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PAPER

The Evolution of the Foreign-Ownership Wage Premium in Poland

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Abstract The study examines the foreign-domestic wage differential in Poland during 2014-2017. The individual-level data come from ongoing surveys conducted by a major Polish HR consulting firm. The empirical analysis shows that during this period, there was a substantial (albeit decreasing) raw wage advantage for workers whom foreign-owned firms employed. This differential reduced significantly after controlling for personal, work, and workplace characteristics. Foreign firm employees at the lower end of the earnings distribution faced a smaller wage gap than those at the upper end; the wage gap showed a noticeable decline at all the percentiles over the years. Wage gap decompositions reveal that a predominant portion of the wage differential was due to differences in observed characteristics; nevertheless, a substantial portion of the wage gap remained unexplained.

Keywords: Foreign-owned firms; Domestic firms; Wage differential; Poland

Jel Classification: F2, J3, P2

1. Introduction

For the 30 years since the fall of communism, Poland has been one of the top destinations for foreign investors both in the Central and East European region and in Europe as a whole. According to the 2022 World Investment Report (UNCTAD, 2022), by the end of 2021, Poland's stock of inward FDI reached $269.2 billion, which amounted to 40.0% of GDP; for comparison, in 1995, these statistics were $7.8 billion (5.6%), respectively. The annual inflow of FDI in Poland grew from $3.7 billion in 1995 to $24.8 billion in 2021, amounting to 11.3% of all FDI inflows in Europe and 18.0% of all FDI inflows in the EU. In 2021, Poland was ranked # 17 among the 20 largest FDI host economies in the world, the only one of the post-communist countries on that list.

The growth of FDI inflows led to the growth of firms with foreign capital. The Polish Central Statistical Office (GUS, 2021) reports that there were 23,203 foreign

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firms in the country by the end of 2020. These firms employed share capital of 232.1 billion Polish Zlotys, of which foreign capital constituted 92.9%. More than three-quarters of the firms (78.9%) had a 100% share of foreign capital; in 11.8% of the firms, foreign investors held a majority stake with more than 50% of capital, and only 1.4% of the firms were portfolio investments with less than a 10% share of foreign capital. Foreign capital originated from 116 countries, with the Netherlands, Germany, France, and Luxembourg being the major investors. Foreign businesses expanded their operations to Poland mainly through greenfield investment; for instance, in 2020, 72.4% of newly established foreign-owned firms were greenfield companies, and 27.6% were created through cross-border mergers and acquisitions. The highest percentage of foreign capital was invested in manufacturing (38.1%), trade and repair (20.7%), and real estate activities (10.4%), and in Mazowieckie voivodship (46.7%) with the capital city of Warsaw. At the end of 2020, firms with foreign capital employed more than 2 million employees, of which 76.6% worked in large (> 250 employees) firms; however, the average firm size was relatively small (89 employees).

There are numerous channels through which FDI and foreign-owned firms can impact the host country. Poland welcomes foreign investment as a source of capital and growth and as a vehicle for research and development, technology transfer, and integration into the global supply chain. It is also expected that foreign firms are likely to bring more jobs and better pay. International statistics consistently show a significant gap between the average wages and salaries earned by workers in domestic and foreign-owned firms. Such data are not available in open sources of the Polish Central Statistical Office. Several publications in media outlets report that in Poland, firms with foreign capital pay higher wages than domestic firms, and the gap has been widening in absolute terms but shrinking in relative terms. According to Kowalski (2019), in 2000 (2017), the average wage was about 1.5 (3.5) thousand Zlotys in domestic firms and about 2.7 (5.7) thousand Zlotys in firms with foreign capital. During this period, the absolute gap grew from about 1.2 thousand to about 2.2 thousand Zlotys; however, in relative terms, the gap decreased from 80% to 64%. Jaworek *et al*. (2018) conducted a more detailed analysis of wages in the largest domestic and foreign-owned firms in Poland (from the so-called "Rzeczpospolita 500" list) in 1999 and 2017. The authors report that in this group of enterprises in 1999 (2017), the average wage was 1,833 (4,733) Zlotys in domestic firms and 2,776 (6,758) Zlotys in firms with foreign capital. Like Kowalski, Jaworek *et al*. conclude that while the absolute wage gap increased from about 1 thousand to about 2 thousand Zlotys, the relative wage gap fell from 51.4% to 42.8%.

While a substantial differential between average wages in foreign-owned and domestic firms is well documented, this fact alone cannot imply that foreign-owned firms offer better rewards to employees who are equally qualified and perform similar work as their counterparts in domestic firms. To this end, this study examines whether a foreign-

ownership wage premium persists even after controlling for observable differences in worker quality and firm characteristics. We use proprietary data from ongoing surveys of individual workers conducted by a major Polish HR consulting firm. This source provides detailed information on personal and firm characteristics of nearly 350,000 individuals working in the Polish labor market in the four years, 2014-2017.

The rest of the paper is structured as follows. Section 2 summarizes the theoretical and empirical literature, focusing attention on the relatively small number of studies examining the foreign firm wage effect in Central and Eastern Europe. Sections 3 and 4 discuss our data and research methods, respectively, and Section 5 presents the results of our analyses as well discusses our findings. The paper concludes in Section 6.

2. Direct Impact of Foreign Ownership on Wages: Theoretical Background and Literature Review

2.1 Theoretical Background

Generally speaking, economic literature recognizes a direct effect of FDI on the wages of those workers employed in foreign-owned firms and an indirect (or spillover) effect on wages paid by domestic firms to their workers because the employment activities of foreign-owned firms affect the local labor market. This study focuses solely on the direct effect of foreign ownership on wages.

In competitive labor markets, there is no reason to expect, in general, that firms with foreign capital would offer better pay or working conditions for identical workers than their local counterparts. However, certain market failures may give foreign-owned firms an incentive to offer better pay (so-called 'efficiency wages') than domestic firms to individuals with similar characteristics doing similar jobs. Three types of theories have been used to explain the wage premium in foreign-owned firms: the theories of heterogeneous workers, heterogeneous learning, and heterogeneous firms (Malchow-Møller *et al*., 2013).

According to the 'heterogeneous workers' theories, the observed wage premium reflects a pure selection phenomenon. Foreign firms simply employ ex-ante better workers in terms of observable and unobservable characteristics. As a result, foreign-owned firms achieve a better complementarity between worker skills and technology or capital, between skilled workers and skilled managers, or among skilled workers themselves. Foreign companies typically face greater hiring costs due to their relatively limited knowledge of the local labor market and local networks. Hence, these companies may be willing to pay more to identify, attract, retain and motivate highly qualified individuals. Previous research shows that foreign-owned firms are indeed able to attract highly qualified employees from their local counterparts through higher wages. Furthermore, foreign-owned firms also possess institutional advantages implying advanced human resource management policies, such as performance appraisal systems and incentives.

The 'heterogeneous learning' theories assert that the premium is a pure learning phenomenon. Workers in foreign firms have better learning opportunities and become more productive through better training and more helpful experience or by picking up valuable ideas. Firms investing abroad typically have significant ownership advantages, such as production and management know-how, advanced technology, innovatory capacity, non-codifiable knowledge, organizational systems, distribution networks, and so forth. Local workers in foreign-owned firms become familiar with firm-specific advantages through training and experience and potentially spill this knowledge and skills over if they switch employers or start their own business. In order to prevent these spillovers, among other things (e.g., formal protection of their intellectual property rights and trade secrecy), foreign-owned firms can pay higher wages to reduce labor turnover.

The 'heterogeneous firms' theories postulate that the premium reflects common characteristics of foreign firms that influence the firm-specific wage setting. The premium could thus be compensation for different working conditions in foreign firms, or it could reflect rent sharing under imperfect labor markets. Additionally, foreign-controlled companies may also be willing to pay higher wages to motivate the employees and promote more significant work effort if monitoring costs are high and when it is challenging to manage industrial relations in a context of different cultural and legal environments. Finally, institutional factors may provide incentives for foreign-owned firms to go beyond local labor practices. For instance, if local labor laws are inconsistent with ILO standards, foreign firms may choose to comply with their national labor laws because of reputational concerns and the fair wage preferences of employees.

The aforementioned 'efficiency wage' arguments and predictions have recently been questioned by the political economy framework of wage setting, claiming that the increase of foreign ownership in the economy changes the wage bargaining process between a firm and a trade union. Most of these theories employ Nash bargaining and argue that the wage is a result of the bargaining process between capital (employers) and labor (employees), and the outcome depends on the relative strengths of the two parties. According to these theories, FDI can reduce the negotiated wage due to the collusion and threat-point effects. As FDI is highly mobile and has the propensity to move to lower cost destinations quickly, it could lead to a lower bargaining power for labor in foreign-owned firms. As a result, the unions may have to accept lower wages.

Moreover, the increased presence of foreign-owned firms in the economy can also bring about institutional changes that affect the bargaining process. To attract more FDI, governments introduce special incentives and changes in business rules, such as preferential tax regimes and special subsidies for foreign-owned firms and the establishment of special economic zones. All of these incentives may further strengthen capital's relative bargaining power and reduce labor's relative bargaining power.

To sum up, the 'efficiency wage' arguments predict that, *ceteris paribus*, there may be a positive (or at least neutral) impact on wages in foreign-owned firms as compared to domestic ones; and the 'wage bargaining' approach predicts that foreign investment generally reduces the negotiated wage. Therefore, the actual impact of foreign ownership on wages is a matter for empirical analysis.

2.2 Previous Findings for Developed and Developing Countries

Most studies analyzed the direct impact of foreign ownership on wages in developed and developing countries. Although these papers vary in many aspects (countries and time considered, level of aggregation, definitions of variables, and econometric methodologies), it still seems that, after controlling for a large number of individual and firm characteristics and endogeneity, foreign-owned firms pay better, but the picture is not clear-cut. Hale and Xu (2020) surveyed 30 papers published in academic journals between 1995 and 2015 that empirically analyzed FDI's direct, indirect (spillovers) and aggregate effects on various aspects of labor markets. Their meta-analysis reveals that most micro-level studies focused on the direct effect of FDI on wages. For developed countries, the authors analyzed 71 regressions measuring such effects, of which 58 (4) found a positive (negative) and statistically significant relationship. For developing countries, 47 out of 49 regressions found a positive and statistically significant relationship, with no negative findings. Many papers addressed the identification problem using instrumental variables and other approaches and still found positive and statistically significant effects of foreign ownership on wages. Estimates of the foreign-ownership wage premium vary widely, with the foreign-domestic wage gap often found to be nearly negligible in the most developed economies but more pronounced in developing countries.

2.3 Previous Findings for Post-Communist Central and Eastern European Countries

There is now a wide range of estimates of the foreign-ownership wage premium in post-communist Central and Eastern European countries. Earlier studies typically used industry- or firm-level data; more recently, the availability of different surveys allowed to take into account individual worker characteristics and firm and industry controls. The studies also differ in the applied methods and estimation techniques. One group of studies compared wages (or wage growth) between foreign-owned and domestic-owned firms, and the other group of studies compared wages of workers before and after the foreign acquisition of a firm. The estimation techniques range from OLS to fixed effects or difference-in-difference models. For instance, Csengődi *et al*. (2008), Earle and Telegdy (2008), Earle *et al*. (2018), Köllő *et al*. (2021) analyzed the foreign-domestic wage differential in Hungary; Eriksson and Pytlikova (2011) in the Czech Republic; Delevic and Kennell (2022) in Serbia; Jude (2012) in Romania; Zulfiu-Alili (2014) in North Macedonia; Vahter and Masso (2019) in Estonia; Onaran and

Stockhammer (2008), Brown *et al*. (2010) and Kurtović *et al*. (2021) considered several countries in their analyses. Most studies reported a substantial raw foreign-domestic wage gap (in some cases exceeding 100%). This gap was significantly reduced by removing the effects of observed and unobserved worker and firm characteristics but still remained, although its magnitude varied significantly. Overall, positive wage effects of foreign ownership seem to be considerably larger for firms located in (low-wage) Eastern European countries as compared to developed economies (Oberhofer *et al*., 2012).

Only a handful of studies assess Poland's foreign-domestic wage premium. Using firm-level data from the Amadeus database, Faggio (2001) explored the link between foreign ownership and wages in Poland, Bulgaria, and Romania in 1994-1997. For the manufacturing industry in Poland, the author reported a robust foreign-domestic wage differential of 9-18%, depending on the model specification. Bedi and Cieślik (2002) combined individual labor market data from the quarterly Polish Labor Force Surveys with industry data in 1994-1997. They did not distinguish between domestic and foreign-owned firms and defined two measures of the extent of foreign participation as the shares of industry employment in fully-owned foreign subsidiaries and joint venture undertakings. The authors found that a 1% increase in the share of employment in joint ventures had a positive and statistically significant effect (0.6-2.6%) on wages. On the other hand, a 1% increase in the share of employment in fully-owned subsidiaries did not have any statistically significant effect on wages.

Magda and Sałach (2021) used data from the Structure of Wages and Salaries by Occupation survey conducted by the Polish Central Statistical Office in 2014. Regarding actual hourly wages, workers in foreign-owned companies earned, on average, 64% more than workers in domestically-owned firms; the corresponding difference was 76% for men and 47% for women. Controlling for different worker and firm characteristics reduced this gap to 26-34% for men and 16-23% for women; however, for some specifications, the wage gap between foreign-owned and domestic firms increased to 95%. Broniatowska and Strawiński (2021) employed data from the Structure of Wages and Salaries by Occupation survey conducted by the Polish Central Statistical Office in 2016. The authors used total monthly salary, several definitions of a foreign firm, and a novel two-step matching procedure. Depending on the definition of a foreign firm, the raw foreign firm wage premium was 34-56%. For the semi-parametrically matched data, the authors show that differences in observed characteristics explain 32-37% of the wage differential but 63-68% of the gap remains unexplained.

3. Data

We use proprietary data provided by the Sedlak & Sedlak (S&S) company, the oldest Polish HR advisory company operating in Poland since 1990. The firm supports its compensation consulting services by carrying out many salary surveys of firms

and individuals. Our data are from their Polish General Salary Survey (in Polish – Ogólnpolskie Badanie Wynagrodzeń, OBW), the most extensive non-governmental salary survey in Poland. The survey is conducted all year long, with data presented as annual databases. To ensure data reliability and quality, S&S uses various procedures, both quantitative and qualitative, in the data cleaning process.

The data used here span the years 2014-2017 (see Table 1). Each year, we have samples of about 70,000-105,000 individuals working full-time in the Polish private sector, totaling 346,019 individuals. For our purposes, a critical variable is each respondent's identification of their employer as either a firm with majority Polish ownership or majority foreign ownership. In our annual samples, 39-41% of all employees identify themselves as employed by majority-foreign-owned enterprises. This is consistent with Magda and Sałach (2021) and Broniatowska and Strawiński (2021), who used data from the Structure of Wages and Salaries by Occupation surveys conducted by the Polish Central Statistical Office in 2014 and 2016. In their samples of more than 340,000 and 390,000 employees, about 35% worked in foreign-owned firms.

Nominal monthly earnings, including bonuses, before taxes (in Polish Zlotys), are deflated by the local CPIs with 2014 = 100. As Table 1 shows, there is a substantial (albeit decreasing) raw wage advantage to those workers whom foreign-owned firms employ: the mean log wage differential is 0.431 log points (or 53.9%) for 2014, 0.370 log points (or 44.8%) for 2015, 0.348 log points (or 41.7%) for 2016, and 0.327 log points (or 38.7%) for 2017. This is similar to the raw foreign-domestic wage differentials deduced from the Structure of Wages and Salaries by Occupation surveys conducted by the Polish Central Statistical Office in 2014 and 2016: 34-56% in Broniatowska and Strawiński (2021) and 64% in Magda and Sałach (2021).

Table 1. Selected descriptive statistics

	2014	**2015**	**2016**	**2017**
Mean log wage foreign	8.760 (0.667)	8.633 (0.623)	8.630 (0.589)	8.625 (0.553)
Mean log wage domestic	8.329 (0.621)	8.263 (0.575)	8.282 (0.518)	8.298 (0.488)
Mean log wage differential	0.431	0.370	0.348	0.327
N obs. foreign	28,121	41,501	34,408	35,379
N obs. domestic	41,929	63,597	48,772	52,312
N obs. total	70,050	105,098	83,180	87,691

Standard errors in parentheses.

For each respondent, there are a large number of variables measuring personal attributes (gender, age, education, tenure at the current workplace, hierarchical position), workplace attributes (firm ownership, firm size, sector of employment, industry, department, wage, and job search strategy prior to the current job) and local labor market conditions (region and city size). There are noticeable differences in workforce composition depending on ownership type. On average, our sample's foreign firms employ younger and better-educated workers than their Polish-owned counterparts. The share of male workers in foreign firms is slightly higher than in domestic ones (61.6% *vs*. 57.8%). More than one-half (68.2%) of workers in foreign firms are employed in large enterprises with more than 250 employees; medium-sized enterprises employ 21.9%, small firms – 7.7%, and micro-firms – 2.2%. For domestic entities, these statistics are 27.6%, 30.0%, 27.2%, and 15.2%, respectively. Considering hierarchical organizational position, the share of rank-and-file employees is higher in domestic firms (28.0%) than in foreign-owned firms (18.1%). The shares of specialists and team leaders are higher in foreign firms: 55.0% *vs*. 47.8% and 21.8% *vs*. 19.1%, respectively, while the shares of directors and top managers are the same (5.1%). In addition to identifying their affiliation with foreign-owned or domestic firms, a unique and relevant aspect of our data is each individual's assessment of their proficiency in English, German, French, Russian, Italian, and Spanish. Using this information, we constructed a foreign-language-proficiency index for each respondent. The average value of this index for those employed in foreign-owned firms is much higher than for those working in domestic firms: 0.518 *vs*. 0.412.

There are also differences in the distribution of employees among industries, departments, administrative regions, and city/town size. The most notable differences are observed in heavy industry (13.9% of workers in foreign firms *vs*. 7.0% of workers in domestic firms), construction (5.2% *vs*. 10.9%), banking (9.1% *vs*. 3.6%), light industry (16.9% *vs*. 11.6%), trade (12.8% *vs*. 16.6%), IT department (15.0% *vs*. 10.6%), customer service department (8.2% *vs*. 11.1%), finance & accounting department (10.7% *vs*. 7.9%), administrative board office (4.2% *vs*. 6.9%), and logistic & purchasing department (6.6% *vs*. 4.5%). The regional distributions of workers are quite similar, with most respondents residing in Mazowieckie (capital) voivodship: 26.5% of those employed in foreign firms and 19.1% of those in domestic firms. The predominant majority of foreign firm workers (53.3%) reside in cities with a population over 500 thousand, compared to only 37.5% of domestic firm workers.

4. Estimation Method

Our examination of the foreign-domestic wage differential is based upon the estimation of the following Mincerian (1974) wage equation (in what follows, we drop the subscript i to simplify the notations):

$$lnW = \alpha FOREIGN + \beta X + \varepsilon \quad (1)$$

The dependent variable is the logarithm of an individual's monthly salary W; *FOREIGN* is a dummy variable equal 1 if foreign-majority-owned firm and 0 otherwise; X includes a constant term and a set of standard variables that control for personal, job, firm, and regional characteristics; α and β is the set of parameters to be estimated; and ε is the error term.

It should be noted that OLS estimates of α may be hampered by omitted variable bias resulting from the fact that people who work in foreign-owned firms may also have greater innate abilities (such as cognitive abilities, attitude, motivation, willingness to work hard, entrepreneurial, managerial and organizational skills, *etc*.) as well as a more favorable socio-economic background that would allow them to earn more even without employment in foreign firms. When those traits and other characteristics are not controlled for in the estimation procedures, it may cause OLS to overestimate the true value of α because the estimated premium can reflect the economic returns to these omitted variables as well as the pure causal effect of foreign ownership. The possible ways of dealing with the bias mentioned above typically include finding appropriate proxies for the unobserved factors and/or applying specific econometric techniques. However, in this paper, we cannot resort to these solutions because no suitable proxy variables, or instrumental variables, or repeated measurements are available in the dataset, and no validation studies exist in the literature.

It is also worth noting that, compared to random samples, voluntary response samples may be prone to self-selection bias because they include only those people who voluntarily chose to participate in the survey. We tested our data set against the official data of the Polish Central Statistical Office and found that our sample is representative across several socio-demographic characteristics. Furthermore, our sample is very similar to those in Magda and Sałach (2021) and Broniatowska and Strawiński (2021), who used the Structure of Wages and Salaries by Occupation surveys conducted by the Polish Central Statistical Office in 2014 and 2016. Hence, we can rule out the presence of a strong self-selection bias, which increases our confidence in the quality of our data set.

5. Estimation Results and Discussion

5.1 Foreign Ownership Wage Premium and Its Dynamics

As mentioned in Section 3, throughout the 2014-2017 period, we observe a substantial (albeit decreasing) raw log wage advantage to those workers who are employed by foreign-owned firms (see Table 1). However, the statistics above on foreign-ownership wage differential may be misleading, as they do not control for differences in the socio-demographic and job characteristics of workers employed in domestic and foreign-owned entities. Hence, in addition to the *FOREIGN* dummy in Eq. (1), our regressions include many worker and job characteristics (see the Notes to Table 2).

Panel A of Table 2 shows the OLS estimates of the coefficient on a dummy variable *FOREIGN*. The results show that, once the differences in personal, work, and

workplace characteristics are controlled for, the difference in wages between foreign-owned and domestic private companies in Poland appears much smaller than in a simple comparison of average raw log wages in Table 1. *Ceteris paribus*, the foreign-ownership wage premium is 0.204 log points (or 22.6%) for 2014, 0.157 log points (or 17.0%) for 2015, 0.152 log points (or 16.4%) for 2016, and 0.126 log points (or 13.4%) for 2017.

Table 2. Selected estimation results

	2014	**2015**	**2016**	**2017**
A. OLS regression	0.204 (0.004)	0.157 (0.003)	0.152 (0.003)	0.126 (0.003)
R-sq.	0.594	0.634	0.659	0.653
B. Quantile regression				
10th percentile	0.169 (0.006)	0.136 (0.004)	0.122 (0.004)	0.105 (0.004)
R-sq.	0.572	0.606	0.626	0.622
25th percentile	0.183 (0.004)	0.145 (0.003)	0.134 (0.003)	0.114 (0.003)
R-sq.	0.587	0.626	0.651	0.644
50th percentile	0.194 (0.004)	0.150 (0.003)	0.143 (0.003)	0.124 (0.003)
R-sq.	0.593	0.633	0.658	0.652
75th percentile	0.222 (0.005)	0.159 (0.003)	0.154 (0.004)	0.123 (0.004)
R-sq.	0.586	0.627	0.653	0.645
90th percentile	0.257 (0.008)	0.166 (0.006)	0.158 (0.006)	0.131 (0.005)
R-sq.	0.567	0.609	0.636	0.629
N obs. total	70,050	105,098	83,180	87,691

The values in Panels A and B are the coefficients on a dummy variable *FOREIGN* in Eq. (1) for a private firm with majority foreign ownership (a reference category is a private firm with majority Polish ownership) from OLS and quantile regressions (at the indicated percentiles) of log earnings. Additionally, all regressions included: gender (1 dummy), age and age squared, education (6 dummies), tenure at the current job and tenure squared, hierarchical position (7 dummies), index of foreign language proficiency, job search methods prior to current job (9 dummies), number of prior jobs held by the respondent, firm size (4 dummies), industry (13 dummies), department (25 dummies), region (15 dummies), city size (7 dummies), and the intercept. Standard errors in parentheses: White heteroscedasticity robust standard errors for OLS; bootstrapped standard errors (n replications = 50) for quantile regressions. The means of the explanatory variables and detailed regression results are available from the authors upon request.

In order to test the dynamics of the foreign-domestic wage gap over time, we estimated Eq. (1) using a pooled 2014-2017 cross-section data set comprising of 346,019 individuals (not shown in Table 2 due to space limitations). In addition to the explanatory variables listed in the Notes to Table 2, this regression includes three *YEAR* dummies (for 2015, 2016, and 2017) and three interaction terms *FOREIGN*YEAR*. The estimated coefficients (std. errors) are: 0.225 (0.003) on *FOREIGN*, -0.059 (0.004) on *FOREIGN*YEAR2015*, -0.086 (0.004) on *FOREIGN*YEAR2016*, -0.114 (0.004) on *FOREIGN*YEAR2017*; and *R*-sq. is 0.632. These results imply the foreign-ownership wage premium of 0.225 log points (or 25.3%) in 2014, 0.166 log points (or 18.0%) in 2015, 0.139 log points (or 15.0%) in 2016, and 0.111 log points (or 11.7%) in 2017. Six chi-squared tests of equality of the annual total – that is, both direct and interaction – effects of *FOREIGN* are rejected with the *p*-value = 0.0000; thus, confirming our initial observation about the declining foreign-ownership wage premium.

5.2 Distribution of Foreign Ownership Wage Premia

It is clear that over time the foreign-domestic wage gap shrank. However, it is possible that wage gaps at different percentiles of the wage earnings distribution may have registered totally different changes. In order to examine this potential heterogeneity, we analyze changes in the foreign-domestic wage gap at various percentiles of the wage distribution. Panel B in Table 2 presents the estimation results obtained from quantile regressions of log wages on a set of explanatory variables and estimated for all years. Looking across the various percentiles, the estimates suggest that foreign firm employees at the lower end of the earnings distribution (the 10th and 25th percentiles) face a smaller wage gap as compared to those at the upper end. This pattern prevails for all years. Further, a comparison across years shows a noticeable decline in the wage gap at all the percentiles. Finally, the difference between the foreign-ownership wage premium at the 10th and 90th percentiles decreased from 0.088 log points in 2014 to 0.030 log points in 2015, to 0.036 log points in 2016, and to 0.026 log points in 2017.

5.3 Decomposition of the Mean Log Wage Premium

We use the decomposition technique in order to disentangle the contribution of different factors to the observed raw mean foreign-domestic log wage differential ($\overline{ln\,W_F} - \overline{ln\,W_D} = b_F\bar{X}_F - b_D\bar{X}_D$). Since wage decompositions may be sensitive to the particular method used, we adopt an inclusive approach and decompose the wage differential into its components on the basis of several decomposition methods:

Method 1 (Oaxaca-Blinder): $b_F(\bar{X}_F - \bar{X}_D) + (b_F - b_D)\bar{X}_D$ (2)

Method 2 (Daymont-Andrisani): $b_D(\bar{X}_F - \bar{X}_D) + (b_F - b_D)\bar{X}_F$ (3)

Method 3 (Oaxaca-Ransom-Neumark): $b^*(\bar{X}_F - \bar{X}_D) + (b_F - b^*)\bar{X}_F + (b^* - b_D)\bar{X}_D$ (4)

where b_F, b_D, b^* are the estimated parameters β in Eq. (1) excluding *FOREIGN* for foreign firms, domestic firms, and the whole sample, respectively; $\bar{X}_F$, $\bar{X}_D$ are average individual characteristics of employees in foreign and domestic firms, respectively.

For the Oaxaca (1973) - Blinder (1973) approach, the first term is attributed to differences in personal and job characteristics $(\bar{X}_F - \bar{X}_D)$ and the second is attributed to differences in the valuation of these characteristics $(b_F - b_D)$. As this decomposition is not symmetric, several other approaches have been suggested. Daymont and Andrisani (1984) essentially reverse the roles of the two groups. Oaxaca and Ransom (1994) and Neumark (1988) suggest taking into account a common reference coefficient vector (b^*) estimated for the whole sample. Following this approach, the observed log wage differential is decomposed into three components: due to differences in average characteristics of employees in foreign and domestic firms; due to differences between the estimated parameters of the foreign wage regression and the pooled wage regression – a foreign firm advantage; and due to differences between the estimated parameters of the pooled wage equation and the domestic wage equation – a domestic firm disadvantage. As standard in the literature, the portion of the wage gap due to differences in observable characteristics is referred to as *explained*, and the portion due to differences in returns to these characteristics is referred to as *unexplained*.

The three decompositions of the mean log wage differential are summarized in Table 3. Several clear patterns are discernible from these results. First, although the explained portion varies across the three methods, differences in observed characteristics appear to be responsible for most of the wage gap. In 2014, about 44-65% percent of the foreign-domestic wage gap was explained by differences in human capital endowments and personal characteristics. This explained portion increases to about 52-69% in 2015-2016 and to about 59-72% in 2017. Second, the percentage of the wage gap that is explained by different rewards for the same endowments falls, yet it is still quite substantial: the unexplained portion varies from 35-56% in 2014 to about 31-48% in 2015-2016, and to about 28-41% in 2017. Third, across these years, the portion of the unexplained component that may be thought of as a foreign firm advantage (a domestic firm disadvantage) remains stable at about 60% (40%).

Detailed decomposition of the foreign-domestic wage gap showing the role of individual sets of variables is presented in Table 4. Across all years, all the differences in the observed individual and job characteristics between workers employed in foreign and domestic firms contribute to widening the wage gap. The most significant shares of the wage differential are explained by the differences in firm size, hierarchical position, foreign language proficiency, education, geographic location (region and city), and industrial and departmental affiliations. Although their effect is smaller, all other

characteristics, such as gender, age, tenure, and prior labor market history (the number of prior jobs and job search methods), also work towards increasing wage differences between foreign and domestic firms.

Table 3. Decompositions of the foreign-domestic wage differential

Decomposition method		2014	2015	2016	2017
Method 1	due to X	44.2	52.1	55.6	59.3
	due to b	55.8	47.9	44.4	40.7
Method 2	due to X	55.7	59.6	56.4	60.8
	due to b	44.3	40.4	43.6	39.2
Method 3	due to X	65.3	68.9	68.1	72.3
	due to b*	20.8	18.8	18.7	16.5
	due to b**	13.9	12.3	13.2	11.2

The table shows the percentage of the mean foreign-domestic log wage differential that is explained by differences in observable characteristics (due to X) and by differences in returns to these characteristics as well as by differences in the intercept term (due to b). For Method 3: * indicates a foreign firm advantage; ** indicates a domestic firm disadvantage.

As shown by Oaxaca and Ransom (1999), the choice of the reference category does not alter the decomposition of the wage differential into explained and unexplained portions nor the detailed breakdown of the explained portion; on the other hand, a detailed decomposition of the unexplained portion is sensitive to the choice of the reference category. Although this sensitivity makes it difficult to identify the contribution of each of the sets of dummy variables to the unexplained component of the foreign-domestic wage gap, it does not preclude an assessment of temporal variations in the individual components. The detailed decompositions in Table 4 show that a consistent feature over the entire period under consideration is that only two variables seem to be associated with the pronounced foreign firm wage advantage and domestic firm wage disadvantage: age and hierarchical position. Two other variables – gender (male) and education – also confer an advantage upon foreign firm employees while at the same time reducing wages of domestic firm employees but only in 2015-2017. Firm size, industry, department, and city/town size all seem to reduce foreign firm wage advantage, while the intercept gap consistently reduces domestic firm wage disadvantage. Ideally, we would like to pinpoint the relative importance of the various characteristics that contribute to the intercept wage gap; however, this is not possible given the identification problem associated with detailed wage decompositions.

Table 4. Components of the foreign-domestic wage differential, Method 3

Components	due to X	due to b*	due to b**	due to X	due to b*	due to b**
		2014			**2015**	
Gender (male)	0.6	-0.1	0.9	0.9	0.8	1.2
Age	2.4	42.8	53.8	2.0	61.6	58.9
Education	5.7	-0.4	-0.3	6.5	7.8	1.4
Tenure	0.5	-0.0	1.0	0.3	-0.2	0.9
Hierarchical position	8.1	10.8	5.2	8.7	8.5	3.8
Foreign language proficiency	5.7	-3.0	9.1	6.4	0.1	10.0
Prior labor market history	4.9	-1.7	-0.0	4.3	-0.9	0.2
Industry	4.2	-7.5	1.0	6.1	-5.4	1.2
Department	3.7	-8.1	-0.7	3.9	-7.0	-0.8
Firm size	19.3	-53.1	-0.5	19.0	-41.6	1.3
Region	3.6	1.4	2.2	2.2	-1.2	-0.5
City/town size	6.6	-5.2	0.6	8.6	-4.7	1.4
Constant	0.0	45.0	-58.4	0.0	1.1	-66.7
Total	65.3	20.8	13.9	68.9	18.8	12.3
		2016			**2017**	
Gender (male)	1.5	1.3	2.0	2.2	0.3	1.3
Age	1.4	46.0	55.7	2.0	46.0	57.0
Education	5.8	9.4	2.0	5.8	8.9	1.0
Tenure	0.3	0.5	1.5	1.0	-2.3	-1.2
Hierarchical position	11.9	4.8	2.4	11.1	11.5	4.6
Foreign language proficiency	7.2	-0.4	10.7	7.4	-0.6	10.5
Prior labor market history	2.6	0.8	1.0	2.7	-0.8	-0.1
Industry	6.4	-2.8	1.8	6.7	-0.3	2.7
Department	4.4	-6.7	0.2	5.6	-2.7	0.2
Firm size	16.0	-32.0	1.6	16.5	-35.9	0.4
Region	2.7	2.8	3.7	2.9	1.5	2.9
City/town size	7.9	-1.0	2.2	8.4	-2.8	1.5
Constant	0.0	-4.0	-71.5	0.0	-6.3	-69.7
Total	68.1	18.7	13.2	72.3	16.5	11.2

The table shows the percentage of the mean foreign-domestic log wage differential that is explained by differences in observable characteristics (due to X) and by differences in returns to these characteristics as well as by differences in the intercept term (due to b); * indicates a foreign firm advantage; ** indicates a domestic firm disadvantage.

5.4 Discussion

Our analysis shows that differences in observed characteristics appear to be responsible for a predominant portion of Poland's positive foreign-domestic wage gap throughout 2014-2017. At the same time, the unexplained portion of the gap still remains quite substantial, although decreasing. In this section we speculate on the factors that may underlie this phenomenon.

As a matter of fact, foreign-owned firms differ from domestic firms in many other unobservable characteristics – such as being more productive, more profitable, more export-oriented, *etc*. – that were not controlled for in our analysis. First, throughout the entire post-communist period, foreign-owned firms in Poland have been exhibiting higher labor productivity than domestic ones (see, e.g., Hybel, 2018; Jaworek *et al*., 2018). Specifically, during the period considered in this study, labor productivity in firms with foreign capital was 38-46% higher (GUS, 2015-2018). If workers are paid their marginal revenue product, then more productive workers receive higher wages.

Second, foreign-owned firms in Poland seem to be more profitable (see, e.g., Jasiniak and Pastusiak, 2014; Jaworek *et al*., 2018; Szałucka and Szóstek, 2013). Additionally, firms with foreign capital heavily engage in exports where profit margins are typically higher than in the domestic market (Cieślik, 2019). For instance, in 2014-2017, ROE ranged 10.0-11.8% in foreign-owned firms and 5.7-9.7% in domestic firms; ROA ranged 4.3-5.2% in foreign firms and 3.0-5.1% in domestic firms; and the share of total revenue from exports amounted to 30% in foreign firms and 10% in domestic firms (GUS, 2015-2018). Moreover, many foreign firms operate in Special Economic Zones and are exempt from income tax (Ślusarczyk, 2018; Tarka, 2008). As firms share part of their profits with their employees, the foreign firm wage premium may reflect rent-sharing in the presence of profitability differentials.

Third, foreign-owned enterprises in Poland may be associated with greater job insecurity, higher risks of closure, volatility of employment, and worker separations/turnover (Meriküll and Rõõm, 2014; Nehrebecka and Dzik, 2013). As such, foreign-domestic wage gaps may signify compensating differentials for perceived or actual lower job security.

Fourth, the observed foreign-ownership wage premium may be due to the fact that foreign investors may be acquiring domestic firms which already have higher productivity and higher wages before the change of ownership, and hence foreign takeovers work as cherry-picking (Damijan *et al*., 2015; Hagemejer and Tyrowicz, 2012), and hence the positive foreign-domestic wage differential can be attributed to the ex-ante selection bias of investors.

We speculate that the differences as mentioned above between foreign and domestic firms may be responsible, at least in part, for the unexplained portion of the wage gap between these two groups of firms. However, our finding of the declining unexplained portion of the gap may suggest that those differences became less and less

pronounced over time. Indeed, if we extend our gaze over a longer time horizon, we will see an evident pattern of the decreased economic distance between foreign-owned and domestic enterprises in Poland. For instance, comparing 2005 and 2020, we see that the productivity gap between foreign and domestic firms decreased from 84.4% to 35.2%; the gross profit margin in foreign firms decreased from 5.2% to 4.1% while it remained at 4.5% in domestic firms; net profit margin in foreign firms decreased from 4.1% to 3.2% while it remained at 3.7% in domestic firms; ROE and ROA were higher in foreign firms, but the difference in those indices shrank from 3.3% to 1.5% for ROE and from 0.7% to 0.4% for ROA; and the share of exports in total revenue in domestic firms more than doubled while only slightly increased in foreign-owned firms (GUS, 2006, 2021). Jaworek *et al*. (2018) compare the economic performance of foreign and domestic entities in Poland during 1994-2017 and also conclude that the apparent distance between these two groups of firms diminished overall, but especially among the largest Polish leading enterprises from the "Rzeczpospolita 500" list (a ranking of the 500 largest Polish companies classified by revenue).

Next, while early empirical evidence shows the link between foreign ownership status and increased job insecurity or more demanding working conditions in Poland, more recent studies find the opposite. Baumöhl *et al*. (2020) analyze firm survival determinants in four new European Union member states (the Czech Republic, Hungary, Poland, and Slovakia) during 2006-2015. The authors find strong evidence for Poland that foreign ownership significantly increases survival rates. Finally, the 'cherry-picking' argument is not very applicable to Poland, as foreign businesses expanded their operations to Poland mainly through greenfield investment: cumulatively, during 2005-2020, 18,968 new entities with foreign capital were registered, out of which only 17.3% were M&A and 82.7% were greenfield companies (GUS, 2006-2021).

6. Concluding Remarks, Limitations, and Venues for Future Research

In this paper, we examined the foreign-domestic wage differential in Poland during 2014-2017. The empirical analysis showed that during this period, there was a substantial (albeit decreasing) raw wage advantage to those workers whom foreign-owned firms employed. This differential reduced significantly after controlling for personal, work, and workplace characteristics. Foreign firm employees at the lower end of the earnings distribution faced a smaller wage gap than those at the upper end; the wage gap showed a noticeable decline at all the percentiles over the years. Wage gap decompositions revealed that a predominant portion of the wage differential was due to differences in observed characteristics; nevertheless, a substantial portion of the wage gap remained unexplained. The unexplained portion of the wage gap may be attributed to various unobserved factors that were not considered, for instance, the different economic performances of foreign-owned and domestic firms. The fact that

those differences became less and less pronounced over time may be responsible, at least in part, for the shrinking foreign-ownership wage premium.

As with all studies, there are limitations. First, this study uses cross-sectional data and, hence, can only comment on the correlations among variables. Second, despite the inclusion of many control variables, omitted variable bias/endogeneity might potentially stem from unobserved characteristics. In empirical models, various unobserved characteristics likely correlate with both the outcome variable (wage) and the predictor variable (employment in a foreign-owned firm). Jaworcik (2015, p.76) pointed out that "examining the causal effect of foreign ownership on wages is quite challenging due to the demanding data requirements. Ideally (…) one would like to trace the pay of individual workers who are continuously employed in firms that change ownership and control for unobservable worker heterogeneity as well as firm heterogeneity." Obviously, that is not feasible with our cross-sectional data and a limited number of explanatory variables. In a companion paper, we attempt to explore possible causal links between foreign ownership and wages using different economic gravity measures as well as the historical partitions of Poland as instrumental variables. In summary, we recognize that our research provides only a first step in understanding the relationship between the type of ownership and wages in Poland. Clearly, we need to know more about the causal mechanism that underlies the interaction between these concepts.

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