

# Multinationals, Cross-Border Acquisitions and Wage Dispersion

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## Abstract

We examine the impact of cross-border acquisitions on intra-firm wage dispersion using a detailed Swedish linked employer-employee data set including data on all firms and about 50 percent of the Swedish labour force with information on job-tasks and education. Foreign acquisitions of domestic multinationals and local firms increase wage dispersion but so do also other types of cross-border acquisitions. Hence, it is the acquisition itself rather than foreign ownership that increases wage dispersion. The positive wage effect is concentrated to CEOs and other managers, whereas other groups are either negatively affected or not affected at all.

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## **1. Introduction**

Increased international economic integration has changed relative incomes around the world. Imports of relatively low-skill intensive products have a downward pressure on wages for unskilled workers in wealthy nations and contribute to widen income disparities (see e.g. Feenstra and Hanson 2003). Moreover, studies on international outsourcing suggest that it has decreased demand for unskilled workers and thereby increased wage dispersion (Leamer and Storper 2001; Levy and Murmane 2004)

In addition to trade and outsourcing, foreign direct investment (FDI) is another key aspect of increased international economic integration. Previous studies on FDI and wages find multinational firms to pay higher wages than local firms, which is mainly caused by differences in firm and worker characteristics (Martins 2004; Almeida 2007; Heyman *et al.* 2007; Huttunen 2007; Csengödi *et al.* 2008).

Less attention has been given to FDI's effect on relative wages for different types of workers. Norbäck and Persson (2007) show in a recent paper how complementarities between the acquiring and the targeted firm increases the probability for a successful acquisition and that scarce production factors will be able to secure part of the increased value of the targeted firm. Markusen (1995) argue that skilled labour is a scarce factor and needed to facilitate the transfer of new technologies and business practices to the acquired firm. FDI will, hence, increase wage dispersion since the new owners are dependent on key personnel to make the acquisition successful.

A few studies have examined purely domestic acquisitions and wages, i.e. acquisitions where both the target and the acquiring firm are domestically owned (see Conyon *et al.* 2004 and the references therein). For instance, Brown and Medoffs (1988) find a positive wage effect of acquisitions in the state of Michigan in the US,

as do McGuckin *et al.* (1995) for acquisitions in the American food industry. Moreover, Lichtenberg and Siegel (1992) find increased wage dispersion after acquisitions in the American manufacturing sector: wages for white collar wages increase and there is no effect on blue collar wages.

Most studies on FDI and wage dispersion use average wage levels at the industry level. FDI seems to increase the wage dispersion in the UK (Taylor and Driffield 2005) and Mexico (Feenstra and Hansson 1997), whereas Blonigen and Slaughter (2001) find no such effect in the US. Barba Navaretti and Venables (2004, p. 165) argue that the results might be affected by the use of aggregate industry data, which does not include information on individual worker characteristics. There are also two studies touching on the issue at a more disaggregated level. Girma and Görg (2007) examine average wages of production and non-production workers at the establishment level in the U.K., and find non-production workers to benefit from US acquisitions, whereas production workers only benefit in some of the included industries. Hence, their results suggest that internal wage dispersion increase after a foreign acquisition. Huttunen (2007) examines average wages for different skill groups at the plant level in Finland. She finds a positive effect of foreign acquisitions on wages, which increases with the average educational level of the workers, implying increased within-plant wage dispersion from foreign acquisitions.

We contribute to the literature on FDI and wages in several respects. First, we provide the first estimates on FDI and wage dispersion using the individual worker's wage rather than plant, firm, or industry averages.<sup>1</sup> The most important drawback of studies at more aggregate levels is that they, unlike in our study, cannot control for individual heterogeneity and changes in the labour force composition. The need to

control for a composition effect seems important since turnover rates tend to be high in most firms and particularly high after acquisitions.

Second, if internationalization in the form of multinationality is important for wages and wage dispersion, we will expect to find an effect on wages after foreign acquisitions of local non-MNCs, but no effect after acquisitions of domestic MNCs (which are already internationalized). Therefore, we distinguish foreign acquisitions of domestic multinational corporations (MNCs) from acquisitions of local Swedish firms. Moreover, analyzing both foreign acquisitions of Swedish firms and Swedish acquisitions of foreign-owned firms allows us to examine whether it is ownership or the acquisition itself that affects wage dispersion.

Third, the often used categories “white collar *vs.* blue collar” and “production and non production workers” are crude measures on skill levels. We use detailed information on both education and job tasks to characterize the skill level of individual workers. As an example, among workers with high-skilled jobs, we are able to identify the CEO as well as other managers, and thereby we can examine the impact of acquisitions on very specific groups of employees.

Our results suggest that foreign acquisitions of Swedish firms and Swedish acquisitions of foreign-owned firms tend to have a positive impact on wages for high-skilled workers and a negative or no impact on wages for low-skilled workers. Hence, the acquisition itself rather than the change from local to foreign ownership leads to increased intra-firm wage dispersion. A more detailed breakdown of skill groups shows the positive impact of an acquisition to be concentrated to the CEO and other managers.

The paper is organized as follows. Section II discusses reasons for differences in the wage structure between different types of firms. Section III describes the data

and empirical methodology and Section IV contains descriptive statistics. The results are presented in Section V and the paper ends with concluding remarks in Section VI.

## **2. Acquisitions and Wage Dispersion**

### **2.1 Acquisitions**

Dunning's (1988; 1989) emphasis on firm-specific advantages as a necessary condition for FDI is a good background in discussions on cross border acquisitions and wages.<sup>2</sup> His theoretical framework departs from the observation that foreign firms face the disadvantage of relatively poor knowledge of local conditions, and a need to balance this with firm specific advantages to compete with local firms. Firm specific advantages can be access to modern technologies, or intangible assets such as brand names and organizational capabilities.

Hence, firm specific assets allow firms to compete in foreign markets, for instance through licensing arrangements or through FDI. The choice between the two modes is partly determined by how well the market for technology and brand names work. Different types of market failures often encourage firms to enter foreign markets through FDI. The more important technologies and brand names are in a specific industry, the higher is the likelihood that firms will serve foreign markets through FDI rather than through licensing arrangements (Caves 1996).

FDI can be pursued through a greenfield investment - the start up of a new plant - or through acquisition of an existing firm. Dunning's framework does not only help us understand what makes a firm go abroad, it also gives guidance on characteristics determining whether a firm is a potential target of an acquisition. More precisely, acquisitions may be driven by motives such as market seeking; efficiency seeking; strategic asset and capability seeking; and technology sourcing. Hansson *et*

*al.* (2007) find technology seeking and market seeking being of particular importance in foreign acquisitions of Swedish firms. Other studies, such as Duncan and Mtar (2006), stress acquisitions of targets in sectors where the host country has a competitive advantage and of firms which fits well with the acquirer's core business.<sup>3</sup>

To sum up, the desirability of an acquisition depends of course on the price of the targeted firm, but also on characteristics such as size, competence, profitability, and productivity. The empirical implication is important: acquisitions are not a random event and it is important that the characteristics of the acquired firm are taken in to account when the effect on wages is examined. Failure to do so will result in biased estimates.

## **2.2 Wage dispersion**

Theoretical studies show that foreign firms might find it necessary to pay higher wages than local firms. For instance, Fosfuri et al. (2001) construct a model where foreign firms have a superior technology compared to local firms but where the use of this technology requires training of local workers. After training of the local workers, foreign firms have to pay a wage premium to prevent them from moving to a competitor.

There is less theoretical work on how FDI affect wage dispersion but Markusen (1995) argues that organizational changes resulting from an acquisition will increase demand for skilled labour, since skills is required to handle the new information and new business practices that follows.

Norbäck and Persson (2007) construct a theoretical model which relates to this idea. More specifically, their model stresses the importance of complementarities between the firm-specific assets of the target and the acquiring firm. A foreign firm is

able to win the bidding for the local firm by having access to a superior firm specific advantage such as technology or access to global production networks. When this technology is combined with the right target, it increases output and profit in the target firm. The wages for (identical) workers and capital is decided by the market whereas there is auction for the scarce factor, the firms itself in their model, which makes the seller able to secure part of the increased value of the targeted firm. In our framework, and following from Markusen's argument, the acquiring firm will depend on key high-skilled personnel in the targeted firm. Transfer of firm specific technologies and intangible assets across borders relies on these key personnel's knowledge of the firm and its network. Such high-skilled workers will be a scarce production factors and will be able to secure part of the increased value of the acquired firm. Wages will therefore increase for high-skilled labor and remains constant for other types of workers with a resulting increase in wage dispersion.

Hence, FDI might also affect relative wages through an impact on the bargaining power of the owners, and different categories of workers. Another example is that a foreign firm might credibly threaten to move production, or parts of the production, to other countries if costs increase, or in the event of strikes (Bertrand and Mullainathan 2003; Conyon *et al.* 2002; Cowling and Sugden 1987; Huizinga 1990). Such threat will decrease wages for all workers or part of the workforce. Skilled workers will be in a better position than unskilled workers in this bargain process. One reason mentioned above is that the new owners will depend on high skilled key personnel's knowledge of the firm and its network. In addition, low skilled activities are the ones most threaten by being moved abroad in a relative high wage country. Changes of the bargaining positions of different groups of workers will

then increase intra-firm wage dispersion even without any technology transfer taking place.

### **3. Data and Empirical Methodology**

The data used in this study comes from one individual-level data set and one firm-level dataset from Statistics Sweden. The data sets are linked by unique identification numbers. The analysis covers the period 1996 to 2000 and uses firms with at least 20 employees in the entire private sector. The individual level data set contains individual wage statistics based on the annual salary surveys of Statistics Sweden and is supplemented by material from a series of official data registers. The dataset contains information on approximately 2 million individuals per year (accounting for roughly 50% of the labour force) and includes information on workers' wages, education, labour market experience, working hours, gender and occupation (job) codes. Wages are full-time equivalent and include all types of compensations, including bonuses and non-pecuniary compensations. Fringe benefits are also included, but we do not have information on stock options.

The firm-level data set covers all Swedish firms with at least 20 employees and contains information on a large number of variables including, for instance, accounting profits, capital stocks, sales, value added, firm size, ownership and industry affiliation.

We divide our firms into three groups: foreign-owned MNCs, locally-owned MNCs and locally-owned non-MNCs. A firm is foreign-owned if more than 50 percent of the votes are foreign owned.<sup>4</sup> We define locally-owned MNCs as firms reporting positive exports to other firms within the corporation. Finally, Swedish

firms reporting no exports to other firms within the corporation are classified as locally-owned non-MNCs.<sup>5</sup>

Our analysis will be based on estimating the following individual-level regression:

$$\ln w_{ijt} = \beta_0 + \sum_{s=1}^S \beta_{1s} O_{jt} S_{ijt} + F'_{jt} \beta_2 + \mu_{ij} + \lambda_t + \varepsilon_{ijt} \quad (1)$$

where  $w_{ijt}$  is the full-time equivalent monthly wage for worker  $i$  in firm  $j$  at time  $t$ .  $O_{jt}$  is an ownership indicator variable taking the value of one in the period in which an ownership change is recorded and thereafter, and zero otherwise. In the case of foreign takeovers of domestic firms, it is equal to one in all periods in which the firm is foreign-owned, and zero otherwise. When estimating domestic acquisitions of foreign firms and in the case of comparisons with local MNCs and local firms, we redefine the takeover variable accordingly.  $S_{ijt}$  is the skill level of worker  $i$  defined according to job task or educational level;  $O_{jt} * S_{ijt}$  is an interaction between ownership and skills, capturing the impact of an ownership change on individual wages for different skill groups;  $F_{jt}$  contains time-varying firm-level variables. We include a “spell” fixed-effect  $\mu_{ij}$  for each unique firm-individual combination (see e.g. Abowd *et al.* 1999 and Andrews *et al.*, 2005). The spell fixed-effect is a time-invariant unobservable part of each unique employer-employee combination. This approach allows us to control for both unobserved individual and firm-specific.<sup>6</sup> Finally,  $\lambda_t$  are time fixed effects and  $\varepsilon_{ijt}$  is the error term. To allow for within firm correlation, standard errors are adjusted for clustering at the firm level. Definitions of the variables are found in Table A1 in the Appendix.

In the analysis, we restrict our sample to firms observed for at least four consecutive years (i.e. 4-year spells). This means that for e.g. Swedish firms acquired

by a foreign owner at period (t), we only consider firms that are Swedish owned at (t-1) and remain foreign owned at years (t+1) and (t+2). The same restriction applies to individuals who must remain in the same firm during the period of observation. This restriction enables us to control for both unobserved individual and firm-specific effects.<sup>7</sup> Finally, estimating wage effects on our restricted sample has the advantage of not mixing the acquisition effect on wages with the effect of individuals changing employers and thereby changing the work force composition of the firms.<sup>8</sup> As a robustness check, we will also present results where no restrictions are imposed on individuals and discuss how this affects the results.

To evaluate whether it is internationalization (an MNC acquiring a non-MNC) or change in ownership itself that affects wage dispersion, we analyze foreign acquisitions of domestic MNCs and local non-MNCs as well as changes in ownership from foreign to domestic. If internationalization is the main cause of wage changes, we would expect to see more of an effect on acquisitions of domestic non-MNCs than on acquisitions of domestic MNCs. Moreover, if it is the change in ownership itself that affects wages, we would expect to find a similar effect of all acquisitions, irrespective of whether the change is from domestic to foreign or from foreign to domestic.

Our focus will therefore be on three different types of acquisitions: (i) a foreign owned MNC acquiring a Swedish owned firm, (ii) a foreign owned MNC acquiring a Swedish local firm, and (iii) a foreign owned MNC acquiring a Swedish MNC. The first two allow us to distinguish between effects of foreign ownership. The last allows us to examine if there is an effect on wage dispersion even in acquired firms that are already multinational. Note that we construct our data sample such that, in the case of foreign acquisitions, all firms are Swedish owned in the initial period. Hence, the

analysis of e.g. Swedish firms acquired by a foreign MNC consists of firms that are domestically owned during the entire period or being acquired by a foreign MNE at some time during the period. A similar structure applies to the other two forms of takeovers.

If changes in within-wage dispersion are caused by the ownership change itself, rather than by the change from domestic to foreign control, we will expect to see similar patterns also after domestic acquisitions of foreign owned Swedish firms. We examine this possibility as a robustness check by also studying domestic acquisitions of foreign firms.

### **3.1 Propensity score matching**

One problem in estimating the causal effect of an acquisition on wages is the possible endogeneity of firms being acquired. Which firms are acquired is not likely to be random and acquired firms might exhibit characteristics systematically differing from those of non-acquired firms. This means that estimates on outcome variables (such as wages) become biased if non-randomness is not taken into account.

We approach this problem using propensity score matching (PSM). The aim of the matching procedure is to find a group of non-acquired firms that displays the same characteristics as the group of acquired firms.<sup>9</sup>

The matching procedure can be described as follows. Let  $A \in \{T, C\}$  be an acquisition indicator equal to T for firms being acquired (the treatment group) and equal to C for firms that are not acquired (the control group).  $w_{k,t+s}^T$  is the wage at time  $t+s$  for a firm  $k$  that has been acquired at time  $t$ , and  $w_{k,t+s}^C$  is the wage that would have been observed if the firm had not been acquired. Under certain assumptions, the average treatment effect on the treated can be identified as:

$E\{w_{t+s}^T - w_{t+s}^C \mid A = T\} = E\{w_{t+s}^T \mid A = T\} - E\{w_{t+s}^C \mid A = T\}$ . Matching techniques can be used to construct a sample of non-acquired twin firms to acquired firms and, thus, approximate the non-observed counterfactual event in the last term.

The so-called balancing property of the propensity score must be fulfilled to identify the treatment effect. This means that observations with the same propensity score must have the same distribution of characteristics, independently of treatment status. All estimations in the analysis fulfill the balancing property requirement.

The matching uses the algorithms provided by Becker and Ichino (2002) and Leuven and Sianesi (2003). We use the Nearest-Neighbour without replacement method to identify matched “twin” firms.<sup>10</sup> In a first step, we calculate the probability of a firm being acquired by a foreign owner. Each treated (acquired) firm is then matched by an “identical” but non-treated (non-acquired) firm.

Table A2 shows the estimated logit-model of being acquired by a foreign owner. We have used a variety of independent variables available in our data and that have been mentioned in the literature as being important in explaining foreign acquisitions (e.g. Sjöholm and Lipsey, 2006; Girma and Görg, 2007; Huttunen, 2007).

The propensity score matching of firms is implemented year-by-year using lagged covariates. Each identified control firm is then kept as matching partner for the specific acquired firm. Having obtained a control group of non-acquired firms, we proceed to estimate the impact of acquisitions on individual wages using data on acquired firms and the matched control group using individual spell fixed-effect estimations. This approach compares changes in the wage distribution in similar acquired and non-acquired firms before and after the acquisition.<sup>11</sup>

To evaluate the quality of our matching we, again, note that it satisfies the balancing property of the propensity score. Moreover, many of the included firm characteristics in acquired and non-acquired firms are significantly different in the unmatched sample but there are no, with the exception of size in the 1998 matching, differences in the matched sample of firms.<sup>12</sup>

#### **4. Descriptive Statistics**

Descriptive statistics on our sample of individuals and firms are presented in Table 1, together with figures on the share of each group of firms in total industry value added.

- Table 1 about here -

Local MNCs account for the largest share of value added, 39.5 percent, followed by local non-MNCs with 37.7 percent and foreign MNCs with 23.6 percent. Foreign- and domestic-owned MNCs are rather similar whereas domestic non-MNCs differ from MNCs in some respects: non-MNCs are relatively small and pay relatively low wages. Finally, domestically-owned MNCs show higher profits per employee than foreign-owned MNCs and domestically-owned non-MNCs.

It is important to adequately distinguish between workers with different skills. The most commonly used approach is to use blue- and white-collar workers, or production and non-production workers. This is a crude distinction. For instance, white-collar workers include the manager, but also the person emptying his dustbin; blue-collar workers include the truck driver, but also the specialist installing and running various types of advanced machinery.

We use two different criteria to separate high-, medium-, and low-skilled workers. Data categorizes each worker into one of 105 different job-tasks based on the international standard classification of occupations (ISCO-88), and aggregate these job-tasks to three categories. More precisely, managers and specialists are classified as high-skilled, workers engaged in various service functions and sales are classified as medium-skilled, and the rest are classified as low-skilled. According to this definition, high-skilled workers constitute 17 percent of the total workforce, medium-skilled workers about 44 percent and low-skilled about 37 percent. In the subsequent analysis, we split the high-skilled job group into CEOs, managers and specialist to trace wages for more specific sub-groups of employees.

The workers' educational background is an alternative measure of skill. More precisely, we have divided workers into three groups: workers with tertiary education, secondary education, or not more than primary education.

Both measures on skill show that high skilled workers receive relatively high wages. Wages are lowest in Swedish non-MNCs for all skill groups and these firms also have the lowest wage dispersion, measured as the standard deviation of individual wages. The relatively low wage dispersion in Swedish non-MNCs is also seen in the firm-level variable on the ratio between wages in the highest and lowest ten percent of the workforce. The ratio is 1.63 in local firms, 1.74 in Swedish MNCs, and 1.85 in foreign MNCs.

Our analysis focuses on cross-border acquisitions: firms changing ownership from foreign to local or from local to foreign. The number of foreign acquisitions of domestically owned firms has increased from around 100 in 1997 to around 200 in 2000 (Table 2). The number of Swedish acquisitions of foreign-owned firms has also increased but remains relatively small. The increase in foreign acquisitions is a

development seen worldwide (UNCTAD, 2009). However, the increase has been slightly larger in Sweden than in most other countries. Some plausible explanations to this development include the deregulation of capital and foreign exchange markets in the late 1980s and the Swedish EU membership in 1995. Another possible explanation is the large currency crisis in 1992 which reduced the cost of Swedish assets and the cost of locating production in Sweden.

- Table 2 about here -

- Table 3 about here -

In Table 3, we present descriptive statistics on the changes following an acquisition. Acquired firms tend to shrink in size as compared to non-acquired firms. Accordingly, investments tend to decline with a resulting decline in the capital labour ratio. On the other hand, exports and profits increase after an acquisition. It is possible that these changes in firm characteristics have an effect on wages.

The composition of different skill groups only changes marginally but wage dispersion, measured as the coefficient of variation, increases after an acquisition. One reason for increased wage dispersion could be that the turnover of workers is high within the different skill groups. Therefore, we include figures on the share of different types of workers that leaves, remains and arrives in firms after an acquisition. For instance, it is seen that 95 percent of the CEOs in acquired firms worked in the same firms one year before the acquisitions. Moreover, 23 percent of the CEOs working at the time of acquisition have left one year after the acquisition. It is also seen that about 80 percent of the other workers remain with the firm one year

after the acquisition. The highest separation rate is observed for low-skilled workers (22 percent) whereas highly skilled workers have the lowest separation rate (14 percent).

The high figures stress the importance of using individual level data to control for changes in the labour force composition. We need to separate between the acquisition effect on existing workers and the effect on workers that enter (or leave) the firm at the time around an acquisition.

## **5. Results**

Estimations 1-9 in Table 4 examine the effect of foreign acquisitions on different employees. Wages for high-skill workers are not significantly affected by foreign acquisitions (although the estimated coefficient is positive in all regressions). Wages for low-skilled and medium-skilled workers, on the other hand, decrease after a foreign-acquisition: by around six and four percent, respectively, in both estimations with education and job-tasks. Hence, our results suggest increased within-firm wage dispersion following an acquisition.

- Table 4 about here -

The results for acquisitions are only marginally affected by the inclusion of firm characteristics.<sup>13</sup> Acquisitions have no statistically significant effect on high-skill workers, but a negative effect on low- and medium-skilled workers. Hence, it is not changes in firm characteristics (other than ownership) that cause the increased intra-firm wage dispersion.<sup>14</sup> The estimated wage spread between skilled and unskilled workers is in the interval 4-8 percent depending on the specification.

One important result in Table 4 is that increased wage dispersion does not seem to be caused by multinationality. We find similar effects after foreign acquisitions of MNCs as after acquisitions of non-MNCs, which suggests there to be other mechanisms at work.

As discussed in Section II, if the increased within-firm wage dispersion is caused by the ownership change itself, rather than by the change from domestic to foreign control, we will expect to see similar patterns also after domestic acquisitions of foreign firms.

The wage changes after domestic acquisitions of foreign owned firms shown in columns 10 and 11 are similar to the changes after foreign acquisitions. Domestic acquisitions increase the wages for high-skilled workers and have no or a small negative effect on other workers, thus increasing intra-firm wage dispersion; t-tests comparing the two types of acquisitions indicate that there is no general statistically significant difference. The one exception is for medium skilled workers measured by job types (not shown).<sup>15</sup>

Hence, ownership changes in themselves widen intra-firm wage dispersion, either by having a general positive effect on high-skilled workers' wages, or by reducing the wages for low-skilled workers. This holds irrespective of whether the acquired firm is an MNC or a local firm, or whether the change is from foreign to domestic ownership or from domestic to foreign ownership. Our results therefore suggest that internationalization through FDI is not the key determinant to increased wage dispersion which is in accordance with the study at a more aggregate level by Blonigen and Slaughter (2001).<sup>16</sup>

- Table 5 about here -

Table 5 contains alternative specifications to examine the robustness of our results. We only show estimations with education but using job types gave very similar results. As previously discussed, we have imposed constraints on the data to isolate the wage effect from a possible composition effect. To analyze how our constraints affect the results, we re-estimate our models in Table 4 without these restrictions. The unrestricted sample makes use of almost three times as many observations as estimations with restrictions. The estimated wage effect of foreign acquisitions for high skilled workers roughly doubles in size and becomes statistically significant (see column 1).<sup>17</sup> The effects for low and medium skilled workers remain negative but are smaller in magnitude. The results suggest that the composition effect is important and that workers who join or leave the firm after an acquisition differ from workers remaining in the firm before and after the acquisition.

Some evidence of a difference between new and old workers is found in column 2 where we examine wages for newly hired workers, defined as workers who join the firm in the year of acquisition and remain with the firm at least until two years after the acquisition. The coefficients for newly hired workers measure their wages as compared to workers in non-acquired firms. The coefficients show that newly hired workers obtain comparatively high wages. For instance, newly hired highly educated workers in firms that are acquired get a wage premium of almost 16 percent as compared to workers in non-acquired firms. The wage premium for newly hired medium-skilled workers is also high, whereas the effect for low-skill workers is statistically insignificant.

The wages of exiting workers are examined in column 3. The wages for workers that were present in the acquired firm at the year of acquisition but that have

moved one year after the acquisition are compared to the wages for other workers. The results show that there is an increase in wages for medium- and high-skilled workers leaving the acquired firm and that there is basically no effect for low-skilled workers. The quantitative effect is larger for high-skilled than for medium-skilled workers. The group of comparison is all workers in acquired as well as non-acquired firms. Only using workers remaining in the acquired firms as the group of comparison showed that wages grow even higher for exiting workers than for remaining workers (not shown).<sup>18</sup>

Taking the results on leaving workers together with the previous results on incoming and remaining workers suggests that foreign acquisitions increase intra-firm wage dispersion.

Another issue that needs to be addressed is the nature of FDI. Acquisitions are only one type of FDI and it might be possible that wage effects differ between these and greenfield investments. In column 4, we show the wage effect of workers moving to foreign-owned greenfield investments.<sup>19</sup> The group of comparison is workers not changing firms. The result on education once more shows increased wage dispersion with a large positive effect on highly educated workers, an insignificant effect on medium-educated workers, and a negative effect on low-educated workers.<sup>20</sup>

As an additional robustness check, we also experimented with the control group, dropping firms that did not change ownership. These results are reported in column 5. Only using the variation due to the different timing of foreign acquisitions is sufficient to identify an increase in internal wage dispersion. More specifically, wages increase for high-skill workers after an acquisition, whereas there is no impact on wages for low- and medium-skill workers.

Education and job type are two ways of capturing human-capital and skills and relating cross-border acquisitions to wage dispersion. However, it is likely that people pursuing the same job-task and with the same education differ in their levels of skill, for instance because of differences in ability and experience. Therefore, as a complement, we analyze the impact of foreign acquisitions on workers in the top 10 (25) percent and in the bottom 10 (25) percent of the wage distribution. These results are presented in Table 6. The results are in accordance with previous estimations. The top ten per cent increased their wages by about 15 per cent after an acquisition and the bottom ten per cent got a reduction of about 11 percent. Estimations with the top and bottom 25 percent show a similar pattern of increased wage dispersion.<sup>21</sup> We did also use the same approach to examine the effect of domestic acquisitions of foreign firms, which, again, showed an increased wage dispersion (not shown).<sup>22</sup>

- Table 6 about here -

The above estimations on foreign takeovers are biased if foreigners are targeting firms that exhibit certain specific characteristics and therefore would have developed differently from non-acquired firms even if they would not have been acquired. We therefore have to consider an appropriate comparison group which we do by the use of a propensity score matched sample of acquired and non-acquired firms (Table 7). The results remain similar to the previous ones on the unmatched sample: foreign acquisitions lead to increased high-skill wages and decreased or no effect on medium- and low-skill wages. However, the coefficients change and the positive effect on high-skill wages increases and the negative effect on medium- and low-skilled wages are lower than in the unmatched sample.<sup>23</sup>

- Table 7 about here -

One possible explanation for why the benefits of an acquisition are concentrated to skilled workers could be a strategy by new owners to keep key personnel in the company, which was discussed in Section II.

However, high-skill is a broad concept and our categories include a large number of different job types. All workers classified as “skilled workers” do not necessarily need to be compensated. To examine this issue, we disaggregate the high-skill group and specifically look at the effect on wages for (i) all managers (estimations 1-3; 7), and (ii) the CEOs (estimations 4-6; 8). These results are shown in Table 8.

- Table 8 about here -

The results in Table 8 clearly show that the higher a person is in the job-hierarchy, the higher is the wage premium from a change in ownership. For instance, managers increase their wages after foreign takeovers by between 1 and 2.5 percent, as compared to managers that remain working in a Swedish firm. The effect is even higher for CEOs: around 5 percent. Moreover, separating out managers gives the remaining group of high-skill employees no remaining wage premium. Hence, managers in general and the CEO in particular are the only groups of employees that get relative wage increases after an acquisition.<sup>24</sup>

Analyzing domestic takeovers of foreign firms confirms earlier findings: a positive effect on wages for managers and the CEO of a similar size as found for

foreign takeovers and, after removing managers from the group of skilled employees, no effect on the remaining group of skilled workers. Among domestic acquisitions, there seems to be a less negative effect on low- and medium-skilled workers as compared to foreign takeovers but there are no statistically significant differences between the coefficients. Hence, our results on different types of acquisitions suggest that the acquiring firm favours key personnel, while the position of other groups is weakened or not affected by an acquisition.

## **6. Concluding Remarks**

Whereas the issue of trade and wages has received substantial attention in the literature, less is known about how FDI affects intra-firm wage dispersion. This is unfortunate, considering the important and growing role of FDI in the global economy. In this paper, we have analyzed the impact of cross-border acquisitions on intra-firm wage dispersion. To achieve this, we have divided employees into different skill groups according to job tasks and educational background and we examine wage dispersion within the acquired firm as well as the effects on incoming and leaving workers.

We show that multinational operations do not affect wage dispersion *per se*, which is in accordance with the study at a more aggregate level by Blonigen and Slaughter (2001). Foreign acquisitions of Swedish MNCs, that are already multinational with foreign affiliates, have roughly the same effect as foreign acquisitions of Swedish local firms. Instead, the increased wage dispersion seems to be caused by the acquisition itself: foreign acquisitions of domestic-owned firms and domestic acquisitions of foreign-owned firms have similar effects on wage dispersion.

The wage premium of a cross-border FDI is strongly concentrated to managers in general and the CEO in particular. CEOs in firms that are acquired increase their salaries by around five percent as compared to CEOs in firms that are not acquired. The wage premium to other managers is also positive, but smaller in size. Wages for other high-skilled workers are not affected, but wages for medium- and low-skilled workers decline when foreign owners acquire Swedish firms. This means that the spread between skilled and unskilled workers increases by about 5-7 percentage points following an acquisition. The increased within-firm wage dispersion remains robust through various model specifications.

Theoretical studies focus mainly on general wage effects of FDI (Fosfuri et al. 2001). Our empirical results suggest that more theoretical work trying to explain the linkages between acquisitions and wage dispersion are warranted. One possible approach would be to extend the literature on complementarities between acquiring and targeted firms (Norbäck and Persson 2007). The found wage dispersion could be caused by the ability of scarce and important groups of employees to secure part of the increased value of a firm following its acquisition.

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## TABLES

**Table 1.** Descriptive statistics of firms with different ownership (1996-2000).

	Domestic-owned Non-MNCs	Domestic-owned MNCs	Foreign-owned MNCs
<b>Individual statistics 1996-2000. Stdv. within parenthesis (.)</b>			
Monthly average wage	15 828 (5 676)	17 303 (6 658)	17 152 (6 907)
Wage high-skill jobs	22 145 (9 046)	25 070 (10 294)	24 893 (10 340)
Wage medium-skill jobs	15 294 (3 917)	16 23 (4 613)	15 957 (4 327)
Wage low-skill jobs	13 546 (2 530)	14 708 (2 629)	13 792 (2 417)
Wage high education	23 123 (10 728)	26 373 (10 892)	26 458 (11 079)
Wage medium education	15 542 (4 684)	16 612 (5 279)	16 689 (5 828)
Wage low education	14 054 (3 310)	14 970 (3 330)	14 639 (3 303)
Share female	0.43 (0.25)	0.28 (0.17)	0.31 (0.18)
Share of high-educated	0.08 (0.27)	0.11 (0.31)	0.10 (0.30)
Share of med-educated	0.69 (0.46)	0.67 (0.47)	0.63 (0.48)
Share of low-educated	0.22 (0.42)	0.22 (0.41)	0.26 (0.44)
Share of high-job	0.17 (0.38)	0.17 (0.37)	0.19 (0.40)
Share of med-job	0.48 (0.50)	0.57 (0.49)	0.57 (0.49)
Share of low-job	0.35 (0.48)	0.26 (0.44)	0.23 (0.42)
Experience	26.1 (10.9)	23.7 (11.3)	25.0 (11.2)
Age of employees	44 (10.2)	42 (10.6)	43 (10.4)
No of obs.	772 438	541 075	288 460
<b>Firm statistics 1996-2000 Stdv. within parenthesis (.)</b>			
Wage ratio 90 <sup>th</sup> to 10 <sup>th</sup> percentiles	1.63 (0.44)	1.74 (0.37)	1.85 (0.47)
Firm size	375 (1584)	947 (2379)	574 (776)
log Capital intensity	0.63 (1.88)	0.67 (1.11)	0.60 (1.34)
Profits per employee	1.18 (13.9)	1.95 (15.3)	1.08 (317)
Sales per employee	19.6 (37.4)	20.76 (31.2)	26.2 (47.8)
No of obs.	3 522	1 026	1 007
Share of tot value added	37.7	39.5	23.6

Note: Figures are based on the firms and workers in the linked employer-employee data set. Only workers and firms that are observed for at least four years are included. See Section III for details.

**Table 2.** Number of firms and acquisitions by ownership in Sweden 1996-2000.

	1996	1997	1998	1999	2000
Swedish locally-owned non-MNCs	8 981	9 300	10 254	10 274	10 737
Swedish MNCs	621	1 087	939	800	859
Foreign MNCs	1 360	1 460	1 594	1 725	1 885
Foreign acquisitions of locally owned firms	---	118	162	194	207
Domestic acquisitions of foreign-owned MNCs	---	57	45	44	76

Note: Figures in the table are based on data on all firms with at least 20 employees in the Finance Statistics data set (FS).

**Table 3.** Characteristics of acquired firms before and after acquisitions.

	(t-1)	(t)	(t+1)	(t+2)
<b>Firm statistics, ratio acquired/ non acquired firms</b>				
Firm size	1.16	1.10	1.07	1.05
Investment ratio	0.91	0.94	0.81	0.76
Labor productivity	0.96	0.92	0.91	0.91
Export ratio	2.66	2.75	2.67	2.81
Profit per employee	2.85	1.64	1.60	7.26
Capital stock per employee	1.63	1.36	1.42	0.90
Share high educated	1.00	0.95	0.97	1.02
Share medium educated	1.00	1.02	1.01	1.00
Share low educated	0.99	1.00	1.00	0.98
Coefficient of variation, wages	1.07	1.05	1.12	1.12
Wage ratio, top 90 / low 10	1.02	1.01	1.03	1.03
<b>Individual wages, acquired firms</b>				
High educated	21 855	22 792	23 709	24 106
Medium educated	16 145	16 867	17 222	16 528
Low educated	14 735	14 491	14 682	15 126
High skilled jobs	23 556	24 605	25 896	26 931
Medium skilled jobs	16 293	16 928	17 408	17 221
Low skilled jobs	15 653	16 162	16 306	15 916
<b>Individual wages, non-acquired firms</b>				
High educated	21 547	22 656	23 993	25 139
Medium educated	14 744	15 469	16 263	16 930
Low educated	13 286	13 811	14 299	14 672
High skilled jobs	22 634	23 835	25 478	27 029
Medium skilled jobs	15 014	15 718	16 509	17 176
Low skilled jobs	13 711	14 283	14 803	15 210
<b>Worker turnover in acquired firms</b>				
	Newly hired and stayers (t-1) to (t) <sup>(A)</sup>		Leavers and stayers (t) to (t+1) <sup>(B)</sup>	
	Newly hired	Stayers	Leavers	Stayers
High skilled jobs	15	85	14	86
CEO	5	95	23	77
Managers	19	81	17	83
Medium skilled jobs	18	82	17	83
Low skilled jobs	24	76	22	78

Note: Coefficient of variation is defined as the standard deviation divided by the mean. (A) Percentage of workers in an acquired firm working in the same firm one year before the acquisitions (stayers), and the percentage of workers who have joined the firm at the year of acquisition (newly hired).

(B) Percentage of workers that leave and stay in the firm, respectively, between the acquisition year (t) and the following year (t+1). Only workers and firms that are observed for at least four years are included.

**Table 4.** Cross-border acquisitions and wages by skill groups. Individual-firm fixed-effect estimations on unmatched sample (dependent variable – log monthly wage).

	Foreign acquisitions of all domestic firms			Foreign acquisitions of MNCs			Foreign acquisitions of local firms			Domestic acquisitions of foreign-owned firms	
	1	2	3	4	5	6	7	8	9	10	11
High Edu.* Foreign acquisition	0.017 (1.27)	---	0.015 (1.12)	0.013 (0.74)	---	0.013 (0.69)	0.002 (0.10)	---	0.002 (0.08)	0.024 (2.42)**	---
Medium Edu.* Foreign acquisition	-0.038 (-4.00)***	---	-0.038 (-3.91)***	-0.046 (3.30)***	---	-0.045 (-3.15)***	-0.036 (-1.33)	---	-0.037 (-1.35)	-0.000 (-0.02)	---
Low Edu. * Foreign acquisition	-0.059 (-5.93)***	---	-0.059 (-5.82)***	-0.067 (4.44)***	---	-0.066 (-4.37)***	-0.050 (-1.75)*	---	-0.050 (-1.76)*	-0.003 (-0.10)	---
High skill Jobs * Foreign acq.	---	0.015 (1.57)	---	---	0.011 (0.74)	---	---	0.008 (0.36)	---	---	0.016 (1.37)
Medium skill Jobs * Foreign acq.	---	-0.056 (-4.77)***	---	---	-0.063 (-4.09)***	---	---	-0.055 (-1.41)	---	---	0.002 (0.10)
Low skill Jobs * Foreign acq.	---	-0.032 (-3.35)***	---	---	-0.036 (-2.14)**	---	---	-0.039 (-2.17)**	---	---	-0.013 (-1.31)
log Capital intensity	---	---	-0.006 (-1.10)	---	---	-0.009 (-0.66)	---	---	-0.003 (-0.78)	---	---
log Firm size	---	---	0.002 (1.45)	---	---	0.032 (0.93)	---	---	0.0009 (0.57)	---	---
Profits per employee	---	---	0.0004 (1.58)	---	---	0.0005 (1.60)	---	---	9.8e-06 (0.22)	---	---
Time dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared (within)	0.36	0.35	0.36	0.34	0.33	0.35	0.37	0.36	0.37	0.34	0.34
No. of observation	1 367 459	1 341 463	1 363 692	589 521	568 773	588 448	815 557	810 269	812 863	303 761	296 328

Note: \* - significant at a ten percent level; \*\* - significant at a five percent level; \*\*\* - significant at a one percent level. t-values within brackets, based on clustered standard errors at the firm level. All regressions include individual and firm fixed-effects.

**Table 5.** Alternative specifications on foreign acquisitions and wages by skill groups. Individual-firm fixed-effect estimations on unmatched sample (dependent variable – log monthly wage).

	Unrestricted sample	Newly hired workers	Exiting workers	Movers to greenfields	Acquired firms only
	1	2	3	4	5
High Edu.* Foreign acq.	0.033 (4.24)***	0.159 (8.05)***	0.101 (6.68)***	0.041 (2.55)**	0.065 (4.00)***
Medium Edu.* Foreign acq.	-0.013 (-2.26)**	0.121 (5.02)***	0.031 (3.12)***	-0.011 (-0.72)	0.006 (0.01)
Low Edu. * Foreign acq.	-0.026 (-3.97)***	0.045 (0.59)	0.001 (0.12)*	-0.028 (-4.63)***	-0.017 (-1.40)
Firm characteristics	yes	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes	yes
R-squared	0.30	0.31	0.91	0.92	0.12
No. of observations	3 335 784	2 355 739	3 335 784	2 169 061	73 808

Note: \* - significant at a ten percent level; \*\* - significant at a five percent level; \*\*\* - significant at a one percent level. t-values within brackets, based on clustered standard errors at the firm level. All regressions include individual and firm fixed-effects. Firm-level characteristics include firms' capital intensity, size, and profits per employee. Estimated coefficients for these variables are omitted in the table but are available upon request. The estimations compare foreign acquisitions with all domestic non-acquired firms. Unrestricted sample (column 1) contain all individuals and firms with no survival constraints. Newly hired workers (column 2) refer to workers hired at the year of the acquisition and remaining in the sample at least until two years after the acquisition. The comparison group consists of workers in non-acquired firms. Exiting workers (column 3) consist of workers that are in the acquired firm at the year of acquisition but have left one year after. Movers to greenfields (column 4) refer to workers moving to foreign greenfield investments. Acquired firms only (column 5) contain firms that are taken over by foreign owners.

**Table 6.** Comparing the wage effect of acquisitions on top and bottom wage earners. Individual-firm fixed-effect estimations on unmatched sample (dependent variable – log monthly wage).

	Restricted sample	Restricted sample	Unrestricted sample	Unrestricted sample
	1	2	3	4
Top 10%* Foreign acquisition	0.142 (3.13)*** -0.109	---	0.144 (10.99)*** -0.122	---
Bottom 10%* Foreign acquisition	(-3.16)***	---	(-14.48)***	---
Top 25%* Foreign acquisition	---	0.058 (1.85)*	---	0.104 (8.50)***
Bottom 25%* Foreign acquisition	---	-0.077 (-4.95)***	---	-0.091 (-12.60)***
Firm characteristics	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes
R-squared	0.36	0.36	0.33	0.34
No. of observation	1 372 393	1 372 393	3 363 082	3 363 082

Note: \* - significant at a ten percent level; \*\* - significant at a five percent level; \*\*\* - significant at a one percent level. t-values within brackets, based on clustered standard errors at the firm level. All regressions include individual and firm fixed-effects. Firm-level characteristics include firms' capital intensity, size, and profits per employee. Estimated coefficients for these variables are omitted in the table but are available upon request. All estimations compare foreign acquisitions with all domestic firms. Top 10% (25%) refer to the top 10% (25%) wage earners in each firm's wage distribution. Similarly, Bottom 10% (25%) refer to the bottom 10% (25%) wage earners in each firm's wage distribution.

**Table 7.** Foreign acquisitions of Swedish firms and wages by skill groups. Individual-firm fixed-effect estimations on a propensity score matched sample of firms (dependent variable – log monthly wage).

	Foreign acquisitions of all domestic firms	Foreign acquisitions of domestic MNCs	Foreign acquisitions of local firms
	1	2	3
High Edu. * Foreign acquisition	0.044 (2.94)***	0.057 (2.54)**	0.034 (1.52)
Medium Edu.* Foreign acquisition	-0.014 (-1.41)***	-0.001 (-0.08)	-0.011 (-0.51)
Low Edu. * Foreign acquisition	-0.036 (-3.28)***	-0.025 (-1.42)	-0.028 (-1.36)
Firm characteristics	yes	yes	yes
Time dummies	yes	yes	yes
R-squared	0.19	0.14	0.13
No. of observations	98 005	50 621	51 959

Note: \* - significant at a ten percent level; \*\* - significant at a five percent level; \*\*\* - significant at a one percent level. t-values within brackets, based on clustered standard errors at the firm level. All regressions include individual and firm fixed-effects. Firm-level characteristics include firms' capital intensity, size, and profits per employee. Estimated coefficients for these variables are omitted in the table but are available upon request.

**Table 8.** The effect of acquisitions on wages for managers and CEO:s in targeted firms. Individual-firm fixed-effect estimations (dependent variable – log monthly wage).

	Foreign acquisition of Swedish-owned firms.						Swedish acquisitions of foreign-owned MNCs.	
	All firms	MNCs	Local firms	All firms	MNCs	Local firms		
	1	2	3	4	5	6	7	8
Manager * Foreign acquisition	0.021 (2.20)**	0.013 (0.805)	0.024 (0.96)	---	---	---	0.025 (1.03)	---
Managing director * Foreign acquisition	---	---	---	0.048 (2.51)**	0.049 (2.03)**	0.042 (1.74)*	---	0.055 (2.39)**
Other High skill Jobs* Foreign acquisition	0.004 (0.25)	0.006 (0.31)	-0.014 (-0.80)***	0.012 (1.16)	0.008 (0.49)	0.001 (0.06)	0.012 (1.49)	0.016 (1.33)
Medium skill Jobs * Foreign acquisition	-0.057 (-4.67)***	-0.062 (-3.98)***	-0.055 (-1.38)***	-0.057 (-4.67)***	-0.062 (-3.97)***	-0.056 (-1.42)	0.003 (0.15)	0.003 (0.15)
Low skill Jobs * Foreign acquisition	-0.033 (-3.34)***	-0.036 (-2.08)***	-0.038 (-2.07)**	-0.032 (-3.32)***	-0.035 (-2.00)**	-0.038 (-2.12)**	-0.009 (-0.95)	-0.009 (-0.95)
Firm characteristics	yes	yes	yes	yes	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	0.35	0.33	0.36	0.35	0.33	0.36	0.34	0.34
No. of observations	1 337 705	567 696	807 588	1 337 705	567 696	807 588	296 328	296 328

Note: \* - significant at a ten percent level; \*\* - significant at a five percent level; \*\*\* - significant at a one percent level. t-values within brackets, based on clustered standard errors at the firm level. All regressions include individual and firm fixed-effects. Firm-level characteristics include the firms' capital intensity, size, and profits per employee. The "All firms" column compare foreign acquisitions with all domestic non-acquired firms, "MNCs" compare foreign acquisitions of domestic MNCs with domestic non-acquired MNCs, and "local firms" compare foreign acquisitions of local firms with local non-acquired firms.

## Appendix

**Table A1.** Variable definitions.

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<b>Firm variables:</b>	
Profits per employee	Profits, net financial deduction, 1990 year prices, divided by number of employees.
Capital Intensity	Capital stock per employee, 1990 year prices.
Labor productivity	Sales per employee, 1990 year prices.
Foreign ownership	Dummy=1 if more than 50 percent of a firm's votes are foreign owned.
Size	Number of employees.
<b>Individual variables:</b>	
Wage	Full time equivalent monthly wage per employee, 1990year prices.
Female	Dummy = 1 if female, = 0 if male.
Education	Based on the Swedish education nomenclature (SUN-codes). Own classification of three education groups:  <i>Low educated:</i> At least compulsory school (= 9 years). <i>Medium educated:</i> Upper secondary school. <i>High educated:</i> At least three years of university studies.
Job task	Based on the Swedish Standard Classification of Occupations (SSYK 96) which is a national adaptation of the International Standard Classification of Occupations. Own classification of three categories, based on ISCO skill-levels: <i>Low skilled:</i> Service workers and shop sales workers; Craft and related trades workers; Drivers and mobile-plant operators; Elementary occupations. <i>Medium skilled:</i> Technicians and associate professionals; Clerks; Miscellaneous operators. <i>High skilled:</i> Senior officials and managers; Professionals
Experience	Age minus number of years of schooling minus seven.

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**Table A2.** Propensity Score matching. 1:st step logit. Dependent variable, acquired by a foreign firm.

	<b>1997</b>	<b>1998</b>
Profits/sales	0.00 (0.00)	0.03 (0.02)**
Log firm size	0.21 (0.22)	0.28 (0.17)*
Log firm age	0.61 (0.52)	-0.31 (0.29)
Log capital per employee	0.00 (0.00)**	0.00 (0.00)
Share of low skilled	-0.01 (0.03)	-0.01 (0.02)
Log labour productivity	-0.79 (0.60)	0.18 (0.01)
Export share	0.03 (0.01)**	0.02 (0.01)**
Industry dummies	included	included
Number of firms	468	713
Pseudo R <sup>2</sup>	0.17	0.20

Note: Robust standard errors within brackets. \* - significant at a 10 percent level; \*\* - significant at a five percent level; \*\*\* - significant at a one percent level. All explanatory variables are lagged one year. The 1997 specification also includes an insignificant effect of logged investment over sales. See Section III for information on how the matching procedure was implemented. Low skilled is measured by education.

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<sup>1</sup> This might yield different results than studies at more aggregated levels, as is shown in studies on related topics. See e.g. Heyman *et al.* (2007) and Martins (2004) on FDI and general wage levels, Oi and Idson (1999) on the impact of firm size on wages and Arai (2003) on rent-sharing.

<sup>2</sup> See Conyon *et al.* (2004) for a similar discussion and Blonigen and Slaughter (2001) for a slightly different theoretical approach to FDI and wage dispersion.

<sup>3</sup> In addition, Misra (2009) finds dividends and trading volumes being significant indicators of acquisitions.

<sup>4</sup> Statistics Sweden uses the internationally common 50 percent cut-off in defining foreign ownership. We cannot study whether the results are sensitive to this definition, but other studies on related issues suggest that they are not (e.g. Martins 2004; and Barbosa and Louri 2002).

<sup>5</sup> There might exist a few small multinationals that are classified as local firms due to missing information on exports, but the potential bias is likely to be of minor importance.

<sup>6</sup> Our strategy means that identification originates from within-firm variation over time for individuals staying in the same firm.

<sup>7</sup> As noted above, our approach is to estimate truncated individual-firm spell-fixed effects where the imposed truncation guarantees that each spell lasts at least four years.

<sup>8</sup> The choice of staying at or separating from a job is not a random process. Excluding job switchers from the analysis do not fully eliminate the issue of endogenous job switching, but the impact of acquisitions on individual wages becomes clearer. Non-endogeneity requires separations to be random with respect to acquisitions once we control for the permanent match-specific component, an assumption that is not unreasonable.

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<sup>9</sup> A possible alternative would be to conduct the matching at the worker level. Since acquisitions are presumably independent of an individual worker's characteristics and it is firms that change ownership, we consider it more appropriate to conduct the matching at the firm level.

<sup>10</sup> As a robustness check, we have re-estimated our PSM estimations using the Nearest-Neighbour with replacement method. Switching to sampling with replacement generates identical results as without replacement. This means that our matching is unaffected by replacement method.

<sup>11</sup> The use of fixed-effect and matching is basically a difference-in-differences approach without aiming at a post acquisition year-by-year comparison of treated and non-treated firms. For details, see e.g. Blundell and Costa Dias (2000).

<sup>12</sup> Descriptive statistics on the matched and unmatched samples is available upon request.

<sup>13</sup> We only show the results for education with firm controls but job-types gave very similar results.

<sup>14</sup> As a robustness test, we have estimated models with a varying set of explanatory variables. We have included export ratio, labor productivity and a sector-specific Herfindahl index to control for competition which could have an impact on relative wages. The alternative specifications had no impact on the estimated effect of acquisitions.

<sup>15</sup> Computed p-values from t-test measuring the difference between foreign acquisitions of domestic firms vs. domestic acquisitions of foreign owned firms for workers with high, medium and low education are 0.51, 0.40 and 0.23. The corresponding figures for job types are 0.97, 0.03 and 0.26.

<sup>16</sup> It is also in line with a related literature that finds no differences in productivity between foreign and domestic MNEs (Globerman *et al.* 1994; Doms and Jensen 1998).

<sup>17</sup> Results on the impact of foreign acquisitions on domestic MNCs and domestic non-MNCs, respectively, are available upon request.

<sup>18</sup> Exiting workers include both voluntary and involuntary exits. The wage effect might very well differ between the two groups, but we can unfortunately not separate between them.

<sup>19</sup> We define a greenfield investment as a newly established firm that is foreign owned. A firm is classified as new if it has a new organization number.

<sup>20</sup> The result on job types is less clear with insignificant effects on both high- and low-skilled workers and a negative effect on medium-skilled ones. Taken together, greenfield investments seem to have a similar effect on wage dispersion as acquisitions, but the results are less clear.

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<sup>21</sup> These results are robust to whether we use restricted data with the imposed survival criteria on firms and workers or the unrestricted dataset (results available upon request).

<sup>22</sup> As an alternative, we have also estimated quantile wage regressions for the 10<sup>th</sup> and 90<sup>th</sup> percentiles of the wage distribution in a sample of acquired firms. Once again, the results confirmed an increased wage dispersion following an acquisition (not shown, results available upon request).

<sup>23</sup> Using alternative matched samples, as suggested by Dehejia (2005), did not have any impact on the results (not shown).

<sup>24</sup> The estimations on foreign takeovers were also made on the matched sample of firms (not shown), with only marginally larger coefficients than those reported for the unmatched sample in Table 9.