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Abstract

Global firms have a higher share of female employees than domestic non-exporters. To explain this fact, this paper tests whether international trade and FDI are channels through which norms regarding gender (in)equality are transmitted from customers and investors to firms. We employ pooled cross-sectional data from 2007 - 2016 for around 28,000 firms in 104 different countries. We compare global versus non-global firms in the same market to study the influence of firms' exposure to gender norms in commercial partner countries. The results show a race to the top for low- and mid-level jobs and the opposite for top managerial positions.

JEL Classifications: F66; D22; F42; J16
Key Words: globalization; international trade; FDI; gender; transmission of social norms

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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 (2021), 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 technological upgrading embedded in trade models of heterogeneous firms (Juhn, Ujhelyi, and Villegas-Sanchez, 2014). These three theories have been steady workhorses in the literature explaining women's better outcomes in global firms.

The main contribution of this paper is that it proposes and tests a relatively unexplored explanation for the higher share of female employees in global firms: namely, that the norms of gender (in)equality to which a global firm is exposed via trade and FDI affects its own gender-specific employment structure. As firms are exposed to the gender norms in other countries via customer demand for their goods or via the hiring practices and gender norms of their parent companies, they adapt their own employment structure to match those norms. We empirically evaluate how exposure to norms of gender (in)equality through trade and FDI affects the female employment share in global firms as compared to non-global firms located in the same market. In particular, we study how the difference in the share of female employees in global versus non-global firms varies with the degree of gender (in)equality to which firms are exposed via trade and FDI. We measure exposure to gender (in)equality through trade and FDI by means of spatial lags, in which the gender (in)equality in a country's commercial partners is weighted by the strength of bilateral commercial links. Throughout, we control for variables that represent the three existing causal channels between a firm's global status and its share of female employees typically assumed in the literature.

The paper makes three further contributions to the literature. First, we assess 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 show that trade liberalization in Mexico increased wages and employment for women, but only for those in blue-collar jobs.

Second, we employ firm-level data in our empirical analysis. The paper thus fits into the growing literature on heterogenous firms, which is replacing classical theories of trade by recognizing that firms can fundamentally differ from each other, even in narrowly defined sectors. 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, and the use of technology. There is already a literature that uses firm-level data to study the relationship between gender equality in employment and international trade and FDI, but existing studies have thus far only looked at firms in one country at a time.[1] Therefore, the final major contribution of the paper is that it studies firms in more than 100 different countries, 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 within countries 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.

Existing literature on the transmission of norms has shown that international trade and FDI are indeed channels through which social norms can be transmitted. Greenhill, Mosley, and Prakash (2009), for example, show that customers abroad demand that

[1]Examples 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 (2013), and Juhn, Ujhelyi, and Villegas-Sanchez (2014) for Mexico; Helpman et al. (2017) for Brazil; Dong and Zhang (2009), Chen et al. (2013), and Tang and Zhang (2021) for China; and Kodama, Javorcik, and Yukiko (2016) for Japan.

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," in 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 on norm transmission further shows that trade and FDI can internationally transmit gender norms specifically. Using a panel of countries, Neumayer and de Soysa (2011) show that in all but the lowest-income countries, trade and FDI serve as links for the transmission of a country's level of women's social and economic rights (they find that FDI acts as a weaker channel than trade).[2] Using a cross-section of foreign-owned firms in China, Tang and Zhang (2021) also investigate the transmission of norms of gender equality. They find that firms owned by companies in more gender-equal countries have a higher share of female employees than those owned by firms in less gender-equal countries.

Given that we have information at the firm level for a large number of countries, we can follow a different identification strategy here. Rather than assessing the effect that gender norms in commercial partner countries have on the *level* of gender equality at home (as in Neumayer and de Soysa (2011)) or on the *level* of gender equality of global firms (as in Tang and Zhang (2021)), we assess here the *differential* response to exposure to gender norms from global versus non-global firms in the same market. This approach, comparing global to non-global firms, can help us counter-act two potential concerns from the outset: namely, that there may be other channels of gender-norm transmission present in a particular market, and that there might be reverse causality.

First, there may be other channels of transmission beyond commercial links – trade and FDI – through which gender norms can be transmitted across countries; bilateral migration and the flows of ideas, for example, can also act as powerful mechanisms.

[2]Similar to them, we also employ spatial lags to measure exposure to gender norms in commercial partner countries.

All these channels might be affected by the same set of factors, namely physical and cultural proximity; to the extent that these channels exist and cannot be observed, there would be a problem of identification. Both global and non-global firms are affected by the same set of transmission channels in the local market, but global firms might be disproportionally influenced by gender norms in the commercial partner countries with whom they interact. By comparing global to non-global firms in the same market, we can control for other mechanisms and better identify the role that trade and FDI might play on the transmission of gender norms across countries.

Second, a major concern of our research question stems from reverse causality. Since the emergence of the New Trade Theories, it has become apparent that north-north transactions represent the bulk of trade and FDI (Helpman and Krugman, 1985). This means that commercial transactions take place between similar countries, sharing similar level of development and, presumably, similar levels of gender equality. As such, the estimated impact of commercial interaction on a country's *level* of gender equality might reflect the fact that commercial relations take place between countries sharing similar level of gender equality. Also, at the micro level, the concern of reverse causality might arise if a global firm selects its commercial partners based on whether or not they share similar hiring practices or a similar level of gender equality.[3] The concern of reverse causality is lessened in our approach, which estimates the *differential* response of global and non-global firms in the same market to gender norms in partner countries. It is presumably less likely that the difference in the gender composition between global and non-global firms has an influence on the commercial partners with whom a firm or a country is willing or able to interact.

In our main specification, we also implement IV estimations in order to account for endogeneity arising from unobserved heterogeneity across firms, such as the quality of the management, that might influence both the firm's selection into being an exporter and/or multinational and its female composition. Our instruments are meant to account for the attractiveness of a narrowly defined market cell to global firms.

[3]It might also be the case that global firms are only able to establish commercial links with gender-equal countries if they themselves have more gender-equal practices.

The results consistently show that exposure to gender norms through trade and FDI affects the hiring decisions of global versus non-global firms. When looking at the female share in total employment, this exposure leads to a race to the top in gender equality, in which global firms exposed to gender equality have statistically statistically larger female shares than non-global firms in the same market. At the same time, when exposed to gender *in*equality, the female share of total employment in global firms is not statistically different from that in non-global firms. Our IV results show that when exposed to gender equality, the female employment share in multinationals is 17 – 18 percentage points larger than it is in domestic firms, and the female share is 6.6 – seven percentage points larger in exporting firms than in non-exporting firms.

We identify, however, two limitations to the positive effect of exposure to gender equality via trade and FDI. The first is that it is only firms in relatively gender-equal countries that respond to this exposure. The second is that the race to the top in gender equality exists only for low- and mid-level jobs; there is instead a race to the bottom for top managerial positions.

2 Data and Methods

2.1 Data

The paper employs a pooled cross-sectional dataset of almost 28,000 firms surveyed in 104 countries between 2007 and 2016 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.[4] The surveys are intended to be representative of the population of firms in the non-agricultural private economy.[5] The sample scheme consists of a stratified random

[4]We only include surveys adhering to the Enterprise Surveys Global Methodology so that comparability across countries and over time can be ensured.

[5]The surveys are the main source of information for the World Bank to construct indicators on a broad range of topics, such as access to finance, corruption, and firms' performance. These indicators are meant to be representative for a country, the region within the country, as well as at the industry level.

sample based on sector, firm size, and region. The World Bank administrates the survey each year for a selected number of countries, with some countries being surveyed more than once in the period of analysis.[6] Although some Northern and Eastern European countries have been surveyed, the surveys have been mainly conducted in developing countries.[7]

Our measure of female employment is the share of full-time, permanent positions held by women. We also use information on female employment shares in full-time, permanent positions for production and non-production workers. Finally, we use an indicator variable of whether a firm's top manager is female. The analysis is limited to firms in the manufacturing sector, since data on several important variables such as the number of individuals employed in production versus non-production work and information on the skill level of the firms' production workers are unavailable for firms in other sectors.[8] "Global" firms are identified in two ways: first, we identify exporters as firms whose exports make up at least 10%[9] of total sales, and second, we identify multinationals or foreign-owned firms as those who are completely financed by foreign investment.

To account for firms' exposure to gender norms through trade and FDI, we construct a set of spatial lags, which 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 on the Gender Inequality Index (GII) compiled by the United Nation Development Programme (UNDP).[10] The GII measure ranges from 0 to 1, where higher values correspond to higher

[6]One-third of the observations in the regression sample are in countries that have been surveyed more than once in the period of analysis.

[7]Based on the UN country classification, only 8% of the firms surveyed in our main specification reside in developed economies.

[8]Only manufacturing firms were asked to report the shares of employees that were "highly skilled production workers," "semi-skilled production workers," or "unskilled production workers."

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

[10]The GII is a battery measure of five issues indicating a country's level of gender (in)equality: 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.

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 share of its commerce done 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 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.[11] The resulting exposure indicators vary across countries and over time. Given that we have information on firms in more than 100 countries, we can exploit this variation to identify the impact that the exposure to gender norms has across countries. The spatial lags are constructed as in equation 1, where the exposure to gender (in)equality SL in country c at time t equals the sum across all commercial partner countries P of the gender (in)equality GII in commercial partner p weighted by the bilateral share w_{cpt} of trade and FDI between countries c and p at time t.

$$SL_{ct} = \sum_{p \neq c}^{P} w_{cpt} * GII_{pt}, \text{ with } \sum_{p \neq c}^{P} w_{cpt} = 1 \tag{1}$$

There are two different sets of weights (w_{cp}), 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 c going to each of its partner countries, while in the second, the weights represent the share of a country's inward FDI stocks originating from partner countries. As such, countries trading and receiving FDI mainly from gender equal countries will be exposed to

[11] The 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. Further details on the construction of the spatial lags can be found in appendix A.1.

gender equality, while those having commercial ties mainly with gender unequal countries will be exposed to gender inequality.

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.

2.2 Methods

Our dependent variable in all specifications is the female composition G in firm i in year t. We start by explaining firms' female share of total employment. We then break down the analysis, investigating the impact on the female share of production and non-production workers as well as whether the top manager is a female.

All specifications throughout the paper include time-varying country effects (Ω_{ct}) and a set of fixed effects for the region within a country in which the firm is located (Γ_l). The inclusion of region-specific effects ensures that we are comparing global to non-global firms that are geographically close and that are thus likely exposed to a similar level of gender equality and to the same set of gender norm transmission mechanisms. The time-varying country-specific effects further account for any potential policy changes at the country level over time, such as tariff cuts and those regarding labor market conditions. All specifications include industry fixed effects based on the firm's 2-digit ISIC industry code (λ_s) and the same vector of firm characteristics ($\mathbf{C}_{it}$).

$$\begin{aligned} G_{it} =& \alpha + \beta X_{it} + \gamma M_{it} \\ &+ \delta X_{it} * Trade\_SL_{ct} + \theta M_{it} * FDI\_SL_{ct} \\ &+ \mathbf{C}_{it}\zeta' + \Omega_{ct} + \Gamma_l + \lambda_s + \varepsilon_{it}. \end{aligned} \tag{2}$$

We employ the spatial lags in two specifications in order to evaluate how the female

composition of global versus non-global firms is affected by the exposure to gender norms in commercial partner countries. In the first specification, we interact the spatial lags with the global status of the firms (equation 2). In our second specification, we instead split the sample of firms into two groups – firms exposed to gender equality and those exposed to gender inequality, based on the median values of the spatial lags in the sample. In all specifications, spatial lags are lagged by one year.

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 source countries of FDI are relevant only to firms that are foreign-owned. The first specification thus interacts the export-weighted spatial lag variable ($Trade\_SL_{ct}$) with the export status dummy (X_{it}), while the FDI-weighted spatial lag variable (FDI_SL_{ct}) is interacted with the foreign-owned dummy variable (M_{it}). The main coefficients of interest in this specification are δ and θ, which capture how the difference in the female composition in global versus non-global firms operating in the same market varies with the degree of gender inequality to which firms are exposed via trade and FDI, respectively. Since the spatial lags were centered around their means before constructing the interaction terms, the coefficients on the global status (β and γ) are to be interpreted as the difference in the female composition of global versus comparable non-global firms in the same market that face average exposure to gender inequality through trade and FDI.[12]

Throughout the analysis, we control for a host of issues that the literature has identified as linkages between a firm's global status and its share of female employees. Controlling for these items isolates the effect of the exposure to gender norms. 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.[13] Studies that take as

[12]Notice that the standalone spatial lag variables ($Trade\_SL$ and FDI_SL), which only vary across country and over time, are dropped from equation 2, as they are accounted for by the time-varying country specific effects (Ω_{ct}).

[13]Indeed Weber and Zulehner (2014) show that firms in a competitive market with a

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. The vector $\mathbf{C}$ includes information on whether a firm's working capital is financed by credit or advances, which we use 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 gender gaps in employment and wages in developing countries while widening them in rich economies (Sauré and Zoabi, 2014).[14] To account for this idea, along with including industry fixed-effects (λ_s), all models also control for the firm's skill intensity based on its 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 large 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

preference for discrimination against hiring women have lower survival rates.

[14]However, 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 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, thus lowering the gender wage gap.

set of controls refers to new trade models 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 Juhn, Ujhelyi, and Villegas-Sanchez (2014). 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.[15] 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 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), firm 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 the last fiscal year.

Along with the control variables based on the three theories described above, all models includes a dummy variable indicating whether the firm is located in a large city. The city variable controls for confounding factors arising from global firms being attracted to large cities, where attitudes towards female work might differ from those in rural areas.

[15]In the context of 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.

The models further control for the firm's age; if at least one of its owners is a woman; its share of temporary employees; and management quality. The latter is proxied by the number of years that the top manager has been working in the sector.[16] Finally, to account for stratification structure of the sampling methodology of the survey, we further control for three broad categories of the a firm's size. The list of all control variables and their related survey questions are presented in appendixes A.2 and A.3, respectively.

2.2.1 IV for global status of the firm

Our IV strategy is meant to deal with unobserved firm heterogeneity that might simultaneously influence a firm's decision to become global and its female share. Although we already control for a large set of confounding factors that are external to a firm's operations,[17] there may still be some endogeneity arising from unobserved firm heterogeneity. One example of unobserved firm heterogeneity could be the managerial quality of a firm. This factor might act as a confounder, in that only highly professionalized management teams might have the tools and the skills to engage in exporting and to attract investment from abroad, and at the same time, these teams might be more likely to conduct formal recruitment processes that are less prone to gender-based discrimination.

The models employed in this analysis control for firm size and productivity, both of which might be correlated with the quality of firm management; all models further use the number of years the top manager spent in the industry as a proxy of management quality. However, if these variables do not capture all variation in managerial quality, the models might suffer from omitted variable bias.[18] If the latter is true, then a good instrument would capture factors that are external to a firm's operation, but that can

[16] 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.

[17] Notice that the set of specific effects and firm-level variables used in our main specification already allow us to control for considerations such as gender norms in the local market, the skill composition, the incidence of temporary employment, and country-wide policy changes, among others.

[18] In family-run businesses, for example, managers may have experience spanning generations, but hiring practices may still be informal.

still influence the decision to become global.[19]

One of the preferred instruments for global status in the trade literature that is external to a firm's operation – namely, geography – cannot be used in this setting, as the exclusion restriction might not be satisfied. This is because not only trade and FDI are strongly influenced by geography, but other transmission channels of gender norms are as well.[20]

Our strategy here is to find instruments that can account for the attractiveness of a narrowly defined market cell to global firms. Over-representation of exporters and multinationals in a particular market might indicate that the market offers especially advantageous conditions to global firms. To ensure that the instruments are representative of the population of firms in a market, we use the survey weights and include all firms independently of whether or not they belong to the regression sample. The market is defined by the year, sector, and region within a country in which a firm is located.[21] Using the weights, we construct measures of the market concentration of global firms based on firm characteristics for which we explicitly control in the model. In particular, the "attractiveness" of a market cell is measured via two observed firm characteristics: the employment (in the previous three years) of the firms and whether a firm had invested in fixed assets in the last year. As such, the instruments are the estimated population share of employment in the cell employed by global firms, and the global firms' share of all firms in the cell that invested in fixed assets in the last year. We calculate the share

[19] Arguably, the quality of the management might be itself the result of a firm's decision to become global. It might be that firms undergo a restructuring process, including of the management, in order to be able to enlarge their market and deal with foreign markets. In this case, one would rather avoid controlling for management quality. At the same time, using instruments that capture factors that are external to a firm's operations might be, in principle, unproblematic. Compared to OLS estimates, however, instrumenting in this case might lead to less precise estimates and, in case of heterogeneous effects, to results that reflect only the behavior of the complier population, that is, the impact on the gender composition for the group of firms that decided about their global status based on external factors.

[20] In addition, using instruments based on geography would require dropping the region within a country effects, which were included in our main specification precisely to control for other mechanisms of gender transmission across countries.

[21] We take advantage of the fact that the surveys are conducted in order to create indicators that are representative of a region, year, and sector.

of exporters and the share of multinationals for each firm characteristic separately. We thus have an over-identified model with four instruments for two endogenous variables.

One important advantage of our instruments is that they allow us to keep the full set of control variables and specific effects of the main specification. The instruments thus capture the attractiveness of the narrowly defined market, holding constant considerations such as the gender norms in the local market, the skill level, the incidence of temporary employment, as well as country-wide policy changes.[22]

However, there are two concerns that might undermine the validity of our instruments. First, our instruments, which vary across market cells, might capture unobserved market characteristics which themselves have a direct impact on the female share of firms. The second concern arises because in order to construct instruments that are representative of the population in a market, we use all firms, including the reference firm i whose female share we want to estimate. This problem does not come from the variables used in the construction of the instruments – total employment and investment of the firm – since these variables are controlled for and thus explicitly taken out from the error term in the reduced form. The problem arises, however, because each firm contributes to the instrument value based on its own global status. We thus conduct a set of checks on the plausibility of the exclusion restriction in appendix A.4. In particular, we conduct regressions controlling for a fulls set of market-cell characteristics, and regressions in which a firm's own value is discarded in the construction of the instruments. The checks confirm the plausibility that our instruments reflect the attractiveness of the market cell that is not confounded by unobserved market-cell characteristics nor driven by the inclusion of a firm's own values.

Finally, one example of an external factor that these instruments might capture is the emergence of Export Processing Zones (EPZ) or Special Economic Zones (SEZ),

[22] Although the instruments are meant to deal with the endogeneity arising from the self-selection of global firms in a market, using instruments that capture conditions external to a firm's operations might indirectly help us reduce concerns about the reverse causality of the exposure to gender equality, at least if one thinks that a firm's characteristics (such as the degree of gender bias of the management) might define the markets with whom the firm interacts.

which aim to attract foreign investors and promote exports.[23] 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. Other examples include 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

We start by presenting the impact of exposure to gender norms on firms' female share of total employment. We then break down the analysis, investigating the impact of exposure to gender (in)equality on the female share of production and non-production workers as well as whether the top manager is a female.

3.1 Total employment

Table 1 shows OLS regressions, in which the female share in total employment is explained by the global status of the firm and the gender norms to which the firm is exposed. In column (1), the trade and FDI spatial lags (Trade_SL and FDI_SL, respectively) are interacted with their corresponding dummy variables for being an exporter or being foreign-owned. The coefficients on the stand-alone variables for global status show that global firms employ a higher share of female workers than domestic firms and non-exporters, in line with the literature. The female share in exporting firms is 2.7 percentage points higher than it is in non-exporting firms, and the share is 3.2 percentage

[23] These zones are geographically delimited areas, which are sometimes sector-specific. According to the UNCTAD (WIR 2019), there are 5,400 SEZs, 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.

points higher in multinationals than in domestic firms.[24] The coefficient on the interaction terms are negative and statistically significant. They indicate that exposure to greater gender inequality via trade and FDI leads to a lower share of female employment in global firms compared to non-global firms in the same market. 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 employed by a global firm. Evaluated at the average female employment share, which is 25% in the sample, this drop represents a 13% decline in the share of female employees. These results indicate a convergence in gender norms: international trade and FDI are associated with 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.

Columns (2)-(5) in table 1 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.[25] Splitting the sample in this way gives a direct assessment of whether the exposure to gender norms through trade and FDI leads to a race to the bottom or rather to a race to the top for the sample at hand. 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 countries of FDI.[26]

[24] Appendix table A2 presents and discusses the results on the impact of global status in a regression that does not account for the exposure to gender norms. The findings there confirm that global firms have a higher share of female employment. Moreover, the table shows that 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 employment. This result would be in line with the idea that the gender-specific employment structure in global firms is influenced by the gender norms to which the firm is exposed.

[25] This exercise is essentially the same as interacting the global status variables, as well as all the other covariates of the model, with the exposure to gender inequality in commercial partner countries when the latter is accounted for by a binary variable.

[26] One 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

Table 1: OLS estimates of firms' share of female workers, based on their global status and exposure to gender norms

Dependent variable: share of female workers					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	2.746***	4.315***	0.824	3.216***	2.770***
	(0.498)	(0.783)	(0.539)	(0.676)	(0.949)
Foreign (100%)	3.208***	5.208***	-0.135	5.623***	0.500
	(0.872)	(1.078)	(1.083)	(1.133)	(1.056)
Exporter × Trade_SL	-37.771***				
	(12.873)				
Foreign × 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

This table shows the relationship between a firm being an exporter and receiving FDI and its share of female workers, based on its exposure to gender norms in its commercial partner countries. Equal and unequal mean that the exposure to gender norms in partner countries is in the bottom or top half of the distribution of the spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

When studying the effect of exposure to gender norms through trade, we see that global firms only have a statistically significantly higher female employment share than non-global firms when they are exposed to gender equality. Exporting firms exposed to gender equality via trade have a four percentage point greater female employment share than non-exporters, while multinationals exposed to gender equality via trade have a five percentage point higher female share. On the other hand, the female employment share 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

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.

columns (4)-(5). Multinationals have a 5.6 percentage points greater share of female employees than domestic firms when exposed to norms of gender equality, while the coefficient on the multinational status is statistically insignificant when exposed to norms of gender inequality.

Another interesting result from table 1 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.

We repeat the analysis from columns (2)-(5) in table 2, using our IVs.[27] For all specifications, the battery of tests of the quality of the IV suggest that the IV is appropriate. Column (1) shows that while there is a positive relationship between being global and the female employment share, this relationship is only precisely estimated for the effect of being a foreign-owned company. The female employment share in foreign-owned firms is 13.6 percentage points greater than in similar domestically-owned firms, but the coefficient on being an exporter, although positive (2.7 percentage points), is statistically insignificant.

The IV results further confirm our OLS findings from table 1. Table 2 shows a race to the top in gender norms. The share of female 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 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 than in non-global firms. Again, these are relatively large numbers, considering that the average female employment share in all firms in the sample is just 25 percent. At the same time, global firms exposed to gender inequality via trade or FDI have female shares that are never statistically different from non-global firms (columns (3) and (5)).

[27]The first stage results can be found in table A6 in the appendix.

Table 2: 2SLS estimates of firms' share of female workers, based on their global status and exposure to gender norms

Dependent variable: share of female workers					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	2.657	6.594***	-5.445	7.013**	0.532
	(2.146)	(2.517)	(3.329)	(3.186)	(3.139)
Foreign (100%)	13.605***	17.377***	4.816	18.052***	5.916
	(3.642)	(4.109)	(5.695)	(5.246)	(4.522)
Observations	27,833	13,915	13,918	13,375	14,458
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 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 and its share of female workers, based on its exposure to gender norms in its commercial partner countries. Equal and unequal mean that the exposure to gender norms in partner countries is in the bottom or top half of the distribution of the spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

In the next exercise, we investigate whether the response to the exposure to gender (in)equality of global versus non-global firms depends on the level of gender (in)equality in the firm's home country. Some counteracting effects might be in place. On the one hand, if gender norms in gender-unequal countries are so entrenched that global firms are impeded from deviating from the local hiring practices, we will see insignificant effects of being global in gender-unequal countries. On the other hand, since the firms in our sample reside primarily in developing countries, most of the countries in the sample are relatively less gender equal than their commercial partner countries. As such, the distance in gender norms between the country in which a firm resides and its commercial partners is the largest among gender-unequal countries. One might thus expect to find a more pronounced difference in the female employment share of global versus non-global firms within gender-unequal countries.[28]

[28]Note that most countries in the sample have high GII scores, meaning that they have relatively gender unequal norms. For the years 2005-2015, the average GII was .460 for the countries in the Enterprise Survey data, while the average GII in OECD countries was .233. Moreover, most of the countries are more gender unequal than their commer-

To address this question, table 3 further divides the sample according to the median values of gender inequality index in the countries in which the firms reside. Countries in the top half of the GII distribution are labeled "unequal" and those in the bottom half as "equal." Table 3 shows the IV estimates for each of the four resulting groups. Results for firms in relatively gender-equal countries that are exposed to gender equality are presented in column (1); firms in equal countries that are exposed to inequality are in column (2); firms in unequal countries that are exposed to equality are in column (3); and firms in unequal countries that are exposed to inequality are in column (4). The top panel of the table shows the impact of firms' exposure to gender norms through trade, while the bottom panel shows the impact of firms' exposure to gender norms through FDI.

As in our previous results, we find signs of a race to the top in gender norms. Only global firms exposed to gender equality have statistically significantly higher female shares than non-global firms. At the same time, the female share in global firms exposed to gender inequality is never statistically significantly different from the female share in non-global firms in the same market. However, the table further shows that the race to the top in our sample is driven by firms in relatively equal countries. This might suggest that for norms of equality to spread across countries, there must already be some common ground of norms or values in place. For firms in countries with relatively unequal gender norms, we observe neither a race to the top nor a race to the bottom in gender norms.

Finally, we notice that countries exposed to gender equality tend to be themselves more gender equal relative to countries exposed to gender inequality. In principle, this imbalance in gender equality at home might not be a source of concern in our analysis as, by comparing global to non-global firms, we are already controlling for the level of gender equality of the market. However, one cannot rule out that gender norms at home might be confounded with the different ways in which global versus non-global firms respond

cial partners. Based on countries' own values of GII and their trade and FDI spacial lags, almost all countries in the sample (98.5%) have more gender unequal norms than their investing countries, and almost as many (93%) have more unequal norms than the countries to whom they export.

Table 3: 2SLS estimates of firms' share of female workers, split by level of gender equality in own country and by level of exposure to partner countries' gender equality

Dependent variable: share of female workers				
	(1)	(2)	(3)	(4)
	Equal and exposed to equality	Equal and exposed to inequality	Unequal and exposed to equality	Unequal and exposed to inequality
Panel A: Exposure to gender norms from **export markets**				
Exporter (≥10%)	8.317***	3.734	3.967	-4.368
	(2.625)	(3.611)	(5.919)	(3.496)
Foreign (100%)	19.736***	12.523	6.053	-0.732
	(4.829)	(7.823)	(5.313)	(6.762)
Observations	9,117	4,487	4,276	9,417
Hansen J statistic	0.99	2.30	0.30	0.16
p-value Hansen J stat.	0.61	0.32	0.86	0.92
Weak IV Kleinbergen-Paap	60.71	59.01	61.15	54.25
Panel B: Exposure to gender norms from **FDI source countries**				
Exporter (≥10%)	9.809***	2.120	-3.154	4.514
	(2.799)	(3.201)	(7.472)	(4.735)
Foreign (100%)	20.398***	7.046	0.589	0.939
	(5.587)	(5.593)	(7.187)	(6.083)
Observations	8,587	5,017	4,266	9,427
Hansen J statistic	2.50	0.60	0.90	2.09
p-value Hansen J stat.	0.29	0.74	0.64	0.35
Weak IV Kleinbergen-Paap	56.86	47.97	46.72	86.02

This table shows the relationship between a firm being an exporter and receiving FDI and its share of female workers, divided by the level of gender equality in the firm's own country and the level of exposure to gender equality in its partner countries. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

to exposure across countries. Sub-sampling firms by their own level of (in)equality as in table 3 improves balance for the sample of firms in gender-unequal countries, but not for those in gender-equal countries. We thus replicate table 3 for a trimmed sample, which ensures balance in the level of own gender norms across comparison groups. The balance check and the results of this exercise are presented in appendix A.8. The results are very similar to those found in table 3, leaving the main message unchanged.

The results presented up through this point use as their outcome variable the female share of *all* jobs. Below, we replicate table 2 for the female employment share in production and non-production jobs as well as whether the top manager is female. All estimates are based on our IV specification.[29]

3.2 Production jobs

Table 4 shows the results for production workers. The results are similar to the overall results for all worker types in section 3.1. In particular, column (1) shows that the female share of production employees in foreign-owned firms is higher than it is in domestic firms. However, the share of female production workers employed by exporters is not statistically significantly different than it is in non-exporting firms.

Columns (2)-(5) show the effect of being a global firm on the female share of production workers based on the gender norms to which a firm is exposed through trade or FDI. Similar to our previous results, we find a race to the top for production workers. Exposure to gender inequality never statistically significantly affects the hiring practices of global firms versus non-global firms. At the same time, coefficients on the global status of the firms are positive and statistically significant only when firms are exposed to gender equality.

[29] Appendix tables A3 - A5 present the results using OLS. They show a race to the top in gender equality for production workers and a race to the bottom for top managers. The results for non-production workers lie in between.

Table 4: 2SLS estimates of firms' female share of production workers, based on their global status and exposure to gender norms

Dependent variable: female share of production workers					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	1.836	5.289	-6.024	8.467**	-2.031
	(2.643)	(3.602)	(4.147)	(3.817)	(3.687)
Foreign (100%)	12.596***	16.029***	4.243	15.754**	6.077
	(4.256)	(4.885)	(7.554)	(6.410)	(5.393)
Observations	27,795	13,891	13,904	13,352	14,443
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 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 and its female share of production workers, based on its exposure to gender norms in its commercial partner countries. Equal and unequal mean that the exposure to gender norms in partner countries is in the bottom or top half of the distribution of the spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.3 Non-production jobs

Table 5 shows that the race to the top persists in non-production jobs as well. Only exposure to gender equality statistically significantly affects the female employment share in global firms, while exposure to gender inequality never does. However, the size of the effects of being a global firm are smaller compared to those found for the female share in total employment and production workers. For example, in multinationals exposed to equality through FDI, the coefficient on foreign status in the analysis of all employees is 18, while it is 15.8 for production workers and just nine for non-production workers.

3.4 Top manager positions

Finally, table 6 shows the results of the analysis studying the probability that a firm's top manager is female. The striking result is that we now find a statistically significant *negative* relationship between being global and the probability of having a female top manager. Exporters are four percentage points less likely to have a female as

Table 5: 2SLS estimates of firms' female share of non-production workers, based on their global status and exposure to gender norms

Dependent variable: female share of non-production workers					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	2.312	5.111**	-1.651	4.078*	0.695
	(1.902)	(2.349)	(2.433)	(2.462)	(2.874)
Foreign (100%)	4.902	6.208	1.293	9.043**	0.961
	(3.344)	(4.013)	(5.401)	(4.420)	(5.038)
Observations	26,056	12,980	13,076	12,401	13,655
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 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 and its female share of non-production workers, based on its exposure to gender norms in its commercial partner countries. Equal and unequal mean that the exposure to gender norms in partner countries is in the bottom or top half of the distribution of the spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

a top manager and multinationals are 6.7 percentage points less likely to have a female top manager (column (1)). This negative effect is driven by firms' exposure to gender inequality. Exporters exposed to gender inequality are between 4.5-6.1 percentage points less likely than non-global firms to have a female top manager, and multinationals exposed to inequality are between 11-13 percentage points less likely to do so (columns (3) and (5)). However, when exposed to gender equality, results are never statistically significant. Therefore, the race to the top that we have observed so far 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 they do spread norms of inequality.

3.5 Robustness checks

Based on specifications using the female share in total employment as the dependent variable, we conduct a set of robustness tests in this section.

Table 6: 2SLS estimates of the probability that a firm's top manager is female, based on firms' global status and exposure to gender norms

Dependent variable: indicator of whether the top manager is female					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	-0.040**	-0.033	-0.061*	-0.036	-0.045*
	(0.019)	(0.024)	(0.031)	(0.028)	(0.024)
Foreign (100%)	-0.067*	-0.030	-0.131**	-0.050	-0.110**
	(0.038)	(0.049)	(0.062)	(0.055)	(0.047)
Observations	25,523	13,129	12,394	12,320	13,203
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 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 and its indicator of whether the top manager is female, based on its exposure to gender norms in its commercial partner countries. Equal and unequal mean that the exposure to gender norms in partner countries is in the bottom or top half of the distribution of the spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.5.1 Falsification check

One issue that can undermine the credibility of our results is that our measure of exposure to gender equality might be reflecting the level of economic development in commercial partners countries rather than their degree of gender equality. To test whether it is economic development instead of gender norms that are driving the results, we construct a new set of spatial lags, in which we replace the gender inequality index (GII) in equation 1 by the GDP per capita at constant prices in commercial partner countries. The new spatial lags are meant to reflect firms' exposure to wealth through trade and FDI.

We conduct two exercises based on the new spatial lags. We first conduct a falsification test in table 7, in which instead of splitting the sample according to the exposure to gender (in)equality in partner countries, we split the sample based to the exposure to wealth in commercial partner countries. In the first two columns the sample is split according to the median value of the exposure to wealth in export markets and in the last two

columns according to median value of the exposure to wealth in source countries of FDI. The first noticeable difference in the falsification results is that the coefficients on the global status in columns 3 are very similar to those in column 4, both in magnitude and in significance level. As such, the female share in global versus non-global firms does not depend on whether countries are receiving FDI from relative richer or poorer countries. The results on the exposure to wealth through trade in columns 1 and 2, however, seem to indicated that the exposure to gender equality might be confounded with the fact that more gender-equal export markets tend to be richer markets as well. The correlation of the exposure to gender equality and the exposure to wealth is indeed relatively high in the sample.[30] To gain more insight, we thus conduct a second exercise in table 8. In this table, we come back to our main specification (that is, that found in table 2), where the sample of firms is split according to the exposure to gender norms, but where we further control for the exposure to wealth in commercial partners. This is done by adding the interaction terms between the new spatial lags and the global status of the firm.[31, 32] The results are reassuring: after controlling for the exposure to wealth, only global firms that are exposed to gender equality have a significantly larger female share than non-global firms, while the coefficients on the global status are either insignificant or negative for firms exposed to gender inequality, confirming our main results.

3.5.2 Sensitivity checks

As a sensitivity test we drop China and India from the specifications. Excluding these countries can be important, because firms from these two large countries are over-represented in the sample – the sample size for India is around 18 times larger than the average sample size per country, and 5 times larger in the case of China. The main message once dropping these countries, shown in 9, is unchanged. Global firms hire

[30]The sample correlation is 0.61 based on export market weights and 0.52 based on source country of FDI weights.

[31]Notice that the stand-alone spatial lags are accounted for in all specifications by the time-varying country effects.

[32]The interaction terms are treated as endogenous variables and instrumented using the interaction of the spatial lags based on the GDP per capita and the instruments for the global status of firms.

Table 7: 2SLS estimates of firms' share of female workers, based on their global status and exposure to wealth

Dependent variable: share of female workers				
	Export markets		FDI source country	
	Rich	Poor	Rich	Poor
	(1)	(2)	(3)	(4)
Exporter (≥10%)	8.361***	-5.372*	3.115	4.671
	(2.672)	(3.076)	(2.690)	(3.524)
Foreign (100%)	12.501***	10.869	13.604***	15.131**
	(3.999)	(8.956)	(4.740)	(5.932)
Observations	13,946	13,887	14,375	13,458
Hansen J statistic	2.01	1.34	0.07	4.84
p-value Hansen J stat.	0.37	0.51	0.96	0.09
Weak IV Kleinbergen-Paap	94.25	79.73	65.90	117.61

This table shows the relationship between a firm being an exporter and receiving FDI and its share of female workers, based on its exposure to wealth via commercial links. Rich and poor mean that the exposure is in the bottom or top half of the GDP per capita spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

relatively more women than non-global firms, but only if they are exposed to gender equality. One difference found here is that the coefficient on the exporter status for all firms in column 1 becomes now positive and highly statistically significant. Further results in appendix A.9, where we drop one country at a time, show that this result is mainly driven by the exclusion of India from the sample.

In the last sensitivity check, found in table 10, we add firms in the service sector. In this specification, however, we cannot control for the skill level of production workers, as this variables is not available for services firms. The results are comparably similar: the share of female workers in global firms is statistically significantly larger than that of non-global firms when firms are exposed to gender equality. Further, the coefficients on the global status are always larger for firms exposed to gender equality than for firms exposed to gender inequality.

Table 8: 2SLS estimates of firms' share of female workers: controlling for exposure to wealth

Dependent variable: share of female workers				
	Export markets		FDI source country	
	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)
Exporter (≥10%)	7.311***	-7.742**	7.177**	-0.030
	(2.742)	(3.715)	(3.371)	(3.165)
Foreign (100%)	21.204***	3.459	18.149***	5.263
	(4.745)	(6.401)	(6.156)	(4.539)
Exporter × Trade_SL (GDPcp)	-0.000	-0.001*		
	(0.000)	(0.000)		
Foreign × Trade_SL (GDPcp)	-0.001*	-0.000		
	(0.001)	(0.001)		
Foreign × FDI_SL (GDPcp)			-0.000	-0.000
			(0.001)	(0.000)
Exporter × FDI_SL (GDPcp)			-0.000	-0.001**
			(0.000)	(0.000)
Observations	13,915	13,918	13,375	14,458
Hansen J statistic	2.54	2.83	2.78	2.52
p-value Hansen J stat.	0.64	0.59	0.59	0.64
Weak IV Kleinbergen-Paap	14.38	28.94	34.97	38.75

The results in this table replicate those from table 2. Here, we additionally control for the insteaction terms between the global statuses and the spacial lags based on the wealth (GDP per capita) in commercial partner countries. The models include the full set of control variables and fixed effects listed in appendix A.2. The insteraction terms are treated as endogenous and are themselves instrumented based on interation of our instruments for the global statuses and the spatial lags based on GDP per capita. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4 Discussion and Conclusions

This paper has studied how trade and FDI transmit gender norms across countries and impact the female employment share in global firms. The paper has contributed to the literature by using firm-level data for a large number of countries. We assessed how the impact of exposure to gender norms depends on the class of worker in question – production, non-production, or top manager. Finally, the paper introduced a new 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 employees. We find a race to the top in gender

Table 9: 2SLS estimates of firms' share of female workers, based on their global status and exposure to gender norms, without India and China in sample

Dependent variable: share of female workers					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	5.894***	8.223***	-0.474	9.452**	3.445
	(2.281)	(2.955)	(4.219)	(3.722)	(2.703)
Foreign (100%)	13.259***	18.149***	4.596	19.151***	5.704
	(3.741)	(4.451)	(5.330)	(5.817)	(4.145)
Observations	21,667	12,621	9,046	12,081	9,586
Hansen J statistic	0.90	1.40	1.47	0.69	1.07
p-value Hansen J stat.	0.64	0.50	0.48	0.71	0.59
Weak IV Kleinbergen-Paap	135.63	78.03	94.15	76.26	84.13

This table replicates the results from table 2. Here, the observations related to India and China have been dropped. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: 2SLS estimates of firms' share of female workers, based on their global status and exposure to gender norms, including firms in the service sector.

Dependent variable: share of female workers					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	3.686**	4.467**	0.824	4.058*	3.726
	(1.680)	(1.863)	(2.490)	(2.224)	(2.793)
Foreign (100%)	12.575***	14.031***	9.028**	16.321***	7.030**
	(2.836)	(3.247)	(4.519)	(4.076)	(3.485)
Observations	49,265	24,053	25,212	24,074	25,191
Hansen J statistic	1.52	4.43	4.92	3.29	0.90
p-value Hansen J stat.	0.47	0.11	0.09	0.19	0.64
Weak IV Kleinbergen-Paap	150.95	91.38	60.93	71.85	125.53

This table replicates the results from table 2. Here, we also include information on firms in the service sector. The specification do not control for the skill level of production workers, as this information in not available for firms in this sector. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

norms when looking at total employment. The results show that global firms exposed to norms of gender equality employ a higher share of women than non-global firms. When global firms are exposed to inequality, on the other hand, their female employment share does not differ from that of non-global firms in the same market.

However, the paper has identified two clear limitations to global trade and FDI as a conveyor of norms of gender equality across countries. First, moving up the occupational ladder from production to non-production to top managerial positions, the positive effect of exposure to gender equality fades and is even reversed. While there was a race to the top in the employment of women in production and non-production positions, there is instead a race to the bottom when it comes to top manager positions. 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 relatively gender-equal countries. 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.

The paper has been silent on the issue of potential spillover effects onto non-global firms. If these firms imitate the hiring practices of their global counterparts in the same market, the global firms' exposure to gender norms might also indirectly affect female employment in non-global firms. Considering this type of spillover would be a fruitful area for future research.

A Appendix

A.1 Further details on the spatial lag construction

We have information on the Gender Inequality Index (GII) for every year starting from 2010, however, prior to this the index is only available in 5-year intervals. To construct a balanced panel of the GII index between 1995 and 2015, we interpolate data gaps between years using the ipolate command in Stata. In few cases, we also extrapolated the GII index by regressing a country's GII on a time trend.

The main source of bilateral trade data is the Center for International Data (CID). Bilateral exports between 2000 and 2012 were directly download from the yearly database published on the CID website.[33] To account for recent revisions of trade figures, trade data from 2013 to 2016 were drawn directly from COMTRADE instead.[34] These data were then processed using the Stata codes developed by Robert Feenstra and John Romalis in order to account for mirror flows (see step 1 of https://www.robertcfeenstra.com/data.html, based on Feenstra and Romalis (2014)). All missing bilateral export values are assumed to be real zero flows.

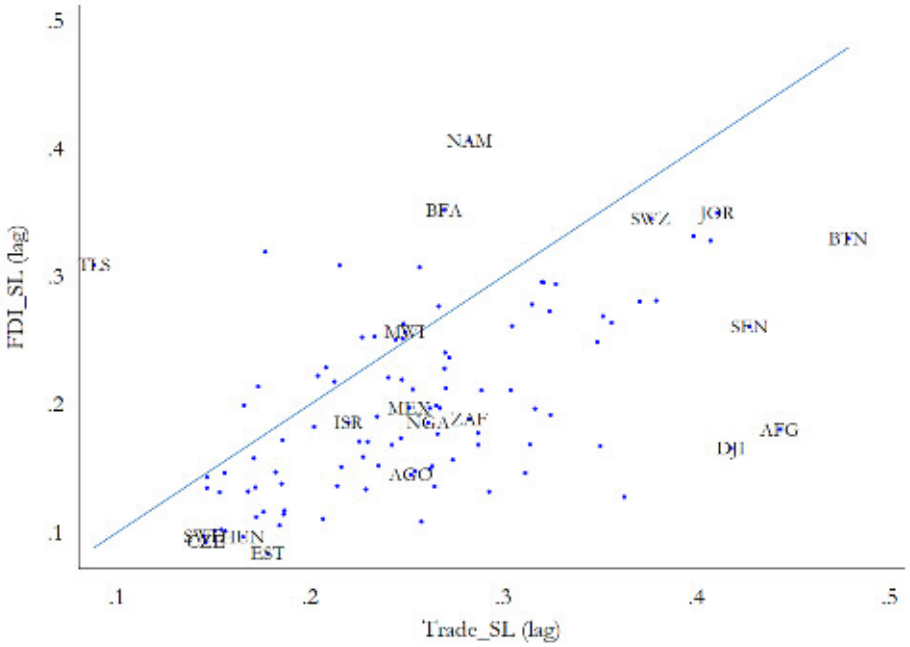
The quality of the bilateral FDI inward stock data, however, is not comparable to that of bilateral trade flows. To the best of our knowledge, only the United Nations Conference on Trade and Development (UNCTAD) publishes bilateral FDI stocks data for developing and developed economies. However, these data are only available between 2001 and 2012. Moreover, the data clearly show an improvement in the country coverage over time, with the number of non-zero bilateral stock figures more than doubling between 2001 and 2011. To improve the data coverage and to reduce the distortions arising from missing values, we use the average of bilateral FDI stock between 2006 and 2012.

The resulting spatial lags vary across countries and over time. While the exposure to gender inequality through trade ($Trade\_SL$) comes from both the variation in the GII index and the variation of bilateral exports over time, the time variation for the exposure through FDI (FDI_SL) only comes from changes in the GII index in source countries of investment. Finally, in all specifications, we lag our exposure variables by one year. Figure A1 presents the scatter-plot of countries' average exposure to gender inequality through trade on the horizontal axis, and their exposure to gender inequality through FDI, on the the vertical axis.

The data on the GDP per capita at constant prices for the construction of the exposure to wealth come from the World Bank's World Development Indicators.

[33] https://cid.econ.ucdavis.edu/Html/WTF_bilateral.html
[34] https://comtrade.un.org/db/default.aspx

Figure A1: Exposure to gender norms through trade and FDI



A.2 List of control variables

All specifications include the following control variables and fixed effects:

- share of the working capital financed on credits from suppliers and on advances from customers
- skill intensity: share of skilled production workers
- size of the firm, based on the number of full-time, permanently employed workers three fiscal years (FY) ago
- productivity of the firm three FY ago (sales per worker)
- purchase of new equipment (US 2009)
- investment in fixed asset
- firm located in a large city (large, capital or main business city)
- age of the establishment
- female ownership
- share of temporary employees
- management quality based on the number of years that the top manager has been working in the sector
- time-varying country effects
- region within a country specific effects
- industry fixed-effects: 2-digit ISIC industry code
- three broad categories of the a firm's size (to account for the strata)

The only exception is table 10, which includes firms in the services sector. Since information on the skill intensity is not available for firms in this sector, the skill intensity is not controlled for in the table.

A.3 Survey questions used for the construction of variables

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 variables were constructed based on:

  l1 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

  l3a, l3b At the end of fiscal year [insert last complete fiscal year], how many permanent, full-time employees were: **Production** employees - l3a; **Non-production** employees- l3b

  l5a, l5b 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- l5a; **Female** permanent full-time **non-production** employees- l5b

  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?

  l2 [*Retrospective question on full-time, permanently employed 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, l2 [*Sales per worker based on retrospective questions*]

  l2 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

l1, l8, l6 [*Temporary workers share*]

l1 See above

l6 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)

l8 What was the average length of employment of all full-time temporary employees in the fiscal year?

l4b [*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**

b7 [*Years of top manager's experience in sector*] How many years of experience working in this sector does the top manager have?

a3/a3c [*Large city*] city over 250.000 inhabitants or city is the capital or main business center

a3a [*Region within country FE*] Screener region

d1a2 [*ISIC 2-digit FE*] In fiscal year [insert last complete fiscal year], what were this establishment's two main products represented by the largest proportion of annual sales? **First** (ISIC, revision 3.1)

a6b [*Firm's Size broad categories*] Screener size; small ($<$ 20 employees) , medium ($>=$ 20 and $<=$ 99), and large ($>=$ 100)

Country×Year FE based on the year and country of the survey.

A.4 Instrumental variable strategy

In this appendix, we provide more details on the construction of our instruments and conduct some checks on the plausibility of the exogeneity assumption (table A1).

The instruments are constructed as the weighted average of the share of global firms in a narrowly defined cell (m) based on two firm characteristics (W) that are controlled for in all specifications; namely, the number of permanent, full-time workers (three fiscal years ago) and whether the firm had invested in any fixed asset in the last year. The market cell (m) is defined by the year, sector, and region within a country in which a firm is located. Since we are interested in estimates of the population distribution of global firms in the cell, we use the survey weights and include all firms in the cell, regardless of whether or not the firm is in the regression sample. The shares at the cell level are constructed for each of the two variables and for each of the global statuses (that is, exporters and multinationals). As such, we have four instruments in our IV estimations: exporters' share in permanent employment, exporters' share in investment, multinationals' share in permanent employment, and multinationals' share in investment.

In particular, the instruments are based on equation 3:

$$IV_m^{glob} = \frac{\sum_j^{N_m^{glob}} W_j}{\sum_j^{N_m} W_j} \text{ , with } glob\{\text{exporter, foreign owned}\} \quad (3)$$

where W_j refers to the weighted value for firm j, and N_m and N_m^{glob} refer to the total number of firms and the number of global firms in the market, respectively.

There are two considerations that might cast doubt on the validity of our proposed instruments. First, our instruments, which vary across market cells, might capture unobserved market characteristics that themselves have a direct impact on the female share of firms. In order to check this, column 2 in Table A1 shows the OLS results when unobserved market characteristics are accounted for by the full set of cell-specific effects (i.e. region×sector×year effects). To facilitate comparison, we also present the OLS results based on the full set of controls and specific effects used throughout the paper in column 1 (see appendix A.2).[35] The magnitude and significance of the coefficients on the global status are very similar in both columns. This suggests that the region, sector, and time-varying country-specific effects, used in our main specifications throughout the paper are enough to account for confounding factors that are external to a firm's operations. Further, the similarity of the results of the short (column 1) and long (column 2) models

[35] In particular, the specification in column 2 differs from our main specification in column 1 in that the region, sector and time-varying country-specific effects are replaced by the full set of interaction terms between the year, sector and region within a country. All the other control variables remain the same.

also indicates that unobserved cell characteristics are not inducing omitted variable bias in our main specification. The similarity in the results further suggests that cell-specific factors either do not systematically affect the female share or are not correlated with the global status of firms. While the latter cannot be true, since our cell-specific instruments are shown to be good predictors of the global status of firms, this might suggest that unobserved cell characteristics have no systematic partial effect on a firm's female share.

Second, our instruments are meant to reflect the conditions faced by all firms in a market. This is the main reason behind using weights and all firms in a cell, including the reference firm i whose female share we want to estimate and off-the sample firms. If the weighted averages are driven by influential firms in the cell, however, this might lead to a correlation of the instrument and the error terms in the reduced model.[36] To check if this is driving our results, we thus re-calculate the four instruments by excluding a firm's own value as in equation 4:

$$IV'^{glob}_{mi} = \frac{\sum_{j\neq i}^{N_m^{glob}} W_j}{\sum_{j\neq i}^{N_m} W_j} \text{ , with } glob\{\text{exporter, foreign owned}\} \tag{4}$$

where the new instrument (IV'^{glob}_{mi}) now varies across firms and is constructed using the weighted average of all firms j in the cell except for firm i. Although the new set of instruments are arguably more exogenous, deducting a firm's own value might induce measurement errors as the distribution of firms is no longer representative of the population, particularly for small market cells.

We present the results based on the instruments in our main specification in column 4, and show the results based on the new instrument in column 5. The results are comparatively similar—only foreign-owned firms have a significantly larger share of female workers than domestic firms in the same market, while the impact of being an exporter is never statistically significant. These results suggest that the instruments in our main specification are capturing factors of the market cell rather than characteristics of a single firm. Not surprisingly, the new instruments are relatively weak, which prevents us from using them further in the paper. However, we can still conduct a last check.

All throughout the paper, the over-identification tests fail to reject the null hypothesis that the four instruments in our main specification are exogenous. However, these tests might fail to reject the null hypothesis even when the instruments are endogenous if all

[36] Notice that the source of endogeneity from adding a firm's own value does not come from variable W, as this variable is controlled for in the reduced and first-stage regressions, but from the fact that whether a firm's own value is added or not in the numerator in equation 3, which depends on the global status of the firm.

instruments are very similar. Since the second set of instruments should be a priori less endogenous, we have a good opportunity to use the over-identification test to check for the endogeneity of the instruments in our main specification. With a p-value of 0.45, the Hansen test based on a specification using the four instruments of our main specification alongside the four new instruments fails to reject the null hypothesis that the instruments are valid.

The checks in this appendix suggest that the 2SLS results based on the instruments in the main specification are not driven by unobserved confounding factors at the market level nor by endogeneity arising from a firm's own values. Although not a proof, the checks together assess the plausibility that the our instruments are reflecting the attractiveness of the market cell to global firms that is independent to a firm's female share and to a firm's unobserved characteristics.

Table A1: Estimates of share of female workers, further checks on the IV strategy

Dependent variable: share of female workers					
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	2.997***	3.064***	2.955***	3.087	-0.236
	(0.576)	(0.568)	(0.491)	(2.438)	(6.303)
Foreign (100%)	3.360***	2.399***	2.197**	15.288***	38.052**
	(0.965)	(0.918)	(0.853)	(4.457)	(16.387)
Exporter × Trade_SL			-32.251**		
			(14.914)		
Foreign × FDI_SL			-26.924*		
			(15.491)		
Observations	27,152	27,152	27,152	27,152	27,152
R^2 (adj.)	0.47	0.54	0.54	.	.
Cell effects	No	Yes	Yes	No	No
Hansen J statistic				1.01	1.58
p-value Hansen J stat.				0.60	0.45
Weak IV Kleinbergen-Paap				123.60	5.33

This table shows the relationship between a firm being an exporter and receiving FDI and its share of female workers. The first column shows the OLS estimates including the full set of controls listed in appendix A.2. In columns 2 and 3, the region, sector and time-varying country effects are replaced by the full set of cell effects (i.e. sector×region×year effects). Column 4 shows the IV estimates based on our proposed instruments. Finally, column 5 shows IV estimates based on instruments that do not include firms' own values. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.5 Is the female employment share higher in global firms?

The empirical background of the analysis in this paper is that the female employment share is higher in global versus domestic non-exporting firms. The section confirms that

this is true in the Enterprise Survey data used.

A firm's female employment share (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 and specific effects described in section 2. The model takes the form

$$G_{it} = \alpha + \beta X_{it} + \gamma M_{it} + \mathbf{C}_{it}\zeta' + \varepsilon_{it}. \tag{5}$$

Table A2 presents the results, confirming the common finding in the literature that there is a positive relationship between being a global firm and having a greater share of female employees. The first column shows that, relative to domestic, non-exporting firms, the female share of 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 female employment share. Compared to domestically-owned non-exporters (i.e. the base group), the female share 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 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 the measure of a firm being global and its share of female employees. Indeed for the measure of exporters, only firms that export at least half of their output employ a higher share of women than domestically-owned, non-exporting companies; especially firms that export all of their output employ a greater share of women. In terms of FDI, it is only firms that are completely foreign-owned that employ a significantly higher share of women than domestic, non-exporting firms do.

Table A2: OLS estimates of the relationship between a firm's global status and its share of female workers

	(1)	(2)	(3)
Measure of globalization			
Exporter (≥10%)	2.909***	2.610***	
	(0.572)	(0.595)	
Foreign (100%)	3.398***	1.524*	
	(0.958)	(0.907)	
Exporter (≥10%)*Foreign (100%)		4.040***	
		(1.532)	
Exporter (≥10%, <50%)			0.593
			(0.473)
Exporter (≥50%, <100%)			2.686***
			(0.904)
Exporter (100%)			10.997***
			(1.501)
Foreign (≥10%, <50%)			-0.626
			(0.941)
Foreign (≥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

This table shows the relationship between a firm being an exporter and receiving FDI and its share of female 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 include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

A.6 Additional specifications: OLS results

A.6.1 Production workers

Table A3: OLS estimates of firms' female share of production workers, based on their global status and exposure to gender norms

Dependent variable: female share of production workers				
	Export markets		FDI source country	
	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)
Exporter (≥10%)	4.699***	0.840	3.718***	2.756***
	(0.797)	(0.649)	(0.777)	(0.935)
Foreign (100%)	5.045***	-0.733	5.187***	0.289
	(1.248)	(1.342)	(1.273)	(1.350)
Observations	13,891	13,904	13,352	14,443
R^2	0.420	0.401	0.426	0.400

This table shows the relationship between a firm being an exporter and receiving FDI and its female share of production workers, based on its exposure to gender norms in its commercial partner countries. Equal and unequal mean that the exposure to gender norms in partner countries is in the bottom or top half of the distribution of the spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.6.2 Non-production workers

Table A4: OLS estimates of firms' female share of non-production workers, based on their global status and exposure to gender norms

Dependent variable: female share of non-production workers				
	Export markets		FDI source country	
	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)
Exporter (≥10%)	2.362***	1.298**	2.085***	1.911***
	(0.706)	(0.610)	(0.648)	(0.726)
Foreign (100%)	2.551***	-2.210*	2.581**	-1.333
	(0.972)	(1.234)	(1.175)	(1.043)
Observations	12,980	13,076	12,401	13,655
R^2	0.281	0.359	0.293	0.352

This table shows the relationship between a firm being an exporter and receiving FDI and its female share of non-production workers, based on its exposure to gender norms in its commercial partner countries. Equal and unequal mean that the exposure to gender norms in partner countries is in the bottom or top half of the distribution of the spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.6.3 Top managers

Table A5: OLS estimates of the probability that a firm's top manager is female, based on firms' global status and exposure to gender norms

Dependent variable: indicator of whether the top manager is female				
	Export markets		FDI source country	
	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)
Exporter (≥10%)	0.006	-0.002	0.005	-0.000
	(0.008)	(0.007)	(0.008)	(0.007)
Foreign (100%)	0.011	-0.026*	-0.002	-0.009
	(0.014)	(0.016)	(0.014)	(0.013)
Observations	13,129	12,394	12,320	13,203
R^2	0.237	0.185	0.235	0.190

This table shows the relationship between a firm being an exporter and receiving FDI and its indicator of whether the top manager is female, based on its exposure to gender norms in its commercial partner countries. Equal and unequal mean that the exposure to gender norms in partner countries is in the bottom or top half of the distribution of the spatial lags. The models include the full set of control variables and fixed effects listed in appendix A.2. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.7 First-stage results

Table A6: First-stage regressions, corresponding to IV results in table 2

Panel A -*Dependent variable: Exporter (≥10%)*		Export markets		FDI countries	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporters share in Permanent, full-time workers, three FY ago	0.003***	0.003***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Exporters share in new investment	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Multinationals share in Permanent, full-time workers, three FY ago	-0.000*	-0.001	-0.000	-0.001*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Multinationals share in new investment	0.000*	0.001*	0.000	0.001*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.000	-0.000	0.001***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
At least one female owner? (1 yes, 0 no)	0.000	0.010	-0.010	0.006	-0.007
	(0.006)	(0.007)	(0.009)	(0.008)	(0.009)
Permanent, full-time workers, three FY ago	0.005***	0.004***	0.005***	0.004***	0.007***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Sales per worker, 3 FY ago	-0.001***	-0.002***	0.023***	-0.002***	0.023***
	(0.000)	(0.000)	(0.006)	(0.000)	(0.006)
Temporary workers share (rounded)	0.000	0.001*	0.000	0.001**	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***	0.027	0.000***	-0.025
	(0.000)	(0.000)	(0.019)	(0.000)	(0.054)
Purchase of new equipment? (yes=1, no=0)	0.032***	0.021***	0.044***	0.030***	0.032***
	(0.006)	(0.007)	(0.008)	(0.008)	(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)

Panel B -*Dependent variable: Foreign (100%)*

		Export markets		FDI countries	
	All obs.	Equal	Unequal	Equal	Unequal
Main business/large city	0.010	0.002	0.018	0.002	0.018
	(0.008)	(0.011)	(0.012)	(0.010)	(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

Panel B -*Dependent variable: Foreign (100%)*

		Export markets		FDI countries	
	All obs.	Equal	Unequal	Equal	Unequal
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***	0.002***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Multinationals share in new investment	0.002***	0.003***	0.002***	0.002***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age	-0.000***	-0.001***	-0.000	-0.001**	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
At least one female owner? (1 yes, 0 no)	-0.036***	-0.042***	-0.029***	-0.041***	-0.031***
	(0.007)	(0.011)	(0.006)	(0.012)	(0.005)
Permanent, full-time workers, three FY ago	0.001***	0.001**	0.001	0.001**	0.001*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Sales per worker, 3 FY ago	0.000	-0.000	0.032***	-0.000	0.032***
	(0.001)	(0.000)	(0.001)	(0.000)	(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	0.022	-0.000	0.040
	(0.000)	(0.000)	(0.042)	(0.000)	(0.032)
Purchase of new equipment? (yes=1, no=0)	0.005	0.006	0.004	0.003	0.008**
	(0.003)	(0.005)	(0.004)	(0.006)	(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	0.001	0.002	0.010	-0.005
	(0.005)	(0.012)	(0.004)	(0.010)	(0.005)
Years of top manager's experience in sector	-0.001***	-0.001***	-0.001**	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	27,833	13,915	13,918	13,375	14,458

Panel B -*Dependent variable: Foreign (100%)*

		Export markets		FDI countries	
	All obs.	Equal	Unequal	Equal	Unequal

Notes: All models additionally include the full set of firms' region, 2-digit ISIC code, country × year, and firms' size specific effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.8 Balance check

In this appendix, we conduct a balance check based on the level of gender equality in the firm's home country and replicate the results of table 3 after trimming the sample so that balance in the level of own gender (in)equality can be achieved.

We notice that countries exposed to gender equality tend to be themselves more gender equal than countries exposed to gender inequality. As shown in table A7, the normalized difference in gender equality at home between firms exposed to gender equality and those exposed to gender inequality is negative and its absolute value is larger than .25.[37, 38] Splitting the sample of firms by the level of gender equality at home as in table 3 does improve balance for the sample of firms in gender-unequal countries, but balance based on the normalized differences is not achieved for those in gender-equal countries.[39]

Although imbalance in gender equality at home is not necessarily a concern in the analysis, because our identification strategy – which relies on the difference in the female composition of global versus non-global firms in a same market – already takes the level of gender equality at home into account. However, one cannot rule out the possibility that the imbalance in the level of gender norms at home is confounded with the differential response that global versus non-global firms have across countries.

We thus follow a simple trimming procedure and keep observations with levels of own gender equality between the minimum GII value of firms exposed to gender inequality and the maximum GII value of firms exposed to gender equality. This is done separately for firms in gender-equal countries and those in gender-unequal countries. After the trimming procedure, we reach balance for all groups of firms except for firms that reside in gender-equal countries and are exposed to gender norms through FDI. For this group, we further drop firms residing in countries with low values of GII until balance is achieved. Figures A2 and A3 present the histograms of firms by groups, based on the level of gender inequality of the country of residence and on the level of exposure to gender (in)equality. In particular, in figure A2 the sample is split according to the exposure to gender norms in export markets, while in figure A3 it is split according to the exposure to gender norms through FDI. The shaded area represents the observations dropped after the trimming procedure. Now, the normalized differences based on the trimmed sample are lower than the one-quarter threshold and range between -.21 and 0.04.

Table A8 presents the results after trimming the sample. Results are comparable to

[37] One quarter is often used in the policy evaluation literature as the threshold value in order to assess balance in covariates (see Imbens and Rubin (2015)).

[38] In particular, the normalized difference is -.76 based on the exposure to gender equality from export markets and -.59 based on the exposure to gender norms through FDI source countries. This means that firms exposed to gender equality are located in countries that are relatively more gender equal.

[39] The normalized difference for firms in gender-equal countries ranges between -.63 and -.76.

Table A7: Balance - gender equality in firms residing country

	Exposed to equality		Exposed to inequality		Normalized
	mean	σ	mean	σ	Δ
	(1)	(2)	(3)	(4)	(5)
Exposure from export markets					
All firms					
	0.395	0.141	0.522	0.086	-0.76
Firms in gender-equal countries					
	0.323	0.110	0.414	0.047	-0.76
trimmed	0.400	0.052	0.414	0.047	-0.21
Firms in gender-unequal countries					
	0.549	0.046	0.573	0.043	-0.38
trimmed	0.560	0.045	0.570	0.036	-0.18
Exposure from FDI source countries					
All firms					
	0.405	0.152	0.509	0.086	-0.59
Firms in gender-equal countries					
	0.325	0.116	0.403	0.045	-0.63
trimmed	0.411	0.056	0.402	0.039	0.14
Firms in gender-unequal countries					
	0.567	0.061	0.565	0.036	0.04
trimmed	0.567	0.061	0.565	0.036	0.04

Statistics are constructed based on the GII values of the country in which a firm resides. Higher values mean higher levels of gender inequality. The table presents the sample average of the gender inequality index (cols. 1 and 3), its sample standard deviation (cols. 2 and 4), and the normalized difference (col. 5). The first two columns refer to the sample of firms that are exposed to gender equality through commercial links, while cols. 3 and 4 refer to the sample of firms that are exposed to gender inequality. The normalized differences are calculated as the difference between the sample mean of firms exposed to gender equality minus that of firms exposed to gender inequality (col. 1 - col. 3) divided by the square root of the average of the sample variance of the GII for firms exposed to gender equality and those exposed to gender inequality.

those in table 3: only global firms that are exposed to gender equality and that reside in relatively gender-equal countries have a larger female share than non-global firms in the same market (col. 1). The coefficients on the global status of the firm in column 1 are also larger here than in table 3, reinforcing our previous message.

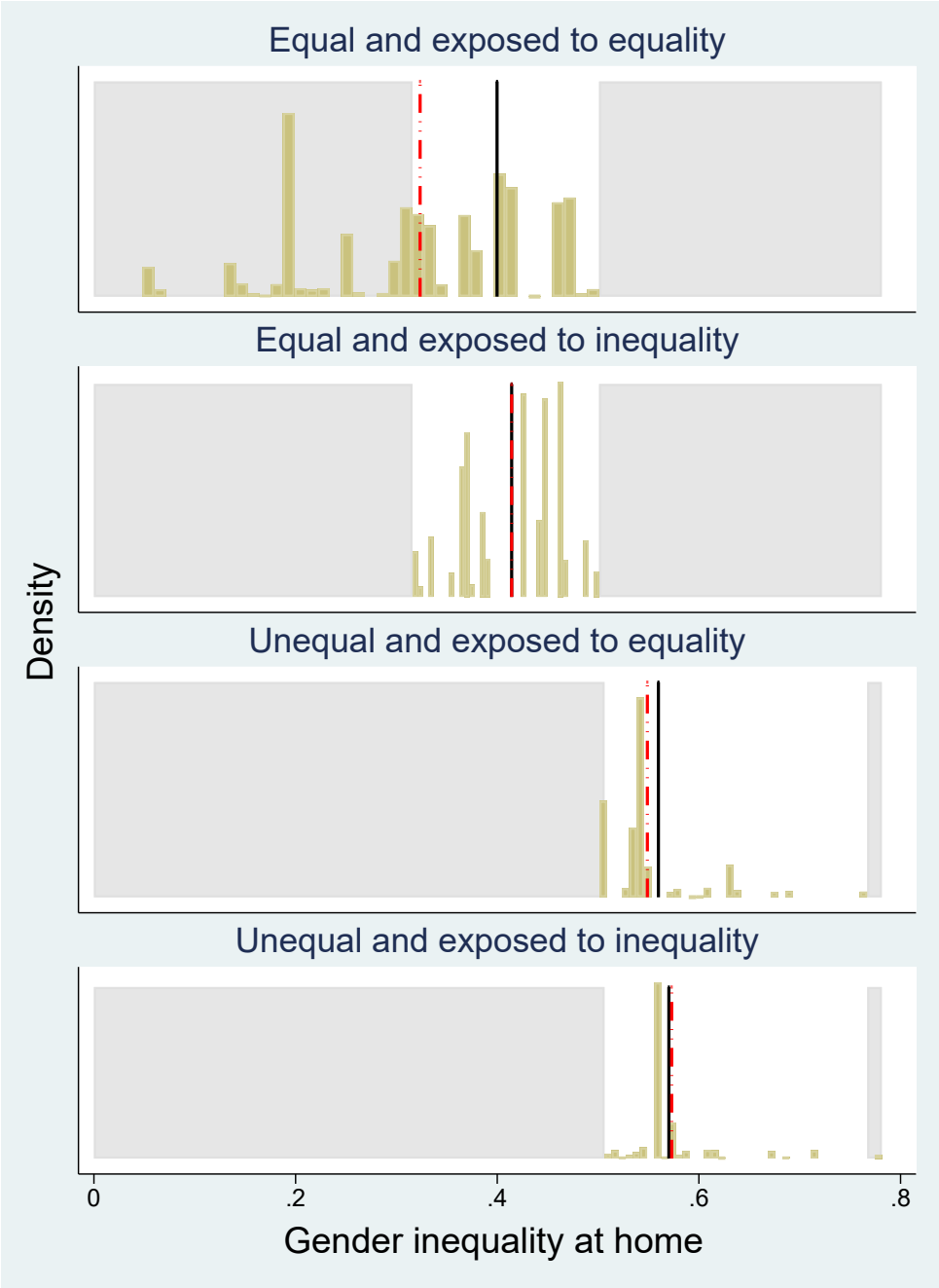
Finally, as the gender equality at home might itself be the result of the exposure of gender norms through commercial links and thus be itself an outcome variables of the treatment, we also conducted the same trimming procedure based on countries own GII values lagged in 10 years. The results are very similar and are available upon request.

Table A8: 2SLS estimates of firms' share of female workers, split by level of gender equality in own country and exposure to partner countries' gender equality : Trimmed sample

Dependent variable: share of female workers				
	(1) Equal and exposed to equality	(2) Equal and exposed to inequality	(3) Unequal and exposed to equality	(4) Unequal and exposed to inequality
Panel A: Exposure to gender norms from **export markets**				
Exporter (≥10%)	14.844***	3.734	4.705	-4.867
	(4.577)	(3.611)	(4.159)	(3.530)
Foreign (100%)	19.856***	12.523	6.557	-0.377
	(7.539)	(7.823)	(5.743)	(6.744)
Observations	5,393	4,487	3,427	9,293
Hansen J statistic	1.43	2.30	0.33	0.14
p-value Hansen J stat.	0.49	0.32	0.85	0.93
Weak IV Kleinbergen-Paap	31.43	59.01	51.84	53.99
Panel B: Exposure to gender norms from **FDI source countries**				
Exporter (≥10%)	19.409***	0.763	-3.154	4.514
	(4.280)	(3.458)	(7.472)	(4.735)
Foreign (100%)	27.321**	6.682	0.589	0.939
	(10.620)	(5.550)	(7.187)	(6.083)
Observations	4,751	4,852	4,266	9,427
Hansen J statistic	0.81	0.40	0.90	2.09
p-value Hansen J stat.	0.67	0.82	0.64	0.35
Weak IV Kleinbergen-Paap	29.35	55.03	46.72	86.02

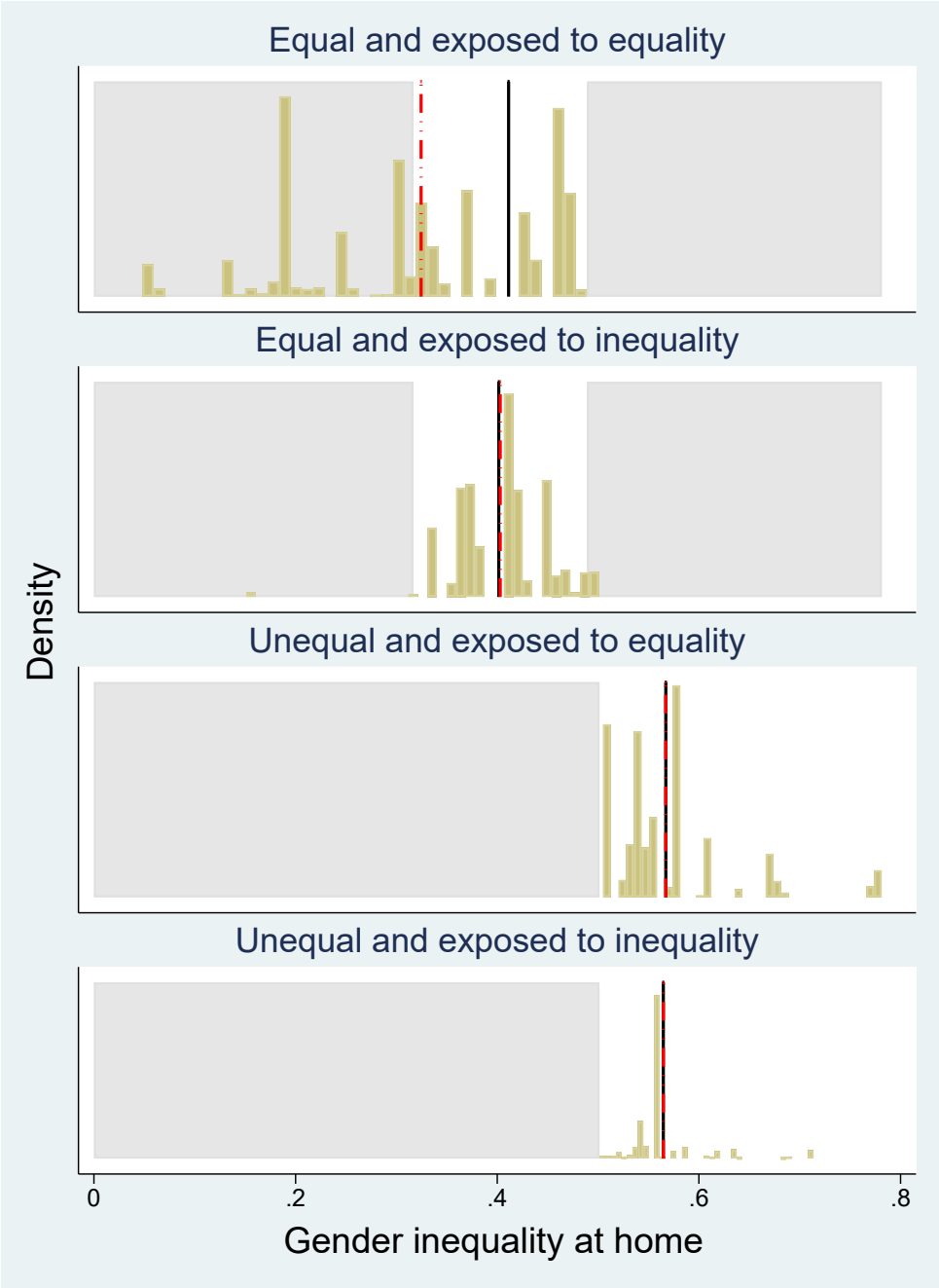
This table replicates the results from table 3 by trimming the sample of observation so that balance in the level of gender equality at home of firms exposed to gender equality and those exposed to gender inequity can be achieved. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Figure A2: Distribution of firms by gender inequality at home and exposure to gender (in)equality in export markets



The figure presents the histograms of firms by the level of gender inequality at home. The higher the value, the higher the level of inequality in the country in which firms reside. Each histogram refers to one of the four groups used in panel A of table 3. That is, the sample of firms is split according to both the level of gender inequality at home and the exposure to gender norms through trade. The shaded area represents the observations dropped after the trimming procedure. The dashed line indicates the average gender inequality at home before trimming, and the solid line the mean value after trimming.

Figure A3: Distribution of firms by gender inequality at home and exposure to gender (in)equality in source countries of FDI



The figure presents the histograms of firms by the level of gender inequality at home. The higher the value, the higher the level of inequality in the country in which firms reside. Each histogram refers to one of the four groups used in panel B of table 3. That is, the sample of firms is split according to both the level of gender inequality at home and the exposure to gender norms through FDI. The shaded area represents the observations dropped after the trimming procedure. The dashed line indicates the average gender inequality at home before trimming, and the solid line the mean value after trimming.

A.9 Additional sensitivity checks

Table A9: 2SLS estimates of firms' share of female workers, based on their global status and exposure to gender norms, without India in sample

Dependent variable: share of female workers					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	4.907**	6.594***	-0.474	7.013**	3.445
	(2.113)	(2.517)	(4.219)	(3.186)	(2.703)
Foreign (100%)	13.037***	17.377***	4.596	18.052***	5.704
	(3.547)	(4.109)	(5.330)	(5.246)	(4.145)
Observations	22,961	13,915	9,046	13,375	9,586
Hansen J statistic	0.99	1.92	1.47	0.94	1.07
p-value Hansen J stat.	0.61	0.38	0.48	0.62	0.59
Weak IV Kleinbergen-Paap	146.75	89.50	94.15	84.96	84.13

This table replicates the results from table 2. Here, the observations related to India have been dropped. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10: 2SLS estimates of firms' share of female workers, based on their global status and exposure to gender norms, without China in sample

Dependent variable: share of female workers					
		Export markets		FDI source country	
	All obs.	Equal	Unequal	Equal	Unequal
	(1)	(2)	(3)	(4)	(5)
Exporter (≥10%)	3.310	8.223***	-5.445	9.452**	0.532
	(2.306)	(2.955)	(3.329)	(3.722)	(3.139)
Foreign (100%)	13.563***	18.149***	4.816	19.151***	5.916
	(3.813)	(4.451)	(5.695)	(5.817)	(4.522)
Observations	26,539	12,621	13,918	12,081	14,458
Hansen J statistic	1.39	1.40	1.23	0.69	1.20
p-value Hansen J stat.	0.50	0.50	0.54	0.71	0.55
Weak IV Kleinbergen-Paap	151.15	78.03	107.23	76.26	94.59

This table replicates the results from table 2. Here, the observations related to China have been dropped. Standard errors, in parentheses, are clustered at the region within a county level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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