

that women are more likely to participate in the labour force in places where men have positive and favorable attitudes towards women. Many authors consider religion to be an important indicator of culture and explore the relationship between religion and FLFP (Bayanpourtehrani and Sylwester, 2013; H'madoun, 2010). Bayanpourtehrani and Sylwester, (2013) found a negative relationship between Islam and female labour market. By analyzing the MENA region, and South Asia, they showed how Muslim women are less likely to participate in the labour market. Heyne, (2017) also reached a similar conclusion about the MENA region, where the study found that religion, traditional gender roles, and patriarchal structure are the key correlates of FLFP.

An increasing divorce rate is also argued to be associated with women's decisions to participate in the labour market. According to this argument, divorced women have little access to non-labour income, and the absence of support from their ex-husbands prompts them to participate in the labour market (McConnell and Brue, 1995). A time series analysis from 1960 to 2001 in the U.S.A shows that divorced women are more likely to participate in the labour market than married women (Bremmer and Kesselring, 2004).

Institutions and the state have also been found to play important roles in increasing female labour force especially in developed welfare countries (Jaumotte, 2003; Thévenon, 2013). A panel analysis of 17 OECD countries from 1985 to 1999 found that there is a positive relationship between FLFP in the labour market and different policy instruments such as tax incentives, maternity and parental leave, childcare subsidies, child benefits as well as part time job opportunity for women (Jaumotte, 2003). Ruhm (1998) also found similar results for the relationship between parental leave and increasing FLFP, when analyzing nine OECD countries.

### 2.3 Bangladesh Studies of Female Labour Force Participation (FLFP)

The literature on FLFP in Bangladesh, where female participation is low, highlights similar factors and correlates as the literature from other countries.

Social structures and norms are important factors for women in the patriarchal society of Bangladesh. Sarkar (2015) argues that patriarchal rules and norms favor men and disadvantage women. Norms dictate that it is the man's responsibility to support their families financially, while the woman's responsibility is to maintain the household. Patriarchal norms limit women's economic and educational activities in the name of prejudice of "Purdah" (Purdah is a Bangla word

for female exclusion or veil). Moreover, gendered norms concerning women suggest that women should carry out household responsibilities (Sarkar, 2015). Kabeer (2012) also adds that the women's participation in the labour market is often not her own decision. Due to strong patriarchy in the Bangladeshi society, the male members of the family usually dictate or guide such a decision.

Shamsuddin (2015) demonstrates the importance of education in increasing female labour participation. He illustrates that Bangladesh's female secondary education stipend program (one of the cash transfer to promote female education) had an impact on earnings and FLFP. Results suggest that due to the program, women's average years spent in education have increased by 0.36–1.08 years. It has also increased FLFP by about 2.2–6.6 percentage points. However, it decreased earnings by 5.8–17%, as the surplus of secondary-educated females failed to find productive employment and excess labour supply pushed down wages. The study also found that education was associated with the type of employment that women accessed. One additional year of schooling for girls increased their likelihood of working in the service industry and decreased their likelihood of working in manufacturing. Most self-employment among women in Bangladesh involves running a poultry farm, working in a tailoring shop or cultivating one's own land. These kinds of employment opportunities require very little education, and estimations suggest that fewer women are self-employed as their education level increases. Women who are beneficiaries of the government's stipend were also found to enter the labour force, but they faced difficulties in finding a productive job, and as a result they had to move into self-employment that give lower returns to their education (Shamsuddin, 2015).

Household income is also a key factor associated with women's participation in the labour force in Bangladesh. According to Bridges et al. (2011), women from extremely poor households have a significantly higher probability of participating compared to women from non-poor households. Mahmud (1997) also found that female participation is highest in the poorest households and that participation declines as household income rises in Bangladesh. In contrast to the predictions that increasing wages would be negatively associated with fertility levels, Groesbeck and Israelsen (1994) found that higher wages increased the potential for a woman to have an additional child, hence decreasing female labour force participation.

Increases in the demand for female labour has been one of the biggest factors which helps to increase the FLFP. Bridges et al. (2011) argue that the recent large growth in female employment in Bangladesh is a result of the export-led expansion of the ready-made garments (RMG) industry in the urban centers of Dhaka and Chittagong in the 1980s and 1990s. Moreover, the RMG industry plays an important role in reducing poverty in both rural and urban areas, as many of those in the labour force are women who migrated from rural households (Rushidan and Islam, 2013).

The validity of a U-shaped relationship between female labour force participation and economic growth for Bangladesh over the period 1991 -2012 is supported by Husain (2016). The study also finds that women are becoming more economically active in the manufacturing sector. The expansion in the services sector is also positively and significantly correlated with female labour force participation. This result indicates that women are getting absorbed in both the private and public sectors. They are employed as sales workers, and in administrative positions, as well as working as independent small entrepreneurs. This might be the result of advancement in education beyond secondary level and the overall change in social norms or attitudes. Husain (2016) also found the positive correlation between FLFP and agriculture, indicating female labour force is still actively participating in rural agriculture. This is possibly because of their active involvement in the non-crop agricultural sector as a result of microfinance by non-government organizations such as Bangladesh Rural Advancement Committee (BRAC) and the Grameen Bank. Due to the availability of microcredit, there are many small and medium size enterprises that are run by women, which also increase female employment (Rumke, 2014). The precisely determined coefficients of industry and service sector's value added could explain the rising portion of the U shaped labour supply function of women in Bangladesh though their estimation results have not got any substantial evidence of structural transformation.

There are also a number of factors which have been found to act as constraints to FLFP in Bangladesh. These include limited access to formal education in rural areas and the lack of appropriate skills and trainings, as well as the non-availability of childcare provisions, women's household and family responsibilities, inadequate social protection, wage discrimination, regulatory constraints, and unsuitable working conditions, all of which discourage or prevent women from participating in the labour market (Romke, 2014). Marriage also has a negative effect on participation in the labour market. Bridges et al. (2011) find that married women and/or women

living in households with dependents are significantly less likely to participate in the labour market. There is also a wage gap between men and women, which Ahmed and Maitr (2011 and 2015) analyzed using Oaxaca (1973) decomposition. There is also a wage gap between men and women which may also constrain for female labour force participation. Using the Oaxaca (1973) decomposition, Ahmed and Maitr (2011 and 2015) found that on average female employees are paid less compared to male employees and this the gap is greater at the lower end of the wage distribution compared to the upper end of the wage distribution.

The existing literature on Bangladesh FLFP has already indicated some of the associations of the female labour force participation, both on the demand-side (such as economic structure and employer benefits) and the supply-side (education, social morns and tradition, family and household structure). To the best of my knowledge, there have not been other studies which have decomposed the change in FLFP in recent years in Bangladesh using national microdata. Therefore, to contribute to the existing literature, this study will present an econometric analysis which explores the supply-side correlates of changes in FLFP, and which decomposes the increase in FLFP over time. Due to data inaccessibility, the decomposition analysis will focus on the period 2005 to 2010, which was when women's labour force participation in Bangladesh increased by 6.8 percentage points. Details about the decomposition analysis and econometric technique will be explained in Chapter Four. The microdata which are analysed include little information on demand-side factors, and the role of these factors is only be explored descriptively in the next chapter.

## Chapter Three: Descriptive Analysis of the Correlates of Female Labour Force Participation in Bangladesh

The main objective of this chapter is to describe patterns and trends in FLFP, highlighting both demand- and supply-side factors. The chapter will first provide an overview of the data. Next, it will describe overall trends in FLFP. It will detail some demand-side factors to see if these are correlated with an increasing demand for female labour. Then the chapter will consider supply-side factors that may be expected to be correlated with FLFP.

### 3.1 Data

The data for the study come from the Labour Force Survey (LFS) of 2005 and 2010. The LFS data are government official data which are collected by the government statistics office, Bangladesh Bureau of Statistics. The government conducts the LFS periodically, every 3 or 5 years. Data are collected from individuals and the households in which they live across the country in urban and rural areas. The 2005 LFS sampled 40 000 households (representing 188 487 individuals), of which 25 600 are in rural areas, and 14 400 in urban areas. In the 2010 LFS, 43 945 households (representing 199 704 individuals) were sampled of which 9 325 were in urban areas and 34 620 in rural areas. The dataset also includes weights and all the calculations have been weighted to represent national statistics.

In the survey, labour force participants are defined as persons aged 15 years or above, who are either employed or unemployed during the reference period of the survey, which is the preceding week of the day of the interview. Labour force participants exclude disabled and retired persons, housewives, full-time students, beggars and other persons who did not work for pay or profit for at least one hour during the reference week (Bangladesh Bureau of Statistics, 2011).

The unemployed are defined as adults aged 15 years and over who were actively looking to work or did not work due to temporary illness or because there was no work available at the time of the survey week, along with those did not work at all during the survey week (Bangladesh Bureau of Statistics, 2011).

The survey includes the following information:

- Characteristics of the population, including gender, age, marital status, locality (areas of living) and religion.
- Household information including household size, households' head, and household's asset.
- Detailed information on education and training, such as literacy, educational attainment, and vocational training.
- Economic activities of the labour force, sector of employment, place of the work, hours of work and income.

The data also have some limitations which in turn limit my empirical analysis. In particular, the 2010 survey includes more variables than the 2005 survey. For example, the survey in 2005 did not capture the information of employment benefits (paid leave, maternity leave), but the survey in 2010 captured. The 2005 survey did not separate formal and informal work whereas the 2010 survey included a separate module for informal work (Asian Development Bank, 2012). Therefore, the analysis could not separate female participation according to women's involvement in formal and informal work. Moreover, data such as if women have children or not (thus this study is considered number of children (younger than 15) in a household), and migration are also missing.

The empirical study of FLFP has two endogeneity problems which are difficult to control. Firstly, there is the problem of unobservable characteristics, which cannot be controlled for when estimating the correlates of FLFP. If these characteristics are correlated with the observable covariates and with FLFP, this will produce bias in the estimated coefficients. For example, there may be a positive coefficient for education in the relationship with FLFP, but it is possible that part of the education effect reflects the effects of unobservable characteristics of women that are correlated with education (such as ambition, discipline, and talent) and with their likelihood of participating in the labour market. In this case, the relationship between education and FLFP will be overestimated.

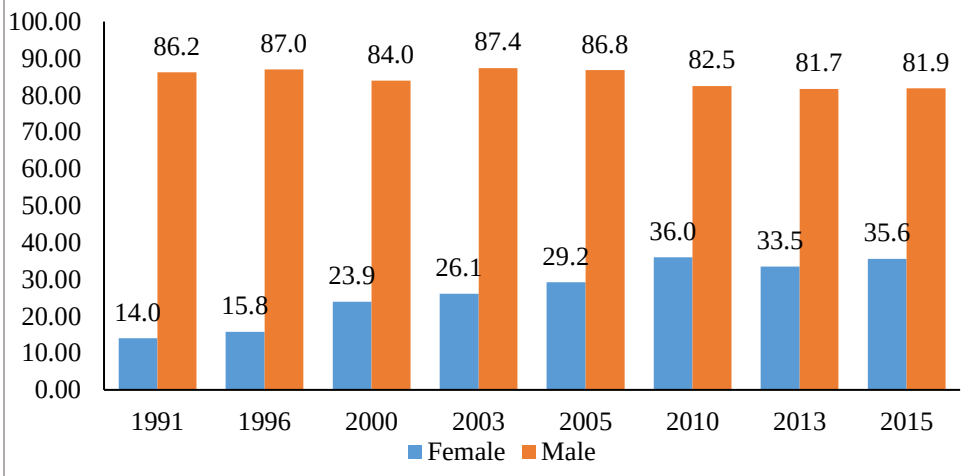
Second, there is a problem of reverse causality. For example, the estimations assume that increasing education leads to women's labour force participation. However, it may also be that women's labour force participation leads to their education because when women have employment, they can afford to study further. This endogeneity would also produce biased coefficients.

Given these problems of endogeneity, the relationships between the explanatory variables and FLFP should be interpreted only as correlations or associations, and not as causal relationships.

### 3.2 Trends in Female Labour Force Participation

As discussed earlier in Chapter One, women's vulnerable social status is one of the obstructions for women to participate in the labour market. Looking at the historical data of labour force participation rates published by the Bangladesh Bureau of Statistics, the participation gap between men and women was very large in earlier periods. Gradually, this gap has been narrowing as more women have been entering the labour market since 2000. However, women's participation rate is still very low compared to men (Figure 3.1).

**Figure 3. 1: Bangladesh labour force participation rates (%)**

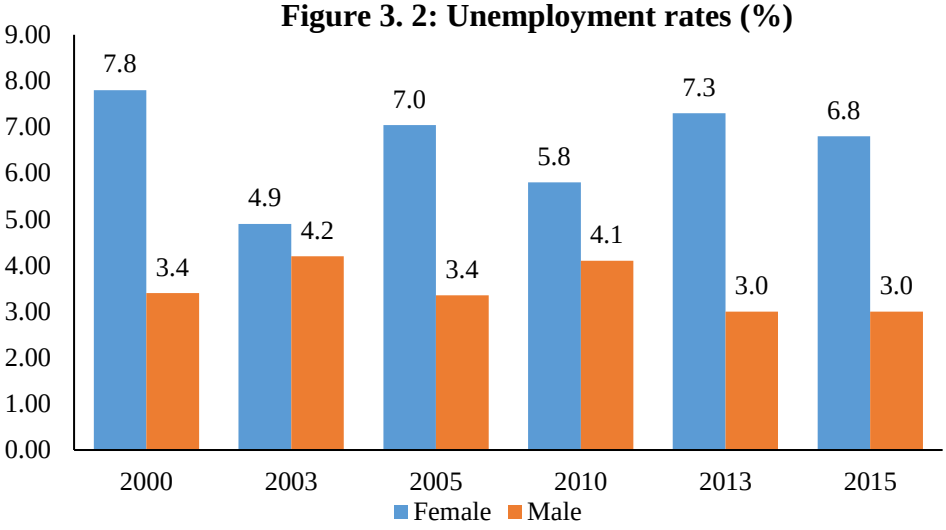



Source: Bangladesh Bureau of Statistics-LFS data (Author's presentation)

Labour force participants include both the employed and the unemployed. Although women are less likely than men to participate in the labour market, the unemployment rates is higher among women compared to men in each year (Figure 3.2). In spite of this fact, female unemployment rate declined to 5.8 percent in 2010 from 7.0 percent in 2005. Interestingly, as female unemployment rates fell so the FLFP rate increased (it increased by 6.8 percentage point in 2010 from 2005) (the differences in women's participation for urban and rural areas will discussed in later of this chapter). This suggests that women are more likely to seek work if the demand for female labour

increases. Hence, it is important to see demand-side factors of the FLFP alongside supply-side factors.

**Figure 3. 2: Unemployment rates (%)**




Source: Bangladesh Bureau of Statistics-LFS data (Author's presentation)

### 3.3 Demand-Side Dynamics

This section of the chapter will attempt to look at the demand-side factors that may influence female labour force participation. By looking at this, I will try to see whether the structure of the economy has influenced the demand for female labour, and how the demand-side is responding to an increasing FLFP. The demand-side analysis will discuss changes in demand-side factors that may influence women's labour force participation, such as changes in employment in agriculture, manufacturing, and the services sector.

As mentioned in Chapter One, Bangladesh's economy is growing with 6 plus percent Gross Domestic Product (GDP) growth in near and medium-term. The growth is driven mainly by exports, which are mostly dominated by the manufacturing sector (see Table 3.1). Indeed in FY2016, 96 percent of total exports came from the manufactured goods. The economy is also shifting to the manufacturing sector and service sector from agriculture. For example, in FY1995 agriculture was 25.1 percentage of GDP, however, in FY2016, the share of agriculture in GDP declined to 14.8 percent. In contrast, the share of manufacturing and services increased to 17.9 percent and 56.5 percent of GDP respectively in FY2016 from 14.6 percent and 52.3 percent of GDP respectively in FY1995. This shift is very drastic especially after FY2000, the year when

female unemployment also started to fall. This may signal that women are employed in these manufacturing and service sectors. There is a positive correlation between FLFP and growth from 1991 to 2015 (0.85)[6] (own calculations). Here, it is possible that the relationship between growth and FLFP runs in both directions: growth increases FLFP and increasing FLFP contributes to economic growth. A study "FLFP in Bangladesh: Trends, Drivers, and Barriers" by the ILO, estimated the elasticity of employment with respect to economic growth. The results show that women have more access to jobs during the process of economic diversification in the different sectors of the economy, such as manufacturing, construction, and service (Rahman and Islam, 2013).

**Table 3. 1: Overview of economic structure**

| | FY 95 (1994-1995) | FY 00 (1999-2000) | FY 05 (2004-2005) | FY 10 (2009-2010) | FY 15 (2014-2015) | FY 16 (2015-2016) |
|---|---|---|---|---|---|---|
| GDP Growth | **5.1** | **5.3** | **6.5** | **5.6** | **6.6** | **7.1** |
| | | | % of GDP | | | |
| Agriculture | 25.1 | 23.8 | 19.6 | 17.8 | 15.5 | 14.8 |
| Industry | 22.6 | 23.3 | 24.6 | 26.1 | 28.1 | 28.8 |
| o/w Manufacture | 14.6 | 14.7 | 15.6 | 16.9 | 17.6 | 17.9 |
| Services | 52.3 | 52.9 | 55.8 | 56.0 | 56.3 | 56.5 |
| Export (US$ billion) | 3.5 | 5.8 | 8.7 | 16.2 | 31.2 | 34.3 |
| | | | % of total exports | | | |
| Manufacture | 70.1 | 92.4 | 94.0 | 95.8 | 95.9 | 96.3 |
| o/w RMG | 75.6 | 81.5 | 78.9 | 80.5 | 85.2 | 85.2 |

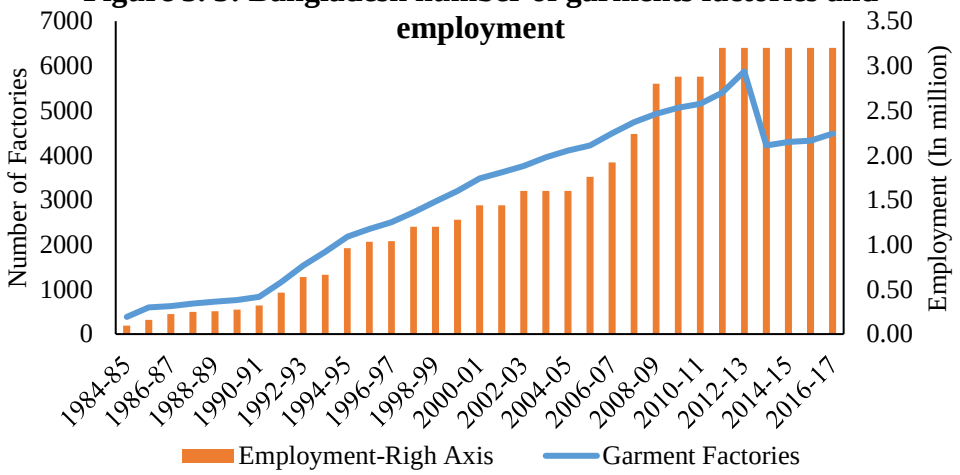
Source: Bangladesh Bureau of Statistics-National Accounts Data; Export Promotion Bureau
o/w: of which

The growth of the garments industry in Bangladesh (shown in Figure 3.3) is likely to be particularly important in explaining the increasing FLFP rate, as this is an industry which is more likely to employ women. According to The Bangladesh Garment Manufacturers and Exporters Association (BGMEA), 80 percent of those employed in the garments sector are women (BGMEA, 2011), which is 3.2 million women in 2017 (BGMEA, 2017). However, this represents only 16.8 percent of female employment of all women in the labour force and 6 percent of the total working-age female population (15 and above). BGMEA data also showed that country started with 384 factories in FY1985 and this increased to 4482 factories in FY2017, while the number employed

[6] To calculate correlation, long time series are not available especially for labour force participation. Therefore only data point, 1991, 1996, 2000, 2003, 2005, 2010, 2013, and 2015 have been considered.

increased to 4 million from 0.12 million. From the year 2005 to 2010, the number employed increased dramatically from 2 million to 3.6 million (BGMEA, 2017). This is also the period when the FLFP rate also increased considerably, by 6.8 percentage points. The number of factories increased over the years until 2013, but then there is a reduction after 2013 due to the collapse of Rana Plaza[7] in 2013. For instance, the number of factories decreased to 4222 from 5876 in 2014. After the collapse, only 260 new garment factories were recorded in 2017. Hence, the number employed in this sector remained constant after 2013. The decline in the number of garment factories tracks the decline in women's employment in garment sector from 2013 to 2015 (Figure 3.3).

**Figure 3. 3: Bangladesh number of garments factories and employment**



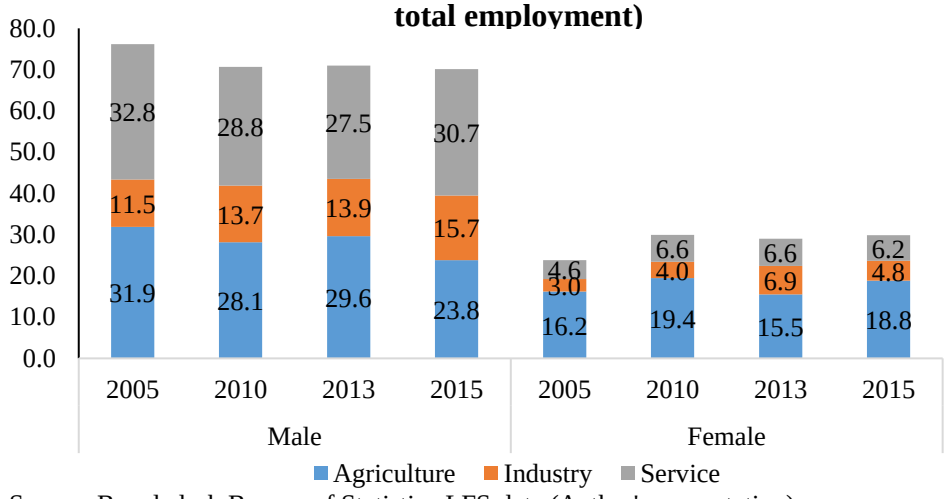

Source: Data from Bangladesh Garment Manufacturers and Exporters Association (BGMEA, 2017) (Author's presentation)

Sector-wise employment segregation shows that female employment in the industry (especially manufacturing) and service sectors increased from 2010 at the same time as employment decreased in agriculture especially until 2013 (Figure 3.4). For example, female employment in industry accounted for 6.9 percent of total female employment in 2013, up from 3.0 percent in 2005. Female employment in the service sector, as a share of total female employment, increased to 6.6 percent in 2013 from 4.6 percent in 2005. At the same time, female employment in the agriculture (as a percentage of total female employment) decreased to 15.5 percent in 2013 from 16.2 percent in

[7] An eight-storey commercial building collapsed on 24th April 2013. This building was used by numerous garment factories working for 39 various major international brands. The collapse resulted in the death of 1132 workers and injured 2438 workers while 332 workers went missing (Lund-Thomsen and Lindgreen, 2013; Central for Policy Dialogue, 2013).

2005. This suggests that increasing female participation is associated with the economy's shifting from agriculture to service and industry. After the Rana Plaza incident, the share of female employment in industry decreased from 6.9 percent to 4.8 percent, while the share in agriculture increased markedly, from 15.5 percent to 18.8 percent. The importance of the garments sector to female employment in particular can be seen when comparing female and male employment in the industry sector. For example, after Rana Plaza collapse, the percentage of female employment in industry decreased but the share of male employment did not decrease. This is because men are employed in other sub-sectors of industry rather than garments, whereas women are concentrated in garments.

**Figure 3. 4: Sector-wise employment by gender (% of total employment)**




Source: Bangladesh Bureau of Statistics-LFS data (Author's presentation)

Another important emerging sector, where employment is increasing both for men and women, is the service sector. Service sector jobs include financial intermediations (bank, insurance), real estate activities, public administration, education, health, community and social work. These jobs typically require higher education and skills than jobs in industry and agriculture. There is a 10 percent quota for women in total employment of Bangladesh Civil Service (BCS) which is considered as the pathway to enter high-status government decision making jobs (Ministry of Public Administration, 2010). However, in the private or corporate sector there is no quota for women.

Table 3.2 describes FLFP according to type of employment. The table shows that more than 50 percent of employed women are involved in unpaid family work (e.g. family firms, agriculture,

forestry, and fisheries). This might be one of the reasons for high female participation in agriculture even though this sector is not expanding. However, the share of women in unpaid family work decreased by 2.6 percentage points in 2010 from 2005 (from 55.9 percent to 53.3 percent). This is because the share of women in self-employment increased due to availability of micro-credit for women (Rumkey, 2014). Interestingly, the share of women employed in regular paid jobs decreased to 8.4 percent in 2010 from 10.9 percent in 2005, although the number of women employed in regular paid jobs increased by over 100 000 women.

**Table 3. 2: FLFP according to employment status**

| | 2005 | 2010 |
|---|---|---|
| | Millions of women | |
| Regular paid employee | 1.32 | 1.44 |
| Employer | 0.01 | 0.03 |
| Self-employer | 1.79 | 4.07 |
| Unpaid family worker | 6.78 | 9.12 |
| Irregular paid worker | 0.16 | 0.30 |
| Day labour (agriculture) | 0.28 | 0.40 |
| Day labour (non-agriculture) | 0.45 | 0.45 |
| Domestic Worker | 0.26 | 0.41 |
| | % of total FLFP | |
| Regular paid employee | 10.86 | 8.41 |
| Employer | 0.11 | 0.18 |
| Self-employer | 14.75 | 23.81 |
| Unpaid family worker | 55.89 | 53.28 |
| Irregular paid worker | 1.35 | 1.73 |
| Day labour (agriculture) | 2.30 | 2.34 |
| Day labour (non-agriculture) | 3.71 | 2.63 |
| Domestic Worker | 2.18 | 2.39 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: The statistics may not all up to 100 percent for all columns because of rounding

Hence, the demand-side analysis shows garment sector is one of the sectors in Bangladesh's economy that can employ women with less education, but it can only just capture about 16.8 percent of the total number of women labour force and 6 percent of total working age female (15 or above). However, even if the garments sector were only to employ women (hypothetically), this would still represent only 20.9 percent of total female labour force participation, and 7.4 percent of the total working-age female population in FY2016. This shows that in order to increase female labour force participation in the future women will have to find employment in other sectors of the economy. The service sector is increasing and has huge potential, but if women seek employment in this sector, they are required to have more education and other skills. Therefore, the dissertation

will now consider possible supply-side factors which may also help to explain changes in female labour force participation in Bangladesh.

### 3.4 Supply-Side Characteristics

The individual supply-side characteristics that will be described in this part of the chapter include a woman's age and education, any prior training, her marital status and the number of children in the household, whether a woman is the head of household and her religious status. The household characteristics include household composition, household location (rural or urban, and according to divisions-geographically the country is divided in eight divisions), and household income (excluding the income earned by women who are employed).

#### 3.4.1 The Role of Education

Many studies support the importance of education in increasing female labour force participation (Becker, 1974; Lewis and Peterson, 1997), including studies from developing countries. Education changes individual attitudes to women working (among both women and men) and helps to make women's employment more acceptable in society (Hussain et al., 2012; Shamsuddin, 2015). In Bangladesh, female educational attainment increased considerably from 1991 to 2015. Table 3.3 shows that over the years, the ratio of girls to boys increased particularly in secondary education. This follows the provision by the government of free education, books, and a stipend for girls until secondary level (General Economics Division, 2015).

**Table 3. 3: The ratio of girls to boys by education level**

| | 1990/91 | 2015 | % Change |
|---|---|---|---|
| Ratio of girls to boys in primary education | 0.8 | 1 | 15.7 |
| Ratio of girls to boys in secondary education | 0.5 | 1.1 | 119.2 |
| Ratio of girls to boys in tertiary education | 0.4 | 0.7 | 75.7 |

Source: General Economics Division, (2016)

**Table 3. 4: Educational attainment of women –15 years or above**

| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Rural | Urban | Total | Rural | Urban | Total |
| | Millions of women | | | | | |
| No education | 15.75 | 3.40 | 19.14 | 17.62 | 3.58 | 21.20 |
| Class I-V | 7.01 | 2.09 | 9.11 | 7.44 | 2.51 | 9.95 |
| Class VI-VII | 3.80 | 1.28 | 5.08 | 4.59 | 1.77 | 6.36 |
| Class IX-X | 2.36 | 0.95 | 3.31 | 3.57 | 1.39 | 4.96 |
| S.S.C/equivalent | 1.55 | 1.26 | 2.81 | 1.78 | 1.04 | 2.83 |
| H.S.C/equivalent | 0.48 | 0.75 | 1.23 | 0.94 | 0.96 | 1.90 |
| Degree/equivalent | 0.17 | 0.38 | 0.55 | 0.09 | 0.11 | 0.20 |
| Master's/equivalent | 0.04 | 0.24 | 0.28 | 0.08 | 0.20 | 0.29 |
| Engineering/medical | 0.01 | 0.02 | 0.03 | 0.01 | 0.02 | 0.03 |
| Technical/vocational | 0.02 | 0.01 | 0.03 | 0.01 | 0.00 | 0.01 |
| Others | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| | % of population | | | | | |
| No education | 50.49 | 32.70 | 46.04 | 48.74 | 30.83 | 44.39 |
| Class I-V | 22.49 | 20.12 | 21.90 | 20.59 | 21.63 | 20.84 |
| Class VI-VII | 12.19 | 12.27 | 12.21 | 12.71 | 15.26 | 13.32 |
| Class IX-X | 7.56 | 9.16 | 7.96 | 9.88 | 11.99 | 10.39 |
| S.S.C/equivalent | 4.96 | 12.11 | 6.75 | 4.94 | 8.99 | 5.92 |
| H.S.C/equivalent | 1.53 | 7.26 | 2.96 | 2.61 | 8.29 | 3.99 |
| Degree/equivalent | 0.55 | 3.64 | 1.32 | 0.25 | 0.95 | 0.42 |
| Master's/equivalent | 0.13 | 2.31 | 0.68 | 0.23 | 1.75 | 0.60 |
| Engineering/medical | 0.03 | 0.23 | 0.08 | 0.02 | 0.21 | 0.06 |
| Technical/vocational | 0.07 | 0.11 | 0.08 | 0.02 | 0.04 | 0.03 |
| Others | 0.01 | 0.09 | 0.03 | 0.02 | 0.06 | 0.03 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: The statistics may not all up to 100 percent for all columns because of rounding
S.S.C: Secondary School Certificate
H.S.C: Higher Secondary Certificate

Overall female educational attainment of primary, secondary, and higher secondary increased as the government introduced many initiatives to achieve the millennium development goals. However, it has not consistently increased overall for higher levels of education – undergraduate or master's degree, engineering, medical and technical or vocational education (Table 3.4). In addition, while educational attainment increased among women in both rural and urban areas, women in urban areas have more education than women in rural areas

Among female labour force participants specifically, the number and share of women with primary and secondary education increased (Table 3.5). However, this was not the case for post-secondary

education. Moreover, the number and share of all female participants with different levels of education increased from 2005 to 2010. This suggests that the rising FLFP could not have been driven (only) by rising levels of education among women.

**Table 3. 5: Share of the labour force with various levels of education (15 years or older)**

| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Rural | Urban | Total | Rural | Urban | Total |
| | Millions of women | | | | | |
| No education | 5.04 | 1.13 | 6.17 | 5.79 | 1.17 | 6.97 |
| Class I-V | 2.17 | 0.61 | 2.78 | 2.93 | 0.95 | 3.88 |
| Class VI-VII | 0.99 | 0.31 | 1.30 | 1.97 | 0.65 | 2.62 |
| Class IX-X | 0.50 | 0.16 | 0.66 | 1.38 | 0.43 | 1.80 |
| S.S.C/equivalent | 0.34 | 0.22 | 0.56 | 0.63 | 0.32 | 0.95 |
| H.S.C/equivalent | 0.13 | 0.15 | 0.28 | 0.27 | 0.23 | 0.51 |
| Degree/equivalent | 0.09 | 0.14 | 0.22 | 0.09 | 0.11 | 0.20 |
| Master's/equivalent | 0.02 | 0.10 | 0.12 | 0.04 | 0.10 | 0.14 |
| Engineering/medical | 0.00 | 0.02 | 0.02 | 0.00 | 0.02 | 0.02 |
| Technical/vocational | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 |
| Others | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 |
| | % of FLFP | | | | | |
| No education | 54.26 | 39.76 | 50.86 | 44.14 | 29.44 | 40.72 |
| Class I-V | 23.35 | 21.34 | 22.88 | 22.32 | 23.92 | 22.69 |
| Class VI-VII | 10.71 | 10.73 | 10.72 | 15.02 | 16.29 | 15.32 |
| Class IX-X | 5.40 | 5.63 | 5.45 | 10.49 | 10.68 | 10.54 |
| S.S.C/equivalent | 3.65 | 7.76 | 4.61 | 4.83 | 7.99 | 5.57 |
| H.S.C/equivalent | 1.38 | 5.39 | 2.32 | 2.09 | 5.87 | 2.97 |
| Degree/equivalent | 0.92 | 4.75 | 1.82 | 0.70 | 2.77 | 1.18 |
| Master's/equivalent | 0.21 | 3.54 | 0.99 | 0.31 | 2.42 | 0.80 |
| Engineering/medical | 0.03 | 0.71 | 0.19 | 0.02 | 0.41 | 0.11 |
| Technical/vocational | 0.07 | 0.25 | 0.11 | 0.06 | 0.10 | 0.07 |
| Others | 0.02 | 0.14 | 0.05 | 0.02 | 0.10 | 0.04 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: The statistics may not all up to 100 percent for all columns because of rounding

The gap between educational attainment and labour force participation among women also fell from 2005 to 2010 but the gap is still very large (Table 3.6). More than 50 percent women in each level of education were not in labour force in 2010 with the exception of women with an undergraduate degree, and vocational or technical education (100% participation rate) and with medical and engineering degrees (34 percent of female doctor and engineers were not in the labour force in 2010). However, 51 percent of women with a master's degree were not labour force participants in 2010 (Table 3.6). This shows that even with high levels of education, women in

Bangladesh may not seek employment. Cultural approach and institutional approaches can help to explain why this is the case, for these statistics suggest that there is a problem of social attitudes towards female employment and a lack of government provision of childcare and others facilities that would help facilitate women's employment.

**Table 3. 6: Percentage of women by education who are not in labour force**

| | 2005 | 2010 |
|---|---|---|
| No education | 67.76 | 67.14 |
| Class I-V | 69.52 | 60.99 |
| Class VI-VII | 74.39 | 58.82 |
| Class IX-X | 80.03 | 63.66 |
| S.S.C/equivalent | 80.05 | 66.32 |
| H.S.C/equivalent | 77.09 | 73.35 |
| Degree/equivalent | 59.77 | 0.00 |
| Master's/equivalent | 57.24 | 51.92 |
| Engineering/medical | 31.12 | 34.33 |
| Technical/vocational | 58.48 | 0.00 |
| Others | 56.67 | 55.24 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

### 3.4.2 Technical Training

Besides education, technical skills also important to increase productivity both for men and women. Skills deficiencies or skills mismatch could be one of the important reasons for low female labour force participation (The World Bank, 2017b). If we look at Bangladesh's economy, it has been seen that most of the people who are in the labour force lack some form of technical training. Only 6.0 and 6.6 percent people had technical training in 2005 and 2010 respectively. From 2005 to 2010, the share of labour with training increased only by 0.6 percentage points from 6.0 percent to 6.6 percent. Generally, skills are acquired through in-service training which increased from 1.5 percent of all labour force participants in 2005 to 1.9 percent in 2010; this is followed by vocational or technical training holder, which increased by 0.3 percentage points in 2010 from 1.3 percent in 2005 (see Table 3.7). This increase is due to vocational institutions in the education system. Here, many people are holding others type of skills like motor mechanics, welding, foreign languages, and typing.

When comparing training by gender, the female labour force is found to lack training compared to the male labour force. For example, in 2005, 6.5 percent of male labour force participants had

training, compared to 4.3 percent of female labour force participants. The share increased for men to 7.6 percent but it decreased to 4.1 percent for female in 2010. Women mostly acquire skills in tailoring or garments sector, which can be one of the reasons for women's increasing participation in the garments sector.

**Table 3. 7: Percentage of trained labour force participants by gender –15 years or above**

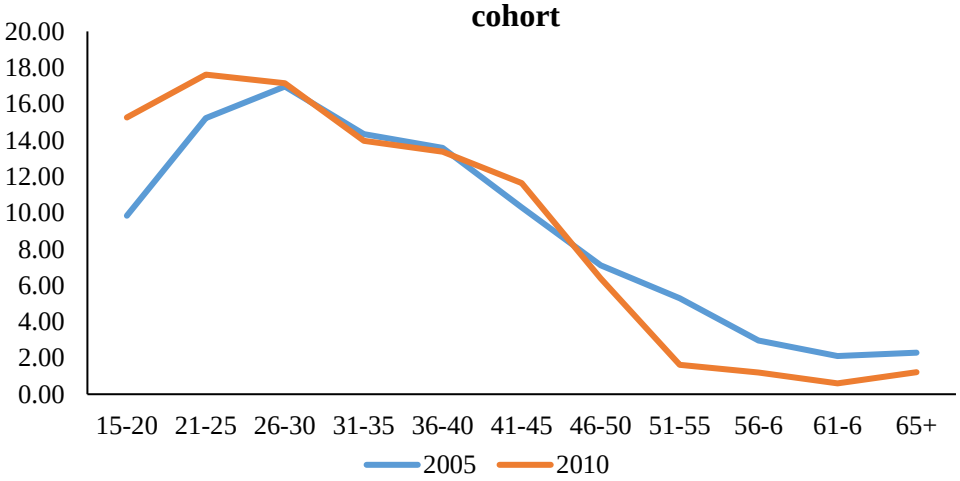
| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total |
| No Training | 93.47 | 95.66 | 94.01 | 92.36 | 95.88 | 93.42 |
| Vocational/Technical | 1.41 | 0.95 | 1.29 | 1.91 | 0.81 | 1.58 |
| Tailoring/Garments | 0.66 | 1.12 | 0.77 | 0.82 | 1.15 | 0.92 |
| In service Training | 1.60 | 1.20 | 1.50 | 2.23 | 1.07 | 1.88 |
| Nursing | 0.04 | 0.11 | 0.06 | 0.04 | 0.10 | 0.06 |
| Youth Development | 0.22 | 0.16 | 0.21 | 0.53 | 0.18 | 0.42 |
| Others | 2.59 | 0.80 | 2.15 | 2.12 | 0.82 | 1.73 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: The statistics may not all up to 100 percent for all columns because of rounding.

### 3.4.3 Age

Age is another important factor that may influence women's labour force participation. Women's participation rate declined among women when they reached 30 in 2005, and even earlier in 2010 (Figure 3.5). The fall in female labour force participation is likely to be because women are responsible for childcare in the home.

**Figure 3. 5: Female labour force participation rate by age cohort**




Source: Bangladesh Bureau of Statistics-LFS data (Author's presentation)

**Table 3. 8: FLFP by age cohort (%)**

| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Rural | Urban | Total | Rural | Urban | Total |
| 15-20 | 16.90 | 20.76 | 17.97 | 30.96 | 30.12 | 30.73 |
| 21-25 | 30.54 | 28.25 | 29.92 | 42.81 | 38.81 | 41.73 |
| 26-30 | 36.12 | 29.40 | 34.38 | 47.29 | 44.98 | 46.71 |
| 31-35 | 35.57 | 32.25 | 34.72 | 46.38 | 43.30 | 45.61 |
| 36-40 | 34.97 | 33.59 | 34.62 | 49.09 | 43.99 | 48.00 |
| 41-45 | 36.43 | 32.21 | 35.38 | 49.25 | 38.48 | 46.54 |
| 46-50 | 33.03 | 28.56 | 31.96 | 37.92 | 35.14 | 37.34 |
| 51-55 | 30.56 | 26.19 | 29.68 | 10.19 | 11.93 | 10.60 |
| 56-60 | 26.30 | 18.88 | 24.83 | 9.77 | 13.92 | 10.45 |
| 61-65 | 21.51 | 15.58 | 20.39 | 6.91 | 6.78 | 6.89 |
| 65+ | 15.01 | 11.78 | 14.45 | 8.74 | 6.49 | 8.31 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

Women's participation is higher in rural areas than urban areas for each age cohort in both 2005 and 2010, except for those between 15 to 20 years old in 2005 and 56 to 60 years old in 2010 who are still involved in agriculture (Table 3.8). In urban areas, most of the families are nuclear families, where either the husband or wife has to take care of the families and children exclusively, so once they leave their job they rarely return to their former occupation. In rural areas, women are involved in agriculture or others unpaid family jobs that still they can continue at their older age. Moreover, people live in joint family households in rural areas where other people in the household can take care of children. Over the years, female labour participation for the age cohort 15 to 50 increased from 2005 to 2010, but decrease for all other age cohorts.

### 3.4.4 Marital Status

Women's marital status is also likely to influence women's labour force participation decision. Usually divorced women are more likely to participate in the labour market than married women (Becker, 1974; Lewis and Peterson, 1997; Bridges et al., 2011). This is because married women typically rely on their husband's income, and unmarried women may rely on parents. Table 3.9 shows that among unmarried and married women, 20 percent and 30.4 percent were in the labour force in 2005 respectively and these percentages have increased to 26 percent and 39.3 percent respectively in 2010. However, participation is higher for divorced women. For example, more than 50 percent of divorced and separated women are in the labour force both in 2005 and 2010.

Participation rates for widowed women are lower because most of the women are widowed after age of 50 (Table 3.10), and at this age women's labour force participation is generally low.

**Table 3. 9: FLFP according to marital status**

| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Rural | Urban | Total | Rural | Urban | Total |
| | Millions of women | | | | | |
| Unmarried | 0.62 | 0.39 | 1.01 | 0.98 | 0.54 | 1.52 |
| Married | 7.39 | 2.11 | 9.50 | 11.24 | 3.13 | 14.37 |
| Widowed | 1.05 | 0.27 | 1.32 | 0.70 | 0.21 | 0.91 |
| Divorced | 0.14 | 0.05 | 0.19 | 0.12 | 0.04 | 0.16 |
| Separated | 0.08 | 0.02 | 0.10 | 0.09 | 0.06 | 0.15 |
| | % of women who are in the labour force according to marital status | | | | | |
| Unmarried | 18.46 | 23.17 | 20.02 | 24.91 | 28.92 | 26.21 |
| Married | 31.22 | 27.84 | 30.41 | 40.07 | 36.57 | 39.25 |
| Widowed | 28.34 | 26.64 | 27.97 | 18.53 | 20.97 | 19.05 |
| Divorced | 51.47 | 66.31 | 54.91 | 52.59 | 58.08 | 53.85 |
| Separated | 53.42 | 59.69 | 54.79 | 47.08 | 71.80 | 54.80 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

**Table 3. 10: Percentage of widowed women by age cohort**

| Age | 2005 | 2010 |
|---|---|---|
| 15-20 | 0.41 | 0.35 |
| 21-25 | 0.92 | 0.86 |
| 26-30 | 1.81 | 1.33 |
| 31-35 | 3.04 | 2.26 |
| 36-40 | 4.99 | 3.79 |
| 41-45 | 7.59 | 8.31 |
| 46-50 | 9.66 | 7.71 |
| 51-55 | 13.05 | 11.56 |
| 56-6 | 12.27 | 14.87 |
| 61-6 | 14.92 | 15.32 |
| 65+ | 31.35 | 33.64 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: The statistics may not all up to 100 percent for all columns because of rounding

### 3.4.5 Geographical Location

It is typically expected that in urban areas, female labour force participation would be higher than in rural areas, because most firms and businesses are in urban areas. Moreover, there may be more progressive and positive social attitudes towards women having employment in urban areas. However, given the nature of Bangladesh's economy, most of the female labour force participation

is still in agriculture. Thus there is higher female labour force participation in rural areas in Bangladesh. Table 3.11 shows that FLFP rates are higher in rural areas than in urban areas in both 2005 and 2010. However, the FLFP rates has increased by absolutely and relatively more in urban areas (rising by 7.1 points compared to 6.6 percentage points in rural areas), because the economy started to move from agriculture to services and industry.

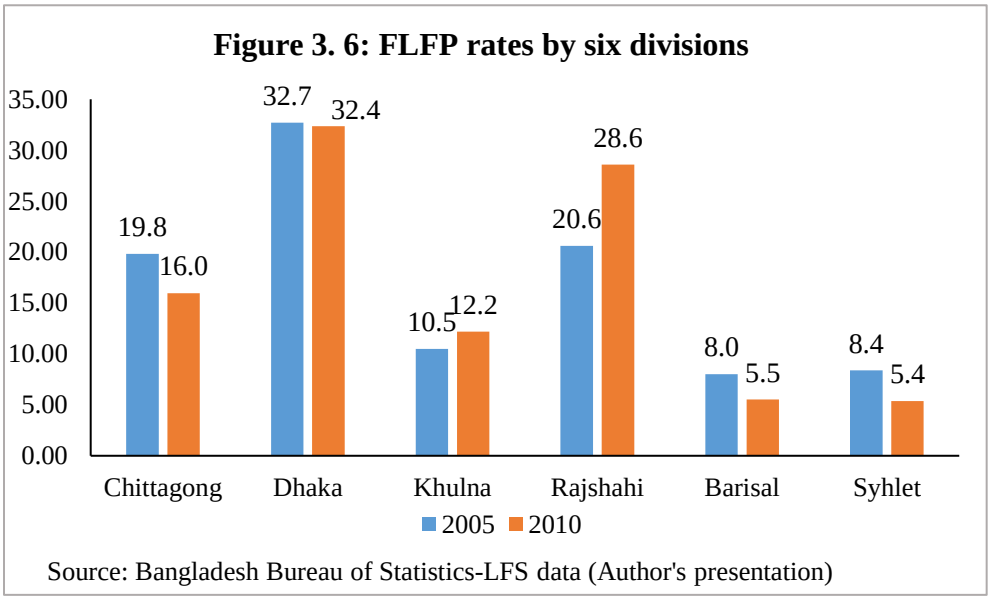
**Table 3. 11: FLFP rates by areas**

| | 2005 | | 2010 | |
|---|---|---|---|---|
| | Rural | Urban | Rural | Urban |
| Female labour force participation | 29.80 | 27.40 | 36.40 | 34.50 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

In Bangladesh, there are eight divisions with 64 districts. However, the study presents six divisions because two new divisions were added after the LFS 2010 survey. Here, two divisions were incorporated within the six divisions. Figure 3.6 shows that FLFP rates are highest in Dhaka (the capital of the country), at 32.7 percent in 2005 and 32.4 percent in 2010. Most of the job opportunities and some economic processing zones are in Dhaka. Rajshahi is the division with the second highest FLFP rates, of 20.6 percent in 2005 and 28.6 percent in 2010. This region is mostly dominated by agriculture (Islam et al., 2015), and female participation is agriculture has increased, as shown earlier.

**Figure 3. 6: FLFP rates by six divisions**




Source: Bangladesh Bureau of Statistics-LFS data (Author's presentation)

### 3.4.6 Religion

We would expect culture (social norms, behavior, attitude towards women, religion) to be another of the very important factors influencing female labour force participation (Pfau-Effinger 2000 cited in Heyne 2017). However, it is hard to quantify social norms, behavior, and attitude; hence religion has been used as a proxy to measure culture (Heyne, 2017). Moreover, in the literature focused on Bangladesh, it has been shown that religion can have an effect on female labour force participation. Research has found that Muslim women do not participate in the labour force due to Purdah (Purdah is a Bangla word for female exclusion or veil) (Sarkar, 2015). In 2005, among the total population, the majority of the people are Muslim, comprising 89.3 percent of the total population followed by 9.7 percent Hindu, 0.4 percent are Buddhist, 0.2 percent are Christian, and 0.2 percent are others. In 2010, the share who are Muslim increased to 90 percent, Hindu people decreased to 9 percent, Buddhist people increase to 0.7 percent and 0.1 percent for Christian, and 0.09 percent are others.

Although, Muslims are the majority of the population, labour force participation rates are lowest among Muslim women. For example, among all Muslim women only 28.8 percent were in the labour force in 2005, increasing to 35.4 percent in 2010, although still the lowest FLFP rate by religion (Table 3.12). Participation rates are also low among Hindu women, however their participation is higher than among Muslim women.

**Table 3. 12: FLFP rates by religion**

| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Rural | Urban | Total | Rural | Urban | Total |
| Islam | 29.19 | 27.59 | 28.78 | 35.82 | 33.97 | 35.36 |
| Hindu | 31.06 | 25.70 | 29.84 | 38.91 | 36.20 | 38.27 |
| Buddhist | 62.08 | 28.21 | 53.39 | 54.12 | 76.39 | 57.24 |
| Christian | 70.82 | 12.50 | 60.68 | 45.16 | 21.03 | 38.91 |
| Others | 71.04 | 36.35 | 67.62 | 33.32 | 60.35 | 36.35 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

### 3.4.7 Household Size

Usually, there is negative association between female labour participation and household size (Groesbeck and Israelsen, 1994). In Bangladesh, on average there are 5 members in a household in both 2005 and 2010. However, Table 3.13 shows that the percentage of small families is

increasing over time. For example, households with 1 to 2 members, increased to 11.9 percent of all households in 2010 from 9.9 percent in 2005, and households with 3 to 4 members increased to 44.8 percent in 2010 from 40.2 percent in 2005. In contrast, the share of bigger families decreased from 2005 to 2010. For example, the percentage of households with 5 to 6 members household decreased by 2.5 percentage points. Bigger families are more likely to be located in rural areas than urban areas.

**Table 3. 13: Percentage of household according to household size**

| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Rural | Urban | Total | Rural | Urban | Total |
| Size 1-2 | 9.81 | 10.13 | 9.89 | 11.65 | 12.56 | 11.87 |
| Size 3-4 | 38.31 | 46.06 | 40.23 | 43.39 | 49.24 | 44.78 |
| Size 5-6 | 34.62 | 32.08 | 33.99 | 32.34 | 28.77 | 31.49 |
| Size 7-8 | 12.68 | 8.58 | 11.66 | 9.27 | 6.99 | 8.73 |
| Size 8+ | 4.58 | 3.16 | 4.23 | 3.35 | 2.45 | 3.13 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: The statistics may not all up to 100 percent for all columns because of rounding

Female participation rates initially increase with household size and then decrease (Table 3.14). Labour force participation among women is highest when women live in households with 3 to 4 members, and this rate increased from 2005 to 2010. The participation rate for women with 1 to 2 family member is higher than in very big households (it was 22.3 percent in 2005 and 19.3 percent in 2010). This may be because with 2 family members there are typically no children that women have to take care of. Participation rates among women are substantially lower in big households, which include more children as well as more elderly adults, and participation rates among households with more than 5 members also declined from 2005 to 2010.

**Table 3. 14: FLFP rates by household size**

| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Rural | Urban | Total | Rural | Urban | Total |
| Size 1-2 | 21.40 | 24.80 | 22.30 | 18.40 | 21.90 | 19.30 |
| Size 3-4 | 37.50 | 45.60 | 39.50 | 42.70 | 48.50 | 44.10 |
| Size 5-6 | 28.00 | 21.10 | 26.30 | 28.00 | 23.70 | 26.90 |
| Size 7-8 | 9.40 | 5.50 | 8.50 | 7.70 | 4.50 | 6.90 |
| Size 8+ | 3.60 | 2.90 | 3.40 | 3.20 | 1.40 | 2.70 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: The statistics may not all up to 100 percent for all columns because of rounding

### 3.4.8 Number of Children

Theory and empirical literature have found a negative association between female labour force and the number of the children in the family (McConnell and Brue, 1995; Mincer, 1985, Mishra et al., 2010). A similar result is also seen in Bangladesh. In a household where the number of children (younger than 15 years) is higher, female participation is lower (Table 3.15). In the family, a women has to take care of children because childcare centers are still not popular. Women get 3 months maternity leave only if they work in formal jobs. After that maternity leave, many women do not return to their jobs. Throughout the country, there are 32 daycare centers run by the government and there are 12 daycare centers run by Non-Government Organizations (NGO). However, due to poor service most families do not want to keep their children in daycare (Islam and Khan, 2015).

**Table 3. 15: FLFP rates by number of children in the household**

| | 2005 | | | 2010 | | |
|---|---|---|---|---|---|---|
| | Rural | Urban | Total | Rural | Urban | Total |
| No Child | 41.20 | 51.50 | 43.70 | 39.20 | 46.40 | 41.00 |
| 1 Child | 26.50 | 28.00 | 26.90 | 31.30 | 30.90 | 31.20 |
| 2 Child | 20.70 | 14.70 | 19.20 | 20.00 | 18.20 | 19.60 |
| 3 Child | 8.40 | 4.30 | 7.40 | 6.80 | 3.70 | 6.00 |
| 4 Child | 2.50 | 1.00 | 2.20 | 2.00 | 0.60 | 1.70 |
| 5 Child | 0.40 | 0.10 | 0.30 | 0.50 | 0.00 | 0.40 |
| 6 Child | 0.10 | 0.30 | 0.10 | 0.20 | 0.00 | 0.10 |
| 7 Child | 0.30 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: The statistics may not all up to 100 percent for all columns because of rounding

### 3.4.9 Income in Relation to Household Size

Female participation also varies according to income (Bridges et al., 2011; Mahmud, 1997). Sometimes, in higher income households, women substitute their work with technology and with other services (like childcare, adult care, although this is not popular in Bangladesh), and thus are better able to participate in the labour market. However, Table 16 shows that female labour force participation is highest in low-income households even the household is bigger. This is likely to be because women in poor households have to look for work for their household's survival. Across all household sizes, FLFP rates fall as income increases but then rise for the highest income group (more than 2000 BDT) (Bangladeshi currency Taka) in a week. A similar pattern is observed in

both rural and urban areas for the lower income group (less than 500 BDT in a week) (Tables 3.17 and 3.18). However, for the highest income group (more than 2000 BDT), participation rates are far lower in rural than in urban areas, across all household sizes. This indicates that in rural areas, where the income of the husband is high, women tend to stay at home, hence the very low participation with high income (Table 3.17).

**Table 3. 16: FLFP rates according to average household income and household size at national level**

| | 2005 | | | | 2010 | | | |
|---|---|---|---|---|---|---|---|---|
| Household Size | <500 | 501-1000 | 1001-2000 | >2000 | <500 | 501-1000 | 1001-2000 | >2000 |
| Size 1-2 | 75.13 | 8.94 | 1.21 | 7.40 | 38.87 | 25.96 | 5.74 | 10.84 |
| Size 3-4 | 76.82 | 8.80 | 1.40 | 6.40 | 68.70 | 8.48 | 0.42 | 2.69 |
| Size 4-5 | 85.56 | 5.21 | 0.45 | 2.80 | 81.76 | 4.28 | 0.18 | 1.14 |
| Size 6-7 | 79.90 | 7.29 | 0.28 | 1.16 | 85.72 | 3.17 | 0.00 | 0.34 |
| Size 8+ | 81.02 | 6.40 | 1.04 | 3.89 | 84.47 | 7.83 | 0.00 | 0.70 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
Note: weekly income level by local currency (BDT)

**Table 3. 17: FLFP rates according to average household income and household size in rural areas**

| | 2005 | | | | 2010 | | | |
|---|---|---|---|---|---|---|---|---|
| Household Size | <500 | 501-1000 | 1001-2000 | >2000 | <500 | 501-1000 | 1001-2000 | >2000 |
| Size 1-2 | 84.81 | 5.97 | 0.17 | 2.08 | 46.41 | 22.21 | 5.48 | 7.06 |
| Size 3-4 | 86.35 | 5.16 | 1.00 | 2.15 | 77.42 | 4.33 | 0.25 | 0.93 |
| Size 4-5 | 89.54 | 4.35 | 0.49 | 0.80 | 87.11 | 2.50 | 0.00 | 0.51 |
| Size 6-7 | 81.81 | 7.15 | 0.34 | 0.19 | 90.31 | 0.84 | 0.00 | 0.40 |
| Size 8+ | 84.82 | 5.73 | 1.32 | 0.74 | 87.95 | 4.23 | 0.00 | 0.80 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

**Table 3. 18: FLFP rates according to average household income and household size in urban areas**

| | 2005 | | | | 2010 | | | |
|---|---|---|---|---|---|---|---|---|
| Household Size | <500 | 501-1000 | 1001-2000 | >2000 | <500 | 501-1000 | 1001-2000 | >2000 |
| Size 1-2 | 49.28 | 16.87 | 4.00 | 21.63 | 19.92 | 35.39 | 6.39 | 20.32 |
| Size 3-4 | 52.67 | 18.04 | 2.40 | 17.18 | 45.79 | 19.42 | 0.87 | 7.31 |
| Size 4-5 | 69.30 | 8.71 | 0.27 | 10.95 | 62.83 | 10.56 | 0.83 | 3.38 |
| Size 6-7 | 69.89 | 8.02 | 0.00 | 6.21 | 62.35 | 15.07 | 0.00 | 0.00 |
| Size 8+ | 66.60 | 8.97 | 0.00 | 15.87 | 60.76 | 32.39 | 0.00 | 0.00 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

In conclusion, this chapter used descriptive methods to investigate female labour force participation in Bangladesh. The empirical analysis considered factors associated with both demand- and supply-side. Looking from the demand-side, economic structure is important to consider as the economy is moving from agriculture to services and industry. However, the increase in women's employment is particularly marked among women who are self-employed. This suggests that supply-side characteristics also need to be taken into consideration (such as education, training, marital status, religion access to childcare, household resources) when understanding female labour force participation in Bangladesh, and how it has changed from 2005 to 2010. In the next chapter, I investigate the relationship between the different supply-side characteristics and FLFP in a multivariate context, and I consider which of these characteristics help to account for the rise in FLFP from 2005 to 2010.

## Chapter Four: Econometrics Analysis

This chapter estimates the correlates of female labour force participation using regression analysis, and then it uses decomposition analysis to explore why female labour force participation increased in Bangladesh from 2005 to 2010. First, the chapter introduces the models which will be estimated, and then, the results are presented and interpreted.

### 4.1 The Model

The correlates of female labour force participation are estimated using a probit model. In this model, the dependent variable equals 1 if the woman (aged 15 year or older)[8] is a labour force participant (employed or unemployed) and zero if the woman is economically inactive. Between 2005 and 2010, women's labour force participation in Bangladesh increased by 6.8 percentage points and I will use these two years for the decomposition analysis. I therefore first estimate individual probit regressions for 2005 and 2010 by using the probit model. The changes in FLFP between the two years may derive from changes in the characteristics of women, or from changes in the relationship between characteristics and labour force participation. The decomposition analysis makes it possible to distinguish between changes in the characteristics and changes in the coefficients.

As the dependent variable is a binary categorical variable, I will use the Gomulka and Stern decomposition (1990) technique. The decomposition separates the factors accounting for a change in women's labour force participation into changes in the characteristics of women, and changes in the returns to these characteristics (or changes in the coefficients of these variables). The decomposition analysis also makes it possible to recognize which explanatory variables are responsible for this rise.

If the coefficients have a large effect, then this would suggest that overall, women with the same characteristics in 2010 as in 2005 would be more likely to participate in 2010. If the characteristics of the women have a large effect, then this would suggest that overall, the values of the explanatory variables have changed in such a way that would encourage labour force participation.

[8] I used the same definition as provided in the Labour Force Survey. Moreover, there is no state-provided social pension for older people, so I have included older women in the sample of potential labour force participants.

The equation for the probit model is:

$$\Pr(y = 1 \mid X) = P(\alpha, X) \ldots (1)$$

Here, $y$ is a binary categorical variable which takes the value of 1 if the woman is a participant and zero if a non-participant; $\alpha$ is the vector of coefficients; $X$ is the vector of variables (individual and household characteristics) such as education, marital status, religion (Islam, Hinduism, Christianity, Buddhism or others), number of children and family income.

The predicted change in participation between period 0 (2005) and period 1 (2010) will be computed as follows:

$$\bar{y}^1 - \bar{y}^0 = \bar{P}(\hat{\alpha}^1, X^1) - \bar{P}(\hat{\alpha}^0, X^0) \ldots (2)$$

where $\bar{P}(\hat{\alpha}^1, X^1)$ represents the average across the sample $X$ of the predicted probabilities using the estimated coefficients. The decomposition will be carried out as follows:

$$\bar{y}^1 - \bar{y}^0 = \{\bar{P}(\hat{\alpha}^1, X^1) - \bar{P}(\hat{\alpha}^0, X^1)\} + \{\bar{P}(\hat{\alpha}^0, X^1) - \bar{P}(\hat{\alpha}^0, X^0)\} \ldots (3)$$

Here, the first term on the right-hand side of equation 3 represents the change in FLFP that arises due to the changing coefficients. More specifically, the term describes the change arising from changing coefficients from 2005 to 2010 values, i.e. the change in participation that occurs if the sample is held constant at 2005 values (2005 now being the reference year) and only the estimated *coefficients* were to change from 2005 to 2010 values (2010 now being the comparison year). The second term describes the change due to changes in the characteristics of women. This will explain the change in participation that would have occurred if the coefficients were kept constant at 2010 values (2010 being the reference year) and only the sample's *characteristics* were to change from 2010 to 2005 values (2005 being the comparison year)Having identified whether the change in the coefficients or the change in the characteristics is responsible for most of the overall increase in female labour force participation, it is then useful to explore which particular coefficients or characteristics, or groups of coefficients or characteristics, carry the greatest weight in the decomposition.

In terms of the coefficients, equation 3 can be decomposed further:

$$\bar{P}(\hat{\alpha}^1, X^1) - \bar{P}(\hat{\alpha}^0, X^1) = \{\bar{P}(\hat{\alpha}^1, X^1) - \bar{P}(\hat{\alpha}^{k_1}, X^1)\} + \{\bar{P}(\hat{\alpha}^{k_1}, X^1) - \bar{P}(\hat{\alpha}^0, X^1)\} \ldots (4)$$

where $\hat{\alpha}^{k_1}$ represents the vector of estimated coefficients corresponding to the first k variables from year 2010 and the remainder from year 2005. The first term on the right-hand side of equation

4 tells us how much of the change arising from the coefficients, using the sample for year 2010, is associated with those coefficients (those outside the first k) that are allowed to change over the years.

To decompose the overall change caused by the characteristics, equation 3 can be decomposed as follows:

$$\bar{P}(\hat{\alpha}^0, \bar{X}^1) - \bar{P}(\hat{\alpha}^0, \bar{X}^0) = \{\bar{P}(\hat{\alpha}^0, \bar{X}^1) - \bar{P}(\hat{\alpha}^0, \bar{X}^{k_0})\} + \{\bar{P}(\hat{\alpha}^0, \bar{X}^{k_0}) - \bar{P}(\hat{\alpha}^0, \bar{X}^0)\} \dots (5)$$

In equation 5, the second term on the right-hand side represents the increase in predicted participation that can be attributed to the changing mean values of the variable or group of variables represented by k, if all else was held constant at the 2005 values, and only the mean values of k were restricted to the 2010 values.

### 4.2 Variables

One of the major constraints of this estimation is that demand-side variables are not accommodated in the supply-side model which uses available micro-data. Like the dependent variable, the independent variables are also binary variables, and are specified as follows:

No education= 1 when a woman has no education, 0 otherwise

Class I-V= 1 when a woman has education from class I to V, 0 otherwise

Class VI_VIII = 1 when a woman has education from class VI to VIII, 0 otherwise

Class IX_X = 1 when a woman has education from class IX to X, 0 otherwise

S.S.C = 1 when a woman has education up to Secondary School Certificate (S.S.C), 0 otherwise

H.S.C= 1 when a woman has education up to Higher Secondary Certificate (H.S.C), 0 otherwise

Masters= 1 when a woman has a master's degree, 0 otherwise

Training= 1 when a woman has any training, 0 otherwise

Age 15-25 = 1 when a woman is aged between 15-25, 0 otherwise

Age 26-35 = 1 when a woman is aged between 26-35, 0 otherwise

Age 36-45 = 1 when a woman is aged between 36-45, 0 otherwise

Unmarried= 1 when a woman is not married, 0 otherwise

Married = 1 when a woman is married, 0 otherwise

Divorced = 1 when a woman is divorced, 0 otherwise

Area= 1 when a woman is in a rural areas, 0 otherwise

Religion = 1 when a woman is Muslim, 0 otherwise

Household Size 1 to 2= 1 when a woman is living in a household with 1 or 2 members, 0 otherwise

Household Size 3 to 4= 1 when a woman is living in a household with 3 or 4 members, 0 otherwise

Household Size 5 to 6= 1 when a woman is living in a household with 5 or 6 members, 0 otherwise

No child = 1 when a woman has no children in the household, 0 otherwise

Child 3 to 4 = 1 when a woman has 3 to 4 children in the household, 0 otherwise

Child 5 to 6= 1 when women have 5 to 6 children in the household, 0 otherwise

Income 500 or less = 1 when income net of women's income in a household is less than 500 BDT in a week, 0 otherwise

Income 501 to 1000= 1 when income net of women's income in a household is between 501 to 1000 BDT in a week, 0 otherwise

Income 1001 to 2000 = 1 when income net of women's income in a household is between 1001 to 2000 BDT in a week, 0 otherwise

In the probit regressions, the omitted categories are degree/equivalent, engineering/medical, technical/vocational, and others for education categories; age 46 years and older are for the age cohort; separated and widowed for marital status; all religions other than Islam; household size of more than 6 members; more than 6 children in the household; and household income of more than 2000 BDT

### 4.3 Results

The results for the separate probit regressions are reported in Table 4.1, while the results for the decomposition analysis are presented in Table 4.2. The mean values of the sample are presented in Table 4.3, as these the mean values are important while explaining the role of characteristics in the decomposition analysis.

In the probit regressions most of the variables have a significant relationship to female labour force participation. Perhaps surprisingly, the probability of women participating in the labour market does not increase consistently with education. In 2010, women holding a higher secondary

certificate (H.S.C) were significantly less likely to participate in labour market than any other level of education. This is at least partly because women are not only employed in relatively high-skilled jobs, for example in the service sector, but also in agriculture and unpaid family work. Due to the importance of agricultural employment, women living in rural areas were more likely to participate in the labour force in 2005, but the relationship is negative and not statistically significant in 2010.

However women who had prior training were significantly more likely to participate in the labour market (although as shown in the previous chapter, only 4.1 percent of women held prior training in 2010).

Religion, which likely also captures culture, is significantly associated with the probability that women participate in the labour market. In comparison to other women, Muslim women were significantly less likely to be labour force participants in both 2005 and 2010. Divorced women were significantly more likely to participate than widowed women in both years, while unmarried women, who may rely on their parents for economic support, were significantly less likely to participate. Married women were also more likely to participate than widowed women in 2005 but there was no significant difference in their participation in 2010.

Women who live in small households (with only one or two members) were more likely than women who live in big households to participate in the labour market. However, women in households with 3 to 6 members were less likely to participate than women in households with more than 6 members. The influence of fertility on FLFP is proxied using the number of children in the household. The likelihood of participation declines as the number of children in the household increases. Women living with no children, or less than 5 children were more likely to participate than women living with more than 6 children in the household, although the relationships are only significant in 2010.

**Table 4. 1: Probit regressions for FLFP (15 year and above)**

| | 2005 | 2010 |
|---|---|---|
| No Education | 0.725*** | 0.192*** |
| Class I-V | 0.506*** | 0.196*** |
| Class VI-VIII | 0.427*** | 0.237*** |
| Class IX-X | 0.348*** | 0.160*** |
| S.S.C | 0.362*** | 0.0652 |
| H.S.C | 0.479*** | -0.0959* |
| Masters | 0.878*** | 0.432*** |
| Training | 0.614*** | 0.201*** |
| Age 15-25 | 0.710*** | 1.253*** |
| Age 26-35 | 0.847*** | 1.286*** |
| Age 36-45 | 0.762*** | 1.198*** |
| Unmarried | -0.396*** | -0.968*** |
| Married | 0.257*** | -0.0290 |
| Divorced | 0.706*** | 0.216*** |
| Area/Rural | 0.0508*** | -0.0205 |
| Religion/Muslim | -0.137*** | -0.178*** |
| Household Size 1 to 2 | 0.347*** | 0.0282 |
| Household Size 3 to 4 | -0.102*** | -0.248*** |
| Household Size 5 to 6 | -0.0835*** | -0.0885*** |
| No child | 0.380*** | 0.741*** |
| Child 1 to 2 | 0.121 | 0.531*** |
| Child 3 to 4 | 0.0165 | 0.346* |
| Child 5 to 6 | -0.0467 | 0.286 |
| Income 500 or less | 0.0113 | 0.490*** |
| Income 501 to 1000 | -0.0208 | 0.0586*** |
| Income1001 to 2000 | 0.0736** | -0.0226 |
| Constant | -2.019*** | -1.706*** |
| | | |
| Number of observations | 92,365 | 98,471 |
| R-Squared | 0.17 | 0.27 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)
*** p<0.01, ** p<0.05, * p<0.1

The coefficients for income for both years show different signs. When household weekly income (net of any income earned by a potential female labour force participant) is less than 500 BDT, women were more likely to participate in the labour force than women in the richest households although this relationship is only significant in 2010. With weekly household income of 501 to 1000 BDT, women were less likely to participate in 2005 but more likely to participate in 2010 (but the coefficient is not statistically significant for 2005). With household income of 1001 to

2000 BDT, women were more likely than women in the richest households to participate in 2005 but less likely to participate in 2010, but the coefficient for 2010 is not statistically significant.

The decomposition analysis is shown in the Table 4.2. Here I consider the reference year as 2005 and the comparison year as 2010. Total change in female labour force participation from 2005 to 2010 is shown 5.3 percentage points which is mostly due to coefficients rather than characteristics of the sample. This implies that women in 2010, with the same characteristics as in 2005, were much more likely to participate in the labour market in 2010 than women in 2005.

**Table 4. 2**: **Decomposition of FLFP (for women 15 years or above) for the years 2005 and 2010**

| FLFP | Coefficient | Std. Err. | Z | P>\|z\| | [95% Confidence Interval] | | Pct. |
|---|---|---|---|---|---|---|---|
| Characteristics | -0.047 | 0.002 | -30.710 | 0.000 | -0.050 | -0.044 | -90.143 |
| Coefficients | 0.100 | 0.002 | 41.180 | 0.000 | 0.095 | 0.105 | 190.140 |
| Total | 0.053 | 0.002 | 28.990 | 0.000 | 0.049 | 0.056 | |
| Due Difference in Characteristics | | | | | | | |
| FLFP | Coefficient | Std. Err. | Z | P>\|z\| | [95% Confidence Interval] | | Pct. |
| No Education | 0.000 | 0.000 | 5.170 | 0.000 | 0.000 | 0.000 | 0.086 |
| Class I-V | -0.001 | 0.000 | -5.320 | 0.000 | -0.001 | 0.000 | -1.269 |
| Class VI-VIII | 0.000 | 0.000 | 6.240 | 0.000 | 0.000 | 0.000 | 0.233 |
| Class IX-X | 0.000 | 0.000 | 4.340 | 0.000 | 0.000 | 0.000 | 0.497 |
| S.S.C | -0.000 | 0.000 | -2.180 | 0.029 | 0.000 | 0.000 | -0.162 |
| H.S.C | -0.000 | 0.000 | -1.060 | 0.289 | 0.000 | 0.000 | -0.132 |
| Masters | -0.000 | 0.000 | -5.430 | 0.000 | 0.000 | 0.000 | -0.045 |
| Training | 0.004 | 0.001 | 5.500 | 0.000 | 0.002 | 0.005 | 7.092 |
| Age 15-25 | 0.005 | 0.000 | 54.510 | 0.000 | 0.005 | 0.005 | 8.882 |
| Age 26-35 | -0.001 | 0.000 | -53.160 | 0.000 | -0.002 | -0.001 | -2.752 |
| Age 36-45 | -0.000 | 0.000 | -53.350 | 0.000 | 0.000 | 0.000 | -0.150 |
| Unmarried | -0.026 | 0.001 | -34.060 | 0.000 | -0.027 | -0.024 | -49.214 |
| Married | -0.000 | 0.000 | -1.250 | 0.211 | 0.000 | 0.000 | -0.260 |
| Divorced | -0.000 | 0.000 | -2.940 | 0.003 | 0.000 | 0.000 | -0.079 |
| Area/Rural | -0.000 | 0.000 | -1.410 | 0.158 | 0.000 | 0.000 | -0.042 |
| Religion/Muslim | -0.000 | 0.000 | -10.400 | 0.000 | 0.000 | 0.000 | -0.305 |
| Household Size 1 to 2 | 0.000 | 0.000 | 0.360 | 0.717 | 0.000 | 0.000 | 0.037 |
| Household Size 3 to 4 | -0.003 | 0.000 | -12.640 | 0.000 | -0.003 | -0.002 | -4.977 |
| Household Size 5 to 6 | 0.000 | 0.000 | 4.370 | 0.000 | 0.000 | 0.000 | 0.188 |
| No child | 0.003 | 0.001 | 5.950 | 0.000 | 0.002 | 0.004 | 5.818 |
| Child 1 to 2 | 0.003 | 0.001 | 3.840 | 0.000 | 0.001 | 0.004 | 5.319 |
| Child 3 to 4 | -0.002 | 0.001 | -2.330 | 0.020 | -0.004 | 0.000 | -3.652 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Child 5 to 6 | -0.001 | 0.000 | -1.910 | 0.056 | -0.002 | 0.000 | -1.418 |
| Income 500 or less | -0.028 | 0.001 | -26.630 | 0.000 | -0.030 | -0.026 | -53.134 |
| Income 501 to 1000 | 0.001 | 0.000 | 3.060 | 0.002 | 0.000 | 0.001 | 0.984 |
| Income 1001 to 2000 | -0.001 | 0.001 | -1.420 | 0.157 | -0.002 | 0.000 | -1.686 |

Due Difference in Coefficients

| FLFP | Coefficient | Std. Err. | Z | P>\|z\| | [95% Confidence Interval] | | Pct. |
|---|---|---|---|---|---|---|---|
| No Education | -0.054 | 0.006 | -9.160 | 0.000 | -0.066 | -0.043 | -102.830 |
| Class I-V | -0.022 | 0.005 | -4.840 | 0.000 | -0.032 | -0.013 | -42.770 |
| Class VI-VIII | -0.005 | 0.002 | -2.360 | 0.018 | -0.010 | -0.001 | -10.006 |
| Class IX-X | -0.003 | 0.001 | -2.250 | 0.025 | -0.005 | 0.000 | -4.935 |
| S.S.C | -0.003 | 0.001 | -3.770 | 0.000 | -0.005 | -0.002 | -6.301 |
| H.S.C | -0.003 | 0.000 | -7.060 | 0.000 | -0.004 | -0.002 | -5.656 |
| Masters | -0.001 | 0.000 | -2.990 | 0.003 | -0.001 | 0.000 | -1.005 |
| Training | -0.002 | 0.000 | -8.060 | 0.000 | -0.003 | -0.002 | -4.634 |
| Age 15-25 | 0.030 | 0.002 | 17.190 | 0.000 | 0.027 | 0.034 | 57.397 |
| Age 26-35 | 0.021 | 0.002 | 13.390 | 0.000 | 0.018 | 0.024 | 40.467 |
| Age 36-45 | 0.017 | 0.001 | 14.290 | 0.000 | 0.015 | 0.019 | 32.441 |
| Unmarried | -0.043 | 0.003 | -15.640 | 0.000 | -0.049 | -0.038 | -82.179 |
| Married | -0.041 | 0.004 | -9.040 | 0.000 | -0.049 | -0.032 | -77.022 |
| Divorced | -0.001 | 0.000 | -4.730 | 0.000 | -0.001 | 0.000 | -1.464 |
| Area/Rural | -0.016 | 0.005 | -3.420 | 0.001 | -0.026 | -0.007 | -30.990 |
| Religion/Muslim | -0.011 | 0.007 | -1.620 | 0.104 | -0.024 | 0.002 | -20.818 |
| Household Size 1 to 2 | -0.004 | 0.001 | -8.130 | 0.000 | -0.006 | -0.003 | -8.466 |
| Household Size 3 to 4 | -0.015 | 0.003 | -5.000 | 0.000 | -0.021 | -0.009 | -28.561 |
| Household Size 5 to 6 | 0.001 | 0.003 | 0.410 | 0.682 | -0.004 | 0.007 | 2.207 |
| No child | 0.007 | 0.004 | 1.470 | 0.141 | -0.002 | 0.015 | 12.459 |
| Child 1 to 2 | 0.035 | 0.018 | 1.920 | 0.054 | -0.001 | 0.070 | 66.305 |
| Child 3 to 4 | 0.020 | 0.012 | 1.630 | 0.104 | -0.004 | 0.044 | 37.572 |
| Child 5 to 6 | 0.005 | 0.003 | 1.810 | 0.070 | 0.000 | 0.010 | 8.965 |
| Income 500 or less | 0.093 | 0.005 | 18.810 | 0.000 | 0.084 | 0.103 | 177.730 |
| Income 501 to 1000 | 0.003 | 0.001 | 2.550 | 0.011 | 0.001 | 0.005 | 5.294 |
| Income 1001 to 2000 | -0.002 | 0.001 | -2.830 | 0.005 | -0.003 | -0.001 | -3.337 |
| Constant | 0.095 | 0.041 | 2.300 | 0.021 | 0.014 | 0.175 | 180.280 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

**Table 4. 3**: **Mean values of the independent variables and standard deviations for the 2005 and 2010 for women aged 15 or above**

| | 2005 | | 2010 | |
|---|---|---|---|---|
| | Mean | Std. Err. | Mean | Std. Err. |
| FLFP | 0.180 | 0.001 | 0.232 | 0.001 |
| No Education | 0.362 | 0.002 | 0.363 | 0.002 |
| Class I-V | 0.276 | 0.002 | 0.258 | 0.001 |
| Class VI-VIII | 0.122 | 0.001 | 0.125 | 0.001 |
| Class IX-X | 0.060 | 0.001 | 0.067 | 0.001 |
| S.S.C | 0.043 | 0.001 | 0.038 | 0.001 |
| H.S.C | 0.018 | 0.001 | 0.026 | 0.001 |
| Degree | 0.008 | 0.000 | 0.003 | 0.000 |
| Masters | 0.004 | 0.000 | 0.004 | 0.000 |
| Medical/engineering | 0.001 | 0.000 | 0.000 | 0.000 |
| Technical | 0.001 | 0.000 | 0.000 | 0.000 |
| Others education | 0.000 | 0.000 | 0.000 | 0.000 |
| Training | 0.019 | 0.001 | 0.136 | 0.001 |
| Age 15-25 | 0.190 | 0.002 | 0.213 | 0.001 |
| Age 26-35 | 0.163 | 0.001 | 0.157 | 0.001 |
| Age 36-45 | 0.123 | 0.001 | 0.123 | 0.001 |
| Age 46 or higher | 0.141 | 0.001 | 0.156 | 0.001 |
| Unmarried | 0.262 | 0.002 | 0.430 | 0.002 |
| Married | 0.469 | 0.002 | 0.498 | 0.002 |
| Divorced | 0.005 | 0.000 | 0.004 | 0.000 |
| Widow | 0.071 | 0.001 | 0.065 | 0.001 |
| Separated | 0.003 | 0.000 | 0.004 | 0.000 |
| Area/Rural | 0.763 | 0.002 | 0.770 | 0.001 |
| Religion/Muslim | 0.893 | 0.001 | 0.899 | 0.001 |
| Religion Hindu | 0.098 | 0.001 | 0.091 | 0.001 |
| Religion Buddhist | 0.004 | 0.000 | 0.008 | 0.000 |
| Religion Christian | 0.002 | 0.000 | 0.002 | 0.000 |
| Household Size 1 to 2 | 0.044 | 0.001 | 0.056 | 0.001 |
| Household Size 3 to 4 | 0.348 | 0.002 | 0.413 | 0.002 |
| Household Size 5 to 6 | 0.385 | 0.002 | 0.376 | 0.002 |
| Household Size 7 or more | 0.267 | 0.002 | 0.210 | 0.001 |
| No child | 0.116 | 0.001 | 0.149 | 0.001 |
| Child 1 to 2 | 0.484 | 0.002 | 0.531 | 0.002 |
| Child 3 to 4 | 0.326 | 0.002 | 0.272 | 0.001 |
| Child 5 to 6 | 0.067 | 0.001 | 0.043 | 0.001 |
| Child 7 to more | 0.007 | 0.000 | 0.005 | 0.000 |
| Income 500 or less | 0.643 | 0.002 | 0.297 | 0.002 |
| Income 501 to 1000 | 0.117 | 0.001 | 0.171 | 0.001 |
| Income 1001 to 2000 | 0.060 | 0.001 | 0.289 | 0.002 |
| Income 2001 or higher | 0.181 | 0.002 | 0.242 | 0.001 |

Source: Bangladesh Bureau of Statistics-LFS 2005, and 2010 data (author's own calculation)

However, the decomposition analysis (Table 4.2) shows that positive changes in the coefficients do not derive from the relationship between education and FLFP. Rather, there are negative coefficient changes from 2005 to 2010 for all levels of education. This implies that women with the same education level in 2010 as in 2005 were less likely to participate in 2010.

Over the period, the share of women with training increased (Table 4.3), and the probit regressions showed the women with prior training were more likely to participate in both 2005 and 2010. The decomposition analysis reveals negative coefficient changes for training and positive characteristic changes. Here, positive changes in characteristics dominate coefficient changes. This indicates that over the period, the increase in training helped to increase women's participation in the labour market.

The regression analysis (Table 4.1) showed that women in the age cohorts (15 to 25), (26 to 35), and (36 to 45) were more likely than older women to participate in labour force, and the relationship appeared stronger in 2010 than 2005. For women in the age cohorts (15 to 25) and (36 to 45), the decomposition analysis shows an increase in female participation in 2010 from 2005 which is due to both positive coefficient and characteristic changes. Positive coefficient and characteristic changes imply that there are relatively more women in these age cohorts in 2010 than 2005, and at the same time they are more likely to participate in the labour force in 2010 than 2005. For the age cohort (26 to 35), there is a negative characteristic change meaning relatively fewer women in this age cohort in 2010. However, there is a positive coefficient change for this age cohort which implies that women aged 26 to 35 were more likely to participate in the labour market in 2010 than 2005. Here, the coefficient change effect is more dominant than the change in characteristics.

Women's marital status is also associated with FLFP, as seen in the descriptive analysis in Chapter Three. The regression results (Table 4.1) showed that unmarried women were less likely than widowed women to participate in the labour force both for 2010 and 2005. From 2005 to 2010, the share of unmarried women increased considerably, shown in Table 4.3. The decomposition analysis indicates that the effect of being unmarried on changing labour force participation is due to the negative effects of both changes in characteristics and coefficients. The negative coefficient change means that unmarried women were less likely to participate in 2010 than 2005. There were

also relatively more married women in 2010 compared to 2005. As in the case for unmarried women, the negative coefficient change from 2005 to 2010 indicates that married women were also less likely to participate in the labour force in 2010. Although divorced women were significantly more likely to participate in the labour market in both 2005 and 2010, this tendency declined in 2010 than 2005. This is due to negative changes in both the coefficient and the characteristics. There were relatively fewer divorced women in 2010 than 2005 and at the same time they were less likely to be labour force participants in 2010 compared to 2005 (were the coefficient effect is more dominant than effect of changing characteristics).

The probit regressions showed that women in rural areas were more likely than women in urban areas to participate in the labour market in 2005 but there was no significant relationship in 2010. The decomposition analysis confirms a decline in coefficients over the period. Although the share of women living in rural areas increased significantly from 2005 to 2010 (Table 4.3), the negative coefficient effect means that even with the same share of rural women in 2005, women's labour participation would have declined in 2010.

Religion is a very important factor associated with women's participation in the labour market. There was little change in the religious affiliation of women from 2005 to 2010. However, a negative coefficient effect indicates that Muslim women were even less likely than other women to participate in the labour market in 2010 compared to 2005.

We would expect household size to be associated with women's labour force participation. The probit regression analysis indicated a non-linear relationship in Bangladesh –the likelihood of participating decreased with household size and then increased for households with more than 6 members (Table 4.1). The decomposition analysis shows that there has an increase in women living in small households (at most 2 members) over the period. However, the negative coefficient change dominates this positive change in characteristics. Thus, women from households with at most 2 members were less likely to participate in the labour market in 2010 compared to 2005. For women living in households with 3 to 4 members, women were less likely to participate than women in the largest households (more than 6 members) (Table 4.1). The decomposition shows a decline in women participating from households with 3 to 4 members from 2005 to 2010, due to both negative coefficient changes and an increase in the share of women living in households of

this size. Here, with similar characteristics of the household in 2010 as in 2005, women are less likely to participate. Decomposition for women's participation from households with 5 to 6 members, found positive changes both for characteristics and coefficient changes. This means that the share of women living in households comprising 5 to 6 members increased from 2005 to 2010, and at the same time, women from this size of household were more likely to participate in 2010 than 2005.

There is a negative association between the number of children in the household and women's labour force participation. Compared to women living in households with more than 6 children, the probit regressions showed a positive association between women's labour force participation and women living with fewer children (no child, child 1 to 2, and child 3 to 4) in a household. These relationships were only significant in 2010. The decomposition analysis found positive changes in characteristics for women living in households with no children or 1 to 2 children. This means that women's participation is higher due to changes in the characteristics of the sample: Table 4.3 shows that there were relatively more women living with no children or 1 to 2 children in 2010 than 2005, hence the increase in FLFP. There are also positive coefficient changes for women living with no children or 1 to 2 children. This means that even had the share of women living with two children or less remained unchanged from 2005 to 2010, more women in these households would have participated in the labour force. In addition, women living with 3 to 4 or 5 to 6 children were more likely to participate in 2010 because of the dominance of positive coefficient changes. This implies with that had the distribution of women by number of children in the household remained unchanged, women would have been more likely to participate in 2010 than 2005.

Women in households with low income are more likely to participate in the labour market both in 2005 and 2010 (Table 4.1) but this is statistically significant only for 2010. The decomposition analysis for this income group (500 BDT or less) shows negative changes in characteristics and positive changes in coefficient. Negative changes in characteristics imply that the share of women in this income group declined in 2010 from 2005, but their participation increased due to positive coefficient changes. This means that women from this income group were more likely to participate in 2010 than in 2005. For the income group 501-1000 BDT, women were more likely to participate in 2010 than 2005 due to both positive changes in characteristics and coefficients.

The share of women living in households with this income range (501-1000 BDT) increased in 2010, which is also seen in Table 4.3. But even if the share of women in this income group had stayed constant for 2010 as in 2005, they were more likely to participation in 2010 than 2005.

To conclude this chapter, along with the descriptive analysis, the econometrics analysis highlights important supply-side associations with female labour force participation, and it increases over the period from 2005 to 2010. Education, training, age, marital status, religion, household size, income, and the number of children are some of the major supply-side correlates for female labour force participation. The probit regression analysis found that women with prior training, who are divorced, living in a small household, and living with fewer children are significantly more likely to participate in the labour market. In contrast, women who are Muslim, married, unmarried, living in bigger household, and have more children are less likely to participate in the labour market. Perhaps surprisingly, the probability of women participating in the labour market does not increase consistently with education, a finding which is explained by the importance of agricultural work and self-employment as women's work.

Over the years from 2005 to 2010, FLFP increased primarily due to coefficient changes, meaning that if the characteristics of women had remained unchanged from 2005 to 2010, women would still have been more likely to participate in the labour market in 2010 than 2005. Positive coefficient changes are found for women aged from 15 to 45, in bigger households, with fewer children, and in lower and higher income households. In contrast, negative coefficient changes are found for education, religion (being Muslim), marital status (married, unmarried, and divorced), and small households. Besides this, positive changes in characteristics of women also contributed to the increase in FLFP (and particularly the share of women with prior training and the share of women from middle-income households).

## Conclusion

Attaining a highly ambitious growth rate in Bangladesh will be challenging unless policy is able to engage half of the country's population in economic activity. As the economy is growing and its manufacturing and service sector is expanding, there is a demand for labour in the economy. Male participation is high (81.9 percent in 2015) hence there is little room to increase male participation rates. Therefore, the country has to increase its female labour force participation (FLFP) from the far lower rate of 35.6 percent. Most of the literature focused on Bangladesh's labour force has discussed either demand- or supply-side factors of FLFP. This dissertation attempted to analyse the correlates of the female labour force participation incorporating both demand- and supply-side analysis. It also used decomposition analysis to explore what supply-side characteristics are more strongly associated with female labour force participation.

Demand-side analysis shows that FLFP and growth are positively correlated. From 2005 to 2010, the share of women employed in manufacturing and services increased, suggesting a positive link between changes in the economy and the increasing female labour force participation. However, the share of women in self-employment also increased suggesting that the rise in female labour force participation is not only about an increase in the demand for female labour.

Looking at the supply-side factors in terms of both household and individual characteristics, this study finds that education, age, having training, marital status, religion (a proxy of culture), geographical location, household size, number of children in the household, and household income are all important factors to be considered when explaining changes in FLFP. The probit regression analysis showed that women are significantly more likely to be labour force participants if they are younger than 46, they are married or divorced (rather than widowed), and they have prior training. Although education is a significant correlate of FLFP, the relationship appears non-linear. This likely to be because the increase in FLFP has been associated not only with more employment in services and manufacturing but also more women working in domestic work or irregular work. As women's engagement in agriculture is high, female participation in the labour market is higher in rural areas. Supporting the literature, household size and the number of children in the household are important factors associated with women's labour force participation. Women who live in households with fewer than 5 members, and with fewer children, are more likely to be labour force

participants. Though social norms and values are difficult to measure, the analysis of religion shows that Muslim women are significantly less likely to participate in the labour market.

To see which supply-side factors may be associated with the change in female labour force participation over the years from 2005 to 2010, decomposition analysis was used. This analysis shows that the increase in FLFP was partly explained by changes in the characteristics of women from 2005 to 2010. These changes in characteristics include increasing shares of young women in the female population, growing shares of women with prior training, and an increase in the proportion of women living with no or few children. However, the analysis shows that coefficient changes are more dominant than changes in characteristics, meaning that changes in female labour force participation from 2005 to 2010 would have occurred even if the characteristics of women had remained unchanged over the period. Factors which are dominated by positive coefficient changes include: age (women younger than 46 were more likely to participate in 2010 than in 2005); household size and household composition (women living in large households, and in households with up to 6 children) were more likely to participate in 2010 than in 2005; and household income (women living in low-income households were more likely to participate in the labour market in 2010 than in 2005).

Other factors, however, are associated with negative changes. For example, although the number of females with an education increased in 2010, their probability of participating declined over the period. This indicates that government initiatives like free books, and stipend are helping to increase women education but they are not coming to labour force. In comparison to widowed women, the coefficients for all other forms of marital status (married, unmarried and divorced) are negative (indicating a falling probability of participating over the period). A negative coefficient change is also associated with women being Muslim, suggesting the importance of social norms in influencing female labour force participation.

These findings support some theoretical approaches. For example, Becker's (1974) theoretical framework can be used here to explain household behaviour in the areas of marriage, fertility, divorce, and education. The country is still lacking proper institutions and policy which can help to increase female labour force participation, with a lack of childcare, child subsidies, policies for parental leave, elderly home care and more (Del Boca et al. 2008; Dieckhoff et al. 2015; Iversen

et al. 2005). The findings also support the cultural approach which argues that female labour force participation is dominated by cultural values, social attitudes, norms and religion (Heyne 2017; Pfau-Effinger 2000 cited in Heyne 2017).

However, the estimations presented in this study also have a number of limitations. As seen, social norms, attitudes, and values are very important for female labour force participation. However, except for religion, my study could not control for any other variables which capture social norms. The study also has two endogeneity problems. The first is the problem of unobservable characteristics (e.g. ambition, discipline, and talent), and if these characteristics are correlated with other supply-side characteristics, then the estimated coefficients will be biased upwards. There is also the problem of reverse causality. Supply-side characteristics (such as training or household income) may influence FLFP, but FLFP may also influence supply-side characteristics.

Still, even with these limitations, the estimations may help one to evaluate policies to empower women, which could lead countries towards increased growth, and more gender equality. For example, to encourage self-employment among women, making micro credit or access to financial institution available to women is important. As male employment still dominates female employment in industry and services, introducing women's quotas in various sectors may be needed to increase women's participation in regular employment. As seen the importance of training to increase FLFP, government can set up different skills development centers which might essential accessing in skilled labour market. The analysis also highlights the importance of more institutions that provide childcare and support of the elderly, because when the care of children and the elderly occurs in the household, then this remains the responsibility of women, and this limits women's ability to participate in the labour market.

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