

How is global commerce affecting the gender composition of employment? A firm-level analysis of the effects of exposure to gender norms via trade and FDI

Carolina Lennon and Alyssa Schneebaum

Department of Economics
Vienna University of Economics and Business

January 2020* :: Latest version [here](#)

Abstract

Global firms (exporters and multinationals) have a higher share of female employees than domestic non-exporters, a fact that the literature has explained by economic theories of discrimination, comparative advantages, and firm heterogeneity. This paper proposes and assesses another reason why global firms, on average, have a greater share of female employees. The core idea in the paper is that international trade and FDI serve as media through which norms regarding gender (in)equality are transmitted from customers and investors to firms. It is because of their exposure to different gender norms from around the world that global firms employ a greater share of female workers than domestic non-exporters. This prediction is tested using a large international firm-level dataset, estimating the impact of the exposure to gender norms coming via trade and FDI on the female share of a firm's full-time, permanent employees. The analysis uses OLS/LPM and IV approaches controlling for a wide range of variables that account for pre-existing economic theories linking the global status of a firm with its share of female employees. In some specifications, the analysis applies a new instrumental variable for the global status of the firm. The results consistently show a race to the top for low- and mid-level jobs: when firms are exposed to norms of gender equality, the female share of full-time, permanently employed production and non-production workers is higher than it is in non-global firms. However, there is instead a race to the bottom for top managerial positions. Moreover, the positive effects of exposure to gender equality are limited to firms that are in gender-equal countries.

JEL Classifications: F66; D22; F42; J16

Key Words: globalization; international trade; FDI; gender; transmission of social norms

*The authors are grateful for helpful comments from René Böheim, Jesús Crespo Cuaresma, Tuna Dökmeci, Pirmin Fessler, Max Kasy, Carla Rainer, Petra Sauer, Andrea Weber, and participants at seminar presentations at the Vienna Institute for International Economic Studies, the Workshop on Gender and Macroeconomics at the Levy Institute in New York, the AK Wien "Workshop feministischer Ökonominen," and at the Department of Economics at WU Vienna. This research was supported by the Austrian Science Fund (FWF) under grant number P 32709-G. Isabella Bachleitner provided helpful research assistance.

1 Introduction

Global firms (exporters and multinationals) have been found to have more gender-equal employment and wage outcomes than domestically-owned non-exporting firms; examples include Black and Brainerd (2004), Juhn, Ujhelyi, and Villegas-Sanchez (2014), Tang and Zhang (2017), Bøler, Javorcik, and Ulltveit-Moe (2018), and Kodama, Javorcik, and Abe (2018). The literature has relied on three strands of economic theory to explain this phenomenon: Becker's (1957) thinking on discrimination and the role of competition in determining firm mark-ups; the Heckscher-Ohlin application of comparative advantage to female workers in developing countries; and new conceptions of firms as heterogeneous (Melitz, 2003). These three theories have been steady workhorses in the literature explaining women's better outcomes in global firms; they are described in detail in section 2.2.2 below. Is there perhaps another unexplored link between a firm's global status and its female employment share?

The central contribution of this paper is the proposal and investigation of a novel fourth mechanism to explain the difference in the gender-specific employment structure in global versus non-global firms. In particular, the proposed mechanism is that commercial links via international trade and FDI serve as media through which norms of gender equality (or inequality) are transmitted across countries. As firms are exposed to the gender norms in other countries via customer demand for their goods or via the wishes of their foreign investors, they adapt their own employment structure to match those norms. In assessing this line of thought empirically, the paper controls for variables encompassing the three existing theories to single out the effect of the norms to which global firms are exposed on the female share of their full-time, permanent employees.

Existing literature on the transmission of norms has shown that international trade and FDI are indeed media through which social norms can be transmitted. Greenhill, Mosley, and Prakash (2009), for example, show that customers abroad demand that sellers meet their own local standards of equality: in that study, exporters adapted their treatment of workers to comply with norms of labor rights in the countries in which their customers were located. Those findings echo the idea of Vogel's (1995) "California

Effect,” by which international car manufacturers were found to conform to the high environmental standards for cars driven in California. Moreover, Harrison and Scorse (2010) find that in the face of activism against sweatshop labor conditions, exporters and multinationals raised employee wages to meet the demands of customers abroad.

The literature further shows that trade and FDI can internationally transmit gender norms in particular. In a paper whose methodology is close to the current study (the implementation of spatial lags to measure exposure to gender norms), Neumayer and de Soysa (2011) show at the country level that in all but the lowest-income countries, trade serves as a link for transmission of women’s social and economic rights across countries. In their results, FDI acts as a weaker channel than trade to transmit women’s rights. At the firm level, Tang and Zhang (2017) find that firms in China owned by companies in more gender-equal countries have a higher share of female employees. We build on this literature to explore several new dimensions of the effect of the transmission of gender norms via trade and FDI on a firm’s share of female employees, as described below.

The second major contribution of this study is the assessment of the effect of exposure to gender norms on the share of women employed in various classes of jobs. The analysis differentiates the effect of exposure to gender norms for production workers (such as those on assembly lines), non-production workers (such as those in offices), and top managers. The findings in Juhn, Ujhelyi, and Villegas-Sanchez (2013) show why this differentiation is important: they found that trade liberalization in Mexico increased wages and employment for women, but only for those in blue-collar jobs.

The third main contribution of the study is that it uses a firm-level dataset in its empirical analysis. In employing these firm-level data, the paper fits into the growing literature on heterogeneous firms, which is replacing classical theories of trade by recognizing that firms can fundamentally differ from each other. Global and non-global firms have different characteristics and processes that may be related to their decisions about hiring more or fewer women. Using firm-level data is important to be able to control for the effects of the firm-level characteristics that differ by global status, such as productivity, size, industry, and location. There is already a literature studying the relationship

between international trade and FDI with gender equality in employment using firm-level data, but existing studies have thus far only looked at firms in one country at a time.¹ Therefore, the fourth major contribution of the paper is that it studies firms in more than 100 different countries. The data employed contain information on almost 30,000 firms in mainly developing and transition economies, observed between 2007-2016. By looking at firms in so many countries, the analysis is able to control for institutional characteristics across countries and regions that may impact the link between a firm's global status and the share of women it employs. Moreover, the large sample of countries makes the analysis less prone to concerns about the external validity of the results, as is the case in single-country studies.

The analysis reveals that international trade and FDI do indeed affect the female share of full-time, permanent employees in global firms, and that the effect of being global on the higher share of women employed comes through the gender norms that trade and FDI transmit. These results hold both when the analysis is performed with OLS/LPM and when it employs an instrumental variable for the global status of the firm (introduced in section 2.2.3). In particular, the IV results show that the female share of full-time, permanent workers employed by foreign-owned firms is 13.6 percentage points higher than in domestic non-exporting firms. Crucially, the gender norms to which a firm is exposed make a significant difference in the impact of being global on the share of women employed: the share of women employed by exporters exposed to equality is 6.6 to seven percentage points higher than the female share in domestic non-exporters, but the share is not any different from that in domestic non-exporters when the exporters are exposed to inequality. Similarly, the share of women employed by multinationals exposed to norms of gender equality is 17-18 percentage points higher than in non-global firms, but it is not any different if the multinationals are instead exposed to inequality. However, the strong positive effect of exposure to gender equality is limited in two dimensions.

¹Examples include Ozler (2000) for Turkey; Klein, Moser, and Urban (2010) for Germany; Chan (2018) for Italy; Bøler, Javorcik, and Ulltveit-Moe (2015) and Bøler, Javorcik, and Ulltveit-Moe (2018) for Norway; Vahter and Masso (2019) for Estonia; Aguayo-Tellez et al. (2010), Juhn, Ujhelyi, and Villegas-Sanchez (2012), and Juhn, Ujhelyi, and Villegas-Sanchez (2013) for Mexico; Helpman et al. (2017) for Brazil; Dong and Zhang (2009), Chen et al. (2013), and Tang and Zhang (2017) for China; and Kodama, Javorcik, and Yukiko (2016) for Japan.

First, it is only the female share in low- and mid-level jobs that increases in response to exposure to equality; the higher up the job ladder, the lower the positive effect is. For top managerial positions, there is no positive effect of exposure to norms of gender equality; instead, global firms' choice of top manager is affected by exposure to norms of gender inequality, which makes them less likely to have a woman as a top manager. The second limitation to the positive effect of exposure to gender equality is that it is only firms in already gender-equal countries that respond to exposure to equality. Exposure to norms of equality does not affect the gender-specific employment structure of global firms in countries with norms of gender inequality.

2 Data and Methods

2.1 Dataset and the identification of “global” firms

To study the effect of the gender norms to which global firms are exposed on the share of women they employ, the paper employs a rich dataset of enterprise surveys from almost 30,000 firms in 104 countries administered by the Enterprise Analysis Unit of the World Bank. A major advantage of these surveys is that they were carried out using a uniform sampling methodology and the same set of questionnaires across firms, countries, and over time. The sample scheme consists of a stratified random sample based on sector, firm size, and region. The data contain information on the female share of a firm's full-time permanent (FTP) employees in both production and non-production jobs, as well as information on whether the top manager in the firm is a woman. The analysis is limited to firms in the manufacturing sector, because data on several important variables (such as the number of individuals employed in FTP positions in production versus non-production work and information on the skill level of the firms' production workers²) are scarce or unavailable for firms in other sectors.

²Only manufacturing firms were asked to report how many FTP employees were “highly skilled production workers,” “semi-skilled production workers,” or “unskilled production workers.”

“Global” firms are identified in two ways: those whose exports make up at least 10%³ of total sales (“exporters”) and those who are completely owned by foreigners (“multinationals” or “foreign(-owned)”).

2.2 Empirical Approach

There are two steps to the empirical analysis. The first step is to test the effect of the gender norms to which a firm is exposed via trade and FDI on its female share of FTP employees. The second step is to introduce and apply an instrumental variable for a firm’s global status to the analysis, to ensure that the effect can be given a causal interpretation (the IV is described in section 2.2.3). All models employ the control variables described in section 2.2.2, which account, among other things, for the existing theories linking firms’ global status and their female FTP employee share.

2.2.1 Identification Strategy

To assess how exposure to norms of gender (in)equality affect the relationship between a firm’s global status and its share of women in FTP positions, the empirical analysis constructs spatial lag variables indicating the gender (in)equality in commercial partner countries. Constructing these spatial lag variables entails two steps. The first step is to measure the norms of gender (in)equality in countries around the world, which is done using data from the Gender Inequality Index (GII) compiled by the United Nation Development Programme (UNDP).⁴ The GII measure ranges from 0 to 1, where higher values correspond to higher levels of gender inequality. The next step entails the creation of a firm’s exposure to gender (in)equality, which is a weighted measure of the gender (in)equality in the countries with whom a firm interacts and the amount of its commerce that it does with each country. In the firm-level Enterprise Survey data, there is no direct information on the countries with whom a firm trades or the countries from whom

³The 10% cut-off is standard in the literature; see e.g. Juhn, Ujhelyi, and Villegas-Sanchez (2014) and Kodama, Javorcik, and Yukiko (2016).

⁴The GII is a battery measure of five issues indicating a country’s level of gender inequality: the share of parliamentary seats held by women; the maternal mortality ratio; the adolescent fertility rate; the share of women with at least a secondary educational degree; and women’s labor market participation.

it receives FDI. To supplement this information, country-level data on bilateral trade and FDI are employed to get a measure of the countries with whom a firm interacts, based on its country of residence.⁵ Though the Enterprise Survey data do not have this information directly at the firm level, they do contain information on firms in many different countries, with varying degree of exposure to gender norms, offering enough variation to identify the impact of countries' exposure to gender norms on the hiring decision of global firms. The spatial lags (SL_i) take the form

$$SL_i = \sum_{j \neq i}^P w_{ji} * GII_j \quad (1)$$

where a firm's exposure to gender (in)equality equals the attitudes in the countries with whom a firm interacts (GII_j) weighted by the share of interactions it has across all commercial (FDI and trading) partners P (w_{ji}). There are two different sets of weights (w_{ji}), depending on whether the focus is on identifying exposure to gender norms in final consumer countries ($Trade_SL$) or in investor countries (FDI_SL). In the first case, the weights account for the share of exports in country i going to each of its partner countries j , while in the second, the weights represent the share of a country's inward FDI stocks originating from partner countries. Figure A1 in the appendix shows the average gender norms to which countries are exposed via trade and FDI; the ISO country codes for the highest, lowest, and some middle values are highlighted. The Czech Republic, Hungary, Sweden, and Estonia have high exposure to norms of equality; Namibia, Eswatini, Jordan, and Bhutan have high exposure to inequality.

The spatial lags are then employed in a model predicting the female share of FTP employees. As a starting point, it is reasonable to assume that attitudes towards female work in final export markets are relevant only for exporting firms, and that the attitudes in

⁵The data on FDI come from the United Nations Conference on Trade and Development (UNCTAD). The UNCTAD data give information on the stock of FDI in any country received from each other country. The UNCTAD data come primarily from countries' self-reports and are supplemented with data from partner countries and other international organizations, when available (UNCTAD, 2018). The data on bilateral trade come from the United Nations (COMTRADE), organized into so-called "World Trade Flows" (WTF) data by the Center for International Data (2018). These data give the total value of exports from one country to another.

source countries of FDI are relevant only to firms that are foreign owned (this approach is later expanded to additionally allow multinationals to be affected by exposure via exports, and exporters to be affected by exposure via FDI). The specification thus interacts the export weighted spatial lag variable ($Trade_SL$) with the export status dummy (X), while the FDI-weighted spatial lag variable (FDI_SL) is interacted with the foreign-owned dummy variable (M):

$$\begin{aligned}
 G_i = & \alpha + \beta X_i + \gamma M_i + \mathbf{C}_i \zeta' + \\
 & \phi Trade_SL_c + \delta X_i * Trade_SL_c + \\
 & \varphi FDI_SL_c + \theta M_i * FDI_SL_c + \varepsilon_i.
 \end{aligned} \tag{2}$$

The coefficients of interest are δ and θ , which predict the differential impact of the exposure to gender norms on the female share of FTP employees between global firms and domestic non-exporting firms operating in the same market. The standalone spatial lag variables ($Trade_SL$ and FDI_SL), which only vary across country and over time, are dropped from the model and accounted for by the country*year effects in all specifications. As such, the country*year effects account not only for a country's own level of inequality, but also for any spatial correlation in gender norms. This is particularly relevant here, since trade and FDI are strongly influenced by geographical distance; leaving this information in the error term would thus certainly induce endogeneity.

Along with the estimation of δ and θ based on equation 2, some specifications further investigate the interaction effect between being global and exposure to gender norms by splitting the sample of observations into countries exposed to gender equality versus those exposed to gender inequality. This binary measure of exposure to inequality versus equality is a relative measure of the gender norms of all levels of exposure in the data, split at the median. This portion of the analysis assesses the impact of being global for firms exposed to inequality versus the impact of being global for firms exposed to equality.

2.2.2 Control Variables

Each model controls for a host of issues that the literature has identified as linkages between a firm’s global status and its female share of FTP employees. Controlling for these items isolates the effect of the exposure to gender norms, which is the key question in the analysis. The first set of controls relates to Becker’s (1957) theory of employers’ taste for discrimination, in which firms in non-competitive markets enjoy relatively larger mark-ups and profits that can be used to “purchase” costly discrimination. By increasing market competition and lowering firms’ mark-ups, increased international commerce can reduce the scope for discriminatory practices and thus improve female labor outcomes.⁶ Studies which take as their theoretical starting point that globalization may reduce discrimination via greater competition include Artecona and Cunningham (2002), Black and Brainerd (2004), and Ederington, Minier, and Troske (2009). Each of these studies show that an increase in trade led to a decrease in discrimination against women in global firms. To account for the idea that international commerce can increase competition and thus reduce firms’ mark-up and ability to discriminate against women, the models in this paper include controls for whether a firm has working capital financed by credit or advances. This information is used as an indicator of the level of monopolistic power held by the firms, since only large firms with strong influence in the final market might ask suppliers for credits in advance.

The second set of controls comes out of the traditional trade theories based on comparative advantages and countries’ endowments. In particular, the Heckscher–Ohlin model predicts that as an economy opens up to trade, employment and production expand in the sector that uses the most abundant factor of production more intensely. To the extent that unskilled labor by women is relatively abundant in developing economies, the theory predicts that trade liberalization will reduce the gender employment and wage gaps in developing countries while widening them in rich economies (Sauré and Zoabi, 2014).⁷

⁶Indeed Weber and Zulehner (2014) show that firms in a competitive market with a preference for discrimination against hiring women have lower survival rates.

⁷However, the empirical literature does not find full support for this theory. Oostendorp (2009), for example, finds that being more globalized is related to a lower occupational-level gender wage gap only in developed countries – the opposite of what the Heckscher–Ohlin theory predicts. Moreover, the

To account for this idea, the models in this paper include controls for industry fixed-effects (ISIC codes at the 2-digit level) and the firm's skill intensity (that is, the share of skilled production workers). These controls ensure that the results are not driven by the concentration of unskilled female labor in particular sectors, such as the apparel sector, which is typically a big employer of unskilled female workers and is a prevalent example of comparative advantage in the developing and transition economies in our data.

The third set of controls shows how the use of firm-level data is crucial to properly identify the link between a firm's global status and the share of women it hires. This set of controls refers to new models of firm behavior based on firm heterogeneity and monopolistic competition (Melitz, 2003), which acknowledge that there is heterogeneity across firms even within narrowly defined sectors. Only a handful of firms export, and these exporters are larger, more productive, and invest more in new technology. The latter issue, greater investment in technology, is one key link between global status and gender equality, as shown in the model in Juhn, Ujhelyi, and Villegas-Sanchez (2012) and Juhn, Ujhelyi, and Villegas-Sanchez (2013). Their model predicts that new technology reduces the female comparative disadvantage of performing physically demanding tasks. At the same time, as a country opens up to trade, a selection of firms takes place, in which less productive firms exit the market. This process in turn increases the country's average productivity, and subsequently the number of firms in the economy that can afford the fixed costs of exporting and investing in new technology. Thus, trade liberalization leads to an increase in the number of exporting firms as well as in investment in new technology, favoring female workers.⁸ This example shows that greater gender equality among exporting firms and multinationals might not stem from their global status *per sé*, but instead from the fact that those firms tend to be larger and more technology-intensive than domestic and non-exporting firms. To account for firm heterogeneity in

model in Brussevich (2018) predicts that in the US, where trade openness should theoretically increase gender gaps on the labor market, the high cost of switching sectors upon facing import pressure actually disproportionately negatively affected men, not women, lowering the gender wage gap.

⁸In developed countries, Weinberg (2000) shows that the increase in computer use in the US between the 1970s and 1980s can explain more than half of the growth of demand for female workers, and Black and Spitz-Oener (2010) show that the adoption of computers can explain 41% of the declining gender wage gap in West Germany between 1979 and 1999.

general and the heterogeneity in firms' use of new production technologies in particular, the models here control for firm size (measured as the total number of employees three fiscal years ago), its productivity (sales per worker three fiscal years ago), and whether the firm had invested in any fixed asset in the last year. Finally, to account for firms' use of new production technologies, the models include firms' expenditure in equipment, machinery, and vehicles in its last fiscal year.⁹

Along with the control variables based on the three theories described above, all models further control for the region within a country in which a firm is located and a dummy variable indicating whether the firm is located in a large city. The information on the presence of a firm in a city controls for the possibility that there are different attitudes towards female work in metropolitan versus rural areas; since global firms are more likely to be in cities, it is important to include this information. The models further control for the firm's age; if at least one of its owners is a woman; and its share of temporary employees. Finally, all models include country*year controls to account for a country's level of gender inequality and any potential policy changes at the country level over time, such as tariff cuts and those regarding labor market conditions.

2.2.3 IV for global status of the firm

Finally, to ensure a causal interpretation of the results, the last component of the empirical strategy is to create and apply an instrumental variable for a firm's global status. Although all models include a large set of variables to control for issues exogenous to a firm's operations that could explain female employment,¹⁰ there may still be some endogeneity arising from unobserved firm heterogeneity.¹¹ An IV in this setting must explain

⁹Another way in which firms may differ in a way that is related to both their probability of being global and the share of women they employ is their management skill or style. Indeed Bloom et al. (2018) show that better managed firms are more likely to be exporters, and the results in Heyman, Svaleryd, and Vlachos (2013) suggest that more efficiently-managed firms hire a greater share of women and have a lower gender wage gap. To account for firm heterogeneity in management skill, all models in the analysis control for the number of years that the top manager has been working in the sector.

¹⁰Such as gender norms, labor policy, labor supply, and the factor intensity of sectors, which is captured via country*year, region within a country, and industry fixed effects, among other things.

¹¹One example of potential unobserved heterogeneity across firms related to both global status and the share of women employed in the firm could be managerial quality. Only highly professionalized management teams have the tools and the skills to engage in exporting and investing abroad (making management related to global status) and better managerial teams might conduct formal recruitment

a firm's selection into being an exporter or multinational while also being unrelated to the firm's female share of FTP employees. One of the preferred instruments for global status in the trade literature, firm geographical location,¹² cannot be used in this setting. Geography and distance in particular are powerful determinants of trade and FDI, and in most applications, they can be considered exogenous to firm-level outcomes since neither countries nor firms can modify geography. However, geography does not fulfill the condition of exogeneity in this case, since gender norms may be spatially correlated. If the distance between countries impacts not only trade and FDI but also the gender norms across countries, distance would have its own direct impact on female employment along with an indirect impact through trade and FDI.

The instrument for a firm's global status used here is based on the attractiveness of a market cell for global firms. If a firm is located in a narrowly-defined market cell (that is, the sector, region within a country, and year) that is particularly attractive for global firms, then the firm itself is likely to be global. The "attractiveness" of a market cell to global firms is measured via two indicators: the share of all employment in the cell (three years ago) employed by global firms within the cell, and the global firms' share of all firms in the cell that invested in fixed assets in the last year. When a high share of these measures within the cell is attributed to exporters and multinationals, the cell is particularly attractive to global firms.¹³ There are a total of four instruments: two variables (share of cell's employment and share of cell's investing firms) for each of the two endogenous explanatory variables (the exporter and multinational status of the firm). Since the measures of a market's attractiveness for global firms are based exclusively on firm characteristics for which the models explicitly control, the instruments

processes that are less prone to discrimination (making management related to female employment). The models specified here control for managerial quality proxied by the number of years the top manager spent in the industry, but this variable may not capture all variation in internal operations. In family-run businesses, for example, managers may have experience spanning generations, but hiring practices may still be informal. Moreover, the enterprise survey is an establishment survey and as such, does not contain information on the quality and skill of the management in the parent firm that might be relevant for multinationals and multi-establishment firms.

¹²See, for instance, the seminal work of Frankel and Romer (1999).

¹³Using the weights in the Enterprise Surveys makes the observed firms in each cell representative of all firms in their cells, since the survey design is stratified by sector, region, and year and the cells are defined by exactly these characteristics.

are uncorrelated with any determinants of the dependent variable.

One example of what these instruments might capture is the emergence of Export Processing Zones (EPZ) or Special Economic Zones (SEZ).¹⁴ A firm existing in one of these zones is much more likely to be global, but there is no reason to think that the zone itself would impact the gender-specific hiring decisions of the firms in it. Another example of what these instruments might capture is any new regional infrastructure, such as the construction of new air- and seaports within the period of analysis, which might disproportionately benefit exporting firms. Any such changes to infrastructure are unrelated to firms' gender-specific hiring decisions. Finally, the instruments capture any sectoral/industry clustering that might disproportionately attract global firms.

3 Results: The effects of exposure to gender norms

The starting point of the analysis is that global firms have a greater female share of FTP employees than domestic non-exporters; this is shown to be true in the Enterprise Surveys data in appendix table A1. Appendix A.1 discusses these baseline results in detail, but one point should be made here. The weaker a firm's global ties (based on the share of its output that is exported or the share of its owners that are abroad), the weaker the relationship between these measures and the share of female FTP employees. This result is not surprising if firms adapt to meet the gender norms to which they are exposed via commercial links. This section of the paper gives the results of the tests of exactly that question. The results analyzing the effect of exposure to gender (in)equality on a firm's share of women in all FTP positions are presented first, followed by analyses broken down by the type of position in the firm (production, non-production, and top managerial).

¹⁴These zones are geographically delimited areas, which are sometimes sector-specific. According to the UNCTAD (WIR 2019), there are 5,400 SEZs today, almost one-fifth of which were created within the last five years. These zones are separate customs territories within a country that are free from customs duties and tariffs. Most zones also offer fiscal incentives and infrastructure support in order to attract foreign investors, increase exports, and diversify industrial activity.

3.1 All full-time permanent employees

Table 1 shows the relationship between the norms to which global firms are exposed and the female share of their FTP employees. Column (1) reveals two important things. First, the top two rows confirm that the FTP positions in global firms comprise a greater share of women than non-global firms. This finding is explored more fully in appendix section A.1, where the data reveal that global firms do indeed have a greater share of women in their FTP jobs. Second, the next two rows show that a firm's exposure to greater levels of gender inequality (via the spatial lag) is associated with a lower female share of FTP positions. In other words, exposure to greater inequality via trade and FDI leads to a lower share of women in FTP jobs at the firm level.¹⁵ A one standard deviation increase in a country's exposure to gender inequality through both trade and FDI is associated with a 3.3 percentage point decrease in the share of women the firm hires in FTP positions. Evaluated at the average female share in FTP positions, which is 25% in the sample, this drop represents a 13% decline in the share of women in FTP positions.

The results in column (1) indicate a convergence in gender norms: international trade and FDI lead to either a race to the top or a race to the bottom in gender norms, depending on the level of gender (in)equality in commercial partner countries. The remaining four columns split the sample into two groups of observations based on whether a country's exposure to gender equality is below or above the sample median.¹⁶ Splitting the sample based on exposure in this way gives a direct test of how norms of gender equality versus norms of inequality impact the effect of being a global firm on the female share of FTP employees. Column (2) shows the firms whose exposure to gender norms via trade is in the upper half of the equality distribution, and column (3) shows the firms whose exposure via trade is in the bottom half of the gender equality distribution. In columns (4) and (5), the sample is split based on the exposure to gender norms from the source

¹⁵The measure of exposure to gender norms was centered around its mean before constructing the interaction terms in table 1. Therefore, the coefficients on exporter status and being a multinational can be interpreted as the impact of being global on the female share of FTP workers for firms that face average exposure to gender inequality through trade and FDI.

¹⁶This exercise is basically the same as interacting the global status of the firm, as well as all the other covariates of the model, with the exposure to gender inequality in partner countries.

Table 1: Relationship between a firm's female share of full-time permanent workers, based on its exposure to gender norms in commercial partner countries

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter ($\geq 10\%$)	2.746*** (0.498)	4.315*** (0.783)	0.824 (0.539)	3.216*** (0.676)	2.770*** (0.949)
Foreign (100%)	3.208*** (0.872)	5.208*** (1.078)	-0.135 (1.083)	5.623*** (1.133)	0.500 (1.056)
Exporter ($\geq 10\%$) * Trade_SL	-37.771*** (12.873)				
Foreign (100%) * FDI_SL	-26.307* (15.798)				
Observations	27,833	13,915	13,918	13,375	14,458
R^2	0.475	0.454	0.465	0.464	0.463
Region FE	Yes	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes	Yes

This table shows the relationship between a firm being an exporter and receiving FDI with its female share of full-time permanent workers, based on its exposure to gender norms in its commercial partner countries. Unequal and equal gender norms mean that the exposure is in the bottom or top half of the exposure distribution, respectively. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

countries of FDI.¹⁷

Columns (2)-(3) in table 1 show that in terms of exposure to gender norms via trade, the positive relationship between being a global firm and the female share of FTP employees is most prevalent when firms are exposed to more equal gender norms. Exporting firms exposed to gender equality via trade have a four percentage point greater female share of FTP jobs than domestic non-exporters. The female share of FTP employees in

¹⁷One by-product of this approach is that exporters and multinationals are now allowed to be influenced by both types of exposure to gender norms, that is, through both trade and FDI. This approach might be more realistic than assuming that only exporters are influenced by the norms in export markets and that only multinationals are influenced by the norms in FDI source countries, since a large share of multinationals in the manufacturing sector engages in exports (in our data, almost half (49%) of foreign-owned firms are also exporters). Thus, gender norms in export markets might have an effect not only on the hiring decisions of exporting firms but also, although to a lesser extent, on the hiring decisions of foreign-owned firms. Exporters, on the other hand, are predominantly domestically owned (89%) and are thus less likely to be influenced by the gender norms in source countries of FDI.

multinationals exposed to gender equality via trade is five percentage points higher than it is in domestic non-exporting firms. On the other hand, the female share of FTP employees in exporting and multinational firms exposed to unequal gender norms through trade is not different than it is in domestic and non-exporting firms.

A similar pattern emerges when looking at exposure to gender norms via FDI in columns (4)-(5). When exporting firms are exposed to norms of gender equality via FDI, the female share of FTP employees is three percentage points higher than it is in non-global firms; multinationals exposed to equality through FDI have a 5.6 percentage points greater share of women in these positions.

The same analysis is repeated in table 2, using the IV for a firm's global status explained in section 2.2.3.¹⁸ For all specifications, the battery of tests of the quality of the IV suggest that the IV is appropriate. Column (1) shows that for all firms, there is a positive relationship between being global and the female share of FTP employees, though this relationship is precisely estimated only for the effect of being a foreign-owned company. In particular, the share of women employed in foreign-owned firms is 13.6 percentage points greater than in similar domestic, non-exporting firms.

Results from the IV approach in table 2 show the same story whether looking at the exposure to gender norms via trade or via FDI. There is a race to the top in gender norms. The share of female FTP employees in global firms is statistically significantly larger than that in domestic, non-exporting firms, but only when countries are exposed to gender equality through trade or FDI (columns (2) and (4), respectively). The gap is economically important: when exposed to gender equality, the female share of FTP employees in exporting firms is between 6.6-7.0 percentage points larger than in non-global firms, and the female share in multinationals is 17.4-18.1 percentage points larger. Again, these are relatively large numbers, considering that the average share of women in FTP positions in all firms in the sample is just 25 percent. At the same time, global firms exposed to gender inequality via trade have female shares that are never statistically different from non-global firms (columns (3) and (5)).

¹⁸The first stage results can be found in table A2 in the appendix.

Table 2: The effect of a firm being global on its female share of full-time permanent workers; IV estimates

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter ($\geq 10\%$)	2.657 (2.146)	6.594*** (2.517)	-5.445 (3.329)	7.013** (3.186)	0.532 (3.139)
Foreign (100%)	13.605*** (3.642)	17.377*** (4.109)	4.816 (5.695)	18.052*** (5.246)	5.916 (4.522)
Observations	27,833	13,915	13,918	13,375	14,458
R^2	0.015	0.011	0.009	0.006	0.023
Region FE	Yes	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes	Yes
Underind. LM test	130.40	83.07	62.05	68.78	65.23
p-value LM statistic	0.00	0.00	0.00	0.00	0.00
Hansen J statistic	1.52	1.92	1.23	0.94	1.20
p-value Hansen J stat.	0.47	0.38	0.54	0.62	0.55
Weak IV Cragg-Donald	543.96	274.45	249.14	240.19	292.96
Weak IV Kleinbergen-Paap	162.46	89.50	107.23	84.96	94.59

This table shows the relationship between a firm being an exporter and receiving FDI with its female share of full-time permanent workers, based on its exposure to gender norms via commercial links. Unequal and equal gender norms mean that the exposure is in the bottom or top half of the exposure distribution, respectively. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Similarly, in columns (4)-(5), the positive effect of being global comes only for the firms whose exposure from FDI is to gender equality, while there is no response to exposure to norms of gender inequality. When exporters are exposed to equality via FDI, their female share of FTP employees is seven percentage points higher than it is in domestic firms. The female share of FTP employees in multinationals exposed to equality through FDI is more than 18 percentage points higher than it is in non-global companies. None of the estimates for firms exposed to gender inequality (columns (3) and (5)) are statistically significantly different from zero.

The results in table 2 reveal two things: first, it is the nature of being global that

incites multinationals to employ a greater share of women in their FTP positions (column (1)). Second, the effect of being global on the female share of FTP employees for both exporters and multinationals is dependent on the gender norms to which the firm is exposed (columns (2)-(5)). Those firms that are exposed to more equal gender norms have a greater female share of FTP jobs.

Taken together, the results in tables 1 and 2 show a clear “race to the top” effect: exposure to gender equality via commercial links incites global firms to have a higher share of women in their FTP positions. At the same time, exposure to norms of inequality does not reduce their female share of FTP employees.

One question that arises in the analysis is whether the *relative* level of gender inequality in the firm’s home country and the norms to which it is exposed plays a role in the relationship between being global and the female share of FTP employees. One might theorize that firms in gender unequal countries that interact with customers or investors in gender equal countries could experience a larger effect of being global than, say, firms that reside in already equal countries. The question is thus if the impact of exposure to particular gender norms differs based on the level of gender (in)equality in the firm’s country.

To address this question, table 3 divides the sample of firms’ countries into two, based on their level of equality (split at the median of the GII in the set of firms’ countries) and the level of gender equality to which firms are exposed. Countries in the top half of GII distribution are labeled “unequal” and those in the bottom half “equal.” There are thus four cells: firms in equal countries that are exposed to equality (column (1)); those in equal countries that are exposed to inequality (column (2)); firms in unequal countries that are exposed to equality (column (3)); and firms in unequal countries that are exposed to inequality (column (4)). The analysis is conducted using the IV. The top panel of the table shows firms’ exposure to gender inequality through trade, while the bottom panel shows firms’ exposure to gender inequality through FDI. The two samples show qualitatively similar findings.

The striking result in table 3 is that the “race to the top” suggested in tables 1 and

Table 3: Effect of being a global firm on share of women in FTP positions, depending on own and partner country's gender equality

	(1)	(2)	(3)	(4)
	Equal and exposed to equality	Equal and exposed to inequality	Unequal and exposed to equality	Unequal and exposed to inequality
Export markets				
Exporter ($\geq 10\%$)	8.153*** (2.602)	3.734 (3.611)	4.971 (6.072)	-4.368 (3.496)
Foreign (100%)	19.025*** (4.750)	12.523 (7.823)	5.335 (5.733)	-0.732 (6.762)
Observations	9,175	4,487	4,218	9,417
Underind. LM test	65.261	18.605	27.243	43.419
p-value LM statistic	0.000	0.000	0.000	0.000
Hansen J-statistic	1.241	2.299	0.066	0.165
p-value Hansen J-stat.	0.538	0.317	0.968	0.921
FDI source countries				
Exporter ($\geq 10\%$)	9.809*** (2.799)	1.849 (3.180)	-3.154 (7.472)	4.959 (4.792)
Foreign (100%)	20.398*** (5.587)	6.112 (5.398)	0.589 (7.187)	0.156 (6.445)
Observations	8,587	5,075	4,266	9,369
Underind. LM test	47.983	26.246	32.218	39.889
p-value LM statistic	0.000	0.000	0.000	0.000
Hansen J-statistic	2.497	0.491	0.904	1.506
p-value Hansen J-stat.	0.287	0.782	0.636	0.471
Region FE	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes

This table shows the relationship between a firm being global (exporting or receiving FDI) with its female share of full-time permanent workers, divided by the level of gender equality in the firm's own country and the level of gender equality in its partner countries. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating in the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

2 holds only for firms that are in equal countries. Exposure to equality does not push firms in unequal countries to employ a greater share of women in FTP positions. The first column in the top panel shows that the female share of FTP employees in exporting and multinational firms in equal countries that are exposed to equality via trade is eight and 19 percentage points higher than in very similar non-exporting and domestic firms, respectively. At the same time, the share of female FTP employees in firms in equal countries that are exposed to inequality (column (2)) is not different than it is in domestic non-exporting firms. This is the race to the top effect: there is no negative effect of being exposed to inequality for global firms that are in equal countries, but there are strong positive effects from exposure to equality.

The female share of FTP employees in global firms in unequal countries, however, is no different than it is in non-global firms, regardless of the norms to which the firms are exposed (columns (3)-(4)). There is a slight tendency for global firms in unequal countries to have a greater share FTP employees being female if they are exposed to equality and a lower share if they are exposed to inequality, but these results are statistically insignificant. The same results hold if we consider the effect of exposure to particular gender norms via FDI, shown in the bottom panel. The positive effect of being global exists only for firms in equal countries that are exposed to norms of gender equality. The finding that the effect of exposure to equality is dependent on a firm's own location is an important part of the story. That the transmission of norms of gender equality helps boost the share of women in FTP positions only if the firms are located in gender-equal countries suggests that commercial links cannot be the way to spread employment inequality to gender-unequal countries.

Another interesting result from tables 2 and 3 is that foreign-owned firms are very strongly affected by exposure to gender norms through trade. This result is not surprising, considering that almost half of foreign-owned manufacturers are also exporters. Not as many exporters are foreign-owned, so the effect of exposure through FDI for exporters is weaker than the effect of exposure through trade for multinationals.

The results presented up through this point use as their outcome variable the share of

all FTP positions held by women, that is, without differentiating the type of job. Below, parts of the analysis are repeated, differentiating the outcome variable into the share of women in FTP positions in production, non-production, and top managerial jobs.

3.2 Production jobs

Table 4 repeats the IV analysis from table 2 for production workers only. The results are rather similar to the overall results for all worker types. In particular, column (1) shows that the female share of FTP production jobs in foreign-owned firms is higher than it is in domestic non-exporting firms. However, the share of female FTP production workers employed by exporters is not statistically significantly different than it is in domestic non-exporting firms.

Columns (2)-(5) show the effect of being a global firm on the female share of FTP production workers based on the gender norms to which a firm is exposed through trade or FDI. As in table 2 looking at all employees, there is clear evidence of a race to the top of gender equality for production workers. Exposure to norms of gender equality for exporters (the top row) is associated with hiring a greater female share of FTP production workers. While the coefficients themselves are not always statistically significant, the difference between the coefficients in columns (2) and (3) as well as between columns (4) and (5) is statistically significant. For multinationals (second row), there is a positive, statistically significant effect of being global on the female share of FTP production workers only when the firm is exposed to norms of gender equality.

3.3 Non-production jobs

The results for the female share of FTP non-production workers are somewhat different. Table 5 shows that the race to the top persists in these jobs in that exposure to inequality never increases the female share of FTP non-production employees. However, exposure to equality only sometimes increases it – and to a lesser degree than it does for all FTP employees. In particular, exporters who are exposed to equality through either trade or FDI employ a greater share of women for these FTP office jobs than non-global

Table 4: The effect of a firm being global on its female share of FTP production workers; IV estimates

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter ($\geq 10\%$)	1.836 (2.643)	5.289 (3.602)	-6.024 (4.147)	8.467** (3.817)	-2.031 (3.687)
Foreign (100%)	12.596*** (4.256)	16.029*** (4.885)	4.243 (7.554)	15.754** (6.410)	6.077 (5.393)
Observations	27,795	13,891	13,904	13,352	14,443
R^2	0.010	0.011	0.003	0.005	0.010
Region FE	Yes	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes	Yes
Underind. LM test	131.38	83.49	62.00	69.76	65.37
p-value LM statistic	0.00	0.00	0.00	0.00	0.00
Hansen J statistic	0.33	1.03	0.75	0.24	1.02
p-value Hansen J stat.	0.85	0.60	0.69	0.89	0.60
Weak IV Cragg-Donald	543.31	274.45	248.65	239.76	292.83
Weak IV Kleinbergen-Paap	163.12	89.68	107.00	85.92	94.90

This table shows the relationship between a firm being an exporter and receiving FDI with its female share of FTP production workers, based on its exposure to gender norms via commercial links. Unequal and equal gender norms mean that the exposure is in the bottom or top half of the exposure distribution, respectively. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

firms: when exposed to equality in export markets, they employ a five percentage point greater share of women; the exposure to equality comes through FDI source countries, the difference is four percentage points. When looking at the effect for all workers (table 2), these estimates were six and seven percentage points, respectively. Moreover, foreign-owned firms employ a greater share of women in their FTP non-production positions than domestic non-exporters do only when the global firms are exposed to equality from their FDI source countries. Here the effect is 8.8 percentage points; for all workers, it was 18, and for production workers, it was 15.6 percentage points. There is thus evidence of some positive effects of exposure to equality when it comes to the female share of FTP

non-production jobs, but the results are weaker than they were for all workers and for production jobs.

Table 5: The effect of a firm being global on its female share of FTP non-production workers; IV estimates

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter ($\geq 10\%$)	2.312 (1.902)	5.111** (2.349)	-1.651 (2.433)	4.078* (2.462)	0.695 (2.874)
Foreign (100%)	4.902 (3.344)	6.208 (4.013)	1.293 (5.401)	9.043** (4.420)	0.961 (5.038)
Observations	26,056	12,980	13,076	12,401	13,655
R^2	0.014	0.015	0.011	0.012	0.016
Region FE	Yes	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes	Yes
Underind. LM test	125.86	81.19	57.06	65.45	64.75
p-value LM statistic	0.00	0.00	0.00	0.00	0.00
Hansen J statistic	1.54	0.51	4.16	1.43	0.73
p-value Hansen J stat.	0.46	0.77	0.12	0.49	0.70
Weak IV Cragg-Donald	517.51	256.54	241.29	223.44	282.07
Weak IV Kleinbergen-Paap	151.37	82.17	100.74	74.40	94.66

This table shows the relationship between a firm being an exporter and receiving FDI with its female share of FTP non-production workers, based on its exposure to gender norms via commercial links. Unequal and equal gender norms mean that the exposure is in the bottom or top half of the exposure distribution, respectively. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

3.4 Top manager positions

Finally, this section shows the results of the analysis studying the probability that a firm's top manager is female. Table 6 gives the results. The striking result is that the positive effect of being a global firm completely disappears. Instead, there is a *negative* relationship between being global and the probability of having a female top manager. Exporters are 3.9 percentage points less likely to have a female as a top manager (column

(1)). This negative effect is particularly pronounced when exporters are exposed to inequality through either trade (column (3)) or FDI (column (5)). Thus, the race to the top when it came to the female share of FTP production and non-production positions is flipped. When considering top management positions, there is instead a race to the bottom. For these jobs, global commercial links never serve as a catalyst to spread equality, but in some cases they do spread inequality.

Table 6: The effect of a firm being global on its indicator of whether the top manager is female; IV estimates

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter ($\geq 10\%$)	-0.040** (0.019)	-0.033 (0.024)	-0.061* (0.031)	-0.036 (0.028)	-0.045* (0.024)
Foreign (100%)	-0.067* (0.038)	-0.030 (0.049)	-0.131** (0.062)	-0.050 (0.055)	-0.110** (0.047)
Observations	25,523	13,129	12,394	12,320	13,203
R^2	0.124	0.147	0.097	0.136	0.112
Region FE	Yes	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes	Yes
Underind. LM test	127.95	80.37	62.56	77.72	51.21
p-value LM statistic	0.00	0.00	0.00	0.00	0.00
Hansen J statistic	0.59	1.01	0.36	1.96	1.06
p-value Hansen J stat.	0.74	0.60	0.83	0.38	0.59
Weak IV Cragg-Donald	515.57	265.98	231.68	236.07	270.87
Weak IV Kleinbergen-Paap	146.01	84.52	90.72	88.43	69.04

This table shows the relationship between a firm being an exporter and receiving FDI with its indicator of whether the top manager is female, based on its exposure to gender norms via commercial links. Unequal and equal gender norms mean that the exposure is in the bottom or top half of the exposure distribution, respectively. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

4 Discussion and Conclusions

This question of whether globalization can serve as a channel through which greater gender equality on labor markets can be achieved is one that has been discussed from both a theoretical and empirical perspective. The careful discussion in Neumayer and de Soysa (2011), for example, shows the complexity of the theoretical aspects of the topic. Increased international commercial links can boost women's employment in that economic growth can lead to new jobs, giving economic opportunities to women – but expanding markets can also increase the scope of opportunity to exploit them.

This paper has contributed to the conversation by providing an empirical analysis of the gender-specific employment structure of global versus domestic firms. It has studied how gender norms across countries impact the share of women in global firms' FTP positions. Moreover, the paper assessed how the impact of global status and exposure to gender norms differs by the type of position in question (production, non-production, top manager). It further contributed to the literature by studying the relationship between international trade and FDI with women's employment outcomes for a very large number of countries at once. The paper built on the insights of the literature on heterogeneous firms, employing firm-level data to control for key firm characteristics and a rich array of firm-specific effects. Finally, the paper introduced a novel IV for a firm's global status into the literature.

The central finding of the paper is that the gender norms to which a firm is exposed via trade and FDI impact its female share of FTP employees. In both the OLS and IV estimates, there is clear evidence that the norms to which a firm is exposed via trade or FDI impact the female share of FTP employees in the firm. In particular, it is global firms that are exposed to norms of gender equality that employ a higher share of women than non-global firms. When firms are exposed to inequality via trade and FDI, their female share of FTP production and non-production workers is not any different than it is in non-global firms. In these types of jobs, international trade and FDI can serve as a race to the top. Interaction with gender-equal countries incites firms to hire a greater percentage of women in these positions.

However, the paper has identified two clear limitations to global trade and FDI as a conveyor of gender equality. First, moving up the occupational ladder from production to non-production to top managerial positions, the positive effect of exposure to gender equality fades, or even disappears. The positive employment effects of exposure to gender equality are stronger for production than for non-production workers. What is more, global firms are no more likely than domestic firms to have a woman as their top manager – indeed, they are less likely than domestic firms to be managed by a woman. While there was a race to the top in the employment of women in FTP production and non-production positions, there is instead a race to the bottom when it comes to top manager positions. Firms that interact with unequal countries are much less likely to have a female as a manager than domestic firms.

One reason for the asymmetry in the findings regarding production and non-production versus top manager positions may be that even in developed and relatively gender equal countries, women are much less likely to hold top managerial jobs. Until firms in these circumstances can break their own glass ceilings, there is no gender equality norm regarding top managers to transmit abroad.

The second important limitation to the ability of trade and FDI to spread gender equality is that global firms only react to their exposure to equality if they themselves are in gender-equal countries. Table 3 showed that the positive effect of exposure to equality only exists for firms that are already in countries with norms of gender equality. These findings imply that for norms of equality to spread across countries, there must already be some common ground of norms or values in place. Exposure to equality through commerce is not enough to incite firms to employ a greater share of women; the firms must already be in a country that itself already lives norms of gender equality.

In sum, a main take-away message of this paper is that international trade and FDI can serve as a vessel through which gender norms can be transmitted. This is encouraging: progress in one country can more easily reach another country through economic activity. However, globalization will not be the only “intervention” necessary to achieve more gender equality in employment. Particularly when it comes to top management positions,

firms will need to do more if they want to have more women for the job.

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A Appendix

A.1 Is the female share of FTP employees higher in global firms?

The starting point of the analysis in this paper is that the female share of FTP employees is higher in global versus domestic non-exporting firms. The section analyzes whether this is true in the Enterprise Survey data used.

A firm’s female share of FTP employees (G) is predicted based on the firm’s global status, namely, a dummy variable (X) equal to 1 if a firm exports and a dummy variable (M) that identifies multinationals. The models include the vector (C) containing the control variables described in section 2. The baseline model takes the form

$$G_i = \alpha + \beta X_i + \gamma M_i + \mathbf{C}_i \zeta' + \varepsilon_i. \quad (3)$$

Table A1 presents the baseline OLS results, confirming the common finding in the literature that there is a positive relationship between being a global firm and having a greater female share of FTP employees. The first column shows that, relative to domestic, non-exporting firms, the female share of FTP employees in firms whose sales comprise at least 10% exports is 2.9 percentage points higher, while the share in foreign-owned firms is 3.4 percentage points higher.

Column (2) looks at whether there are synergies between being an exporter and being foreign owned. Almost half (49%) of foreign-owned firms in the data are also exporters; 11% of exporting firms are foreign-owned. The coefficient on the interaction term between these two measures of being a global firm reveals that it is the completely foreign-owned exporting companies that have the strongest relationship between being global and the share of women in their FTP positions. Compared to domestically-owned non-exporters (i.e. the base group), the female share of FTP employees in domestically-owned exporters is 2.6 percentage points higher (first row in column (2)), and the share in non-exporting multinationals is 1.5 percentage points higher (second row). It is, however, the foreign-owned exporters with the biggest difference in female employment: the female share of FTP employees in these firms is 8.1 percentage points higher than in the base-group firms.

To see another dimension of these results, column (3) gives a variety of measures for the “degree” to which the firm is global. The lower the share of output that is exported and the lower the percentage of the firm that is foreign-owned, the weaker the relationship between these measures and the share of women in FTP positions. Indeed for the measure of exports, only firms that export at least half of their output hire a greater share of women in FTP positions than domestically-owned, non-exporting companies; especially firms that export all of their output employ a greater share of women in FTP

positions. In terms of FDI, it is only firms that are completely foreign-owned that employ a significantly higher share of women in FTP positions than domestic, non-exporting firms do.

Table A1: Relationship between a firm's global status and its female share of full-time permanent workers

	(1)	(2)	(3)
Measure of globalization			
Exporter ($\geq 10\%$)	2.909*** (0.572)	2.610*** (0.595)	
Foreign (100%)	3.398*** (0.958)	1.524* (0.907)	
Exporter ($\geq 10\%$)*Foreign (100%)		4.040*** (1.532)	
Exporter ($\geq 10\%$, $< 50\%$)			0.593 (0.473)
Exporter ($\geq 50\%$, $< 100\%$)			2.686*** (0.904)
Exporter (100%)			10.997*** (1.501)
Foreign ($\geq 10\%$, $< 50\%$)			-0.626 (0.941)
Foreign ($\geq 50\%$, $< 100\%$)			0.345 (0.815)
Foreign (100%)			2.595*** (0.885)
Observations	27,833	27,833	27,833
R^2	0.474	0.474	0.477
Region FE	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes

This table shows the relationship between a firm being an exporter and receiving FDI with its female share of full-time permanent workers. The two measures of whether a firm is global - being an exporter or being foreign owned - are presented by the percentage of total sales exported or the share of firm that is owned by foreign companies. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

A.2 First-stage IV results

Table A2: First stage IV results, corresponding to results in table 2

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
Panel A: Exporters					
Exporters share in Permanent, full-time workers, three FY ago	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Exporters share in new investment	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Multinationals share in Permanent, full-time workers, three FY ago	-0.000* (0.000)	-0.001 (0.000)	-0.000 (0.000)	-0.001* (0.000)	-0.000 (0.000)
Multinationals share in new investment	0.000* (0.000)	0.001* (0.000)	0.000 (0.000)	0.001* (0.000)	0.000 (0.000)
Age	0.000 (0.000)	-0.000 (0.000)	0.001*** (0.000)	0.000 (0.000)	0.000 (0.000)
At least one female owner? (1 yes, 0 no)	0.000 (0.006)	0.010 (0.007)	-0.010 (0.009)	0.006 (0.008)	-0.007 (0.009)
Permanent, full-time workers, three FY ago	0.005*** (0.001)	0.004*** (0.001)	0.005*** (0.002)	0.004*** (0.001)	0.007*** (0.002)
Sales per worker, 3 FY ago	-0.001*** (0.000)	-0.002*** (0.000)	0.023*** (0.006)	-0.002*** (0.000)	0.023*** (0.006)
Temporary workers share (rounded)	0.000 (0.000)	0.001* (0.000)	0.000 (0.000)	0.001** (0.000)	0.000 (0.000)
Share of skilled production workers (rounded)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Purchase of new equipment (US 2009)	0.000*** (0.000)	0.000*** (0.000)	0.027 (0.019)	0.000*** (0.000)	0.000 (0.000)
Purchase of new equipment? (yes=1, no=0)	0.032*** (0.006)	0.021*** (0.007)	0.044*** (0.008)	0.030*** (0.008)	0.032*** (0.008)
Working Capital Purchased On Credit/Advances	0.000** (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)
Main business/large city	0.010 (0.008)	0.002 (0.011)	0.018 (0.012)	0.002 (0.010)	0.018 (0.012)
Years of top manager's experience in sector	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Observations	27,833	13,915	13,918	13,375	14,458

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
Panel B: Foreign-owned					
Exporters share in Permanent, full-time workers, three FY ago	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Exporters share in new investment	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Multinationals share in Permanent, full-time workers, three FY ago	0.003*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Multinationals share in new investment	0.002*** (0.000)	0.003*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.000)
Age	-0.000*** (0.000)	-0.001*** (0.000)	-0.000 (0.000)	-0.001** (0.000)	-0.000*** (0.000)
At least one female owner? (1 yes, 0 no)	-0.036*** (0.007)	-0.042*** (0.011)	-0.029*** (0.006)	-0.041*** (0.012)	-0.031*** (0.005)
Permanent, full-time workers, three FY ago	0.001*** (0.000)	0.001** (0.000)	0.001 (0.001)	0.001** (0.000)	0.001* (0.001)
Sales per worker, 3 FY ago	0.000 (0.001)	-0.000 (0.000)	0.032*** (0.001)	-0.000 (0.000)	0.032*** (0.001)
Temporary workers share (rounded)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Share of skilled production workers (rounded)	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)
Purchase of new equipment (US 2009)	-0.000 (0.000)	-0.000 (0.000)	0.022 (0.042)	-0.000 (0.000)	0.040 (0.032)
Purchase of new equipment? (yes=1, no=0)	0.005 (0.003)	0.006 (0.005)	0.004 (0.004)	0.003 (0.006)	0.008** (0.003)
Working Capital Purchased On Credit/Advances	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Main business/large city	0.004 (0.005)	0.001 (0.012)	0.002 (0.004)	0.010 (0.010)	-0.005 (0.005)
Years of top manager's experience in sector	-0.001*** (0.000)	-0.001*** (0.000)	-0.001** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Observations	27,833	13,915	13,918	13,375	14,458

Notes: This table shows the results of the first stage IV regression, that is, it predicts a firm's global status.

A.3 Additional specifications: OLS results without IV

A.3.1 Production workers

Table A3: Relationship between a firm's female share of FTP production workers, based on its exposure to gender norms in commercial partner countries

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter ($\geq 10\%$)	2.946*** (0.538)	4.699*** (0.797)	0.840 (0.649)	3.718*** (0.777)	2.756*** (0.935)
Foreign (100%)	2.905*** (1.032)	5.045*** (1.248)	-0.733 (1.342)	5.187*** (1.273)	0.289 (1.350)
Exporter ($\geq 10\%$) * Trade_SL	-43.450*** (12.618)				
Foreign (100%) * FDI_SL	-21.027 (18.244)				
Observations	27,795	13,891	13,904	13,352	14,443
R^2	0.423	0.420	0.401	0.426	0.400
Region FE	Yes	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes	Yes

This table shows the relationship between a firm being an exporter and receiving FDI with its female share of FTP production workers, based on its exposure to gender norms in its commercial partner countries. Unequal and equal gender norms mean that the exposure is in the bottom or top half of the exposure distribution, respectively. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

A.3.2 Non-production workers

Table A4: Relationship between a firm's female share of FTP non-production workers, based on its exposure to gender norms in commercial partner countries

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter ($\geq 10\%$)	1.949*** (0.475)	2.362*** (0.706)	1.298** (0.610)	2.085*** (0.648)	1.911*** (0.726)
Foreign (100%)	0.655 (0.851)	2.551*** (0.972)	-2.210* (1.234)	2.581** (1.175)	-1.333 (1.043)
Exporter ($\geq 10\%$) * Trade_SL	-4.767 (10.796)				
Foreign (100%) * FDI_SL	-15.083 (14.481)				
Observations	26,056	12,980	13,076	12,401	13,655
R^2	0.337	0.281	0.359	0.293	0.352
Region FE	Yes	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes	Yes

This table shows the relationship between a firm being an exporter and receiving FDI with its female share of FTP non-production workers, based on its exposure to gender norms in its commercial partner countries. Unequal and equal gender norms mean that the exposure is in the bottom or top half of the exposure distribution, respectively. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

A.3.3 Top managers

Table A5: Relationship between a firm's indicator of whether the top manager is female, based on its exposure to gender norms in commercial partner countries

	All obs.	Export markets		FDI source country	
		Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter ($\geq 10\%$)	0.002 (0.005)	0.006 (0.008)	-0.002 (0.007)	0.005 (0.008)	-0.000 (0.007)
Foreign (100%)	-0.006 (0.010)	0.011 (0.014)	-0.026* (0.016)	-0.002 (0.014)	-0.009 (0.013)
Exporter ($\geq 10\%$) * Trade_SL	-0.168** (0.085)				
Foreign (100%) * FDI_SL	-0.133 (0.192)				
Observations	25,523	13,129	12,394	12,320	13,203
R^2	0.213	0.237	0.185	0.235	0.190
Region FE	Yes	Yes	Yes	Yes	Yes
ISIC 2-digit FE	Yes	Yes	Yes	Yes	Yes
Firm Size FE	Yes	Yes	Yes	Yes	Yes
Country*Year FE	Yes	Yes	Yes	Yes	Yes

This table shows the relationship between a firm being an exporter and receiving FDI with its indicator of whether the top manager is female, based on its exposure to gender norms in its commercial partner countries. Unequal and equal gender norms mean that the exposure is in the bottom or top half of the exposure distribution, respectively. The models control for the firm's region, 2-digit ISIC code, size, age, share of skilled employees, share of temporary employees, investment in technology, as well as dummy variables indicating if the firm is in a large city and if at least one owner is female, the top manager's number of years in the sector, and country*year fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

A.4 Distribution of exposure to gender norms

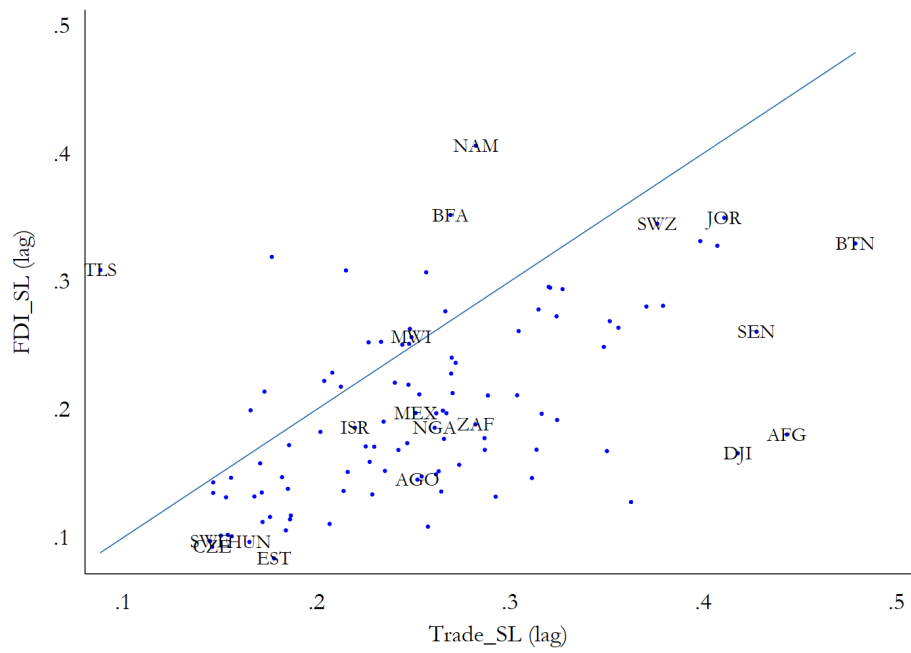


Figure A1: Exposure to gender norms through trade and FDI

A.5 Additional Information on the Enterprise Survey data

Information on firm characteristics are drawn from the Enterprise Survey from the World Bank. In particular, the analysis draws on the Standardized (Comprehensive) Database from October 2017, complemented by the Indicators Database from September 2017.

The questions used in the analysis are listed below.

- Female employment and female share were constructed based on:
 - 11** At the end of fiscal year [insert last complete fiscal year], how many permanent, full-time employees did this establishment employ? Please include all employees and managers
 - 13a, 13b** At the end of fiscal year [insert last complete fiscal year], how many permanent, full-time employees were: **Production** employees - 13a; **Non-production** employees- 13b
 - 15a, 15b** At the end of fiscal year [insert last complete fiscal year], how many permanent full-time employees of this establishment for the following categories were female?: **Female** permanent full-time **production** employees- 15a; **Female** permanent full-time **non-production** employees- 15b
 - b7a** Is the Top Manager female? (yes, no)
- The global status of the firm was constructed based on:
 - d3c** In fiscal year, what percentage of this establishment's sales were: **Direct exports**
 - b2b** What percent of this firm is owned by each of the following: **Private foreign individuals, companies or organizations**
- Control variables and fixed effects were constructed based on:
 - b4 / b4a** [*Female ownership*] Amongst the owners of the firm, are there any females? / Percentage of female ownership
 - b5** [*Age*] In what year did this establishment begin operations in this country?
 - 12** [*Retrospective question on FTP workers*] Looking back, at the end of fiscal year [insert last complete fiscal year minus two], how many permanent, full-time individuals worked in this establishment? Please include all employees and managers
 - n3, 12** [*Sales per worker based on retrospective questions*]
 - 12** See above

- n3** Looking back at the end of fiscal year [insert last complete fiscal year minus two], what were total annual sales for this establishment?
- other** Amounts were deflated and converted into US dollars
- 11, 18, 16** [*Temporary workers share*]
- 11** See above
- 16** How many full-time seasonal or temporary employees did this establishment employ during the fiscal year? (Full-time, temporary workers are all short-term (i.e. for less than a year) employees with no guarantee of renewal of employment and work full-time)
- 18** What was the average length of employment of all full-time temporary employees in the fiscal year?
- 14b** [*Share of skilled production workers*] At the end of fiscal year, how many permanent, full-time individuals working in this establishment were: Workers in unskilled production jobs, whose tasks involve no specialized knowledge
- n5a** [*Purchase of new equipment (US 2009)*] In fiscal year, how much did this establishment spend on purchases of: New or used machinery, vehicles, and equipment? (Amounts were deflated and converted into US dollars)
- k4** [*New investment (yes/no)*] In fiscal year [insert last complete fiscal year], did this establishment purchase any new or used fixed assets, such as machinery, vehicles, equipment, land or buildings, including expansion and renovations of existing structures?
- k3f** [*Working Capital Purchased On Credit/Advances*] Over fiscal year, please estimate the proportion of this establishment's working capital, that is the funds available for day-to-day operations, that was financed from each of the following sources? **Purchases on credit from suppliers and advances from customers**
- a3/a3c** Size of locality (Over 250.000 inhabitants or city is the capital or main business center)
- a3a** [*Region FE*] Screener Region (region within country)
- d1a2** [*ISIC 2-digit FE*] Code of the main product and activity (ISIC, revision 3.1)
- Screener Size** [*Firm Size FE*] Micro < 5 employees, Small >= 5 and <= 19, Medium >= 20 and <= 99, Large >= 100
- Country*Year FE** based on the year of the survey.

The four IVs to instrument firms' exporter status and firms' foreign ownership are based on l2 and k4. In particular, they are weighted averages by sector, region, and year of:

- Exporters' share in permanent, full-time workers, three fiscal years ago
- Share of exporters among firms making new investments during last fiscal year
- Multinationals' share in permanent, full-time workers, three fiscal years ago
- Share of multinationals among firms making new investments during last fiscal year

These averages were taken from firms not restricted to the regression sample, but based on all observations for which l2 and k4 were available.