

Women empowerment, supply chain linkages and FDI: evidence from Bangladesh⁺

Ana M. Fernandes[#] and Hiau Looi Kee^{*}

This paper studies foreign direct investment spillovers on the gender-related labour market practice of domestic firms, based on a unique firm-to-firm data set of Bangladesh's textiles and garment sectors. The paper looks at the female employment of domestic firms that are directly and indirectly related to foreign-owned firms through supply chain linkages. These domestic firms are either the local suppliers or customers of foreign-owned firms, or they share local suppliers and customers with foreign-owned firms. The estimates show that domestic firms related to foreign-owned firms have significantly more female administrative workers, but not necessarily more female non-administrative workers, owing to the former participating in more firm-to-firm interactions.

Keywords: Bangladesh, female labour force participation, foreign direct investment, supply chain linkages, women

JEL: F1, F2, F6, J2.

⁺ Received 15 July 2020 – Revised: 31 August 2020 – Accepted: 9 October 2020.

The authors thank Sabiha Mohona and Nicolas Eduardo Santos Villagran for excellent research assistance. They also thank seminar participants at the United Nations Conference on Trade and Development's MNE and Gender expert group workshop and colleagues at the World Bank for comments. This paper has benefited from support from the Umbrella Facility for Trade trust fund financed by the governments of the Netherlands, Norway, Sweden, Switzerland and the United Kingdom. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank of Reconstruction and Development or the World Bank and its affiliated organizations, nor those of the Executive Directors of the World Bank or the countries they represent. All errors are our responsibility.

[#] Ana M. Fernandes is at the Trade and International Integration, Development Research Group, The World Bank, Washington, D.C., United States.

^{*} Corresponding author. Hiau-Looi Kee (hlkee@worldbank.org) is at the Trade and International Integration, Development Research Group, The World Bank, Washington, United States.

1. Introduction

Foreign direct investment (FDI) may affect gender parity objectives and gender inequality through increased economic growth and new employment opportunities. Jobs in foreign-owned firms (which we term “FDI firms”) are shown to be “good” jobs associated with higher wages, more stability and training than jobs in domestic firms, especially in developing countries (Javorcik, 2015). In addition to direct effects, FDI can have indirect spillover effects through supply chain linkages. Technological spillovers from foreign affiliates to their suppliers or customers may improve their productivity and allow them to increase the wage premiums they pay to workers.¹ If the technology diffused is more complementary to the female workforce, it can lead to relative increases in female labour demand. Additionally, FDI may improve female labour outcomes via corporate social responsibility efforts to improve working conditions, and health and safety in the workplace. Foreign investors (especially those from advanced economies) may push for more gender-equal norms and less discrimination against females in the workplace, and these practices may spill over to their suppliers or customers in the host country (as well as to other domestic firms) (UNCTAD, 2014).

But FDI can worsen gender inequality depending on the type of technology it brings, the predominant occupations of women, firms’ export activities, the competitive environment, and the origin of the investment. Foreign affiliates operating with sophisticated, skill-biased production processes may not improve female labour outcomes in countries with a large gender gap in education. If foreign affiliates transfer technologies to their supplier or customer firms that automate production, those firms’ female workers who are engaged in manual occupations, will see a reduction in employment and wages.² Foreign affiliates engaged in exports require greater time commitment and flexibility from their employees (e.g. to interact with foreign buyers in different time zones or to travel at short notice). If females are less flexible in their work hours (due to family responsibilities), such FDI may worsen the gender wage gap.³ The increase in competition driven by FDI weakens the bargaining power of workers, especially of female workers, when they are disproportionately employed in sectors such as ready-made garments that compete on the basis of

¹ See Havránek and Iršová (2011) for a review and meta-analysis of the evidence on spillovers from FDI through supply chain linkages on firm productivity.

² Juhn et al. (2014) have shown evidence of such effects in Mexico as a result of trade liberalization: females, engaged in white-collar manual occupations, experienced a decrease in employment and wages as firms invested in production automation, replaced those occupations. However, women employment and wage inequality were reduced for females engaged in blue-collar occupations, which were complemented by automation technologies.

³ Boler et al. (2014) show that firms beginning to export in Norway see an increase in the gender wage gap for high-skilled workers due to women’s reduced ability to work flexibly.

low labour costs with highly mobile capital. Finally, female labour market outcomes may be harmed if FDI originates in countries with a prejudice against female labour (Tang and Zhang, 2017).

This paper examines how FDI affects gender-related labour outcomes directly, but especially via supply chain linkages, focusing on firms in Bangladesh's apparel and textiles sectors. The ready-made garments sector in Bangladesh has been a key contributor to the country's robust economic growth, poverty reduction, and women's empowerment over the last three decades. Bangladesh is the world's second largest exporter of ready-made garments after China, with the sector accounting for more than 80 percent of the country's exports as of 2015, and providing jobs to over four million low and semi-skilled workers (Farole et al., 2017). We exploit a unique firm-level survey collected by the World Bank covering representative samples of firms in the apparel and textiles sectors. It includes information on each firm's suppliers and customers, which allows the construction of novel measures of supply chain linkages to FDI firms in the country. We follow and extend the approach proposed by Kee (2015) by relating FDI firms with domestic firms that share local input suppliers. She designates as FDI siblings those domestic firms that share local input suppliers with an FDI firm in the same sector.⁴

In this paper, we first examine whether there are significant differences in terms of the gender labour practices of FDI firms compared to domestic firms in Bangladesh. We show that FDI firms hire significantly more female administrative workers and non-administrative (production) workers than domestic firms. This is true even after controlling for firm size, location and industry fixed effects. We then exploit the unique firm-to-firm relationships present in our dataset. We study whether domestic firms that are related to FDI firms as their suppliers or customers are different from other domestic firms in terms of gender labour market practices. The estimates show that customers of FDI firms employ significantly more female administrative workers. Finally, we explore the gender labour practices of domestic firms that share local suppliers or local customers with FDI firms. We show that apparel firms that are FDI siblings employ significantly more female administrative workers than other domestic firms. Overall, these results suggest that domestic firms that are associated with FDI firms through backward and forward linkages in the supply chain have similar gender practices as the FDI firms.

Three caveats should be made regarding our study. Although our analysis is able to exploit novel and unique data rarely available, which captures firms' suppliers and customers, the information is available for only a cross-section of firms in one

⁴ Using a natural experiment generated by the Everything-But-Arms Initiative of the European Union that increased market access for Bangladeshi exporters, Kee (2015) shows that one-quarter of the product scope expansion and one-third of the productivity gains of domestic firms in Bangladesh that were FDI siblings can be attributed to the presence of the related FDI firms.

year. Thus, our results are robust cross-sectional correlations but cannot be given a causal interpretation. The fact that the data covers the year 2005 implies that our evidence provides a historic perspective on the development of the apparel and textiles sectors in Bangladesh before many changes to working conditions had been made following the Rana Plaza accident in 2013. Unfortunately, our survey does not include information on wages by gender, hence, we consider the gender labour market outcomes in terms of female employment across different types of occupations.

The paper relates to two strands of literature. The first strand of literature examines the role of FDI in gender labour outcomes and work practices. From a macro perspective, stronger FDI inflows are shown to be linked to better welfare for women and lower gender inequality across countries, through decreases in informal employment and the gender wage gap, and improved life expectancy and school enrollment (Ouedraogo and Marlet, 2018). The within-occupation gender wage gap tends to decrease with FDI but only in richer countries, with no clear link identified for poorer countries (Oostendorp, 2004).⁵ The expansion of light manufacturing activities led by FDI, such as ready-made garments, is associated with an increase in female labour force participation around the world (Heath and Jayachandran, 2017). From a micro perspective, evidence on how foreign affiliates affect gender inequalities in the labour market is just emerging. Evidence based on large cross-sections of firms in China, Japan, Viet Nam, and a sample of 64 developing countries shows that foreign affiliates hire relatively more female workers than comparable domestic firms in the same sector (Chen et al., 2013; Coniglio et al., 2017; Kodama et al., 2018; Rocha and Winkler, 2019).⁶ The female labour share premium in the sample of 64 developing countries is much higher for production than non-production workers, indicating a specialization of women in low-skill production activities. Along the same lines, the lower wages offered to females in China reflect their assignment to low-tech and low-training jobs and their lower productivity, but this is not indicative of gender discrimination. The job opportunities for females in Viet Nam are also in low-skilled occupations due to the country's comparative advantage in labour-intensive, low-tech manufacturing. Across all countries the findings point to foreign affiliates' wage premia being lower when they

⁵ UNCTAD (2014) argues that the impact of FDI on the gender wage gap is not one-sided but rather that it varies over time and is country- and context-specific, depending on the level of education and work experience of women and their bargaining power, but also the nature of the industry where they work, the degree of international competition, and the technological spillovers.

⁶ While for China, Viet Nam and the sample of 64 developing countries the evidence is based only on large cross-sections of firms, for Japan the evidence provided by Kodama et al. (2018) also relies on a panel of firms. Specifically, following a rigorous causal approach (propensity score matching difference-in-differences) they show that foreign acquisitions are associated with a 9-10 percentage point increase in the share of female workers, although this effect takes place with a delay.

employ a higher share of female workers. Foreign affiliates in Japan are also shown to create more female-friendly workplace conditions than domestic firms, including flexible working hours, telecommuting, childcare facilities, or subsidies.⁷ Foreign affiliates can also transmit gender norms from their countries of origin to the host country. Tang and Zhang (2017) show that foreign affiliates in China with parent companies from countries with a more gender-equal culture, employ relatively more women and appoint more female managers. Additionally, those affiliates generate cultural spillovers, increasing female labour shares and the likelihood of hiring a female manager in the domestic firms in the same industry or city.⁸

The second literature strand focuses on Bangladesh's ready-made garment sector's gender outcomes and working conditions. Heath and Mobarak (2015) show that the new employment opportunities brought by the ready-made garment sector had sizeable effects on female welfare in Bangladesh: delayed marriage, decreased fertility, and a rapid increase in girls' educational attainment over the last 30 years. Ready-made garment jobs were the first large-scale employment opportunities for women in a country with very traditional social values, where women generally did not have paid jobs outside the home. Garment jobs provide women with steady incomes but working conditions in the sector are far from perfect. Concerns about worker safety were amplified by the Rana Plaza accident, a factory disaster that killed more than 1,000 garment workers in Bangladesh in 2013. Foreign buyers implemented reforms in response to this accident, including a minimum wage increase, voluntary audits, and an increased reluctance to sub-contract to smaller factories. Bossavie et al. (2019) show that such reforms led to an improvement in overall working conditions in the garment sector, although at the expense of hourly wages for female workers, possibly due to the sector's globally competitive nature. Foreign multinationals in Bangladesh are also shown to play a growing role in improving working conditions in compliance with labour law upstream in their supply chains (Boudreau, 2020).

The contribution of our paper is two-fold. First, we document differences in gender-related labour market outcomes for firms in Bangladesh depending on their links to foreign affiliates in the country through supplier or customer relationships. Studies of supply chain linkages and gender impact are not available in the literature due to the difficulties in measuring such linkages, which our unique dataset allows us to circumvent. Second, we contribute to the broader debate on the link between globalization and gender inequality in developing countries.

⁷ The study shows that these differences are more pronounced in affiliates with a higher foreign ownership share, suggesting that control is essential for the ability of the foreign parent to affect the corporate culture in the overseas affiliate.

⁸ Tang and Zhang (2020) show theoretically and empirically that these relationships are quantitatively stronger in industries that make more intensive use of female labour.

This paper is organized as follows. In Section 2, we describe the data and provide summary statistics. Our empirical approach is described in Section 3, while regression results are shown in Section 4. Section 5 concludes the paper.

2. Data

Our analysis uses data from a firm-level survey conducted by the World Bank in Bangladesh during November 2004 and September 2005, covering the apparel and textiles sectors.⁹ For each sector, the sample was drawn from a different data source. For the apparel sector, a stratified random sample was drawn based on the rich Bangladesh Garment Manufacturers and Exporters Association directory covering 350 firms, which corresponded to about 10 percent of the total population of the domestic firms and 100 percent of FDI firms operating in the sector as of 2004. The sample of apparel firms was stratified to reflect the population distribution of firms by size, industry (woven garments versus non-woven garments), and location (Chittagong, Chittagong-Export Processing Zone, Dhaka, and Dhaka-Export Processing Zone). For the textiles sector, the random sample was drawn based on the most recent list of firms from the corresponding business association, also stratified by size. Strict quality control criteria were applied during the data collection and data processing phases. The survey collected a wealth of information on firm characteristics, in particular related to foreign ownership and exports, as well as several labour market-related variables. Most importantly, the apparel firms were asked to list the names and addresses of their top three local suppliers and the textiles firms were asked to list the names and addresses of their top three local customers. Based on this and on information pertaining to firms' foreign ownership, we were able to identify which firms are suppliers or customers of FDI firms, as well as link domestic firms to FDI firms through common local suppliers or customers.

In our analysis we use the following women employment practice variables as outcome variables: the total number of female workers, the number of female administrative workers, and the number of female non-administrative workers (which includes in particular female production workers).¹⁰ Our main regressors of interest are variables related to FDI. An FDI dummy variable is defined as being

⁹ See Fernandes (2009) and Kee (2015) for studies on firm productivity based on the Bangladesh survey data.

¹⁰ Another potential outcome variable would be the gender of the manager of each firm. The survey collected information on the name of the manager and we manually categorized each name as female or male. But we do not use this outcome variable in our analysis given the lack of variability across firms. Among all 350 apparel firms, only three have a female manager, and of all 144 textiles firms, only two have a female manager.

equal to one for firms with any degree of foreign ownership and zero otherwise. An FDI supplier dummy variable equals one for textiles firms that sell to an FDI apparel firm and zero otherwise. An FDI customer dummy variable equals one for apparel firms that buy from a textiles FDI firm and zero otherwise. An FDI sibling dummy variable equals one if the firm shares a local input supplier with an FDI firm and zero otherwise and it is defined for apparel firms only. An FDI partner dummy variable equals one if the firm shares a local customer with an FDI firm and zero otherwise and it is defined for textiles firms only. We use several firm controls including firm size defined as the log of total sales, a dummy for being an exporter, and a dummy for being located in an Export Processing Zone (EPZ).

After data cleaning to exclude firms with incomplete information, the samples used in the econometric estimation include 350 firms in apparel and 144 firms in textiles, as shown in Table 1. Within apparel, 65 percent of firms belong to the woven sub-sector, 34 percent belong to the knitwear/sweater sub-sector, and 1 percent belong to other apparel sub-sectors (e.g. linens).

Table 1: Sectoral distribution of firms

		Number of firms
Apparel	Knitwear	119
	Woven	226
	Other	5
Textiles		144

Table 2 shows summary statistics for our sample. Firms in our sample are large, averaging more than 700 workers, of which 384 are women. About 77 percent of the firms are exporters and 12 percent are located in an EPZ. Within our sample, 11 percent of firms are FDI firms, 5 percent are suppliers to FDI firms, and 15 percent are customers of FDI firms. Moreover, 37 percent of firms are FDI siblings (which share local suppliers with FDI firms), while 4 percent of firms are FDI partners (which share local customers with FDI firms).

Table 2: Summary statistics

	Number of observations	Mean	Standard deviation	Minimum	25 th percentile	Median	75 th percentile	Maximum
Panel A. Total employment and female labour-market outcomes								
Total number of workers	493	700	815	1	291	450	780	8,200
Total number of female workers	456	384	541	0	128	252	443	7,259
Number of female administrative workers	409	3	7	0	0	2	4	102
Number of female non-administrative workers	388	399	571	-3	127	250	480	7,253
Panel B. FDI variables								
FDI dummy	494	11%	31%	0%	0%	0%	0%	100%
Supplier to FDI firm dummy	494	5%	21%	0%	0%	0%	0%	100%
Customer of FDI firm dummy	494	15%	35%	0%	0%	0%	0%	100%
FDI sibling dummy	494	37%	48%	0%	0%	0%	100%	100%
FDI partner dummy	494	4%	20%	0%	0%	0%	0%	100%
Panel C. Firm controls								
Firm size (log of total sales)	489	18.6	1.3	12.6	17.9	18.6	19.5	22.0
Exporter dummy	494	77%	42%	0%	100%	100%	100%	100%
EPZ dummy	494	12%	33%	0%	0%	0%	0%	100%

3. Empirical specifications

3.1. Impact of FDI

To examine the impact of foreign ownership *per se* on firm-level gender labour market outcomes, the following regression is estimated on the full sample of apparel and textiles firms:

$$Y_{ij} = \beta_{FDI}FDI_i + \beta_X X_i + \mu_j + \varepsilon_{ij} \quad (1)$$

where Y_{ij} is one of the outcome variables for firm i in sector j , FDI_i is the dummy variable for FDI firms, X_i is the vector of firm controls (size, exporter status, and EPZ location), μ_j is an industry fixed effect, and ε_{ij} is an independent and identically distributed error term. Standard errors are clustered by industry and location.¹¹

3.2. Impact of being suppliers or customers of FDI firms

To examine the impact of directly buying from an FDI textiles firm or the impact from directly selling to an FDI apparel firm on firm-level gender labour market outcomes, we estimate the specification below on the sample of domestic apparel and textiles firms:

$$Y_{ij} = \beta_{FDI}FDI_supplier_i + \beta_X X_i + \mu_j + \varepsilon_{ij} \quad (2a)$$

$$Y_{ij} = \beta_{FDI}FDI_customer_i + \beta_X X_i + \mu_j + \varepsilon_{ij} \quad (2b)$$

where all variables are defined as above, $FDI_supplier_i$ is the dummy variable for domestic firms that sell to FDI apparel firms, and $FDI_customer_i$ is the dummy variable for domestic firms that buy from FDI textile firms.

3.3. Impact of being FDI siblings or partners

To examine the impact of sharing a local input supplier with an FDI apparel firm or the impact of sharing a local customer with an FDI textiles firm on firm-level gender labour market outcomes, we estimate the following two specifications, respectively, on the sample of domestic apparel or textiles firms:

¹¹ The industries considered are woven, knitwear/sweater, other apparel and textiles.

$$Y_{ij} = \beta_{FDI} FDI_sibling_i + \beta_X X_i + \mu_j + \varepsilon_{ij} \quad (3a)$$

$$Y_{ij} = \beta_{FDI} FDI_partner_i + \beta_X X_i + \mu_j + \varepsilon_{ij} \quad (3b)$$

where all variables are defined as above, $FDI_sibling_i$ is the dummy variable for domestic apparel firms which share a local input supplier with an FDI firm, and $FDI_partner_i$ is the dummy variable for domestic textiles firms which share a local customer with an FDI firm.

4. Results

Table 3 presents the regression results examining whether FDI firms are different from domestic firms in terms of their gender labour practices. The estimates of Equation (1) show that FDI firms in Bangladesh consistently employ more female workers across all worker categories. However, some of these results are driven by other covariates. Once we control for firm size, exporter status, location and industry fixed effects, the results show that FDI firms only hire significantly more female administrative workers relative to domestic firms.

Tables 4 and 5 present the results from estimating Equations (2a) and (2b) to examine whether domestic firms that are the suppliers and customers of FDI firms have different gender labour practices, respectively. The estimates show that customers of FDI firms have significantly more female administrative workers, once we control for firm size, exporter status, location and industry fixed effects. For suppliers to FDI firms we find no significant differences in gender labour practices relative to other domestic firms.

Tables 6 and 7 present the results from assessing whether FDI siblings and partners have different gender labour practices than other domestic firms by estimating, respectively, Equations (3a) and (3b). These are the domestic firms that share local suppliers or local customers with the FDI firms. The estimates in Table 6 show that, all else being equal, FDI siblings employ significantly more female administrative workers than other domestic firms. In contrast, the estimates in Table 7 show that FDI partners are no different from other domestic firms in terms of their female hiring practices.

As a robustness check, we use as dependent variables in Equations (1), (2a), (2b), (3a), and (3b) shares (rather than levels) of female administrative and non-administrative workers. The results are very similar to those in Tables 4-7. Domestic firms that are either FDI siblings or FDI customers are found to hire significantly larger shares of female administrative workers, controlling for firm size, exporter status, location and industry. No significant differences across FDI siblings or customers and other domestic firms are found for the share of female non-administrative workers. These results are available upon request.

Table 3: Do FDI firms exhibit different gender labour practices?

	Dependent variable is firm-level:					
	Number of female workers (1)	Number of female workers (2)	Number of female administrative workers (3)	Number of female administrative workers (4)	Number of female non-administrative workers (5)	Number of female non-administrative workers (6)
FDI dummy	556.0** (199.5)	95.22 (134.7)	5.706** (2.617)	3.095* (1.562)	608.2*** (185.0)	115.1 (166.5)
Firm size (log of total sales)		162.7*** (55.44)		1.836*** (0.318)		163.3** (59.77)
Exporter dummy		-74.43 (85.81)		-0.537 (0.663)		-65.86 (83.92)
EPZ dummy		354.0* (202.7)		0.547 (1.353)		357.2 (217.8)
Mean of dependent variable	383.24	385.32	3.31	3.32	398.45	401.09
Observations	455	451	408	404	387	383
R-squared	0.102	0.340	0.056	0.163	0.110	0.339
Industry fixed effects	No	Yes	No	Yes	No	Yes

Notes: robust standard errors in parentheses clustered by industry and location. ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.

Table 4: Are gender labour practices of suppliers of FDI firms different from those of other domestic firms?

	Dependent variable is firm-level:					
	Number of female workers (1)	Number of female workers (2)	Number of female administrative workers (3)	Number of female administrative workers (4)	Number of female non-administrative workers (5)	Number of female non-administrative workers (6)
FDI suppliers dummy	-46.66 (58.37)	-46.17 (67.79)	0.761 (1.515)	1.099 (1.292)	-47.12 (60.45)	-46.07 (69.90)
Firm size (log of total sales)		44.61*** (7.005)		1.534*** (0.0812)		42.26** (7.239)
Exporter dummy		21.94 (15.71)		0.648** (0.177)		13.16 (17.90)
EPZ dummy		-63.91 (67.77)		-3.216 (2.094)		-58.25 (67.45)
Mean of dependent variable	161.44	162.38	2.8	2.78	157.95	158.96
Observations	113	112	117	116	106	105
R-squared	0.002	0.043	0.004	0.286	0.003	0.039
Industry fixed effects	No	Yes	No	Yes	No	Yes

Notes: robust standard errors in parentheses clustered by industry and location. ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.

Table 5: Are gender labour practices of customers of FDI firms different from those of other domestic firms?

	Dependent variable is firm-level:					
	Number of female workers (1)	Number of female workers (2)	Number of female administrative workers (3)	Number of female administrative workers (4)	Number of female non-administrative workers (5)	Number of female non-administrative workers (6)
FDI customers dummy	253.7* (127.3)	154.7 (107.3)	2.584* (1.345)	2.054* (1.071)	276.3* (145.1)	161.7 (116.3)
Firm size (log of total sales)		194.6** (67.07)		1.466*** (0.249)		205.0** (81.25)
Exporter dummy		-250.5 (141.1)		-1.311** (0.566)		-244.5 (176.7)
EPZ dummy		484.7 (292.3)		-0.532 (0.696)		509.1 (332.2)
Mean of dependent variable	385.81	387.95	2.67	2.67	409.83	412.8
Observations	293	290	248	245	239	236
R-squared	0.041	0.259	0.036	0.120	0.044	0.255
Industry fixed effects	No	Yes	No	Yes	No	Yes

Notes: robust standard errors in parentheses clustered by industry and location. ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.

Table 6: Are gender labour practices of FDI siblings different from those of other domestic firms?

	Dependent variable is firm-level:					
	Number of female workers (1)	Number of female administrative workers (2)	Number of female administrative workers (3)	Number of female administrative workers (4)	Number of female non-administrative workers (5)	Number of female non-administrative workers (6)
FDI siblings dummy	101.9 (70.83)	43.00 (51.57)	1.919*** (0.471)	1.405** (0.468)	102.4 (88.10)	38.49 (62.75)
Firm size (log of total sales)		200.0** (69.35)		1.505*** (0.331)		212.0** (84.16)
Exporter dummy		-245.5 (139.3)		-1.380** (0.480)		-237.3 (173.1)
EPZ dummy		503.0 (295.1)		-0.322 (1.054)		529.2 (336.5)
Mean of dependent variable	385.81	387.95	2.67	2.67	409.83	412.8
Observations	293	290	248	245	239	236
R-squared	0.011	0.246	0.030	0.114	0.009	0.242
Industry fixed effects	No	Yes	No	Yes	No	Yes

Notes: robust standard errors in parentheses clustered by industry and location. ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.

Table 7: Are gender labour practices of FDI partners different from those of other domestic firms?

	Dependent variable is firm-level:					
	Number of female workers (1)	Number of female workers (2)	Number of female administrative workers (3)	Number of female administrative workers (4)	Number of female non-administrative workers (5)	Number of female non-administrative workers (6)
FDI partners dummy	-17.54 (35.14)	-67.89 (29.29)	1.602* (0.600)	0.332 (0.280)	-18.80 (34.48)	-65.77 (29.09)
Firm size (log of total sales)		48.98** (8.949)		1.527*** (0.101)		46.65** (9.216)
Exporter dummy		19.79 (13.16)		0.651* (0.242)		10.85 (15.68)
EPZ dummy		-87.57 (101.2)		-2.470 (1.228)		-82.13 (101.2)
Mean of dependent variable	161.44	162.38	2.8	2.78	157.95	158.96
Observations	113	112	117	116	106	105
R-squared	0.000	0.045	0.017	0.280	0.000	0.041
Industry fixed effects	No	Yes	No	Yes	No	Yes

Notes: robust standard errors in parentheses clustered by industry and location. ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.

In summary, the regression analysis above shows that FDI firms hire relatively more female administrative workers than domestic firms. Domestic firms that are related to FDI firms directly as their customers or indirectly as their siblings also employ more female administrative workers, but not necessarily more female non-administrative workers. This could be because administrative workers are involved in the intense firm-to-firm interactions between FDI firms and their related domestic firms, but other workers are not. By hiring more female administrative workers, the presence of FDI firms created a more gender-conducive environment that encouraged the related domestic firms to also hire more female administrative workers. It is possible that female administrative workers are more comfortable dealing with female administrative workers of other related firms.

One concern about our results above is that they might be driven by selection bias. Some domestic firms self-select to be FDI customers. If these domestic firms happen to have better gender practices, the estimated impact of the FDI customer dummy variable would be driven by selection, not by spillovers of the gender practices from FDI firms. Likewise, some domestic firms may self-select to be FDI siblings that share local suppliers with FDI firms. If these domestic firms hire more female administrative workers, the positive coefficient on the FDI sibling dummy variable would be driven by selection and not by spillovers from FDI firms.

In the absence of a valid instrumental variable correlated with FDI-related variables but not with the number of female administrative workers in our cross-sectional sample, we conduct a placebo exercise to address potential selection bias. First, we randomly assign FDI supplier, customer, sibling, and partner status to the domestic firms in our sample, categorized into the apparel and textiles sectors, in a way that results in new versions of the indicator variables *FDI_supplier*, *FDI_customer*, *FDI_sibling*, and *FDI_partner*, with similar averages as those shown in Table 2 for the original variables. Second, we re-estimate Equations (2a), (2b), (3a), and (3b) including these new versions of the variables. Finally, we repeat this process 100 times. We compute the average of the estimated coefficients and their standard deviations and present them in Table 8. The results of this placebo exercise show that when the linkages between FDI and domestic firms are randomly assigned, there are no statistically meaningful differences in gender labour practices of linked firms relative to other domestic firms. The coefficients are either insignificant or have counter-intuitive signs. This finding gives us some confidence that selection effects are not the driving force behind our previous findings.

Table 8: Placebo exercise

	Dependent variable is firm-level:					
	Number of female workers		Number of female administrative workers		Number of female non-administrative workers	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
FDI suppliers	3.057	91.833	-0.110	0.931	5.839	95.029
FDI customers	-3.456	58.424	0.087	0.964	-5.583	73.038
FDI siblings	3.821	58.657	0.070	0.784	4.464	70.837
FDI partners	6.417	96.211	-0.142	0.945	7.169	98.871

Notes: this table reports the mean and standard deviation of the bootstrap coefficients on the new indicators for FDI suppliers, FDI customers, FDI siblings and FDI partners from 100 regressions, where domestic firms are randomly assigned to FDI supplier/customer/sibling/partner status according to industry proportions.

5. Conclusion

This paper studies whether the presence of FDI firms has positive spillover effects on the gender labour practices of domestic firms in developing countries. Based on a unique linked firm-to-firm data set of the apparel and textiles sectors in Bangladesh, the paper first shows that FDI firms hire more female workers, particularly administrative and production workers. Domestic firms that are directly related to FDI firms as their local customers, also hire more female administrative workers, but not necessarily more female non-administrative workers. Moreover, domestic firms that share local suppliers with FDI firms, which are the FDI sibling firms, also employ more female administrative workers. But the same is not verified for female production workers. This could be due to the fact that, unlike production workers, administrative workers participate more in firm-to-firm interactions. Thus, with FDI firms hiring more female administrative workers, they create a more conducive environment for domestic firms that interact with them to hire female administrative workers.

Traditionally, in the study of FDI spillovers, the focus is on the impact of FDI presence on the productivity of domestic firms. However, FDI presence may provide more jobs for women and lead to women empowerment, which, through supply chain linkages, may encourage domestic firms to hire more women.

References

- Böler, E.A., Javorcik, B. and Ulltveit-Moe, K.H. (2018). Working across time zones: Exporters and the gender wage gap. *Journal of International Economics*, 111, pp. 122-133.
- Bossavie, L.L.Y., Cho, Y. and Heath R. (2019). *The Effects of International Scrutiny on Manufacturing Workers: Evidence from the Rana Plaza Collapse in Bangladesh*. World Bank Policy Research Working Paper 9065.
- Boudreau, L. (2020). *Multinational Enforcement of Labor Law: Experimental Evidence from Bangladesh's Apparel Sector*. Working Paper, Columbia Business School.
- Farole, T., Cho, Y., Bossavie, L. and Aterido, R. (2017). *Bangladesh jobsdiagnostic*. Jobs working paper 9, World Bank Group.
- Havránek, T. and Iršová, Z. (2011). Estimating Vertical Spillovers from FDI: Why Results Vary and What the True Effect Is. *Journal of International Economics*, 85 (2), pp. 234-244.
- Heath, R. and Mushfiq Mobarak, A. (2015). Manufacturing Growth and the Lives of Bangladeshi Women, *Journal of Development Economics*, 115, pp. 1-15.
- Heath, R. and Jayachandran, S. (2017). *The Causes and Consequences of Increased Female Education and Labor Force Participation in Developing Countries*. NBER Working Paper 22766.
- Javorcik, B. (2015). Does FDI Bring Good Jobs to Host Countries? *World Bank Research Observer*, 30(1), pp. 74-94.
- Juhn, C., Ujhelyi, G. and Villegas-Sanchez, C. (2014). Men, Women, and Machines: How Trade Impacts Gender Inequality. *Journal of Development Economics*, 106, pp. 179-193.
- Kee, H.L. (2015). Local intermediate inputs and the shared supplier spillovers of foreign direct investment. *Journal of Development Economics*, 112, pp. 56-71.
- Kodama, N., Javorcik, B. and Abe, Y. (2018). Transplanting corporate culture across international borders: Foreign direct investment and female employment in Japan. *The World Economy*, 41, pp. 1148-1165.
- Oostendorp, R. (2009). Globalization and the Gender Wage Gap. *World Bank Economic Review*, 23(1), pp. 141-161.
- Ouedraogo, R., and Marlet, E. (2018). *Foreign direct investment and women empowerment: New evidence on developing countries*. IMF working paper WP/18.25.
- Rocha, N. and Winkler, D. (2019). *Trade and Female Labor Participation: Stylized Facts Using a Global Dataset*. World Bank Policy Research Working Paper 9098.
- Tang, H. and Zhang, Y. (2017). *Do Multinationals Transfer Culture? Evidence on Female Employment in China*. CESifo Working Paper Series 6295.
- Zhihong, C., Ying, G., Huiwen, L. and Wan, C. (2013). Globalization and Gender Wage Inequality in China. *World Development*, 44, pp. 256-266.