

The Impact of Foreign Acquisitions on Wage Dispersion

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Abstract

Empirical studies at a firm- or sector-level suggest that Foreign Direct Investment (FDI) increase wage dispersion by positively impact high skill wages. We contribute to the literature by examining the issue of FDI and wages on a large matched Swedish employer-employee data-set. Results suggest that foreign owned multinational firms (MNCs) tend to pay relatively high-skill wages, especially in comparison with non-multinational Swedish-owned firms. Moreover, foreign acquisitions of Swedish firms tend to increase high-skill wages and decrease low-skill wages. That is, the positive impact on high-skill wages and increased wage dispersion seems to be caused by the acquisition itself rather than by the ownership. A breakdown of skill groups shows that the positive impact of acquisitions is largest for COEs and managers whereas other groups are either negatively affected by the change or not affected at all.

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I. Introduction

Increased integration of the global economy has changed relative incomes around the world. For instance, competition from trade of relatively low-skill intensive products has had a downward pressure on low-skill wages in wealthy nations and presumably contributed to widening income disparities (e.g. Baldwin, 1995). Most focus in this process is on the role of international trade, and less attention has been given to Foreign Direct Investment (FDI).

The lack of studies on FDI and wage dispersion is unfortunate since FDI has increased dramatically in size and importance during the last decades, growing at a rate far greater than growth in international trade. The main reason to this high growth is arguably increased interests among countries to host foreign firms that are widely assumed to bring with them various benefits including technology and access to foreign markets. An additional aspect that has been increasingly focused upon is that foreign-owned firms might pay relatively high wages. There are a large number of studies on nationality and average firm wages. It seems to be a universal rule that in every country foreign-owned firms tend to pay higher average wages than domestically-owned ones. However, closer analysis at an individual level find that, firstly, a large share of this wage difference can be attributed to differences in worker characteristics, and that, secondly, foreign-owned firms pay higher wages than local non-multinational firms but not higher than local multinational firms (Heyman *et al.*, 2004; Martins, 2004). The lesson is that it is not nationality of the firm that matter for wages but whether the firm is a multinational firm or a non-multinational firm. These results is in line with what to be expected from the theory of localization decisions of firms (see e.g. Markusen, 2004)

Hence, in comparison with pure local firms there are reasons to expect that multinational firms in general, and foreign multinationals in particular, might pay comparably high wages for some key employees. For instance, multinational firms might try to avoid loss of their firm-specific advantage through labour turnover by paying a wage premium to high-skill workers. Furthermore, foreign MNCs might import foreign wage structures to their affiliates, wage structures that might differ from local firms.

Going one step further analyzing not only average wages but the distribution of wages there are some firm level evidences of increased wage dispersion due to foreign acquisitions. For instance, Girma and Görg (2003) find skilled workers to benefit from US acquisitions in the UK, and unskilled workers to benefit only in some industries. Huttunen (2004) examines wages at the plant level in Finland. Using information on the share of the workforce with different levels of education Huttunen finds a positive effect from foreign acquisition on wages for all skill groups (defined by education). Moreover, the positive impact of an acquisition on wages increase with the schooling of the workers, implying increased wage dispersion from inflows of FDI. At a sector level, Taylor and Driffield (2005) find FDI to have a positive effect on wage dispersion in the UK, whereas Bloningen and Slaughter (1999) find no such effect in the US.

This paper contributes to the literature on FDI and wages by in several ways. First, when analyzing wages, the individual worker wage rather than firm or industry averages is the preferred level of aggregation. Using detailed matched employer-employee data spanning we are able to analyze the impact of acquisitions on individual workers wage rather than firm or industry averages.

Second, as suggested above, there are reasons to believe that the difference really is between local and multinational firms rather than between domestically and foreign owned firms. Using information of whether a firm is a local-, foreign MNC or a domestically owned MNC we analyze the impact of different types of acquisitions: Swedish to foreign, foreign to Swedish and comparing these with wages in all Swedish firms as well as both Swedish local firms and Swedish MNCs. These issues are tackled by analyzing large dataset covering roughly 2,000,000 workers annually (covering about 50% of the labour force) linked to a highly detailed data set including all Swedish firms. That is, we cover not only the manufacturing sector but also the service sector.¹

Results suggest that compared to Swedish local firms, foreign owned multinational firms tend to pay relatively high-skill wages but not in comparison with Swedish MNCs. This result goes through independently if we are analyzing the impact of foreign ownership on wages for a given level of education or job type. When analyzing the impact of acquisitions on wages result suggest that foreign acquisitions of Swedish firms tend to increase high-skill wages and decrease low-skill wages. That is, increase wage dispersion. However, the positive impact on high-skill wages seems to be caused by the acquisition rather than by the change of ownership itself. To be precise, ownership changes from foreign to Swedish result as well as Swedish to foreign ownership increases high-skill wages and wage dispersion. A detailed breakdown of skill groups shows that the positive impact of acquisitions are attached to managers and the CEO in targeted firms whereas other groups are either negatively affected by the change, or not affected at all. Hence, offering a wage premium to individuals in high positions in targeted firms may work as oil in the machinery enhancing acquisitions.

¹ Data does not include the financial sector.

The rest of the paper is organized as follows. Section II discusses reasons to why there might be differences in the wage structure between foreign and local firms. Section III describes the data. Section IV contains the econometric results and the paper ends with some concluding remarks.

II. Conceptual Framework

FDI is likely to have an impact on wages, most obviously by increasing demand for labour. It is also likely that FDI will affect different types of workers differently. More precisely, multinational firms will locate production in a country partly according to the country's comparative advantage and thereby increase demand for the abundant production factor reflecting comparative advantage, which in a country like Sweden is likely to be skilled workers.²

There are empirical results showing multinational companies to pay comparable high wages, even after controlling for worker and firm characteristics (see e.g. Heyman *et al.*, 2004). A number of rationales for MNCs to pay relatively high wages has been suggested, such as a wage premium caused by rent-sharing arrangements among foreign firms (Budd *et al.*, 2005); a higher labour demand volatility in foreign plants (Fabri *et al.*, 2003); or as compensation for a higher foreign closure rate (Bernard and Sjöholm, 2003).

We raise the question whether foreign-owned firms differ from Swedish-owned firms in their remuneration of different types of workers. If there are theoretical arguments why MNCs might pay different wages than non-MNCs it is less obvious why foreign owned firms would pay different wages for different workers compared to locally-owned MNCs. The issue has

² See e.g. Gustavsson and Kokko, 2003, 2004 and Karpaty and Lundberg, 2004.

not been much elaborated in the theoretical literature. However, there are some theoretical fundamentals that might be used as a framework.

Firstly, the theory on the multinational firm, as expressed by for instance Dunning (1988), stress the aspect of ownership advantages as a determinant of firms' competitiveness in foreign markets. Ownership advantage can be a brand name but also specific technologies, distribution, and marketing systems. Since ownership advantages are important for the firm's competitiveness, it will try to guard them and restrict access to them by other competitors. One way to restrict such access is by trying to reduce labour turnover. In other words, competitors can get access to, for instance, the firm's technologies by recruiting some of the firm's employees, and it is in the interest of the firm to avoid such recruitment. One way for the multinational firm to avoid the loss of employees is to pay a wage premium. It is not likely that the firm has to pay such a wage premium to all of its employees; the firm will most likely pay a wage premium only to those workers that might take some of the firm specific advantage with them if they join a competitor. It is plausible that such workers are mainly found among top-level employees and among various specialists. Hence, we might expect a larger wage dispersion among MNCs than within local firms. It should be noted that the above hypothesis concerns a possible difference in wages between multinational and non-multinational firms. It does not predict a wage difference between foreign owned and locally owned multinational firms.

A second plausible reason for foreign owned firms to pay different wages than locally owned firms is if they apply a wage structure used in their home also on their Swedish operations. If Swedish wage differentials, in an international comparison, are relatively small foreign ownership may increase wage dispersion (REF).

Thirdly, ownership changes is typically followed by a “shake out” or a rationalization of the labour force (REF). Large changes put pressure on the management who might require a wage premium to be willing to pursue changes necessary. By offering managers in central positions a wage premium they might be more willing to accept an acquisition and the restructuring of the targeted firm. However, there are no reasons to expect this mechanism to be specific for foreign takeovers rather it is change of ownership itself that drives changes in the wages.

Furthermore, multinational firms typically differ from non-multinational firms in their firm specific advantages, which are often labelled as a difference in technology. Differences in technology might result in differences in factor demand functions and inflows of FDI could, for instance, increase the relative demand for skilled labour in a process analogous to skill-biased technological change (see discussion in Taylor and Driffield, 2005, p.4). Moreover, foreign acquisitions are typically associated with organizational changes, and thereby an increased demand for skilled workers who are better able to deal with new information and the introduction of new ideas, an ability which decreases the cost of activities in firms spread out over many countries (Markusen, 1995; Bresnahan et al, 2001). Again, whereas this mechanism could explain differences in relative wages between MNCs and non-MNCs, it is less obvious that it would lead to a difference between locally- and foreign owned MNCs.

As seen in the discussion above, the theoretical framework for analysing the issue at hand is fragmented. It should be noted that there are theoretical papers where inflows of FDI can both increase or decrease wage dispersion depending on the assumptions that are being made on, for instance, the initial equilibrium or the underlying parameter changes on trade costs and factor endowments (Markusen and Venables, 1998). The ambiguous theoretical results stress

the importance of more empirical research to better be able to understand the impact of FDI on wage dispersion. This paper will contribute to this task.

III. Data and Descriptive Statistics

The analysis is based on three register-based data sets from Statistics Sweden. At lowest degree of aggregation we have the individual wage statistics database (LS), which contains detailed information worker wages and characteristics. The LS span the period 1996-2000 and cover approximately 2 million observations per year, covering roughly 50 percent of the Swedish labor force. Examples of variables included are full-time equivalent wages, education, labor market experience, gender and job type.

Our data on individuals needs is complemented by firm-level statistics, which is obtained from the financial statistics (FS). This database contains detailed information on all Swedish firms. Examples of variables included are value added, capital stock (book value), number of employees, ownership, profits, and industry sector etc. Finally we have plant level data (Regional labour Statistics data, RAMS) that is aggregated to the firm level. These data complement the FS with information on the structure of education, gender and experience for the firms' employees.

The data sets are matched by unique identification codes and the analysis is based on our matched employer-employee data set for the period 1996-2000. We restrict the analysis to firms with at least 20 employees.³

³ Reasons for this restriction are that we only have data on export for firms with at least 20 employees. Further we want to exclude household and one-man firms from the analysis since these are less likely to be involved in international acquisitions.

To separate out different types of firms we divide our sample into three groups: foreign-owned MNCs; locally-owned MNCs; and locally-owned non-MNCs. The number of firms with different ownership is shown in Table 1. Counting the number of firms in each category an overwhelming share of the firms are locally-owned non-MNCs, followed by foreign-owned MNCs and locally-owned MNCs. Part of our analysis will focus on acquisitions and firms that change ownership from foreign to local or from local to foreign. As seen in Table 1, the number of foreign acquisitions of locally owned firms has increased from around 100 in 1997 to around 200 in 2000 while number of local acquisitions foreign firms though has increased but remain relatively few.

The share of each firm type in total industry value added between 1996 and 2000 is shown in Table 2. The figures show that local non MNCs accounts for more than twice as large share of value added compared to foreign owned firms. However, as shown in Heyman *et al.* (2004), the weight of foreign owned firms is increasing rapidly and has roughly doubled during the 1990s. Moreover, the figures show that MNCs is larger, having a higher labor productivity (measured as sales per employee) and hiring highly educated workers more intensively than non MNCs. Therefore it is not surprisingly that non-MNCs pay relatively low wages while the average wage is very similar among Swedish and foreign owned MNCs. Finally, non MNCs has the largest share of female workers and is almost as profitable per employee as are Swedish owned MNCs. Hence, maybe surprisingly, foreign owned firms have a lower profit per employee than both Swedish MNCs and non MNCs.

It is of importance for our analysis that we adequately can separate between workers with different skills. The most common way in the literature is to separate between 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 high-tech machinery.

We use a number of different criteria to separate between high- and low-skill workers to avoid drawing conclusion based on results caused by poor and crude distinctions. The different criteria are shown in Table 3. Firstly, we use the job-description to divide workers in different skill-groups. The data categorize each worker to one of 26 different job-types. We aggregate these job-types to three categories. More precisely, management and specialists are considered high-skill, workers engaged in various service functions and sales are considered medium-skilled, and the rest are characterised as low-skill. Table 4 shows that, according to this definition, high-skill workers constitute 17 percent of total workforce, medium-skill workers about 44 and low-skilled about 37 percent. As expected, high-skilled workers have the highest salaries, followed by medium-skilled and low-skilled (Table 6). Though the separation of workers by job-types is an improvement on earlier work, it is not without problem. For instance, should operation of machinery be considered as a medium-skilled or low-skilled job? Hence, even this low level of aggregation hides heterogeneous job-types.

An alternative measure on skill takes in to account the educational background of the worker. More precisely, we have divided workers in three different groups with tertiary education, secondary education, or not more than primary education. This measure makes the high-skill group and low-skill group smaller compared to the distinction according to job-types (Table 4). Wages remains relatively high for high-skill workers and low for low-skill workers (Table 6). Our focus is not only wages as such but also, wage dispersion and differences among different firm types. In Table 6 we compare the wage gap between skill groups for different

types of firms. Table 6 show that for all skill groups, the average wage is lowest in Swedish non MNCs, and in absolute terms they also exhibit the lowest wage dispersion.

IV. Econometric Methodology and Results

Method

We begin our analysis by examining the effect of ownership on wages starting from the following expression:

$$\ln w_{ijt} = \beta_0 + \sum_S \beta_{1S} S_{ijt} + \sum_S \beta_{2S} O_{jt} S_{ijt} + X'_{ijt} \beta_2 + F'_{jt} \beta_3 + \alpha_i + \eta_j + \varepsilon_{it} \quad (1)$$

where w_{it} is the full-time equivalent monthly wage for worker i at time t ; O is a foreign ownership dummy for firm j , the foreign ownership dummy is 1 if at least 50 percent of the equity is foreign owned.; S is the skill level of worker i defined according to job type or educational level, $O_{jt} * S_{ijt}$ is an interaction between ownership and workers skill capturing the wage premium related to working in a certain firm type, X a vector of other individual characteristics including gender an labor market experience, F contains firm level variables such as (log) firm size, profits per employee, capital intensity, the share of women, labor productivity and industry affiliation,. Finally, α_i and η_j are fixed individual- and firm-effects, respectively and ε_{it} is the classical error term. We will analyze the stock of foreign owned firms as well as takeovers. To isolate the impact of multinational status, we compare foreign owned firms with both Swedish multinationals and Swedish local firms. A firm is classified as a multinational if it reports positive exports to other firms within the company.⁴

⁴ This information is available for firms with at least 50 employees or smaller firms with large sales.

Propensity score matching

An econometric problem in estimating the causal effect of an acquisition on wages concerns the endogeneity of firms becoming targeted. In other words, it is not random which firms that are acquired. Firms that become acquired might exhibit characteristics that systematically differ from other firms. Moreover, and analogously to the problem in the evaluation literature of non-random treatment groups, the characteristics of the firms that become foreign owned might be such that they in any case would develop differently than their non-acquired counterparts. This, in turn, means that estimates on outcome variables (such as wages) become biased. We approach this problem by way of propensity score matching combined with the more general difference-in-differences (d-i-d) technique.

How much of the OLS-bias that is removed by the matching depends crucially on the identification of the characteristics that determine acquisitions (Heckman *et al.* (1998), Becker and Ichino (2002)). We use the algorithms provided by Becker and Ichino (2002) and Leuven and Sianesi (2003) for the matching. The propensity score is estimated with the Nearest-Neighbor method without replacements. The balancing property of the propensity score is tested and satisfied in all estimations.⁵ Since we have a panel of firms and individuals over time, the matching of firms is first calculated year-by-year using lagged covariates. Finally, to evaluate the impact of foreign acquisition we combine the matching procedure with difference-in-difference estimations, as suggested by Blundell and Costa Dias (2000). Using difference-in-difference estimations allow us to examine the dynamic effects of foreign takeovers on wages.

⁵ To test for this, the sample is split into intervals of the propensity score. Within these intervals, the algorithm tests that the means of the covariates in the logit do not differ between treated and control observations. In testing the balancing property, only observations in the region of common support are included.

Results

We start our econometric analysis by examining wage levels for different skill groups, measured by education or job-types, in firms with different ownership (Table 7). Estimation 1 shows that highly educated workers have a 50 percent higher wages than workers with low education, and that the premium for medium education is around 9 percent. Moreover, the wage premium for education increases further for workers in foreign-owned MNCs: high-educated workers in foreign-owned firms increase their wage with another 6.8 percent, medium-educated workers with 3.8 percent, and low-educated workers with 1.7 percent pointing at a higher wage dispersion in foreign owned firms. The results are similar in Estimation 2 where we use job-types to categorize workers in different skill groups: high-skilled jobs pay better than medium skill-jobs and even better in comparison with low-skill jobs. Moreover, workers in high-skill jobs in foreign-owned firms are paid a premium of 6.8 percent. However, foreign owned firm wage premium is isolated to workers classified as having a high-job, for other job types there are no significant difference between foreign owned and domestically owned firms. It is also worth noting that job-types as a measure on skill gives substantially higher R-square values than regressions with education, suggesting that an individual's job-position is a better predictor of the wage than is education.

Wages are, of course, affected by a host of factors other than education and job-type. In Estimations 3-8 we append individual specific characteristics such as, gender and experience, and firm specific characteristics, size, profits and capital intensity. Estimations show that females are paid substantially less than males (roughly 11-13 percent) and that experience increase wages but at a diminishing rate. Moreover, results suggest that capital intensive tend to pay relatively high wages and that rent sharing might be at hand. However, the economic significance of profits is very small.

More importantly, results from estimation 3-4 in Table 7 suggest that appending firm and individual characteristics do not upset the result that there is a wage premium working in a foreign owned firm and that this wage premium is concentrated to skilled workers. Hence, suggesting larger wage dispersion in foreign owned firms.

Previous research has shown that the relevant distinction is rather between multinational companies and non-multinational companies, rather than between foreign-owned and domestically-owned companies (Heyman *et al.*, 2004). To be precise, multinational companies pay higher wages than non-multinational companies in Sweden, but there is no difference in wages for workers working in Swedish-owned or foreign-owned MNCs. In Estimations 4-8 we examine whether there is a systematic difference in wages for workers in in Swedish MNC as well as non MNC. Estimations 5 and 6 in Table 7 compare wages in foreign-owned firms with Swedish MNCs, and Estimations 7 and 8 with Swedish non-MNCs (local firms). Results show that the wage in foreign-owned firms is substantially larger than wages in Swedish non-MNCs and that the wage premium is concentrated to skilled workers. For workers employed in Swedish MNCs the wage premium is unclear. In the estimations with education only the coefficient for medium-skilled wages is significantly positive while in estimations with job types, foreign ownership is positive and positive significant for high- and medium-skill workers and negative for low-skill workers. Results using information on workers education suggest that Swedish and foreign owned MNCs pay similar wages while pure local firms pay both lower wages and has lower wage dispersion. In short, in terms of wages the difference between foreign owned firms and Swedish non-MNCs is large but unclear in comparison with Swedish MNCs.

In Table 7 we have used either education or job-types to capture differences between skill groups. A more direct way to analyze wages and wage dispersion among different types of firms is to analyze different segments of the wage distribution. We proceed with such approach by way of percentile (also labeled quantile) wage regressions. Due to computational issues we perform the percentile estimations for one year at a time using a random sample of 50 percent of the observations.⁶ The results are shown in Table 8. Because of space limitations only the coefficients and the t-statistics of the foreign ownership variable are shown.⁷

Results from the percentile regressions shown in Table 8 are in line with previous results. That is, skilled workers with high wages benefit most from foreign ownership. The coefficient for percentile 90 is positive and statistically significant in all estimations and ranges between 2 and 5.2 percent. Low-skill workers, as captured by relative wages, also seem to benefit from foreign ownership but the wage premium is much smaller for these workers. Hence, results again suggest larger wage dispersion in foreign owned firms than in domestically owned firms.

When analyzing the stock of firms there are a potential bias that can be attributed to unobserved firm characteristics. Firms with foreign ownership might differ in some unobserved characteristics, which could also explain the wage premium. One may overcome this bias by examining firms that change ownership. In other words, we would not expect any wage increase following a foreign acquisition of a Swedish-owned firm, if it is unobserved firm characteristics rather than ownership itself that explains the high wages. Another problem is that firms may not be acquired randomly. There may be certain characteristics that

⁶ Percentile regressions are very computer demanding which explains why we haven't been able to do the estimations on the whole sample of individuals, over the whole period.

⁷ The complete results are available from the authors upon requests.

make a firm an interesting object to acquire. We tackle these issues by way of analyzing acquisitions using both the whole sample of untargeted firms as well as a matched sample of firms that exhibit similar characteristics as targeted firms. It is likely to assume that if targeted firms not would have been acquired, wages in these firms would have followed the wage development in the matched sample of firms closely. Therefore, as discussed above, the matching procedure, in an efficient way, singles out or isolates the impact of ownership on wages. In Table 9, by way of a fixed estimation procedure examine wages for individuals working in firms that change ownership from domestic to foreign. The fixed effect means that time invariant firm and individual characteristics is differenced out.

Analyzing acquisitions the previous pattern of differences in the foreign wage premium between different skill groups remains and becomes perhaps even clearer. More precisely, the estimations show that high-skill workers increase their wage after foreign acquisitions, compared to high-skill workers in firms that remain Swedish owned. The wage premium is small, however; around one percent irrespective if education or job-types are used. Moreover, the wage premium is larger after acquisitions of Swedish MNCs than after acquisitions of Swedish local firms. This contrasts previous results and suggest that there might be something else than internalization that explain the wage premium in MNCs. That is, if MNCs possess firm specific assets that they want to internalize by paying a wage premium we would then expect a relatively large wage premium for skilled workers when acquiring non MNCs (compared to acquisitions MNCs).

Analyzing wages for workers with a lower skill level the wage decrease substantially after a foreign-acquisition. Estimation 3-4 in Table 9 suggests that for medium skilled workers the relative wage drop is around four percent in estimations with education and around six

percent in estimations with job-types. The negative effect on low-skilled wages is slightly stronger: between 5-5.7 percent in estimations with education and between 3.3-3.9 percent in estimations with job-types.

If foreign takeovers are targeted toward firms with specific characteristics these results may be biased. For example, takeovers might primarily target large firms, and the wage pattern might differ between large firms and the general population of firms. We therefore include estimations 7-12 with a matched sample of firms: for each firm that is taken over by foreign owners we find an “identical” firm that remains Swedish owned. The results remain relatively stable with foreign acquisitions leading to higher high-skill wages and lower medium- and low skill wages. The coefficients changes, however, and the positive effect on high-skill wages amount to between 4.2-5.2 percent. On the other hand, the negative effect on medium- and low-skilled wages is less than in the unmatched sample. Hence, results points unambiguously toward increased wage dispersion after a foreign acquisition.

An alternative way to estimate a dynamic pattern is to use difference-in-difference estimations, shown in Table 10. The result is broadly in accordance with previous ones. Using workers educational background as separation criteria results suggest that skilled workers benefit from a foreign acquisition while medium and low skilled worker receives depressed wages. Hence, wage dispersion increases. Using job types as our separation criteria results from the difference in difference estimations is less clear. Results using job types suggest that all categories lower their wages after an acquisition. However, the wage for low skilled workers is depressed by most. Hence, again results points at increasing wage dispersion after an acquisition.

Given that MNCs attempt to internalize firm specific knowledge by offering a wage premium to skilled workers we would expect to see that largest positive wage premium attached to workers in Swedish non MNCs that becomes acquired. This is a pattern that we do find.

Hence, results in Table 9 casts doubt on the argument.

However, if the change in ownership itself, rather than the change from local to foreign is what drives the increased wage dispersion we would expect to see a wage premium to skilled workers also after other types of ownership changes. We examine this possibility in Table 11 where ownership changes from foreign to Swedish. Results show that there is a wage increase for high-skilled workers after a ownership change from foreign to Swedish, and that the magnitude is slightly larger than for corresponding changes from Swedish to foreign (Table 9). For other workers there is no significant effect on wages due to the acquisition. Hence, in this kind of reversed acquisitions we can see increased wage dispersion as well. That is, results suggest that it is changes in ownership and not the change from one nationality that increase high-skill wages and wage dispersion.

The results suggest that changes of ownership positively affect wages for high-skill workers. Possible explanations to the effects include a compensation for turmoil associated with ownership changes, or as a strategy by new owners to keep key personnel in the company. However, high-skill is a broad concept and our category include a relatively large number of different job-types (see table 3). It is not obvious that all these categories need to be compensated for an acquisition to be pulled through. To examine the issue further, we disaggregate the high-skill group and look specifically at the effect on wages of, firstly, all managers (estimations 1-3; 7) and secondly on wages of CEOs (estimations 4-6; 8). Results are shown in table 12. It is clear that the higher up in the job-hierarchy, the higher is the

increase in wages from a change in ownership. This goes through for foreign acquisitions of Swedish firms as well as for Swedish acquisitions of foreign owned firms.

Analyzing results in some detail, starting with foreign takeovers of Swedish firms we can see that managers receive a wage premium of 1-2 percent while other groups are either unaffected or receives decreasing wages. The positive effect is even higher for CEOs: around 5 percent. Separating out management or CEOs has a negative effect on remaining high-skill workers indicating that the positive effects of a foreign acquisition is concentrated to workers in key positions. This pattern goes through independently if we are using all Swedish firms, Swedish MNCs or Swedish non MNCs as reference group. Analyzing Swedish takeovers of foreign firms of foreign owned firms cement this pattern. We find a positive effects on wages for managers and CEOs that are of similar size as the ones found for foreign takeovers. However, there seems to be one important difference between the two types of takeovers. Contrary to foreign acquisitions of a Swedish owned firms there does not seem to be a negative effect on wages for low- and medium-skilled workers after a local takeover of a foreign owned firm.⁸

Concluding Remarks

We have, in some detail, analyzed the impact of ownership and firm type (Swedish non MNC, Swedish MNC and foreign owned MNC) on wages and wage dispersion for different type of workers as well as the impact of acquisitions on wages and wage dispersion. To achieve this task we divided workers into different skill groups according to job type and educational background. As a supplement we have also analyzed the impact of ownership and firm type on wages and wage dispersion using percentile regressions. The results suggest that there is

⁸ The estimations on foreign takeovers were also done on the matched sample of firms (not shown), and resulted in slightly larger coefficients than the one reported for the unmatched sample in table 11.

greater wage dispersion in MNCs than in non-MNCs and that what really matters for this is multinationality rather than nationality. Secondly when analyzing takeovers we find that takeovers increase wage dispersion and that the positive wage effect is concentrated to workers in key positions. Other, medium and low skilled workers are typically unaffected or receive a relative wage decrease after an acquisition. A further decomposition of workers according to job type reveal that the positive wage effect of an acquisition is strongly concentrated to managers and in particular to the CEO in the targeted firms. It is the acquisition itself rather than ownership that are important. This opens up many new questions. One is how the results compare to purely domestic acquisitions. There are some studies on domestic acquisitions that also find wage effects. 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. However, few studies try to distinguish between wage effects for high- and low-skilled workers. One exception is Lichtenberg and Siegel (1992) who in a study of acquisitions in the American manufacturing sector find a negative effect on white collar wages and no effect on blue collar wages. Hence, to some extent these results are in line with findings here. However, we stress that this study is the first study that uses matched employer-employee data to analyze not only the impact of ownership on wages and wage dispersion. We have also analyzed the impact of acquisitions on wages and compared foreign takeover of domestic firms with domestic takeovers of foreign owned firms. This is rarely done. Finally, our data allows us to separate out not only managers but also the CEO in targeted firms and to analyze the impact of an acquisition on this highly specific group of workers.

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TABLES

Table 1. 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: Data cover all the whole economy and we do not force all firms to be linkable to our individual statistics.

Table 2. Descriptive statistics of firms with different ownership (1996-2000).

	Locally-owned non-MNCs		Locally-owned MNCs		Foreign-owned MNCs	
Individual level statistics 1996-2000. Stdv. within parenthesis (.)						
Monthly Average Wage	19700	(7101)	21 635	(8437)	21 364	(8732)
Share female	0.42	(0.49)	0.27	(0.44)	0.30	(0.46)
Share of high-educated	0.082	(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	0.23	(0.42)	0.22	(0.41)	0.26	(0.44)
Share of high-job	0.17	(0.37)	0.16	(0.37)	0.19	(0.39)
Share of med-job	0.47	(0.50)	0.54	(0.50)	0.55	(0.50)
Share of low-job	0.35	(0.48)	0.25	(0.43)	0.23	(0.42)
Experience	26.1	(10.9)	23.6	(11.2)	24.9	(11.2)
Age of employees	44	(10.2)	42	(10.6)	43	(10.4)
No of obs.	778 017		551 732		298 148	
Firm level statistics 1996-2000						
Firm size	371	(1572)	950	(2377)	573	(776)
Capital intensity	CHECK		404	(1158)	424	(1044)
Profit per employee	184	(3000)	191	(1532)	108	(317)
Sales per employee	1971	(3735)	2079	(3111)	2617	(4770)
No of obs.	3 573		1 033		1 010	
Share of tot value added *	52.5		27.1		20.4	

Note: Figures are based on firms-workers remained in employer-employee linked data.

* The share of value added is the only variable in Table 2 that is based on data covering firms not linkable to the individual statistics; this makes the number a description of the Swedish economy.

Table 3. Criteria for separating high- and low-skilled workers.

Criteria	High-Skill	Medium-Skill	Low-Skill
Job Types	Management, Specialists	Misc. Services, Sales	Others
Education	Tertiary Education	Secondary Education	Primary Education

Table 4. Share of workers according to different skill groups.

Criteria	High-Skill	Medium-Skill	Low-Skill
Job Types	17.0	51.0	29.4
Education	9.4	67.6	23.0

Table 5. Wages for workers according to different skill groups.

Criteria	High-Skill	Medium-Skill	Low-Skill
Job Types	29 482	19 635	17 313
Education	31 188	20 040	18 004

Note: Monthly full-time equivalent wage.

Table 6. Wages for workers according to skill levels and ownership of the firm.

	Locally-owned non-MNCs	Locally-owned MNCs	Foreign-owned MNCs
High-Skill Jobs	27 555	31 336	31 047
Medium-Skill Jobs	19 029	20 252	19 859
Low-Skill Jobs	16 854	18 309	17 153
High Education	28 773	32 900	32 919
Medium Education	19 340	20 695	20 762
Low Education	17 484	18 633	18 208

Note: Monthly full-time equivalent wage.

Table 7. The effect of foreign ownership on wages 1996-2000 (dependent variable – log wage per employee).

	1	2	3	4	5	6	7	8
	vs. All	vs. All	vs. All	vs. All	vs. Swe. MNEs	vs. Swe. MNEs	vs. Swe. Local	vs.Swe. Local
High Education * Foreign	0.068 (5.63)***	---	0.060 (5.10)***	---	-0.002 (0.18)	---	0.132 (8.89)***	---
Medium Education * Foreign	0.038 (3.95)***	---	0.035 (4.16)***	---	0.013 (1.67)*	---	0.063 (5.82)***	---
Low Education*Foreign	0.017 (2.48)**	---	0.012 (1.83)*	---	-0.001 (0.18)	---	0.029 (3.44)***	---
High-Skill Jobs*Foreign	---	0.068 (6.06)***	---	0.057 (6.07)***	---	0.021 (2.20)**	---	0.090 (7.97)***
Medium-Skill Jobs*Foreign	---	0.011 (1.24)	---	0.022 (4.19)	---	0.012 (1.80)*	---	0.041 (5.82)***
Low-Skill Jobs*Foreign	---	-0.001 (0.11)	---	-0.016 (1.53)	---	-0.036 (4.27)***	---	0.005 (0.40)
High Education	0.489 (63.56)***	---	0.511 (64.57)***	---	0.548 (60.44)***	---	0.460 (46.70)***	---
Medium Education	0.089 (19.73)***	---	0.107 (25.15)***	---	0.111 (19.38)***	---	0.100 (16.82)***	---
High-Skill Jobs	---	0.473 (43.85)***	---	0.311 (49.65)***	---	0.300 (35.35)***	---	0.310 (36.71)***
Medium-Skill Jobs	---	0.111 (12.48)***	---	0.066 (11.60)***	---	0.046 (6.36)***	---	0.072 (9.47)***
Female	---	---	-0.128 (19.28)***	-0.1109 (19.47)***	-0.133 (21.45)***	-0.120 (20.04)***	-0.129 (15.29)***	-0.111 (15.86)***
Experience	---	---	0.017 (36.53)***	0.014 (34.08)***	0.018 (22.53)***	0.015 (22.90)***	0.017 (36.73)***	0.014 (33.73)***
Experience^2	---	---	-0.000 (36.10)***	-0.000 (30.95)***	-0.000 (22.41)***	-0.000 (21.77)***	-0.000 (37.92)***	-0.000 (30.50)***
Log Firm size	---	---	0.004 (1.07)	0.007 (2.39)**	-0.001 (0.09)	0.003 (0.65)	0.003 (0.66)	0.006 (1.66)*
Profits/Employee	---	---	5.42e-06 (3.38)***	3.55e-06 (2.69)***	1.31e-05 (1.83)*	9.70e-06 (1.82)*	5.02e-06 (5.52)***	3.05e-06 (3.92)***
Capital intensity	---	---	0.031 (8.09)***	0.031 (9.37)***	0.024 (3.30)***	0.033 (5.82)***	0.027 (7.40)***	0.025 (7.68)***
Time dummies	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	0.26	0.37	0.36	0.51	0.38	0.52	0.35	0.52
No. of obs.	1 618 008	1 584 606	1 614 161	1 571 987	841 162	806 438	1 069 894	1 054 009

Note: Robust standard errors within brackets. * - significant at a ten percent level; ** - significant at a five percent level; *** - significant at a one percent level. Industry dummies correspond to 14 industries.

Table 8. The effect of foreign ownership on wages for low- and high-income workers. Results from wage quintile regressions.

	1996		1997		1998		1999		2000	
	Low 10%	High 10%	Low 10%	High 10%	Low 10%	High 10%	Low 10%	High 10%	Low 10%	High 10%
Foreign Ownership	-0.001 (0.88)	0.020 (4.73)***	0.009 (6.31)***	0.044 (13.08)***	0.015 (7.95)***	0.052 (11.81)***	0.012 (8.30)***	0.043 (8.37)***	0.018 (11.65)***	0.027 (7.37)***
Firm characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Individual characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Period dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Pseudo R ²	0.14	0.25	0.17	0.27	0.16	0.26	0.21	0.35	0.24	0.36
No. of obs.	128 014		127 717		127 717		122 302		122 007	

Note: Individual level characteristics include control for seven levels of education, job type, gender and experience. Firm level characteristics include the firms' composition of skilled and unskilled workers, capital intensity, size, profit per employee, and industry class.

Due to computational complexity and the sample size percentile regressions are calculated year by year using a random sample of 50 percent.

Table 9. The effect of foreign takeovers of Swedish firms. Fixed effect estimations.

	Unmatched Sample						Matched Sample					
	Vs all	Vs all	Vs MNCs	Vs MNCs	Vs Local	Vs Local	Vs all	Vs all	Vs MNCs	Vs MNCs	Vs Local	Vs Local
	1	2	3	4	5	6	7	8	9	10	11	12
High Edu * For.	0.015 (3.63)***	---	0.012 (2.14)**	---	0.001 (0.18)	---	0.044 (9.21)***	---	0.053 (9.17)***	---	0.034 (3.98)***	---
Medium Edu. * F.	-0.039 (34.89)***	---	-0.046 (32.54)***	---	-0.040 (18.14)***	---	-0.014 (8.75)***	---	-0.002 (0.78)	---	-0.011 (3.92)***	---
Low Edu*Foreign	-0.059 (37.29)***	---	-0.067 (34.91)***	---	-0.050 (14.35)***	---	-0.036 (17.88)***	---	-0.023 (9.17)***	---	-0.028 (6.17)**	---
H-Skill Jobs*For.	---	0.015 (6.45)***	---	0.010 (3.51)***	---	0.007 (2.18)**	---	0.045 (16.36)***	---	0.059 (17.26)***	---	0.043 (9.89)***
M-Skill Jobs*For	---	-0.060 (51.88)***	---	-0.063 (47.06)***	---	-0.055 (25.37)***	---	-0.035 (21.67)***	---	-0.019 (8.99)***	---	-0.034 (11.14)***
L-Skill Jobs*For.	---	-0.033 (19.56)***	---	-0.037 (17.17)***	---	-0.039 (15.11)***	---	-0.009 (4.35)***	---	0.001 (0.29)	---	-0.014 (3.83)
Firm characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	0.36	0.35	0.35	0.33	0.37	0.36	0.19	0.19	0.14	0.15	0.13	0.14
No. of obs.	1 367 520	1 341 323	591 715	570 754	813 499	808 223	98 005	96 875	76 982	75 867	57 025	56 983

Note: Firm level characteristics include the firms' capital intensity, size, profit per employee, and industry class.

Table 10. Difference-in-difference estimation. Foreign takeover of Swedish firms.

	Wage growth (t-1) - (t+1)		Wage growth (t-1) - (t+2)	
	Job type	Edu cat	Job type	Edu cat
High edu		0.360 (53.79)***		0.382 (57.03)***
Medium edu		0.069 (18.88)***		0.075 (20.79)***
High Edu * FoF.		0.052 (3.29)***		0.031 (1.93)**
Med Edu. * FoF		-0.027 (-4.61)***		-0.079 (-13.79)***
Low Edu * FoF		-0.027 (-4.31)***		-0.080 (-13.41)***
High job	0.385 (77.11)***		0.4000 (79.48)***	
Medium job	0.099 (30.71)***		0.103 (32.19)***	
H-Skill Job * FoF.	-0.017 (-1.82)*		-0.052 (-5.41)***	
M-Skill Job * FoF	-0.009 (-1.70)*		-0.088 (-16.68)***	
L-Skill Job * FoF.	-0.058 (-9.61)***		-0.067 (-11.43)***	
Treated	0.028 (5.72)***	-0.008 (-1.54)	0.022 (4.53)***	-0.007 (-1.24)
Period	0.079 (17.99)***	0.079 (17.04)***	0.122 (27.52)***	0.119 (25.63)***
Firm characteristics	yes	yes	Yes	yes
Time dummies	yes	yes	yes	yes
R-squared	0.44	0.35	0.43	0.35
No. of obs.	33 537	33 720	33 394	33 704

Note: Firm level characteristics include the firms' capital intensity, size, profit per employee, share of females and industry class.

**Table 11. Domestic takeovers of foreign owned firms.
Fixed effect estimation.**

	1	2	3	4
High Education* Foreign	0.024 (3.48)***	0.022 (3.19)***	---	---
Medium Education * Foreign	-0.000 (0.12)	0.001 (0.29)	---	---
Low Education*Foreign	-0.003 (0.44)	-0.000 (0.07)	---	---
High-Skill Jobs*Foreign	---	---	0.016 (3.28)***	0.016 (3.33)***
Medium-Skill Jobs*Foreign	---	---	0.002 (0.78)	0.003 (1.12)
Low-Skill Jobs*Foreign	---	---	-0.013 (1.94)*	-0.009 (1.40)
Firm characteristics	no	yes	no	yes
Time dummies	yes	yes	yes	yes
R-squared	0.34	0.34	0.34	0.34
No. of observations	303 761	303 681	296 408	296 328

Note: Firm level characteristics include the firms' capital intensity, size, profit per employee, share of females and industry class.

**Table 12. The effect of foreign takeovers of Swedish firms on Managers and CEO in targeted firms.
Fixed effect estimation.**

	Foreign acquisition of Swedish owned firms.						Swedish acquisitions of foreign owned MNCs.	
	Vs all	Vs Swe MNCs	Vs Swe Locals	Vs all Swe	Vs Swe MNCs	Vs Swe Locals	Vs foreign MNCs	Vs foreign MNCs
	1	2	3	4	5	6	7	8
Manager*Foreign	0.021 (7.37)***	0.012 (3.58)***	0.024 (5.67)***	---	---	---	0.025 (3.20)***	---
CEO*Foreign	---	---	---	0.048 (5.86)***	0.049 (4.86)***	0.041 (5.08)***	---	0.055 (1.84)*
Other High-Skill*Foreign	0.004 (1.06)	0.005 (1.02)	-0.014 (2.94)***	0.012 (5.11)***	0.007 (2.33)***	0.001 (0.34)	0.012 (2.20)**	0.016 (3.22)***
Medium-Skill Jobs*Foreign	-0.057 (51.86)***	-0.062 (47.06)***	-0.055 (25.00)***	-0.057 (51.85)***	-0.063 (46.98)***	-0.056 (25.41)***	0.003 (1.13)	0.003 (1.11)
Low-Skill Jobs*Foreign	-0.033 (19.48)***	-0.037 (17.13)***	-0.038 (14.61)***	-0.032 (19.20)***	-0.036 (16.53)***	-0.038 (14.56)***	-0.009 (1.40)	-0.009 (1.40)
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	0.37	0.35	0.33	0.36	0.34	0.34
No. of observations	1 341 323	570 754	808 223	1 341 323	570 754	808 223	296 328	296 328

Note: Firm level characteristics include the firms' capital intensity, size, profit per employee, share of females and industry class. Unmatched sample.

