Gender Pay Gaps in Domestic and Foreign-Owned Firms

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1 Introduction

A number of studies have shown that, contrary to most theoretical predictions, the gender wage gap tends to be larger in foreign-owned companies than in domestically owned firms. This larger gender wage gap is found both when the raw differences in the average wages of men and women

This paper benefited from the financial support of the National Science Center, Poland (grant number 2013/10/E/HS4/00445). We use the data provided by Statistics Poland. Statistics Poland has no responsibility for the results and conclusions, which are those of the authors.

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P. Goulart et al. (eds.), *Global Labour in Distress, Volume I*, Palgrave Readers in Economics,
https://doi.org/10.1007/978-3-030-89258-6_8

are measured, and when the pay gap is adjusted by taking into account differences in observable individual, job, and firm characteristics. So far, however, neither theoretical nor empirical research has provided a convincing explanation for why women are more disadvantaged in terms of pay if the company they work for is owned by foreign investors.

Our study has two main goals. First, using different methodological approaches to calculating gender pay gaps, we aim to determine whether these gaps are indeed larger in foreign-owned firms than in domestically owned firms, and whether this pattern holds both for low- and high-wage earners. Second, we seek to shed light on the factors that could explain the differences in the size of the gender pay gap depending on firm ownership. In particular, we are interested in learning whether firm-level wage policies differ between domestically owned and foreign-owned firms.

Our study focuses on Poland, which, like other Central and East European countries, benefited from large foreign direct investment (FDI) inflows after the economic transition in the early 1990s. As a consequence, foreign-owned firms are well established in the Polish market: 16% of entities employing 10 or more employees in Poland in 2014 were at least partially owned by foreign investors (CSO, 2015).[1] These entities employed 14% of all paid employees in Poland and offered them wages that were, on average, 60–70% higher than those offered by domestically owned firms. These features make examining the gender pay gap in foreign-owned firms particularly interesting.

Four main findings emerge from our study. First, gender wage gaps are significantly larger in the foreign sector than in the domestic sector. The raw gender wage gap is more than 2.7 larger in foreign-owned than in domestically owned companies. Adjusting for firm and worker characteristics and for firm fixed effects decreases this difference considerably, although the adjusted gender wage gap is still 45–80% larger in the foreign-owned than in the domestically owned sector. Moreover, the gender wage gaps are larger in foreign-owned firms than in domestically owned companies at every quantile of the wage distribution, although the differences are the greatest at the two ends of the wage distributions and are the smallest in the middle. Second, while in the foreign-owned sector the returns to individual, job, and firm characteristics earned by women

[1] The largest shares of foreign capital were invested in the manufacturing sector, the wholesale and retail trade, motor vehicle and motorcycle repair, and information and communication.

are much lower than the returns earned by men, foreign-owned firms appear to pay higher firm-specific wage premia to women than to men, thereby narrowing within-firm gender wage inequality. These patterns differ from those observed in the domestic sector, where firm wage premia widen within-firm wage distributions and contribute to overall wage inequality. However, despite this divergence in firm and price effects in the two ownership sectors, the median and the average levels of within-firm wage inequality are still higher in foreign-owned than in domestically owned firms. These findings hold for both for low- and high-paid workers in the two ownership sectors. Third, the estimates of gender wage inequality can be susceptible to the reference group chosen. In particular, we argue that the greater heterogeneity in worker and firm characteristics in the domestic sector drives the difference in the estimates of the gender wage gap based on male versus female characteristics. Fourth, we find that the two ownership sectors display similar patterns of gender pay differences among firms with large within-firm wage gaps, but different patterns of gender pay differences at the lower tail of the within-firm wage gap distribution. Specifically, we show that there is a larger share of domestically owned firms in which men earn less than "similar" women.

This chapter is organised as follows. In Sect. 2, we review the relevant literature. In Sect. 3, we present the data we use. The methodological approach and the results are discussed in Sect. 4. Section 5 concludes.

2 Firm Ownership and Gender Wage Differentials

Economic theory suggests that gender pay gaps should be smaller among foreign-owned companies than among domestically owned firms. This prediction is based on the observation that, compared to their domestic counterparts, foreign-owned firms are more likely to operate under highly competitive market conditions. As such, in line with the predictions of the personal taste hypothesis, discrimination is expected to be (more) costly for foreign-owned firms (Becker, 1957; Arrow, 1973). These theoretical arguments are further reinforced by the assumption that the weaker product market competition that is enjoyed by domestic companies, and by publicly owned firms in particular, could create opportunities for higher rents, which may be shared with employees. To the extent that these domestic firms prefer to employ men and to reward them more than women (gender differences in rent-sharing have been confirmed by Nekby, 2003), gender wage gaps should be larger in domestic firms than in

foreign-owned companies. Apart from these competition theory considerations, the expectation that gender pay gaps would be smaller in foreign-owned firms is supported by trade theory, which posits that the ability of foreign-owned firms to engage in gender-based pay discrimination is reduced (Black & Brainerd, 2004). Again, this expectation is based on the observation that foreign-owned firms tend to import and export products, whereas domestic companies tend to be oriented towards the domestic market, where competition is weaker.

The empirical evidence regarding these assumptions is inconclusive: the theoretical link between the (higher) degree of market competition and the (smaller) size of the gender labour market gap has been confirmed by Black and Strahan (2001); Meng (2004); Zweimueller et al. (2008); and Lovasz (2008). By contrast, Li and Dong (2011) found that firms that have larger gender wage premia are more likely to operate in industries subject to fierce competition.

There could be other reasons why the gender pay gap might be smaller in foreign-owned firms. First, these companies may have firm-level policies regarding childbearing and childcare that result in smaller gender wage differentials. Family-friendly practices in the workplace can help to close the gender pay gap (Felfe, 2012). Foreign-owned firms may be more likely than domestically owned companies to support both equal pay and equal promotion legislation and family-friendly workplace solutions (Kodama et al., 2018). If highly educated women are selected into foreign-owned companies because these firms have a flexible approach to work-life balance,[2] the pay gaps in these companies should be smaller. We assume that these transmission mechanisms are particularly important for Poland, as approximately 90% of all foreign capital that has been invested in Poland came from EU countries (with the biggest shares coming from the Netherlands (18%), Germany (16%), and France (15%) (Statistics Poland, 2017)). We would expect to find that these firms "import" their pay

[2] To the best of our knowledge, there are no studies that have investigated how work-life balance policies differ between domestically and foreign-owned firms in Poland or other Central Eastern European countries. However, when we refer to data from the 2018 Labour Force Survey ad hoc module on reconciliation between work and family life for Poland, we find that one of the dimensions of work-life balance—namely, working time flexibility—is more than twice as common among private-sector workers as among public-sector workers. While there is no domestic/foreign dimension, we can see that the types of employees over-represented in foreign-owned firms (younger, better educated, working in information or communication) enjoy more working time flexibility.

policies from their home countries, which tend to have much smaller adjusted gender pay gaps than Poland (Christofides et al., 2013).

However, some authors have argued that gender pay gaps are likely to be larger in foreign-owned companies because these firms often require employees to work long hours. Such demands tend to benefit men, who are more likely than women to be willing to work long hours and to adjust to a flexible schedule (Goldin, 2014; Vahter & Masso, 2019). Similarly, Bøler et al. (2018) have suggested that exporting firms may require their workforce to have a greater degree of employer-centred working time flexibility, as employees may need to work with customers in different time zones. Since exporting firms are more likely to be foreign owned than domestically owned, such demands on workers might also contribute to the observed differences in the gender pay gaps of domestically owned and foreign-owned workplaces.

The empirical literature that refers explicitly to differences in the gender pay gaps in domestically owned and foreign-owned firms is limited. It is widely acknowledged that foreign firms usually offer wage premia (attributed to the technology, capital, and competition externalities of multinational companies) that have a direct impact on the foreign-domestic pay gap (Hijzen et al., 2013). However, it is less obvious whether (and, if so, why) these foreign-ownership wage premia are higher or lower for men than for women; and, thus, whether the gender pay gap is increased or decreased by FDI inflows and ownership structure. Most of the previous research that addressed these questions investigated conditions in China from a microeconomic perspective. These studies found that wage premia are indeed higher for men than for women in the foreign ownership sector, and that the gender pay gaps are therefore larger in foreign-owned firms than in domestically owned companies (Liu et al., 2000; Maurer-Fazio & Hughes, 2002; Rickne, 2012). Braunstein and Brenner (2007) found that while FDI inflows benefited the wages of women more than those of men in the mid-1990s, this pattern reversed in the early 2000s. It is worth emphasising that the mechanisms that operate in a developing country might not be present in a more advanced context, where FDI inflows may not translate into more women entering the labour market or attaining higher levels of education (Seguino & Grown, 2006; Oostendorp, 2009). To the best of our knowledge, there is little evidence regarding this relationship for European countries. The main exceptions are Zulfiu-Alili (2014), who found that gender wage gaps are larger in foreign-owned firms than in domestically owned companies in Macedonia,

and Vahter and Masso (2019), who observed a similar pattern in Estonia. Earle et al. (2018) found that the foreign acquisition of Hungarian firms had a similar impact on the wages of men and women. Thus, it appears that foreign ownership is not necessarily associated with a smaller or a bigger gender pay gap (at least in firms that are taken over).

We add to the studies on the association between gender pay gaps and firm ownership by linking our research to the literature on within-firm wage inequality and its gender dimension. The existing studies differ in terms of both their methodological approaches and the results they provide, although most find that women earn only a portion of the firm wage premia earned by men. Meng (2004) and Meng and Meurs (2004) decomposed the gender wage differentials into standard endowment and coefficients effects and additional firm wage premia to show that firm wage policies reduced unexplained gender wage gaps to a much greater extent in Australia than in France. Heinze and Wolf (2010) were able to partly capture the non-random selection of women into firms by calculating the gaps separately for each firm in their study. However, they found only a small difference between the mean cross-section gender wage gap within firms and the mean overall gender wage gap. By contrast, Magda and Cukrowska-Torzewska (2019) found that in Poland, both the raw and the adjusted gender gaps were much smaller when men and women were compared within firms rather than across firms.[3] In their recent influential paper, Card et al. (2016) estimated employer and employee wage fixed effects (firm wage premia) and found that both sorting across firms (i.e. women's higher probability of working at firms that pay low wages) and differences in within-firm bargaining (i.e. women receiving less of the wage premium than men) contributed to the gender wage gap. In a similar vein, Javdani (2015) separated the effects of female segregation into low-paying firms and female segregation into low-paying jobs within firms and concluded that the former effects were a major driver of gender wage inequality. Other studies of within-firm gender wage gaps include Song et al. (2019), Bayard et al. (2003), Reilly and Wirjanto (1999). We contribute to this literature with empirical findings showing the need to account for firm-level

[3] Other studies on gender pay gaps in Poland neither focused on the firm-level wage premia, nor distinguished between foreign and domestic firms, which are our major contributions. The recent studies on this topic looked at the measurement of the adjusted pay gap (Matysiak et al., 2010; Goraus et al., 2017), its changes over time (Tyrowicz & Smyk, 2019), and the role of occupational segregation (Strawiński et al., 2018).

characteristics, as these characteristics affect the differences in the estimates of economy-wide and within-firm gender wage gaps. We also show that firms' heterogeneity—in particular along the domestic/foreign ownership divide—leads to the sensitivity of the results to the choice of reference group in the decompositions of gender wage gaps.

3 Data and Descriptive Statistics

We use data from the Structure of Wages and Salaries by Occupations (SWSO) survey conducted by Statistics Poland in 2014.[4] The SWSO is a large, linked employer-employee dataset that covers organisations employing ten or more employees and that provides information on both the yearly and the monthly (during the reference month of October) earnings of individuals. The dataset also contains information on the number of normal and overtime hours employees have worked, and on a range of individual characteristics (e.g. gender, age, education, occupation, experience, tenure) and firm characteristics (e.g. NACE, type of ownership [public/private and domestic/foreign ownership], coverage by collective pay agreement, and firm size). Because we are interested in comparing the gender wage gaps in domestically owned and foreign-owned firms in the private sector, we restrict our sample to companies with one ownership type only (i.e. we exclude firms with mixed ownership).[5] For the same reason, we exclude public sector firms entirely. The final sample includes 343,143 individual observations: 222,203 in the domestic sector and 120,940 in the foreign sector. We use sample weights that reflect the survey's two-stage sampling procedure (at the firm level and at the worker level). We calculate gender wage gaps using data on hourly wages, which we compute as the yearly salary divided by the number of hours worked yearly. We include in the salary any compensation from overtime, awards, additional fees, and statutory bonuses.

Foreign-owned firms account for 14.3% of all of the firms in our data, and employ 30% of all of the workers in the sample. Clearly, there are differences in the structure of the workforce depending on ownership type (Table 1). Women constitute a minority of the workforce in both the

[4] The survey is conducted every two years. The analyses for the years 2008, 2010, and 2012 yielded similar results, and are available from the authors upon request.

[5] We also exclude observations with wages that we consider mistakenly low (far below the minimum wage) and those that claim that the unit size is less than ten workers (they should not be captured by the survey by design).

Table 1 Descriptive statistics of selected variables, 2014

	Domestic	*Foreign*
Female	0.40	0.43
	(0.49)	(0.49)
Age	40.3	36.7
	(11.3)	(9.94)
Primary education	0.07	0.07
	(0.25)	(0.26)
Basic vocational education	0.30	0.18
	(0.46)	(0.39)
Secondary education	0.38	0.36
	(0.49)	(0.48)
Tertiary education	0.24	0.39
	(0.43)	(0.49)
Job experience	15.7	12.6
	(11.6)	(10.1)
Tenure	7.9	7.1
	(8.4)	(7.4)
Firm size (average number of workers)	334	1136
	(651)	(2979)
Fixed-term contracts	0.39	0.28
	(0.49)	(0.45)
Collective agreements (both firm-level and industry-level)	0.38	0.34
	(0.48)	(0.47)
Men, average hourly wage (PLN)	19.77	34.80
	(18.9)	(36.1)
Women, average hourly wage (PLN)	17.39	25.59
	(12.6)	(24.4)
Raw gender wage gap (difference in wages of men and women as % of men's wages)	12.0%	26.5%
Number of firms	6226	1269
Number of individual observations	222,203	120,940

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data

Notes: Standard deviations in parentheses. Sample weights used

foreign-owned and the domestically owned companies, though their share is slightly larger in the foreign-owned companies. Employees of the foreign firms are, on average, three years younger and better educated than those of the domestic firms. Compared to their counterparts who work for domestic firms, employees who work for foreign establishments are less likely to be employed on fixed-term contracts, and they are more likely to work for a large organisation.

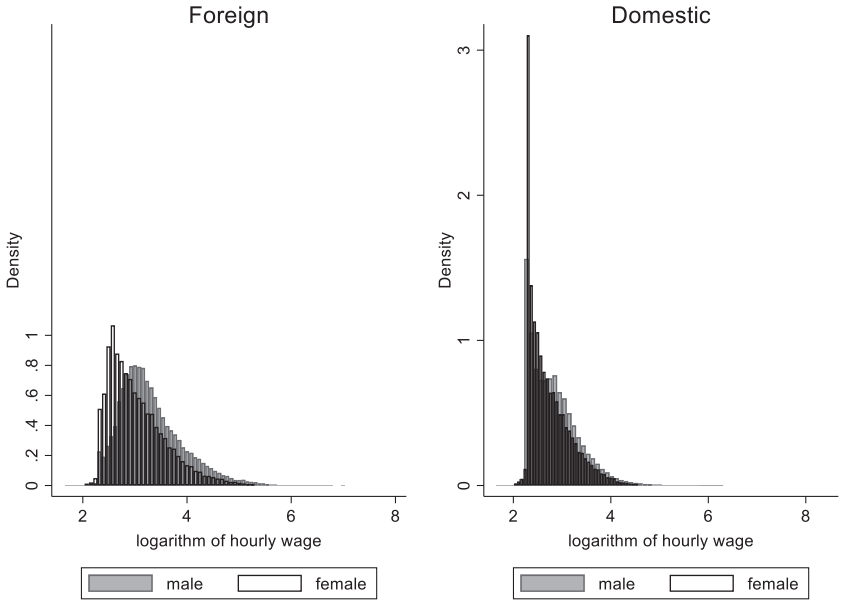

Fig. 1 Men's and women's distribution of log wages in foreign- and domestically owned firms. (Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data)

In terms of wages, men who work for foreign-owned companies earn on average 76% more than men who work for domestically owned firms. Among women, the corresponding difference is 47%. Furthermore, in both sectors, the distribution of female wages is shifted to the left of the male distribution, but this shift is greater in the foreign sector (Fig. 1). Thus, gender wage inequality appears to be considerably higher in foreign-owned than in domestically owned companies.

4 Gender Wage Gap and Firm Ownership

We start the analysis of gender wage gaps in domestically and foreign-owned firms by comparing raw gaps and gaps adjusted for individual and workplace characteristics using classical Mincerian regressions (Section "Adjusted Gender Wage Gaps and Firm Ownership"). Next, we attempt to shed more light on the potential sources of variation in

the size of the gender wage gaps in the two ownership sectors (Section "Decomposition of the Gender Wage Gap"), and focus more on the role firms play (Section "Firm-Specific Effects and Gender Wage Gaps"). Finally, we analyse the gender pay gaps among low- and high-paid workers using quantile regressions (Section "Unconditional Quantile Regression").

Adjusted Gender Wage Gaps and Firm Ownership

In the first step, we calculate the raw gender wage gaps; that is, the difference in the average hourly wages of men and women, expressed as the percentage of men's wages. We do so separately for the two types of firm ownership: domestic and foreign. The raw gender wage gap in Poland is considerably larger among individuals who are working in foreign-owned than in domestically owned firms (Fig. 1, Table 1). Although women have lower wages than men in both sectors, the raw gender wage gap is more than twice as large in the foreign-owned firms as it is in the domestically owned firms (26.5% and 12.0%, respectively, Table 1).

Obviously, the raw gender wage gap is not the most suitable measure of gender wage inequality. While the size of the gender pay gap varies substantially between the two ownership sectors, this pattern may be explained in part by differences in the composition of male and female workers in domestically and foreign-owned firms. To eliminate this effect, we calculate the gender wage gap adjusted for the characteristics of workers, jobs, and firms. We use a traditional Mincer wage regression with the logarithm of the hourly wage as a dependent variable. We include in the models an interaction term between gender (female) and type of ownership (foreign), and we estimate them using weighted least squares (WLS).[6] As a robustness check, results of regressions estimated separately for domestic and foreign firms are presented in the Appendix, Tables 5, 7, and 8

Our models contain a set of standard control variables, which we group into four categories: individual-level characteristics (age, education, experience), job-level characteristics (occupation, type of job contract, tenure, and part-time/full-time position), firm-level characteristics (firm size, NACE sector, collective bargaining coverage), and co-worker characteristics (share of women within a given firm, share of workers aged 55 or older, share of workers aged 34 or younger, share of workers with tertiary

[6] Using sample weights, as described in Sect. 3.

education). Model 1 contains individual-level, job-level, and firm-level characteristics. Model 2 adds to these variables co-worker characteristics. Model 3 uses firm fixed effects instead of firm-level and co-worker characteristics. Finally, we run model 3 on the common support, as explained below (results reported as model 4). In models 1 and 2, we cluster standard errors at the firm level.

In order to address the possibly limited overlap in the observable characteristics of male and female employees, we calculate the common support. In doing so, we follow Lechner and Strittmatter (2019): we estimate the propensity score—the conditional probability of being a female given the value of covariates—and then drop observations for both genders when the value of the propensity score is higher than the 99th percentile of the propensity score distribution in the male subpopulation. In our case, this procedure resulted in 2.8% of the sample being dropped.

We must admit, that—in line with many analyses of this type—we do not observe many factors that could be correlated with both gender and wages, such as personality traits, the propensity to negotiate wages, gender role attitudes, or absenteeism. We implicitly assume in our analysis that gender is independent of these unobservables conditional on observables, which is disputable. Moreover, following a common assumption in the gender wage gap literature, we treat job experience and occupation as exogenous, which may lead to inconsistent parameter estimates (Kunze, 2008). This is a limitation of our study, and we acknowledge it.

Table 2 presents a summary of the results, and detailed estimates are presented in Appendix, Table 6. First, as a benchmark, we calculate the raw difference in the logarithms of hourly wages, and find that it amounts to 0.100 in the domestic sector and 0.273 in the foreign sector. Model 1, which includes individual-level, job-level, and firm-level characteristics as covariates, yields an adjusted gender wage gap equal to 0.164 in the domestic sector and to 0.249 in the foreign sector. Model 2 also includes a set of co-worker characteristics in the covariates list. It turns out that these particular variables play an important role in explaining gender wage gaps, as in model 2, these gaps decrease to 0.107 in domestically owned firms and to 0.194 in foreign-owned firms. Thus, it appears that taking co-worker characteristics into account solves the omitted variables problem to a certain extent and captures a portion of firms' unobserved heterogeneity. Indeed, the estimated adjusted gender wage gaps are found to be similar once we run a model with firm fixed effects (model 3): 0.116 in the domestic sector and 0.172 in the foreign sector. Finally, in model 3

Table 2 WLS-adjusted gender wage gaps in domestically and foreign-owned firms

Ownership	*Raw difference in logarithms*	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Domestic	0.100	0.164	0.107	0.116	0.117
Foreign	0.273	0.249	0.194	0.172	0.170
Model specification					
Individual characteristics	–	Yes	Yes	Yes	Yes
Job characteristics	–	Yes	Yes	Yes	Yes
Firm characteristics	–	Yes	Yes	No	No
Co-worker characteristics	–	No	Yes	No	No
Firm fixed effects	–	No	No	Yes	Yes
Common support	No	No	No	No	Yes

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data

Notes: The full set of estimates is available in Appendix, Table 6. The models are estimated on a pooled dataset with both domestically and foreign-owned firms, and use the female#foreign interaction term. The regression results estimated separately for domestic and foreign firms as a robustness check are presented in Appendix, Tables 7 and 8

re-estimated on the common support sample (model 4), the results are very similar. It must be noted, however, that in practice, the wage gap estimates from models 1–4 cannot be interpreted as either wage gains for men or wage losses for women. If there are more or less equal numbers of advantaged and disadvantaged individuals in the sample—as in our case—the estimates are closest to the average wage gap (Słoczyński, 2019). We will attempt to shed more light on these estimates in Section "Decomposition of the Gender Wage Gap".

Thus, we find that the adjusted gender wage gaps are indeed larger in the foreign-owned companies, but that the difference between the two ownership sectors is much smaller than the raw gaps would suggest. Moreover, distinct patterns emerge in the two ownership sectors. First, once we adjust for worker and firm characteristics, the gender pay gap increases in the domestic sector (compared to the raw gender pay gap), but decreases in the foreign sector. Second, firm-level unobserved heterogeneity (which is captured by co-worker characteristics to a similar extent as by firm fixed effects) plays an important role in shaping gender wage inequality. However, it appears that firm-level policies have different outcomes in domestically and foreign-owned firms. To gain a better understanding of the nature of the gaps in the two sectors and the role firms

play, we decompose gender wage gaps in Section "Decomposition of the Gender Wage Gap" and analyse within-firm gender wage gaps in Section "Firm-Specific Effects and Gender Wage Gaps".

Decomposition of the Gender Wage Gap

We draw on the standard generalised linear decomposition of the difference in wages between men and women (Oaxaca & Ransom, 1994). The difference (the wage gap) is decomposed into the composition effect ("the explained part") that arises due to differences in the characteristics of men and women and the coefficient effect ("the unexplained part," or, in this setting, the adjusted gender wage gap) that arises due to different rewards from the characteristics. It takes the form of:

$$\mathrm{E}(y|f=0)-\mathrm{E}(y|f=1)=\left[\mathrm{E}(X|f=0)-\mathrm{E}(X|f=1)\right]\beta^{*}+\mathrm{E}(X|f=0)\left(\beta_{m}-\beta^{*}\right)+\mathrm{E}(X|f=1)\left(\beta^{*}-\beta_{f}\right),$$

$$\mathrm{E}(y|f=0)-\mathrm{E}(y|f=1)=\left[\mathrm{E}(X|f=0)-\mathrm{E}(X|f=1)\right]\beta^{*}+\mathrm{E}(X|f=0)\left(\beta_{m}-\beta^{*}\right)+\mathrm{E}(X|f=1)\left(\beta^{*}-\beta_{f}\right), \quad (1)$$

where by y we denote wage (in logarithm); X is the vector of all individual and workplace characteristics; f is an indicator for female workers; β_m and β_f are the vectors of regression coefficients for men and women, respectively; and β^* is defined as a weighted average of the coefficient vectors:

$$\beta^{*}=\Omega\beta_{m}+\left(I-\Omega\right)\beta_{f}. \quad (2)$$

In the latter equation, Ω is a weighting matrix and I is an identity matrix. The original decomposition equations proposed in seminal papers by Blinder (1973) and Oaxaca (1973) represent special cases of the generalised equation in which Ω is either a null matrix or an identity matrix, respectively.

However, the choice of Ω is not innocuous. Słoczyński (2019) and Goraus et al. (2017) summarised the possible options. We stick to the two the most popular ones: namely, $\Omega = 1$, where male coefficients are taken as a reference (and we thus estimate the average wage loss for women); and $\Omega = 0$, where female coefficients are taken as a reference (estimating the

Table 3 Gender wage gaps in domestically and foreign-owned firms, adjusted for firm and worker characteristics: Oaxaca-Blinder decomposition results

	Total predicted gap	*Ω = 0*		*Ω = 1*	
		Unexplained (average wage gain for men)	*Explained*	*Unexplained (average wage loss for women)*	*Explained*
Domestic	0.100	0.129	-0.029	0.088	0.012
		(0.003)	(0.003)	(0.003)	(0.003)
Foreign	0.273	0.183	0.090	0.169	0.104
		(0.003)	(0.005)	(0.003)	(0.004)

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data

Notes: The covariates for the decomposition are the same as those included in model 2. Bootstrap standard errors in parentheses

average wage gain for men). Other possible choices of Ω include weighting each coefficient by the proportion of the same gender (Cotton, 1988); Ω = 0.5, or the simple average of both (Reimers, 1983); weighting each coefficient by the proportion of the opposite gender (Słoczyński, 2019); and taking the coefficients from a pooled regression, with a gender dummy (Fortin, 2008) or without it (Neumark, 1988).

The decomposition is based on model 2.[7] The results confirm that while the adjusted (unexplained) gender pay gap is greater in the foreign-owned firms than it is in the domestically owned firms, this ownership gap is much smaller than the raw gender wage gaps would suggest (Table 3). At the same time, the decomposition reveals another difference between the two ownership types: namely in the foreign-owned firms, the average wage gain for men is similar to the average wage loss for women (0.183 and 0.169 account for 67% and 62% of the total gap, respectively); whereas in the domestically owned firms, the average wage gain for men exceeds 129%, and the explained part of the gap is negative. This means that while female workers have "better" characteristics than males in the domestic sector, and this advantage should narrow the gap, the returns to these characteristics paid to men are so much higher than the returns paid to women that they more than counterbalance the better endowments of women. The picture changes once we focus on the counterfactual wages of women, which would be observed if they were paid according to the

[7] We additionally run the decomposition on common support only. The results are robust, and are available from the authors upon request.

wage structure of men (average wage loss for women). The unexplained gender pay gap is smaller.

Altogether, the results confirm that the unexplained ("adjusted") gender pay gap is larger in the foreign sector than in the domestic sector. However, the difference is much smaller than the raw gender pay gaps would suggest, as the different characteristics of men and women employed in foreign-owned companies explain part of the gap. From a methodological perspective, our findings show that even if the proportions of the advantaged and disadvantaged groups (men and women) are similar in the domestic and the foreign sector, the choice of the reference group matters more in domestically owned firms.[8]

Firm-Specific Effects and Gender Wage Gaps

In the next step, we want to shed more light on the effects of firms on gender wage inequality. To this end, we use two strategies of looking at within-firm gender pay gaps. First, taking advantage of our linked employer-employee data, we calculate the gender pay gaps separately for each firm using WLS regressions with a set of covariates that include personal and job characteristics, as in model 1. To do so, we had to exclude the smallest firms in order to have a reasonable number of observations for the calculation. We therefore excluded firms with fewer than 100 workers and fewer than 10 observations of men or women, which resulted in the number of observations per firm ranging from 40 to 868, with the median at 100. The distribution of the estimated coefficients associated with the male dummy (which are interpreted as gender pay gaps) in each firm is plotted in Fig. 2, separately for each sector of ownership.

On average, within-firm gender wage gaps are slightly larger in foreign-owned firms. The difference between the average size of the within-firm gender wage gap in the two ownership sectors is small, but statistically significant (0.12 versus 0.10 in foreign- and domestically owned firms, respectively). The analysis also reveals that the within-firm gender wage

[8] The results are similar when we run the model on common support; thus, even when the overlapping support assumption is ensured. Still, the combination of observed workers and workplace characteristics is much different for men and women in domestically owned firms than it is for their counterparts in foreign-owned firms. We calculated a simple Duncan dissimilarity index (Duncan & Duncan, 1955). It provided evidence of a significantly higher degree of worker dissimilarity by gender in the domestic sector than in the foreign sector. This observation holds regardless of the combination of individual, job, and firm characteristics we take into account.

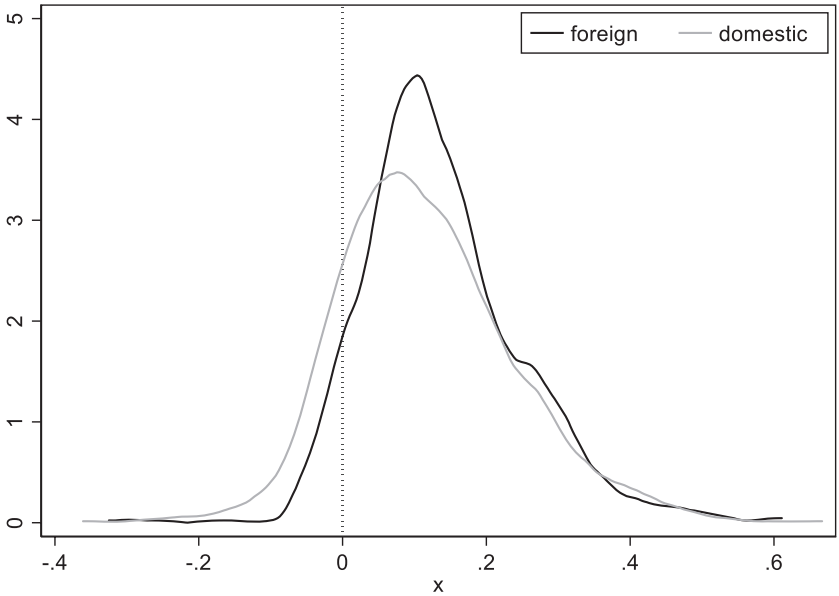

Fig. 2 Kernel density of within-firm gender wage gap estimates. (Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data. Note: Firms employing at least 100 workers and with at least 10 observations of each gender in the sample. A positive gap means that men earn more than "similar" women)

gaps are more dispersed among the domestically owned than the foreign-owned companies. The standard deviation of the gender wage gap is larger in the domestic sector (0.12) than in the foreign sector (0.11), and the difference is again statistically significant. Interestingly, 16% of domestically owned firms have negative gender pay gaps, meaning that in these firms, men earn less than "similar" women. This is the case for 7% of the foreign-owned companies.[9] Thus, we find that among medium- and

[9] The firms that advantage women in terms of pay do not seem to be particularly different from the other firms, both domestically and foreign-owned, in terms of observable characteristics such as industry, mean age of workers, workers' mean level of education, or workers' experience. There are two exceptions: both domestically and foreign-owned firms that pay particularly high wage premia to women tend to be smaller and to have lower average wages.

large-sized firms, the gender pay gaps are, on average, quite similar in domestically and foreign-owned firms, although the domestically owned sector is more heterogeneous.

In the second step, we draw on Meng and Meurs (2004) and extend the Oaxaca-Blinder decomposition to isolate firm effect from the unexplained part, so that *total predicted gap = endowment effect (explained) + price effect (unexplained) + firm effect:*

$$\begin{aligned}\mathrm{E}(y|f=0)-\mathrm{E}(y|f=1) &= \left[\mathrm{E}(X_c|f=0)-\mathrm{E}(X_c|f=1)\right]\beta^* \\ &+\left[\mathrm{E}(X_{firm}|f=0)-\mathrm{E}(X_{firm}|f=1)\right]\beta^* \\ &+\mathrm{E}(X_c|f=0)(\beta_m-\beta^*)+\mathrm{E}(X_c|f=1)(\beta^*-\beta_f) \\ &+\mathrm{E}(X_{firm}|f=0)(\beta_m-\beta^*)+\mathrm{E}(X_{firm}|f=1)(\beta^*-\beta_f) \quad (3)\end{aligned}$$

where all symbols denote the same as in Eq. (1), with the exception of the vector of characteristics X, which is now split into firm dummies (X_{firm}) and other controls (X_c); that is, individual, job, co-worker, and firm characteristics (except for the firm indicator). The firm effect, which is the main component of our study, is given by $\mathrm{E}(X_{firm}|f=0)(\beta_m-\beta^*)+\mathrm{E}(X_{firm}|f=1)(\beta^*-\beta_f)$ part of Eq. (3). Please note that the explained firm component $[\mathrm{E}(X_{firm}|f=0)-\mathrm{E}(X_{firm}|f=1)]\beta^*$ (stemming from the fact that women and men work in different firms) contributes to the endowment effect.

We use a fixed effects model (model 3) to estimate the firm-specific wage premia, for men and women separately. Table 4 summarises the results again separately for wage gains for men ($\Omega = 0$) and wage losses for women ($\Omega = 1$). Compared to the Oaxaca-Blinder decomposition from the previous section (in which we did not include firm fixed effects), the unexplained component is now accounted for by the price effect (reflecting different returns to individual characteristics among men and women) and the firm effect, which captures differences in the wage premia paid by particular firms to men and women in these firms. We find that in the foreign-owned sector, the returns to individual, job, and firm characteristics that women earn are much lower than the returns earned by men. This is reflected in the price effect, which amounts to 189–200% of the total difference in the average wages of men and women in the foreign-owned companies. In contrast, the firm effect is also large in foreign-owned companies (approximately 130%) but is negative—which means that foreign-owned companies tend to have narrower within-firm gender wage gaps.

Table 4 Gender wage gaps in domestically and foreign-owned firms, adjusted for firm and worker characteristics: decomposition into endowment, price, and firm effects

	Domestic		*Foreign*	
	Value	*%*	*Value*	*%*
Ω = 1				
Total difference	0.107		0.274	
	(0.002)		(0.003)	
Price effect	-0.040	-37	0.517	189
	(0.000)		(0.000)	
Endowment effect	0.005	5	0.092	34
	(0.002)		(0.004)	
Firm effect	0.141	132	-0.335	-122
	(0.001)		(0.001)	
Ω = 0				
Total difference	0.107		0.274	
	(0.002)		(0.004)	
Price effect	-0.021	-20	0.547	200
	(0.000)		(0.000)	
Endowment effect	-0.020	-19	0.100	37
	(0.002)		(0.004)	
Firm effect	0.148	139	-0.373	-136
	(0.001)		(0.001)	

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data

Note: Decomposition method based on Meng and Meurs (2004). Bootstrap standard errors in parentheses. We discarded firms with a 0% or a 100% share of female employees in order to be able to calculate firm effects

The opposite is the case for the domestically owned firms, in which the within-firm gender wage gaps are wider. This is reflected in the positive firm effect, which amounts to approximately 135% of the average gender wage gap in domestically owned companies.

To sum up, the gender wage gap is much larger among workers in foreign-owned companies than it is among workers in domestically owned firms. In the foreign-owned firms, the within-firm gender wage differentials are narrower, although the firm-specific wage premia they pay to women are not sufficient to compensate for the gender wage inequality observed in the entire sector. Domestically owned firms offer higher firm-specific wage premia to men than to women, which increases within-firm wage inequality and contributes to the overall gender wage gap in the domestic sector. How can we reconcile the findings of positive firm effects and negative price

effects among foreign-owned firms? In other words, why do female workers working in foreign-owned firms earn so much less than their male colleagues if these companies have narrower within-firm gender wage gaps? Apart from the omitted variable bias, the sorting channel is one of the potential explanations: that is, women are likely to be underrepresented at firms that pay higher firm-specific wage premia (Card et al., 2016).[10] The difference in the size of the endowment effect observed in the domestically and foreign-owned firms lends support to this hypothesis.

Unconditional Quantile Regression

Finally, we look at how the gender pay gap changes along the wage distribution, in the domestically and foreign-owned firms separately. To this end, we use unconditional quantile regression (UQR), as proposed by Firpo et al. (2009). Unlike conditional quantile regression (CQR), UQR defines quantiles of the variable of interest (logarithm of wages in our case) *prior to* regression. This means that the inclusion of any covariates in the regression helps to net out their effect on the relationship of interest (i.e. in our case, between wages and gender), but it has no effect on which observations are assigned to given quantiles of the wage distribution (Killewald & Bearak, 2014).

The UQR method consists of transforming the dependent variable into the re-centred influence function (RIF) of the unconditional quantile of the wage distribution, and then regressing it on the list of explanatory variables. Standard OLS regression can be used. The RIF takes the form (Firpo et al., 2009):

$$RIF\left(Y;,q_\tau;,F_Y\right) = q_\tau + \frac{\tau - \mathbf{1}_{\{Y \le q_\tau\}}}{f_Y\left(q_\tau\right)}$$

[10] While the formal test of this pattern is beyond the scope of our paper, we run simple OLS estimates of (1) the link between the male wage premium, the share of women in the firm, and firm ownership; and (2) the probability of being employed at a high-/low-paying firm (defined by above the 75th/below the 25th percentile of the male wage premium distribution), controlling for individual- and firm-level characteristics, and interacting female with the foreign/domestic dummy. We find that Polish female workers are less likely to be employed at high-paying foreign-owned companies, but not at high-paying domestically owned companies. This might suggest that the sorting channel is more relevant in foreign-owned companies. We must note, however, that these results are based on correlation, and not causality. The data we use do not have a longitudinal dimension that would allow us to study job switching, as Card et al. do. The results are available from the authors upon request.

where τ is a given quantile, q_τ is the value of the outcome variable, Y, at the τ th quantile, $f_Y(q_\tau)$ is the density of Y at q_τ, F_Y is the cumulative distribution function of Y and $\mathbf{1}_{\{Y \leq q_\tau\}}$ is a dummy variable indicating whether the value of the outcome variable is below q_τ. We bootstrap the standard errors to diminish the uncertainty involved in the estimation of the RIF (Killewald & Bearak, 2014). We apply the UQR to our model 3.

The gender wage gaps are larger in foreign-owned firms than in domestically owned companies in every quantile of the wage distributions (Fig. 3 plots the results). However, the differences are greatest at the two ends of

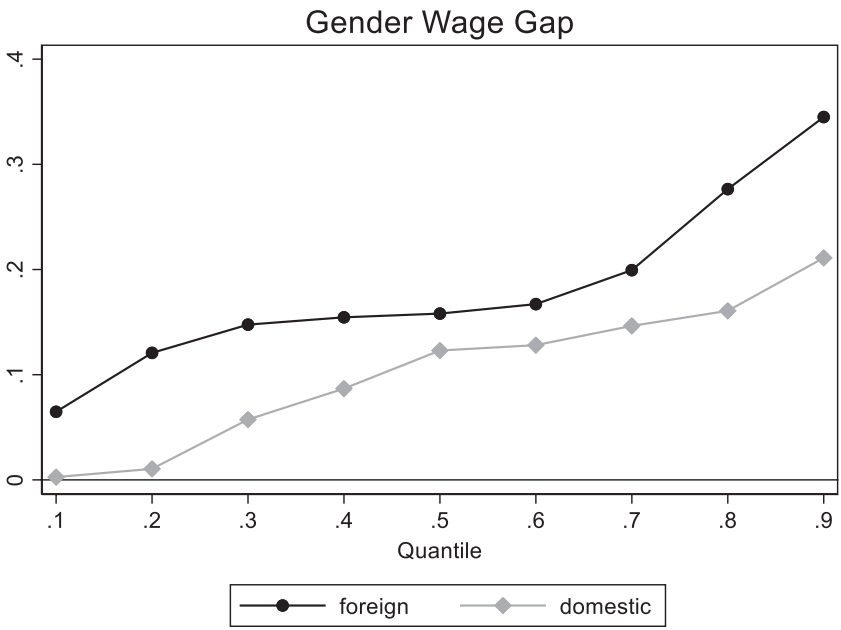

Fig. 3 Gender pay gaps by quantiles, in foreign-owned and domestically owned firms. (Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data. Note: The quantiles are defined prior to regression, and separately for domestically and foreign-owned firms; thus, the absolute wage levels in each quantile are different between the two sectors (and higher in the foreign sector). For clarity, the absolute value of the gender pay gaps is plotted (with the notation we use throughout the paper, they are negative))

the wage distributions and are smallest in the middle. There is virtually no pay gap among low-paid men and women working in the domestic sector, since they are paid the minimum wage. Wages are higher in the foreign-owned companies, and the minimum wage is binding only for a small fraction of workers in these firms.[11] In the first decile of wages in the foreign-owned companies, the adjusted pay gap among men and women does not exceed 7%. The pay gaps increase along the wage distribution and are largest among top-earning workers in both domestically and foreign-owned firms. However, the sizes of these gaps differ significantly between the two ownership sectors: in domestically owned firms, female workers from the top decile earn around 21% less than male workers; whereas in the foreign-owned firms, this gap amounts to 35%. Interestingly, there are much smaller differences in the shares of women among the top earners in the two ownership sectors: women account for 31% of workers in the top decile of the wage distribution in the domestically owned firms, compared to 28% in the foreign-owned firms.

5 Conclusions

We studied gender pay gaps among workers in domestically and foreign-owned firms in Poland, analysing the differences in the sizes of these gaps. We found that, contrary to most theoretical expectations, gender pay gaps are larger in foreign-owned firms than in domestically owned firms. However, our results also showed that the differences between the two ownership sectors are much smaller than the raw data would suggest.

Moreover, we found that the foreign and the domestic sectors display diverging patterns of gender wage inequality. Women working in the foreign-owned sector earn much less than men based on their personal and workplace characteristics, but the firm-level policies in their workplaces appear to partly reduce this pay disadvantage (as the female employees of foreign-owned companies are paid higher firm-specific wage premia than male employees). In contrast, men working in domestically owned firms receive a higher firm-wage premia than women, which contributes to a female pay disadvantage in the domestic sector. All in all, we found that the average within-firm gender wage gaps are larger in foreign-owned firms than in domestically owned companies, but that the differences

[11] To be precise, around 2% of workers in foreign-owned firms earned the minimum wage, compared to around 20% of workers in domestically owned firms.

between the two ownership sectors are smaller than the economy-wide data would suggest.

In addition to having lower levels of gender wage inequality, the domestic sector is more heterogenous with respect to the sizes of the within-firm gender wage gaps. The right tails of the within-firm gap distribution (representing firms in which women have a large pay disadvantage) are similar for the domestically and foreign-owned companies, but the left tails diverge. In particular, our results showed that almost one-sixth of domestically owned companies pay women more than men (adjusting for individual characteristics), which is more than twice the share of the foreign sector.

This heterogeneity of domestically owned firms also affects the methodology for estimating and interpreting gender wage gaps. Whereas in the foreign sector, the estimates based on male and female characteristics as a reference group yielded similar results, these two approaches yielded more divergent results in the domestic sector. Even though the shares of men and women in total employment in the two ownership sectors are similar, the female and male employees of domestically owned firms tend to be more "dissimilar" in terms of their personal and workplace characteristics (compared to the employees of foreign-owned firms). This is, in our view, the reason why the estimates of gender wage gaps in the domestically owned firms were more susceptible to the choice of the reference group.

More research is needed to identify the factors that could be driving the foreign/domestic firm differences in gender pay gap patterns. First, the question of why there is such a large gender wage gap among the employees of foreign-owned firms remains open. The first step to addressing this question would be to investigate to what extent this gender gap is driven by the sorting channel and gender segregation into lower paying jobs and firms. Second, while there is evidence that firm-level policies can narrow gender wage inequality in other countries, little is known about the ownership divide we identified in our paper. Could it be determined by unions? This is unlikely to be the case in our study. The presence of unions is usually associated with lower within-firm wage inequality, but union density and collective bargaining coverage are low in Poland (and in most other CEE countries) and are even lower in foreign-owned companies than they are in domestically owned firms. Thus, it is unlikely that unions are shaping the equal wage policies of companies in Poland. A portion of the greater heterogeneity of within-firm gender pay gaps in domestically

owned firms could be a legacy of the economic transition, as the domestic companies include both newly created firms and older establishments set up under socialism. The employment and wage policies of these new and old firms are likely to vary more than those of foreign-owned companies. Finally, when we look beyond the mean outcomes, we find that the gender pay gaps are larger in foreign-owned firms than in domestically owned companies at all points of the earnings distribution. However, the gaps are clearly largest among high-paid employees in both ownership sectors.

Our study has its limitations. First, we studied wages earned by men and women, but we were unable to account for non-wage benefits and perks offered by employers. These are likely to differ by sex, and by firm ownership. Second, as our study was limited to paid employees, we were unable to capture the labour incomes of workers with a different employment status (self-employed, those working under special management contracts, etc.). The share of these workers is likely to be highest among the top earners. Third, the use of longitudinal data would allow researchers to better understand the role of firm-level wage premia paid to men and women in domestic and foreign-owned firms.

Appendix

Table 5 Raw and OLS adjusted gender wage gaps in domestically and foreign-owned firms, estimated separately: summary

Ownership	*Raw gender wage gap*	*Models 1a & 1b*	*Models 2a & 2b*	*Models 3a & 3b*	*Models 4a & 4b*
(a) Domestic	10.0	15.4	10.9	10.6	10.5
(b) Foreign	27.3	23.9	17.9	17.9	17.9
Model specification					
Individual characteristics	–	Yes	Yes	Yes	Yes
Job characteristics	–	Yes	Yes	Yes	Yes
Firm characteristics	–	Yes	Yes	No	No
Co-workers characteristics	–	No	Yes	No	No
Firm fixed effects	–	No	No	Yes	Yes
Common support	No	No	No	No	Yes

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data

Notes: The full set of estimates is available in Table 7 (models 1a, 2a, 3a, 4a) and Table 8 (models 1b, 2b, 3b, 4b)

Table 6 Regression results: gender wage gap in domestic and foreign-owned firms

	Logarithm of wage (OLS, Model 1)	*Logarithm of wage (OLS, Model 2)*	*Logarithm of wage (OLS, Model 3)*	*Logarithm of wage (OLS, Model 4)*
Female	-0.164***	-0.107***	-0.116***	-0.117***
	(0.005)	(0.005)	(0.002)	(0.002)
Foreign	0.293***	0.232***	0.668***	0.666***
	(0.013)	(0.011)	(0.052)	-0.053***
Female x foreign	-0.085***	-0.087***	-0.056***	(0.003)
	(0.015)	(0.012)	(0.003)	0.027***
Age	0.030***	0.027***	0.027***	(0.000)
	(0.001)	(0.001)	(0.000)	-0.000***
Age squared	-0.000***	-0.000***	-0.000***	(0.000)
	(0.000)	(0.000)	(0.000)	0.010***
Education: basic vocational (base: primary)	0.015**	-0.000	0.011***	(0.002)
	(0.006)	(0.010)	(0.002)	0.045***
Education: secondary (base: primary)	0.083***	0.048***	0.045***	-0.053***
	(0.007)	(0.011)	(0.002)	(0.002)
Education: tertiary (base: primary)	0.334***	0.193***	0.199***	0.196***
	(0.011)	(0.010)	(0.003)	(0.003)
Experience	0.003***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Part-time dummy	0.010	0.004	0.003	0.002
	(0.007)	(0.007)	(0.002)	(0.002)
Fixed-term contract dummy	-0.118***	-0.094***	-0.085***	-0.083***
	(0.007)	(0.006)	(0.002)	(0.002)
Tenure	0.658***	0.655***	0.005***	0.005***
	(0.035)	(0.034)	(0.000)	(0.000)
Firm size: more than 250 workers (base: 51–250)	0.374***	0.310***		
	(0.032)	(0.034)		
Firm size: 10–50 workers (base: 51–250)	0.253***	0.212***		
	(0.031)	(0.033)		
Collective bargaining	0.088***	0.065*		
	(0.031)	(0.033)		
Share of women		-0.002***		
		(0.000)		
Share of workers with tertiary education		0.006***		
		(0.000)		
Share of workers under age 35		-0.002***		
		(0.000)		

(*continued*)

Table 6 (continued)

	Logarithm of wage (OLS, Model 1)	*Logarithm of wage (OLS, Model 2)*	*Logarithm of wage (OLS, Model 3)*	*Logarithm of wage (OLS, Model 4)*
Share of workers aged 55 or older		-0.002*** (0.000)		
Other controls:				
occupation dummies	Yes	Yes	Yes	Yes
NACE dummies	Yes	Yes	No	No
Firm fixed effects	No	No	Yes	Yes
Observations	343,143	343,143	343,143	333,661 (common support)
R-squared/ pseudo-R-squared	0.537	0.576	0.757	0.760

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data

Notes: Models with an intercept. Standard errors in parentheses. In models 1 and 2, standard errors clustered at the firm level. In models 3 and 4, cluster-robust variance estimator used. $^{***}p<0.01$, $^{**}p<0.05$, $^{*}p<0.1$

Table 7 Regression results: gender wage gap in domestically owned firms

	Logarithm of wage (OLS, Model 1a)	*Logarithm of wage (OLS, Model 2a)*	*Logarithm of wage (OLS, Model 3a)*	*Logarithm of wage (OLS, Model 4a)*
Female	-0.154*** (0.005)	-0.109*** (0.003)	-0.106*** (0.002)	-0.105*** (0.002)
Age	0.018*** (0.001)	0.017*** (0.001)	0.018*** (0.000)	0.018*** (0.000)
Age squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Education: basic vocational (base: primary)	0.019*** (0.006)	0.015*** (0.006)	0.021*** (0.002)	0.021*** (0.002)
Education: secondary (base: primary)	0.084*** (0.006)	0.065*** (0.006)	0.055*** (0.002)	0.055*** (0.002)
Education: tertiary (base: primary)	0.283*** (0.008)	0.179*** (0.007)	0.182*** (0.003)	0.176*** (0.003)
Experience	0.003*** (0.000)	0.003*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Part-time dummy	0.019** (0.007)	0.013* (0.007)	0.015*** (0.002)	0.013*** (0.002)

(*continued*)

Table 7 (continued)

	Logarithm of wage (OLS, Model 1a)	*Logarithm of wage (OLS, Model 2a)*	*Logarithm of wage (OLS, Model 3a)*	*Logarithm of wage (OLS, Model 4a)*
Fixed-term contract dummy	-0.107*** (0.006)	-0.088*** (0.006)	-0.075*** (0.002)	-0.075*** (0.002)
Tenure	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)
Firm size: more than 250 workers (base: 51–250)	0.096*** (0.015)	0.092*** (0.014)		
Firm size: 10–50 workers (base: 51–250)	-0.139*** (0.009)	-0.131*** (0.009)		
Collective bargaining	0.033*** (0.009)	0.037*** (0.009)		
Share of women		-0.001*** (0.000)		
Share of workers with tertiary education		0.006*** (0.000)		
Share of workers under age 35		-0.001*** (0.000)		
Share of workers aged 55 or older		-0.000 (0.000)		
Other controls:				
Occupation dummies	Yes	Yes	Yes	Yes
NACE dummies	Yes	Yes	No	No
Firm fixed effects	No	No	Yes	Yes
Observations	222,203	222,203	222,203	215,944 (common support)
R-squared/ pseudo-R-squared	0.447	0.480	0.730	0.732

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data

Notes: Models with an intercept. Standard errors in parentheses. In models 1a and 2a, standard errors clustered at the firm level. In models 3a and 4a, cluster-robust variance estimator used. $^{***}p<0.01$, $^{**}p<0.05$, $^{*}p<0.1$

Table 8 Regression results: gender wage gap in foreign-owned firms

	Logarithm of wage (OLS, Model 1b)	*Logarithm of wage (OLS, Model 2b)*	*Logarithm of wage (OLS, Model 3b)*	*Logarithm of wage (OLS, Model 4b)*
Female	-0.239***	-0.179***	-0.179***	-0.179***
	(0.012)	(0.008)	(0.003)	(0.003)
Age	0.049***	0.043***	0.043***	0.043***
	(0.003)	(0.003)	(0.001)	(0.001)
Age squared	-0.001***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Education: basic vocational (base: primary)	-0.040	-0.066*	-0.047***	-0.049***
	(0.027)	(0.034)	(0.004)	(0.004)
Education: secondary (base: primary)	0.059**	0.006	0.007*	0.006*
	(0.030)	(0.038)	(0.004)	(0.004)
Education: tertiary (base: primary)	0.380***	0.209***	0.204***	0.205***
	(0.023)	(0.030)	(0.005)	(0.005)
Experience	0.002*	0.002**	0.002***	0.002***
	(0.001)	(0.001)	(0.000)	(0.000)
Part-time dummy	0.013	0.006	-0.010**	-0.009**
	(0.017)	(0.018)	(0.004)	(0.004)
Fixed-term contract dummy	-0.158***	-0.120***	-0.103***	-0.101***
	(0.017)	(0.016)	(0.004)	(0.004)
Tenure	0.008***	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.000)	(0.000)
Firm size: more than 250 workers (base: 51–250)	-0.036*	0.025		
	(0.020)	(0.016)		
Firm size: 10–50 workers (base: 51–250)	0.023	-0.010		
	(0.025)	(0.021)		
Collective bargaining	0.010	0.018		
	(0.022)	(0.018)		
Share of women		-0.003***		
		(0.000)		
Share of workers with tertiary education		0.007***		
		(0.000)		
Share of workers under age 35		-0.003***		
		(0.001)		
Share of workers aged 55 or older		-0.008***		
		(0.001)		
Other controls:				

(*continued*)

Table 8 (continued)

	Logarithm of wage (OLS, Model 1b)	*Logarithm of wage (OLS, Model 2b)*	*Logarithm of wage (OLS, Model 3b)*	*Logarithm of wage (OLS, Model 4b)*
Occupation dummies	Yes	Yes	Yes	Yes
NACE dummies	Yes	Yes	No	No
Firm fixed effects	No	No	Yes	Yes
Observations	120,940	120,940	120,940	117,717 (common support)
R-squared/ pseudo-R-squared	0.591	0.637	0.748	0.748

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2014 data

Notes: Models with an intercept. Standard errors in parentheses. In models 1b and 2b, standard errors clustered at the firm level. In models 3b and 4b, cluster-robust variance estimator used. $^{***}p<0.01$, $^{**}p<0.05$, $^{*}p<0.1$

References

Arrow, K. (1973). The Theory of Discrimination. In O. Ashenfelter & A. Rees (Eds.), *Discrimination in Labor Markets* (pp. 3–33). Princeton University Press.

Bayard, K., Hellerstein, J., Neumark, D., & Troske, K. (2003). New Evidence on Sex Segregation and Sex Differences in Wages from Matched Employee-Employer Data. *Journal of Labor Economics, 21*(4), 887–922.

Becker, G. S. (1957 [1971]). *The Economics of Discrimination* (2nd ed.). University of Chicago Press.

Black, S. E., & Brainerd, E. (2004). Importing Equality? The Impact of Globalization on Gender Discrimination. *Industrial & Labor Relations Review, 57*(4), 540–559.

Black, S. E., & Strahan, P. E. (2001). The Division of Spoils: Rent-Sharing and Discrimination in a Regulated Industry. *American Economic Review, 91*(4), 814–831.

Blinder, A. S. (1973). Wage Discrimination: Reduced Form and Structural Estimates. *The Journal of Human Resources, 8*, 436–455.

Bøler, E. A., Javorcik, B., & Ulltveit-Moe, K. H. (2018). Working Across Time Zones: Exporters and the Gender Wage Gap. *Journal of International Economics, 111*, 122–133.

Braunstein, E., & Brenner, M. (2007). Foreign Direct Investment and Gendered Wages in Urban China. *Feminist Economics, 13*(3–4), 213–237.

Card, D., Cardoso, A. R., & Kline, P. (2016). Bargaining, Sorting, and the Gender Wage Gap: Quantifying the Impact of Firms on the Relative Pay of Women. *Quarterly Journal of Economics, 131*(2), 633–686.

Central Statistical Office (CSO). (2015). *Economic activity of entities with foreign capitalin 2014*. Warsaw, Poland.

Christofides, L. N., Polycarpou, A., & Vrachimis, K. (2013). Gender Wage Gaps, 'Sticky Floors' and 'Glass Ceilings' in Europe. *Labour Economics, 21*, 86–102.

Cotton, J. (1988). On the Decomposition of Wage Differentials. *The Review of Economics and Statistics, 70*, 236–243.

Duncan, O. D., & Duncan, B. (1955). A Methodological Analysis of Segregation Indexes. *American Sociological Review, 20*(2), 210.

Earle, J. S., Telegdy, Á., & Antal, G. (2018). Foreign Ownership and Wages: Evidence from Hungary, 1986–2008. *ILR Review, 71*(2), 458–491.

Felfe, C. (2012). The Motherhood Wage Gap: What About Job Amenities? *Labour Economics, 19*(1), 59–67.

Firpo, S., Fortin, N. M., & Lemieux, T. (2009). Unconditional Quantile Regressions. *Econometrica, 77*(3), 953–973.

Fortin, N. (2008). The Gender Wage Gap Among Young Adults in The United States. *The Journal of Human Resources, 43*(4), 884–918. University of Wisconsin Press.

Goldin, C. (2014). A Grand Gender Convergence: Its Last Chapter. *American Economic Review, 104*(4), 1091–1119.

Goraus, K., Tyrowicz, J., & Van der Velde, L. (2017). Which Gender Wage Gap Estimates To Trust? A Comparative Analysis. *Review of Income and Wealth, 63*(1), 118–146.

Heinze, A., & Wolf, E. (2010). The Intra-Firm Gender Wage Gap: A New View on Wage Differentials Based on Linked Employer–Employee Data. *Journal of Population Economics, 23*(3), 851–879.

Hijzen, A., Martins, P. S., Schank, T., & Upward, R. (2013). Foreign-Owned Firms around the World: A Comparative Analysis of Wages and Employment at the Micro-Level. *European Economic Review, 60*, 170–188.

Javdani, M. (2015). Glass Ceilings or Glass Doors? The Role of Firms in Male-Female Wage Disparities. *Canadian Journal of Economics/ Revue canadienne d'économie, 48*(2), 529–560.

Killewald, A., & Bearak, J. (2014). Is the Motherhood Penalty Larger for Low-Wage Women? A Comment on Quantile Regression. *American Sociological Review, 79*(2), 350–357.

Kodama, N., Javorcik, B. S., & Abe, Y. (2018). Transplanting Corporate Culture across International Borders: Foreign Direct Investment and Female Employment in Japan. *The World Economy, 41*(5), 1148–1165.

Kunze, A. (2008). Gender Wage Gap Studies: Consistency and Decomposition. *Empirical Economics, 35*, 63–76.

Lechner, M., & Strittmatter, A. (2019). Practical Procedures to Deal with Common Support Problems in Matching Estimation. *Econometric Reviews, 38*(2), 193–207.

Li, L., & Dong, X.-Y. (2011). Economic Transition and the Gender Earnings Gap in Chinese Industry: The Role of Firm Characteristics. *Contemporary Economic Policy, 29*(1), 67–87.

Liu, P.-W., Meng, X., & Zhang, J. (2000). Sectoral Gender Wage Differentials and Discrimination in the Transitional Chinese Economy. *Journal of Population Economics, 13*(2), 331–352.

Lovasz, A. (2008). *Competition and the Gender Wage Gap: New Evidence from Linked Employer-Employee Data in Hungary 1986–2003.* Budapest Working Papers on the Labour Market 0804. Institute of Economics, Centre for Economic and Regional Studies.

Magda, I., & Cukrowska-Torzewska, E. (2019). Do Women Managers Lower Gender Pay Gaps? Evidence from Public and Private Firms. *Feminist Economics, 25*(4), 185–210.

Matysiak, A., Słoczyński, T., & Baranowska, A. (2010). Kobiety i Mężczyźni na Rynku Pracy,[w:] Zatrudnienie w Polsce 2008. Praca w cyklu życia, red. M. Bukowski, Warszawa.

Maurer-Fazio, M., & Hughes, J. (2002). The Effects of Market Liberalization on the Relative Earnings of Chinese Women. *Journal of Comparative Economics, 30*(4), 709–731.

Meng, X. (2004). Gender Earnings Gap: the Role of Firm Specific Effects. *Labour Economics, 11*(5), 555–573.

Meng, X., & Meurs, D. (2004). The Gender Earnings Gap: Effects of Institutions and Firms—A Comparative Study of French and Australian Private Firms. *Oxford Economic Papers, 56*(2), 189–208.

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.

Neumark, D. (1988). Employers' Discriminatory Behavior and the Estimation of Wage Discrimination. *The Journal of Human Resources, 23*(3), 279–295.

Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review, 14*(3), 693–709.

Oaxaca, R. L., & Ransom, M. R. (1994). On Discrimination and the Decomposition of Wage Differentials. *Journal of Econometrics, 61*(1), 5–21.

Oostendorp, R. H. (2009). Globalization and the Gender Wage Gap. *The World Bank Economic Review, 23*(1), 141–161.

Reilly, K. T., & Wirjanto, T. S. (1999). Does More Mean Less? The Male/Female Wage Gap and the Proportion of Females at the Establishment Level. *Canadian Journal of Economics, 32*(4), 906–929.

Reimers, C. W. (1983). Labor Market Discrimination Against Hispanic and Black Men. *The Review of Economics and Statistics, 65*, 570–579.

Rickne, J. (2012). Gender and Work Compensation in China's Industrial Sector. *Review of Income and Wealth, 58*(2), 307–329.

Seguino, S., & Grown, C. (2006). Gender Equity and Globalization: Macroeconomic Policy for Developing Countries. *Journal of International Development, 18*(8), 1081–1104.

Słoczyński, T. (2020). Average gaps and Oaxaca–Blinder decompositions: A cautionary tale about regression estimates of racial differences in labor market outcomes. *ILR Review, 73*(3), 705–729.

Song, J., Price, D. J., Guyenen, F., Bloom, N., & von Wachter, T. (2019). Firming up Inequality. *The Quarterly Journal of Economics, 134*(1), 1–50. Published 25 October 2018.

Statistics Poland. (2017). *Economic Activity of Entities with Foreign Capital in 2016*. Warsaw, Poland.

Strawiński, P., Majchrowska, A., & Broniatowska, P. (2018). Occupational Segregation and Wage Differences: the Case of Poland. *International Journal of Manpower, 39*(3), 378–397.

Tyrowicz, J., & Smyk, M. (2019). Wage Inequality and Structural Change. *Social Indicators Research, 141*(2), 503–538.

Vahter, P., & 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.

Zulfiu-Alili, M. (2014). Inward Foreign Direct Investment and Wage Inequality in Macedonia. *Eastern European Economics, 52*(5), 56–86.

Zweimueller, M., Winter-Ebmer, R., & Weichselbaumer, D. (2008). Market Orientation and Gender Wage Gaps: an International Study. *KYKLOS, 61*(4), 615–635.