

THE IMPACT OF THE 2017 ROHINGYA REFUGEE INFLUX ON WOMEN'S LABOR
FORCE PARTICIPATION IN HOST COMMUNITIES

by

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TABLE OF CONTENTS

1. INTRODUCTION	1
2. LITERATURE REVIEW	4
3. BACKGROUND OF COX’S BAZAR.....	9
4. DATA	11
5. EMPIRICAL METHODOLOGY	16
The Selection of Control Divisions.....	16
Labor Market Participation and Economic Activity Trends Among Women in the Host Country	18
Empirical Strategy	26
6. RESULTS.....	31
Rohingya Influx and Women’s Labor Force Participation in Cox’s Bazar.....	31
Married and Unmarried Women	38
Women and Children	42
7. SUPPLEMENTARY ANALYSIS	48
The Connection between Migration and LFP	48
Assessing the Impact of Religious Composition	49
8. DISCUSSION & STUDIES	51
9. CONCLUSION.....	55
REFERENCES CITED.....	57
APPENDIX.....	65

LIST OF TABLES

Table	Page
1. Table 1. Descriptive Statistics of Treatment and Control Group	13
2. Table 2. Economic Activity of Women	20
3. Table 3. Economic Activity of Women with Restricted Sample Size.....	21
4. Table 4. Female Labor Force Participation by Occupation in Percentage.....	23
5. Table 5. Difference-in-Differences Estimates of the Refugee Influx on Women's Labor Force Participation, Formal Employment, NGO Jobs and Business, with Pre-Trend Analysis	33
6. Table 6. Difference-in-Differences Estimates of the Refugee Influx on Men's Labor Force Participation, Formal Employment, NGO Jobs and Business, with Pre-Trend Analysis	36
7. Table 7. Difference-in-Differences Estimates of the Refugee Influx by Marital Status	40
8. Table 8. Difference-in-Differences Estimates of the Refugee Influx by Women with children	43
9. Table A. Difference-in-Difference Estimates of the Refugee Influx on Women's Labor Force Participaation, Formal Employment, NGO jobs and Business with Household Fixed Effects	66

LIST OF FIGURES

Figure	Page
1. Figure 1. Map of Bangladesh.....	10
2. Figure 2. Map of Chittagong Division along with the districts	17

ABSTRACT

This study explores how the 2017 Rohingya refugee influx influenced host community women's involvement in the labor market in Cox's Bazar, Bangladesh. Using nationally representative panel data from the Bangladesh Integrated Household Survey (BIHS) for the years 2012, 2015, and 2018, this study compares changes in economic activity among women in Cox's Bazar before and after the refugee influx compared to women in the surrounding region who were not directly impacted by the arrival of refugees. The analysis only focuses on women in the working age group from 16 to 59 years old and applies a difference-in-differences methodology. The treatment group includes women from Cox's Bazar, while the control group consists of women from other districts in the Chittagong division. Differential impacts by marital status and number of children in the household are also examined in this analysis. The results show that women's labor force participation in Cox's Bazar increased in 2018 compared to 2015, relative to control districts. The effect was particularly strong among single women and those with young children. Despite these findings, caution is warranted. Pre-treatment data suggest that Cox's Bazar may not have followed parallel labor market trends to control areas, limiting causal claims.

INTRODUCTION

With a population of 179,329,138 people and an area of 147,570 square kilometers, Bangladesh is one of the world's most densely populated countries (Idrish, 2024). Currently, Bangladesh's population density is 3,496 persons per square mile. Despite its high population density, Bangladesh is host to almost 1 million refugees who fled from the neighboring country, Myanmar in the middle of 2017. The majority of these refugees lives in the Cox Bazar's region in the Chittagong division of Bangladesh, which includes to the world's largest refugee camp. (UNHCR, 2024).

The government of Bangladesh refers to the Rohingya as Forcibly Displaced Myanmar Nationals (FDMN), who have been in Bangladesh since August 2017 after fleeing Myanmar (Mohiuddin, 2023). The Rohingya, a predominantly Muslim ethnic group that has resided in Buddhist-majority Myanmar for centuries, have faced decades of persecution. After Myanmar gained independence in the 1940s, the plight of the Rohingya worsened, culminating in the 1982 Citizenship Law that officially excluded the Rohingya from citizenship (UNHCR 2017). On August 25, 2017, Myanmar's military launched a brutal crackdown, forcing over 700,000 Rohingya to flee to neighboring Bangladesh. An estimated 10,333 Rohingya entered Bangladesh per day between that date and October 20, 2017 (UNOCHA 2017). However, the refugee influx did not end there. Rohingya people have continued to seek refuge in Bangladesh, and by the end of 2023, Bangladesh was hosting over 2.6 million Rohingya refugees (UNHCR, 2024). It is estimated that women and girls represent 76% of the Rohingya population that fled to Bangladesh (Hutchinson, 2018). Most of them have been victims of various forms of gender-based and sexual violence in Myanmar and are applying for asylum in Bangladesh (Chowdhury and Mostafa, 2020).

Humanitarian organizations responded promptly to provide life-saving services to the Rohingya population, while also extending support to the local Bangladeshi host communities, who now find themselves outnumbered 3:1 by the refugees (Rosenbach, 2018). About 150 humanitarian organizations, including both non-governmental organizations (NGOs) and United Nations (UN) agencies, have worked with the Government of Bangladesh (GoB) to provide vital aid to refugees in the camps and the local host communities (Goodman and Mahmood, 2019).

The Government of Bangladesh prohibits most displaced Myanmar nationals, including the Rohingya, from legally working, leaving the camps without permission, or owning property (Rosenbach, 2018; UNHCR, 2013; Zetter & Ruaudel, 2016). Despite these restrictions, Rohingya refugees are predominantly engaged in small businesses and day labor (Hosen & Shahria, 2020; Filipski et al., 2021). Even Rohingya refugee children are often forced into labor, working in small workshops or as domestic workers (Hoque, 2021).

While the existing literature on the Rohingya refugee influx in Bangladesh covers various dimensions including economic impacts, labor market dynamics, wage effects, environmental challenges, and disruptions in education and healthcare, the effects on women's labor force participation in the host community remain poorly understood and insufficiently documented. This study aims to address this gap by examining how the influx of Rohingya refugees has influenced women's labor force participation in the Cox's Bazar, Chittagong division.

The hypothesis driving this research is that there are two potential mechanisms influencing women's labor force participation in the host community. On one hand, despite legal restrictions, many refugee women have reportedly engaged in informal economic activities (UNHCR, 2013), potentially increasing competition in low-skilled sectors and displacing host community women from jobs. On the other hand, the involvement of NGOs and humanitarian agencies (Rosenbach,

2018) has created new training and employment opportunities, targeting both refugee and host community women, which may have empowered host women and enhanced their labor market engagement. Given these opposing forces, the net effect on women's labor force participation remains theoretically ambiguous. This study aims to address the following three key questions, focusing specifically on non-refugee women from the host community in Cox's Bazar: (1) Did non-refugee women's labor force participation in the host community increase or decrease in the Cox's Bazar following the 2017 Rohingya refugee influx? (2) Was there a different impact on married and unmarried women? (3) How does labor force participation differ between women with children and those without in the Cox's Bazar?

Using Bangladesh Integrated Household Survey data from 6,500 households across 325 villages, this study employs a difference-in-differences model by comparing changes between 2015 and 2018 in Cox's Bazar, which was affected by the Rohingya influx, and other areas that were not. The analysis presents several key findings. First, women's participation in the labor force increased in Cox's Bazar following the Rohingya influx relative to changes in the control districts. Second, there is evidence of a differential impact by marital status. The magnitude of the effects of the refugee influx on labor force participation was larger for single women than for married women. Finally, the magnitude of impacts was smallest for women with older children.

While these findings are statistically significant, causal inference should be viewed with caution, as the pre-treatment trends in labor force participation suggest that the parallel trends assumption may not hold. This limits the extent to which we can confidently attribute these changes to the refugee influx.

LITERATURE REVIEW

The economic interactions between host communities and refugees have been the focus of extensive research in countries such as Tanzania (Garcia, 2010), Uganda (Omata, 2013), Kenya (Betts, 2019a), Rwanda (Alloush, 2017), Ethiopia (Betts, 2019b; Omata, 2019), among others. Evidence from Uganda and Kenya highlights that refugee presence can positively impact host communities by enhancing local markets, trade networks, and service sectors. However, studies from Uganda also note occasional competition in low-skilled labor markets and small businesses within the host community due to the refugee influx. Nevertheless, it is important to note that while these studies highlight economic interactions between refugees and host communities, they do not specifically examine labor force participation outcomes.

Specifically focusing on the Rohingya refugee crisis in Bangladesh, several studies have examined its multifaceted impacts on host communities. The influx of Rohingya refugees indeed poses an economic burden (László, 2018). Studies have explored the dynamics between the refugees and host communities, through field engagements and identified various concerns among the local population (Habib, 2023; Ahamed, 2020, Ahmed 2020). In particular, the areas surrounding Cox's Bazar in the Chittagong Division have faced severe challenges, including social, public service provision, environmental, legal, and financial impacts (Habib, 2023). Even education and healthcare services were disrupted for the local population (Habib, 2023; Khuda, 2020). Cox's Bazar, known as one of the largest sea beaches in the world and a major tourist destination, has been a cornerstone of the local economy. Many residents who depend on tourism have been profoundly affected, as the Rohingya crisis has had a devastating impact on the tourism industry (Dey, 2017).

The economic dimension of refugee inflows has been widely discussed in the literature, with studies outlining both the expansionary benefits and the labor market pressures experienced by host communities (Verme, 2023). From an economic standpoint, the inflow of refugees could contribute to an increase in a country's gross domestic product (GDP) and household earnings. The rise in population, combined with foreign aid and government spending, tends to boost local demand for goods and services, encouraging greater production and sales. Nevertheless, an outward shift in the labor supply can reduce wages and employment of native workers. Although formal work opportunities for refugees are restricted, refugee participation in informal labor markets (day laborers in construction and agriculture, domestic workers, waste collectors), for lower wages can reduce labor costs for employers and increase competition for jobs, especially those that require little education or prior training. Employers and business owners, including landlords, entrepreneurs, producers, and suppliers might experience increased earnings due to the rise in refugee population. These effects are commonly referred to as the expansionary impacts of refugee inflows (Verme, 2023).

Several studies suggest that an increase in refugee arrivals can negatively impact host countries' labor markets. The impact of refugee influxes on host communities labor markets, including employment and wages, has been extensively studied in countries such as Jordan (Fallah, 2019; Malaeb, 2018), Turkey (Esen, 2017), Bangladesh (Habib, 2023; Idrish, 2024) and many more. Refugee arrivals often lead to increased competition in the labor market, resulting in decreased wages and employment opportunities (Habib, 2023; Idrish, 2024). In some cases, the influx has contributed to a decline in formal sector employment (Esen, 2017) while simultaneously increasing employment in the informal sector (Malaeb, 2018). However, the labor market effects of refugee influxes are not universally negative or severe. For example, studies in Jordan indicate

that Jordanians living in areas with a high concentration of refugees have not experienced worse labor market outcomes compared to those with less exposure to the influx (Fallah, 2019). Nonetheless, these significant disruptions in the labor market have created economic challenges for local households, intensifying their financial vulnerabilities (Filipski, 2019; Ahmed, 2020).

Other studies indicate that refugee influxes can also bring economic benefits to host communities. Despite an additional strain on resources, the arrival of the refugees also likely generated economic opportunities for the local population (Maystadt, 2014). The refugee influx boosted demand for local goods and services, prompting job creation in sectors like transportation and e-voucher shops, with financial aid commitments supporting settlement efforts and economic opportunities for host communities (Rosenbach, 2018; Khuda, 2020). An examination of household assets suggests positive wealth effects of refugee camps on nearby rural households (Garcia, 2010). Moreover, host communities with greater refugee presence have experienced substantial improvements in local development (Zhou, 2023).

In addition to these broader economic benefits, several studies have explored how refugee inflows have positively impacted labor force participation in host communities. For example, in Turkey, the influx of Syrian refugees led to a slight increase in formal employment among men, driven by the increased presence of organizations providing services such as health, education, and childcare for refugees, which created formal job opportunities for native workers (Ceritoglu, 2017). Similarly, in countries like Ethiopia and Uganda, increased demand from refugees modestly boosted employment in sectors like agriculture, creating economic opportunities for the host labor market (Goltz, 2024). Other studies indicate that as refugees primarily enter the informal sector at low costs, generating a significant supply shock, this reduction in labor costs enables firms to expand production, increasing demand for formal labor and offering displaced native workers

opportunities to transition into more stable, formal employment (Del, 2015). Additionally, refugees attract nonprofit organizations that create employment opportunities by encouraging entrepreneurship, enhancing retail and distribution capacity, and supporting market development for host communities through various programs (Betts, 2019a).

Studies of the Rohingya influx also mention that despite the restrictions on movement and work, the areas where the Rohingya live are the sites of numerous economic activities, including work for men and women (Filipski et al., 2021). However, the existing literature largely overlooks the specific influence of the influx on women's labor force participation in host communities, except for a brief mention that the labor market has contracted for local Bangladeshi women in areas surrounding the refugee camps (Idrish, 2024). This highlights a significant gap in understanding the unique labor market challenges faced by women in these host communities and the potential role of NGOs that provide refugee services to also increase employment opportunities for women in host communities. Thus, the effects of the Rohingya refugee influx in Bangladesh on women's labor force participation warrants further investigation.

In Bangladesh, women's labor force participation is significantly shaped by socio-cultural and religious norms, often overriding economic need or educational attainment. In Bangladesh, family culture is a more significant determinant of female labor force participation than education or economic need (Chaudhury, 1979). Additionally, Bangladesh, as a predominantly Muslim country, often imposes restrictions on women's mobility outside the home and their participation in activities involving interaction with unrelated men. Since Muslim-majority societies have social judgments or prejudices against women in the workplace, it is often difficult for women to find work or establish their careers (Sordellini, 2009; Jayachandran, 2021; Khatoon, 2024). Barriers such as limited access to education and vocational training, early marriage, and patriarchal social

norms within the household further discourage women's entry into the workforce (Rahman, 2013; Mahmud, 2016). A lack of gender-responsive workplace facilities such as proper sanitation and childcare support, combined with an unsafe and male-dominated public transport system, continues to pose significant barriers to women's participation in the labor force (Khatun, 2018). These insights provide a foundation to understand how unique situations, such as the Rohingya crisis, might interact with pre-existing societal norms and labor market conditions to shape women's economic engagement.

BACKGROUND OF COX'S BAZAR

Cox's Bazar (Chittagong Division) is one of the smallest districts in Bangladesh, covering 2,491.9 km², or 1.7% of the country's total area. As of 2022, the population of Cox's Bazar constitutes only 1.64% of the total population of Bangladesh, whereas the entire Chittagong Division accounts for 19.36% of the population. The percentage of men in Cox's Bazar stands at 55.6%, which is significantly higher than the national average of 50.1% (Banglapedia).

As of 2018, the labor force participation rate (LFPR) in Cox's Bazar as a whole is estimated to be 54.8% (UNDP, 2018), about 6 percentage points lower than the national average of 60.8% (BBS, 2018) and also lower than the Chittagong Division average of 51.1%. In Cox's Bazar, as in all other districts in Bangladesh, agriculture remains the primary source of income. However, the people of Cox's Bazar have limited opportunities for agricultural production and cultivation due to a shortage of arable land. Approximately 60% of the land in Cox's Bazar is either forest area or otherwise unusable for agriculture, compared to 40% nationally (BBS, 2017). Similarly, in the Chittagong Division, 61% of the land is classified as either forest or agriculturally unusable. This may be one of the contributing factors to the lower labor force participation rate in Cox's Bazar. In addition to land-related limitations, low levels of educational attainment are another important factor. Cox's Bazar lags behind most other districts in terms of education. The adult literacy rate in Cox's Bazar is only 48%, compared to the national average of 69% (UNDP, 2018).

However, despite limited opportunities in agriculture, many residents rely on the tourism industry for income. Cox's Bazar, home to the world's longest natural sea beach, and major tourist attraction in Bangladesh, generating significant employment in sectors like hotels, restaurants, and transportation (Inspira, 2024)

Figure 1. Map of Bangladesh



Source: Migration Policy Institute, 2024

The map shows the international borders of Bangladesh with its neighboring countries. The district of Cox's Bazar, located in the southeast, shares a border with Myanmar. The star symbol marks Dhaka, the capital city of Bangladesh.

DATA

To assess the impact of the 2017 Rohingya refugee influx on female labor force participation, this study utilizes the microdata from the Bangladesh Integrated Household Survey (BIHS). It is a nationally representative panel dataset that covers rural Bangladesh across all seven administrative divisions.¹ The BIHS was conducted by the International Food Policy Research Institute (IFPRI) with funding from the United States Agency for International Development (USAID). It follows the same households over time throughout three survey waves: the first in 2011/12, the second in 2015, and the third in 2018, shortly after the refugee crisis. The dataset provides detailed information on 6,500 households across 325 villages. The dataset does not include the Rohingya refugee people. It only surveyed the host community people.

The interviews cover a wide range of topics concerning rural living conditions, including household and individual incomes, employment, housing, social relations, early marriage, health and nutrition, sanitation and water, women's mobility and decision-making status, and other characteristics. This dataset has been widely utilized for economic research on rural Bangladesh. Key areas of study include food consumption and dietary patterns (Sununtnasuk, 2014; Sununtnasuk, 2017; Hazrana, 2024) and agricultural practices (Alam, 2023), rural income dynamics (Iqbal, 2023), women's labor force participation following economic shocks (Ehsan, 2020), women's empowerment within the agricultural sector (Sraboni, 2013; Seymour, 2017; Anik, 2021), and the intersection of women's empowerment and nutritional outcomes (Holland, 2019; Rasha, 2022).

¹ Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur, and Sylhet.

As this study focuses exclusively on women and their labor force participation, the sample includes only women who are in the working-age group, specifically those aged 15 to 59 years. The sample has women who are actively participating in the labor force, either in the formal or informal sectors; those who are not working but earn money from sources such as house rent, shop rent, bank interest, pensions, or remittances; and individuals who are not engaged in any economic activity and do not have any source of income.

The analysis focuses on the period 2012–2018. The attrition rate of women of working age from the sample between 2015 and 2018 was 8.1% for the treatment group Cox’s Bazar, (68 of the 74 women in the 2015 survey were also surveyed in 2018, while 6 were dropped from the sample as they had reached the age of 60 or older by 2018). In the control group, the attrition rate was 10.3% (763 of the 851 women surveyed in 2015 sample were also surveyed in 2018). The overall sample size in 2018 was larger than in 2015 due to the inclusion of new entrants, including those who were below the age threshold in 2015 and turned working age by 2018.

Treatment and district fixed effects in the analysis are assigned based on the district where each individual was first surveyed in 2012. Even if a woman moved from a treatment area to a control area or the reverse, she is still associated with her original district. Because of this, a woman’s decision to migrate between areas does not change her treatment or control status in the analysis.

The treatment group in this study consists of women from Cox’s Bazar District, which falls under the Chittagong division in 2018. This region was directly impacted by the Rohingya refugee influx following the mass migration in August 2017. In the aftermath of the influx, numerous refugee camps were established, eventually forming a network of over 30 camps. This development led to the creation of the largest refugee settlement in the world, housing over

600,000 inhabitants (ISCG, 2018). Cox's Bazar 2015 serves as the pre-treatment baseline for the same region, allowing for a comparison of outcomes before and after the intervention. The control group consists of women from the other districts of the Chittagong division.

This analysis includes summary statistics for key subgroups, including share of women with children, women with younger children, married women, and single women, education categorization. Here, pre-treatment and post-treatment is the Cox's Bazar area from 2015 and 2018, where the control group is the Chittagong division excluding Cox's Bazar.

Table 1. Descriptive Statistics of Treatment and Control Group

	Chittagong Division (Excluding Cox's Bazar)		Pre-Treatment (Cox's Bazar 2015)	Post-Treatment (Cox's Bazar 2018)
	Mean 2015	Mean 2018	Mean 2015	Mean 2018
<i>Household Characteristics</i>				
Household Size	4.51 (1.74) 868	4.88 (1.93) 787	4.32 (1.79) 77	4.61 (1.85) 72
Youth Ratio	0.457 (0.498) 1234	0.473 (0.499) 1281	0.433 (0.495) 97	0.440 (0.496) 100
Avg number of children	2.11 (1.31) 1553	2.14 (1.38) 1408	2.42 (1.53) 149	2.69 (1.31) 127
<i>Individual Characteristics</i>				
Education				
▪ Less Than Primary School	0.395 (0.489)	0.347 (0.476)	0.557 (0.499)	0.510 (0.502)
▪ Primary School	0.352 (0.478)	0.350 (0.477)	0.268 (0.445)	0.280 (0.451)

Table 1. Continued

▪ Less Than High School	0.201 (0.401) <i>1234</i>	0.233 (0.423) <i>1281</i>	0.103 (0.306) <i>97</i>	0.110 (0.314) <i>100</i>
▪ High School	0.045 (0.207)	0.059 (0.220)	0.062 (0.242)	0.090 (0.288)
▪ Higher Education	0.007 (0.085) <i>1234</i>	0.011 (0.104) <i>1281</i>	0.010 (0.012) <i>97</i>	0.012 (0.011) <i>100</i>
Married Women	0.767 (0.378) <i>1234</i>	0.731 (0.403) <i>1281</i>	0.660 (0.474) <i>97</i>	0.670 (0.470) <i>100</i>
Marital Age	17.2 (2.68) <i>947</i>	17.7 (3.25) <i>937</i>	17.6 (2.26) <i>64</i>	18.0 (2.42) <i>67</i>
Age	33.0 (12.1) <i>1234</i>	32.2 (12.1) <i>1281</i>	33.6 (12.4) <i>97</i>	33.4 (12.5) <i>100</i>
Muslim Women	0.939 (0.239) <i>1234</i>	0.945 (0.227) <i>1281</i>	0.670 (0.470) <i>97</i>	0.720 (0.470) <i>100</i>

Notes: The standard deviations are in parentheses and number of observations in italics. The sample only includes females 16-59 (both active and non-active in the labor force). The control group includes individuals in all districts of the Chittagong Division except Cox's Bazar.

It is important to note that the sample size for Cox's Bazar is much smaller, only 97 observations in 2015 and 100 in 2018 compared to over 1,200 in the control group each year. This smaller sample may affect the accuracy of the estimates, especially for less common types of work.

Table 1 shows that in 2015, household size in Cox's Bazar (4.32) is slightly smaller than in other areas of the Chittagong division (4.51). A similar trend is observed for the youth ratio in Cox's Bazar. In this analysis, individuals aged 16 to 25 are classified as youth, and those aged 26 and above are classified as adults. On the other hand, the average number of children and adult ratio is higher in the Cox's Bazar compared to the Chittagong division. In terms of education, the

proportion of women with less than primary education, high school and higher education is more pronounced in Cox's Bazar compared to the control group.

The classification of marital status consists of two categories: married and single, where the single category includes a small proportion of divorced and widowed women. From the summary statistics, it is evident that the majority of women in both groups are married. The average marital age and overall age is similar in both groups in 2015. In terms of religion, Muslims constituted the majority in both groups, but the proportion of Hindus was notably higher in Cox's Bazar (33.0%) compared to Chittagong (6.1%).

Comparing trends from 2015 to 2018, household size and average number of children increased in both treatment and control groups. However, the average number of children in Cox's Bazar increased by 0.27%, whereas in the control group, it increased by only 0.03%. In terms of the individual characteristics, the share of married women decreased in Chittagong division by 0.36%, while in Cox's Bazar, it is slightly increased by 1%.

EMPIRICAL METHODOLOGY

This paper aims to examine the impact of refugee inflows on women's labor force participation in the host country. To achieve this, I first describe (i) the selection of control divisions, (ii) female labor force participation and economic activity in the host country, and (iii) the empirical model.

The Selection of Control Divisions

To examine the impact of the Rohingya refugee influx on women's labor force participation, formal employment, and NGO job participation, it is essential to define appropriate treatment and control groups for the analysis. A treatment group refers to the area directly affected by the shock in this case, Cox's Bazar. For a control group to be a valid comparison, it must have similar characteristics in terms of demographics, economic activities, cultural norms, and social structures as these characteristics are suggestive that the treatment and control would have followed the same trends absent the refugee influx. Most importantly, both groups should have followed a similar or parallel trend in the outcome variables before the refugee crisis to indicate that they would have likely continued on parallel trends apart from the treatment shock.

Based on these considerations, the analysis focuses only on the Chittagong division. Here, Cox's Bazar district is defined as the treatment group, and the other districts of the Chittagong division are considered as the control group. One thing to be noted that, apart from Cox's Bazar, other districts haven't experienced the refugee influx. In the dataset, there are five districts² from the Chittagong division. Therefore, apart from Cox's Bazar, the other four districts are selected as

² Chittagong, Cox's Bazar, Noakhali, Bandarban, and Chandpur.

the control group. All of these districts belong to the same administrative division, and Chittagong itself is a relatively small area. A map of the Chittagong division is provided below, which shows all the districts included in the sample. In such a case, it is most likely that they share similar demographic characteristics, economic activities, and cultural norms, making them a suitable comparison group relative to other divisions in the country. As shown in Table 1, the summary statistics indicate comparable household size, youth ratio, marital status, and educational attainment between the treatment and control groups prior to the refugee influx. With this consideration, the treatment and control groups have been selected accordingly.

Figure 2. Map of Chittagong Division along with the districts



Source: Wikitravel, 2022.

The map highlights the districts from which the data has been collected. The marked areas represent the treatment and control groups used in the analysis. Cox's Bazar serves as the treatment group, while Chittagong, Bandarban, Chandpur, and Noakhali serve as the control group districts.

However, to further ensure the suitability of this selection, the summary statistics presented in Table 1 can be revisited here. From the table, it can be observed that, prior to the refugee influx, the treatment and control districts exhibited similar patterns in key indicators such as household size, average age, and average number of children. Additionally, Summary Table 2 indicates that women's economic activity was also comparable between Cox's Bazar and the other districts of the Chittagong division before the refugee crisis. These findings provide additional justification for the selection of the control group and reinforce the credibility of the analytical framework.

Labor Market Participation and Economic Activity Trends Among Women in the Host Country

The dataset is unique in that it uses specifically designed questions for each respondent to capture people's economic actions in a comprehensive manner. It explicitly inquires whether individuals are currently employed, work seasonally, or engage in economic activities within or outside their homes. Additionally, it assesses whether individuals are engaged in formal employment, meaning they receive a fixed monthly salary, or in informal work. Beyond direct employment, it includes questions regarding alternative income sources such as rent, pensions, or financial assistance.

Based on their response, females aged 16 to 59, identified as the working-age group, are categorized into three distinct groups based on their economic activity and income status. The first category comprises those actively participating in the labor force, either in a formal or informal capacity, representing individuals engaged in economic activities contributing to the labor market.

The second category includes individuals who are not formally part of the workforce but still earn income through sources such as rent, bank interest, pensions, or remittances. Lastly, the third category consists of those not engaged in any economic activity and without any source of income, reflecting a segment entirely detached from the labor market.

In this study, labor force participation (LFP) refers to all individuals who participate in economic activity encompassing both formal and informal engagement. This includes individuals engaged in salaried employment, self-employment, or daily wage-based activities such as service workers or artisans. Individuals who are not actively working but earning income through other sources and individuals who are not working and earning any income are also included in the labor force under the categorization.

Table 2 presents the economic activity of women aged 16–59 across the control areas and Cox’s Bazar during the pre-treatment (2015) and post-treatment (2018) periods. It is observed that in 2015, 50.6% of women in the control group were in the labor force, whereas in Cox’s Bazar, this figure was 38.1%. This indicates that the labor force participation of women was already 12.5 percentage points lower in Cox’s Bazar compared to the control group. Additionally, the proportion of women who were not in the workforce and had no other source of income was higher in Cox’s Bazar compared to the control group.

After the refugee influx in 2018, labor force participation among women decreased in the control group to 42.2%, while it increased in Cox’s Bazar to 40%. This reflects a 6.9 percentage point decline in labor force participation in the control group and a 1.9 percentage point increase in Cox’s Bazar. Conversely, the proportion of women not in the workforce and without any income increased in the control divisions but decreased in Cox’s Bazar from 2015 to 2018.

Table 2. Economic Activity of Women

	<i>Control Districts</i>		<i>Cox's Bazar</i>	
	Mean 2015	Mean 2018	Mean 2015	Mean 2018
In workforce	0.506 (0.485)	0.422 (0.494)	0.381 (0.486)	0.400 (0.490)
Not working but earning income	0.143 (0.232)	0.167 (0.297)	0.216 (0.412)	0.250 (0.490)
Not in workforce & no earning	0.351 (0.467)	0.411 (0.471)	0.402 (0.490)	0.350 (0.477)
<i>Number of Observations</i>	<i>1234</i>	<i>1281</i>	<i>97</i>	<i>100</i>

Notes: Standard deviations are in parentheses and number of observations in italics.

In table 2, the changes in labor force participation and income status may partially reflect differences in the composition of women surveyed in 2015 and 2018, as some women dropped out and new individuals entered the sample. To address this, I create a balanced sample that includes only women who are present in both years. This allows us to observe whether the changes in outcomes are driven by the same individuals over time, rather than by new participants who may have different characteristics or economic status.

The outcomes shown in Table 3 are very similar to those in Table 2. Cox's Bazar women's labor force participation was still 10 percentage points lower than that of the control districts in 2015. In Cox's Bazar, labor force participation increased by 2.8 percentage points after the refugee explosion, and the percentage of women who were not in workforce and not earning fell by 4.8 percentage points. This suggests that restricting the sample to only women who were present in both years does not significantly alter the findings, indicating that changes in economic activity are not primarily driven by sample composition effects.

Table 3. Economic Activity of Women with Restricted Sample Size

	<i>Control Districts</i>		<i>Cox's Bazar</i>	
	Mean 2015	Mean 2018	Mean 2015	Mean 2018
In workforce	0.527 (0.499)	0.446 (0.497)	0.427 (0.466)	0.455 (0.495)
Not working but earning income	0.142 (0.349)	0.173 (0.379)	0.253 (0.495)	0.284 (0.451)
Not in workforce & no earning	0.331 (0.471)	0.380 (0.485)	0.320 (0.435)	0.261 (0.472)
<i>Number of Observations</i>	<i>1125</i>	<i>1125</i>	<i>75</i>	<i>75</i>

Notes: Standard deviations are in parentheses and number of observations is in italics.

Following the analysis of economic activity and income status in Table 2, Table 4 provides a more detailed breakdown of female labor force participation by occupation across pre-treatment and post-treatment periods for both the treatment and control groups.

The categorization of occupations is structured to capture both formal and informal economic activities. Crop production is divided into two subcategories: formal employment, where individuals are hired to work in agricultural fields for a fixed hourly wage, and self-employment, where women cultivate crops on their own land for income. Livestock and poultry farming is a form of self-employment, and mostly housewives are engaged in this work. Business activities are exclusively self-employment-based, encompassing roles such as large traders (owners of wholesale businesses), medium traders (operators of medium-sized shops), small industry owners (proprietors of small-scale manufacturing units), and small traders (operators of roadside stands or stalls). These categories reflect entrepreneurial efforts among women in rural areas.

Education includes women employed as teachers in primary schools, high schools, colleges, and universities, while salaried employees comprise professionals such as doctors,

lawyers, private company employees and all of whom hold formal employment positions. The domestic service sector is further divided into formal and informal categories. Formal domestic service includes structured positions with fixed monthly salaries, such as housemaids, drivers, factory workers, tea garden workers and transport workers. Informal domestic service, on the other hand, comprises workers offering services without fixed contracts or salaries, including tailors, midwife, sweeper, mechanics, and rickshaw pullers, who typically work on a need-based system.

Finally, NGO jobs are employment opportunities established through NGO activity, which rose in Cox's bazar after the arrival of the refugees. Since most of the refugees were women and children, many NGOs prioritized hiring and supporting women through tailored programs and employment opportunities (Das, 2024). NGOs hired salaried employees or officers, domestic service workers, and artisans whom the NGOs typically trained to help the refugees learn to make handcrafted goods to distribute through NGO channels. Since the NGOs hired a variety of workers and likely provided new and unique opportunities in Cox's Bazar, for this analysis, I group together women who report that they work for an NGO, who are employed as domestic workers, and artisans under the category "NGO employment".

Table 4 highlights notable changes in employment patterns among women in Cox's Bazar between 2015 and 2018 compared to the control districts. In 2015, the majority of women in the workforce were engaged in poultry farming in both groups. However, the proportion was much lower in Cox's Bazar (26.8%) compared to the control group (38.4%). The second highest occupation was business, with 2.35% of women engaged in business activities in the control group, while 6.19% of women in Cox's Bazar were involved in business. However, in 2015, there were very few women in the control group working in domestic service, NGO jobs, education, whereas no women in Cox's Bazar were engaged in these occupations at that time.

Table 4. Female Labor Force Participation by Occupation in Percentage

	<i>Control Division</i>		<i>Pre-Treatment Cox's Bazar</i>	<i>Post-Treatment Cox's Bazar</i>
	2015	2018	2015	2018
Crop Production				
➤ Day Labor	0.486	1.540	0.000	0.000
➤ Self-Employee	0.625	2.576	2.062	2.000
Livestock/Poultry	39.222	29.899	26.804	24.000
Business	2.350	2.732	6.186	3.000
Education	0.243	0.234	0.000	0.000
Salaried Employee	0.810	0.781	2.062	1.000
Government Job	0.486	0.546	1.031	1.000
NGO				
➤ Salaried Employee	3.485	2.420	0.000	2.000
➤ Domestic Service	0.000	0.000	0.000	3.000
➤ Artisans	0.000	0.000	0.000	4.000
Domestic Service				
➤ Formal	0.810	0.390	0.000	0.000
➤ Informal	0.000	0.937	0.000	0.000
Not working, but receive Income from Other sources	14.263	16.706	21.649	25.000
Not working and no personal income sources	35.089	42.155	40.206	35.000
Observations	1234	1281	97	100

In 2018, there were some interesting occupational changes in Cox's Bazar. By 2018, both treatment and control experienced a decline in participation in livestock and poultry farming. In

the control group, the decline was approximately 10%, whereas in Cox's Bazar it was only 2.8%. This represents a decline of just a few women in Cox's Bazar.

In contrast, while the business sector saw an increase in other areas of Chittagong division in 2018, it declined more than 3% in Cox's Bazar after the refugee influx. In general, the business sector in Cox's Bazar has traditionally been more active compared to other regions in the Chittagong division, largely because of its status as a tourist hub and the world's longest sea beach (Dey, 2013). The strong tourism industry created numerous business opportunities, especially for small and medium-scale traders operating around the beach area, including food vendors, flower carts, seafood stalls, and souvenir shops (Islam, 2020). However, after the refugee influx, the situation changed considerably. The rising concerns over safety, crime, and instability discouraged tourists from visiting the area, leading to a decline in tourism-related businesses (Islam, 2020). Small and medium traders also faced increased competition following the arrival of refugees. Rohingya people often sold their aid products such as rice, lentils, vegetable oil, and sugar on the black market at significantly lower prices than those in local markets, which disrupted market stability. As a result, many local shops were forced to shut down due to the lack of buyers (Alsaafin, 2018).

Interestingly, in 2018, women in the control group showed less interest in NGO jobs, whereas in Cox's Bazar, participation in NGO jobs increased by 9%. This increase includes several categories of work that emerged or expanded through NGO support. Artisan activities increased by 4% and these were entirely supported and organized through NGOs. In addition to supporting the Rohingya community, international and local organizations extended support to the host community as well. Women from the local population received various types of training, including sewing face masks, producing handicrafts, tailoring based on color palettes and market demand,

and crocheting. Also, these trainings are conducted by local women themselves. These initiatives likely contributed to the rise in employment in NGO sectors (Oxfam, 2022). Domestic service under the NGO category has increased by 3%. The growing presence of NGOs has also generated employment opportunities in support roles such as drivers, tailors, office cleaners, and cooks after the refugee influx (Alsaafin, 2018). Since all these roles were either directly employed by or made possible through NGO interventions, they are collectively included under the NGO job category.

Overall, unemployment in Cox's Bazar decreased from 40.2% to 35% after the refugee influx, whereas in the control group, the same category increased from 38.7% to 41.3%. One possible explanation is the significant role of NGOs in influencing the labor market dynamics within the host community (Alsaafin, 2018). An increase was also observed in the category of 'not working but earning' across both the treatment and control areas. This category refers to individuals who do not participate in the labor force but report income from sources such as pensions, house rent, or remittances. This trend may be explained by a rise in remittance inflows from family members working abroad. Remittance remains one of the most significant income-generating sectors in Bangladesh. According to government statistics, Bangladeshi workers have taken approximately 16.1 million short-term labor contracts in 164 countries from 1976 through 2023. As international labor migration has expanded, remittance inflows have also grown from USD 12.8 billion in 2013 to USD 18.4 billion in 2019. This increase in external income sources may explain the rise in non-working individuals, particularly women, reporting earnings in the dataset (Farhana, 2024).

Empirical Strategy

In this thesis, I apply a difference-in-differences methodology to estimate the impact of the refugee influx on female labor force participation in the host area Cox's Bazar. Specifically, I compare the changes in the outcome of interest women's labor force participation between the treatment and control groups during the pre-treatment and post-treatment periods. For the purpose of this analysis, labor force participation is coded as a binary outcome variable, where 1 indicates women who are engaged in salaried employment, self-employment, or daily wage-based activities such as service work or artisan tasks, and 0 represents women who are either not actively working but earning income from other sources or not working and not earning any income.

The identification assumptions are twofold: First, labor force participation trends for the treatment and control groups would have been the same in the absence of the refugee influx. Second, there were no other contemporaneous events during the implementation of the refugee influx that could have differentially impacted labor force participation between the two groups.

A typical standard linear specification of the diff-in-diff model is represented in equation (1).

$$\begin{aligned}
 LFP_{idt} = & \alpha + \beta_1 Cox'sBazar_d + \beta_2 Year_2018_t \\
 & + \beta_3 Cox'sBazar_d * Year_2018_t + \delta X_{idt} + \epsilon_{idt}
 \end{aligned}
 \tag{1}$$

The outcome variable LFP_{idt} is a binary indicator taking the value 1 for individual i in district d and year t who is working and the value 0 if not working. The model includes the indicator variable $Cox'sBazar$ that takes the value 1 for the individuals who lived in *Cox's Bazar* in 2012 and 0 otherwise. $Year_2018$ is an indicator variable for year 2018 (post-treatment) and X_{idt} is a

vector of individual and household-level controls. Individual controls include age, educational level, marital status, and marital age. Household-level controls include household size and youth-to-adult ratio.

Secondly, I aim to control for unobserved heterogeneity across districts that might influence women's labor force participation but remain constant over time. To achieve this, I modified Equation 1 and incorporated district fixed effects and time fixed effects in Equation (2).

$$LFP_{idt} = \alpha + \beta_1 Cox'sBazar_d * Year_{2018_t} + \gamma_d + \partial_t + \delta X_{idt} + \epsilon_{idt} \quad (2)$$

In equation (2), γ_d absorbs all unobserved, time-invariant characteristics of districts that might affect labor force participation. In my sample, there are only 5 districts. Although using only five clusters may raise concerns, it is still widely used in applied research if the limitation is acknowledged (DeHaan, 2020). Therefore, I report standard errors clustered at the district level with transparency about the small number of clusters. And ∂_t are the time fixed effects which account for unobserved factors that may vary over time but are constant across districts.

Then, I conduct a pre trend analysis. This is done by analyzing data from the pre-treatment period, data from 2012 and 2015. The hypothesis is that, in the absence of the refugee influx, it is expected that Cox's Bazar, the treatment group, would have followed a similar trend in female labor force participation as the control group, as well as its own pre-treatment baseline in 2015. An additional hypothesis is that if the pre-trends are similar, any observed differences that are noticed after 2015 are probably due to the refugee influx rather than pre-existing differences between the groups. The potential model for this is represented in equation (3).

$$LFP_{idt} = \alpha + \beta_1 Cox'sBazar_d * Year_2012_t + \beta_2 Cox'sBazar_d * Year_2018_t + \gamma d + \partial_t + \delta X_{idt} + \epsilon_{idt} \quad (3)$$

In Equation (3), 2015 is the reference year. β_2 is the coefficient of interest that represents the interaction term between being in Cox's Bazar and the year 2018. This means that β_2 captures the specific impact of the refugee influx on women's labor force participation in Cox's Bazar in 2018, compared not only to the control groups but also to Cox's Bazar in 2015. If β_2 is negative and statistically significant for labor force participation (LFP), it suggests that women in Cox's Bazar were less likely to participate in the workforce in 2018, likely due to the challenges brought on by the refugee influx. On the other hand, if β_2 is positive and significant for labor force participation, it indicates that women in Cox's Bazar had greater job opportunities in these sectors after the refugee influx.

On the other hand, β_1 is critical for the pre-trend analysis. It represents the interaction between being in Cox's Bazar and the year 2012, which is before the refugee influx. If β_1 is not statistically significant, it means there was no major difference in trends in labor force participation between Cox's Bazar and the control group from 2012-2015 before the refugee influx. This suggests that any changes in 2018 are likely due to the influx and not because Cox's Bazar was already on a different trend. If β_1 is significant, it means there were already differences in labor force participation trends before the refugee influx, which could mean other factors were affecting labor market trends in Cox's Bazar from 2015-2018 apart from the introduction of refugees in the treatment area in 2017. While it is technically possible to test for pre-trends with just one pre-event year, ideally, we would observe more pre-treatment years. When there are too few pre-event periods, it becomes difficult to tell whether any observed differences in trends are meaningful or

due to random variation. There is no strict rule on how many pre-event years are sufficient, but as a rule of thumb three pre-trend observations are generally considered the minimum (Miller, 2023).

I use four empirical models to analyze women's labor force participation in order to capture various aspects of economic engagement. The first model looks at the overall labor force participation (LFP) and shows how different socioeconomic characteristics affect the employment of women. The second model narrows the focus to formal employment, exploring whether women gained access to structured job opportunities post-influx. The third model looks into work in non-profit organizations, which became an increasingly popular way for women to get involved in the economy after the refugee crisis. The fourth model focuses on women's involvement in business activities, assessing how their participation changed before and after the refugee influx.

One interesting finding from the summary statistics in table 3, is that women in Cox's Bazar are increasingly working for NGOs. None of the sampled women reported working for non-profit organizations prior to the refugee crisis. Yet by 2018, 9% of Cox's Bazar's female workforce worked for non-profits. Considering that there were 100 women in the Cox's Bazar sample in 2018, this indicates that only nine of them moved into a nonprofit work. While this may seem like a small number, it does potentially indicate a shift in labor market opportunities. In particular, the presence of local and international NGOs created additional job options for women, which might have affected general trends in economic involvement. This study acknowledges this as a significant trend and examines NGO employment to determine how much the refugee inflow helped to open up new economic opportunities for women in the area.

Another notable finding from the summary statistics is the decline in women's engagement in the business sector in Cox's Bazar between 2015 and 2018. Despite the relatively low total

percentage of women in business, the fall is suggestive of a reduction in entrepreneurial activity, which could be.

To check the robustness of these findings, I also estimate a regression model using household fixed effects. This approach controls for all unobserved, household specific characteristics that remain constant over time, such as cultural norms, family attitudes, geographic location. This is particularly important, as certain household traits may influence both women's likelihood of participating in the labor force and their exposure to the refugee influx. For instance, households with more conservative cultural norms might restrict women's participation in economic activities while also being less likely to interact with refugee-related employment opportunities. Failing to control for such unobserved traits could lead to biased estimates. On average, there are approximately 1.47 working aged women in 2018 per household in the dataset, whereas it was 1.31 in 2015. Therefore, the inclusion of household fixed effects strengthens the difference-in-differences strategy and enhances the credibility of the results.

RESULTS

The results and discussion section has been divided into three categories, as the aim is to analyze labor force participation from different perspectives. Finding the influx's direct and indirect effects on women's economic participation in the area is the primary objective of this investigation. The second category examines the differences in labor force involvement between women in the Cox's Bazar division who have children of different ages or none at all. This section explores how women's engagement with economic activities may be impacted by parental responsibilities. In the third category, the effects of women's marital status on labor force participation in Cox's Bazar are examined. This involves analyzing whether women who are married, single, or widowed have distinct labor market behaviors and how these trends might have changed in the aftermath of the refugee crisis.

Rohingya Influx and Women's Labor Force Participation in Cox's Bazar

In this section, I present and discuss the results of estimating the difference-in-differences equations (3) to evaluate the impact of Rohingya influx on women's labor force participation, formal employment, NGO job and Business in Cox's Bazar. Table 5 shows the model (3).

Table 5 depicts that the labor force participation in 2012 is statistically significantly higher in Cox's Bazar compared to the control group and 2015. This indicates that pre-treatment period does not satisfy the parallel trends assumption, suggesting that Cox's Bazar was already following a different labor market trend prior to the control group before 2017 refugee influx. As a result, any changes observed in 2018 should be interpreted carefully. The labor force participation increased 10% in Cox' Bazar relative to control group between 2015 and 2018. However, since

the parallel trend assumption is violated in the pre-treatment period, it is not possible to conclusively attribute to post-treatment effect to the refugee influx.

It is noteworthy that the differences in trends between treatment and control groups reversed direction from 2012-2015 and from 2015-2018 in all specifications. The positive coefficient on (Cox's Bazar * Year 2012) indicates that the probability that women in Cox's Bazar participated in the labor force decreased from 2012-2015 relative to the control group, but the positive coefficient on (Cox's Bazar * Year 2018) indicates that labor force participation increased following treatment.

In terms of the formal employment, the interaction term for Cox's Bazar and the year 2012 is also statistically significant. The regression results indicate that the percentage of women engaged in formal employment has increased by 5.9% compared to control group between 2015 and 2018, and this effect is statistically significant.

Regarding NGO employment, the regression coefficient for Cox's Bazar in 2012 is positive and statistically significant. The result implies that women's employment by an NGO fell by 2.7% relative to the control between 2012 and 2015. However, the 2018 coefficient is 0.102 and statistically significant, indicating an increase in NGO employment in Cox's Bazar following the refugee arrival relative to the control group. It is important to note that the sample size is quite small. For instance, only nine women in the 2018 Cox's Bazar sample reported NGO employment. Therefore, even a small number of observations can influence the regression results, which may explain the statistically significant coefficient.

The negative and statistically significant coefficient on the interaction between Cox's Bazar and Year 2012 shows that women's engagement in the business sector increased from 2012-2015 by 10% relative to the control group. However, the participation dropped again between 2015 and

2018. Women's employment in business fell 3.3% in Cox's Bazar after the refugee influx relative to the control group. These findings are statistically significant.

Table 5. Difference-in-Differences Estimates of the Refugee Influx on Women's Labor Force Participation, Formal Employment, NGO Jobs and Business, with Pre-Trend Analysis

	<i>Districts Fixed Effect</i>			
	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
Year 2012	0.028 (0.040)	0.006 (0.025)	-0.025*** (0.075)	0.070*** (0.013)
Year 2018	-0.072* (0.027)	-0.004 (0.008)	-0.009 (0.010)	0.006 (0.061)
Cox's Bazar * Year 2012	0.186*** (0.036)	0.048** (0.019)	0.027*** (0.017)	-0.100*** (0.013)
Cox's Bazar * Year 2018	0.100** (0.030)	0.059*** (0.014)	0.102** (0.025)	-0.033*** (0.060)
<i>Districts</i>				
Cox's Bazar	-0.112*** (0.018)	-0.036** (0.058)	-0.051*** (0.056)	0.018** (0.070)
Chandpur	-0.015 (0.012)	0.009*** (0.039)	-0.009*** (0.015)	0.003 (0.020)
Bandarban	0.175*** (0.060)	0.048*** (0.031)	-0.030*** (0.019)	0.042*** (0.021)
Noakhali	0.085*** (0.031)	-0.012*** (0.021)	-0.006** (0.070)	-0.001 (0.022)
<i>Marital Status</i>				
Single Women	-0.088 (0.057)	0.043** (0.017)	0.019** (0.028)	0.013 (0.032)
Women Married before 16 years old	0.012 (0.028)	-0.007 (0.074)	-0.011 (0.056)	-0.009 (0.051)
<i>Women & Children</i>				
Women with child aged below 5 years old	0.028 (0.037)	-0.006 (0.008)	-0.001 (0.029)	0.013 (0.051)
Women with child aged between 6 to 15 years old	0.069 (0.050)	0.003 (0.004)	0.002 (0.034)	0.012 (0.021)

	<i>Districts Fixed Effect</i>			
	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
<i>Education</i>				
Less than Primary School	0.078 (0.088)	-0.167 (0.117)	-0.092 (0.079)	-0.039 (0.071)
Primary School	0.002 (0.094)	-0.202 (0.126)	-0.091 (0.077)	-0.058 (0.017)
Less than High School	-0.060 (0.091)	-0.207 (0.119)	-0.094 (0.074)	-0.066 (0.020)
High School	-0.022 (0.087)	-0.172 (0.116)	-0.063 (0.056)	-0.023 (0.044)
Age	0.007*** (0.001)	-0.001 (0.035)	-0.001*** (0.016)	-0.001* (0.019)
Youth to Adult Ration	0.003 (0.011)	-0.016 (0.071)	-0.002 (0.029)	0.002 (0.057)
Household Size	-0.012 (0.008)	-0.006* (0.028)	-0.004 (0.068)	-0.005 (0.012)
Muslim Women	-0.025 (0.041)	-0.039 (0.104)	-0.009 (0.040)	-0.068 (0.015)
Constant	0.302** (0.040)	0.316** (0.110)	0.114 (0.071)	0.180*** (0.015)
Observations	3855	3855	3855	3855
R ²	0.115	0.039	0.021	0.039

Note: Standard errors are clustered at the district level. Standard errors are reported in parentheses below the coefficient estimates. ***Significant at 1%; **significant at 5%; *significant at 10%. In this table, districts are compared to the Chittagong district (the reference category). Marital status is based on married women, the women and children category are relative to women with no children, and education is compared to individuals with higher education. Finally, Muslim women are compared with Hindu women only as the sample has only 2 religions.

Most of the control variables were not statistically significant. For example, education categories did not show a significant relationship with labor force participation. This could be due to the inclusion of district dummies, which absorb much of the within-district variation in education levels or simply because the estimates are too noisy due to the small sample size. Higher

youth to adult ratio means that women have more dependents or young adolescents in the household, and they might need supervision and support.

The outcome variables under the household fixed effects specification, show similar results with the main results which shows in the table A1. The coefficient of interest representing the interaction term for Cox's Bazar in 2018, indicates that women were 11.4 percentage points more likely to be in the labor force, compared to women being in Cox's Bazar 2015 and this result is statistically significant. However, the parallel trends assumption remains a concern. For formal employment, NGO jobs, the results under household fixed effects also show positive coefficients in 2018, but these estimates are not statistically significant.

Next, I examine whether the refugee influx had any adverse effects on male labor force participation in contrast to the positive effect I found for women's labor force participation. NGOs were known to hire local women to help with services related to the refugee crisis, and I find evidence that supports an increase in female employment by NGOs. I now investigate whether men were more likely to work for an NGO following the refugee shock. I conducted a Difference-in-Differences (DiD) estimation (Table 6) using the same dataset and model specifications as used for women. However, in this analysis, I restricted the sample to men aged 16 to 59 years old.

The results from table 6 is interestingly different from my original findings for women. First note that men's labor force participation and formal employment in Cox's Bazar decreased from 2012 to 2015 relative to men in the control area. On the other hand, men's engagement in NGO job and business in Cox's Bazar increased from 2012 to 2015 relative to men in the control area. The coefficients on Cox's Bazar interacted with Year 2012 are statistically significant in all specifications, suggesting that Cox's Bazar did not follow a parallel trend for men's labor market outcomes prior to the introduction of refugees.

By 2018, after the refugee influx, men's engagement in Cox's Bazar across all sectors declined relative to the control area. Specifically, men's labor force participation decreased by 5%, formal employment decreased by 11.3%, NGO employment decreased by 11.5%, and business employment decreased by 2.4% relative to simultaneous changes in the control districts. These findings indicate that the refugee influx had a negative impact on male workforce engagement, with all results being statistically significant.

Table 6. Difference-in-Differences Estimates of the Refugee Influx on Men's Labor Force Participation, Formal Employment, NGO Jobs and Business, with Pre-Trend Analysis

	<i>Districts Fixed Effect</i>			
	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
Year 2012	0.093*** (0.019)	-0.072*** (0.020)	-0.073*** (0.017)	0.129*** (0.023)
Year 2018	0.029 (0.030)	0.073*** (0.022)	0.079 (0.039)	-0.026* (0.011)
Cox's Bazar * Year 2012	0.048** (0.018)	0.185*** (0.025)	-0.148** (0.012)	-0.096** (0.022)
Cox's Bazar * Year 2018	-0.050** (0.024)	-0.113*** (0.017)	-0.115** (0.015)	-0.024* (0.011)
<i>Districts</i>				
Cox's Bazar	-0.098*** (0.015)	0.065*** (0.017)	0.167*** (0.011)	-0.043** (0.028)
Chandpur	-0.046*** (0.045)	-0.029** (0.023)	0.008*** (0.011)	-0.040*** (0.041)
Bandarban	0.024* (0.060)	0.035*** (0.032)	-0.017*** (0.015)	0.048*** (0.049)
Noakhali	-0.044*** (0.024)	0.018*** (0.035)	0.028*** (0.025)	0.000 (0.030)

	<i>Districts Fixed Effect</i>			
	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
<i>Marital Status</i>				
Single Men	-0.124*** (0.017)	-0.067** (0.070)	-0.034* (0.011)	-0.002 (0.028)
Men Married before 16 years old	0.049** (0.018)	0.033 (0.032)	0.019 (0.019)	-0.017 (0.019)
<i>Men & Children</i>				
Men with child aged below 5 years old	-0.018 (0.015)	-0.052 (0.030)	-0.048* (0.015)	0.005 (0.025)
Men with child aged between 6 to 15 years old	-0.063 (0.042)	-0.039 (0.040)	-0.054** (0.012)	-0.011 (0.017)
<i>Education</i>				
Less than Primary School	-0.016** (0.057)	-0.170 (0.117)	-0.084 (0.029)	-0.0116* (0.031)
Primary School	-0.006** (0.064)	-0.226 (0.104)	-0.074 (0.031)	0.005 (0.044)
Less than High School	-0.132 (0.062)	-0.316 (0.182)	-0.066 (0.023)	-0.005 (0.031)
High School	-0.122 (0.045)	-0.226 (0.097)	-0.035 (0.036)	0.008 (0.056)
Age	0.000 (0.001)	-0.004** (0.073)	-0.001* (0.056)	0.006** (0.012)
Youth to Adult Ration	-0.037 (0.014)	-0.003 (0.071)	0.002 (0.086)	-0.010 (0.011)
Household Size	0.002 (0.047)	-0.008 (0.022)	-0.001 (0.015)	0.011* (0.050)
Muslim Men	0.015 (0.037)	0.098* (0.044)	0.037* (0.060)	0.015 (0.040)
<i>Constant</i>	0.933*** (0.093)	0.620*** (0.101)	0.207*** (0.038)	-0.001 (0.069)
Observations	3056	3056	3056	3056
R ²	0.0655	0.0507	0.0875	0.0715

Note: Standards errors (clustered at the district level) are reported in the parentheses below coefficient estimates. ***Significant at 1%; **significant at 5%; *significant at 10%. The sample only includes males 16-59 (both active and non-active in the labor force).

These results contrast with what I observed for women in certain sectors, where labor force participation in Cox's Bazar increased in 2018 compared to 2015 following the refugee influx. Significant efforts and resources were directed towards designing programs that addressed women's needs and promoted gender equality, so NGOs hired women (Rahman, 2023). NGOs supported both refugee and host community women by creating safe spaces where they could learn skills such as sewing, handicraft making, literacy, and life skills, along with raising awareness on gender-based violence, child marriage, and social norms (Engler, 2024). Humanitarian organizations primarily focused on improving the lives of women and girls, while there was no evidence of similar initiatives for men. These results may indicate that NGO interventions empowered women, while men, lacking such support, experienced a decline in their workforce engagement after the refugee influx.

Married and Unmarried Women

I next examine the heterogeneous effects of the refugee influx on women's labor force participation by marital status. From the literature review, it is found that in the context of Bangladesh, women's decision to participate in the labor force after marriage is often influenced by their in-laws and family expectations (Khatoon, 2024). Moreover, after marriage, it is customary for women to move in with their in-laws, which sometimes hampers the labor force engagement of women who are already in the workforce, as they may need to leave their previous job due to commuting challenges or relocation issues (Odrika, 2022).

As NGOs were primarily focusing on women through various employment and empowerment initiatives, I was interested to examine whether these interventions had any

differential impact on married and unmarried women. With this thought, the analysis aims to investigate whether the refugee influx and NGO-led initiatives influenced women's workforce engagement differently based on their marital status.

To conduct this analysis, I applied a Triple Difference (DDD) model, which serves as an extension of my main regression analysis. This model allows me to capture the differential effects of the refugee influx on women's labor force participation across marital status groups. The results from this analysis are presented in Table 7.

Table 7 shows that, on average, married women in 2015 were 24.3% more likely to participate in the labor force than single women, with the result being statistically significant. However, when considering formal employment married women were 2.6 percentage points less likely to be employed. The result from 2012 also shows that some of the coefficients are statistically significant prior to the refugee rush which violates the parallel trend assumption.

To interpret the post-influx coefficients from the triple-difference regression model, I calculated marginal effects for each subgroup in 2018 by assigning 0 or 1 to each variable based on the group being analyzed and summing the relevant coefficients. The marginal effect of treatment on single women in Cox's Bazar relative to the single women in the control area is the coefficient for Cox's Bazar in 2018. This means that after the refugee influx, the labor force participation for single women in Cox's Bazar increased by 16.6% compared to the single women in the control area. Similarly, the effect of treatment on married women is the combined result of the coefficient for Cox's Bazar in 2018 and the interaction term for married women in Cox's Bazar in 2018, which is 0.078. This states that after the influx, the labor force participation of married women in Cox's Bazar increased by 7.8% relative to the married women in the control group. As my core interest was to examine the differential effect between married and single women, the

triple difference estimate shows a coefficient of -0.088. It means that the effect of treatment on married women's labor force participation in Cox's Bazar was 8.8% lower compared to single women in Cox's Bazar.

Table 7. Difference-in-Differences Estimates of the Refugee Influx by Marital Status

	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
Cox's Bazar * Year 2012	-0.048 (0.067)	0.114*** (0.021)	0.040* (0.025)	-0.145*** (0.065)
Cox's Bazar * Year 2018	0.166** (0.035)	0.099*** (0.047)	0.201*** (0.037)	-0.120*** (0.017)
<i>Marital Status</i>				
Married Women	0.243*** (0.020)	-0.026*** (0.039)	-0.018 (0.028)	-0.006 (0.087)
Married Women * Year 2012	-0.249** (0.071)	-0.027 (0.058)	0.022 (0.095)	-0.021 (0.015)
Married Women * Year 2018	0.043** (0.076)	0.007 (0.015)	0.019 (0.019)	0.007 (0.020)
Married Women*Cox's Bazar	-0.216*** (0.027)	-0.019** (0.039)	-0.018 (0.029)	-0.084 (0.087)
Married Women*Cox's Bazar*Year 2012	0.308*** (0.149)	-0.114** (0.059)	-0.022 (0.019)	0.059 (0.015)
Married Women*Cox's Bazar*Year 2018	-0.088*** (0.148)	-0.079*** (0.072)	-0.150 (0.016)	0.128 (0.021)
Constant	0.287*** (0.013)	0.061*** (0.011)	0.055*** (0.029)	0.026* (0.011)
Year FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Observations	3895	3895	3895	3895
R ²	0.0605	0.0183	0.0154	0.0281

Note: Standards errors (clustered at the district level) are reported in the parentheses below coefficient estimates. ***Significant at 1%; **significant at 5%; *significant at 10%.

Using the same approach, I examined the impact of the refugee influx on formal employment. The result shows that, after the influx, women's engagement in formal employment has increased by 9.9% for single women and 2% for married women in Cox's Bazar compared to their counterparts in the control group. In here the differential effect for married women relative to single women is negative -7.9%. This indicates that the effect of treatment on married women's engagement in formal employment in Cox's Bazar was 7.9% lower compared to single women. For NGO job employment and Business, the estimated coefficients are not statistically significant.

Like before, these results should be interpreted with caution. Pre-treatment data from 2012 reveal existing differences in labor force participation between the treatment and control groups. Therefore, while the observed associations are significant, a strong causal interpretation cannot be made with confidence. However, if the results had satisfied the parallel trend assumption, I could have concluded that after the refugee influx, the NGO-led initiatives and women empowerment opportunities positively influenced the labor force participation of single women, whereas married women were less likely to benefit from these interventions.

Women and Children

I next examine how the refugee influx has impacted female labor force participation, formal employment, NGO job and business participation based on the age group of their children. The underlying assumption is that women with children under five years old, who are not yet of school-going age and require continuous care, have lower participation in the workforce as they need to attend to their children. In contrast, women with school-aged children are more likely to be in the labor force since their children require less constant attention. However, following the refugee influx, several organizations have provided support to vulnerable women in the host community and created job opportunities. My hypothesis is that women with children under five years old are now more likely to engage in the workforce for two main reasons. First, the sudden influx has placed financial constraints on their families, pushing them to seek employment. Second, the availability of job opportunities facilitated by these organizations has encouraged their workforce participation.

It is important to note that, model tests for differential impact for three categories of women based on the number of children in each household categorized by age group. In rural areas of Bangladesh, nuclear families are less common, and extended families tend to live together. While the dataset provides information on the number of children and their respective ages within each household, it does not specify which child belongs to which mother. Given this limitation, identifying a specific woman and her corresponding child is not feasible. Consequently, the categorization is approached differently, shifting the focus from individual women to the household level. This means that the analysis examines the overall household context, whether a household includes a toddler or a school-aged child and how these household characteristics may

influence female labor force participation. Also, in this section, I was more focused in the Cox's Bazar area only and that is why the interaction terms were only with the Cox's bazar area.

The findings in Table 8 presents the results from a triple difference model and compare women with no children to those with children of various ages. On average, women with children in different age groups are more likely to be in the labor force than women without children. Women with older children are more likely to be in the labor force than women with young children. However, women with young children are less likely to be in formal employment than those without. The results are not statistically significant in terms of NGO job employment and business activities.

Whether the results satisfy the parallel trend assumption can be evaluated by examining both the coefficient for Cox's Bazar in 2012, and the interaction terms for the Women and Children categories in Cox's Bazar in 2012. In both cases, many of the coefficients are statistically significant in 2012. This indicates that Cox's Bazar was already following a different trend prior to the refugee influx.

Table 8. Difference-in-Differences Estimates of the Refugee Influx by Women with children

	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
Cox's Bazar * Year 2012	0.054 (0.046)	0.100*** (0.021)	0.038*** (0.022)	-0.156*** (0.090)
Cox's Bazar * Year 2018	0.139** (0.027)	0.073*** (0.051)	0.176*** (0.038)	-0.126*** (0.011)
<i>Women & Children</i>				
▪ Women with child aged below 5 years old	0.125*** (0.019)	-0.027** (0.048)	-0.025 (0.037)	-0.002 (0.030)
▪ Women with child aged between 6 to 15 years old	0.303*** (0.027)	-0.007 (0.013)	-0.003 (0.026)	0.001 (0.012)

	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
<i>Women & Children*2012</i>				
▪ Women with child aged below 5 years old	-0.214** (0.064)	-0.021 (0.016)	0.036* (0.008)	-0.009 (0.017)
▪ Women with child aged between 6 to 15 years old	-0.363*** (0.062)	-0.027 (0.021)	0.007 (0.004)	-0.020 (0.011)
<i>Women & Children*2018</i>				
▪ Women with child aged below 5 years old	0.000 (0.024)	-0.006 (0.095)	0.031*** (0.071)	-0.001 (0.024)
▪ Women with child aged between 6 to 15 years old	-0.015 (0.011)	-0.012 (0.019)	0.009 (0.071)	-0.000 (0.010)
<i>Women & Children*Cox's Bazar</i>				
▪ Women with child aged below 5 years old	-0.029 (0.018)	-0.022** (0.048)	0.025 (0.033)	-0.120*** (0.030)
▪ Women with child aged between 6 to 15 years old	-0.176*** (0.027)	-0.005 (0.048)	-0.003 (0.023)	-0.086*** (0.017)
<i>Women & Children*Cox's Bazar*Year 2012</i>				
▪ Women with child aged below 5 years old	-0.002 (0.064)	-0.097*** (0.043)	-0.036* (0.076)	0.083** (0.017)
▪ Women with child aged between 6 to 15 years old	0.450*** (0.061)	-0.128*** (0.041)	-0.007** (0.069)	0.093*** (0.011)
<i>Women & Children*Cox's Bazar*Year 2018</i>				
▪ Women with child aged below 5 years old	0.015 (0.024)	0.008 (0.027)	-0.109*** (0.091)	0.160*** (0.024)
▪ Women with child aged between 6 to 15 years old	-0.111*** (0.011)	-0.109* (0.021)	-0.161*** (0.092)	0.159*** (0.003)
Constant	0.351*** (0.016)	0.052*** (0.010)	0.049*** (0.028)	0.002*** (0.018)
Year FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Observations	3895	3895	3895	3895
R ²	0.0626	0.0174	0.0174	0.0284

Note: Standards errors (clustered at the district level) are reported in the parentheses below coefficient estimates. ***Significant at 1%; **significant at 5%; *significant at 10%.

The effect of treatment on women with no children in Cox's Bazar relative to control group is the coefficient for women being in Cox's Bazar in 2018 which is 0.139. This indicates that the labor force participation of women with no children in Cox's Bazar 2018 increased by 13.9% compared to the women with no children in the control area with the result being statistically significant. The effect of treatment on women with children below 5 years old in Cox's Bazar can be calculated by the combined effect of the coefficient for Cox's Bazar 2018 and Women with young child from Cox's Bazar in 2018. The result for the combined marginal effect is 15.4%, but it is not statistically different from the effect for women with no children. On the other hand, the effect of treatment on women with children aged 6 to 15 years old in Cox's Bazar is -0.111 and statistically significant. It indicates that the effect of influx causes and 11.1% decrease in the labor force participation of women with older children in the Cox's Bazar. than for women with no children in Cox's Bazar.

For formal employment, in Cox's Bazar after the refugee influx women with young children have a 0.8% increase relative to women with no children. And the effect of treatment for women with older children is 10.9% less than for women with no children in Cox's Bazar 2018. In terms of NGO, in Cox's Bazar after the influx women who have child aged below 5 years old are 10.9% and women who have child aged between 6 to 15 years old are 16.1% less engaged in the NGO job compared to women with no children at all in Cox's Bazar after the refugee influx. Finally, in terms of business activities, after the refugee influx in Cox's Bazar women with no children experienced a decline, while women with children experienced a statistically significance increase. Although the results are statistically significant, it is important to note that I cannot draw a strong causal relationship from these findings due to the violation of the parallel trend assumption.

However, I would like to mention that if the results had satisfied the parallel trend assumption, it might indicate that the NGO activities and women empowerment initiatives implemented after the refugee influx create a positive impact for women with young children and women with no children. These programs and interventions appeared to focus more on young women and young mothers, providing them with greater opportunities to engage in economic activities. In contrast, women with older children seem to have been left behind, as their labor force participation, formal employment, and NGO employment did not show any improvement indicating that the empowerment activities did not effectively target them.

One possible explanation for this finding is supported by the existing literature. Several humanitarian organizations, including UN agencies and NGOs, have specifically designed interventions targeting young women in Cox's Bazar. These programs primarily aimed to improve access to education, skills development, and protection services for young women and young mothers (Women's Refugee Commission, 2021; JRP, 2018). For instance, UNICEF, in partnership with BRAC, implemented job skills training programs mainly focusing on youth aged 15 to 24 years (Ferguson, 2019). This may explain the observed gap in women's economic engagement between women with no children and women with older children. Since women with older children are likely to be comparatively older, they might have been excluded from such youth-focused programs, limiting their opportunities to engage in the labor market.

Another possible explanation I considered is related to children's schooling status. According to existing literature, institutions in Cox's Bazar were heavily affected after the refugee influx with many schools closed or repurposed as refugee shelters, thereby limiting access to education for children in host communities (Khuda, 2020). With this in mind, I was interested in

exploring whether the decline in women's labor force participation, particularly for women with older children, might be associated with their children's inability to continue schooling.

To investigate this, I examined the school attendance status of children aged 6 to 15 (school age group) in both the treatment and control groups in 2015 and tracked their status in 2018. In 2015, school participation was notably high in the control group, with 94% of children attending school. In contrast, 83.2% of children in Cox's Bazar were enrolled, while 16.8% were not. After the refugee influx, I restricted my analysis to the same set of children who were present in both 2015 and 2018. I did not include any new school-aged children who fell within this age group in 2018. From this analysis, it is observed that, in Cox's Bazar, among those children who were attending school in 2015, only 72.5% continued their education in 2018, while 27.5% reported that they were no longer attending school.

This finding indicates that after the refugee influx, a significant proportion of children were unable to continue their education, possibly due to schools being used for refugee-related services or other disruptions. This situation may have indirectly affected women's labor force participation, particularly for those with older children. As children stayed home due to school closures or dropout, women might have been required to give more attention to caregiving and household responsibilities, which in turn could have negatively impacted their engagement in the labor market in 2018.

SUPPLEMENTARY ANALYSIS

To deepen the understanding of the labor force dynamics, I conducted a series of supplementary analyses. These include examining migration patterns and controlling for religious composition.

The Connection between Migration and LFP

Another approach to analyzing labor force participation (LFP) is through the lens of migration dynamics. By examining migration data, I intend to examine whether there is evidence that non refugee women migrated into Cox's Bazar in response to new employment opportunities created by the refugee influx, or out of Cox's Bazar as a result of increased competition for jobs and economic pressures introduced by the influx.

As long as the household head remains in the same location, the survey tracks the location, marital status, and working status of all other household members, even if they migrate to another division or country. The dataset contains a variable called "Reason for migration," which asks household members to explain why they moved. The primary reasons for migration among the women in the dataset were marriage, work, and education.

Only 4.8% (187 women) of the total population (3,895) in the Chittagong area moved elsewhere between 2012 and 2018. Of them, 87.2% of women migrated to different districts within Chittagong division, and 12.8% women moved out of Chittagong division primarily as a result of marriage. Since it is customary for women in Bangladesh to live with their spouses or in-laws after marriage, it is not surprising that a sizable portion of the women in the dataset relocated to different districts as a result of marriage.

Only 4 women moved to Cox's Bazar between 2012 and 2018, and none moved out. Whereas 159 were moved within the other district of Chittagong division in the same period. Among the 159 women, only 16 women moved because of employment opportunities and other due to their marriage. Given this extremely low migration rate, it does not appear that the refugee influx impacted migration among this sample.

Assessing the Impact of Religious Composition

In the summary statistics of Table 1, there is a notable difference in the religious composition between the control group (rest of the Chittagong Division) and the treatment group (Cox's Bazar). In 2015, Cox's Bazar district had 67% Muslim, and the rest were Hindu, whereas in the other districts of the Chittagong division, 93.9% were Muslim. By 2018, the Muslim population in Cox's Bazar increased to 72%, while in the other districts in the Chittagong division it was 94.5%. If labor force participation trended differently for Hindus than for Muslim's during the sample period, these trends might confound the results, mistakenly attributing differences in trends in labor force participation for Hindus as the effects of exposure to the refugee influx. To explore this possibility, a regression analysis was conducted using a restricted sample that included only Muslim women.

However, the results from the regression analysis did not show any substantial deviation from the original findings. Women in Cox's Bazar were still 8.3 percentage points more likely to participate in the labor force compared to the control group in 2018, which is not significantly different from the findings in the main analysis of 8.4 percentage points. Therefore, I conclude that religious background is not a key driving factor behind the observed changes in female labor force participation in the treatment area.

Second, I examined whether selecting a control group with similar religious composition to Cox's Bazar led to different results. Upon analyzing districts within the Chittagong division, I found that only Bandarban has a comparable religious pattern.

However, summary statistics reveal that aside from religious similarities, other household and individual characteristics differ substantially. First, the population of women aged 16 to 59 years considered the working-age group is relatively small in Bandarban, with only 140 women in the sample for both 2015 and 2018. Secondly, the economic activities of women in Cox's Bazar differ significantly from those in Bandarban. For instance, in 2015, only 28.8% of women in Bandarban were neither working nor earning any income, compared to 38.7% in the broader Chittagong division. Moreover, 8.22% of women in Bandarban were engaged in crop production (both formal and informal sectors), whereas only 2.06% of women in Cox's Bazar were involved in similar activities. Other notable differences were also found in occupational categories.

I conducted a regression analysis where the sample was restricted to observations from only Bandarban and Cox's Bazar. The results revealed a significantly larger treatment effect, showing that treatment increased women's labor force participation by 18.3 percentage points and the results were statistically significant at 5% level.

Although Bandarban has a relatively large Hindu population like Cox's Bazar, given the differences in demographics, economic activities, cultural norms, and social structures between Bandarban and Cox's Bazar, I am cautious about interpreting the larger marginal effects as the causal effect of exposure to the refugee influx.

DISCUSSION & STUDIES

The findings indicate that women's labor force participation in 2012 was significantly higher but declined by 2015, even before the refugee influx. To support these findings, I review the relevant literature to better understand the socioeconomic conditions and labor market dynamics in the pre-2015 period. For instance, what might be the reasons behind the rise in women's labor force participation in 2012, and why it declined in 2015? Was it due to certain government policies that boosted participation in 2012, or were there changes that contributed to the decline in 2015?

From various studies, it was found that several policies initiated in 2009 may have contributed to the increase in women's labor force participation. Since 2009, the former Prime Minister introduced ten special initiatives, one of which focused on ensuring the holistic empowerment of women. Under this initiative, Bangladesh launched numerous projects aimed at achieving goals such as gender equality through advocacy and increasing women's representation in government jobs, as well as banning dowry payments in rural areas by strengthening law enforcement (Rasper, 2016). She emphasized that education is the key to women's empowerment and, to support this, invested heavily in girls' education offering tuition-free education up to the degree level, expanding stipends and scholarships, providing free meals and textbooks, and establishing separate toilet facilities for girl students. The presence of female teachers also played a crucial role, and currently, 60 percent of primary school teachers in Bangladesh are women (Farhad, 2018; Kabir, 2024). Additionally, policies such as six months of maternity leave, establishment of maternity centers, provision of healthcare services, and a voucher scheme for women were also introduced (Farhad, 2018).

However, no specific cultural or demographic factors have been identified to explain the decline in labor force participation in the Cox's Bazar area in 2015 relative to the control districts. One possible explanation could be the occurrence of natural disasters in the region during the period from 2013 to 2015. Most parts of the Cox's Bazar district are surrounded by hills, rivers, making the area prone to frequent natural disasters. Cyclones, tidal surges, flash floods, and excessive rainfall are common in Cox's Bazar (DDMC, 2014). However, some years were more severely affected than others. Between 2013 and 2015, several disasters occurred, among which Cyclone Komen was the most significant. While exploring the impact of natural disasters, I also came across projects carried out by a local NGO named Mukti, which operates solely in the Cox's Bazar area. From 2010 to 2012, Mukti implemented programs such as the Women Support Center, Gender and Development Program, and Education for Sea Beach Working Children. However, their focus shifted towards disaster-related projects during 2013–2014, including Emergency Response to Cyclone and Flood Resilient Recovery Projects. Following the Rohingya refugee influx, Mukti's initiatives further shifted to humanitarian aid, such as Biometric Registration of Rohingya Families, Emergency Assistance to Rohingya Families, and support for Rohingya children and vulnerable host communities (Mukti, n.d.).

While my thesis primarily focuses on labor force participation of women in the host community up to the year 2018 because of the data I have. However, recent developments in women labor force participation can be shown by reports, articles, case stories from 2019 onward. NGOs, such as BRAC and other international humanitarian agencies, have played a significant role in creating employment opportunities for local women and girls in the Cox's Bazar area, particularly through their operations in the Rohingya refugee camps.

A platform named NGO Platform was established in 2018 in response to the exodus of Rohingyas from Myanmar to Cox's Bazar in 2017. This platform brought together 163 NGOs, including 56 international, 79 national, and 28 local organizations, to work collaboratively in the region. Their combined efforts have laid the groundwork for significant socio-economic interventions (NGO PLATFORM, 2025). These organizations have employed local women as language interpreters, volunteers, data collectors, record keepers, and office assistants (Mohiuddin, M., 2019).

Several success stories highlight the achievements of these organizations. For instance, one NGO started working in the Chittagong division immediately after the refugee influx in 2017 to support the youth and the host community. The host community faced significant challenges, including rising prices of daily necessities due to the refugee influx. With the help of this NGO, a local girl who was struggling to survive managed to join the labor force by engaging in agriculture, eventually generating a profit by 2022. This example underscores the tangible impact of NGO initiatives on individual lives (Shushilan, 2022).

Among the organizations making a notable impact is BRAC, which has been actively supporting women in the host communities by providing artisanal skills training and creating new employment opportunities. Following the refugee influx, BRAC established a production center with support from UNHCR, where women received six months of on-the-job training from experienced trainers. By the end of 2019, 600 women from host communities were trained in machine-sewing, hand embroidery, block printing, and screen printing, equipping them with skills for sustainable livelihoods (Haque, Sadiaa; Samira Syed, 2019).

Other NGOs have also undertaken projects to empower the host community. For instance, initiatives aimed at adolescents include vocational training in computer operation, sewing, mobile

servicing, and carpentry to enhance their employability (Karim, 2024). UN Women has contributed significantly by establishing Multi-purpose Women's Centers in Cox's Bazar, serving both Rohingya refugees and the Bangladeshi community. These centers provide education and livelihood training, teaching skills such as tailoring, sanitary napkin and mask production, block printing, handicrafts, and embroidery (UN Women Asia and the Pacific, 2021).

This involvement of NGOs has allowed women to step out of their traditional domestic roles, providing them with financial independence and enabling them to support their families something previously uncommon in the community. Through field-level activities and economic empowerment, NGOs have contributed to significant socio-economic changes in the host community, reshaping long-standing gender roles and social structures. (Mohiuddin, M., 2019).

These post-2018 changes, although not covered in my current dataset, offer important insights. If recent micro-level data becomes available, future research could build on this study by conducting a more detailed analysis of long-term economic changes and the ongoing impact of NGO-led initiatives on labor market outcomes in the region.

CONCLUSION

The influx of Rohingya migrants beginning in August 2017 marked the most significant wave in recent times. Most migrants now reside in large resettlement areas in Cox's Bazar, Bangladesh. This thesis examines how this influx has affected labor force participation among women in the host community, specifically those aged 16 to 59 years. To explore this, I employed a difference-in-differences (DiD) model using a panel dataset covering three time periods: 2012, 2015, and 2018. In this model, 2018 is considered the treatment period, reflecting the post-influx scenario. The year 2015 serves as the baseline or pre-treatment year, providing a reference point for comparison. Additionally, 2012 is included to conduct a pre-trend analysis, which helps assess whether the treatment and control groups followed parallel trends prior to the refugee influx.

Key findings are as follows: (1) Women in Cox's Bazar in 2018 are 10% more likely to be in the labor force; (2) 5.9% more likely to be employed in the formal sector; (3) 10.2% more likely to be employed in NGO jobs; (4) 3.3% less likely to be in business. These results are statistically significant. The findings indicate that more women were joining the workforce after the refugee influx. However, the findings are not without caveats. None of the results follow the parallel trend assumption during the pre-treatment period. Therefore, I cannot confidently attribute the observed changes solely to the refugee influx since I do not find evidence of parallel pre-trends.

The paper also finds that marital status has a differential impact on women's participation in the labor force. Although the parallel trend assumption does not fully hold, compared to the single women, married women showed statistically significant negative labor force participation and formal employment involvement after the refugee influx in Cox's Bazar. In contrast, for NGO jobs and business, the difference in treatment impact for married versus single women is not

statistically significant. As in earlier analyses, the impact cannot be fully attributed to the refugee influx, given that the parallel trend assumption is not satisfied for all outcomes.

Finally, I have analyzed how the 2017 refugee influx influenced women's labor market outcomes in Cox's Bazar, with a focus on the age of children in the household. In Cox's Bazar, the effects of the Rohingya influx on labor force participation, NGO and formal employment was significantly lower for women with older children compared to women with no children.

Whether in terms of increased labor force participation, greater involvement in formal employment, engagement in NGO work or involved in business, the findings on women's labor market behavior in Cox's Bazar offer a silver lining in an otherwise challenging environment for women's economic participation in Bangladesh. While the violation of the parallel trend assumption limits the ability to draw strong causal conclusions about the impact of the refugee influx, the results still highlight a visible rise in women's engagement and participation in the labor market within the host community.

REFERENCES CITED

Ahmad, S. M., & Naeem, N. (2020). Adverse economic impact by Rohingya refugees on Bangladesh: Some way forwards. *International Journal of Social, Political and Economic Research*, 7(1), 1-14.

Ahamed, A., Chowdhury, M. A., & Rahman, M. S. (2020). A Critical Review on Political Economy of Rohingya Influx in Bangladesh. *International Journal of Scientific and Research Publications*, 10(06), 6.

Ahmed, A. U., Ahmad, K., Chou, V., Hernandez, R., Menon, P., Naeem, F., Naher, F., Quabili, W., Sraboni, E., Yu, B., & Hassan, Z. (2013). The status of food security in the feed the future zone and other regions of Bangladesh: results from the 2011–2012. *Bangladesh integrated household survey, Project report submitted to the US Agency*.

Alam, M. J., Begum, I. A., Mastura, T., Kishore, A., Woodhill, J., Chatterjee, K., & Jackson, T. (2023). Agricultural diversification and intra-household dietary diversity: Panel data analysis of farm households in Bangladesh. *Plos one*, 18(6), e0287321.

Alsaafin, Linah (2018). Price hikes and jobs: How NGOs affect the economy in Cox's Bazar. *News report by Aljazeera*.

Alix-Garcia, J., & Saah, D. (2010). The effect of refugee inflows on host communities: Evidence from Tanzania. *The World Bank Economic Review*, 24(1), 148-170.

Alloush, M., Taylor, J. E., Gupta, A., Valdes, R. I. R. And Gonzalez-Estrada, E. (2017). Economic Life in Refugee Camps. *World Development* 95: 334–347.

Anik, A. R., & Rahman, S. (2021). Women's empowerment in agriculture: Level, inequality, progress, and impact on productivity and Efficiency. *The Journal of Development Studies*, 57(6), 930-948.

Bangladesh Population (2025). *Worldometer*

BBS (2017) Yearbook of Agricultural Statistics 2017. Dhaka: BBS.

Banglapedia. Chittagong Division. In National Encyclopedia of Bangladesh.

Betts, A., Delius, A., Rodgers, C., Sterck, O. And Stierna, M. (2019a). Doing Business in Kakuma: Refugees, Entrepreneurship, and the Food Market. *Oxford, UK: Refugees Studies Center; University of Oxford; World Food Programme*, pp. 1–44.

Betts, A., Fryszer, L., Omata, N. And Sterck, O. (2019b). Refugee Economies in Addis Ababa: Towards Sustainable Opportunities for Urban Communities? *Oxford, UK: Refugees Studies Center; University of Oxford; World Food Programme*, pp. 1–24.

Bratti, M. (2003). Labour Force Participation and Marital Fertility of Italian Women: The Role of Education. *Journal of Population Economics*, 16(3), 525–554.

- Ceritoglu, E., Yunculer, H. B. G., Torun, H., & Tumen, S. (2017). The impact of Syrian refugees on natives' labor market outcomes in Turkey: evidence from a quasi-experimental design. *IZA Journal of Labor Policy*, 6, 1-28.
- Chaudhury, R. H. (1979). Marriage, Urban Women, and the Labor Force: The Bangladesh Case. *Signs*, 5(1), 154–163.
- Das, R., & Rani, D. (2024). The role played by non-governmental organizations in the protection of refugee women in Greece. *Journal of International Women's Studies*, 26(7).
- Dey, S. (2017). Adverse Rohingya impacts on Bangladeshi economy and its solutions. *American Journal of Trade and Policy*, 4(3), 129-32.
- Dey, P., Uddin, S., & Hasan, M. K. (2013). Tourists' perception towards Cox's Bazar Sea beach in Bangladesh as a tourist destination. *Asian Business Review*, 2(1), 54-60.
- Del Carpio, X. V., & Wagner, M. C. (2015). The impact of Syrian refugees on the Turkish labor market. *World Bank policy research working paper*, (7402).
- DeHaan, E. (2020). A Primer on Using and Interpreting Fixed Effects Models. *SSRN Electronic Journal*.
- DDMC (2014). Development of District Disaster Management Plan: Cox's Bazar. *District Disaster Management Committee, Cox's Bazar*.
- Dorosh, P., Filipski, M. J., Hoddinott, J. F., Hoque, M., Iqbal, Z., Mozumder, G. N., Rosenbach G., Sen B., Tiburcio E., Uddin R., & Yunus, M. (2019). The Rohingya: Displacement, deprivation, and policy.
- Ehsan, S. M. A., & Akter, S. (2020). Female labor force participation with adverse shocks: The case of rural households in Bangladesh. *International Review of Business Research Papers*, 16(1).
- Engler-Williams, J. (2024). Creating safe spaces for women and girls in Cox's Bazar refugee camp, Bangladesh. CARE International. <https://www.care.org/news-and-stories/news/creating-safe-spaces-for-women-and-girls-in-coxs-bazar-refugee-camp-bangladesh/>
- Esen, O., & Oğuş Binatlı, A. (2017). The impact of Syrian refugees on the Turkish economy: Regional labour market effects. *Social Sciences*, 6(4), 129.
- Fallah, B., Krafft, C., & Wahba, J. (2019). The impact of refugees on employment and wages in Jordan. *Journal of Development Economics*, 139, 203-216.
- Farhad, S.A. (2018). Women's empowerment and Sheikh Hasina. *Bangladesh News* 24.
- Farhana, K. M., & Mannan, K.A. (2024). Bangladesh's Economic Vitality Owes in Part to Migration and Remittances. *Migration Policy Institute*.

Ferguson, S. (2019). A youth job skills program is building futures in Bangladesh. UNICEF USA. <https://www.unicefusa.org/stories/youth-job-skills-program-building-futures-bangladesh/36490>.

Filipski, M., Tiburcio, E., Dorosh, P., Hoddinott, J., & Rosenbach, G. (2019). Modelling the economic impact of the Rohingya Influx in Southern Bangladesh. *IFPRI*.

Filipski, M. J., Rosenbach, G., Tiburcio, E., Dorosh, P., & Hoddinott, J. (2021). Refugees who mean business: Economic activities in and around the Rohingya settlements the Rohingya settlements in Bangladesh. *Journal of Refugee Studies*, 34(1), 1202-1242.

Goodman, A., & Mahmood, I. (2019). The Rohingya refugee crisis of Bangladesh: Gender based violence and the humanitarian response. *Open Journal of Political Science*, 9, 490-501.

Goltz, Jan von der; Schuettler, K.; Bousquet, J.; & Kebede, T. A. (2024). The Labor Market Impact of Forced Displacement Jobs in Host Communities in Colombia, Ethiopia, Jordan, and Uganda. *World Bank Group*.

Habib, M. R. (2023). Rohingya refugee–host community conflicts in Bangladesh: issues and insights from the “field”. *Development in Practice*, 33(3), 317-327.

Haghighat-Sordellini, E. (2009). Determinants of female labor force participation: a focus on Muslim countries. *International Review of Sociology—Revue Internationale de Sociologie*, 19(1), 103-125.

Hazrana, J., & Mishra, A. K. (2024). Food and Nutrition Security in Developing Economies: An Intra-household and Gender Based Assessment.

Hosen, S., & Shahria, G. (2020). Economic challenges of Rohingya peoples: A study on displacement (Rohingya) peoples on Myanmar in Cox’s bazar. *International Journal of Social, Political and Economic Research*, 7(3), 415-436.

Holland, C., & Rammohan, A. (2019). Rural women’s empowerment and children’s food and nutrition security in Bangladesh. *World Development*, 124, 104648.

Hoque, M. M. (2021). Forced labour and access to education of Rohingya refugee children in Bangladesh: Beyond a humanitarian crisis.

Hutchinson, S. (2018). Gendered insecurity in the Rohingya crisis. *Australian Journal of International Affairs*, 72(1), 1-9.

Idrish, M. H. B., & Ahmed, F. (2024). Deconstructing the nexus between the influx of Rohingya refugees and the economy (Labor) in Cox’s Bazar, Bangladesh. *GSC Advanced Research and Reviews*, 18(1), 290-298.

International Food Policy Research Institute (IFPRI). (2016). Bangladesh Integrated Household Survey (BIHS) 2015. *Harvard Dataverse*, V3.

Inspira Advisory and Consulting Limited. (2024). Economic Dynamics of Cox's Bazar: Sectoral Insights of the Region.

IFPRI (International Food Policy Research Institute). (2013). Bangladesh Integrated Household Survey (BIHS), 2011–2012.

IFPRI (International Food Policy Research Institute). (2020). Bangladesh Integrated Household Survey (BIHS) 2018–2019.

Iqbal, K., Pabon, M. N. F., & Ibon, M. W. F. (2023). Examining rural income and employment in Bangladesh: A case of structural changes in the rural nonfarm sector in a developing country. *Australian Journal of Agricultural and Resource Economics*, 67(3), 364-387.

ISCG. Inter Sector Coordination Group & Inter Sector Coordination Group. (2018). Situation report Rohingya refugee crisis. Cox's Bazar, 2.

Islam, T. M. (2020). Rohingya massive exodus into Cox's Bazar grows security concern: impacts over tourism industry of Bangladesh. *Asian J Soc Sci Manage Stud*, 7(3), 236-249.

Jayachandran, S. (2021). Social norms as a barrier to women's employment in developing countries. *IMF Economic Review*, 69(3), 576-595.

Joint Response Plan (JRP). (2018). 2018 Joint Response Plan for Rohingya Humanitarian Crisis: March-December 2018. *Inter Sector Coordination Group (ISCG)*.

Karan, A., & Mahal, A. (2019). The Impact of Rashtriya Swasthya Bima Yojana on Female Labour Force Participation in India: A Matched Difference-In-Differences Analysis. *Available at SSRN 3371821*.

Kabir, F., Ahsan, N. (2024). Reimagining primary and compulsory education in Bangladesh. *The Daily Star*.

Khatun, F. (2018). Women's participation in the job market. *The daily star*, 8.

Khatoon, F. (2024). Work participation rates and employment structure of Muslim females in urban India: 2005–2010. *Journal of Social and Economic Development*, 26(2), 457-473.

Klasen, S., Le, T. T. N., Pieters, J., & Santos Silva, M. (2020). What drives female labor force participation? Comparable micro-level evidence from eight developing and emerging economies. *Journal of Development Studies*, 57(3), 417-442.

Kudrat-E-Khuda (Babu). (2020). The impacts and challenges to host country Bangladesh due to sheltering the Rohingya refugees. *Cogent Social Sciences*, 6(1), 1770943.

László, E. L., & Schmidt, J. D. (2018). The impact of refugees on host countries: A case study of Bangladesh under the Rohingya Influx (*Doctoral dissertation, Aalborg University*).

Mahmud, S. and Bidisha, S.H. (2016). Female Labor Market Participation in Bangladesh: Structural Changes and Determinants of Labor Supply. *Chapter 4 in S. Raihan (ed.) Structural Change and Dynamics of Labor Markets in Bangladesh: Studies on Labor and Employment. Dhaka: SANEM.*

Maystadt, J. F., & Verwimp, P. (2014). Winners and losers among a refugee-hosting population. *Economic development and cultural change*, 62(4), 769-809.

Malaeb, B., & Wahba, J. (2018, April). Impact of refugees on immigrants' labor market outcomes. *In Economic Research Forum Working Paper Series No (Vol. 1194).*

Mastura, T., Begum, I. A., Kishore, A., Jackson, T., Woodhill, J., Chatterjee, K., & Alam, M. J. (2023). Diversified agriculture leads to diversified diets: panel data evidence from Bangladesh. *Frontiers in Sustainable Food Systems*, 7, 1044105.

Miller, D. L. (2023). An introductory guide to event study models. *Journal of Economic Perspectives*, 37(2), 203-230.

Migration Policy Institute (2024). Bangladesh's Economic Vitality Owes in Part to Migration and Remittances. <https://www.migrationpolicy.org/article/bangladesh-migration-remittances-profile>.

Mohiuddin, M., & Molderez, I. (2023). Rohingya influx and host community: A reflection on culture for leading socioeconomic and environmental changes in Bangladesh. *European Journal of Cultural Management and Policy*, 13, 11559.

Mukti Cox's Bazar. <https://www.mukticox.org/completed-projects/>

NextBillion. (2019). Answering Rohingya Refugee Crisis in Bangladesh with Skills Development, Artisan Training. Retrieved from <https://nextbillion.net/rohingya-refugee-crisis-skills-training/>.

NGO Platform Cox's Bazar. (2022). How vegetable gardening changes a young woman's life. Retrieved from <https://www.ngoplatform.net/page/how-vegetable-gardening-changes-a-young-womans-life>.

Omata, N. And Kaplan, J. D. (2013). Refugee Livelihoods in Kampala, Nakivale and Kyangwali Refugee Settlements: Patterns of Engagement with the Private Sector. *Oxford, UK: Refugee Studies Centre, Oxford Department of International Development, University of Oxford.*

Omata, N. And Sterck, O. (2019). Refugee Economies in Dollo Ado: Development Opportunities in a Border Region of Ethiopia. *Oxford, UK: Refugee Studies Centre, Oxford Department of International Development, University of Oxford.*

Odrika, T. (2022, October 27). The growing complexities of a working woman's life. *The Daily Star*. <https://www.thedailystar.net/star-weekend/views/news/the-growing-complexities-working-womans-life-3151091>

Oxfam. (2022). How handicrafts training enhanced the livelihoods of women in Cox's Bazar. *Human Rights Day Special Magazine 2022.*

Policy paper – Bangladesh 2020. (2020). Analysis of the situation in Bangladesh; opportunities, challenges and risks. In *Denmark's Country Policy Paper for Bangladesh*.

Prantic Unnayan Society. Information retrieved from <https://pranticbd.org/>.

Psacharopoulos, G., & Tzannatos, Z. (1989). Female Labor Force Participation: An International Perspective. *The World Bank Research Observer*, 4(2), 187–201.

Rahman, R. I., & Islam, R. (2013). Female labor force participation in Bangladesh: trends, drivers and barriers. *New Delhi, India: International Labor Organization, DWT for South Asia and Country Office for India*.

Rahman, F. (2023). Assessing gender, power, and NGO programming in Bangladesh's Rohingya refugee camps. *Centre for Asia-Pacific Refugee Studies (CAPRS), University of Auckland*.

Rasha, R. K., Mandal, R. K., & Kazal, M. M. H. (2022). Effect Of Women Empowerment on Child Nutrition in Bangladesh: An Empirical Analysis: Effect of women empowerment on child nutrition.... *Farm Economy*, 17, 1-14.

Rasper, A. (2016). Empowering Bangladeshi women. <https://www.dw.com/en/programs-in-bangladesh-offer-women-the-chance-at-a-decent-days-work/a-5793716>.

Rosenbach, G., Tiburcio, E., Filipski, M. J., Dorosh, P. A., and Sen, B. (2018). Economic activities of forcibly displaced populations: An analysis of enterprises in Southern Bangladesh. *IFPRI Discussion Paper 01763*.

Seymour, G. (2017). Women's empowerment in agriculture: Implications for technical efficiency in rural Bangladesh. *Agricultural Economics*, 48(4), 513-522.

Sraboni, E., Quisumbing, A. R., & Ahmed, A. U. (2013). The women's empowerment in agriculture index: Results from the 2011-2012 Bangladesh Integrated Household Survey. *Project Report submitted to the US Agency for International Development. International Food Policy Research Institute, Dhaka, Bangladesh*.

Sununtnasuk, C., & Fiedler, J. L. (2017). Can household-based food consumption surveys be used to make inferences about nutrient intakes and inadequacies? A Bangladesh case study. *Food Policy*, 72, 121-131.

Sununtnasuk, C. E. L. E. S. T. E. (2014). Individual energy and nutrient intake from a 24-hour and 7-day recall: comparing estimates using the 2011/2012 Bangladesh Integrated Household Survey. *United States Agency for International Development (USAID): Washington, DC, USA*.

UNDP (2018). Impacts of the Rohingya refugee influx on host communities. <https://www.undp.org/sites/g/files/zskgke326/files/migration/bd/Impacts-of-the-Rohingya-Refugee-Influx-on-Host-Communities.pdf>.

UNHCR (2024). Rohingya refugee crisis explained. *UNHCR*.

UNHCR (2013). UNHCR Submission for the Universal Periodic Review – Bangladesh – UPR 15th Session (2013).

Verme, P. A. O. L. O. (2023). Theory and evidence on the impact of refugees on host communities. *World Bank Blogs*.

Wainerman, C. H. (1980). The Impact of Education on the Female Labor Force in Argentina and Paraguay. *Comparative Education Review*, 24(2), S180–S195.

Women’s Refugee Commission. (2021). Rohingya refugee response: Empowering adolescent girls in Cox’s Bazar. *Women’s Refugee Commission*.

Yakubu, A. (2010). Factors influencing female labor force participation in South Africa in 2008. *African Statistical Journal*, 11.

Zhou, Y. Y., Grossman, G., & Ge, S. (2023). Inclusive refugee-hosting can improve local development and prevent public backlash. *World Development*, 166, 106203.

Zetter, R., & Ruaudel, H. (2016). Refugees’ right to work and access to labor markets—An assessment. World Bank Global Program on Forced Displacement (GPDF) and the Global Knowledge Partnership on Migration and Development (KNOMAD) Thematic Working Group on Forced Migration. *KNOMAD Working Paper*. Washington, DC: World Bank Group.

APPENDIX

Table A. Difference-in-Difference Estimates of the Refugee Influx on Women's Labor Force Participation, Formal Employment, NGO jobs and Business with Household Fixed Effects

	<i>Household Fixed Effects</i>			
	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
Year 2012	0.155 (0.206)	-0.001 (0.047)	-0.025** (0.012)	0.071*** (0.011)
Year 2018	-0.079*** (0.072)	-0.005 (0.043)	-0.009 (0.011)	0.005 (0.069)
Cox's Bazar * Year 2012	0.206*** (0.101)	0.055* (0.056)	0.035*** (0.012)	-0.106*** (0.027)
Cox's Bazar * Year 2018	0.114** (0.092)	0.047 (0.037)	0.095 (0.012)	-0.015 (0.023)
<i>Marital Status</i>				
Single Women	-0.089** (0.034)	0.011 (0.014)	-0.002 (0.007)	0.022 (0.016)
Women Married before 16 years old	-0.002 (0.033)	-0.017* (0.013)	-0.015 (0.007)	-0.044* (0.015)
<i>Women & Children</i>				
Women with child aged below 5 years old	0.047 (0.036)	-0.001 (0.012)	0.002 (0.006)	0.018 (0.0137)
Women with child aged between 6 to 15 years old	0.104*** (0.034)	0.008 (0.014)	0.006 (0.007)	0.016 (0.013)
<i>Education</i>				
Less than Primary School	-0.238 (0.117)	-0.178 (0.088)	-0.074 (0.059)	-0.093 (0.074)
Primary School	-0.278 (0.116)	-0.198 (0.088)	-0.072 (0.059)	-0.108 (0.073)
Less than High School	-0.306 (0.117)	-0.194 (0.089)	-0.085 (0.057)	-0.100 (0.073)
High School	-0.263 (0.118)	-0.163 (0.089)	-0.053 (0.060)	-0.059 (0.076)

	<i>LFP</i>	<i>Formal Employment</i>	<i>NGO Job</i>	<i>Business</i>
Age	0.009*** (0.001)	0.000 (0.003)	0.000 (0.002)	-0.001 (0.004)
Youth to Adult Ratio	0.032* (0.018)	-0.008 (0.008)	0.002 (0.020)	-0.009 (0.073)
Household Size	-0.013 (0.010)	-0.001 (0.004)	-0.002 (0.021)	-0.006 (0.042)
Muslim Women	-0.007 (0.075)	-0.009 (0.079)	0.004 (0.009)	-0.179 (0.015)
Constant	0.437*** (0.144)	0.335*** (0.004)	0.105* (0.059)	0.339* (0.163)
Observations	3855	3855	3855	3855
Number of Groups	940	940	940	940
R ²	0.143	0.025	0.016	0.027

Notes: Standards errors are reported in the parentheses below coefficient estimates. ***Significant at 1%; **significant at 5%; *significant at 10%.