Gender Pay Gap Patterns In Domestic And Foreign-Owned Firms•

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Abstract

We investigate differences in the adjusted gender wage gaps between foreign and domestic-owned firms in Poland, a country that has experienced large FDI inflows over the past three decades. We show that while standard estimates of adjusted gender wage gaps reveal they are much higher in size in the foreign-owned companies, as found in several other studies, these estimates cannot be trusted. The domestic-owned firms display considerably higher levels of gender segregation and the OLS estimates of the adjusted gender wage gaps in this sector are more likely to be biased. Using a matching and decomposition technique (Ñopo 2008) that allows to capture gender wage differentials over a common support we find that gender wage gaps in the domestic-owned firms are only slightly lower than those in foreign-owned companies. We also find that gender wage gaps are lower in foreign-owned firms established before the economic transition, as compared to those set up after early 1990s, whereas in domestic-owned firms the opposite is true.

Keywords: gender wage gaps, domestic ownership, foreign ownership, FDI

JEL: F23, J16, J31, J71, P31

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1. Introduction

Large discrepancies in the size of the gender pay gaps between the domestic and foreign-owned sector remain a puzzle. A few studies document a much higher pay disadvantage of women in the foreign-owned companies, both when raw gaps are considered, and when workers' differences in observable individual, job and firm characteristics are controlled for. However, neither the theoretical nor empirical research provide convincing explanation on why the differences arise.

We aim at adding to this literature in three major ways. First, we show that standard OLS estimates of the ownership differences in the gender pay gaps may be strongly biased by the fact that domestic-owned firms present a much higher degree of gender segregation than foreign-owned firms do. Therefore, male and female employees of domestic-owned firms are less likely to be *comparable* in terms of their individual and workplace characteristics, challenging the assessment of their potential wage gaps. Once men and women are compared over a joint set of individual and job characteristics, it turns out that gender pay gaps are only slightly lower in domestic-owned firms than in foreign-owned ones, contrary to what raw gaps and standard estimates of adjusted pay gaps suggest.

Second, our analysis explores a firm-oriented strand of literature. Blau & Kahn (2017) in their extensive update of the latest research on gender wage gaps emphasize that firm dimension has the potential to become an increasingly active area of research, as wage policies at firm level may shape wage differentials across genders. There are still relatively few studies which investigate the gender pay differences between foreign and domestic-owned companies and we believe our input to be valuable in this respect. This is more so as we not only have firm level identifier providing explicitly information on the type of ownership (and allowing us to exclude firms with e.g. mixed ownership), but also the fact that we use linked employer–employee data which allows us to capture more of firm level heterogeneity by including data on co-workers. Additionally, most of the existing evidence comes from China, whereas the mechanisms operating in a developing country may be different in more advanced ones, in particular in Poland, a CEE country that experienced large FDI inflows during the economic transition.

Finally, our study sheds light on the interesting differences in the size of gender pay gaps depending on whether a firm was set up after the transition, or existed before and became privatized. We provide a set of potential explanations for the existing differences.

2. Firm ownership and gender wage differentials

Theory suggests that we should observe a lower gender pay gap among foreign-owned companies, as compared to domestic ones. This prediction is based on the fact that foreign-owned firms are more likely to operate under strong market competition (stronger than domestic-owned firms) and as such they should display lower levels of discrimination, as – in line with the personal taste hypothesis – discrimination is costly to an employer subject to competition (Becker, 1957; Arrow, 1973). The theoretical arguments are further reinforced by the fact that the weaker product market competition (enjoyed mostly by domestic companies, in particular public ones) could create opportunity for higher rents, likely shared with employees. To the extent that these domestic firms prefer employing men and reward them better (gender differences in rent sharing are confirmed by Nekby (2003)), this would drive up gender wage gaps in domestic firms, compared to gender pay differences in foreign-owned establishments. Apart from the competition theory, the expectation of lower gender pay gaps in the foreign-owned firms is supported by the considerations around the theory of trade, which reduces firms' ability to discriminate women in terms

of pay (Black and Brainerd, 2004). Again, this expectation is based on the fact that foreign-owned firms display a higher degree of openness to imports and exports, compared to domestic companies which are more likely to be oriented towards the domestic market.

The empirical evidence is in this respect inconclusive: the theoretical link between the (higher) degree of market competition and (lower) gender labour market gaps is confirmed by Black and Strahan (2001), Meng (2004), Zweimüller, Winter-Ebner, and Weichselbaumer (2008) and Heyman, Svaleryd and Vlachos (2013); the latter, however, find employment but not wage effects. Li & Dong (2011) find that on the contrary, firms that exhibit larger gender wage premia are more likely to operate in industries subject to fierce competition.

There could be other reasons behind a lower gender pay gap in foreign-owned firms. Firstly, one might assume that these firms differ with respect to firm-level policies that are likely to play a crucial role in shaping the gender wage differentials also because of the impact of childbearing and childcare on earnings of men and women. Workplace support and family-friendly practices can contribute to women earning equal pay (Felfe, 2012) and one might expect the foreign-owned firms to be more likely to introduce both equal pay legislation and family-friendly workplace solutions (Kodama, Javorcik and Abe, 2018). More flexible approach to work-life balance might lead to higher selection of better educated women into the foreign-owned firms, lowering the pay gap. Moreover, domestic and foreign-owned firms vary significantly in the extent of practices such as internal labour markets, organizational structure, job ladders and vacancy-based promotions or standardized wage schedules – all of which impact wage setting mechanism and thus gender pay differentials (Gerber, 2012; Ono 2007).

Yet, some authors argue that gender pay gaps are likely to be higher in foreign-owned companies due to their higher requirements with respect to working time – which are met mostly by men, who are rewarded for working longer hours and being more flexible (Goldin 2014; Vahter and Masso, 2018). Boler, Javorcik, and Ultveit-Moe (2014) follow a similar line, suggesting that exporting firms need more employer-centred working time flexibility to be able to work with customers in different time zones, among other. To the extent that exporting firms are more likely to be foreign-owned, this would also contribute to gender pay gaps observed among the domestic and foreign-owned workplaces.

The theoretical arguments discussed above shed light on the potential link between gender wage gaps and domestic and foreign firm ownership. The empirical literature is however limited in this respect. On the one hand, it is widely acknowledged that foreign firms usually offer wage premia, which directly impact the foreign-domestic pay gap (Conyon et al., 2002; Eriksson and Pytlikova, 2011; Hijzen et al., 2013). These wage premia arise due to technology, capital and competition externalities from multinational companies (Bandick 2011, Conyon et al. 2002, Chen, Ge, & Lai, 2011). On the other hand, it is less obvious if (and why) these foreign-ownership wage premia are higher or lower for men than for women and thus whether the gender pay gap is thus increased or decreased by FDI inflows. Studies in this respect usually investigate China, where – from a microeconomic perspective - many do document higher wage premia for men than for women in the foreign-owned sector and thus higher gender pay gaps in foreign-owned companies, compared to domestic-owned ones (Maurer-Fazio et al., 1999; Liu et al., 2000; Hughes and Maurer-Fazio, 2002; Rickne, 2012). Chen, Ge, Lai, & Wan (2013) claim that higher differences in earnings of men and women in the foreign-owned firms reflect higher productivity gap between men and women, and not discrimination, though it must be noted that their study measures gender pay gaps as the association between firm's female employment share and average wages at firm level. The patterns of gender pay gaps may also change over time: Braunstein and Brenner (2004) also investigate China, though find that while the FDI benefitted women's wages more compared to men in mid-1990s, this has reversed in early

2000s. It is also worth emphasising that the mechanisms operating in a developing country may not be present in a more advanced one, where the FDI inflow does not necessarily translate into higher inflow of women on the labour market or into women's educational enrolment (Seguino & Grown, 2006). Seguino (2000) finds a positive correlation between total FDI and the gender wage gap in Taiwan but no similar relationship in Korea. Oostendorp (2009) finds that gender wage gaps decrease with trade and FDI inflows, though this evidence concerns richer countries only, with no evidence found for poorer ones. Friedman et al. (2011) investigates Chilean experience and also state that a higher degree of FDI openness is associated with lower gender pay gaps. To the best of our knowledge, there is little evidence for European countries: Zulfiu-Alili (2014) documents higher gender wage gaps in the foreign-owned firms in Macedonia, compared to domestic companies, Vahter and Maaso (2018) observe a similar pattern in Estonia.

[Add literature on gender segregation across domestic/foreign owned sectors; on firms privatized vs greenfield investments, on OLS estimates of GPG].

Summing up, the received empirical evidence stands in contrast to the theoretical predictions and usually finds higher gender pay gaps in the foreign owned firms than in the domestic owned ones. [To be developed].

3. Data and descriptive statistics

We use data from the Structure of Wages and Salaries by Occupations (SWSO) conducted by Statistics Poland in 2008, 2010, 2012 and 2014. The SWSO is a large linked employer-employee dataset, which provides information on both yearly and monthly (during the reference month – October) earnings of individuals. It contains also information on the number of hours worked, normal and overhours, and both a set of individuals' characteristics, such as gender, age, education, occupation, experience, tenure, and a set of firms' characteristics, e.g. NACE, type of ownership (public/private and domestic/foreign ownership), firm size, coverage by collective pay agreement and firm's size. Because we are interested in gender wage gaps in domestic and foreign-owned firms in the private sector, we restrict our sample to these two pure types of ownership only (we exclude mixed ownership). The sample size varies from 278,032 individual observations in 2010 to 343,143 in 2014, with a total of 1,230,945 in a pooled sample of the years 2008, 2010, 2012, and 2014. We use sample weights which reflect the survey's two-stage sampling procedure (at firm and worker's level).

We calculate gender pay gaps using data on hourly wages, which we compute as the sum of the yearly salary and the yearly honorarium, divided by the number of hours worked yearly. We count in the salary received from overtime, awards and statutory bonuses. The age of the firm is calculated based on the information on the distribution of tenure among firms' workers. In particular, following Magda et al. (2012) we proxy the age of the firm by the tenure of 99th percentile of its workers[1]. This especially allows us to identify the firms that existed before 1990, i.e. before the economic transition of Poland, and were privatized afterwards.

[1] As a robustness check, we use also 95th and 90th percentile of workers' tenure to proxy the age of the firm. The results remain consistent.

Table 1. Descriptive statistics of selected variables, 2014

	domestic	foreign
female (share)	40%	43%
age (average)	40	37
primary education (share)	7%	7%
basic-vocational education (share)	30%	18%
secondary education (share)	38%	36%
tertiary education (share)	24%	39%
job experience (average)	16	13
tenure (average)	8	7
firm size (average)	334	1136
fixed term contracts (share)	39%	28%
collective agreements (both firm-level and industry-level)	38%	34%
Men, average hourly wage (PLN)	17.04	30.00
Women, average hourly wage (PLN)	14.99	22.06
Number of observations	222,203	120,940

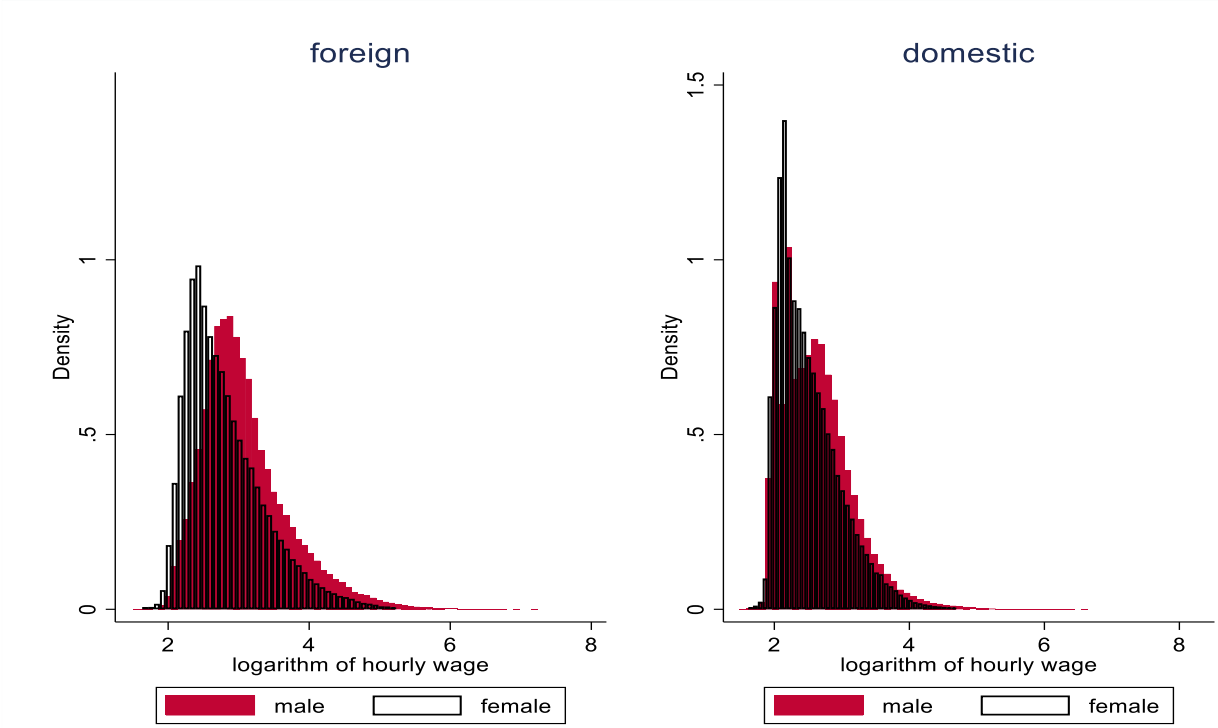
Notes: For descriptive statistics for years 2008, 2010 and 2012 see Appendix A1. Wages expressed in PLN, 2008 value, deflated with the CPI.

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

Foreign-owned firms constitute 14.3% of all firms in our data, and employ 30% of all workers. Clearly, there are differences in the structure of workforce in the two types of firms (Table 1 and Appendix A1). In both types of firms, women constitute a minority among the workforce, with their share being slightly higher in foreign-owned companies. Employees in the foreign firms are on average 3 years younger and better educated: shares of workers with primary and secondary education are similar between the two types of ownership, but there are striking differences in the shares of workers with basic-vocational education (12 p.p. more in domestic companies in 2014) and tertiary education share (15 p.p. more in foreign ones). Although the share of workers with tertiary education employed in domestic-owned firms increased over time (Appendix A1), the gap is still remarkable.

Those working in foreign establishments are less likely to be employed on fixed term contracts and the firms they work in are on average much larger. This contributes to some extent to higher wages they obtain: men in foreign-owned companies earned on average 76% more than men in domestic ones (in 2014). For women, the difference amounted to 47%. Furthermore, in both sectors the distribution of female wages is shifted to the left of the male distribution, but this shift is higher in the foreign sector. Thus, the Polish data seem to confirm the patterns of higher gender wage inequalities observed in the foreign-owned sector (compared to domestics sector), found for other countries.

Figure 1. Men's and women's distribution of log wages in foreign and domestic-owned firms



Notes: Wages expressed in PLN, 2008 value, deflated with the CPI.

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2008, 2010, 2012, and 2014 data.

[Further in our analysis we distinguish between firms which started operating before and after the economic transition. Interestingly, while the share of women workers is on average similar in foreign and domestic-owned firms, this is no longer true once we look separately at firms that were privatized and those that were greenfield investments, i.e. that were created after the transition. In the domestic sector, the former and the latter display no gender bias, whereas the firms that existed prior to the transition and became foreign-owned are much less likely to employ women, compared to newly created foreign-owned companies. The gender discrepancies in average wages are substantial – the hourly wage of women employed in domestic firms that entered the market after the transition is less than half of an hourly wage of men employed in new, foreign-owned firms. – To be developed].

4. Research methodology

In the first step, we use a traditional Mincer wage regression with the logarithm of hourly wage as a dependent variable. We estimate it using OLS. We start with a basic model, with a set of standard control variables, including obviously gender, and additionally individual (age, experience, education), job (occupation, type of job contract, part-time/full-time position) and firm-level characteristics (firm's size, NACE sector, collective bargaining coverage, a set of characteristics of co-workers which allows us to better capture firm heterogeneity). Next, we introduce an interaction term between gender (female) and type of ownership (foreign). This allows us to investigate differences in the size of the gender pay gaps between domestic and foreign-owned firms, and answer the first question we ask. Finally, we use triple interaction between gender (female), type of ownership (foreign) and age of the firm (binary variable indicating whether the firm existed before 1990). Thanks to it we can address the second question and

investigate whether gender wage gaps are different in firms that were created before and after the economic transition. In all our models, we cluster standard errors at firm level.

The second part of our analysis is based on a novel, different approach to estimating gender wage gaps, introduced by Ñopo (2008). This approach is a non-parametric method, based on a matching algorithm. Its main advantage is that it allows us to capture gender differences in the common support, that is, between these men and women, for whom their at least one "statistical twin" (based on the observable characteristics) could be found in the sample. The Ñopo decomposition also provides information about the distribution of the differences in wages of men and women that remain unexplained by the characteristics of comparable male and female individuals. It has been successfully applied to studies of the wage gap by, for example, Görzig, Gornig, and Werwatz (2005); Nicodemo and Ramos (2012); Ñopo, Daza, and Ramos (2012); and Anspal (2015).

Following the Ñopo procedure, we calculate average differences in hourly wages of men and women in the domestic and foreign-owned firms (separately) and then we decompose this average wage gap into four main components. Denoting the gender wage gap in sector *j* – the average difference in wages between men and women – by Δ_j, we decompose the gap as:

$$\Delta_j = \Delta_{X_j} + \Delta_{O_j} + \Delta_{M_j} + \Delta_{F_j}, \quad (1)$$

where the specific components take the form of:[2]

$$\Delta_X = \int_{S^M \cap S^F} g^M(x) \left[\frac{dF^M}{\mu^M(\overline{s^F})} - \frac{dF^F}{\mu^F(\overline{s^M})} \right](x) \quad (2)$$

$$\Delta_O = \int_{S^M \cap S^F} [g^M(x) - g^F(x)] \frac{dF^F(x)}{\mu^F(\overline{s^M})} \quad (3)$$

$$\Delta_M = \left[\int_{\overline{s^F}} g^M(x) \frac{dF^M(x)}{\mu^M(\overline{s^F})} - \int_{\overline{s^F}} g^M(x) \frac{dF^M(x)}{\mu^M(\overline{s^F})} \right] \mu^M(\overline{s^F}) \quad (4)$$

$$\Delta_F = \left[\int_{\overline{s^M}} g^F(x) \frac{dF^F(x)}{\mu^F(\overline{s^M})} - \int_{\overline{s^F}} g^F(x) \frac{dF^M(x)}{\mu^F(\overline{s^M})} \right] \mu^F(\overline{s^M}) \quad (5)$$

Functions $g^M(\cdot)$ and $g^F(\cdot)$ represent expected earnings conditional on characteristics and gender (*M* for males and *F* for females); S^M and S^F denote the support of the distribution of characteristics for men and for women, respectively; and $\overline{s^M}$ and $\overline{s^F}$ represent the respective out-of-common support. The characteristics over which matching is performed correspond to the covariates we used in the Mincer wage regression, with previously continuous variables being categorized now. Thus we include age (six 10-years groups), education (four levels), experience (3 groups), occupation (at ISCO 1 level), firm size (3 groups), full time/part time indicator, type of job contract (permanent/fixed), NACE sector and type of firm ownership (domestic or foreign), as well as year dummy.

The first component Δ_X reflects the part of the wage gap that can be explained by the differences in the distribution of characteristics of comparable men and women; i.e., those individuals who are in the common support. In contrast, Δ_0 stands for the "unexplained" part; that is, the part that cannot be attributed to the differences in the characteristics of men and women over the common support. This part

[2] For simplicity, in the formulas that follow we omit the subscript *j*.

of the gap is usually attributed to unobservable characteristics (that determine earnings), which may also include discrimination. The last two components, Δ_M and Δ_F, capture the gender-specific gap between individuals who are in and out of the common support. The two components are computed as the difference between the expected wage of men/women out of the common support minus the expected wage of men/women in the common support, weighted by the probability measure (under the distribution of characteristics of males/females) of the set of characteristics that females/males do not have. For example, Δ_F captures the part of the gap that would disappear if there were no women with the combination of characteristics *X* that remain unmatched by men; or, in other words, if every woman had at least one combination of the set of characteristics that men have.

5. Results

We start with looking at the raw gender wage gaps, that is the differences in average wages of men and women, expressed as the percentage of men's wages. These are calculated separately for domestic and foreign-owned firms, and summarized in Table 3 (column 2). Women have lower wages than men in both sectors, but the raw gender wage gap is twice higher in the foreign-owned firms than in domestic ones.

Table 3. Raw and OLS adjusted gender wage gaps in domestic and foreign-owned firms

Ownership	Raw GWG	Adjusted GWG
domestic	13.6%	11.4%
foreign	27.3%	21.7%

Notes: The full set of estimates of adjusted wage gaps is available in Appendix Table A2.
Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2008, 2010, 2012, and 2014 data.

These differences in the size of the gender pay gaps across sectors, although striking, might partly (or even largely) be explained by the different composition of male and female workers in the domestic and foreign-owned firms. Thus, we calculate gender pay gaps adjusted for workers, job and firm characteristics. In the first step we use a standard OLS regression, as discussed in the Methodology section. Column 3 in Table 3 summarizes the results, whereas the entire set of estimated coefficients is presented in Table A2 in the Appendix. Once individual, job and firm-level characteristics are controlled for, the female wage penalty amounts to 11.4% in the domestic sector and 21.7% in the foreign owned. Thus, the adjusted wage gap is lower than the raw gender difference in wages both in the foreign and domestic-owned sector, meaning that women and men have different individual characteristics and different workplace, which explains part of the observed raw wage gaps. Yet, the large discrepancy between the two ownership sectors is confirmed: even once differences in workers' characteristics are accounted for, the gender wage gap is much higher in the foreign-owned sector than in the domestic one.

We are afraid the above comparison of raw and adjusted gender pay gaps could be biased: the differences in the size of the gender pay gaps between sectors could stem from unobservable differences among workers in the two sectors and from the fact that the OLS fails to capture gender segregation into different types of jobs. While we are unable to deal with unobserved heterogeneity with our data (though we try to minimize it using a set of co-workers characteristics), we re-run our analysis of the gender pay gaps using the Ñopo methodology presented in the previous section. Compared to the OLS, this approach allows us to better control for the fact that women and men may not share the same *sets* of observable characteristics, and that the shares of men and women in the common support may be different in the foreign/domestic-owned companies.

The results of the Ñopo estimates are presented in Table 4. Once workers are matched over the common support, the differences in the size of the gender pay gap between the domestic and foreign-owned sector are considerably lower (column 4). Interestingly, this lower sectoral difference is driven mainly by a large increase in the estimated size of gender pay gaps in the domestic sector, while the Ñopo results for the foreign-owned firms are much in line with the OLS estimates. All in all, it turns out that the size of the gender pay gap is only slightly higher in the foreign-owned sector compared to the domestic one, contrary to what raw pay gaps and OLS estimates would suggest.

Table 4. Gender wage gaps in domestic and foreign-owned firms, adjusted for firms' and workers' characteristics: summary of Ñopo decomposition results

	Gender wage gap	Percentage of matched women	Percentage of matched men
domestic	18.9%	88.6%	75.9%
foreign	22.1%	91.0%	85.4%

Notes: The full set of estimates is available in Appendix Table A2.

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2008, 2010, 2012, and 2014 data.

It thus appears that men and women are less likely to be "similar" in domestic-owned companies. This is confirmed by the summary of the matching results, presented in columns 3 and 4 of Table 4. While 91% of women and 85% of men in the foreign-owned sector had a "twin" observation in the dataset, these shares were lower in the domestic-owned firms. This is likely to reflect different degrees of gender segregation between the domestic and foreign-owned firms. To verify this, we calculate a standard measure of gender segregation, that is the Duncan dissimilarity index (Duncan & Duncan, 1955), with the formula of the following form:

$$D = \frac{1}{2}\sum_{i=1}^{N}\left|\frac{m_i}{M} - \frac{f_i}{F}\right|,$$

where M and F denote total male and female population, respectively, and m_i and f_i denote the population of males or females in the ith category (i.e. occupation, occupation x education, occupation x education x age group, etc.). N is the total number of currently analysed categories.

The results, presented in Table 5, provide evidence of a higher degree of workers dissimilarity by gender in the domestic sector, as compared to the foreign one. This observation holds strong regardless of the combination of individual, job and firm characteristics we take into account. Therefore, it lends support to our strategy of comparing gender pay gaps in the domestic and foreign-owned firms using Ñopo matching methods, rather than OLS estimates.

Table 5. Duncan dissimilarity index (gender segregation index)

Duncan dissimilarity index		Included variables						
domestic	foreign	occupation (9 categories)	education (4 categories)	age group (6 categories)	fixed term contract (binary)	part-time (binary)	years of experience (3 categories)	firm's size (3 categories)
0.36	0.20	X						
0.38	0.23	X	X					
0.40	0.25	X	X	X				
0.40	0.26	X	X	X	X			
0.41	0.27	X	X	X	X	X		

0.41	0.27	X	X	X	X	X	X	
0.42	0.29	X	X	X	X	X	X	X

Notes: Numbers range on a scale from 0 to 1, where 0 = perfect similarity and 1= perfect dissimilarity.

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2008, 2010, 2012, and 2014 data.

[ADD A DISCUSSION OF THE FIRM'S COHORT RESULTS – PRE/POST TRANSITION, Table 6]

Table 6. Gender wage gaps in domestic and foreign-owned firms, adjusted for firms' and workers' characteristics: summary of Ñopo decomposition results

ownership	the firm's establishment year		
	before 1990	after 1990	all
domestic	19.9%	18.5%	18.9%
foreign	17.6%	23.0%	22.1%

Source: Own calculations based on the Structure of Wages and Salaries by Occupations 2008, 2010, 2012, and 2014 data.
Notes: The full set of estimates is available in Appendix Table A3.

6. Conclusions

We study gender pay gaps in domestic and foreign-owned firms in Poland, analysing the differences in their size. We first evidence why the OLS estimates may be a misleading indicator of the differences in the size of the gender wage gaps between the foreign and domestic-owned sector, pointing to a much higher degree of gender segregation in the latter. Female employees are much less "comparable" to male employees in the domestic-owned firms, in contrast to the foreign-owned sector, where men and women are more likely to share the same sets of individual, job and firm level characteristics. This makes the comparison of the sizes of gender pay gaps in the two sectors more challenging.

Responding to this challenge we use a novel approach by Ñopo (2008). We decompose the observed differences in average wages of men and women, in the foreign and domestic-owned sector separately, into a component that reflects differences in observable characteristics of men and women over the common support, and the components that reflect unexplained differences in and out of the common support. We thus show that the size of the gender pay gap is slightly higher in the foreign-owned firms compared to domestic-owned firms, but the difference is much smaller than the OLS estimates would suggest. Yet, the gender wage gap is by no means lower in the foreign-owned firms, contrary to what competition theory would imply. More research is needed to understand the factors that could be driving the foreign/domestic differences in this respect.

Furthermore, we also find that the size of the gender pay disadvantage depends on whether the particular workplace existed before the economic transition, or whether it was created afterwards. In particular, in the foreign-owned sector the gender pay gaps are higher among newly established foreign-owned companies, which stands in contrast to the pattern observed in the domestic-owned sector, where 'older' firms display slightly higher pay gaps than newer ones.

[Suggestions for explanation: competition theory, versus temporal flexibility arguments by Goldin (2014); need for more in depth research on differences in gender segregation in the domestic and foreign owned sector – to be developed].

References

Anspal, S. (2015). Gender wage gap in Estonia: a non-parametric decomposition. *Baltic Journal of Economics*, *15*(1), 1–16.

Bandick, R. (2011). Foreign acquisition, wages and productivity. *The World Economy*, *34*(6), 931-951.

Barth, E., Bryson, A., Davis, J. C., & Freeman, R. (2016). It's where you work: Increases in the dispersion of earnings across establishments and individuals in the United States. Journal of Labor Economics, 34(S2), S67-S97.

Black, Sandra E., and Philip E. Strahan. 2001. The division of spoils: Rent-sharing and discrimination in a regulated industry. *American Economic Review* 91(4): 814–31.

Boler, E. A., Javorcik, B., & Ultveit-Moe, H. K. (2014). Globalization: A woman's best friend? Exporters and the gender wage gap.

Bøler, E. A., Smarzynska Javorcik, B., & Ulltveit-Moe, K. (2015). Globalization: A woman's best friend? Exporters and the gender wage gap.

Chen, Z., Ge, Y., & Lai, H. (2011). Foreign Direct Investment and Wage Inequality: Evidence from China. *World Development*, *39*(8), 1322–1332.

Chen, Z., Ge, Y., Lai, H., & Wan, C. (2013). Globalization and Gender Wage Inequality in China. World Development, 44, 256–266.

Conyon, M. J., Girma, S., Thompson, S., & 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.

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

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

Gerber, T. P. (2012). The structural perspective on postsocialist inequality: Job loss in Russia. *Research in Social Stratification and Mobility*, *30*(1),

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.

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.

Magda, I., Mardsen, D., & Moriconi, S. (2012). Collective agreements, wages, and firms' cohorts: evidence from Central Europe. Industrial and Labor Relations Review, 65(3), 607-629.

Nekby, Lena. 2003. Gender differences in rent sharing and its implications for the gender wage gap, evidence from Sweden. *Economics Letters* 81(3): 403–10.

Ono, H. (2007). Careers in foreign-owned firms in Japan. *American Sociological Review*, *72*(2), 267-290.

Oostendorp, R. H. (2009). Globalization and the gender wage gap. *The World Bank Economic Review*, *23*(1), 141-161.

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

Seguino, S. (2000). The effects of structural change and economic liberalisation on gender wage differentials in South Korea and Taiwan. *Cambridge Journal of Economics*, *24*(4), 437-459.

Vahter, P., & Masso, J. (2018). The Contribution Of Multinationals To Wage Inequality: Foreign Ownership And The Gender Pay Gap. *University of Tartu-Faculty of Economics & Business Administration Working Paper Series*, (106).

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

Appendix

Table A1. Descriptive statistics of selected variables for years 2008, 2010, 2012

	2008		2010		2012	
	domestic	foreign	domestic	foreign	domestic	foreign
female (share)	40%	43%	39%	42%	40%	41%
age (average)	39	35	39	36	40	36
primary education (share)	8%	6%	7%	5%	7%	5%
basic-vocational education (share)	36%	25%	34%	24%	31%	21%
secondary education (share)	38%	39%	39%	41%	38%	39%
tertiary education (share)	18%	30%	19%	30%	23%	35%
job experience (average)	15	12	16	12	16	13
tenure (average)	6	5	7	6	8	7
firm size (average)	286	1216	308	1274	330	1071
fixed term contracts (share)	42%	35%	41%	33%	39%	28%
collective agreements (both firm-level and industry)	36%	34%	42%	42%	42%	42%
Men, average hourly wage (PLN)	16.32	27.67	15.94	27.32	16.36	26.79
Women, average hourly wage (PLN)	13.54	19.16	13.83	19.64	14.37	20.09
Number of observations	219,170	69,908	200,599	77,433	219,045	101,647

Notes: The sample is weighted so as to represent total population of Polish workforce in private domestic and foreign-owned firms. Wages expressed in PLN, 2008 value, deflated with the CPI.

Source: Own calculations based on the Polish SES 2008, 2010, 2012 data.

Table A2. OLS results: gender wage gap in domestic and foreign-owned firms

	Model 1	Model 2	Model 3
female	-0.143*** (0.002)	-0.114*** (0.003)	-0.096*** (0.003)
foreign		0.203*** (0.007)	0.229*** (0.008)
firm_age_before_90			0.046*** (0.007)
female*foreign		-0.103*** (0.008)	-0.131*** (0.009)
female*firm_age_before_90			-0.065*** (0.006)
foreign*firm_age_before_90			-0.103*** (0.012)
female*foreign*firm_age_before_90			0.118*** (0.015)
age	0.025*** (0.000)	0.025*** (0.000)	0.026*** (0.000)
age2	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
education: basic vocational (base: primary)	0.008** (0.003)	0.009*** (0.004)	0.010*** (0.004)
education: secondary (base: primary)	0.069*** (0.004)	0.067*** (0.004)	0.068*** (0.004)
education: tertiary (base: primary)	0.224*** (0.005)	0.226*** (0.005)	0.225*** (0.005)
tenure	0.006*** (0.000)	0.006*** (0.000)	0.006*** (0.000)
experience	0.003*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
part-time dummy	-0.008** (0.004)	-0.008* (0.004)	-0.008* (0.004)
fixed-term contract dummy	-0.101*** (0.004)	-0.086*** (0.004)	-0.085*** (0.004)
ln_firm_size	0.062*** (0.003)	0.045*** (0.002)	0.045*** (0.003)
collective bargaining	0.018*** (0.005)	0.026*** (0.005)	0.026*** (0.005)
share_women	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
share_edu_tert	0.008*** (0.000)	0.007*** (0.000)	0.007*** (0.000)
share_young	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)

share_old	-0.002*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Other controls:			
occupation dummies	yes	yes	yes
NACE dummies	yes	yes	yes
year dummies	yes	yes	yes
Observations	1,230,945	1,230,945	1,230,945
R-squared	0.562	0.573	0.574

*Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.*

Source: Own calculations based on the Polish SES 2008, 2010, 2012, and 2014 data.