

Martins, Pedro Silva

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Do Foreign Firms Really Pay Higher Wages? : Evidence from Different Estimators

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Pedro S. Martins

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Pedro S. Martins

*Queen Mary, University of London
and IZA Bonn*

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
Email: iza@iza.org

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ABSTRACT

Do Foreign Firms Really Pay Higher Wages? Evidence from Different Estimators*

We contribute to the literature on Foreign Direct Investment and labour markets by examining wage differentials between domestic and foreign firms, drawing on a large Portuguese matched employer-employee panel. Using OLS, the foreign-firm premium is large and significantly positive but falls substantially when firm and worker controls are added. Moreover, the premium also does not vary monotonically with foreign control, it increases along the wage distribution and it is generally insignificant when using propensity score matching. Finally, using differences-in-differences, we find lower wage growth for workers in domestic firms that are acquired by foreign investors, a result that holds when combining differences-in-differences and propensity score matching. Overall, our evidence suggests that the commonly-documented OLS premium cannot be interpreted as a causal impact.

JEL Classification: C23, F23, J31

Keywords: FDI, wages, matched employer-employee data, propensity score matching, Portugal

Pedro S. Martins
Centre for Business Management
Queen Mary, University of London
Mile End Road
London E1 4NS
United Kingdom
Email: p.martins@qmul.ac.uk

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1. Introduction

Globalisation, or increasing international economic integration, is arguably one of the main forces that have shaped the world since the second half of the 20th century. The increasing ubiquity of the many symptoms of globalisation, in particular the large trade, investment and worker flows, has therefore led to substantial interest in the economic impacts of these changes. As the economic domain that plays the greater direct role in the determination of people's welfare, the labour market has received considerable attention by economists interested in evaluating the consequences of globalisation.

One specific aspect of this topic that has sparked controversy is the impact of foreign firms on wages. On the one hand, many individuals and organisations, mostly outside academia, claim that multinational firms pay lower wages, especially in developing countries, and present that view as a key motivation for their opposition to globalisation. However, on the other hand, this topic boasts a clear stylised fact within academic circles, which argue precisely the opposite of what is asserted by the opponents to globalisation: as discussed below, an overwhelming majority of studies finds that foreign-owned firms pay higher wages, to equivalent workers, than their domestic-owned counterparts.

This is a debate of great importance also for policy-makers across the world, who have in many cases invested large amounts of public funds in order to attract foreign multinationals to their economies, arguing that the presence of these firms could be an important source of increased prosperity. One channel of such presumed impacts includes the employment created by such foreign-owned firms and the higher wages they are perceived to pay, at least when one takes into account most of the available academic research.¹ In this context, it is also important to make sure that foreign direct investment does indeed lead to the creation of high-wage firms.

A final motivation point concerns the debate about the relative importance of international trade and technology in explaining the increasing wage inequality observed in some countries, in particular the U.S. and the U.K., since the 1980's (Feenstra and Hanson, 1999). Regardless of whether one considers FDI by itself or as component of trade, it is also of interest from the point

¹ Another channel, arguably the most important one, concerns the possible (productivity) spillovers to domestic firms. In this case, recent literature surveys (see Görg and Greenaway, 2004) find, at best, mixed effects.

of view of this literature to assess whether increasing FDI flows can explain higher wage inequality in host countries. Of course, this will be the case if similar workers are paid different wage rates depending on the nationality of their firms, which would be consistent with the observed increase of within or residual inequality.

In this context, this paper aims at examining the robustness of the wage premium attributed to foreign firms by previous research. In particular, we try to assess whether that premium can be understood in terms of a *causal* impact of the firms' ownership type (domestic or foreign) on wages. This causal impact is, in our view, the parameter of interest should one want to understand the consequences of this aspect of globalisation (its link with wages), rather than simply to describe a statistical result.

Our methodology involves studying differences in pay between workers in foreign and domestic firms using different econometric methods, each of them drawing on different assumptions and focusing on different aspects of the wage determination process. Such variety of methods is facilitated by our use of a large matched employer-employee panel data set, covering more than five million workers-year in the Portuguese labour market over the 1991-99 period. Portugal is also an interesting case study, as it has received large inflows of Foreign Direct Investment, particularly since European Union accession in 1986. Moreover, wages in Portugal have been the lowest in the European Union up to the 2004 enlargement: this may possibly make it more likely to observe higher wages in foreign-owned firms.

As to our results, when using standard (OLS) methods we find that foreign firms (defined in different ways) pay higher wages. However, this result does not hold with different econometric methods. For instance, we do not observe a higher wage premium for firms that exhibit a stronger degree of control by foreign parties. More importantly, the result of a significantly positive wage premium is not obtained when workers in domestic and foreign firms are matched by their propensity scores. The same occurs when we look at the same set of workers before and after their initially-domestic-owned firms are acquired by foreign investors and compare that with workers whose firms remain domestically owned. Overall, we interpret our results as indicating that there is not a causal effect of foreign ownership on wages.

The structure of the paper is as follows. Section 2 briefly surveys some of the key contributions in the literature on the foreign-firm wage premium and critically evaluates their possible theoretical underpinnings. Section 3 presents the data set used and some descriptive statistics. Section 4 presents the results, obtained under different estimators. Finally, Section 5 concludes.

2. Literature and Theory

As mentioned in the introduction, the empirical literature that examines the impact of foreign firms on host-country labour markets typically finds that such firms pay higher wages. Below we briefly summarise some of the main contributions.

In an important study, Aitken et al. (1996) use establishment level cross-sections for Mexico, the USA and Venezuela and find evidence of higher wages in foreign firms in the three countries covered. Using OLS, the premium ranges between 38% in Mexico and 12% in the US, across different specifications. Feliciano and Lipsey (1999) focus on the US case using industry-state-ownership cell averages and again find evidence of a positive wage differential. This differential however disappears (although only for the manufacturing sector) when controls for firm characteristics are added. Griffith and Simpson (2003) present estimates for the U.K., finding in all specifications positive premia for foreign firms.

In research that focuses only on developing countries, Lipsey and Sjöholm (2001) study the Indonesian case and find a premium of 12% for blue-collar workers and 22% for white-collar workers. The results are obtained by drawing on a 1996 cross-section of plants and regressing average wages on plant characteristics, including their domestic or foreign ownership type. Velde and Morrissey (2003) examine the cases of five African countries (Cameroon, Ghana, Kenya, Zambia and Zimbabwe) and again find that foreign firms pay higher wages (the premia range between 8% and 23% across the countries). Similar results are also documented for Ghana by Görg et al. (2002).²

² Another strand in this literature adopts a difference-in-differences approach at the wage differences following the acquisition of domestic firms by foreign investors. These studies, which also generally conclude that wages increase in firms that undergo acquisition, are examined in Section 4.5. A different strand, not directly related to our topic in

From this brief literature survey, one concludes that there is a great degree of agreement in the empirical research about the wage practices of foreign firms in host labour markets: foreign firms pay higher wages to equivalent workers. One also notices that most papers draw on similar research methodologies, namely by applying OLS to firm-level data. However, it is well known that a causal interpretation of these findings under OLS requires the (strong) assumption of orthogonality of firm ownership with respect to the error term. Moreover, domestic and foreign firms typically display very different (observable) characteristics. For instance, it is not uncommon that the average size (number of workers) of foreign firms is at least five times that of the average size of domestic firms. To this extent, given the different supports for each type of firms, the quality of like-for-like comparisons produced by OLS may be poor, leading to biased results. These hypotheses (about orthogonality and the quality of comparisons) are explored in greater detail in Section 4.

Before that, we present and critically evaluate some theoretical views that have been put forward to explain the stylised fact that foreign firms pay higher wages. From our reading of the literature, we consider the following four possible views: increased labour demand, rent sharing, compensating differentials, and unobservable heterogeneity.

The first explanation is that foreign firms, as they enter the domestic country, may increase labour demand. This will necessarily occur in the case of greenfield investments. It may also possibly occur in the case of acquisitions – the most predominant method of entry for foreign firms in developed countries – if, for instance, (foreign) multinationals³ decide to expand production in the host country beyond the previous output level of the acquired firm and that implies hiring additional workers. Moreover, should the labour supply curve be positively sloped, then wages for the marginal workers hired by multinationals will be higher than those of infra-marginal workers.

One concern with this and other similar views is that the nationality of the firm *per se* would not be expected to matter, in the sense of being a key determinant in the increase of labour demand: the same increase would also apply to domestic firms that entered the market or increased their

this paper, looks at wage spillovers from foreign to domestic firms: see Aitken et al (1996) and Feenstra and Hanson (1997).

³ Throughout the text we use “foreign firms” and “multinationals” interchangeably: Portuguese firms with subsidiaries abroad are considered as domestic firms for the purposes of this paper.

workforce. Moreover, it is important to stress that the higher wages paid by foreign firms would critically depend on the labour market not being sufficiently competitive. Otherwise, the wage differentials would not be sustained for long as the rents of workers in (new and/or expanding) foreign firms would be competed away via worker mobility from domestic firms. If, on the other hand, labour markets are competitive, such wage differentials would probably not even arise in the first instance, as labour supply curves under competitive markets would be essentially horizontal: this is precisely the standard view in neoclassical trade theory.

At this stage, we should underline that a competitive labour market model is unlikely to apply in the case of many countries. This is particularly true for Portugal, the country studied in this paper, given the rigidities brought by institutions (namely labour law) and other non-competitive forces.⁴ In this context, our choice of the country under study biases our analysis against the rejection of the hypothesis of a foreign-firm premium, at least under the labour demand explanation. In other words, since the labour market presents many non-competitive features, it is more likely that higher wages in foreign firms will not be competed away by workers in domestic firms and that new or expanding firms will face a positively sloped labour supply curve.

A second possible explanation is that multinationals may pay a wage premium to dissuade workers from moving to other firms or disrupting activity. This is consistent with the Ownership-Location-Internalisation model of Dunning (1977), in particular with the internalisation motive.⁵ Under this model, foreign firms own special assets (e.g. new products or technologies) that are more profitably exploited abroad via FDI than via exporting (or franchising schemes). Foreign firms would then pay higher wages in order to prevent the costly turnover which would occur once quitters provided insights about the multinationals' specific assets to competing firms (see Fosfuri et al., 2001). Alternatively, or complementarily, foreign firms may share with workers some of the rents produced by those assets, driving their wages above those of comparable individuals working in firms that do not generate such rents.

⁴ For instance, Blanchard and Portugal (2001) highlight the large burden to economic efficiency brought by restrictive firing regulations. Portugal and Cardoso (2003) also do not find any employment effects of minimum wage laws, unlike what one expects in a competitive market. Additionally, Martins (2004c) presents evidence of substantial levels of rent sharing.

⁵ Other prominent models of FDI, such as the vertical, horizontal and capital-knowledge models, are more difficult to be applied in the context of pay determination. But see Markusen and Venables (1997) for a study of the role of multinationals in explaining wage inequality (between skilled and unskilled workers) and Martins (2004b) for an examination of different FDI models using U.S. domestic and multinational labour market data.

Although this type of explanation is appealing, it again raises some concerns. One issue is that, while foreign firms may indeed generate rents, such firms are also likely to have stronger bargaining power than domestic firms, since they may easily shift production (and thus employment) across countries (see Caves, 1996, pp. 123-131). It is therefore ambiguous whether the rent sharing effect would outweigh the bargaining power effect. Martins (2004d) compares the extent of rent sharing in domestic- and foreign-owned firms in Portugal and finds evidence consistent with stronger bargaining power effects as the results reject the hypothesis that workers in foreign firms benefit more from rent sharing than similar workers in domestic firms.

Another concern is that this rent-sharing view assumes that foreign firms are more likely to draw on special assets than a *representative* domestic firm. In other words, it may not be “foreignness” itself that drives the pay gap, but rather the differences in the (average) characteristics of domestic and foreign firms. In this case, one again cannot interpret the pay differences between the two types of firms in a causal way.

A third explanation for the stylised fact that foreign firms pay higher wages is about compensating differentials. For instance, multinationals may provide less interesting job amenities than domestic firms. Workers would thus have to be compensated in the form of higher wages in order to take jobs in foreign-owned firms. Although this view is theoretically reasonable, it of course implies that workers are not better-off in foreign-owned firms. Moreover, the little evidence available, including Sutherland (2002) and Brown et al (2003) for developed and developing countries, respectively, suggests that working conditions are better in foreign firms. The first paper finds that workers exhibit higher levels of job satisfaction in foreign-owned firms while the second suggests that working conditions are more enjoyable in foreign firms. In their study of Portugal, Mata and Portugal (2002) also find no differences in exit probabilities between domestic and foreign firms: workers would therefore be expected not to demand a pay premium which would compensate them for a higher probability of displacement when employed by a foreign firm.⁶

⁶ Görg and Strobl (2003) find mixed results for the case of Ireland: foreign firms are more likely to exit but the jobs they create are more persistent.

Finally, foreign firms may select workers that are more skilled in dimensions unobservable to the researcher. For instance, given the larger size of multinationals, both when considered individually in each host country and particularly when taken jointly in all countries in which each firm operates, these enterprises may benefit from scale economies in setting up sophisticated human resource departments. This would allow these firms to screen and hire the best applicants for their vacancies, possibly also along dimensions of skill not observable by the researcher. Under this case, the wage differential attributed to multinationals would be spurious in the sense that no causal impact of foreign ownership upon wages could be inferred. This also means that evidence of wage differentials should not necessarily support the case for government intervention, to the extent that foreign firms are not effectively paying higher wages to comparable workers.

Overall, we conclude in this section that there are few, if any, theoretical reasons to reconcile the empirical stylised fact of a foreign-firm wage premium with a causal relationship between foreign ownership and pay. Moreover, the little empirical evidence available does not support such theoretical explanations. The strongest account is probably that labour markets are not sufficiently competitive, but even this view does not highlight any reasons why foreign firms would be different from similar domestic firms. This conclusion provides further motivation the empirical work carried out in this paper, in which we examine the robustness of the stylised fact about pay differences between foreign and domestic firms.

3. Data

Our analysis draws on a large matched employer-employee data set, “Quadros de Pessoal” (Personnel Records). This is a compulsory survey run by the Ministry of Employment and which covers all firms located in Portugal with at least one employee. Those firms are required to provide information on an annual basis about their characteristics and those of their workforce. The former variables include geographical location, industry, sales and the share of the firm’s equity owned by foreign parties. The set of worker characteristics includes gender, highest qualification, tenure, wages and hours worked.

There are also unique (time-invariant) identifiers for each firm and each worker that allow each one of them to be followed over time. Information for each worker-year also includes his/her employer's identifier, allowing for the matching of the two sides of the labour market. It should also be mentioned that particular care is placed on the reliability of the information, as that is used by the Ministry of Employment for the purpose of checking the employer's compliance with labour law.

The data set considered here is an 80% representative sample of all manufacturing sector firms. The information refers to each year in the period 1991-99 and to a specific month of each year (March up to 1993 and October from 1994 onwards). There is also information on all workers of each firm sampled in each year.⁷ This amounts to an annual average of about 678,000 workers per year and 29,481 firms (and a total of 71,240 different firms over the nine years). After dropping observations with missing or inconsistent information in key variables and firms based outside continental Portugal we obtain a data set with an annual average of 601,000 workers and 16,935 firms (and a total of 39,783 different firms).

The foreign/domestic firm ownership type classification is derived from the share of equity held by foreign nationals. We define as foreign firms those for which at least 50% of equity is owned by foreign parties,⁸ and we obtain an annual average of 16,557 domestic and 378 foreign firms. These firms correspond to 434,000 workers in domestic firms and 62,600 workers in foreign firms – the yearly data are available on Tables 1 (workers) and 2 (firms). This large share of workers in foreign firms is also in line with the considerable flows of inward FDI in Portugal, especially since European Union membership in 1986 – over the 1990's, such flows averaged about 7% of GDP per year.

⁷ This means there is attrition in the panel at the firm level but not at the worker level, in the sense that only the workers of the firms that are not sampled in a given year will not be present in the data.

⁸ Some authors use a 10% threshold, in line with the International Monetary Fund criterion that distinguishes between portfolio and direct foreign investment flows. We have opted for the 50% level instead because we want to focus on the impacts of foreign firm ownership (and not of firms with some positive level of foreign participation). However, we acknowledge that, in our data, a 50% foreign-ownership share is not either a necessary or a sufficient condition for foreign control, since there may be more than one foreign or domestic investor per firm. For the benefit of robustness, we present in the Appendix an analysis of our data using the 10% threshold – see Tables A1a and A1b. We find little differences from the results documented in the main text. There is only a small increase in the percentage of workers in foreign firms (from 13% to 16%), suggesting that most firms with a positive level of foreign ownership are above the 50% threshold. These results are also consistent with those of Barbosa and Louri (2002).

The descriptive statistics reveal some important differences between foreign and domestic firms. For instance, in all measures of earnings (monthly or hourly), workers in foreign firms earn more than their counterparts in domestic firms. In 1991, for example, the average worker in a foreign firm earned €91 per month (2000 prices), whilst the average worker in a domestic firm earned only €28, implying a pay premium of 30.9%. In the end of the decade, the corresponding values were €63 and €28 (and a pay premium of 37.4%).

These differences in earnings can be partly explained by differences in schooling attainment: workers in foreign firms are found to have an (unweighted) average of 6.9 years of schooling across the nine years covered, whereas the same figure for workers in domestic firms is only 5.8. On the other hand, workers in domestic firms are found to be more experienced. This is partly due to their lower schooling, as we are measuring Mincer experience (age-experience-6).

As to the distribution of workers by industries, again there are clear differences between domestic and foreign firms. A particularly striking contrast is the over-representation of foreign firms in the Metallic and Transport industry (43% of workers against 19%). In an opposite direction stands the Textiles, Clothing and Leather industry (29% of foreign workers versus 38% of domestic workers) and the Wood and Cork industry (1% versus 8%). These differences have also a geographical dimension, as workers of foreign firm are relatively more prevalent in the Lisbon region (40% versus 23%) and less prevalent in the North region (40% versus 52%).⁹

A complementary way to establish the contrast between domestic and foreign ownership can be pursued by looking at firm (rather than worker) unweighted averages, i.e. without weighting firm characteristics by their firm size. This exercise – see Table 2 – reveals even stronger pay differences between foreign and domestic firms. For instance, in 1999, the average multinational paid €889 to an average worker (€502 for the average domestic firm), which amounts to a pay premium of 77.1%, more than twice the premium documented for same year in Table 1.¹⁰

⁹ See Guimarães et al. (2000) for a study of FDI agglomeration in Portugal.

¹⁰ An important explanation for this difference between the worker and firm data lies on the fact that foreign firms are, on average, much bigger, at least in terms of the number of workers. Foreign firms have an average of 190 workers whereas domestic firms have an average of only 32 workers. This helps in understanding the very large pay difference, as it is well known that smaller firms pay lower wages (Brown and Medoff, 1989, and Oy and Idson,

4. Results

4.1 OLS estimator

In this section, different versions of the following wage equation are considered:

$$y_i = X_i' \beta_1 + F_{j(i)}' \beta_2 + \beta_3 \text{Foreign}_{j(i)} + \varepsilon_i \quad (1)$$

y_i denotes the logarithm of real hourly wages. X_i denotes a set of human capital characteristics (six dummies for educational attainment, a quartic in experience, a quadratic in tenure – measured in months, and a female dummy). $F_{j(i)}$ denotes a set of characteristics of the firm j of worker i (four regional dummies, log number of workers, a dummy for public firms and eight industry dummies¹¹). $\text{Foreign}_{j(i)}$ is a dummy variable taking value 1 if the firm of worker i is a multinational and 0 otherwise. Our attention is focused on the β_3 coefficient.¹² ε_i is the error term.

The first version of equation (1) includes only the foreign dummy. In this case, the wage premium for workers in foreign firms is found to average 32%, ranging between 27% and 37% across the different years – see the first row of Table 3. However, as suggested before, these wage differences may be attributed to different levels of human capital. Indeed, it is found that, when one controls for these variables, the (unweighted) average premium falls to 27% (ranging between 23% and 32%). Finally, when firm characteristics are also considered, the premium falls further and more substantially than when human capital variables were added. The average premium is now only 11%, ranging between 8% and 13%.¹³

1999), although it is less well known why this is so. No other major differences are found in terms of the industry or geographical distributions of domestic and foreign firms in the firm statistics table.

¹¹ A new industry code was adopted in 1995. We use the old, more-aggregated version (“CAE-Rev.1”). Given that some firms are not available in our sample in the period 1991-1994 and there is not always an unequivocal correspondence between the industry codes over the two periods, their industry code was obtained from extrapolating from the changes observed in such codes for firms present in both periods (1991-94 and 1995-99).

¹² This coefficient is discussed in terms of percentage differences in wages, after taking into account the logarithmic transformation of wages.

¹³ As to time trends, there is some evidence, in the first and second specifications, of increasing foreign multinational wage premia between 1991 and 1995, when they peak, and declining premia from then until 1999. This pattern is however not present in the specification that includes both human capital and firm controls.

Overall, these results, which are in line with those of studies for other countries, suggest that about two thirds of the average difference in pay between domestic and foreign firms are determined by the different human capital of their workers and, more importantly, by the different characteristics of foreign and domestic firms. However, at 11%, the pay gap between domestic and foreign firms is still economically significant and may suggest an important effect of multinationals on wages.

The previous results assume a constant pay premium for different industries. But there are many reasons for one to expect that foreign wage differentials depend on the industry examined. For instance, following the theoretical discussion in Section 2, multinationals in technology-intensive industries may have to pay larger premia in order to prevent the dissemination of their new methods to competitors via workers' mobility. However, in other industries, multinationals may see no need to pay above market wages. Indeed, under the case of vertical FDI (which is the case that probably best fits Portugal, given its relatively small domestic market), multinationals may choose a given host country precisely in order to pay lower wages.

We examine this possibility, by allowing the multinational premium to depend on the industry. Table 4 presents the results: the first eight main rows denote the average industry premia, the following row refers to the average foreign firm premium and the last eight rows present the industry-specific premium. The comparison group (dropped dummy) is the Clothing, Textiles and Leather industry, the biggest one in our data and also one of the industries that pays the lowest premia.¹⁴ In contrast, the four industries that exhibit higher average premia are Paper, Chemicals, Non-Metallic Minerals and Metallurgic sectors.

As to the differences in the multinational premium, the industries in which the premium is larger are Food, Wood, Paper and Chemicals, where the average additional premia range between 26% (Food) and 17% (Chemicals). In the remaining industries, Clothing, Non-Metallic Minerals, Metallurgic, Metallic and Others, the average additional premia range between 8% (Non-Metallic Minerals) and 0% (the dropped industry, Clothing).

These findings may represent some mild support for the hypothesis described above about different incentives across different industries to pay above-market wage rates. For instance,

¹⁴ See Martins (2003) for a study of wage determination in this industry.

Chemicals pay higher foreign premia and are probably a good example of an industry where patents and other inputs that generate rents are prevalent. On the other hand, Clothing, which pays the lowest wages and the lowest foreign premium, may be a good example of an industry that draws on standard technical processes.

4.2 Different levels of control

In this section, we test the hypothesis that a greater share of foreign ownership leads to a greater foreign premium. One can argue that this would occur under the case of a causal impact of foreign ownership upon wages. We test this hypothesis by allowing the wage impact of foreign firms to differ depending on the degree of control of the firm by the multinational, as implicit in the share of the firm's equity held by foreign parties.

Our first approach is to generate different dummy variables for firms with different shares of foreign control: 1%-9%, 10-19%, ..., 40-49%, 50-59%, ..., 90%-99% and 100%. We find that, within the group of firms which are considered as foreign-owned, the most prevalent category is that of full foreign control (which accounts for 60% of workers in foreign firms) and then that of 90%-99% (20% of workers). Within the group of firms that have less than 50% foreign shares, they correspond to between .5% and 2% of the workers in domestic firms.

We find – see Table 5a – positive premia for all workers whose firms have some positive share of equity held by foreign parties, regardless of the size of that share. For instance, firms with a share of equity of between 1% and 9% pay their workers, on average across the decade, 12% more than similar workers in firms without any share of equity held by foreigners.

Although average premia are higher in the 50%-100% range than in the 1%-49% range, there is no clear evidence of a monotonic relationship between premia and the share of foreign ownership. This result weakens the case for a causal relationship between the degree of control and the wage differential. However, one must bear in mind the relatively low number of workers in firms that exhibit low but positive levels of foreign ownership. This may explain the considerable volatility in the estimates for lower levels of foreign ownership at different years.

As a further check on this link between the degree of foreign control and the wage premium, we also investigated the wage difference between domestic and foreign firms when the latter are defined at different thresholds. Here we consider ownership starting alternatively at the 10%, 20%, 30%, 40% and 50% levels and compute the premium accordingly. Taking into account the hypothesis described above that greater control translates into a higher premium, we expect that the greater the ownership threshold, the higher the premium.

Consistently with the previous findings, the results – see Table 5b – indicate that there is no monotonically positive relationship between the premium and the level of control. Moreover, in most years the premium is found to fall at higher levels of control. Overall, we believe the results presented in this sub-section are not consistent with a causal link between foreign ownership and wages.

4.3 Quantile Regression

As suggested in Section 2, the commonly documented wage premium of foreign firms may be explained by unobservable differences between their workers and those of domestic firms, particularly amongst the best paid of each group. Under this view, the average wage in foreign firms could be pushed upwards by a longer right tail of the conditional wage distributions for workers in those firms. Such longer tail would represent the higher ability (and wages) of the more skilled workers hired by foreign firms.

This difference between the wage distributions of domestic and foreign firms would however not be uncovered by OLS. This method examines only the impact of regressors on the mean of the dependent variable. In this case, quantile regression (Koenker and Bassett, 1978) can be used instead, as it examines the possibility that the impact of a regressor (the foreign-firm dummy) varies along the distribution of the dependent variable (wages).¹⁵

¹⁵ In the context of inter-industry wage differentials, Martins (2004a) suggests that, if such differentials are explainable by workers' unobserved heterogeneity, then those wage differentials are likely to be more acute at the top than at the bottom of the wage distribution. Quantile regression would then capture the over-representation of high-ability workers in high-wage industries. Unlike in the present paper, no differences in premia along the distribution are found.

We test this hypothesis drawing on equation 1, considering the wider set of controls for firm and worker characteristics. Using quantile regression, we examine the returns at the 75th and 25th percentiles, proxying for the top and bottom of the wage distribution, respectively. We find that the foreign-firm wage premium is generally larger at the top than at the bottom of the distribution – see Table 6. Except for 1991 and 1992, the foreign-firm premium is always statistically larger at the top of the distribution at the 1% level (the tests are carried out using simultaneous estimation of both quantiles) and that the difference is between about 2 and 3 percentage points.

Following the theoretical discussion in Section 2, these findings are consistent with the case of unobserved worker differences driving the foreign-firm premium. Should all workers in foreign firms be of a similar unobserved quality to their counterparts in domestic firms, one would expect the wage premium to be the same along the wage distribution. However, we show here that, although the premium remains positive at the bottom of the distribution, it is even higher at the top. Therefore those workers in foreign firms whose skills place them at the top of their conditional wage distributions benefit from a stronger premium with respect to their counterparts at the bottom of the distribution. This is consistent with the view that workers in foreign firms are more skilled along unobserved dimensions.

4.4 Propensity Score Matching

One concern with OLS estimators is that their “like-for-like” comparisons disregard the possibility of a different support (i.e. range of values of the regressors) between observations with and without some characteristic whose impact is of interest. Moreover, the distribution of characteristics over that region of common support may also be very different between the two groups, further biasing OLS results. Heckman et al (1997) suggests that these two biases (non-overlapping support and different distributions of covariates) are more important than the bias related to selection on unobservables. The latter bias has however received much more attention, at least in the literature on programme evaluation (e.g., job training). In their words, “the simple balancing of observables goes a long way towards effective evaluation” (p. 607).

Propensity score matching (PSM) is a non-parametric method that tackles these issues directly by restricting the analysis over the region of common support (i.e. by only comparing observations that are effectively comparable) and by taking into account the distribution of the regressors across each group under study. The relevance of this method for the analysis conducted in this paper stems from the large differences documented before in terms of the observable characteristics of workers in domestic and foreign firms, particularly along the education, firm size and industry distribution. Failure to take this into account may thus have seriously biased our previous results.

In this sub-section, we implement PSM, using the same annual data sets described before. The variables considered for the estimation of the propensity score are: six education dummies, experience, tenure, gender, log firm size, three region dummies (north, centre and Lisbon) and four industry dummies (textiles, wood, chemicals and metallic). It is this propensity score, obtained via a logit estimation, that will be used to match workers in foreign firms to those in domestic firms, in this case via the one-to-one matching procedure.¹⁶

The first nine rows of Table 7 present the results. The estimates of the foreign firm premium range between -8.9% (1994) and 1.1% (1998), averaging -1.22% over the nine years studied. Most coefficients are not significant. Therefore, the average premium (and, to a lesser extent, its variability across years) stand in clear contrast with the initial findings in sub-section 4.1 and in the literature of a positive and “large” impact of foreign ownership on wages. However, this is not at odds with the subsequent finding in section 4.1 that a more detailed comparison of workers in domestic and foreign firms leads to substantially lower estimates of the foreign-firm wage premium and the finding in sub-section 4.2 of no monotonic relationship between foreign control and the wage differential. Further analysis – not reported here – indicates that these results are due, at least partially, to the differences in the degree of common support observed between the treatment and comparison groups.

¹⁶ Since the estimation proved very time consuming, in particular because the standard errors are obtained via bootstrapping (50 repetitions) and the data set is very large, we use a subset of the original data set in this sub-section. For each year, this subset was made of a random sample of 20% of the observations for workers in domestic firms added to the full sample of workers in foreign firms. Using these smaller samples, we have also examined the robustness of our findings to different matching techniques and different sets of control variables. The results – not reported but available upon request – are qualitatively similar to those presented here.

4.5 Acquisitions – difference-in-differences

The difference-in-differences method involves contrasting the change in a variable of interest in a group of observations that have undergone some treatment with the change in the same variable in a similar group of observations but which have not undergone such treatment. The advantage of this approach is that one is able to control indirectly for variables that may influence the parameter of interest but which may not be available, provided that such variables are time-invariant and the assignment to treatment is random. Here, we apply this method for the case of domestic firms that are acquired by multinationals: such acquisition is the treatment whose impacts are studied vis-à-vis the control group of domestic firms that are not acquired over the period considered.

A similar approach is used in Conyon et al (2002) and Almeida (2003).¹⁷ The first paper uses UK firm level panel data and focuses on the productivity and wage impacts of acquisitions, considering the cases of acquisitions of domestic firms originated by foreign multinationals and those originated by other domestic firms. The authors find evidence of higher wage growth when domestic firms are acquired by multinationals than when domestic firms are not acquired by any firm. However, they also note that the domestic firms that are acquired already exhibit higher levels of wage growth before acquisition than those firms that are not acquired, suggesting some role for “cherry picking”. Another interesting result is that, after controlling for productivity, the wage differential is eliminated,¹⁸ although it is not obvious that one would want to control for productivity differences. If such productivity changes are due to, say, different management practices brought by the new owners, any wage differences that arise should be interpreted as a causal impact of ownership change, even if they can be accounted for by productivity differences.

Almeida (2003) also studies the wage impacts of foreign acquisition using the “Quadros de Pessoal” data set. However, some important differences in relation to what is done in this subsection are that Almeida considers both the manufacturing and non-manufacturing sectors,

¹⁷ Other papers that use this methodology include Girma and Görg (2003) for the UK and Lipsey and Sjöholm (2003) for Indonesia, both drawing on firm-level data. The two papers document higher wage growth for acquired firms, although Girma and Görg (2003) finds that this result applies only to some industries and when the acquirers are of specific nationalities.

but using data aggregated at the firm level. Moreover, foreign ownership (or acquisition) is defined at the 10% equity threshold. If we focus on the case of manufacturing, in order to compare the two sets of results, Almeida's estimates of the foreign firm wage premium fall from 0.16 in the OLS cross-section estimator (a similar value to the 11% premium we estimate using worker-levels regressions) to an insignificant coefficient of 0.02 in the difference-in-differences results. Moreover, as in Conyon et al (2002), important observational differences between acquired and always-domestic firms are also documented, even before acquisition.

Our contribution to this literature is twofold. Firstly, we take the analysis to worker-level data, in order to minimise the aggregation bias implicit in firm-level studies. Secondly, we focus on the same workers before and after acquisition (i.e. we consider only stayers). This should substantially decrease the scope of unobserved heterogeneity to bias our estimates of the foreign ownership effect. Moreover, this approach also means that we do not suffer from the selection biases that may occur when, upon acquisition, firms adjust their workforces, particularly when such changes occur along unobserved dimensions. For instance, the wage increase following acquisition which is documented in Conyon et al (2002) could arise if the foreign owners replace some incumbents with more skilled individuals.

We construct the data set used in this subsection as follows. The control group includes all firms which are never foreign owned over the up to nine years in which such firms are available in our sample. Only two specific years are considered for the wage analysis: the "before" year is randomly selected in the 1991-1998 range, while the "after" year is the subsequent year available in the sample for that firm. (This is not necessarily the "before" year plus one as the panel is unbalanced.) A total of 23,991 firms (and about 250,000 workers) were selected.

The treatment group (domestic firms acquired by foreign parties) was defined as the set of firms whose ownership is initially domestic (i.e. share of equity owned by foreign parties below 50%) and which, in some subsequent year, become foreign owned. Firms following this criterion but in which the foreign acquisition process is reversed at a later stage were dropped. A total of 231 firms (and about 18,000 workers) were found.

¹⁸ Similar results are obtained when the acquisition dummy is instrumented. However, it is not clear whether the instruments used in the paper pass the validity tests, i.e. whether they can be excluded from the main equation and whether they contribute to the explanatory power of the auxiliary regression.

These two groups of firms and workers were found to be very different, as far as their observable characteristics are concerned – see Table 8. The treatment workers are more educated than their control group counterparts. The former are also over-represented in bigger firms and in the metallic industry while they are under-represented in the clothing industry, for instance. The distribution of acquisitions per year, in terms of workers, is also less balanced as in the control group, particularly in 1992 (25% vs 12%) and in 1995 (6% vs 13%). Importantly, there is also a substantial difference in wage growth for each group of workers over the period in which they are followed: the treatment group has an average wage growth of 0.6% whereas for the control group that figure increases to 5.1%.

These differences in wage growth may, however, be due to the different characteristics of each type of workers, and not to the acquisition effect. The impact of the treatment was therefore obtained from running a regression in which the dependent variable is wage growth between the “before” and “after” period, i.e. differences of the log hourly wage, as in the equation below:

$$\Delta y_{it,t-1} = X_{it-1}'\beta_1 + F_{j(i),t-1}'\beta_2 + \beta_3 \text{Foreign}_{j(i),t} + \beta_4 \Delta t_{it} + \varepsilon_{it} , \quad (2)$$

The regressors are the characteristics of the workers and their firms in the “before” period (t-1) and a dummy variable (Foreign) taking value one for workers in firms that become foreign-owned and value zero for workers in firms that are still domestically-owned in the second period. A control for the difference in years between the two periods (Δt_{it}) is also included.

Consistently with the descriptive statistics, the regression results indicate that, after controlling for the differences in worker characteristics, the impact of foreign acquisition on wages is significantly negative, at -3.1 p.p..¹⁹ According to subsequent analysis (not reported but available upon request), this negative result is due to the fact that the domestic firms that are subject to an acquisition are paying wages (conditional of firm and worker characteristics) much above the market rates, with respect to their domestic counterparts that will not be subject to an acquisition. Taking the latter group as the benchmark, pooled cross-section OLS results find that the domestic firms that will be acquired are paying 11.7% more. After acquisition, the acquired

¹⁹ Similar results were obtained when one disregards the panel nature of the data (i.e. if one runs a pooled cross-section regression and focuses on the interaction between the before/after and the foreign dummies). This suggests that, given the controls used, there are not significant unobservable differences across workers.

firms are paying a 7.1% premium while those firms that remain domestically owned are paying only 0.8% more.

As a further check on the robustness of these results, we considered a different control group: those firms that are always foreign-owned. The motivation for this choice is that the latter firms (and their workers) are, from the observable point of view, more similar to the treatment group under study. To that extent one may argue that foreign firms stand as a better control group. It turns out, however, that wage growth is even lower for acquired firms than for always-foreign-owned firms, controlling or not for worker and firm characteristics. From the regression results – see Table 8 –, the coefficient on the treatment dummy is now -0.042 ($-4.1p.p.$).

For the benefit of robustness, a further treatment group was considered: the subset of firms in the former target group that exhibit a positive level of foreign ownership before acquisition. The motivation was to try to control more directly for the possible selectivity involved in the process of foreign acquisition. To the extent that this subset of firms has already been targeted by foreign firms, we may be more likely to capture with our difference-in-differences estimator in this case only the acquisition effect, rather than a combination between the selection and the acquisition effects. However, we found only 26 firms (and 2,578 workers) that satisfy this condition (non-zero but less than 50% foreign ownership before acquisition). These firms (and their workers) also exhibited characteristics which are even more different, with respect to the control group, than our main treatment group (see below). This forced us to abandon this specific robustness analysis.

Coming back to the main results of this sub-section, the findings of negative wage premia can be characterised as surprising, given the opposite stylised fact in the literature. However, this result is not unexpected from the point of view of the literature on takeovers. Here, it has been hypothesised that a key motivation for the acquisition of firms is that such take-overs enable new employers to renege on implicit contracts and to appropriate a larger portion of the surplus produced by employees (Schleifer and Summers, 1988). Other authors claim that mergers and acquisitions are the outcome of a process of improved matches between firms and managers, whereby firms that are being badly run (for instance by paying wages too high given the workers alternative options) are more likely to be taken over (Lichtenberg and Siegel, 1990).

Two other matters should be taken into account. The first is that one has to proceed with care when extrapolating from the wage impact of foreign acquisitions to the wage differences between “standard” multinationals and domestic firms. Possibly a better control group in this analysis would be domestic firms acquired by other domestic investors. Unfortunately, it is not possible to identify these firms given the variables available in this data set. On the other hand, this criticism is, however, attenuated when taking into account the stylised fact that most of the current levels of FDI in developed countries (although lower shares in developing countries) are derived from firm acquisitions and not greenfield investment. Therefore, to a large extent, a “standard” foreign firm was, in fact, in an earlier stage domestically owned. In the specific case of Portugal, over the period 1996-2001, acquisitions (and equity increases) took 39% of net inward FDI, while greenfield investment (establishment of new firms) represented only 2% of that total value of FDI inflows (Ministério das Finanças, 2003, p. 17).²⁰

Another concern, probably more important, is that “cherry picking” may affect the quality of the comparison between acquired and non-acquired domestic firms. This is examined in the next section.

4.6 Acquisitions – difference-in-differences and propensity score matching

In this section, we combine the research approaches of the two previous sections. As mentioned before, this is motivated, *inter alia*, by the findings of Heckman et al (1997) that a difference-in-differences extension of the method of matching is particularly effective in eliminating bias, especially that due to time-invariant unobserved variables. In this case, that of domestic firms acquired by multinationals, there may be an important dimension of “cherry picking” over both observed and unobserved variables. However, the direction of the bias is not so straightforward, as some authors argue that the asymmetry of information inherent in the acquisition of firms may be particularly acute for foreign firms, leading them to pick “lemons” rather than “cherries” (see Gioia and Thomsen, 2003).

To the extent that the unobserved variables are time-invariant, the combined method used here will provide unbiased estimates of the impact of foreign ownership upon wages. To the more

²⁰ The remaining share concerns credits and reinvested profits.

likely extent that some of those variables are not time-invariant but are picked up by the observable variables controlled for in the analysis, our approach will reduce bias. (See Blundell et al, 2004, for an application of this approach to the evaluation of a job search assistance programme.)

In this subsection, we consider as before the same two control groups (always-domestic and always-foreign firms) and the same treatment group (domestic firms that become foreign-owned). In particular, we match workers of acquired firms to workers of always domestic firms along their characteristics in the “before” period. The dependent variable is, however, the change in wages over the two periods, rather than wage levels, as in our earlier propensity score matching analysis.

We find again negative estimates (see the bottom row of Table 8): -1.5 p.p. and -7.8 p.p. for the always domestic and the always foreign control groups, respectively. These results reinforce our previous findings as they suggest that the evidence of lower wage growth documented in the simple difference-in-differences analysis is not due to a poor match between workers in the treatment and control groups.

5. Conclusions

We provide new evidence on the role of FDI in labour markets from the perspective of wages, using detailed Portuguese matched data and drawing on a variety of methods. In contrast with the literature, we conclude that the wage differentials between workers in foreign and domestic firms cannot be easily reconciled with a causal impact from ownership to pay.

Although when using OLS methods we find that foreign firms pay more in unconditional terms – the average premium across the nine years covered is about 32% –, the addition of control variables (worker and, in particular, firm characteristics) substantially decreases the premium to an average of about 11%. There was some mild support for a rent-sharing mechanism, as the foreign premium was found to be larger in some industries that may be associated with higher rents. However, no evidence is found of a positive relationship between the degree of foreign

control and the wage premium of the firm, unlike what would be expected should foreign control have a positive causal impact upon pay.

We also investigate if the foreign premium is constant along the wage distribution. We find that the premium is generally larger for workers at the top of the conditional distributions. This finding of heterogeneity is consistent with the case in which foreign firms select workers that are more skilled in their unobservable characteristics. Moreover, further evidence at odds with a significant wage premium was obtained using Propensity Score Matching, allowing for better like-for-like comparisons. Using this approach, we find a foreign wage premium on average of -1% , ranging between -9% and 1% , and, in most cases, statistically insignificant.

Finally, we examine the wage consequences of the acquisition of domestic firms by foreign firms, in a difference-in-differences framework, considering two alternative control groups. Consistently with the previous results, negative coefficients are obtained. This finding also holds when we combine difference-in-differences with Propensity Score Matching.

Overall, our results suggest that the foreign-firm wage premium commonly documented in the literature is exaggerated due to a combination of two factors: the lack of a proper like-for-like comparison between domestic and foreign firms; and (to a smaller extent) workers' unobserved heterogeneity. Moreover, our results were obtained for a country with a predominantly non-competitive labour market, where one could expect wage differentials to be longer lasting. This feature reinforces the conclusion that our evidence is at odds with causal interpretations of the foreign-firm wage premium.

These findings may have important implications for public policy. For instance, the results suggest that, should governments want to attract high-wage firms, criteria focusing on firm size or industry are more important than the distinction between domestic and foreign firms. In other words, workers would benefit from the presence of more firms with the characteristics of multinationals, regardless of their nationality. Taken together with the recent but increasingly more abundant evidence of weak productivity spillover effects, our findings strengthen the case for policy makers to re-think their strategies as to the attraction of foreign direct investment.

References

Aitken, B., Harrison, A, and Lipsey, R. (1996) “Wages and Foreign Ownership. A Comparative Study of Mexico, Venezuela, and the United States”, Journal of International Economics, 40, 345-371.

Almeida, R. (2003) “The Effects of Foreign Owned Firms on the Labor Market”, IZA Discussion Paper 785.

Barbosa, N. and Louri, H. (2002) “On the Determinants of Multinationals Ownership Preferences: Evidence from Greece and Portugal”, International Journal of Industrial Organization, 20, 493-515.

Blanchard, O. and Portugal, P. (2001) “What Hides Behind an Unemployment Rate: Comparing Portuguese and U.S. Labor Markets”, American Economic Review, 91, 187-207.

Blundell, R., Costa Dias, M., Meghir, C. and Van Reenen, J. (2004) “Evaluating the Employment Impact of a Mandatory Job Search Assistance Program”, Journal of the European Economic Association, 2, 569-606.

Brown, C. and Medoff, J. (1989) “The Employer Size-Wage Effect”, Journal of Political Economy, 97, 1027-1059.

Brown, D., Deardoff, A. and Stern, R. (2003) “The Effects of Multinational Production on Wages and Working Conditions in Developing Countries”, National Bureau of Economic Research Working Paper 9669.

Caves, R. (1996) *Multinational Enterprise and Economic Analysis*, 2nd edition, Cambridge University Press: Cambridge.

Conyon, M., Girma, S., Thompson, S. and Wright, P. (2002) "The Productivity and Wage Effects of Foreign Acquisition in the United Kingdom", Journal of Industrial Economics, 50, 85-107.

Dunning, J. (1977) "Trade, Location of Economic Activity and the MNEs", in B. Ohlin, P. Hesselborn and P. Wijkman (eds), *The International Allocation of Economic Activity*, Macmillan.

Feenstra, R. and Hanson, G. (1997) "Foreign Direct Investment and Relative Wages: Evidence from Mexico's Maquiladoras", Journal of International Economics, 42, 371-393.

Feenstra, R. and Hanson, G. (1999) "Productivity Measurement and the Impact of Trade and Technology on Wages: Estimates For the U.S., 1972-1990", Quarterly Journal of Economics, 114, 907-940.

Feliciano, Z and Lipsey, R. (1999) "Foreign Ownership and Wages in the United States, 1987 – 1992", National Bureau of Economic Research Working Paper 6923.

Fosfuri, A., Motta, M. and Rønde, T. (2001) "Foreign Direct Investments and Spillovers Through Workers' Mobility", Journal of International Economics, 53, 205-222.

Gioia, C. and Thomsen, S. (2003) "International Acquisitions in the Danish Business: Selection and Performance", Copenhagen Business School, mimeo.

Girma, S. and Görg, H. (2003) "Evaluating the Causal Effects of Foreign Acquisitions on Domestic Skilled and Unskilled Wages", IZA Discussion Paper 903.

Görg, H. and Greenaway, D. (2004) "Much Ado About Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment", World Bank Research Observer, forthcoming.

Görg, H., Strobl, E. and Walsh, F. (2002) "Why do Foreign-Owned Firms Pay More? The Role of On-the-Job Training", University of Nottingham, mimeo.

- Görg, H. and Strobl, E. (2003) “‘Footloose’ Multinationals?”, Manchester School, 71, 1-19.
- Griffith, R. and Simpson, H. (2003) “Characteristics of Foreign-Owned Firms In British Manufacturing”, NBER Working Paper 9573.
- Guimarães, P., Figueiredo, O. and Woodward, D. (2000) “Agglomeration and the Location of Foreign Direct Investment in Portugal”, Journal of Urban Economics, 47, 115-135.
- Heckman, J. Ichimura, H. and Todd, P. (1997) “Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme”, Review of Economic Studies, 64, 605-654.
- Koenker, R. and Bassett, G. (1978) “Regression Quantiles”, Econometrica, 46, 33-50.
- Lichtenberg, F. and Siegel, D. (1990) “The Effect of Ownership Change on the Employment and Wages of Central-Office and Other Personnel”, Journal of Law and Economics, 33, 383-408.
- Lipsey, R. and Sjöholm, F. (2001) “Foreign Direct Investment and Wages in Indonesian Manufacturing”, National Bureau of Economic Research Working Paper 8299.
- Lipsey, R. and Sjöholm, F. (2003) “Foreign Firms and Indonesian Wages: A Panel Study”, National Bureau of Economic Research Working Paper 9417.
- Markusen, J. and Venables, A. (1997) “The Role of Multinational Firms in the Wage-Gap Debate”, Review of International Economics, 5, 435-451.
- Martins, P. (2003) “Firm Wage Differentials in a Competitive Industry: Some Matched-Panel Evidence”, International Journal of Manpower, 24, 336-346.
- Martins, P. (2004a) “Industry Wage Dispersion: Evidence from the Wage Distribution”, Economics Letters, 83, 157-163.

Martins, P. (2004b) “The Inter-Industry Wage Structure of US Multinationals”, Queen Mary, University of London, mimeo.

Martins, P. (2004c) “Rent Sharing Before and After the Wage Bill”, Queen Mary, University of London, mimeo.

Martins, P. (2004d) “Rent Sharing and Foreign Ownership”, Queen Mary, University of London, mimeo.

Mata, J. and Portugal, P. (2002) “The Survival of New Domestic and Foreign Owned Firms”, Strategic Management Journal, 23, 323-343.

Ministério das Finanças (2003) “Portugal no Espaço Europeu: O Investimento Directo Estrangeiro” [“Portugal in the European Area: Foreign Direct Investment”], Departamento de Prospectiva e Planeamento, Ministério das Finanças [Finance Ministry], Lisbon.

Oi, W. and Idson, T. (1999) “Firm Size and Wages”, in O. Ashenfelter and D. Card (eds) *Handbook of Labor Economics*, Elsevier: Amsterdam.

Portugal, P. and Cardoso, A. R. (2003) “Disentangling the Minimum Wage Puzzle: An Analysis of Worker Accessions and Separations”, IZA Discussion Paper 544.

Schleifer, A. and Summers, L. (1988) “Breach of Trust in Hostile Take-Overs”, in A. Auerbach (ed) *Corporate Take-Overs: Causes and Consequences*, NBER: Chicago.

Sutherland, J. (2002) “The Experience of Work. Is Working for an Overseas-Owned Multinational So Different?”, Employee Relations, 25, 149-167.

Velde, D. and Morrissey, O. (2003) “Do Workers in Africa Get a Wage Premium if Employed in Firms Owned by Foreigners?”, Journal of African Economies, 12, 41-73.

Table 1a - Descriptive Statistics, Workers in Foreign and Domestic Firms, 1991-1999

	Variable	1991		1992		1993		1994		1995	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Foreign Firms	Monthly Earnings	690.672	565.65	730.441	610.22	801.833	707.12	767.412	676.25	801.801	710.91
	Hourly Earnings	4.057	4.40	4.410	10.53	4.655	4.93	4.564	4.75	4.731	5.01
	Log Hourly Earnings	1.194	0.57	1.263	0.58	1.307	0.61	1.294	0.59	1.342	0.58
	Schooling Years	6.206	3.10	6.350	3.19	6.417	3.29	6.779	3.18	6.958	3.19
	Experience	21.713	11.77	21.628	12.05	22.450	11.66	20.537	11.43	20.725	11.31
	Tenure (Months)	115.027	104.89	115.957	108.70	121.226	106.47	99.074	100.01	103.560	101.68
	Female	0.561		0.550		0.538		0.576		0.568	
	Food, Beverages	0.061		0.044		0.068		0.111		0.093	
	Textiles, Clothing, Leather	0.351		0.331		0.354		0.291		0.268	
	Wood, Cork	0.013		0.012		0.022		0.016		0.008	
	Paper, Graphical Arts, Edition	0.038		0.035		0.032		0.022		0.024	
	Chemicals	0.152		0.157		0.130		0.111		0.082	
	Non-Metalic Minerals	0.020		0.040		0.035		0.032		0.042	
	Metalurgic	0.009		0.009		0.007		0.008		0.012	
	Metalic, Transport	0.347		0.369		0.351		0.407		0.469	
	Others	0.008		0.003		0.002		0.002		0.002	
	North	0.447		0.507		0.472		0.350		0.364	
	Centre	0.100		0.096		0.109		0.241		0.193	
	Lisboa and T. V.	0.434		0.390		0.416		0.404		0.438	
	Observations	52,485		41,671		53,432		57,843		73,795	
Domestic Firms	Monthly Earnings	528.463	419.95	566.039	495.42	582.574	537.62	575.465	1322.57	562.403	477.85
	Hourly Earnings	3.118	4.12	3.309	4.50	3.399	4.42	3.438	11.71	3.342	4.30
	Log Hourly Earnings	0.954	0.52	1.005	0.53	1.023	0.54	1.024	0.54	1.026	0.52
	Schooling Years	5.260	2.67	5.353	2.71	5.481	2.76	5.735	2.78	5.758	2.74
	Experience	23.510	12.78	23.467	12.81	23.901	12.72	23.235	12.46	23.496	12.38
	Tenure (Months)	116.348	108.02	116.343	107.76	120.108	108.50	110.819	104.92	114.901	108.29
	Female	0.423		0.430		0.417		0.431		0.434	
	Food, Beverages	0.102		0.105		0.109		0.113		0.107	
	Textiles, Clothing, Leather	0.401		0.399		0.375		0.384		0.391	
	Wood, Cork	0.073		0.076		0.080		0.084		0.082	
	Paper, Graphical Arts, Edition	0.053		0.055		0.060		0.060		0.056	
	Chemicals	0.070		0.057		0.065		0.063		0.059	
	Non-Metalic Minerals	0.087		0.080		0.080		0.077		0.083	
	Metalurgic	0.028		0.025		0.025		0.016		0.016	
	Metalic, Transport	0.175		0.193		0.197		0.192		0.196	
	Others	0.010		0.009		0.010		0.010		0.010	
	North	0.511		0.513		0.499		0.513		0.540	
	Centre	0.215		0.207		0.224		0.227		0.223	
	Lisboa and T. V.	0.253		0.257		0.254		0.232		0.211	
	Observations	471,745		475,336		441,029		404,563		427,461	

Notes:

Monetary values are in real terms (2000 prices) and in euros.

Alentejo and Algarve regional dummies are omitted (their share ranges between .0% and 3.8%).

Table 1b - Descriptive Statistics, Workers in Foreign and Domestic Firms, 1991-1999

Variable	1996		1997		1998		1999		Annual Average
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Foreign Firms									
Monthly Earnings	806.128	763.80	841.352	721.85	841.777	713.32	863.091	756.85	793.8
Hourly Earnings	4.728	7.80	4.837	4.42	5.001	4.58	5.147	5.56	4.7
Log Hourly Earnings	1.340	0.57	1.386	0.55	1.426	0.54	1.446	0.55	1.3
Schooling Years	7.196	3.31	7.255	3.32	7.221	3.27	7.367	3.36	6.9
Experience	20.486	11.51	20.635	11.45	21.348	11.62	21.290	11.58	21.2
Tenure (Months)	105.067	102.62	106.347	103.00	111.682	104.88	106.749	105.78	109.4
Female	0.534		0.516		0.548		0.552		0.55
Food, Beverages	0.105		0.075		0.077		0.066		0.08
Textiles, Clothing, Leather	0.258		0.262		0.267		0.234		0.29
Wood, Cork	0.006		0.008		0.016		0.023		0.01
Paper, Graphical Arts, Edition	0.021		0.011		0.024		0.024		0.03
Chemicals	0.070		0.073		0.116		0.085		0.11
Non-Metalic Minerals	0.045		0.036		0.039		0.036		0.04
Metalurgic	0.016		0.023		0.018		0.011		0.01
Metalic, Transport	0.476		0.510		0.441		0.521		0.43
Others	0.002		0.002		0.002		0.001		0.00
North	0.360		0.325		0.382		0.398		0.40
Centre	0.209		0.229		0.254		0.264		0.19
Lisboa and T. V.	0.423		0.434		0.324		0.296		0.40
Observations	72,561		74,804		67,971		68,837		62,600
Domestic Firms									
Monthly Earnings	603.105	526.74	593.721	509.92	610.191	506.39	627.803	520.11	583.3
Hourly Earnings	3.519	4.96	3.536	5.00	3.708	3.78	3.854	4.13	3.5
Log Hourly Earnings	1.066	0.53	1.091	0.50	1.150	0.49	1.188	0.49	1.1
Schooling Years	5.922	2.87	5.958	2.84	6.124	2.95	6.206	2.98	5.8
Experience	23.936	12.34	23.884	12.39	24.328	12.45	24.528	12.39	23.8
Tenure (Months)	120.348	110.83	116.409	110.41	117.825	112.59	118.600	113.08	116.9
Female	0.435		0.449		0.436		0.442		0.43
Food, Beverages	0.112		0.101		0.106		0.110		0.11
Textiles, Clothing, Leather	0.391		0.389		0.363		0.362		0.38
Wood, Cork	0.075		0.092		0.089		0.088		0.08
Paper, Graphical Arts, Edition	0.061		0.066		0.063		0.062		0.06
Chemicals	0.064		0.055		0.062		0.065		0.06
Non-Metalic Minerals	0.082		0.082		0.090		0.085		0.08
Metalurgic	0.017		0.018		0.016		0.017		0.02
Metalic, Transport	0.188		0.186		0.202		0.203		0.19
Others	0.010		0.010		0.009		0.008		0.01
North	0.537		0.548		0.524		0.533		0.52
Centre	0.222		0.225		0.236		0.225		0.22
Lisboa and T. V.	0.214		0.201		0.211		0.216		0.23
Observations	412,961		428,839		409,721		434,319		433,997

Notes:

Monetary values are in real terms (2000 prices) and in euros.

Alentejo and Algarve regional dummies are omitted (their share ranges between .0% and 3.8%).

Table 2a - Descriptive Statistics, Foreign and Domestic Firms, 1991-1999

	Variable	1991		1992		1993		1994		1995	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Foreign Firms	Monthly Earnings	684.276	422.88	736.970	373.94	776.020	457.39	807.893	474.84	837.143	512.65
	Hourly Earnings	4.046	2.58	4.374	2.36	4.573	2.75	4.801	2.96	4.922	3.08
	Log Hourly Earnings	1.167	0.45	1.246	0.46	1.262	0.48	1.312	0.47	1.337	0.48
	Number of Workers	181.324	305.52	180.021	304.82	181.115	341.77	169.094	397.01	200.867	450.71
	Food, Beverages	0.080		0.088		0.089		0.101		0.111	
	Textiles, Clothing, Leather	0.291		0.271		0.268		0.251		0.259	
	Wood, Cork	0.050		0.039		0.061		0.054		0.047	
	Paper, Graphical Arts, Edition	0.050		0.046		0.042		0.054		0.049	
	Chemicals	0.180		0.180		0.182		0.170		0.143	
	Non-Metalic Minerals	0.047		0.063		0.059		0.049		0.057	
	Metalurgic	0.017		0.018		0.020		0.022		0.022	
	Metalic, Transport	0.269		0.282		0.268		0.288		0.301	
	Others	0.017		0.014		0.011		0.010		0.010	
	North	0.374		0.377		0.369		0.367		0.383	
	Centre	0.161		0.165		0.193		0.200		0.193	
	Lisboa and T. V.	0.438		0.426		0.425		0.411		0.402	
	Observations	361		284		358		406		405	
Domestic Firms	Monthly Earnings	413.133	177.60	438.727	201.13	453.590	229.04	454.539	241.90	453.567	207.19
	Hourly Earnings	2.424	1.48	2.558	1.40	2.633	1.49	2.717	2.28	2.715	1.58
	Log Hourly Earnings	0.763	0.31	0.808	0.32	0.827	0.33	0.852	0.34	0.869	0.33
	Number of Workers	39.999	118.25	39.516	116.94	35.779	103.97	31.582	85.73	30.235	77.01
	Food, Beverages	0.100		0.099		0.101		0.107		0.112	
	Textiles, Clothing, Leather	0.282		0.280		0.270		0.265		0.264	
	Wood, Cork	0.148		0.147		0.144		0.147		0.146	
	Paper, Graphical Arts, Edition	0.078		0.080		0.080		0.085		0.083	
	Chemicals	0.055		0.053		0.054		0.052		0.051	
	Non-Metalic Minerals	0.079		0.083		0.081		0.079		0.081	
	Metalurgic	0.014		0.014		0.015		0.013		0.012	
	Metalic, Transport	0.224		0.224		0.235		0.233		0.231	
	Others	0.021		0.020		0.020		0.020		0.021	
	North	0.487		0.482		0.477		0.489		0.496	
	Centre	0.220		0.222		0.227		0.226		0.222	
	Lisboa and T. V.	0.253		0.255		0.256		0.244		0.240	
	Observations	15,095		15,278		15,351		16,171		16,757	

Notes:

Monetary values are in real terms (2000 prices) and in euros.

Alentejo and Algarve regional dummies are omitted (their share ranges between .0% and 3.8%).

Table 2b - Descriptive Statistics, Foreign and Domestic Firms, 1991-1999

Variable	1996		1997		1998		1999		Annual Average
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Foreign Firms									
Monthly Earnings	809.742	406.47	831.480	410.10	874.334	446.85	888.790	481.54	805.2
Hourly Earnings	4.745	2.55	4.863	2.38	5.203	2.66	5.428	3.07	4.8
Log Hourly Earnings	1.319	0.45	1.364	0.43	1.437	0.44	1.466	0.44	1.3
Number of Workers	200.333	487.64	201.334	556.08	196.372	461.98	195.316	456.67	189.5
Food, Beverages	0.119		0.104		0.112		0.093		0.10
Textiles, Clothing, Leather	0.258		0.255		0.242		0.225		0.26
Wood, Cork	0.028		0.045		0.045		0.061		0.05
Paper, Graphical Arts, Edition	0.051		0.037		0.045		0.037		0.05
Chemicals	0.157		0.139		0.162		0.154		0.16
Non-Metalic Minerals	0.063		0.064		0.061		0.054		0.06
Metalurgic	0.018		0.025		0.021		0.017		0.02
Metalic, Transport	0.298		0.322		0.303		0.346		0.30
Others	0.010		0.010		0.008		0.012		0.01
North	0.389		0.356		0.364		0.380		0.37
Centre	0.192		0.230		0.237		0.228		0.20
Lisboa and T. V.	0.391		0.381		0.370		0.353		0.40
Observations	396		404		376		408		378
Domestic Firms									
Monthly Earnings	476.766	234.64	479.462	226.46	493.402	221.24	502.278	221.16	462.8
Hourly Earnings	2.814	1.66	2.881	1.77	3.031	1.41	3.138	2.45	2.8
Log Hourly Earnings	0.898	0.33	0.934	0.32	1.004	0.30	1.039	0.30	0.9
Number of Workers	30.397	84.98	28.035	70.78	27.200	69.77	27.582	82.47	32.3
Food, Beverages	0.114		0.116		0.118		0.114		0.11
Textiles, Clothing, Leather	0.263		0.260		0.247		0.251		0.26
Wood, Cork	0.139		0.151		0.149		0.152		0.15
Paper, Graphical Arts, Edition	0.085		0.083		0.087		0.084		0.08
Chemicals	0.051		0.048		0.048		0.048		0.05
Non-Metalic Minerals	0.084		0.081		0.086		0.084		0.08
Metalurgic	0.011		0.013		0.011		0.013		0.01
Metalic, Transport	0.232		0.229		0.236		0.234		0.23
Others	0.020		0.019		0.019		0.019		0.02
North	0.484		0.497		0.478		0.497		0.49
Centre	0.236		0.231		0.240		0.231		0.23
Lisboa and T. V.	0.237		0.226		0.233		0.227		0.24
Observations	16,093		17,853		17,596		18,819		16,557

Notes:

Monetary values are in real terms (2000 prices) and in euros.

Alentejo and Algarve regional dummies are omitted (their share ranges between .0% and 3.8%).

Table 3 - Wage Premia of Foreign Firms, 1991-1999.

Specifications - Controls	1991	1992	1993	1994	1995	1996	1997	1998	1999	Avg.	Max.	Min.
No Controls	27.1%	29.4%	32.8%	31.0%	37.2%	31.5%	34.3%	31.8%	29.4%	31.6%	37.2%	27.1%
St. Errors	[0.002]**	[0.003]**	[0.003]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**
Adjusted R-squared	0.019	0.017	0.025	0.026	0.043	0.032	0.041	0.036	0.031			
Human Capital (HC)	23.1%	24.5%	26.6%	28.4%	32.3%	26.5%	26.9%	27.9%	25.7%	26.9%	32.3%	23.1%
St. Errors	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**
Adjusted R-squared	0.451	0.436	0.45	0.438	0.453	0.453	0.445	0.477	0.477			
HC and Firm Characteristics	11.6%	9.6%	11.3%	10.5%	12.2%	9.0%	8.0%	12.6%	13.0%	10.9%	13.0%	8.0%
St. Errors	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**
Adjusted R-squared	0.544	0.536	0.542	0.524	0.534	0.534	0.516	0.549	0.546			
Observations	524,230	517,007	494,461	462,406	501,256	485,522	503,643	477,692	503,156			

Notes:

Standard errors in brackets (* significant at 5%; ** significant at 1%).

Human Capital controls are: six dummies for educational degrees, a quartic in experience, a quadratic in tenure (in months), and a female dummy.

Firm Characteristics are: four regional dummies, log number of workers, a dummy for public firms and eight industry dummies.

Table 4 - Wage Premia of Foreign Firms in Different Industries, 1991-1999.

Specifications	1991	1992	1993	1994	1995	1996	1997	1998	1999	Avg.	Max.	Min.
Food, Beverages	6.5%	8.4%	9.2%	10.1%	10.1%	9.7%	6.9%	9.7%	8.5%	8.8%	10.1%	6.5%
	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**			
Wood, Cork	-2.7%	-0.6%	-2.2%	1.4%	2.6%	4.8%	1.7%	2.3%	1.5%	1.0%	4.8%	-2.7%
	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**			
Paper, Graphical Arts	28.7%	21.0%	24.4%	26.5%	29.8%	29.8%	25.7%	23.7%	25.2%	26.1%	29.8%	21.0%
	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.002]**	[0.002]**			
Chemicals	29.0%	26.7%	29.7%	28.0%	28.9%	27.4%	23.1%	26.1%	24.5%	27.1%	29.7%	23.1%
	[0.002]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.002]**	[0.002]**			
Non-Metalic Minerals	19.8%	26.4%	22.5%	23.9%	26.5%	29.6%	20.4%	20.1%	19.8%	23.2%	29.6%	19.8%
	[0.002]**	[0.002]**	[0.002]**	[0.003]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**			
Metalurgic	3.5%	14.7%	13.0%	22.9%	23.5%	29.3%	19.0%	22.9%	22.9%	19.1%	29.3%	3.5%
	[0.003]**	[0.004]**	[0.004]**	[0.005]**	[0.005]**	[0.005]**	[0.004]**	[0.004]**	[0.004]**			
Metalic, Transport	13.1%	15.5%	15.7%	21.3%	20.6%	21.8%	17.0%	15.7%	13.8%	17.2%	21.8%	13.1%
	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**			
Others	7.5%	12.1%	10.7%	12.3%	12.6%	10.0%	6.1%	6.2%	7.4%	9.4%	12.6%	6.1%
	[0.005]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**			
Foreign Firm	5.4%	7.8%	4.8%	3.5%	5.9%	3.9%	1.9%	4.8%	3.9%	4.6%	7.8%	1.9%
	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**			
(Food, Beverages)*For.	42.5%	11.4%	22.6%	15.0%	22.6%	25.0%	32.3%	28.4%	30.3%	25.6%	42.5%	11.4%
	[0.007]**	[0.009]**	[0.007]**	[0.006]**	[0.006]**	[0.005]**	[0.006]**	[0.006]**	[0.006]**			
(Wood, Cork)*For.	28.0%	22.5%	7.0%	24.7%	15.0%	18.3%	19.6%	16.5%	14.8%	18.5%	28.0%	7.0%
	[0.014]**	[0.017]**	[0.012]**	[0.013]**	[0.016]**	[0.018]**	[0.015]**	[0.011]**	[0.009]**			
(Paper, Graphical Arts)*For.	6.9%	14.3%	16.6%	27.4%	29.4%	18.8%	8.5%	14.7%	26.6%	18.1%	29.4%	6.9%
	[0.009]**	[0.010]**	[0.010]**	[0.011]**	[0.009]**	[0.010]**	[0.013]**	[0.009]**	[0.009]**			
Chemicals*For.	11.0%	16.5%	18.8%	19.8%	11.2%	17.5%	24.0%	16.3%	21.9%	17.4%	24.0%	11.0%
	[0.005]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.005]**	[0.006]**			
(Non-Metalic Minerals)*For	8.8%	2.6%	0.0%	10.8%	5.4%	8.1%	13.8%	9.0%	12.2%	7.9%	13.8%	0.0%
	[0.011]**	[0.010]**	[0.009]	[0.010]**	[0.007]**	[0.007]**	[0.008]**	[0.007]**	[0.008]**			
Metalurgic*For.	31.5%	-11.6%	13.4%	-2.3%	-7.8%	-8.4%	4.0%	-0.9%	16.0%	3.8%	31.5%	-11.6%
	[0.017]**	[0.020]**	[0.021]**	[0.018]	[0.013]**	[0.012]**	[0.010]**	[0.011]	[0.013]**			
(Metalic, Transport)*For.	1.9%	-5.2%	4.9%	3.9%	4.0%	-0.4%	0.2%	5.8%	6.3%	2.4%	6.3%	-5.2%
	[0.004]**	[0.005]**	[0.004]**	[0.004]**	[0.004]**	[0.004]	[0.004]	[0.004]**	[0.004]**			
Others*For.	5.3%	-8.2%	4.7%	5.2%	4.7%	14.6%	9.1%	14.1%	14.8%	7.1%	14.8%	-8.2%
	[0.019]**	[0.031]**	[0.033]	[0.035]	[0.033]	[0.034]**	[0.032]**	[0.028]**	[0.037]**			
Adjusted R-squared	0.546	0.538	0.543	0.525	0.536	0.537	0.519	0.551	0.548			
Observations	524,230	517,007	494,461	462,406	501,256	485,522	503,643	477,692	503,156			

Notes:

Standard errors in brackets (* significant at 5%; ** significant at 1%).

Specification used includes controls for human capital and firm characteristics (see previous tables for definitions).

Table 5a - Wage Premia of Foreign Firms for Different Degrees of Control, 1991-1999.

Specifications	1991	1992	1993	1994	1995	1996	1997	1998	1999	Avg.	Max.	Min.
1%-9%	13.8%	9.6%	9.5%	16.1%	13.9%	9.7%	9.6%	2.5%	20.7%	11.7%	20.7%	2.5%
	[0.006]**	[0.006]**	[0.005]**	[0.006]**	[0.005]**	[0.006]**	[0.007]**	[0.010]*	[0.007]**			
10%-19%	17.2%	-2.2%	-5.3%	22.9%	37.2%	28.1%	25.9%	15.6%	-3.4%	15.1%	37.2%	-5.3%
	[0.008]**	[0.013]	[0.010]**	[0.008]**	[0.007]**	[0.007]**	[0.008]**	[0.007]**	[0.010]**			
20%-29%	18.1%	6.4%	3.9%	4.6%	-1.8%	14.0%	3.6%	-4.3%	-2.2%	4.7%	18.1%	-4.3%
	[0.004]**	[0.005]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.006]**	[0.005]**	[0.006]**			
30%-39%	19.7%	-3.4%	-4.1%	18.9%	12.0%	0.0%	9.2%	11.9%	13.9%	8.7%	19.7%	-4.1%
	[0.007]**	[0.008]**	[0.008]**	[0.008]**	[0.008]**	[0.008]	[0.007]**	[0.007]**	[0.008]**			
40%-49%	22.5%	27.5%	19.0%	7.9%	17.2%	11.4%	13.7%	14.0%	15.0%	16.5%	27.5%	7.9%
	[0.006]**	[0.007]**	[0.007]**	[0.007]**	[0.007]**	[0.006]**	[0.005]**	[0.006]**	[0.005]**			
50%-59%	18.6%	6.5%	6.6%	11.3%	8.3%	8.5%	4.1%	-1.2%	9.7%	8.1%	18.6%	-1.2%
	[0.006]**	[0.008]**	[0.006]**	[0.007]**	[0.007]**	[0.007]**	[0.008]**	[0.007]	[0.006]**			
60%-69%	2.3%	17.2%	16.6%	40.8%	36.3%	10.4%	36.5%	36.5%	24.6%	24.6%	40.8%	2.3%
	[0.010]*	[0.007]**	[0.005]**	[0.006]**	[0.006]**	[0.008]**	[0.011]**	[0.009]**	[0.009]**			
70%-79%	2.1%	0.5%	21.2%	38.3%	26.9%	25.0%	6.2%	23.6%	-5.4%	15.4%	38.3%	-5.4%
	[0.009]*	[0.011]	[0.009]**	[0.010]**	[0.007]**	[0.008]**	[0.009]**	[0.009]**	[0.008]**			
80%-89%	7.6%	10.5%	10.5%	12.9%	12.2%	10.5%	17.4%	14.6%	14.3%	12.3%	17.4%	7.6%
	[0.005]**	[0.008]**	[0.010]**	[0.009]**	[0.008]**	[0.008]**	[0.006]**	[0.006]**	[0.007]**			
90%-99%	11.5%	8.0%	15.6%	10.6%	10.3%	15.5%	13.9%	10.8%	17.7%	12.7%	17.7%	8.0%
	[0.004]**	[0.004]**	[0.004]**	[0.004]**	[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.004]**			
100%	15.8%	11.2%	10.4%	7.9%	12.6%	7.8%	6.7%	13.7%	13.3%	11.0%	15.8%	6.7%
	[0.002]**	[0.003]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**			
Adjusted R²	0.548	0.538	0.543	0.528	0.538	0.537	0.518	0.551	0.548			
Observations	524,230	517,007	494,461	462,406	501,256	485,522	503,643	477,692	503,156			

Notes:

Standard errors in brackets (* significant at 5%; ** significant at 1%).

Specification used includes controls for human capital and firm characteristics (see previous tables for definitions).

Table 5b - Wage Premia for Foreign Firms, Different Definitions, 1991-1999

	1991		1992		1993		1994		1995		1996		1997		1998		1999	
	Premium	St. Error	Premium	St. Error	Premium	St. Error	Premium	St. Error	Premium	St. Error	Premium	St. Error	Premium	St. Error	Premium	St. Error	Premium	St. Error
>=10%	14.8%	(0.002)**	9.9%	(0.002)**	10.3%	(0.002)**	11.3%	(0.002)**	13.1%	(0.002)**	10.5%	(0.002)**	9.3%	(0.002)**	12.3%	(0.002)**	12.3%	(0.001)**
>=20%	14.7%	(0.002)**	10.1%	(0.002)**	10.7%	(0.002)**	10.5%	(0.002)**	11.7%	(0.002)**	9.4%	(0.002)**	8.4%	(0.002)**	12.0%	(0.002)**	12.7%	(0.002)**
>=30%	13.0%	(0.002)**	10.2%	(0.002)**	11.2%	(0.002)**	10.8%	(0.002)**	12.7%	(0.002)**	8.9%	(0.002)**	8.7%	(0.002)**	13.1%	(0.002)**	13.4%	(0.002)**
>=40%	12.5%	(0.002)**	11.0%	(0.002)**	12.0%	(0.002)**	10.4%	(0.002)**	12.6%	(0.002)**	9.2%	(0.002)**	8.5%	(0.002)**	13.0%	(0.002)**	13.3%	(0.002)**
>=50%	11.6%	(0.002)**	9.6%	(0.002)**	11.3%	(0.002)**	10.5%	(0.002)**	12.2%	(0.002)**	9.0%	(0.002)**	8.0%	(0.002)**	12.6%	(0.002)**	13.0%	(0.002)**
N. Obs.	524230		517007		494461		462406		501256		485522		503643		477692			

Notes:

Standard errors in parentheses: * significant at 5% level; ** significant at 1% level

The specification considered includes human capital and firm characteristics.

Table 6 - Quantile Regression Results

	25th perc.		75th perc.	
	Coeff.	St. Error	Coeff.	St. Error
1991	0.1027	0.0015	0.1096	0.0019
1992	0.0953	0.0017	0.0888	0.0026
1993	0.0944	0.0016	0.1136	0.0028
1994	0.0848	0.0015	0.1159	0.0020
1995	0.0951	0.0014	0.1255	0.0018
1996	0.0704	0.0014	0.0978	0.0019
1997	0.0683	0.0016	0.0920	0.0024
1998	0.0969	0.0014	0.1386	0.0022
1999	0.1085	0.0016	0.1345	0.0024

Note:

In each each, the full set of controls is considered.

Table 7 - Propensity Score Matching estimates

Year	Estimate	St. Error
1991	-2.36%	0.006
1992	0.31%	0.007
1993	1.30%	0.006
1994	-8.93%	0.010
1995	-0.44%	0.010
1996	-1.95%	0.013
1997	-0.14%	0.012
1998	1.09%	0.008
1999	0.17%	0.010
Average	-1.22%	

Note:

Standard errors obtained via bootstrapping (50 repetitions)

Table 8 - Difference-in-differences Descriptive Statistics and Results

Control group: workers in firms that are always domestically-owned.

Variable	Treatment	Control 1	DID - Control 1		Control 2	DID - Control 2	
	Mean	Mean	Coeff.	St. Error	Mean	Coeff.	St. Error
Change in Log Hourly Wages	0.006	0.051			0.070		
1st Cycle	0.399	0.509	-0.014	0.003	0.340	-0.038	0.010
2nd Cycle	0.232	0.263	-0.009	0.003	0.307	-0.027	0.010
3rd Cycle	0.170	0.098	-0.014	0.004	0.189	-0.031	0.010
Secondary	0.107	0.063	-0.009	0.004	0.108	-0.019	0.011
"Bacharelato"	0.017	0.007	0.009	0.008	0.013	-0.003	0.016
"Licenciatura"	0.040	0.014	0.001	0.006	0.023	-0.011	0.013
Experience	115.247	127.974	0.000	0.000	111.62	0.000	0.000
Tenure (Months)	22.570	24.350	-0.001	0.000	20.80	-0.003	0.000
Female	0.386	0.426	-0.012	0.001	0.56	-0.021	0.003
Log Firm Size	6.080	4.766	-0.008	0.000	6.38	-0.030	0.001
Difference in Years	1.410	1.332	0.030	0.001	1.53	0.074	0.002
Food, Beverages	0.088	0.109	0.013	0.002	0.064	-0.021	0.007
Wood, Cork	0.039	0.081	-0.001	0.003	0.011	-0.108	0.011
Paper, Graphical Arts, Edition	0.038	0.051	0.005	0.003	0.013	0.029	0.011
Chemicals	0.091	0.059	-0.026	0.003	0.128	-0.056	0.006
Non-Metalic Minerals	0.032	0.082	0.015	0.003	0.033	-0.044	0.009
Metalurgic	0.017	0.015	0.015	0.005	0.007	-0.188	0.011
Metalic, Transport	0.443	0.197	0.008	0.002	0.504	-0.034	0.005
Others	0.001	0.008	-0.015	0.007	0.001	-0.103	0.039
Centre	0.211	0.229	-0.001	0.002	0.238	0.038	0.005
Lisboa and T. V.	0.408	0.216	-0.020	0.002	0.380	0.009	0.004
Alentejo	0.033	0.013	-0.008	0.005	0.004	0.033	0.014
Algarve	0.001	0.007	-0.032	0.007	0.000	0.289	0.067
1991	0.165	0.148	0.008	0.003	0.104	-0.125	0.006
1992	0.250	0.117	-0.059	0.003	0.139	-0.004	0.006
1993	0.108	0.114	-0.042	0.003	0.227	0.018	0.006
1994	0.089	0.118	-0.024	0.003	0.211	0.000	0.006
1995	0.063	0.131	-0.022	0.003	0.055	0.004	0.007
1996	0.161	0.158	0.023	0.002	0.098	-0.020	0.007
1997	0.069	0.116	0.001	0.003	0.068	0.002	0.007
Treatment			-0.031	0.003		-0.042	0.003
Observations	18,269	250,031	268,300		27,229	46,476	
Adj. R squared			0.0165			0.0983	
Propensity Score estimate			-1.54%		-7.83%		

Notes:

Treatment group: Workers in firms that are domestic in the first period and foreign in the second.

Control group 1: firms that are always domestically owned.

Control group 2: firms that are always foreign owned.

The standard deviations of the change in log wages is 0,358, 0,31 and 0,3 for the treatment group and for the two control groups, respectively.

Table A1a - Descriptive Statistics, Workers in Foreign and Domestic Firms, 1991-1999 (10% foreign ownership definition).

	Variable	1991		1992		1993		1994		1995	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Foreign Firms	Monthly Earnings	729,233	562,756	748,363	641,801	811,258	696,585	775,501	659,695	817,393	717,845
	Hourly Earnings	4,324	4,434	4,544	9,743	4,699	5,272	4,637	4,698	4,812	4,979
	Log Hourly Earnings	1,264	0,573	1,297	0,576	1,324	0,601	1,318	0,586	1,365	0,576
	Schooling Years	6,211	3,166	6,322	3,186	6,417	3,318	6,780	3,230	6,974	3,261
	Experience	23,153	12,043	22,357	12,151	23,237	11,873	21,370	11,730	21,573	11,700
	Tenure (Months)	126,584	107,267	122,124	111,070	128,755	109,286	105,798	103,571	112,586	107,298
	Female	0,490		0,507		0,493		0,543		0,536	
	North	0,424		0,470		0,453		0,334		0,368	
	Centre	0,113		0,100		0,116		0,227		0,192	
	Lisboa and T. V.	0,450		0,423		0,428		0,435		0,436	
	Observations	70.335		52.362		63.084		69.466		85.323	
Domestic Firms	Monthly Earnings	483,882	360,092	547,771	474,813	552,047	491,848	549,205	1231,43	539,510	448,419
	Hourly Earnings	2,829	3,910	3,188	4,303	3,221	4,131	3,262	11,558	3,193	4,154
	Log Hourly Earnings	0,889	0,465	0,977	0,517	0,984	0,519	0,987	0,513	0,994	0,493
	Schooling Years	5,135	2,525	5,297	2,650	5,387	2,658	5,643	2,668	5,676	2,645
	Experience	22,990	12,809	23,270	12,844	23,584	12,745	23,016	12,463	23,295	12,370
	Tenure (Months)	109,846	106,141	113,417	106,747	115,418	106,809	107,201	103,164	111,715	106,740
	Female	0,444		0,439		0,432		0,440		0,443	
	North	0,542		0,527		0,518		0,532		0,553	
	Centre	0,227		0,214		0,228		0,230		0,224	
	Lisboa and T. V.	0,208		0,235		0,229		0,209		0,196	
	Observations	423.346		446.567		409.669		378.135		403.845	

Notes:

Monetary values are in real terms (2000 prices) and in euros.

Alentejo and Algarve regional dummies are omitted (their share ranges between .0% and 3.8%).

Table A1b - Descriptive Statistics, Workers in Foreign and Domestic Firms, 1991-1999 (10% foreign ownership definition).

	Variable	1996		1997		1998		1999		Annual Average
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Foreign Firms	Monthly Earnings	832,928	767,144	860,720	720,861	855,704	725,472	875,588	748,271	811,85
	Hourly Earnings	4,877	7,502	4,955	4,485	5,088	4,644	5,267	6,442	4,80
	Log Hourly Earnings	1,370	0,574	1,411	0,555	1,447	0,538	1,465	0,550	1,36
	Schooling Years	7,180	3,355	7,267	3,375	7,255	3,332	7,369	3,406	6,86
	Experience	21,365	11,859	21,470	11,844	22,107	11,964	22,016	11,854	22,07
	Tenure (Months)	113,653	107,760	114,099	108,326	120,692	111,406	114,733	111,051	117,67
	Female	0,502		0,487		0,512		0,516		0,51
	North	0,364		0,334		0,389		0,393		0,39
	Centre	0,206		0,228		0,253		0,256		0,19
	Lisboa and T. V.	0,423		0,428		0,323		0,314		0,41
	Observations	84.861		88.031		80.615		79.459		74.837
Domestic Firms	Monthly Earnings	571,277	484,371	568,369	487,239	580,210	464,515	602,491	488,942	554,97
	Hourly Earnings	3,329	4,797	3,384	4,802	3,528	3,579	3,690	3,605	3,29
	Log Hourly Earnings	1,029	0,503	1,059	0,482	1,116	0,464	1,159	0,468	1,02
	Schooling Years	5,822	2,762	5,874	2,757	6,009	2,842	6,119	2,899	5,66
	Experience	23,761	12,348	23,675	12,369	24,203	12,446	24,365	12,376	23,57
	Tenure (Months)	116,938	109,310	112,610	108,318	114,152	110,524	115,158	111,048	112,94
	Female	0,445		0,460		0,447		0,453		0,44
	North	0,554		0,561		0,535		0,548		0,54
	Centre	0,222		0,224		0,240		0,224		0,23
	Lisboa and T. V.	0,196		0,187		0,194		0,201		0,21
	Observations	388.000		402.799		384.213		411.037		404.572

Notes:

Monetary values are in real terms (2000 prices) and in euros.

Alentejo and Algarve regional dummies are omitted (their share ranges between .0% and 3.8%).

Table A2 - Wage Premia of Foreign Firms, 1991-1999 (10% foreign ownership definition).

Specifications - Controls	1991	1992	1993	1994	1995	1996	1997	1998	1999	Avg.	Max.	Min.
No Controls	39,2%	35,3%	36,2%	35,9%	42,3%	37,6%	39,9%	36,3%	33,4%	37,4%	42,3%	33,4%
St. Errors	[0.002]**	[0.003]**	[0.003]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**			
Adjusted R-squared	0,046	0,029	0,035	0,039	0,061	0,049	0,06	0,053	0,044			
Human Capital (HC)	27,4%	26,5%	25,5%	29,2%	32,7%	28,1%	28,1%	28,0%	25,7%	27,9%	32,7%	25,5%
St. Errors	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**			
Adjusted R-squared	0,461	0,443	0,453	0,444	0,46	0,461	0,452	0,482	0,481			
HC and Firm Characteristics	15,0%	9,7%	10,4%	11,3%	13,0%	11,4%	9,2%	12,6%	12,9%	11,7%	15,0%	9,2%
St. Errors	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**			
Adjusted R-squared	0,548	0,539	0,543	0,526	0,541	0,541	0,522	0,554	0,56			
Observations	524.230	517.007	494.461	462.406	501.256	485.522	503.643	477.692	503.156			

Notes:

Standard errors in brackets (* significant at 5%; ** significant at 1%).

Human Capital controls are: six dummies for educational degrees, a quartic in experience, a quadratic in tenure (in months), and a female dummy.

Firm Characteristics are: four regional dummies, log number of workers, a dummy for public firms and eight industry dummies.