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Female Labor Market Opportunities, Household Decision-Making Power, and Domestic Violence: Evidence from the Bangladesh Garment Industry

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Abstract

Rapid growth in Bangladesh's garment industry, brought about by trade policy liberalization, gave Bangladeshi women new opportunities to enter the formal labor market. While it is frequently believed that access to labor market opportunities improves the lives of women, causal evidence on the

1 Introduction

More women are working outside of the home than ever before, as female labor force participation has increased at all income levels since 1980 (World Bank, 2011). Much of the increase in female labor force participation has occurred in developing countries. Low skill, export-oriented manufacturing has been a key driver of industrialization in developing countries and a key characteristic of this industry is the extensive employment of women who previously did not have formal labor market opportunities available to them (World Bank, 2011). While there is an emerging literature

where a woman's initial level of bargaining power is high, and she can easily leave a marriage, theory and empirical evidence finds increasing a woman's relative wage increases bargaining power and decreases domestic violence (Aizer, 2010). In a context where a woman cannot easily leave a marriage and initial bargaining power is low, the theory of "male backlash" predicts that increased autonomy due to an improvement in the woman's reservation utility is accompanied by an increase in spousal violence (Eswaran and Malhotra 2011; Macmillan and Gartner 1999; Tauchen *et al.* 1991). In theory, the husband is using domestic violence as a tool to restore the household bargaining structure to what it was before the woman increased her bargaining power. In a developing country context, the causal link between increased female labor market opportunities and domestic violence has received very little empirical attention.[1]

To address this gap in the literature, I analyze the impact of female labor market opportunities on women's household decision-0.4(3.1519)-06(k)-275.8zoncc8ort27.8(e)-0.4(e)-0.7(t)-0,5.8291khent28 omen's h

experienced domestic violence in the last twelve months, as there may be unintended consequences of increased labor market opportunities if husbands respond to changes in household dynamics with increased domestic violence. I also analyze children's education to explore the possibility of changes in resource allocation and changes in the returns to education.

To estimate the causal effects of female labor market opportunities, this paper takes advantage of an exogenous increase in the number of garment factories and employment in existing garment factories brought about by a liberalization of trade policy. The Agreement on Textiles and Clothing (ATC) ended on January 1st 2005, and subsequently ended preferential trade quotas for developing countries. Following this policy change, trade was exclusively governed by standard World Trade Organization rules. The end of preferential trade quotas created a more competitive environment, and Bangladesh benefited due to its low labor costs. However, during the years leading up to the end of the quotas and directly after their elimination it was unclear how well the Bangladesh garment industry would fare and many thought the industry would suffer (Joarder *et al.* 2010; Mlachila *et al.* 2004; Paul-Majumder and Sen 2001). In spite of the uncertainty, between 2005 and 2010 the number of garment factories in Bangladesh increased by 15 percent, and the number of women employed in the Bangladesh garment industry increased by 63 percent. The industry now employs

Using pooled individual level-data on women for the years 1999 - 2011, from the Bangladesh

Increases in women's labor market participation and measures of household-decision making are

Studying the Bangladesh garment industry in conjunction with women's empowerment is salient as the country is an integral part of the world apparel economy, and much of this low-skill manufacturing is done by females. Bangladesh exports over 19.9 billion (USD) in ready-made garments each year and is the fourth largest exporter of ready-made garments in the world, trailing only

positively a□ects women's household decision-making ability in a setting outside of Mexico (Majlesi 2014; Atkin 2009). Second, by considering all of the dense urban areas in Bangladesh that have garment factories, the geographic scope of this paper is larger than previous literature. Third, I am able to address how migration selection is a□ecting results by using information on if, and how recently, women migrated. This paper provides insight into how countries with similar levels of development as Bangladesh were a□ected with the expansion of their garment industry.

The rest of the paper proceeds as follows. Section 2 provides background on the garment industry in Bangladesh and the mechanisms through which a rise in the garment industry may a□ect women and children; section 3 describes the data; section 4 explains the estimation strategy; results and robustness analysis are described in section 5 and 6; and section 7 concludes.

2 Background

2.1 The Garment Industry in Bangladesh

Over the last thirty years Bangladesh has experienced rapid industrialization, and economic development driven in part by growth in manufacturing exports, 75 percent of which are from the garment industry (Berg *et al.*

trade-dependent one (Rahman, 2002).

From 1974 - 2004 the global apparel and textiles industry was governed by quota restrictions that caused dispersion in the location where products were made. These quota restrictions were negotiated under the Multi-fibre Arrangement (MFA) between importing and exporting countries. Under the quota restrictions, exporting countries were allowed to supply a set volume of a product, and the exporting country allocated quota allowances among its domestic producers. One intention of the MFA was to protect the domestic production of importing countries, and as a result of the

the MFA were binding for exports to the US. In 2004, more than 80 percent of export items to the US were constrained under quota restrictions (ILO, 2006). Bangladesh's exports to the EU were not subject to quotas during the MFA or ATC as Bangladesh benefits from the EU's "Anything but Arms" arrangement.[5] However, the phase out of quotas stood to impact the EU market for Bangladesh as many competing production countries would now have unrestricted access to the EU, creating intense competition.

It was uncertain how the Bangladesh garment industry would fare after the end of the ATC on January 1, 2005 (Joarder *et al.* 2010; Mlachila *et al.* 2004; Paul-Majumder and Sen 2001). There

of quotas, distributors looking to purchase apparel were drawn to Bangladesh for its comparative advantage in labor costs. Bangladesh's hourly wage rate was 0.23 USD, compared to 0.35 USD for China.[7]

2005 when the ATC ended. From 2005 to 2007 the volume of garment trade increased by 44 percent to over 130 million dozen exports for 2007. At the same time, the price per dozen for garments decreased over this same time period due to an increasingly competitive global market for garments after the end of the ATC. To demonstrate that the changes in the garment industry are not a result of another macroeconomic shock I look at the export volume and unit price of two other export oriented industries in Bangladesh. Figures 3 and 4 plot the volume and unit price of Fresh and Frozen Fish and Jute Goods for 2002 through 2007. There is no clear change in the trajectory of either volume or unit price in 2005 for either good, which suggests there is not another macro economic shock to the economy that 0.4(e)(k)-3-0.4(c)a-0.4(u)72.6(s)33.9(0.472.4(n)-0.9(o)-333(t)-0.9(h1.9(p)

are not inside of these zones.[12] To account for the correlation between EPZs and the quality of worker that would choose to live near an EPZ, in the analysis I control for whether or not a factory is inside an EPZ.

2.4 Mechanisms Linking Employment Opportunities, Household-Decision Making, Domestic Violence and Educational Investments

Increased female employment opportunities may change a woman's household decision-making power by a□ecting the bargaining structure in a household. When considering women's empowerment, non-unitary household bargaining theory suggests a woman's utility at an option outside of the household - or her threat point - is a key determinant of her bargaining power within the household (Manser and Brown 1980; McElroy and Horney 1981). A number of factors can a□ect a woman's utility at her outside option (and thus her bargaining power), including divorce laws, the relative wage rate, her education, and her age at marriage (Jensen and Thornton 2003; Aizer 2010; Mocan and Cannonier 2012). A strong component of a woman's threat point should be the number of jobs available to her outside of the home. By increasing the number of employment opportunities for women, theory suggests that her bargaining power, and therefore her decision-making power, will also be increased (Aizer 2010; Cherchye *et al.*

levels of bargaining power, increasing bargaining power could lead to increased domestic violence as they now have more of a say in household decisions which can ultimately lead to conflict. On the other hand, if a woman has high initial levels of bargaining power, increasing this further could lead to decreased domestic violence as the woman can more easily leave the relationship (Aizer, 2010). The increase in domestic violence seen in this context as a result of increased female employment opportunity is likely the result of the husband seeking to o□set the increased bargaining power the women experiences because of increased economic opportunity. This is consistent with a "male

In conjunction with the DHS survey modules, I use the restricted access geographic files to obtain approximate location information of each household. The DHS does not provide geographic information for exact households for confidentiality reasons. Each household is assigned to a DHS cluster and from the geographic files I obtained the latitude and longitude of each DHS cluster. Households are reported to be within 2 kilometers of the GPS coordinates of the DHS cluster. There are over 300 DHS clusters for each wave of the survey. The DHS clusters are not in the same location year to year. Starting in 2004, for each DHS cluster, information was collected on the quality and presence of infrastructure, type of health care services provided nearby, and distance to schools. I use this data to account for differences across DHS clusters in distance to schools, piped water and electricity access.

The second data source, a list of all Bangladesh Garment Manufacturers and Exporters Association (BGMEA) members, provides the factory name, address, year of establishment, and number of current employees for each member.[15] I determined the latitude and longitude of all BGMEA factories in Bangladesh using the factory address. Due to limitations in geocoding exact addresses in Bangladesh, each factory is matched to the centroid of their neighborhood. There are 325 neighborhoods that have a garment factory. For each neighborhood, I know the number of garment factories operating at different points in time based upon the factory's year of establishment.

and garment factories to create a measure of factory density surrounding an individual's home. The variable I use to measure the impact of the policy change is the number of garment factories in 2004 (prior to the elimination of quotas) within a 10 kilometer catchment area of each DHS cluster. I construct this variable for each DHS cluster in each year using a factory's year of establishment. The DHS cluster point is the centroid of the 10 kilometer catchment area. I use a 10 kilometer catchment area as my survey with garment factory workers suggests workers usually walk or take the bus to work for upwards of an hour. Results are robust to 5 and 15 kilometer catchment areas.

I use the 2004 number of factories as a measure of factory density as it captures potential new factories in the 10 kilometer area and increased employment opportunities in existing factories after the elimination of quotas. There is a strong correlation (0.75) between the number of factories in 2004 for a catchment area of a DHS cluster and the increase in the number of factories for that catchment area between 2004 and 2007. Using the 2004 number of factories in a catchment area also captures expansion in employment opportunities after 2004 as current factories expanded their workforce. Data from the survey I conducted with garment factory owners finds factories increased their number of employees by 68 percent between 2005 and 2014.

For the analysis, I categorize the 10 kilometer catchment areas for each DHS cluster into high and low factory density categories. I classify high factory density areas as those above the 25th percentile in the 2004 factory density distribution as there is a distinct break in the distribution of factories at this point. Each individual within a DHS cluster for a given year is assigned either the high or low category based on their cluster's 10 kilometer catchment area.

Since DHS clusters are not in the same location for different years of the survey, one concern is

way for both women and their husbands across all survey years, I combine factory and semi-skilled occupations into one occupation category. This is done since prior to 2011 the DHS Women's Survey pooled together these occupations.[17]

Women's household decision making power is measured using the question "Who usually makes decisions about...", where the options include (1) the respondent (i.e. the woman), (2) husband, (3) respondent and husband jointly, (4) someone else, (5) respondent and someone else jointly. The question is asked about four topics: large household purchases, the woman's own health care, their children's health care, and decisions about family visits. I construct a binary measure for each of the topics that equals one if the woman responded with (1), (3), or (5) indicating that she had some say in the decision.

To measure the incidence of domestic violence and the husband's attitudes towards domestic violence I use the domestic violence module from the 2004 and 2007 DHS Men's survey.[18] I construct a binary measure that equals one if the husband thinks it is appropriate to physically harm his wife for any reason and a binary measure to indicate if the husband reports being the instigator of domestic violence in the last 12 months.[19] To assess the impact on children's education, I use an indicator for whether the child is currently enrolled in school.

[17] In the woman's employment module it also asks for the reported occupation of her husband. This is the variable that I use, not the one from the Men's Surveysleo mbashr(s)h84.60.6(e)-317.4n'same08-369(l)2b085b083bMsoe

3.6 Qualitative Data

My analysis is supplemented by two surveys I fielded in June 2014. The first was conducted with individuals who work in garment factories to gain their perspective on ways in which garment factory job opportunities have a□ected their life, their commute patterns, their childcare practices,

Y_{icdt} =

interacted with $After_t$, it measures the average impact of exposure to increased labor market opportunities in high factory density areas after the elimination of quotas. The coefficient β_1 represents the difference in the mean of the outcome between high and low factory density areas before 2005. If the high and low factory density areas are similar prior to the policy change β_1 will be close to zero. β_2, gives the double-difference estimate and is the difference in the mean of the outcome between high and low factory areas after 2005, subtracting out the differences in the two areas prior to 2005. In order to make appropriate comparisons, I limit the sample to communities that have at least one garment factory in 1999. This effectively restricts the analysis to dense urban areas in Dhaka and Chittagong.[21]

This model assumes that high and low factory density areas would have had the same trend in outcomes if the elimination of quotas did not occur. The identifying assumption specifies that high density areas would have grown the same way as the low density areas in the absence of the elimination of quotas. This is not a testable assumption, but seems likely to hold given that the trends between 1999 and 2004 are similar between high and low density groups. For example, panel B of table 1 shows the difference in women's characteristics and outcomes between 1999 and 2004 for both factory density groups, and the subsequent difference in means. All differences are small and statistical insignificant except for two characteristics. A woman's completed years of education significantly decreases in 2004 in low density areas compared to low density areas in 1999, causing the difference in means to be large, 2.2 years, but not statistically significant. This abnormal dip in the raw data disappears by 2007 as average levels of education rise to above their

[21] All regressions are similar in magnitude, sign and significance if I limit the sample to clusters that have at least one garment factory in 2004.

of quotas are 12 percentage points more likely to be working than women in low density areas after the elimination of quotas. This corresponds to a 39 percent increase at the mean.[22] It is important to note that the point estimate is close to zero for the variable *HighDensity*, showing that high and low density areas were similar prior to the elimination of quotas. The addition of DHS cluster characteristics in column 2 leaves the point estimate on whether or not a woman is currently working essentially unchanged, providing some evidence that differences in access to utilities are not biasing the results. The probability that a woman is currently working in a factory/semi-skill occupation is statistically different between the high and low density areas after 2005, columns 3 and 4 of table 2. Women who live in high density areas after the elimination of quotas are 7 percentage points, or 64 percent, more likely to have a factory/semi-skill job than women in low density areas after the elimination of quotas.

There are no statistically significant effects of the elimination of quotas on the likelihood that men are working in a factory/semi-skilled occupation, column 5 and 6 of table 2. The results for men's employment are noisy and negative. In column 6, men who live in high density areas after the elimination of quotas are 20 percent less likely to work in a factory/semi-skill job than men in low density areas after the elimination of quotas. This result also serves as a falsification test, as one would not expect men's employment to increase because women fill most garment factory jobs. It also helps shed light on potential mechanisms behind the results. It is not likely that men have changed their attitudes towards women's decision-making power through more interaction with women. Specifically, I can rule out the story that men living in high density areas have updated

[22] Going from the mean number of factories in a low density area to the mean number of factories in a high density area is a 1.7 standard deviation increase in the number of factories.

in a factory/semi-skilled occupation. There are no significant effects of the garment industry on decision-making power or likelihood of working in a factory/semi-skilled occupation for women in the highest wealth quartile, as shown in panel B of table 4.

5.3 Domestic Violence

Table 5 presents results for whether a significant presence of the garment industry after the elim-

women age 18 - 40. Results are presented separately for 6 - 12 and 13 - 18 year olds because there may be di□erential e□ects for primary and secondary school age children. Children age 6 - 12 in high density areas are 8 percentage points, or 9.6 percent, more likely to be currently enrolled in school after the elimination of quotas than children age 6 - 12 in low density areas after the

In Table 8, the coefficient on $HighDensity_c \times NewMigrant_i \times After_t$, for all four measures of women's household decision-making power, is positive but statistically insignificant indicating new migrants are not driving the results seen in household decision-making power. The coefficient on $HighDensity_c \times After_t$ is positive for all measures of household decision-making power and statistically significant at the five or one percent level for three of the four measures. This demonstrates that non-migrants are driving the results. The negative coefficient on, $NewMigrant_i \times After_t$ suggests there is some negative selection of migrants after 2005. This coefficient is statistically significant for only one measure of household decision-making.

6.3 Endogenous Factory Placement

Since I am using the 2004 number of factories to capture both increases in employment in already established factories and potential new factory employment opportunities, one concern is that new garment factories consciously choose to locate in places where women's decision-making power is already increasing. While this is unlikely given the discussion in section 2.2, I empirically explore this concern. To do this, I consider only the 1999 DHS to estimate whether women's outcomes in 1999 predict the change in the number of factories in that location between 1999 and 2004. To do this I use Equation (3):

$$(Factories2004 - Factories1999)_{cd} = \beta_0 + WomensOutcomes'_{icd}\delta + \mu_d + AgeFE + \varepsilon_{icd} \quad (3)$$

Where $WomensOutcomes'_{icd}$ is a vector of women's characteristics including her decision-decision making ability, marital status, height, religion and education. All other variables are

the same as defined in equation 1. Standard errors are clustered at the DHS cluster level.

Results are presented in Table 9 for all of the women's outcomes of interest. There is no evidence that new factories are choosing to locate based on the characteristics of the surrounding population in 1999, as none of the coe□cients are statistically significant or meaningful in magnitude. This fact is supported by my survey data, which suggests that the number one reason factories locate where they do is because of access to roads and suitable buildings.

7 Conclusion

This paper examines the e□ects of increased labor market opportunities on women's household decision-making power, likelihood of domestic violence, and school enrollment for children. I use evidence from the explosive growth in the Bangladesh garment industry after the liberalization of trade policy in 2005. The garment industry in Bangladesh primarily hires women, and gives poor women who had limited options in the formal labor market an opportunity to work outside of the home. The findings show household decision-making power increased for women in areas that had

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Figure 1: Garment Factories and Employment by Year

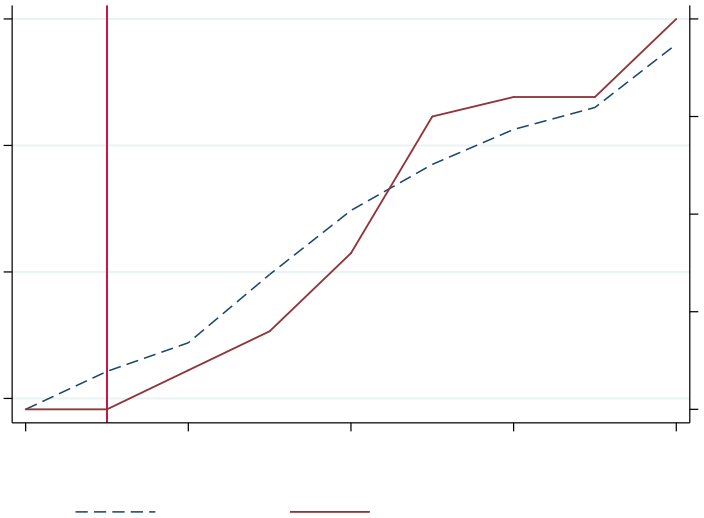


Figure 2: Export Price and Volume: Garments

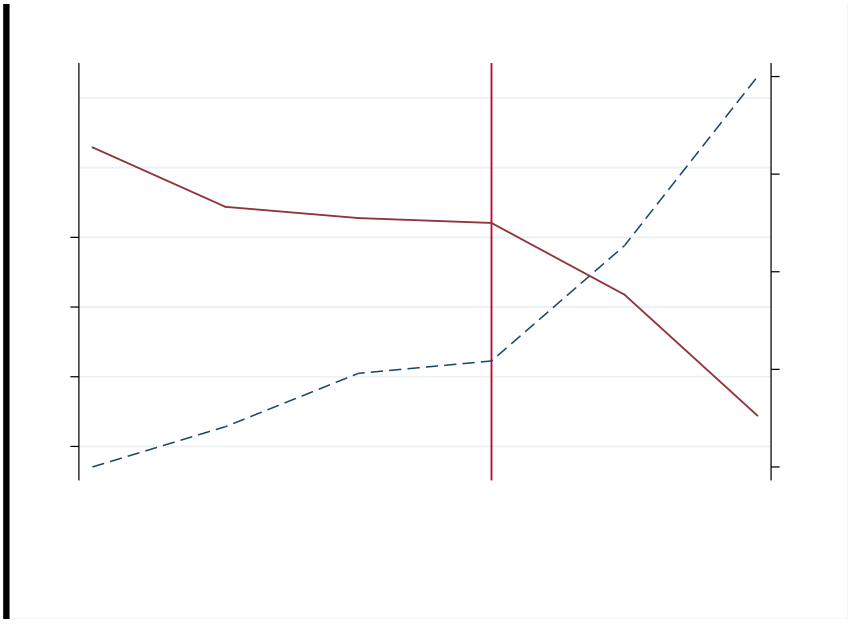
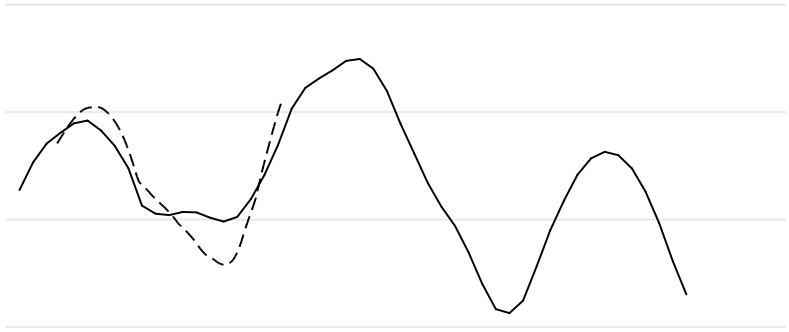


Figure 5: Number of Factories in 2004 in 10km Catchment Area



	Mean	SE	N	Mean	SE	N		T-Stat	Total N		SE		SE		T- Stat
Women's Characteristics															
Age	28.81	0.48	450	28.59	0.37	1450	-0.22	-0.43	1900	-0.23	0.99	0.25	0.37	0.49	0.95
Years of Completed Education	4.53	0.80	450	4.96	0.59	1450	0.43	0.47	1900	-2.55	1.34	-0.26	0.52	2.28	1.59
Currently Married (=1)	0.92	0.01	450	0.91	0.01	1450	0.00	-0.25	1900	0.00	0.02	0.02	0.02	0.02	0.78
Muslim (=1)	0.91	0.04	450	0.92	0.03	1450	0.01	0.25	1900	0.07	0.07	-0.04	0.04	-0.11	-1.36

Table 2: Effect of Living Near Garment Factories on Labor Market Outcomes

	Dependent Var: Woman is Currently Working		Dependent Var: Woman is Currently Working in Factory/Semi-Skill Occupation		Dependent Var: Husband is Currently Working in Factory/Semi-Skill Occupation	
	(1)	(2)	(3)	(4)	(5)	(6)
High Density	0.009	-0.005	0.070	0.058	0.152**	0.120
	(0.060)	(0.064)	(0.056)	(0.061)	(0.072)	(0.078)
High Density * After	0.121**	0.120**	0.070*	0.070*	-0.086	-0.079
	(0.049)	(0.049)	(0.041)	(0.041)	(0.058)	(0.059)
Includes DHS Cluster Characteristics	No	Yes	No	Yes	No	Yes
Mean Dependent Variable in 2004	0.31	0.31	0.11	0.11	0.4	0.4
Observations	3,450	3,450	3,450	3,450	3,380	3,380
R-squared	0.097	0.099	0.075	0.076	0.052	0.053

Notes: Data comes from the 2004, 2007, and 2011 Bangladesh DHS survey and BGMEA

Table 4: Effect of Living Near Garment Factories by Wealth Quartile

Panel A: Women in Lowest Wealth Quartile Age 18 - 40

	Dependent Variable: Does woman have a final say in decisions regarding				
	(1) Woman Working in Factory/Semi-Skill Occ.	(2) Woman's Own Health	(3) Large Household Purchases	(4) Family Visits	(5) Their Children's Health
High Density	0.102	-0.061	0.161	0.067	0.001
	(0.127)	(0.103)	(0.100)	(0.099)	(0.095)
High Density * After	0.130*	0.192**	0.201**	0.199**	0.191**
	(0.073)	(0.088)	(0.088)	(0.088)	(0.076)
Mean Dependent Variable in 2004	0.12	0.58	0.64	0.66	0.61
Observations	836	808	808	807	803
R-squared	0.158	0.106	0.101	0.092	0.101

Panel B: Women in Highest Wealth Quartile Age 18 - 40

	(1)	(2)	(3)	(4)	(5)
High Density	0.083	-0.032	-0.258	0.128	0.221
	(0.067)	(0.224)	(0.159)	(0.227)	(0.162)
High Density * After	-0.045	0.063	0.163	-0.060	-0.207
	(0.050)	(0.180)	(0.119)	(0.200)	(0.138)
Mean Dependent Variable in 2004	0.04	0.53	0.68	0.72	0.62
Observations	832	813	813	813	813
R-squared	0.068	0.174	0.187	0.165	0.181

	(1)	(2)
	Domestic Violence in	

Dependent Variable: Child Currently Enrolled in School (=1)		
	(1)	(2)
	Age 6 - 12	Age 13 - 18
High Density	-0.052	-0.022
	(0.051)	(0.099)
High Density * After	0.080**	-0.093
	(0.036)	(0.077)
Mean Dependent Variable	0.83	0.55
Observations		

Table 7: Effect of Living Near Garment Factories on Women's Falsification Variables

	(1) Height-for-Age Z Score	(2) Years of Education
High Density	0.081	0.127
	(0.163)	(0.701)
High Density * After	-0.086	-0.966
	(0.137)	(0.634)
Mean Dependent Variable	-2.17	4.6
Observations	3,388	3,447
R-squared	0.025	0.131

Notes: Data comes from the 2004, 2007 and 2011 Bangladesh DHS survey and BGMEA database.It is a 1.7 standard deviation increase in the number of factories between low and high density areas. All regressions include age fixed effects, district fixed effects, individual controls for marital status and religion and DHS cluster controls for EPZ status, piped water and electricity access and distance to local boys school. Sample consists of ever married women age 18 - 40. Height-for-Age Z score

	(1) Woman's Own Health	(2) Large Household Purchases	(3) Family Visits	(4) Their Children's Health
High Density	0.079	0.151*	0.112	0.113
	(0.061)	(0.082)	(0.069)	(0.093)
New Migrant	0.375	0.214	-0.037	0.237
	(0.285)	(0.295)	(0.230)	(0.295)
High Density * New Migrant	0.088	0.101	0.119	0.067
	(0.200)	(0.235)	(0.192)	(0.224)
High Density * After	0.155**			

Table 9: Endogenous Factory Placement

Dependent Variable: Number of Factories in 2004 - Number of Factories in 1999, for 1999 DHS Clusters	
	(1)
Woman has input on her own health (=1)	3.006
	(4.057)
Woman has input on large purchases (=1)	-4.818
	(4.952)
Woman has input on family visits (=1)	6.245
	(3.820)
Woman has input on child health (=1)	5.441
	(6.102)
Height-for-Age Z-Score	-0.098
	(1.774)
Years of Education	0.579
	(0.642)
Muslim (=1)	1.397
	(8.787)
Currently Married (=1)	-5.427
	(15.996)
Mean Dependent Variable	121
Observations	427
R-squared	0.795

Notes: Data comes from the 1999 DHS and BGMEA database. Regression includes age fixed effects and district fixed effects. Sample consists of ever married women age 18 - 40. Standard errors are clustered at the DHS cluster level. *** p<0.01, ** p<0.05, * p<0.1

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83*4+#9*$"	:;<<	:;=<	>=
83*4+#$,+3*4.+16*41"	:;=?	:;>:	>=
8+3*4+#$,+*-)".+@# / 093+ / " / A".1+	:;??	:;=B	>=
(0-)+3*4.+2#5"1+, *+3*4+A43+*.+1#C"+@*.+-)"+@*99* 20$57+			
8+@**,+DEFG	:;B?	:;?B	=H
8+."$-+DEFG	:;BF	:;=:	=H
8+,4.#A9"+5**,1+DEFG	:;H=	:;==	=H
8+I)09,."$J1+",4I#-0*$+DEFG	:;=H	:;>:	=H
8+I9*-)0$5+@*.+3*4.1"9@+DEFG+	:;KB	:;F>	=H
8+I)09,."$J1+I9*-)0$5+DEFG	:;=H	:;>:	=H
8+,*I-*.LI90$0I+C010-+@*.+3*4.1"9@+DEFG	:;BH	:;?=	=H
8+,*I-*.LI90$0I+C010-+@*.+3*4.+I)09,."$+DEFG	:;=H	:;>:	=H
8+1"$,0$5+ / *$"3+-*+*-)".+@# / 093+ / " / A".1+DEFG	:;HH	:;=?	=H
8+9"$,+ / *$"3+-*+*-)".1+DEFG	:;?M	:;=K	=H
8+)*90,#31L16"I0#9+*II#10*$1+DEFG+	:;B>	:;?M	=H
( )3+,0,+3*4+I)*1"+-*+2*.N+0$+-)"+@#I-*.3+3*4+#."+I4.."$-93+2*.N0$5+0$8+			
8+I9*1"+-*+3*4.+)*41"+DEFG	:;>K	:;>:	>=
8+."@"."+A3+@.0"$,L@# / 093+DEFG	:;>K	:;>:	>=

VAA"$23R*VY*W#M1"*I*

Q#/N"$-*P#,-./0*ZC$"/*[B")-3.$$#3/"*%BNN#/0*%-#-3)-3,)*

	! "#$	%&	'
!"#$%&'()*"&"#$+&,-$,#-(			
()*+#,-./0*1.,#-"2*3$*4567*89:;*	<=:>	<=>?	@?
&.")*+#,-./0*A/.2B,"*C.D"$*E..2)7*89:;	<=>@	<=?F	@?
&.")*+#,-./0*A/.2B,"*G$3-C"#/*E..2)7*89:;	<=@<	<=@<	@?
&.")*+#,-./0*A/.2B,"*C.D"$*#$2*G$3-C"#/*E..2)7*89:;*	<=<H	<=IJ	@?
&.")*+#,-./0*A/.2B,"*#$0*.-K"/*E..2)7*89:;	<=<H	<=IJ	@?
L"#/*.+*4)-#M13)KN"$-	:OOO	F=I<	@?
'BNM"/*.+*P#,-./3")*.C$"2*M0*)#N"*.C$"/	I=J@	:=0:	@I
./01%'++()*"&"#$+&,-$,#-(			
'BNM"/*.+*,B//"$-*"NA1.0"")	:?<:=0?	:FIJ=JJ	@?
5"/,"$-*.+*4NA1.0"")*-K#-*#/"*!#1"	>F=::	I<=F>	@?
5"/,"$-*.+*4NA1.0"")*-K#-*#/"*P"N#1"	J:=F0	I<=F>	@?
5"/,"$-*.+*P"N#1"*4NA1.0"")*-K#-*#/"*N#//3"2	@J=@F	I:=0@	?@
'BNM"/*.+*"NA1.0"")*#-*")-#M13)KN"$-*0"#/	?J<=?@	?JF=:I	@:
5"/,"$-*Q/.C-K*3$*$BNM"/*.+*"NA1.0"")*M"-C""$*			
")-#M13)KN"$-*2#-"*#$2*I<:?	?OF=JH	0F0=0?	@:
L"#/*-K#-*P#,-./0*"RA"/3"$,"2*1#/E")-*"NA1.0""*E/.C-K	I<<0=@@	@=:?	?I
'BNM"/*.+*4NA1.0"")*3$*I<<@	:>?F=F@	:J::=F>	IJ
4NA1.0""*E/.C-K*M"-C""$*I<<@*#$2*I<:?	JH=J@	:>0=II	IJ
!"#$%&'(2/+3,$,+-(			
&.")*+#,-./0*A/.D32"S*			
ST#+"-"/3#	<=HF	<=?I	@?
SP/""*./*/"2B,"2*1B$,K*	<=>>	<=?F	@?
STK312*T#/"	<=F<	<=?:	@?
S!#-"/$3-0*1"#D"	<=0J	<=:0	@?
4/0%&$"3#+(%5(6"7-("38(9%1,#,+-(			
U.C*3NA./-#$-*#/"*-K"*+.11.C3$E*1#C)*#$2*A.13,3")*C3-K*/"E#/2*-.*0.B/*MB)3$"))S*			
VE/""N"$-*.$*W"R-31")*#$2*T1.-K3$ES			
SD"/0	<=>0	<=?0	@?
S).N"CK#-	<=IF	<=?@	@?
S$.-*	<=I?	<=?>	@?
Q"$"/#13X"2*%0)-"N*.+*5/"+"/"$,")*			
SD"/0	<=H?	<=??	@?
S).N"CK#-	<=:@	<=>J	@?
S$.-*	<=<J	<=I>	@?

!"#$%&'()%#"$*%+(

Appendix A: Table 3 Effect of Living Near Garment Factories on Labor Market Outcomes

	Dependent Var: Woman is Currently Working	Dependent Var: Woman is Currently Working in Factory/Semi-Skill	Dependent Var: Husband is Currently Working in Factory/Semi-Skill
	(1)	(2)	(3)
High Density	-0.002	0.052	0.074
	(0.056)	(0.049)	(0.067)
High Density * After	0.119***	0.087**	-0.027
	(0.037)	(0.035)	(0.051)
Includes 1999	Yes	Yes	Yes
Includes DHS Cluster Characteristics	No	No	No
Mean Dependent Variable for 1999 and 2004	0.3	0.09	0.38
Observations	4,339	4,339	4,253
R-squared	0.097	0.082	0.052

Notes: Data comes from the 1999, 2004, 2007, and 2011 Bangladesh DHS survey and BGMEA database. All regressions include age fixed effects, district fixed-effects, individual controls for marital status and religion. Community controls are EPZ status, piped water and electricity access, and distance to local boys school. Sample consists of ever married women age 18 - 40 and their husbands. Standard errors are clustered at the DHS community level. *** p<0.01, ** p<0.05, * p<0.1