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Abstract

In this paper, we study foreign ownership as a vehicle for transferring gender norms across international borders. Specifically, we analyze how the wage differential between men and women in Swedish firms is affected by the degree of gender inequality in the home country of foreign investors. The results suggest that gender norms of the home country matter—the gender wage gap in foreign-owned subsidiaries appears to increase with the degree of gender inequality prevailing in the investors' home market. This finding is identified from within job-spell variation in wages and proves robust across a series of specifications.

Keywords: Foreign ownership · Gender inequality · Gender wage gap · Internationalization · Gender norms

JEL: J16, J31, F66

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1 Introduction

There is a growing interest in the relationship between internalization and income inequality. While the wage premium for workers in multinational enterprises (MNEs) is well-documented, evidence on the distributional effects of internalization across genders remains inconclusive.[1] Yet, the emerging literature suggests that firms' global engagement has disproportionately affected female workers. Vahter and Masso (2019) examine the gender wage gap in foreign-owned firms in Estonia and document a negative effect of foreign ownership on female wages. This finding is corroborated by Magda and Sałach (2020), who find larger gender pay gaps in foreign-owned firms compared to their domestic counterparts at every decile of wage distribution in Poland. On the other hand, evidence from Tang and Zhang (2021) and Kodama *et al.* (2018) suggests that foreign affiliates in Japan and China employ proportionally more women and appoint more female managers, thereby enhancing female opportunities in the respective labor markets. Kodama *et al.* (2018) further show for Japan that the gender wage differential is smaller in foreign affiliates than in domestic firms. Thus, the effects of internationalization remain equivocal, and the mechanism behind a differential wage-setting across genders in globally active firms is still poorly understood.

This paper adds to the existing literature by studying how the transfer of gender norms across international borders contributes to the gender wage gap in the host country of FDI. The main hypothesis underlying our analysis originates from Tang and Zhang (2021), who develop a theoretical model featuring heterogeneous firms and biased perceptions about female labor costs in the style of Becker (1957). The model predicts that foreign affiliates who are less biased against female workers employ proportionately more women compared to domestic firms. Although the authors do not obtain direct predictions for the relative wages of female workers under discrimination, they establish that biased perceived costs of

[1] On the wage premium and MNEs see e.g Aitken *et al.* (1996), Conyon *et al.* (2002), Doms and Jensen (2007), Driffield and Girma (2003), Griffith (1999), Görg *et al.* (2007), Haddad and Harrison (1993), Lipsey (1994), Lipsey and Sjöholm (2004) and Sjöholm and Lipsey (2006); see also Lipsey (2004), which provides a survey of the literature on the relationship between foreign direct investment (FDI) and wages.

female labor can lower output, revenue, and profits of the respective firms. Departing from this proposition, one may expect that firms' discriminating behavior will in turn also affect relative wages through rent sharing, ultimately leading to a larger gender wage differential. To the extent that foreign-owned firms accommodate the corporate culture and gender norms of their parent companies, we should observe a larger gender wage gap in firms acquired by less gender-equal investors.[2] We therefore hypothesize that the degree of gender inequality in the home country of FDI matters for the size and the direction of the effect that foreign ownership exerts on wages in host-country firms. More specifically, we argue that foreign subsidiaries owned by investors from high (low) gender equality countries will display a relatively larger (lower) gender wage gap.

We take this prediction to the data and analyze how the wage differential depends on the ownership status and the degree of gender inequality in the parent company's home country. To this end, we estimate a wage regression with high dimensional fixed effects using a matched employer–employee dataset for Sweden from period of 2005 to 2015. To capture the impact of gender norms on wages, the model also includes a time-varying measure of gender inequality corresponding to the level of inequality in the parent company's home country. Importantly, our rich data provide a host of time-varying individual and firm-level characteristics to adjust for potential confounding effects. To identify the main effect, we rely on job-match and firm-year fixed effects. By doing so, we utilize variation within individual job-spells and compare otherwise similar workers in otherwise similar firms while simultaneously controlling for selection effects at the firm level.

In addition to the rich features of its registry data, Sweden provides an interesting setting to study gender inequality. While the Swedish government offers a generous parental leave compensation and an extensive daycare system, previous research has established evidence of a substantial glass-ceiling effect (Albrecht *et al.*, 2003, 2015). In particular, the median

[2]E.g., Bloom *et al.* (2012) provides evidence suggesting that MNEs transfer their management practices and other features of their organizational structure overseas. They presumably do so through expatriate staff.

gender wage gap remains at the level of 10 log points, whereas the corresponding gap at the 90th percentile is about 30 log points. Moreover, Nekby (2003) documents unequal rent sharing across genders in Sweden and Albrecht *et al.* (2018) find a significant motherhood penalty, i.e., that wage negatively affects wages and career trajectories of Swedish women. We contribute to this literature by highlighting the role of multinational firms in shaping the gender wage differential in Sweden. Our main findings suggest that, while foreign ownership exerts a small positive (narrowing) effect on the wage gap on average, the effect is heterogeneous when we split it by country of ownership. This result provides compelling support to the idea that foreign investors transfer their corporate culture and gender norms across international borders, presumably by virtue of expatriate staff and standardized policies. Specifically, we find that firms receiving FDI inflows from high-inequality countries tend to exhibit a relatively larger gender wage differential. This finding is robust with respect to the alternative measure of gender culture and country's stage of development. When analyzing the effect of home country gender norms across the wage distribution, we find that the negative impact on relative female wages is more pronounced at the higher end of the distribution. This finding corroborates the presence of the glass-ceiling effect in Sweden, as discussed above.

Our paper relates to at least three strands of the economics literature. First and foremost, it connects to the voluminous literature on gender inequality in the labor market as reviewed by Altonji and Blank (1999), Blau and Kahn (2000), and Goldin (2014). More recent contributions in the field include Olivetti and Petrongolo (2016), Blau and Kahn (2017), and Card *et al.* (2016), among others. This literature has focused on several factors that potentially contribute to gender gaps, such as differences in human capital, occupational and industry segregation, flexibility in working hours, as well as discrimination. Differences in psychological attributes and bargaining power make up the more recent explanations for the observed gaps across genders.

The second strand of related literature explores the interplay between gender outcomes

and various aspects of globalization. Black and Brainerd (2004) test Becker's theory of taste-based discrimination (Becker, 1957) using U.S. industry-level data. In line with Becker's hypothesis, the authors find that increased import competition reduces the gender wage gap more in industries that are less competitive initially. In a similar vein, Heyman *et al.* (2013) study how the competitive pressures in the form of takeovers impact gender outcomes by relying on linked employer–employee data from Sweden. They document that firm takeovers are associated with a higher share of female employees and a lower gender wage differential, which confirms the authors' main theoretical predictions. Another contribution in the field is Juhn *et al.* (2014), who study tariff reductions under the North American Free Trade Agreement and gender inequality using Mexican firm-level data. They find that trade liberalization increases the proportion and relative wage of female blue-collar workers, but they find no effect among white-collar workers. The authors attribute this result to Mexican firms adopting modern technologies that require less physically demanding skills. Hence, they suggest that trade liberalization, through technological advancement, improves women's labor market outcomes in blue-collar jobs but not white-collar jobs. Another study documenting a disproportionate impact of globalization across occupations and gender is Bonfiglioli and De Pace (2021). The paper shows that a higher export share in German firms leads to a wider gender wage gap among blue-collar workers and reduces the gap between male and female white-collar workers. This evidence supports the idea that exports requires more interpersonal and cognitive skills, thereby reinforcing a female comparative advantage in these areas. An additional paper analyzing the effects of exporting is Bøler *et al.* (2018), which finds a relatively large gender wage differential among college-educated workers in exporting firms in Norway. The authors ascribe this result to a high degree of commitment and flexibility requirements imposed by exporters, which is detrimental to relative female wage.

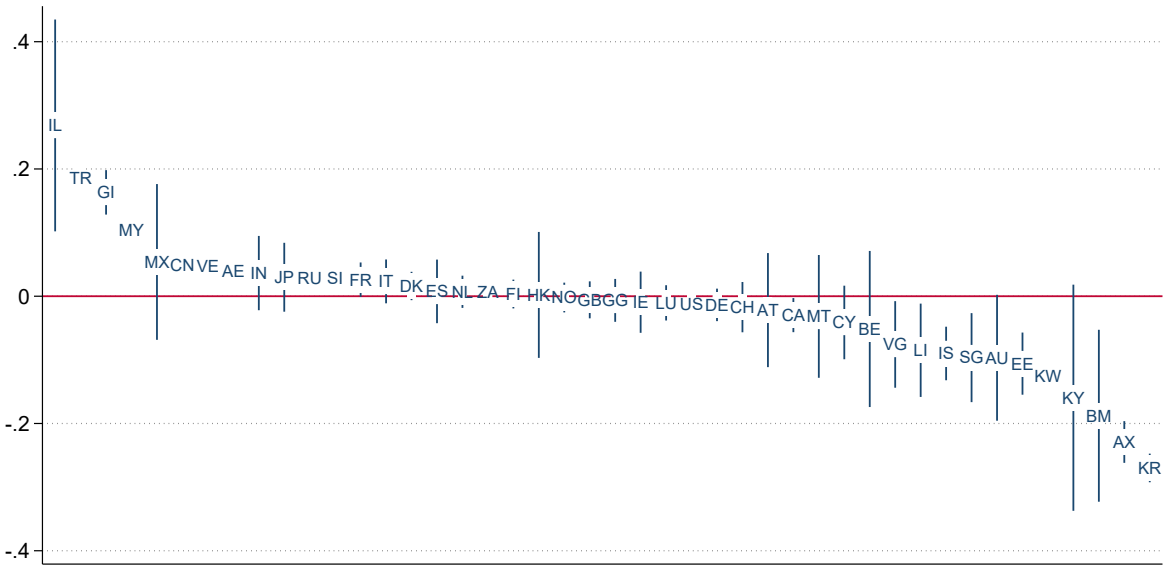
Lastly and most closely, our paper relates to the studies on FDI and the gender wage gap. Kodama *et al.* (2018) examine the effect of foreign ownership on gender-related employment outcomes and work practices in Japan. The authors document that foreign-owned firms

are more gender-equal than domestic Japanese firms are. Foreign affiliates tend to support both equal pay and equal promotion opportunities, as well as flexible working arrangements to a larger extent than their domestic counterparts. On the contrary, results by Vahter and Masso (2019) and Magda and Sałach (2020) suggest that foreign-owned firms exhibit larger gender wage differentials than domestic firms. Tang and Zhang (2021) develop a multi-sector task-based model in the style of Acemoglu and Autor (2011), which accounts for firm heterogeneity in productivity, gender bias, and learning within sectors or regions. The model suggests that parent companies from more gender-equal countries should have less prejudice about women's labor cost and productivity and therefore employ more women in their foreign subsidiaries compared to domestic firms. The authors probe this hypothesis using data on Chinese manufacturing firms and find that affiliates of more gender-biased parent firms exhibit lower shares of female workers.

Taken together, available empirical evidence lends support to the idea that foreign parent companies, to some extent, are able to transfer corporate cultures to their overseas subsidiaries. Our work offers two main novelties with respect to the existing literature. First, to the best of our knowledge, our study is the first to document the effect of gender norms of foreign investors on wages in their subsidiaries abroad. An advantage of our approach over other studies is that we are able to account for and quantify the heterogeneous effect of foreign ownership on relative female wages. Moreover, we rely on a tight identification strategy that controls both for the propensity of certain firms to become acquired and for individual workers' labor market sorting. In the analysis of the gender wage gap, an additional strength of our data is that it allow us to account for part-time employment, which is especially relevant for female workers, who exhibit more frequent and prolonged career interruptions (Manning and Petrongolo, 2008).

While its FDI inflows come from countries with varying cultural backgrounds, Sweden is characterized by a strictly regulated labor market and is generally perceived as highly gender-equal. For these reasons, foreign investors might be limited in their opportunities to

bring changes in this dimension. Hence, the fact that we are able to detect the transfer of gender norms in the Swedish context adds additional weight in favor of the hypothesized relationship. Figure 1 illustrates the link between relative female wages and ownership that we have in mind and further motivates our analysis. The curve depicts unconditional gender wage differential by country of ownership within sector-region-year groups.



Note: The figure displays the OLS estimates of the interaction of female and country of ownership dummy variables within sector-region-year groups. Specifically, it displays $\hat{b}_3 \pm 2 \times \text{se}$ from the following regression $\ln Wage_{ijst} = a + b_1 \text{Female}_i + b_2 \mathbf{Country}_{jt} + b_3 \text{Female}_i \times \mathbf{Country}_{jt} + \varepsilon_{ijst}$, where $\mathbf{Country}_{jt}$ is a set of dummy variables indicating the home country of FDI with at least one subsidiary in Sweden. It is estimated with sector(2-digit)-year(2005–2015) and region (functional region) fixed effects.

Fig. 1 Differences in gender wage gap by country of foreign ownership

Specifically, the figure shows the contribution (in log points) to the gender wage gap in Sweden by different foreign investors, once we account for the sector, region, and time differences. Positive (negative) values suggest that foreign ownership is associated with a lower (higher) gender wage gap. As apparent from Figure 1, a relationship between relative wages and foreign ownership hides considerable heterogeneity across home countries of FDI. Therefore, cultural background plays a certain, though not fully understood, role in the gender wage differential in overseas subsidiaries. In what follows, we seek to shed light on this relationship and return to country heterogeneity analysis in the empirical section.

The rest of the paper unfolds as follows. Section 2 provides information on the data used in the empirical analysis together with descriptive statistics of the main variables. The empirical method is presented in Section 3, and Section 4 presents the results. Section 5 concludes the paper by providing a discussion of the empirical findings and suggestions for future research.

2 Data and Description

2.1 Individual and Firm-Level Data

To study the effect of foreign ownership on the gender wage gap, we use matched employer–employee data based on administrative registers from Statistics Sweden spanning the period of 2005–2015. This section, along with Table A in the Appendix, describes the data used in the analysis.

The main dependent variable—gross monthly wage—comes from the annual labor force survey, *the Salary Structure Statistics*, and is provided by Statistics Sweden. It covers (i) all employees in the public sector and all employees in the private sector that work for a company with at least 500 employees, and (ii) at least 50 percent of the remaining workforce of the private sector[3]. In total, the survey contains about 2 million individual workers in each year, with information on their full-time equivalent monthly earnings (comparable to hourly wage rates) and the extent of their workload (percent of full-time employment).[4] Due to stratification for smaller private-sector employers, the data for smaller private-sector employers have gaps for the dependent variable in some years. While it would be possible to impute wage levels for the missing years, we have opted not to do so due to the possibility of individuals doing temporary work elsewhere. The salary structure statistics also provide

[3]Firms included in the structural business statistics constitute the sampling units of the survey and are stratified according to industry affiliation and firm size.

[4]Specifically, the monthly wage data corresponds to the agreed-upon wage on top of amenities and variable incomes, absent over-time payments. We use annualized and deflated data of wages expressed in EUR in the analysis.

us with detailed information on worker occupation codes (up to 4 digits) and whether the job is blue-collar or white-collar.

To the salary structure statistics, we have merged several different data sets: (i) the longitudinal integrated database for health insurance and labor market studies (LISA) that covers all individuals in the labor force, with information on age, family status and children, education, employment, and income; (ii) the structural business statistics (FEK), which contains information on value-added, capital stock (book value), profits, sales, and industry affiliation for all private sector companies in the non-financial sector; (iii) the labor statistics based on administrative sources (RAMS), which provides information on the location, number of employees, gender and educational composition across all plants[5] in Sweden; and (iv) the concern register (KCR), which gives us information on the identity of the top mother and the company tree for all Swedish-based subsidiaries, both domestic and foreign-owned.

In the resulting database, each firm and individual is associated with a unique identifier. All employed individuals are linked to the firm where they have earned their highest annual income. Regarding sample restrictions, we have dropped all the public-sector firms since they are not covered in the structural business statistics. We have chosen to specifically focus on MNEs, since we believe that domestic MNEs serve as the best comparison group with respect to foreign acquisitions and appear to be a remarkably similar control group, as described in detail below in Table 1. We have also excluded all part-time employees to avoid potential biases associated with part-time penalties (Manning and Petrongolo, 2008; Albrecht *et al.*, 2018). Finally, we have further restricted the sample to individuals between 18 and 67 years of age. The final dataset provides a sample of 5,304,042 worker-firm-year observations, based on roughly 3,164 firms spread across 77 industries.

To describe the acquisition market in our sample, we observe a total of 450 foreign acquisitions with no clear time trend in merger activity during the years 2005–2015. The average foreign acquisition rate is 7.5 percent, hovering between 3 to 11 percent per year. Seventy-

[5]The plant data are aggregated to the firm level.

four percent of firms that have changed ownership status are medium and large firms, where firm size exceeds 50 and 250 employees, respectively. The average acquisition rate is highest in the human health and social work activities sector (9 percent) and information and communication sector (7 percent) and is lowest in the primary sector (1 percent). In absolute terms, foreign takeovers occur mainly in low-tech manufacturing. The most prevalent home countries to foreign investors are Norway, Luxembourg, and the Netherlands, which account for 18, 13, and 11 percent, respectively, of the total number of acquisitions. These are followed by the United Kingdom (10 percent), Denmark and Finland (about 8 percent, each), and Germany (7 percent). Together, these countries account for 76 percent of all foreign acquisitions over the period.

2.2 Descriptives

Table 1 Descriptive statistics: Domestic versus foreign-owned MNEs (2005–2015)

	Foreign-owned MNEs			Domestic MNEs		
	All	Female	Male	All	Female	Male
Monthly Wage (€)	3511.31	3250.23	3613.00	3610.31	3389.91	3678.17
Experience	21.32	19.87	21.88	21.42	19.99	21.86
Age	42.76	42.02	43.05	43.06	42.4	43.27
Share with children	0.59	0.65	0.56	0.74	0.79	0.73
Education						
Share with tertiary education	0.199	0.224	0.189	0.246	0.272	0.238
Occupation						
Share of white-collar workers	0.566	0.613	0.548	0.665	0.722	0.648
Share of blue-collar workers	0.466	0.450	0.472	0.499	0.478	0.505
Firm size	2824.38	2824.38	2824.38	3784.19	3784.19	3784.19
Sales (mln €)	93381.44			159553.47		
Female share of labor force	0.31			0.28		

Note: All numbers refer to average values of the indicated variables for the panel of worker-level data for 2005–2015.

We start with an overview of the differences between individual characteristics of men and women in foreign-owned versus domestic MNEs.[6] As seen in Table 1, foreign-owned multinationals appear remarkably similar to their domestic counterparts with respect to the

[6]See Table A in the Appendix for detailed definitions of all the variables used in the analysis.

observable characteristics of their workers. On average, they employ workers of similar age and with similar labor market experience but who have fewer children than employees in domestic MNEs. At the same time, foreign subsidiaries are somewhat smaller in size (2824 employees versus 3784) and pay slightly lower wages to both genders. Domestic MNEs, on the other hand, exhibit higher sales and skill intensity (the share of employees with university education). Notably, our sample's average female share in the labor force is fairly similar for domestic and foreign-owned MNEs.

2.3 Measure of Gender Inequality

To quantify differences among home country gender cultures, we rely on the Gender Inequality Index developed by the United Nations as part of the Human Development Program. The index is built as a composite measure of disparities across genders in three fundamental dimensions: reproductive health, empowerment, and labor market participation. GII is designed to capture achievement loss due to gender discrimination, with higher values indicating greater gender inequality. GII offers a consistent and objective way to assess gender disparities across countries over an extensive time period: It covers more than 160 countries over almost 20 years (2000–2019), providing the necessary scope to examine the effect of gender norms.[7] The data are obtained from the UN data web-page, whereas the index exhibits fairly low, every-fifth-year, variation during the initial period of 2000 to 2010. We impute the GII values for missing years by relying on a linear interpolation method. However, to minimize data manipulation, we use the years 2005 to 2015 as our default sample period. As an alternative measure of gender culture, we also utilize the Gender Gap Index (GGI) from the World Economic Forum. This index covers 156 countries worldwide, spanning the period of 2006–2021. Since a higher GGI indicates more equality, we use a reversed version of the index in the analysis to match the interpretation of GII, our preferred measure of the gender culture.

[7]Since a country's GII is likely to correlate with its overall development level, we control for countries' GDP as one of the robustness checks.

Table 2 Descriptive statistics: GII (2005–2015)

	Rank	Mean	St. Dev.
GII		0.125	0.071
World		0.474	0.017
OECD		0.235	0.023
Most Gender-Equal Countries			
Denmark	1	0.056	0.005
Switzerland	2	0.062	0.010
Netherlands	3	0.062	0.016
Norway	4	0.073	0.012
Finland	5	0.078	0.010
Germany	8	0.099	0.016
France	13	0.113	0.023
Luxembourg	15	0.113	0.022
Least Gender-Equal Countries			
United Kingdom	24	0.185	0.017
United States	29	0.256	0.009
Brazil	40	0.443	0.004
Venezuela	41	0.485	0.002
Turkey	42	0.531	
India	43	0.593	0.026

Note: The ranking is based on countries having subsidiaries in Sweden over the 2005–2015 period. Home countries of largest FDI investors are marked in italics.

Table 2 provides an overview of GII among the sample of foreign-owned firms during the sample period of 2005–2015. As seen in Table 2, the average level of inequality in foreign subsidiaries in Sweden amounts to 0.125, which lies somewhat below the OECD average of 0.235 and substantially below the world average of 0.474. Hence, Sweden predominantly receives FDI inflows from countries with high levels of gender equality, as can be further confirmed by the lower part of Table 2. Scandinavian and Western European countries make up the largest FDI investors in Sweden and exhibit the highest levels of gender equality globally. On the other hand, Swedish subsidiaries are also exposed to more gender-biased cultures stemming from United States and United Kingdom, as well as a host of other investors characterized by low level of gender equality. We therefore believe that Sweden offers an interesting setting to study the cultural effects of FDI, where parent firms with

varying cultural backgrounds have an opportunity to shape social norms in the host country.

3 Empirical Approach

Building on the preceding literature (c.f. Bøler *et al.*, 2018; Bonfiglioli and De Pace, 2021), we consider a worker-level Mincer (1974) wage regression with high-dimensional fixed effects. Specifically, we rely on the following baseline model for a worker i, who is employed in a multinational firm j, operating in sector s and region r at time t:

$$\ln Wage_{it} = \alpha + \beta_1 Foreign_{jt} + \boldsymbol{\beta}_2 Female_i \times Foreign_{jt} + \tag{1}$$
$$\mathbf{R}_{it}\boldsymbol{\eta} + \mathbf{Z}_{jt}\boldsymbol{\psi} + \phi_r + \nu_{st} + \eta_{ij} + \epsilon_{it},$$

where $Female_i$ is a dummy variable that takes the value of one for being female. In the baseline specification, $Foreign_{jt}$ refers to a scalar dummy variable that takes the value of one if the firm is foreign-owned at time t and zero otherwise. To assess the role of foreign ownership on the gender wage gap, we include the interaction between $Female_i$ and $Foreign_{jt}$.

The wage premium *for men* from working in a foreign-owned company is captured by β_1, as compared to men working in domestically owned MNEs. The premium for women, in turn, translates into $\beta_1 + \beta_2$ (i.e., as compared to women in domestically owned MNEs). In contrast, the difference in the gender wage gaps between foreign-owned and domestic companies is captured by the interaction term and β_2. Thus, a positive β_2 implies a narrowing effect, and a negative β_2 would suggest a widening effect of the total gender wage gap due to foreign ownership.[8]

Confounding observable characteristics at the individual and firm-level are captured by

[8]More specifically, $\beta_2 = GWG_D - GWG_F$, where GWG_D and GWG_F is the gender wage gap in domestic and foreign-owned MNEs, respectively. Moreover, since the dependent variable is expressed in logarithms, the β coefficients can be interpreted approximately as the $100 \times \beta$ percent difference in $Wage$ between the two groups; or, more precisely, by $100 \times (\exp(\beta) - 1)$ percent difference in $Wage$.

vectors $\mathbf{R}_{it}$ and $\mathbf{Z}_{jt}$. For individual workers, we consider $\mathbf{R}_{it} = [$*Experience, Experience*$^2/100$*, University Education, Children, White collar*$]$, and for firms, we control for firm size (log number of employees) and location in the baseline specification. Region fixed effects, ϕ_r, allow us to capture geographical aspects of firms' location. We also augment model (1) with sector-year fixed effects (ν_{st}) to account for any systematic variation in wages across sectors over time.

Specification (1), however, potentially suffers from multiple sources of endogeneity. Most notably, there are two complementary types of selection: (i) the selection of firms into being acquired by a foreign investor, and (ii) individual workers' sorting into foreign-owned companies. In the case of firm selection, we expect that more productive or profitable firms have a higher propensity to be acquired. Thus, if acquisitions are correlated with possibly time-variant and unobserved productivity shocks, estimates of the foreign ownership effect are likely to be biased. Additionally, if productivity shocks also affect wages via, e.g., rent sharing, this might lead to biased estimates of the female dummy.

In the case of labor market sorting, there is a possibility that workers sort into foreign-owned companies based on certain unobserved characteristics. These characteristics may be specific to the individual (e.g., innate ability) or to the worker-firm pair in the form of job-match quality (e.g., having preferences for working in a subsidiary of an established international company). When labor market sorting occurs and individuals with greater abilities and ambition seek to be employed by high-quality firms, we may expect worker characteristics to be correlated with the foreign-owned dummy. Moreover, if the match quality differs across genders, potentially due to discrimination, it may further bias the estimate of the gender dummy.

To address these issues, we include two sets of fixed effect, with the most stringent specification having fixed effects both at the worker-firm level (i.e., job spells) to control for unobserved heterogeneity at the worker level, such as match-quality differences, as well as at the firm-year level to capture any time-variant selection among the acquired firms. Spell

fixed effects are denoted by η_{ij} and are included in the baseline specification (1) above. Note that when we include spell fixed effects in the model, we can no longer quantify the gender wage gap in domestic MNEs.[9] Identification of the main explanatory variable—the interaction term between being a female and working in a foreign-owned firm—utilizes the variation within worker spells and compares male and female wages before and after the acquisition of their current employer.

By incorporating firm-year effects into the model, we control for inter-temporal shocks that may drive the selection of firms into becoming a part of MNE. Effectively, all variation at the firm level drops out, including the $Foreign_jt$ variable, which makes the model quite restrictive. Following Bonfiglioli and De Pace (2021), we also pursue an alternative approach and attempt to directly control for firm selection effects. We do so by including firm (log) sales and its interaction with the female dummy instead of the firm-year fixed effects. While sales may not be a perfect proxy for firm productivity, it serves as a useful comparison when interpreting the results from the more restrictive model. We present the results from both specifications.

As a second step, we seek to explore country specificity with respect to its contribution to the gender wage gap. As seen in 1, there exists considerable unconditional heterogeneity across investor home countries and the gender wage gap in their Swedish subsidiaries. To further explore this heterogeneity, we expand model (1) by partitioning the foreign ownership dummy into two: (i) foreign-owned by one of the major FDI investors, and (ii) foreign-owned by any other foreign investor. Formally,

$$Foreign_{jt} = \begin{cases} CH_{jt} \;/\; DE_{jt} \;/\; DK_{jt} \;/\; FI_{jt} \;/\; FR_{jt} \;/\; GB_{jt} \;/\; LU_{jt} \;/\; NL_{jt} \;/\; NO_{jt} \;/\; US_{jt} \\ Other\ foreign\ owned_{jt} \end{cases}$$

This augmented specification allows us to test whether foreign investors from different

[9]To gauge the domestic wage gap, we also estimate a model without job-spell fixed effects, and the results can be found in Table A2 in the Appendix.

origin countries may contribute asymmetrically to the gender wage differential in Sweden.

In a third step, we turn directly to the gender norms in the home country of FDI and examine their role in shaping the gender wage gap in the host country. To this end, we restrict the sample to include foreign-owned firms only and estimate the following version of model (1):

$$\ln Wage_{ijst} = \alpha + \boldsymbol{\beta}_1 GII_{jt} + \boldsymbol{\beta}_2 GII_{jt} \times Female_i + \mathbf{R}_{it}\boldsymbol{\eta} + \mathbf{Z}_{jt}\boldsymbol{\psi} + \phi_r + \nu_{st} + \eta_{ij} + \epsilon_{ijst}. \tag{2}$$

The interpretation of β_1 and β_2 in equation (2) changes slightly compared to that of equation (1). Since the GII is a continuous variable, β_1 corresponds to the male premium/penalty from a unit increase in the GII.[10] The estimate of β_2, in turn, captures the additional premium/penalty for women compared to men as the GII increases by one standard deviation. In other words, β_2 indicates the extent to which females are rewarded/penalized by working for firms owned by foreign investors from less gender-equal countries.

Our empirical approach largely follows Bøler *et al.* (2018) and Bonfiglioli and De Pace (2021) and implies estimation of a high-dimensional fixed-effects model. Due to the sheer number of fixed effects, the standard panel-data techniques quickly become infeasible for higher dimensions.[11] To estimate the above models, we rely on the efficient algorithm by Correia (2016) that supports multiple sets of high-dimensional fixed effects. In all models, we cluster standard errors at the firm level to adjust for correlation across workers within firms, as well as correlation within firms over time.

[10] Note that a higher value of GII means less equality. We have also normalized the GII such that a unit change corresponds to one standard deviation.

[11] These type of models has spawned a fast growing literature that tries to address the dimensionality problem, see e.g. Abowd *et al.*, 1999, 2002; Jochmans and Weidner, 2019; Mittag, 2019.

4 Empirical Results

In this section, we present our empirical findings. We start by estimating model (1) analyzing the effect of foreign ownership on the gender wage gap, whereafter we turn to the question of whether gender norms of the investor home country are transferred to subsidiaries abroad. The analysis is finalized with a series of robustness tests and additional sub-group analyses.

4.1 Foreign ownership and the gender wage gap

How does foreign ownership contribute to the gender wage gap? In Table 3, we present our findings on the average effect of foreign ownership on relative female wages, where we disregard any asymmetric effects by single investors. As pointed out in the empirical approach section, we limit the comparison to within spells in all models, thereby accounting for possible job-match heterogeneity. By including job-spell fixed effects, we compare the change in wages of Mary and Michael at their current employer before and after the company gets acquired by a foreign investor.[12] In columns (2) and (3), we use firm sales (and its interaction with the female dummy) as proxies for firm-specific unobserved productivity that may drive the selection of firms into being acquired. In the final and most stringent specification (4), the time-varying heterogeneity at the firm level is removed altogether by using firm times year fixed effects. When discussing the results, we refer to model (4) as our preferred specification.

Before delving into the main findings, we note that most individual and firm control variables turn out with the expected signs, which corroborates the validity of our model. Inspecting column (1), we observe that foreign ownership exerts a narrowing and statistically significant effect on the gender wage gap, as economic theory would predict. Controlling for (log) sales and its interaction with the female dummy in specifications (2) and (3) does not

[12] A disadvantage with spell fixed effects specification is that it does not allow us to quantify the effect of foreign ownership on male and female wages, since time-invariant individual characteristics are subsumed. Table A2 in the Appendix reports coefficients without spell fixed effects and documents a female wage gap in domestic MNEs of 17.7 percent when adjusted for firm selection effects.

Table 3 Foreign ownership and gender wage gap. Average effect

Dependent variable: $\ln Wage_{ij}$	(1)	(2)	(3)	(4)
Female × Foreign-owned	0.0076***	0.0076***	0.0076***	0.0052**
	(0.0027)	(0.0027)	(0.0028)	(0.0023)
Foreign-owned	-0.0005	-0.0006	-0.0006	
	(0.0031)	(0.0031)	(0.0031)	
Sales (log)		0.0074**	0.0090**	
		(0.0038)	(0.0044)	
Female × Sales (log)			-0.0057**	-0.0039**
			(0.0027)	(0.0018)
Firm size (log)	0.0108**	0.0056	0.0054	
	(0.0055)	(0.0051)	(0.0052)	
Experience	0.0078***	0.0078***	0.0078***	0.0077***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Experience $^2/100$	-0.0307***	-0.0307***	-0.0307***	-0.0304***
	(0.0010)	(0.0010)	(0.0010)	(0.0010)
Children	-0.0030**	-0.0030**	-0.0030**	-0.0033***
	(0.0013)	(0.0013)	(0.0013)	(0.0013)
University Education	0.0535***	0.0535***	0.0535***	0.0514***
	(0.0026)	(0.0026)	(0.0026)	(0.0025)
White collar	0.0271***	0.0271***	0.0271***	0.0290***
	(0.0025)	(0.0025)	(0.0025)	(0.0027)
Spell FE	✓	✓	✓	✓
Industry× *Year FE*	✓	✓	✓	
Firm× *Year FE*				✓
Observations	5304042	5304042	5304042	5304042
Adjusted R^2	0.941	0.941	0.941	0.945

Note: Estimates are based on the worker-level panel data over 2005–2015. Workers employed in multinational firms (domestic and foreign-owned) are included. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

alter the foreign ownership estimate. Since we account for the firm size and hold it constant, the sales variable serves as a proxy for the increased labor productivity. Turning back to the above-mentioned Mary and Michael, a 10 percent increase in sales (or labor productivity) would translate into a significant wage penalty for Mary of 0.57 percent (column (3)). This result holds even when we add firm-year fixed effects in the specification (4), albeit at a smaller magnitude. Column (4) also provides evidence of foreign ownership having a

narrowing effect on the gender wage gap. The result is strongly significant and in the order of 0.52 percent. Hence, once worker sorting and firm selection effects are accounted for, our preferred specification shows that foreign ownership is, on average, associated with a reduced gender wage differential. This result is reminiscent of Heyman *et al.* (2013) who document a small positive effect of an acquisition (both domestic and cross-border) on relative female wages in Sweden.

To shed additional light on the relationship between foreign ownership and wages, we examine the dynamics of the effect in Table A3 in the Appendix. Specifically, we analyze the effect after one, two, and more than two years after a foreign acquisition takes place. In columns (3) and (4), we also look at two years prior to an acquisition. A dummy variable *Foreign-owned t = 0* indicates the year of acquisition. In contrast, *Foreign-owned t+1* is a dummy for the year after the acquisition, and *Foreign-owned >t+2* refers to the period of more than two years after the change of ownership. The other variables are defined accordingly. In all specifications, we observe that the effect of foreign ownership is significantly positive and tends to propagate over time. Hence, our results suggest that it presumably takes time for parent companies to transfer their corporate culture abroad. A similar conclusion has been reached by Kodama *et al.* (2018), who find that gender-equal employment outcomes in Japanese foreign-owned firms are driven by established (operating more than three years) affiliates rather than new affiliates.

4.2 Foreign ownership by country and gender inequality

The results in Table 3 suggest that foreign ownership is associated with a smaller gender wage gap. A natural question to ask is whether the narrowing effect we observe is uniform across investors, independent of their country of origin. A first glance on this question is provided in Figure 1, which depicts estimates from a regression model with industry-year and region fixed effects. Hence, the estimated coefficients are derived from the within-industry variation in wages and remain rather descriptive, but they nevertheless suggest a significant

variation in the gender wage gap across FDI home countries.

Table 4 Foreign ownership and gender wage gap: Heterogeneity across country of foreign ownership

	Country of foreign ownership									
Dep. var.: $\ln Wage_{ij}$	CH (1)	DE (2)	DK (3)	FI (4)	FR (5)	GB (6)	LU (7)	NL (8)	NO (9)	US (10)
Female × Ctry :	0.0100***	-0.0013	0.0021	0.0124***	0.0092*	0.0029	0.0059**	0.0131***	0.0067*	-0.0034
	(0.0032)	(0.0042)	(0.0035)	(0.0024)	(0.0056)	(0.0031)	(0.0028)	(0.0050)	(0.0035)	(0.0032)
Female × Other :	0.0057**	0.0051***	0.0055***	0.0053**	0.0044*	0.0052**	0.0051**	0.0038*	0.0052**	0.0060***
	(0.0025)	(0.0023)	(0.0023)	(0.0023)	(0.0024)	(0.0023)	(0.0024)	(0.0020)	(0.0023)	(0.0023)
Female× Sales (log)	-0.0039**	-0.0039**	-0.0039**	-0.0039**	-0.0039**	-0.0039**	-0.0039**	-0.0038**	-0.0039**	-0.0037**
	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0016)	(0.0018)	(0.0017)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spell FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm× Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	5304042	5304042	5304042	5304042	5304042	5304042	5304042	5304042	5304042	5304042
Adjusted R^2	0.945	0.945	0.945	0.945	0.945	0.945	0.945	0.945	0.945	0.945

Note: Estimates are based on the worker-level panel data over 2005–2015. Workers employed in multinational firms (domestic and foreign-owned) are included. Worker controls include potential labor market experience, experience squared, education, children, and collar; firm controls are subsumed by firm-year fixed effects. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

To further examine the heterogeneity of the effect by country of origin, we separate each of the major foreign ownership countries using a dummy variable and rerun the most stringent specification (4). In table 4, we observe a narrowing and significant effect on the gender wage gap from ownership by investors originating from Switzerland (CH), Finland (FI), France (FR), Luxembourg (LU), the Netherlands (NL), and Norway (NO). On the other hand, we find no significant effect of ownership by investors from Germany (DE), Denmark (DK), Great Britain (GB), and the United States (US). The only negative (although insignificant) result we observe is for the overseas subsidiaries of the US parent companies. While country dummies capture all country-specific factors at the time of ownership, they do not provide possible explanation behind the results. We expect that part of the observed heterogeneity at the country level may be due to differences in gender norms that propagate to the subsidiary firms in the host country. Looking at the ranking of countries in terms of the GII in Table 2, we note that all positive effects are found among the more equal countries (such as Switzerland, Finland, the Netherlands, and Norway), whereas ownership from the less equal

countries, such as Great Britain and the US, has no statistically significant effect. In light of these findings, it is plausible to argue that the narrowing effect of foreign ownership in Table 3 is not (only) driven by competitive pressures (Heyman *et al.*, 2013), but also occurs due to heterogeneity in investor cultural backgrounds. In particular, gender-biased investors widen the gender wage gap while gender-equal investors, on the contrary, exert a narrowing effect, resulting in a small positive estimate on average.

Table 5 Gender norms and gender wage gap

Dependent variable: $\ln Wage_{ij}$	GII (2005–2015)		Alt. inequality index GGI (2006-2015)		Controlling for GDP (2005–2015)	
	(1)	(2)	(3)	(4)	(5)	(6)
Female × Std GII	-0.0058***	-0.0051***			-0.0055***	-0.0050***
	(0.0013)	(0.0013)			(0.0013)	(0.0013)
Std GII	0.0058***				0.0055***	
	(0.0021)				(0.0020)	
Female × Std GGI (reversed)			-0.0026**	-0.0026**		
			(0.0012)	(0.0011)		
Std GGI (reversed)			0.0028			
			(0.0022)			
Female × GDP per Capita (log)					-0.0022	-0.0016
					(0.0019)	(0.0017)
GDP per Capita (log)					-0.0048	
					(0.0055)	
Female × Sales (log)	-0.0092***	-0.0055***	-0.0096**	-0.0059***	-0.0091***	-0.0055***
	(0.0033)	(0.0020)	(0.0038)	(0.0023)	(0.0032)	(0.0020)
Sales (log)	0.0137**		0.0137*		0.0133**	
	(0.0065)		(0.0071)		(0.0061)	
Controls	✓	✓	✓	✓	✓	✓
Industry× Year FE	✓		✓		✓	
Spell FE	✓	✓	✓	✓	✓	✓
Firm× Year FE		✓		✓		✓
Observations	2959755	2959755	2712514	2712512	2959755	2959755
Adjusted R^2	0.942	0.946	0.943	0.948	0.942	0.946

Note: Estimates are based on the worker-level panel data over a specified period. Only workers employed in foreign-owned firms are included. Worker controls include potential labor market experience, experience squared, education, children, and collar; firm controls include firm size and region fixed effects. The GGI is reversed to maintain the same interpretation as the GII. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

To examine the role of foreign gender norms directly, in Table 5, we proceed by replacing

the foreign ownership dummy with a continuous measure of gender inequality across investor countries—the GII developed by the United Nations.[13] These results are based on the restricted sample of foreign-owned firms only. In columns (1) and (2), we observe that firms owned by gender-biased investors exhibit a higher gender wage differential compared to companies owned by investors from gender-equal cultures. Juxtaposed next to the positive average estimate of foreign ownership from Table 3, the negative effect observed for the GII implies that women stand to benefit more from foreign ownership if the gender culture of investor home country is more equal. In terms of magnitude, we find that a one standard deviation increase in the GII translates into a -0.53 percent relative female wage penalty. Although the estimated effect is small, the results are robust, supporting the hypothesis that the gender wage gap in foreign-owned firms can be affected by gender norms in the home country of the investor.

To further probe the robustness of our preferred measure of gender inequality, we apply an alternative index that also captures gender norms of the country in question, i.e., the GGI derived from the World Economic Forum. Swapping the GII for the GGI provides qualitatively similar results, as displayed in columns (3) and (4).

A potential concern with the inequality measures is that they may capture the overall development of countries since gender inequality is often associated with lower levels of economic advancement. To address this issue, we augment the model with (log) GDP per capita of FDI origin country and its interaction with the female dummy. By doing so, we control for potential home-country effects stemming from the level of economic development rather than gender culture. As seen in columns (5) and (6), the effect of home country gender norms is not altered when controlling for the income level of the investor country. Hence, earlier findings for the GII remain are robust with respect to control of home country income.

[13]Similar to Bøler *et al.* (2018), we have also run the analysis using a log specification of the inequality index, for which we find similar results. The standardized version of the GII is preferred due to its straightforward interpretation.

Taken together, the findings in Table 5 are robust to alternative specifications and add weight in favor of the hypothesized role of gender norms in shaping the gender wage differential. Specifically, we have shown that the gender wage gap in foreign subsidiaries is significantly and robustly related to the degree of gender inequality in the investor's home country. Thus, parent companies appear to transfer their corporate culture and wage-setting practices abroad, contributing to the global diffusion of their home country's culture. Although the estimated impact remains small in magnitude, it aligns with theoretical predictions and the main research hypothesis. Our results also speak to the previous findings of Tang and Zhang (2021) which document that foreign affiliates owned by less gender-biased parent firms exhibit higher shares of female workers.

4.3 Robustness

In the previous section, we established that Swedish foreign-owned firms receiving FDI inflows from countries that are low in gender equality tend to display a relatively large gender wage differential. In Table 6, we further test the robustness of the results. Specifically, in Table 6, we (i) exclude small firms from the sample, (ii) extend the time period, and (iii) include firm-year specific occupational fixed effects.

Because of noisiness in the data for smaller firms[14] and because most studies leave out micro and small firms, we restrict the sample to firms with more than 50 employees. This restriction does not alter the previous results, as apparent from columns (1) and (2) of Table 6. We also perform additional heterogeneity analysis across firm size quantiles in Table A4. Notably, the effect of unequal gender norms appears to be concentrated among largest firms, as seen in columns (1) and (2) of Table A4. We deem this finding important and intuitively appealing since we expect that larger MNEs are likely to have more established corporate

[14] A potential measurement error could occur due to changes in firm identifiers at the time of merger or acquisition. To circumvent this problem, Statistics Sweden has created FAD-identification numbers that attempt to hold a firm ID constant if the majority of its employees are present in two consecutive years. The method becomes less reliable when the number of employees is small, hence the increased risk of errors. See more information on the FAD-identification numbers in Table A in the Appendix.

cultures, which can be transferred more easily to overseas subsidiaries.

Table 6 Gender norms and gender wage gap: Robustness

Dependent variable: $\ln Wage_{ij}$	Firm size > 50 empl. (2005–2015)		Alt. time period (2000–2015)		Adding occ. FE (2005–2015)
	(1)	(2)	(3)	(4)	(5)
Female × Std GII	-0.0060***	-0.0054***	-0.0067***	-0.0056***	-0.0047***
	(0.0013)	(0.0014)	(0.0013)	(0.0014)	(0.0013)
Std GII	0.0058**		0.0049***		
	(0.0023)		(0.0019)		
Female× Sales (log)	-0.0094***	-0.0057***	-0.0067**	-0.0039**	-0.0033*
	(0.0034)	(0.0021)	(0.0029)	(0.0020)	(0.0017)
Sales (log)	0.0133**		0.0114**		
	(0.0067)		(0.0053)		
Controls	✓	✓	✓	✓	✓
Industry× Year FE	✓		✓		
Spell FE	✓	✓	✓	✓	✓
Firm× Year FE		✓		✓	
Firm× Occupation× Year FE					✓
Observations	2906391	2906391	4133663	4133663	2953253
Adjusted R^2	0.942	0.946	0.937	0.941	0.946

Note: Estimates are based on the worker-level panel data over a specified period. Only workers employed in foreign-owned firms are included. Worker controls include potential labor market experience, experience squared, education, children, and collar; firm controls include firm size and region fixed effects. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

The next robustness exercise expands the time horizon of the analysis to cover the years 2000–2015. Our preferred measure of gender norms—the GII—exhibits low, every-fifth-year variation during the years 2000–2010.[15] As a compromise between data manipulation and sufficient sample size, we have decided to focus on a shorter time (2005–2015) for most parts of the analysis. The results in columns (3) and (4) suggest that changing the time frame and, as a consequence, also altering the coverage of firms does not change our earlier findings from Table 5. The inclusion of additional years leads to the same sign and magnitude of the main effect of interest.

Lastly, in column (5), we attempt to account for unobserved contemporaneous shocks

[15]As noted in Table A, we impute the GII from 2000 to 2005 and from 2005 to 2010 using linear interpolation.

that might differentially affect occupations at a particular firm. To this end, we incorporate firm-occupation-year fixed effects, whereas occupations are identified using a one-digit ISCO code[16]. Occupational fixed effects also implicitly control for changes in firm skill-intensity level. The inclusion of additional fixed effects results in only slightly smaller estimate on *Female*Std GII*: from about -0.0051 in column (2) of Table 2 to about -0.0047 in column (5) of Table 6. Interestingly, when firm-occupation-year fixed effects are included, the coefficient on the interaction term *Female*Log Sales* decreases and remains significant only at a 1 percent level, suggesting that firm productivity disproportionately affects female employees through their occupation. Altogether, the results in Table 6 are very close to the original estimates and remain much the same across all specifications. Our findings firmly suggest that a lower level of gender equality in the investor's home country is associated with a relatively larger gender wage differential in their Swedish subsidiaries.

Finally, in addition to the robustness checks above, we have also re-estimated the most stringent specifications from Tables 3 and 5 using Pseudo-Poisson Maximum Likelihood (PPML) estimator. One advantage of this method is that it allows for modeling the conditional expectation of wages directly instead of using log wages. As seen in Table A5 in the Appendix, the estimated results from PPML largely confirm previous findings.

4.4 Employee subgroup analysis

The results on the impact of foreign investor gender norms on the gender wage gap in its subsidiaries are robust to a wide range of specifications. Nevertheless, this effect might not be homogeneous across various employee subgroups. To investigate this issue, in Table 7, we differentiate employees by their education and age. To explore the glass-ceiling effect (Albrecht *et al.*, 2003, 2015), we also restrict our attention to a small subset of workers—managers—in column (6). In addition, we further explore the glass-ceiling effect in Table 8 by partitioning the sample of foreign-owned firms according to the four wage quantiles and

[16]We also perform similar analysis using two-digit ISCO occupational codes and we obtain comparable results; the latter are available upon request.

re-estimating the specification with spell and firm-year fixed effects on each subsample.

Table 7 Gender norms and gender wage gap: Heterogeneity across worker types

Dependent variable: $\ln Wage_{ij}$	Education			Age		Occupation
	Primary	Secondary	Tertiary	Age <= 39	Age > 39	Manager
Female × Std GII	-0.0035**	-0.0042***	-0.0055**	-0.0035**	-0.0045**	-0.0013
	(0.0016)	(0.0013)	(0.0026)	(0.0017)	(0.0019)	(0.0030)
Female × Sales (log)	-0.0023	-0.0068***	-0.0012	-0.0082**	-0.0013	-0.0059
	(0.0018)	(0.0024)	(0.0019)	(0.0036)	(0.0020)	(0.0039)
Experience	0.0084**	0.0066***	0.0117***	0.0095***	0.0025***	0.0109***
	(0.0037)	(0.0004)	(0.0006)	(0.0004)	(0.0002)	(0.0008)
Experience^2/100	-0.0182***	-0.0283***	-0.0466***	-0.0477***	-0.0083***	-0.0405***
	(0.0010)	(0.0013)	(0.0019)	(0.0023)	(0.0005)	(0.0015)
Children	-0.0017	-0.0075***	0.0082***	-0.0102***	-0.0035***	0.0021
	(0.0010)	(0.0016)	(0.0009)	(0.0021)	(0.0005)	(0.0016)
White collar	0.0334***	0.0343***	0.0275***	0.0353***	0.0225***	
	(0.0032)	(0.0027)	(0.0042)	(0.0035)	(0.0018)	
University education				0.0367***	0.0103	0.0282**
				(0.0036)	(0.0083)	(0.0124)
Spell FE	✓	✓	✓	✓	✓	✓
Firm× Year FE	✓	✓	✓	✓	✓	✓
Observations	381775	2044180	520432	1699891	1221607	214794
Adjusted R^2	0.910	0.928	0.962	0.926	0.970	0.962

Note: Estimates are based on the worker-level panel data over 2005–2015. Only workers employed in foreign-owned firms are included. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

When inspecting columns (1)-(3) for different groups of workers with respect to their educational attainment, we observe that the size of the GII estimate is comparable across specifications. Still, the effect is slightly more pronounced for females with tertiary education. A similar pattern with no significant differences across subgroups can be observed when we divide employees by age. The effect of gender norms of the FDI home country on the gender wage gap does not appear to be concentrated to certain age or education employee subgroups. In the last column of Table 7, we find no significant effect on the relative wages of female managers. Hence, these models do not provide robust and significant evidence in favor of the glass-ceiling effect; however, we investigate this issue in more detail in Table 8.

Turning to Table 8, we split the sample by wage quantile and observe that the effect of

Table 8 Gender norms and gender wage gap: Heterogeneity across wage distribution

Dependent variable: $\ln Wage_{ij}$	1st quantile (1)	2nd quantile (2)	3rd quantile (3)	4th quantile (4)
Female × Std GII	-0.0010	-0.0030***	-0.0069***	-0.0094***
	(0.0011)	(0.0009)	(0.0019)	(0.0032)
Female × Sales (log)	-0.0041	-0.0028**	-0.0017	-0.0041
	(0.0030)	(0.0014)	(0.0014)	(0.0029)
	(0.0014)	(0.0014)		
Controls	✓	✓	✓	✓
Spell FE	✓	✓	✓	✓
Firm× Year FE	✓	✓	✓	✓
Observations	662988	640017	660500	703735
Adjusted R^2	0.811	0.569	0.646	0.920

Note: Estimates are based on the worker-level panel data over 2005–2015. Only workers employed in foreign-owned firms are included. Worker controls include potential labor market experience, experience squared, education, children, and collar; firm controls are subsumed by firm-year fixed effects. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

gender culture on the wage gap is uniformly increasing with respect to the wage quantile. The coefficient is consistently negative and is greater in absolute value for the higher quantiles. Specifically, the estimated impact of the GII on the gender wage gap increases from -0.0010 (insignificant) to -0.0094 (highly significant) as we move from the first to the fourth quantile of the wage distribution. The latter result confirms the glass-ceiling effect documented for the Swedish labor market by Albrecht *et al.* (2003) and Albrecht *et al.* (2015). Thus, our analysis suggests that foreign-ownership stemming from gender-biased investors might, to some extent, hamper the career opportunities of female workers in Sweden.

Conclusions

This paper explores the relationship between the gender wage gap and foreign ownership using matched employer–employee data from Sweden. Of specific interest is the question of whether the gender wage gap in foreign-owned subsidiaries is affected by the degree of gender inequality in the home country of investors. That is, does FDI serve as a vehicle for transferring gender norms across borders?

To answer this question, we estimate the wage regression controlling for both unobserved employer–employee match quality and unobserved firm-specific productivity shocks. Our findings show that, while foreign ownership exerts a small positive (narrowing) effect on the wage gap on average, the effect is heterogeneous when we split it by country of origin. We hypothesize that the observed heterogeneity can be explained by foreign investors transferring their corporate culture and gender norms across international borders, presumably by virtue of expatriate staff and standardized policies. We test this hypothesis by augmenting the model with a direct measure of gender inequality of the home country of FDI—the GII (UN, Human Development Program).

In line with theoretical predictions of Tang and Zhang (2021), we find that gender norms of the parent company matter for the wage gap in foreign subsidiaries. Specifically, the analysis reveals that FDI from gender-unequal countries leads to a relatively larger gender wage differential in the respective host country subsidiaries. Although the estimated effects are small in magnitude, they support the cultural transfer hypothesis and corroborate previous findings in the field. Hence, FDI plays a certain role in transferring gender norms abroad and thereby contributes to global cultural convergence. We further document that the effect of gender-biased corporate culture is more prominent at the higher end of the wage distribution, underlining the glass-ceiling effect and suggesting that female career opportunities might be impeded by FDI from gender-unequal countries.

References

Abowd, J. M., Creecy, R. H., Kramarz, F. *et al.* (2002). *Computing person and firm effects using linked longitudinal employer-employee data*. Tech. rep., Center for Economic Studies, US Census Bureau.

—, Kramarz, F. and Margolis, D. N. (1999). High wage workers and high wage firms. *Econometrica*, **67** (2), 251–333.

Acemoglu, D. and Autor, D. (2011). Skills, tasks and technologies: Implications for employment and earnings. In *Handbook of labor economics*, vol. 4, Elsevier, pp. 1043–1171.

Aitken, B., Harrison, A. and Lipsey, R. E. (1996). Wages and foreign ownership a comparative study of mexico, venezuela, and the united states. *Journal of international Economics*, **40** (3-4), 345–371.

Albrecht, J., Björklund, A. and Vroman, S. (2003). Is there a glass ceiling in sweden? *Journal of Labor economics*, **21** (1), 145–177.

—, Bronson, M. A., Thoursie, P. S. and Vroman, S. (2018). The career dynamics of high-skilled women and men: Evidence from sweden. *European Economic Review*, **105**, 83–102.

—, Thoursie, P. S. and Vroman, S. (2015). Parental leave and the glass ceiling in sweden. *Research in labor economics*, **41**, 89–114.

Altonji, J. G. and Blank, R. M. (1999). Race and gender in the labor market. *Handbook of labor economics*, **3**, 3143–3259.

Becker, G. S. (1957). *The economics of discrimination*. University of Chicago Press.

Black, S. E. and Brainerd, E. (2004). Importing equality? the impact of globalization on gender discrimination. *ILR Review*, **57** (4), 540–559.

Blau, F. D. and Kahn, L. M. (2000). Gender differences in pay. *Journal of Economic perspectives*, **14** (4), 75–99.

— and — (2017). The gender wage gap: Extent, trends, and explanations. *Journal of economic literature*, **55** (3), 789–865.

Bloom, N., Sadun, R. and Van Reenen, J. (2012). The Organization of Firms Across Countries*. *The Quarterly Journal of Economics*, **127** (4), 1663–1705.

Bøler, E. A., Javorcik, B. and Ulltveit-Moe, K. H. (2018). Working across time zones: Exporters and the gender wage gap. *Journal of International Economics*, **111**, 122–133.

Bonfiglioli, A. and De Pace, F. (2021). Export, female comparative advantage and the gender wage gap.

Card, D., Cardoso, A. R. and Kline, P. (2016). Bargaining, sorting, and the gender wage gap: Quantifying the impact of firms on the relative pay of women. *The Quarterly Journal of Economics*, **131** (2), 633–686.

Conyon, M. J., Girma, S., Thompson, S. and Wright, P. W. (2002). The productivity and wage effects of foreign acquisition in the united kingdom. *The Journal of Industrial Economics*, **50** (1), 85–102.

Correia, S. (2016). *Linear Models with High-Dimensional Fixed Effects: An Efficient and Feasible Estimator*. Tech. rep., working Paper.

Doms, M. E. and Jensen, J. B. (2007). 7. comparing wages, skills, and productivity between domestically and foreign-owned manufacturing establishments in the united states. In *Geography and ownership as bases for economic accounting*, University of Chicago Press, pp. 235–258.

Driffield, N. and Girma, S. (2003). Regional foreign direct investment and wage spillovers: Plant level evidence from the uk electronics industry. *Oxford Bulletin of Economics and Statistics*, **65** (4), 453–474.

Goldin, C. (2014). A grand gender convergence: Its last chapter. *American Economic Review*, **104** (4), 1091–1119.

Görg, H., Strobl, E. and Walsh, F. (2007). Why do foreign-owned firms pay more? the role of on-the-job training. *Review of World Economics*, **143** (3), 464–482.

Griffith, R. (1999). Using the ard establishment level data to look at foreign ownership and productivity in the united kingdom. *The Economic Journal*, **109** (456), 416–442.

Haddad, M. and Harrison, A. (1993). Are there positive spillovers from direct foreign investment?: Evidence from panel data for morocco. *Journal of development economics*, **42** (1), 51–74.

Heyman, F., Svaleryd, H. and Vlachos, J. (2013). Competition, takeovers, and gender discrimination. *ILR Review*, **66** (2), 409–432.

Jochmans, K. and Weidner, M. (2019). Fixed-effect regressions on network data. *Econometrica*, **87** (5), 1543–1560.

Juhn, C., Ujhelyi, G. and Villegas-Sanchez, C. (2014). Men, women, and machines: How trade impacts gender inequality. *Journal of Development Economics*, **106**, 179–193.

Kodama, N., Javorcik, B. S. and Abe, Y. (2018). Transplanting corporate culture across international borders: Foreign direct investment and female employment in japan. *The World Economy*, **41** (5), 1148–1165.

Lipsey, R. E. (1994). *Foreign-Owned Firms and U.S. Wages*. Working Paper 4927, National Bureau of Economic Research.

— (2004). Home-and host-country effects of foreign direct investment. In *Challenges to globalization: Analyzing the economics*, University of Chicago Press, pp. 333–382.

— and Sjöholm, F. (2004). Foreign direct investment, education and wages in Indonesian manufacturing. *Journal of Development Economics*, **73** (1), 415–422.

Magda, I. and Sałach, K. (2020). Gender pay gaps in domestic and foreign-owned firms. *Empirical Economics*, pp. 1–27.

Manning, A. and Petrongolo, B. (2008). The part-time pay penalty for women in britain. *The economic journal*, **118** (526), F28–F51.

Mincer, J. (1974). Schooling, experience, and earnings. human behavior & social institutions no. 2.

Mittag, N. (2019). A simple method to estimate large fixed effects models applied to wage determinants. *Labour Economics*, **61**, 101766.

Nekby, L. (2003). Gender differences in rent sharing and its implications for the gender wage gap, evidence from sweden. *Economics Letters*, **81** (3), 403–410.

Olivetti, C. and Petrongolo, B. (2016). The evolution of gender gaps in industrialized countries. *Annual review of Economics*, **8**, 405–434.

Sjöholm, F. and Lipsey, R. E. (2006). Foreign firms and indonesian manufacturing wages: An analysis with panel data. *Economic Development and Cultural Change*, **55** (1), 201–221.

Tang, H. and Zhang, Y. (2021). Do multinationals transfer culture? Evidence on female employment in China. *Journal of International Economics*, **133**, 103518.

Vahter, P. and Masso, J. (2019). The contribution of multinationals to wage inequality: Foreign ownership and the gender pay gap. *Review of World Economics*, **155** (1), 105–148.

A Online appendix

Table A1 Variable definitions

Variable	Source	Notes
Individual level variables		
Individual identifier	SSS	All individual identifiers are anonymized by Statistics Sweden using a serial number. The actual social security numbers come originally from the population register.
Wage	SSS	Full-time equivalent monthly earnings (comparable to hourly wage rates) relate to the survey month, usually September. The information is available for all employees in the public sector. In the private sector, the data are available for all workers in firms with at least 500 employees; for the rest, a stratified sample based on the industry affiliation and firm size is used. As a result, roughly 50 percent of private-sector workers are included in the sample in any given year.
Occupation and color	SSS	Detailed worker occupation codes, up to 4 digits. Swedish Standard Classification of Occupations (SSYK96) is based on the International Standard Classification of Occupations (ISCO-88).
Age	LISA	Individual's age, original source: the population register.
Gender	LISA	Individual's gender, original source: the population register.
Education	LISA	We define a worker as having university education (as being skilled) if he or she has at least two years of post-secondary education. To derive the variable, we rely on the information on the highest completed level of education (original source: the education register). The original education variable takes on the following values: (1) Primary and lower secondary education, less than 9 years; (2) Primary and lower secondary education, 9 or 10 years; (3) Upper secondary education; (4) Post-secondary education, less than two years; (5) Post-secondary education, two years or longer; and (6) Postgraduate education.
Experience	LISA	We construct potential labor market experience as a difference between individual's age and (1) the year of obtaining highest level of education, or (2) years of education (based on the education variable). If neither of the variables are available, we subtract 16 to obtain potential labor market experience.
Children	LISA	We define a dummy taking a value of 1 if there is at least one child below 18 years old in the household (original source: population register).

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Table A1 – continued from previous page

Variable	Source	Notes
Firm-level variables		
Firm identifier	FAD	The FAD-identifier is obtained from The Dynamics of Enterprises and Establishments Database (FAD, Statistics Sweden) and is developed to correct for administrative changes in firm legal identifiers over time and. The principle behind the FAD-identifier is that it remains the constant from one year to another if the firm's actual identifier has changed, but a majority of workers stay in the firm between the two consecutive years. More details on FAD-identifiers are available at Statistics Sweden website.
Foreign ownership	KCR	A categorical variable defined as 1 if at least 50 percent of the equity is foreign owned, and 0 otherwise; original source: Swedish Agency for Economic and Regional Growth. According to the definition, a firm is categorized as foreign-owned if more than 50 percent of the equity is foreign-owned.
Firm size	RAMS	Number of employees. Aggregated to the firm level from establishment level data.
Sales	FEK	Sales is the firm's total turnover from goods and services in million EUR, deflated using CPI and turned from SEK into EUR using the Swedish central back annual average exchange rate. Excise duty is excluded, and the measure is also adjusted for merchanting.
Country-level variables		
GII	UN database	An inequality index measuring loss of opportunities due to gender inequality in three aspects of human development: reproductive health, empowerment, and economic status. Higher values indicate more disparities between men and women.
GGI	World Economic Forum reports	An inequality index measuring gender-based gap in access to resources and opportunities in countries across four fundamental dimensions: economic participation and opportunity, educational attainment, health and survival, and political empowerment. Higher values indicate less disparities between men and women. For our analysis, we reverse the index to give it the same interpretation as the GII.

Table A2 Foreign ownership and gender wage gap: No job-spell FE

Dependent variable: $\ln Wage_{ij}$	(1)	(2)	(3)	(4)
Female	-0.1171***	-0.1160***	-0.1606***	-0.1770***
	(0.0048)	(0.0049)	(0.0511)	(0.0561)
Foreign-owned	-0.0016	0.0029	0.0026	
	(0.0051)	(0.0048)	(0.0048)	
Female × Foreign-owned	-0.0016	-0.0032	-0.0026	-0.0026
	(0.0063)	(0.0064)	(0.0065)	(0.0071)
Sales (log), deflated		0.0233***	0.0228***	
		(0.0033)	(0.0033)	
Female × Sales (log), deflated			0.0018	0.0025
			(0.0022)	(0.0024)
Firm size (log)	0.0052***	-0.0162***	-0.0161***	
	(0.0018)	(0.0039)	(0.0039)	
Experience	0.0175***	0.0174***	0.0174***	0.0168***
	(0.0005)	(0.0005)	(0.0005)	(0.0006)
Experience^2/100	-0.0290***	-0.0287***	-0.0287***	-0.0275***
	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Children	0.0335***	0.0334***	0.0334***	0.0317***
	(0.0018)	(0.0018)	(0.0018)	(0.0018)
University education	0.2387***	0.2376***	0.2375***	0.2194***
	(0.0059)	(0.0059)	(0.0059)	(0.0057)
White collar	0.2498***	0.2486***	0.2486***	0.2510***
	(0.0054)	(0.0053)	(0.0053)	(0.0054)
Region FE	✓	✓	✓	
Industry× Year FE	✓	✓	✓	
Firm× Year FE				✓
Observations	6032258	6032258	6032258	6032258
Adjusted R^2	0.519	0.522	0.522	0.566

Note: Estimates are based on the worker-level panel data over 2005-2015. Workers employed in multinational firms (domestic and foreign-owned) are included. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

Table A3 Foreign ownership and gender wage gap: Dynamics

Dependent variable: $\ln Wage_{ij}$	(1)	(2)	(3)	(4)
Female × Foreign-owned t-2			0.0059*	0.0023
			(0.0034)	(0.0027)
Female × Foreign-owned t-1			0.0057*	0.0039
			(0.0032)	(0.0028)
Female × Foreign-owned t=0	0.0086***	0.0038	0.0110***	0.0052*
	(0.0030)	(0.0023)	(0.0036)	(0.0027)
Female × Foreign-owned t+1	0.0073**	0.0039*	0.0097***	0.0053**
	(0.0029)	(0.0023)	(0.0035)	(0.0027)
Female × Foreign-owned t+2	0.0061**	0.0052**	0.0084**	0.0067**
	(0.0030)	(0.0025)	(0.0036)	(0.0029)
Female × Foreign-owned >t+2	0.0078**	0.0073***	0.0100***	0.0087***
	(0.0032)	(0.0026)	(0.0037)	(0.0029)
Female × Sales (log)	-0.0057**	-0.0040**	-0.0056**	-0.0040**
	(0.0027)	(0.0018)	(0.0027)	(0.0018)
Sales (log)	0.0089**		0.0089**	
	(0.0044)		(0.0044)	
Controls	✓	✓	✓	✓
Spell FE	✓	✓	✓	✓
Firm× Year FE		✓		✓
Observations	5304042	5304042	5304042	5304042
Adjusted R^2	0.941	0.945	0.941	0.945

Note: Estimates are based on the worker-level panel data over 2005–2015. Workers employed in multinational firms (domestic and foreign-owned) are included. Worker controls include potential labor market experience, experience squared, education, children, and collar; firm controls are subsumed by firm-year fixed effects. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

Table A4 Gender norms and gender wage gap: Heterogeneity across firm size

Dependent variable: $\ln Wage_{ij}$	(1)	(2)
Female × Std GII × Firm size, Q2	-0.0031	-0.0009
	(0.0023)	(0.0019)
Female × Std GII × Firm size, Q3	-0.0061**	-0.0024
	(0.0025)	(0.0021)
Female × Std GII × Firm size, Q4	-0.0110***	-0.0083***
	(0.0037)	(0.0028)
Female × Std GII	0.0003	-0.0014
	(0.0018)	(0.0014)
Std GII	0.0046*	
	(0.0027)	
Female × Sales (log)	-0.0086***	-0.0050***
	(0.0027)	(0.0017)
Sales (log), deflated	0.0150***	
	(0.0052)	
Controls	✓	✓
Spell FE	✓	✓
Industry× *Year FE*	✓	
Firm× *Year FE*		✓
Observations	2959226	2959226
Adjusted R^2	0.942	0.946

Note: Estimates are based on the worker-level panel data over 2005–2015. Only workers employed in foreign-owned firms are included. Worker controls include potential labor market experience, experience squared, education, children, and collar; firm controls include region fixed effects (subsumed by firm-year fixed effects in column (2)). Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).

Table A5 Foreign Ownership and gender wage gap: Robustness using PPML

Dependent variable: $Wage_{ij}$	All MNEs		Foreign-owned firms	
	(1)	(2)	(3)	(4)
Female × Foreign-owned	0.0063**	0.0041*		
	(0.0026)	(0.0022)		
Foreign-owned	0.0008			
	(0.0031)			
Female × Std GII			-0.0066***	-0.0063***
			(0.0017)	(0.0018)
Standardized values of GII			0.0044**	
			(0.0020)	
Female × Sales (log)	-0.0045**	-0.0034**	-0.0070***	-0.0046**
	(0.0020)	(0.0016)	(0.0025)	(0.0019)
Sales (log)	0.0062*		0.0101**	
	(0.0033)		(0.0047)	
Firm size (log)	0.0090*		0.0192***	
	(0.0050)		(0.0060)	
Experience	0.0087***	0.0085***	0.0083***	0.0082***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Experience^2	-0.0329***	-0.0325***	0.0318***	-0.0315***
	(0.0010)	(0.0009)	(0.0009)	(0.0009)
Children	-0.0003	-0.0007	-0.0007	-0.0008
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
University Education	0.0540***	0.0526***	0.0495***	0.0489***
	(0.0028)	(0.0027)	(0.0038)	(0.0039)
White collar	0.0267***	0.0280***	0.0314***	0.0327***
	(0.0028)	(0.0029)	(0.0027)	(0.0029)
Spell FE	✓	✓	✓	✓
Industry× Year FE	✓		✓	
Region FE	✓		✓	
Firm× Year FE		✓		✓
Observations	5304042	5304042	2959226	2959226

Note: Estimates are based on the worker-level panel data over 2005–2015. Workers employed in multinational firms (domestic and foreign-owned VS only foreign-owned) are included. Standard errors clustered at the firm level are in parentheses. Significance levels: *** ($p < 0.01$), ** ($p < 0.05$), and * ($p < 0.1$).