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**COMPETITION, TAKEOVERS
AND GENDER DISCRIMINATION**

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ABSTRACT

Competition, Takeovers and Gender Discrimination*

Theories of taste-based discrimination predict that competitive pressures will drive discriminatory behaviour out of the market. Using detailed matched employer-employee data, we analyze how firm takeovers and product market competition are related to the gender composition of the firm's workforce and the gender wage gap. Using a difference-in-difference framework and dealing with several endogeneity concerns, we find that the share of female employees increases as a result of an ownership change, in particular when product market competition is weak. Further, increased competition reduces the gender wage gap, especially among highly educated employees. While the estimated wage effect is quite small, the results support the main theoretical predictions.

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1. Introduction

Throughout the world, women earn less and are far less likely to hold high ranking corporate management positions than men. The differences in labor market outcomes between men and women are too large to be readily explained by observable differences in productivity. If women are discriminated on the labor market, this is a major source of inefficiency. However, inefficiencies tend to be competed away. In fact, ever since Becker (1957; 1971) presented his seminal theory of taste-based discrimination, it has been suggested that labor market discrimination can be competed away, at least if discrimination is based on employer preferences.[1]

The implication of Becker's theory is that competitive pressures will tend to keep discriminatory practices at bay. If product market competition is strong, only the most efficient firms will survive and inefficient discrimination will, at least gradually, be eliminated. The market for corporate control is another mechanism through which discriminatory behavior can be driven out of the market. The reason is that a non-discriminatory owner can make higher profits than a discriminatory one. If this is true, a firm is more valuable in the hands of a non-discriminatory owner. Hence, ownership of discriminatory firms will tend to be transferred to owners with less discriminatory attitudes.[2] In this paper, we empirically study if competitive pressures in the form of takeovers and product market competition improve the labor market outcome for women.

Given that discrimination is prevalent on the labor market, women are paid less in relation to their marginal product than men. A straightforward prediction is therefore that non-

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[1] This is not the case when discrimination is due to customer or employee discriminatory preferences or so-called statistical discrimination.

[2] In the corporate governance literature, takeovers are traditionally seen as a mechanism that can restrain inefficient management practices that give firm managers private benefits (Jensen, 1986, 1988).

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discriminatory firms will hire more women than discriminatory firms. As a non-discriminatory (profit-maximizing) firm would have no incentives to pay women more than the going market wage, the theoretical predictions regarding effects on the gender wage gap are less straightforward. Still, there are two main reasons to expect gender wage differences to be reduced by competitive pressures. First, due to glass ceiling effects, female career opportunities are likely to be lower in discriminatory firms.[3] Since wages are closely tied to the employee's hierarchical position, female relative wages should be higher in non-discriminatory firms. Second, firm-level rents may be disproportionately shared with men by discriminatory owners.[4]

We use a very large and detailed panel of Swedish employer-employee data running from 1990-2002 to analyze how product market competition and firm takeovers are related to the gender composition of the firm's workforce and the gender wage gap. Using detailed information on employee education, we are also able to study the impact on different groups of workers, addressing the important issue of employee heterogeneity. Besides the high quality data, the major contribution of this study is to address the prediction that firm takeovers should affect labor market outcomes for women, while the main focus of the previous empirical studies has been on the effects of product market competition. The only study, at least of which we are aware, studying ownership changes and discrimination is Hellerstein et al. (2002). They study if firms with a low share of women are more likely to be taken over on a sample of US firms, but find no such effects. Hellerstein et al. (2002) do not, however, study the effects of takeovers on the composition of employees. Our study also improves on earlier research by using a theoretically sound measure of product market competition developed by Boone (2004) and

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[3] For a detailed analysis of glass ceiling effects in Sweden, see Albrecht et al. (2003).
[4] Nekby (2003) finds evidence of such behavior among Swedish firms.

Boone et al. (2007), whereas previous studies have mainly relied on rudimentary measures such as concentration ratios.[5]

The implications of Becker's theory that new owners should, on average, be more efficient and less discriminatory are analyzed using a within firm difference-in-difference approach. The results show that ownership changes are associated with an increase in the share of women employed, at least when product market competition is weak. At low levels of competition, our estimates show that a takeover leads to a 2.5 percentage point increase in the share of female employees. We show that the result is not likely to be due to the takeover targets being different from other firms in some other fundamental respects. Moreover, a detailed analysis of the timing of events provides further evidence that we indeed identify a takeover effect. Finally, we use industry-level takeover activity in Finland as an instrument for takeovers and once more find similar results.

Our results for wages are somewhat inconclusive. We find no effects of takeovers on male-female wage differentials. However, increased product market competition is related to reduced gender wage differences; in particular among employees with high educational attainment. The estimated effects are quite small: increasing our measure of product market competition by one standard deviation is associated with a 0.5 percentage point reduction of the total gender wage gap.

Notably, the result on wage differences is due to competition being associated with lower male wages, rather than higher female earnings. This is in line with the findings by Black and Strahan (2001) in their study of banking deregulation in the US. Exploiting state-level differences

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[5] The measure, which is described in greater detail below, is based on the within-industry profit response to changes in producer costs. An industry where the elasticity of profits to costs is high (in absolute terms) is also highly competitive according to this measure.

in the timing of deregulation, they find that the exposure of banks to out-of-state competition reduced male wage more than female wages.

This paper is related to a long line of empirical research, starting with Becker's own analysis, which has related various measures of product market competition to the extent of labor market discrimination. The results from previous research are mixed, but at least later studies tend to find that competition on the product market holds back discrimination (see e.g. Ashenfelter and Hannan 1986, Black and Brainard 2004, Hellerstein et al. 2002 and Meng 2004). Product market competition has usually been measured using industry-level concentration ratios and firm-level measures of market power. Ashenfelter and Hannan (1986), for example, use a three-firm concentration ratio when studying the local banking sector in the US. Concentration ratios are also used by Black and Brainard (2004) when studying the impact of increased import competition on relative female wages in concentrated and competitive industries. Hellerstein et al. (2002), on the other hand, use the firm's own market share as a measure of the firm's exposure to product market competition. As already said, that we use a more sophisticated measure of product market competition as well as a larger and more detailed data set constitutes a substantial improvement to earlier studies

The paper is organized as follows. In the next section, we discuss different theories of labor market discrimination. The data and descriptive statistics are presented in Section 3. In Section 4, we discuss our empirical methodology. The results are presented in Section 5 and Section 6 concludes the paper.

2. Theoretical discussion and predictions

2.1 Taste-based discrimination

Theories of taste-based discrimination suggest that under some conditions, market forces will work to reduce discriminatory practices.[6] The underlying reason is that discrimination comes at a cost to the firm owner. If discrimination is prevalent and female wages are lower than their marginal product, profits would increase if more women were employed at the going market wage. Thus, if product market competition is strong, firms that incur the efficiency loss from discriminating against women will be competed away from the market.[7] As a result, we expect there to be a larger share of women employed in non-discriminatory firms and that product market competition limits discrimination. Not just product market competition, but also the market for corporate control will work to reduce taste-based discrimination. The reason is that a non-discriminatory owner can make higher profits than a discriminatory one. Ownership of discriminatory firms will therefore tend to be transferred to owners with less discriminatory attitudes. The predictions from this reasoning are clear. On average, we expect the share of female employees to increase after an acquisition has taken place. Further, we expect this effect to be especially large when product market competition is weak.

While these predictions are derived from an owner-manager setting, they also have implications when ownership and firm management are separated. In such cases, it is possible

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[6] Hellerstein et al. (2002) provide a simple model that clearly illustrates the main predictions from Becker's theory of discrimination.

[7] Perfect product market competition will put an end to discrimination if there is a sufficient number of potential employers with non-discriminatory tastes. Entry will also terminate discrimination when there is at least one non-discriminating employer and non-decreasing returns to scale (Becker, 1971).

that market forces help disciplining firm managers who may pursue their own objectives (such as discriminating against women) rather than maximizing shareholder value.[8]

Since wages are set by the market, it is not clear that takeovers and differences in product market competition should give rise to differences in the gender wage gap across firms. Even non-discriminatory profit maximizing owners have no incentive to pay wages higher than the going market wage. To be more precise, the wage gap ought to be the same for all firms recruiting similar workers in the same labor market. The relevant market for a certain type of labor may, however, only be firms active in one or two industries. In this case, stronger competition on the product market may reduce the industry's equilibrium gender wage gap. If, on the other hand, the type of labor is used in many sectors in the economy, changes in product market competition in one industry should only have negligible effects on the firm's gender wage gap. An analogous reasoning suggests that the effects of a change in firm ownership may have limited effects since a change in a single firm's attitude towards women will only have marginal effects on equilibrium wages. However, as discussed above, the effect may differ across educational and occupational groups.

Even though the theoretical predictions on wages are less clear-cut than those on the share of female employees, there are reasons for studying this outcome. First, female career opportunities may differ between firms as a result of discrimination. Since wages are closely tied to the occupation,[9] the gender wage gap will tend to be lower for non-discriminatory firms. Another reason to look at wages is that firms may share rents with workers. Weak product market competition should give rise to larger rents and thus, possibly higher wages. Since discriminating

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[8] The literature on this topic is too large to cite. However, Nickell (1996) provides a nice discussion of the various mechanisms through which competitive forces can affect corporate performance through this channel and others.

[9] See e.g. Blau and DeVaro (2006) who show that, on average, women have a lower probability of being promoted than men, when controlling for productivity. They also show that wages are intimately related to promotions.

firms prefer men, these rents may be disproportionally shared with their male employees (Nekby, 2003). Thus, we expect product market competition to reduce male wages, thereby improving the relative wages of women. In this case, a takeover may also reduce discrimination and the firm's gender wage gap.

2.2 Other theories of discrimination

A new explanation for discrimination has recently raised an interest among economists. Based on evidence in the area of psychology, the argument is that discrimination may be unintentional, rather than due to taste for a certain group. Bertrand et al. (2005) suggest that this type of "implicit" discrimination should be less apparent in hiring situations where the review process is more structured and when there is more time to access the qualities of the applicants. Hence, structured and well-functioning human resource management may be important for reducing implicit discrimination in employment choices. It can be assumed that more efficient firms should, on average, have better human resource management. In that case, the theory of implicit discrimination yields the same predictions for the impact of market forces on the labor market outcome for men and women as the taste-based theory of discrimination.[10]

Another reason behind discrimination is information difficulties about workers, so called statistical discrimination. Hiring practices are then related to group attributes rather than individual characteristics (Phelps, 1972; Arrow, 1973).[11] If groups differ in average abilities and information costs are high, even perfectly rational employers would discriminate in the statistical sense as such behavior is profitable. As in the case of implicit discrimination, it is possible that

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[10] Bloom and Van Reenen (2007) provide evidence that competition on the product market and the market for corporate control improves management quality. They show that poor management practices are more likely to survive in less competitive industries. Moreover, family-controlled firms passing control down to the eldest son, which are thus isolated from the market for corporate control, exhibit particularly poor management practices.

[11] See also Altonji and Blank (1999) for an overview of more recent research along those lines.

competitive forces compel firms to improve their management but it is not clear how this would affect hiring practices. Among other things, better management could result in better screening processes of applicants. Improved screening would reduce the reliance on group stereotypes, but the impact from this on hiring depends on the relative change in the signal-to-noise ratio, as well as the distribution of attributes in the different groups. Therefore, there are no definite predictions regarding the relation between competition and statistical discrimination.

3. Data and descriptive statistics

3.1 Individual and firm-level data

The analysis is based on three register-based data sets from Statistics Sweden spanning the period 1990-2002. First, for the period 1996-2002, the financial statistics (FS) contain detailed firm-level information on all Swedish firms. For the period 1990-1995, we have data on all manufacturing firms with at least 20 employees and non-manufacturing firms with at least 50 employees. Examples of variables included are value added, capital stock (book value), number of employees, total wages, ownership status, profits, sales and industry affiliation.

Second, the Regional Labor Market Statistics (RAMS) includes data on all establishments spanning the period 1990-2002. RAMS add establishment information on the composition of the labor force with respect to educational level and demographics.[12]

Finally, the individual wage statistics database (LS) contains detailed information from official registers on a very large representative sample of employed individuals. The LS spans the period 1990-2002 and has approximately 2 million observations per year, which is roughly 50

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[12] The plant level data are aggregated to the firm level.

percent of the Swedish labor force. Examples of variables included are full-time equivalent wages, education, labor market experience and gender.

The data sets are matched by unique identification codes. To make the sample of firms consistent throughout the time period, we restrict our analysis to firms with at least 20 employees.

Firm-level data are used to identify takeovers and measure the degree of competition. The data on ownership status originate from a categorical variable, defined as one if at least 50 percent of the equity are foreign owned, and zero otherwise.[13] Firms that change ownership are compared to firms that do not. Our acquisition dummy is equal to one if a firm changes ownership from domestic to foreign or from foreign to domestic. We restrict our sample to firms that are either domestically or foreign owned during the entire period or change ownership once during the period. Unfortunately, data restrictions do not allow us to analyze the effects of purely domestic takeovers. The main advantage of analyzing firms that change between domestic and foreign ownership is that these firms can be tracked over time. When purely domestic ownership changes occur, it is common that the takeover targets lose their unique firm identifier. Therefore, we cannot track the post-takeover development for such firms, something that is possible in the case of international mergers and acquisitions.

3.2 Measure of product market competition

Product market competition is a rather vague concept, not easily captured in a single empirical measure. The measurement issue is even more difficult since different changes in

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[13] Statistics Sweden use the internationally common 50 percent cut-off when defining ownership. We are not able to study whether results are sensitive to this definition. However, other authors have studied effects of takeover and in these cases results are not sensitive to cut-off values (see e.g. Martins (2004) and Barbosa and Louri (2002)).

market conditions, i.e. anything that can be said to be associated with increased competition (e.g. firm entry or increased substitutability of goods), can have different implications for firm behavior. Therefore, the appropriate measure of product market competition is context specific. In our case, we want to use a measure of competition capturing how severely the market punishes inefficient firm behavior.

Based on the theoretical work in Boone (2004), Boone et al. (2007) derive an empirical measure of product market competition precisely along these lines. The starting point is that traditional measures of competition, such as concentration ratios and price-cost margins, are theoretically invalid and especially concentration ratios are of limited empirical value. The theoretically sound measure of competition they derive is based on the within-industry elasticity of profits with respect to marginal costs. The higher the absolute value of this elasticity, the fiercer is competition. In other words, the measure is based on an estimate of how much relative profits are reduced when there is an increase in firms' marginal costs. The measure of competition is generated by estimating the following relation for each 2-digit SNI industry,[14] using OLS:

$$\ln (\pi_{it}) = \alpha_i + \alpha_t + \beta_t \ln (c_{it}).$$

Subscript i is a firm-level identifier and t indicates time period. Variable profits, π, are defined as value added less the total wage bill. Marginal costs are approximated by average variable costs, c, which are defined as the total wage bill plus the costs of variable inputs (sales less value added), divided by sales.[15] Unobservable heterogeneity is taken into account by firm

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[14] SNI roughly corresponds to Standard Industrial Classification (SIC).
[15] In other words, c = (sales - value added + wages)/sales.

fixed effects, α_i, and time fixed effects, α_t. The absolute value of the estimated profit elasticity, β_t, is used as our time-varying industry measure of product market competition.

Using this method, our results show that product market competition (averaged over the 1990-2002 period) is lowest in the utilities (SNI 40), followed by the banking sector (65), rental services (71), transport services (61), and the construction industry (45). Apparel (18) is the most competitive industry, followed by transport equipment (35), the paper industry (21) and electronic components (32). The resulting ranking of industries thus has a considerable intuitive appeal. The industries characterized by weak competition are mainly active on the domestic market, whereas industries exposed to tough international competition are active on markets characterized by strong product market competition.

3.3 Summary statistics

Variable definitions and descriptive statistics are presented in Table 1. Column one shows the mean and standard deviations for the whole sample of firms and column two covers the firms for which we also have access to individual-level data. The latter matched data will be used in our analysis using individual-level data. The data set based on the total sample will be used in the firm-level analysis.

[Table 1 about here]

As can be seen in the first row, on average about 30 percent of the employees are women and there is substantial variation across firms.[16] The smaller sample of firms with data at the

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[16] The female participation rate in Sweden is higher. In 2002, for example, 48 percent of the workforce were women. The lower figures in this data set reflect the fact that women to a larger extent are employed in the public sector.

individual level differs somewhat from the larger sample of firms. In particular, the firms seem to be larger, more capital and R&D intensive and sell more abroad.

The market for corporate control in Sweden has become more competitive over time as the rules surrounding foreign ownership have become less complicated. There was a substantial increase in foreign ownership in the Swedish economy during the 1990s. The share of employees in foreign owned firms in the private sector increased from about 9% percent in 1990 to roughly 13 percent in 1996 and 23 percent in 2005 (ITPS, 2006). There are several reasons for this development. For instance, the deregulation of capital and foreign exchange markets in the late 1980s opened up Sweden to inflows of FDI. Two other important factors include the Swedish membership in the European Union in 1995 and the currency crisis in 1992. The latter event reduced the cost of Swedish assets and the cost of locating production in Sweden. Table 2 shows the number of firms in our sample, and the number and share of firms that change ownership.

[Table 2 about here]

4. Testing predictions from the theory of taste-based discrimination

4.1. The share of female employees

We begin our analysis by examining the effect of product market competition and ownership changes on the share of female employees by estimating the following firm-level regression:

$$y_{jt} = a_1\, acquisition_{jt} + a_2\, competition_{jt} + a_3\, acquisition_{jt} \times comp_j + X_{jt}'a + \mu_j + \mu_t + \varepsilon_{jt}. \quad (1)$$

Here, y_{jt} is the share of women employed by firm j in time period t, while *acquisition* is an indicator variable taking the value of one in the period in which an ownership change is recorded and thereafter. *Competition* is our time-varying industry-level measure of product market competition, described in Section 3.2, *Comp* is equal to the measure of product market competition in the period where the acquisition takes place. Since we let the effect of the takeover vary according to the degree of competition at the time when the takeover actually occurs, the problem that competition itself can be directly affected by the takeover is mitigated.[17]

X is a vector of firm-level control variables such as (log) firm size, capital intensity, share of employees with higher education, and value added per worker (a proxy for labor productivity). Finally, μ_j and μ_t are firm and time period fixed effects and ε_{jt} is the error term. To allow for within firm correlation over time, standard errors are adjusted for clustering at the firm level. In some specifications, when studying the impact of product market competition, we cluster standard errors at the industry level. Equation (1) will also be separately estimated for different types of labor to address labor heterogeneity and study if the effects vary between different skill groups.[18] We expect a_1 to be positive and a_3 to be negative. In other words, we expect firms to employ a larger share of women after a new owner has taken control of the firm, and that this effect is weaker when product market competition is strong. Strong product market competition is in itself expected to have a positive effect on the share of women, thus $a_2 > 0$.

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[17] Furthermore, we find no correlation between the level of takeover activity in an industry and the level or change in product market competition.
[18] See Table 1 for information on how employees are classified into different skill groups.

4.2. The endogeneity problem

In this difference-in-difference setting, all firms that are not changing ownership in the same time period act as the control group. Since firms do not randomly change ownership, this approach suffers from potential endogeneity problems. First of all, theories of taste-based discrimination suggest that discriminatory firms are more likely takeover targets than non-discriminatory ones. Thus, takeovers are not random. Another potential endogeneity problem is that firms that change ownership may be very different from firms that do not, thus implying that takeover targets are on different trajectories along several dimensions, the share of female employees being one. At the same time, it should be clear that we are not interested in estimating the effects of randomized takeovers. Such a randomization would mean that there were discriminatory and non-discriminatory firms both among the acquirers and the takeover targets. Therefore, it is not clear which questions would be answered by a randomized experiment. Rather, the central problem in our context is to ensure that whatever effects we identify can actually be attributed to the takeover, and not to some other aspect of firm differences.

Our first take on the endogeneity problem is to deal with the issue of potentially omitted variables that may be related to the likelihood of being a takeover target. First, this is done by exploiting the fact that all takeovers do not occur in the same time period. Using the "staggered" nature of the data, we compare the baseline estimates from the full sample of firms to the estimates we get when dropping all firms that are never takeover targets from the sample. Since identification in both cases comes from within-firm variation, the difference between the two approaches lies in the choice of control group.[19] If takeover targets as a group have different observable and unobservable characteristics than other firms, using the target sample gives a

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[19] See Stevenson and Wolfers (2006) for a detailed discussion of such a "staggered" difference-in-difference approach.

better estimate of the actual takeover effect, provided that the characteristics are not time varying. Next, we undertake a detailed before-and-after analysis checking if the timing of events is consistent with takeovers being the driving force. Finally, we make use of very flexible empirical specifications allowing takeover targets to be on a different trend than other firms, and allowing the effects of observable firm characteristics to interact with the time period fixed effects.[20]

Our second approach to the endogeneity problem is to use takeover activity at the industry level in Finland as an instrument for takeovers in the corresponding Swedish industry. The idea is that there may be international waves of takeovers, which exogenously affect the likelihood that a firm changes ownership. The development in Finland is likely to be similar to that in Sweden as both countries went through similar developments during the 1990's: both countries experienced severe economic crises in the early 1990's, then both countries entered the EU at the same time, and both countries had a strong macroeconomic development towards the end of the decade. Further, the industry structure of Sweden and Finland has broad similarities: a large raw materials sector based on forestry and minerals, and an export oriented manufacturing sector based on telecommunications and other engineered goods. One drawback of this instrument is that it only varies at the 3-digit industry level. If takeover activity is an indicator of other industry developments, common to both countries, and these affect female employment, the estimates may reflect such industry-level changes rather than takeovers *per se*.

4.3. Wages

Next, we study how product market competition and takeovers affect the gender wage gap by estimating the following individual-level regression:

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[20] This set of robustness checks is similar to that undertaken by Bertrand and Mullainathan (1999).

$$\ln(wage)_{ijt} = b_1 acquisition_{jt} \times wom_i + b_2 competition_{jt} \times wom_i + b_3\ acquisition_{jt}$$

$$+ b_4\ competition_{jt} + X_{jt}'b + Z_{it}'b + \mu_{ij} + \mu_t + \varepsilon_{ijt}. \tag{2}$$

In this regression, $\ln(wage)_{ijt}$ is the log of the full-time equivalent monthly wage of an individual i, employed by firm j at time period t, and *wom* is a dummy variable taking the value of one for women. The interaction terms should be self-explanatory, while X is a vector of time-varying firm-level controls and Z a vector of time-varying individual controls. We include a "spell" fixed-effect μ_{ij} for each unique firm-individual combination (see e.g. Andrews et al., 2005).[21] Finally, μ_t are time fixed effects and ε_{ijt} is the error term. Equation (2) will also be separately estimated for different educational groups.

We expect both b_1 and b_2 to be positive. In case of pre-takeover discrimination, a takeover should reduce the gender wage gap. Similarly, intense product market competition should reduce the scope for discrimination and wage differences should be relatively small when competition is high.

5. Results

5.1. Evidence of taste-based discrimination in employment decisions

The first question we address is whether employment decisions are related to takeovers and the degree of product market competition. If this is the case, we expect takeovers to increase the share of women employed, in particular when product market competition is weak. An

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[21] Note that in the case of no mobility between firms, individual fixed-effects and individual-firm spell fixed-effects are identical. Since the structure of our data is such that information on employees originates from repeated samples of firms, there is limited mobility between firms over time. This means that individual fixed effects and spell-fixed effects are very similar.

increase in product market competition should also in itself induce the firm to hire more women. Table 3 presents results showing some evidence in line with the predictions.

[Table 3 about here]

In the first column, we estimate the effect of a takeover using a within firm differences-in-differences specification. Thus, we compare the firm's employment decisions before and after the takeover in relation to firms that do not change ownership. As can be seen in column 1, there is a weak and small positive direct effect of a takeover on the share of women employed in the firm. In the second column, we see that the degree of product market competition does not directly affect the firms' employment decisions. In column 3, both competition and acquisition are entered simultaneously, but the results do not change as compared to the previous specifications.

In column 4, we consider the interaction effect between takeovers and competition. As discussed above, we expect the impact of takeovers to be weaker when product market competition is strong. True to this expectation, we see that a takeover has a larger effect if product market competition is weak. Both the estimates of the direct effect and the interaction effect have the predicted signs and are statistically significant at the 1 percent level. Then, once more, quantitatively speaking, the effect of a takeover is small: The direct effect of a takeover, when competition equals zero (the lowest possible value), is that the share of women employed increases by 1.6 percentage points. When competition is at its mean value of about 4.5, the effect of a takeover is reduced to approximately a quarter of a percentage point.

The estimated magnitudes of the interaction term and the direct acquisition effect are cause for some concern. At higher than median levels of product market competition, it appears

as if a takeover *reduces* the share of female employees – a finding that is hard to reconcile with any theory of discrimination. To more closely investigate these effects, we include a quadratic term of the interaction term in the fifth column. Interestingly, the quadratic term is positive and significant, showing the interaction between takeovers and competition to be quite complex. At the lowest possible degree of competition, a takeover is associated with an increase in the share of female employees by 2.7 percentage points, which is an 8.5 percent increase for the firm with an average share of women in the workforce. The takeover effect reaches its minimum at about the mean level of competition (5), and then increases slowly. In effect, it seems as if a takeover has a positive effect on the share of women employed up until the average level of competition. At higher levels of competition, the takeover effect is basically zero.[22] In the last column, we include the share of women at the industry level, but this does not affect the results.

As for the other control variables, it seems as if reductions in the labor force and declines in value added per worker are associated with an increase in the share of women employed. The result for value added (per worker) could be due to the greater prevalence of part-time work among women. While wages are full time equivalents in our data, we only have the number of people employed – not information on hours worked.

5.2 Robustness checks

Although the basic results show that a takeover affects the employment decision in the firm, several concerns remain. The most obvious objection to the results presented in Table 3 might be that takeover targets differ from those of other firms in many respects. Below, we will address the concern that our results are not due to the change in ownership, but rather explained

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[22] A concern may be that there are only takeovers in industries characterized by strong product market competition making it difficult to interpret the results. There is, however, no correlation between the number or share of takeovers in an industry, and our measure of product market competition.

by the fact that firms that change ownership and those that do not are different in some fundamental respects. This is done by allowing trends to differ between the different groups of firms, analyzing the timing of the takeover effect, allowing the effects of observable firm characteristics to vary over time and, finally, by using an instrumental variable approach.

5.2.1. Are takeover targets different?

The difference-in-difference estimates will be corrupt if the share of women employed in the firms that change ownership follow a different trend than other firms. Our first take on this problem is to allow different time trends for the two groups of firms. When comparing the estimates presented in the first three columns of Table 4 with the estimates in columns 4-6 in Table 3, we see that our results are not affected by allowing separate trends.

Another approach is to only include firms that are changing ownership at some point in time during the period of investigation. Thereby, we change the control group from including all firms, to just including firms that are subject to takeovers at some point in time. If target firms differ from other firms, the estimates we get using only target firms as a control group will differ from those presented in Table 3. However, as can be seen in the last three columns of Table 4, the results are unaffected by this substantial change in the control group. All in all, the results suggest that the effects we are estimating are due to the takeover and not to some unobserved trends affecting firms in the takeover sample.

[Table 4]

5.2.2. Takeover dynamics

Another potential concern is that a short-term change in economic conditions induces both an ownership change and an increase in the share of female employees. In this case, we expect to see some effect of the takeover prior to the actual change in ownership. In Table 5, we analyze the dynamics of the effect of a takeover by investigating how the takeover effect is spread over time.

First, we study whether the share of women started to increase prior to the actual takeover. This is done by including a dummy for the year before the takeover, *Acquisition t-1*, and a dummy for the year two years prior to the takeover, *Acquisition t-2*. Inspecting the estimates reported in the first column, we see no effect of either of the dummies, thus suggesting there was no effect prior to the takeover. In the next column, we investigate the effect of the takeover after one, two, and three years or more. To this end, we include a dummy for the year of the takeover, *Acquisition t=0*, and three dummies capturing the periods after the change of ownership. *Acquisition t+1* is a dummy for the period after the takeover, *Acquisition t+2* for two periods after the takeover and *Acquisition>t+2* refers to a dummy that takes the value of one, three periods or more after the takeover. The results in the second column show an instant large effect of the takeover that increases over time. In the third column, we allow for effects both before and after the takeover. Consistent with previous results, there is no effect before the takeover and the impact of the takeover increases somewhat over time.

In the last three columns of Table 5, we perform the same exercise as above but only using the sample of firms that changes ownership at some point in time. The results are essentially identical between the two different samples.

[Table 5 about here]

5.2.2. Time varying explanatory variables

A further concern is that firms that change ownership are very different from other firms and are therefore affected differently by shocks contemporaneous to the takeover. To study whether this is the case, we allow other explanatory variables to change over time. This is done by interacting all observable firm characteristics with the time period fixed effects. In the first column in Table 6, we allow the estimates to differ every year and in the second column, we add (as in Table 4) a separate time trend for firms that change ownership over the period. In the third and fourth columns, we add the quadratic effect of product market competition and in the last column, the average share of women in the industry. The results remain largely the same between the different specifications and very close to the original estimates. A change in ownership increases the share of women in the firm and even more so when product market competition is weak. The quadratic term is still positive but no longer statistically significant.

[Table 6 about here]

5.2.3. Instrumental variable approach

Our final approach for dealing with the possible endogeneity of takeovers is to use takeover activity in Finland at the 3-digit industry level as an instrument for takeovers in Sweden. As can be seen in the first column in Table 7, this instrument is highly significant in the first stage.[23] The IV-estimate of the *acquisition* indicator is much larger than the OLS-estimate. In fact, the estimate indicates that the share of women employed increases by a full ten percentage

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[23] The F-test for the full sample of firms is 22.14.

points as a result of the takeover. In columns 3-6, we split the sample according to the median level of product market competition that each firm is facing (averaged over the 1990-2002 period). Although the coefficients are quite imprecisely estimated, they do indicate, in line with theory and earlier results, that the effect of takeovers is larger in less competitive industries.

[Table 7 about here]

5.2.4. Composition effects

An alternative explanation to the results is that firms that change ownership also increase the number of employees. As the number of potential female employees is likely to be relatively large among younger cohorts, the share of women employed by the firm could therefore increase mechanically after a takeover. To explore this hypothesis, we apply the same timing analysis as in section 5.2.2 (Table 5) to study the workforce composition effects of takeovers. In the first column of Table 8, we see that the workforce indeed increases as a result of a takeover. Column two indicates, however, that the share of relatively young employees (up to 39 years of age) actually decreases in connection to the takeover. Finally, in the last two columns we analyze how the share of women among the relatively young (up to 39 years) and old (above 40 years) employees are affected by a takeover. As the share of women in both age groups increase after the takeover, we are quite assured that our main results are not driven by mechanical composition changes.[24]

[Table 8 about here]

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[24] This means that we in all regressions are controlling for variables likely to be endogenous. It is therefore reassuring to note that all estimates are virtually identical if we drop the time varying control variables from the regressions.

5.3. Different educational groups

In this section, we explore if there are any asymmetric effects across educational groups. Table 9 shows regression (1) for the share of female employees with high, medium and low education, respectively. We now restrict our attention to the sample of firms to which we can match our detailed individual-level data.[25]

[Table 9 about here]

In short, we find the main effect of takeovers to be that they increase the share of women among the employees with medium education, once more given that product market competition is weak. In columns 2, 4 and 6, we also include separate time trends for firms that change ownership and other firms, as well as allowing the coefficients on the other explanatory variables to vary across years. Moving to these more flexible specifications does not change the results to any substantial degree.

5.4. Wages

So far, we have found support for the notion that market forces improve the relative labor market outcomes for women. Now, we turn to studying individual wages. The question we ask is whether female relative wages are affected by a takeover or by the degree of product market competition. In this part of the analysis, we control for employee-firm spell fixed-effects to

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[25] The main results for the total share of female employees hold for this sample of firms, the point estimates being similar to those for the full sample of firms (the results are available upon request).

23

isolate the effect of a change in ownership on an individual's wages. We also control for time-varying firm characteristics such as the number of employees, capital intensity, the fraction of the workforce that is high skilled, and value added per worker. We also include the square of (potential) work life experience.[26]

The results are reported in Table 10. Inspecting the first column we see that, as expected, the relative wages of women improve after a change in ownership. The next column shows that also increased product market competition seems to reduce wages improving the relative position of women. This result is in line with Black and Strahan (2001) who find that banking deregulation reduced male wages more than female wages. The effects in economic terms are small, however. A standard deviation increase in the level of product market competition reduces male wages by 0.7 percent and female wages by 0.2 percent, thereby reducing the gender wage gap by 0.5 percentage points. The impact of a takeover is also small in economic terms: A takeover has no effect on female wages and reduces male wages by 0.5 percent. Including both variables (column 3) and adding more control variables (column 4) does not change these results.

[Table 10 about here]

In the first four columns, we cluster the standard errors at the individual level since an individual's wages may be correlated over time. As the whole firm is affected by a takeover, it may be more accurate to cluster at the firm level. Similarly, as the whole industry is affected by a change in the level of product market competition, the appropriate level of clustering may be the industry level. In column 5, standard errors are clustered at the firm level. As is evident from the table, correlation across individuals in the same firm is obviously a problem since the significant

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[26] As we are using spell fixed effects, the effect of experience (not squared) is captured by the time-fixed effects.

effect of a takeover disappears. Clustering the standard errors at the industry level reduces the statistical significance of product market competition, but the effect is still significant at the ten-percent level (column 6).

In Table 11, we allow the effects to differ across groups with different educational attainments. For all three educational groups, we run regressions clustering the standard errors first at the firm- and then at the industry level.

[Table 11 about here]

In columns 1 and 2, we see that there is a significant *negative* effect of a takeover on female relative wages. This is at odds with our prior but might be explained by the substantial heterogeneity of wages in this group. Heyman et al. (2006) find that the largest pay increases after a takeover accrue to highly educated individuals likely to hold key positions in the firm. Since few women hold such positions, the result is likely to be due to such effects. As for the effect of product market competition, we find a highly significant (albeit still small) positive effect on female relative wages.

The results for product market competition are similar when looking at employees with medium educational attainment, although the effects are smaller and only statistically significant at the ten-percent level. Finally, the last two columns show that while product market competition reduces wages for individuals with low education, this decrease is similar for men and women.

6. Conclusions

The theory on discrimination suggests that discrimination may exist due to either taste or information difficulties about employees. The focus of this paper has been on the existence of the former, i.e. that employers discriminate women because they prefer to employ men rather than women. If such mechanisms are at work, competitive forces should reduce gender differences in labor market outcomes. The findings in this paper indicate that market forces, such as takeovers and product market competition, do indeed have a positive impact on the relative position of Swedish female employees. While the estimated wage effects are quite small, the results for employment patterns are non-trivial: When product market competition is weak, a takeover leads to approximately a 2.5 percentage point increase in the share of female employees.

These positive effects manifest themselves somewhat differently across employees with different educational attainments. A takeover mainly leads to an increase in the share of female employees with medium levels of education. Women with high levels of education, on the other hand, get an increase in their relative wages as a result of increased product market competition. Both improved career opportunities and changes in rent sharing can explain this result and, unfortunately, we do not have any sufficiently detailed data on job description to discriminate between these channels.

Our results do not refute the possibility of other types of discrimination. In particular, our paper has little to say about the severity of any potential statistical discrimination that may affect the labor market. Since competitive pressures may improve the quality of the hiring and promotion processes, it is, in fact, difficult to separate between the different types of discrimination using our approach.

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Table 1. Variable definitions and descriptive statistics.

Firm variables		Total sample	Matched sample
Share women	Number of women/employees	0.317	0.311
		(0.247)	(0.229)
Women high	Number of highly educated women/employees with higher education. High education defined as post-secondary education.		0.295
			(0.302)
Women medium	Number of medium educated women/employees with medium education. Medium education defined as upper secondary education.		0.315
			(0.265)
Women low	Number of low educated women/employees with low education. Low education defined as at most 9 years of elementary education.		0.325
			(0.308)
Acquisition	A dummy variable that takes the value of one the year, and all periods after, the firm changes ownership from foreign to domestic or domestic to foreign.	0.074	0.084
		(0.262)	(0.277)
Competition	The elasticity of variable profits to average variable costs. See text for full definition.	4.816	5.434
		(1.952)	(2.378)
L	Number of employees.	125	290
		(614)	(1104)
Capital/L	(Net property, plant and equipment)/employees (in million SEK).	0.291	0.345
		(1.036)	(1.060)
Share high skilled	Number of high skilled/ employees.	0.193	0.178
		(0.212)	(0.188)
Value added/L	(Sales-operational expenses excluding wages)/employees (in million SEK).	0.431	0.433
		(0.366)	(0.353)
Firm age	Age of the firm if established after 1972. Otherwise year-1973.	8.726	9.972
		(6.688)	(7.205)
Age	Average age of the employees.		39.055
			(6.039)
Number of obs.		128,328	41,038
Individual variables			
ln(Wage)	Monthly full-time equivalent salary, including wage, bonus, payment for overtime and work at unsocial hours.		9.788
			(0.313)
Experience	Age minus number of years of schooling minus seven.		22
			(13)
Number of obs.			9,989,595

Presented are means with standard deviations within parenthesis. The data cover Swedish firms and individuals for the period 1990-2002. All monetary variables are in 1995 SEK.

Table 2. The number of firms and acquisitions for every year.

Year	Firms	Acquired	Acquired %
1991	5230	74	1.41
1992	4967	46	0.92
1993	4859	93	1.91
1994	5663	167	2.95
1995	6263	136	2.17
1996	7738	232	3.00
1997	9912	133	1.34
1998	10523	182	1.73
1999	10763	204	1.90
2000	11327	238	2.10
2001	11840	421	3.56
2002	12182	236	1.94

Table 3. The effect of takeovers and product market competition on the share of women employed. Firm-level estimates 1990-2002.

	(1)	(2)	(3)	(4)	(5)	(6)
			Share of women employed			
Acquisition	0.003		0.003	0.015	0.027	0.015
	(1.75)*		(1.72)*	(3.46)***	(3.45)***	(3.34)***
Competition		0.000	0.000	0.000	0.000	0.000
		(0.86)	(1.51)	(1.51)	(1.54)	(0.60)
Acq.×competition				-0.003	-0.008	-0.003
				(3.19)***	(2.73)***	(3.09)***
Acq.×competition^2					0.001	
					(1.96)**	
Ln(size)	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
	(3.30)***	(2.56)**	(3.30)***	(3.32)***	(3.33)***	(3.32)***
Capital/L	0.002	0.002	0.002	0.002	0.002	0.002
	(1.96)**	(1.46)	(1.95)*	(1.92)*	(1.90)*	(1.89)*
Share high skill	-0.015	-0.014	-0.014	-0.014	-0.015	-0.016
	(1.13)	(0.65)	(1.12)	(1.13)	(1.13)	(1.24)
Value added/L	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
	(2.93)***	(2.48)**	(2.92)***	(2.96)***	(2.97)***	(3.02)***
Share women (industry)						0.068
						(6.52)***
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	128848	128848	128848	128848	128848	128848
Number of firms	27104	27104	27104	27104	27104	27104
R-squared	0.01	0.01	0.01	0.01	0.01	0.01

The dependent variable is the share of women employed. Acquisition takes the value of one in the acquisition period and thereafter, zero before. Competition is the industry level of product market competition. Ln(size) is the log of the number of employees. Capital/L is the capital-labor ratio. Share high skill is the share of employees with post-secondary education. Value added/L is value added per employee. Share women (industry) is the share of women employed at the two-digit industry level. All regressions include firm-level fixed effects and year fixed effects. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the firm level in all columns except (2) where they are clustered at the two-digit industry level. ***, **, * show significance at the 1, 5 and 10 percent level, respectively.

Table 4. The effect of takeovers and product market competition on the share of women employed. Firm-level estimates 1990-2002. Different trends for acquired firms.

	(1)	(2)	(3)	(4)	(5)	(6)
			Share of women employed			
		Full sample			Only target firms	
Acquisition	0.015	0.027	0.015	0.015	0.029	0.015
	(3.42)***	(3.41)***	(3.35)***	(3.47)***	(3.61)***	(3.33)***
Competition	0.000	0.000	0.000	0.000	0.000	-0.000
	(1.50)	(1.54)	(0.60)	(0.25)	(0.34)	(0.08)
Acq.×competition	-0.003	-0.008	-0.003	-0.003	-0.009	-0.003
	(3.19)***	(2.73)***	(3.08)***	(3.24)***	(2.95)***	(3.05)***
Acq.×competition^2		0.001			0.001	
		(1.97)**			(2.18)**	
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Share women (industry)	No	No	Yes	No	No	Yes
Target×trend	Yes	Yes	Yes	No	No	No
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	128848	128848	128848	18558	18558	18558
Number of firms	27104	27104	27104	2859	2859	2859
R-squared	0.01	0.01	0.01	0.01	0.01	0.02

The dependent variable is the share of women employed. Acquisition takes the value of one in the acquisition period and thereafter, zero before. Competition is the industry level of product market competition. Firm controls are the log of the number of employees, the capital-labor ratio, the share of employees with post-secondary education and value added per employee. Share women (industry) is the share of women employed at the two-digit industry level. Target×trend is an interaction between firms that are ever takeover targets and a trend variable. Columns (4)-(6) only include firms that are ever takeover targets. All regressions include firm-level fixed effects and year fixed effects. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the firm level. ***, **, * show significance at the 1, 5 and 10 percent level, respectively.

Table 5. The effect of takeovers and product market competition on the share of women employed. Firm-level estimates 1990-2002. Before and after analysis.

	(1)	(2)	(3)	(4)	(5)	(6)
			Share of women employed			
		Full sample			Only target firms	
Acquisition t-2	-0.003		-0.003	-0.003		-0.003
	(1.58)		(1.54)	(1.72)*		(1.46)
Acquisition t-1	-0.001		-0.001	-0.002		-0.001
	(0.57)		(0.52)	(0.84)		(0.54)
Acquisition	0.014			0.013		
	(3.06)***			(2.79)***		
Acquisition t=0		0.014	0.013		0.015	0.013
		(3.29)***	(2.91)***		(3.44)***	(2.82)***
Acquisition t+1		0.015	0.014		0.016	0.015
		(3.36)***	(3.00)***		(3.52)***	(2.84)***
Acquisition t+2		0.017	0.016		0.018	0.016
		(3.56)***	(3.21)***		(3.64)***	(2.92)***
Acquisition >t+2		0.017	0.016		0.018	0.016
		(3.47)***	(3.12)***		(3.39)***	(2.58)***
Competition	0.000	0.000	0.000	0.000	0.000	0.000
	(1.51)	(1.49)	(1.49)	(0.26)	(0.21)	(0.23)
Acq.×competition	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
	(3.20)***	(3.29)***	(3.29)***	(3.28)***	(3.35)***	(3.35)***
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	128848	128848	128848	18558	18558	18558
Number of firms	27104	27104	27104	2859	2859	2859
R-squared	0.01	0.01	0.01	0.01	0.01	0.01

The dependent variable is the share of women employed. Acquisition takes the value of one in the acquisition period and thereafter, zero before. Acquisition t-2 takes the value one two years prior to the acquisition and zero otherwise. The other Acquisition t+/- variables are defined accordingly. Competition is the industry level of product market competition. Firm controls are the log of the number of employees, the capital-labor ratio, the share of employees with post-secondary education and value added per employee. Columns (4)-(6) only include firms that are ever takeover targets. All regressions include firm-level fixed effects and year fixed effects. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the firm level. ***, **, * show significance at the 1, 5 and 10 percent level, respectively.

Table 6. The effect of takeovers and product market competition on the share of women employed. Firm-level estimates 1990-2002. Time varying explanatory variables

	(1)	(2)	(3)	(4)
	Share of women employed			
Acquisition	0.009	0.010	0.019	0.010
	(2.10)**	(2.25)**	(2.50)**	(2.22)**
Competition	0.000	0.000	0.000	0.000
	(0.92)	(0.92)	(0.95)	(0.11)
Acq.×competition	-0.002	-0.002	-0.006	-0.002
	(2.01)**	(1.97)**	(2.05)**	(1.90)*
Acq.×competition^2			0.000	
			(1.61)	
Firm controls	Yes	Yes	Yes	Yes
Firm controls×Year FE	Yes	Yes	Yes	Yes
Target×trend	No	Yes	Yes	Yes
Share women (industry)	No	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	128848	128848	128848	128848
Number of firms	27104	27104	27104	27104
R-squared	0.01	0.01	0.01	0.02

The dependent variable is the share of women employed. Acquisition takes the value of one in the acquisition period and thereafter, zero before. Competition is the industry level of product market competition. Firm controls are the log of the number of employees, the capital-labor ratio, the share of employees with post-secondary education and value added per employee. Firm controls×Year FE means that firm controls are interacted with year fixed effects. Target×trend is an interaction between firms that are ever takeover targets and a trend variable. Share women (industry) is the share of women employed at the two-digit industry level. All regressions include firm-level fixed effects and year fixed effects. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the firm level. ***, **, * show significance at the 1, 5 and 10 percent level, respectively.

Table 7. The effect of takeovers and product market competition on the share of women employed. Firm-level estimates 1990-2002. Instrumental variable analysis.

	(1)	(2)	(3)	(4)	(5)	(6)
			Share of women employed			
	Full sample		Low competition		High competition	
	IV	OLS	IV	OLS	IV	OLS
Acquisition	0.106	0.003	0.142	0.004	0.046	0.001
	(2.71)***	(1.72)*	(1.70)*	(1.82)*	(1.36)	(0.39)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
First stage F-test	22.14		8.99		14.73	
Observations	117545	117545	56973	56973	60572	60572
Number of firms	20120	20120	10704	10704	9416	9416

The dependent variable is the share of women employed. Acquisition takes the value of one in the acquisition period and thereafter, zero before. Firm controls are the log of the number of employees, the capital-labor ratio, the share of employees with post-secondary education and value added per employee. The instrument is the takeover activity at the corresponding 3-digit industry level in Finland. All regressions include firm-level fixed effects and year fixed effects. First stage F-test is an F-test of the instrument from the first stage. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the firm level. ***, **, * show significance at the 1, 5 and 10 percent level, respectively.

Table 8. Workforce composition. Firm-level estimates 1990-2002. Before and after analysis.

	(1) Log(size)	(2) Share 16-39 years	(3) Share women 16-39 years	(4) Share women 40+ years
Acquisition t-2	0.041	0.004	-0.005	-0.002
	(3.39)***	(1.65)*	(2.14)**	(0.57)
Acquisition t-1	0.044	0.002	-0.004	0.002
	(2.99)***	(0.81)	(1.46)	(0.82)
Acquisition t=0	0.135	-0.018	0.013	0.019
	(3.69)***	(2.66)***	(1.90)*	(3.01)***
Acquisition t+1	0.144	-0.016	0.015	0.015
	(3.77)***	(2.25)**	(2.15)**	(2.32)**
Acquisition t+2	0.160	-0.016	0.018	0.021
	(3.99)***	(2.17)**	(2.46)**	(3.02)***
Acquisition >t+2	0.143	-0.009	0.015	0.023
	(3.45)***	(1.24)	(2.02)**	(3.34)***
Competition	0.001	-0.002	0.001	0.001
	(0.27)	(4.78)***	(1.98)**	(1.47)
Acq.×competition	-0.014	0.005	-0.004	-0.003
	(0.32)	(4.14)***	(1.51)	(2.69)***
Firm controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	128848	128848	128848	128848
Number of firms	27104	27104	27104	27104
R-squared	0.08	0.09	0.01	0.01

The dependent variable is (log of) the number of employees, the share of young employees (16-39 years), the share of female employees among the young , and the share of female employees among the old (40+ years). Acquisition t-2 takes the value one two years prior to the acquisition and zero otherwise. The other Acquisition t+/- variables are defined accordingly. Competition is the industry level of product market competition. Firm controls are the capital-labor ratio, the share of employees with post-secondary education and value added per employee. All regressions include firm-level fixed effects and year fixed effects. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the firm level. ***, **, * show significance at the 1, 5 and 10 percent level, respectively.

Table 9. The effect of takeovers and product market competition on the share of women employed. Firm-level estimates 1990-2002. Share of women employed in different educational groups.

	(1)	(2)	(3)	(4)	(5)	(6)
			Share of women employed			
	High education		Medium education		Low education	
Acquisition	0.001	0.009	0.046	0.041	0.007	0.010
	(0.04)	(0.65)	(3.20)***	(2.85)***	(0.32)	(0.42)
Competition	0.000	0.001	-0.000	-0.000	-0.001	-0.000
	(0.38)	(1.02)	(0.35)	(0.10)	(0.52)	(0.06)
Acq.×competition	-0.001	-0.001	-0.008	-0.007	-0.001	0.001
	(0.55)	(0.61)	(2.94)***	(2.74)***	(0.12)	(0.17)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls×Year FE	No	Yes	No	Yes	No	Yes
Target×trend	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35355	35355	40283	40283	25053	25053
Number of firms	11004	11004	12433	12433	7677	7677
R-squared	0.01	0.02	0.02	0.04	0.02	0.03

The dependent variable is the share of women employed in three educational groupings. Acquisition takes the value of one in the acquisition period and thereafter, zero before. Competition is the industry level of product market competition. Firm controls are the log of the number of employees, the capital-labor ratio, the share of employees with post-secondary education and value added per employee. Firm controls×Year FE means that firm controls are interacted with year fixed effects. Target×trend is an interaction between firms that are ever takeover targets and a trend variable. All regressions include firm-level fixed effects and year fixed effects. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the firm level. ***, **, * show significance at the 1, 5 and 10 percent level, respectively.

Table 10. The effect of takeovers and product market competition on women's relative wages. Individual-level estimates 1990-2002.

	(1)	(2)	(3)	(4)	(5)	(6)
			Ln(wage)			
			Clustering at			
		Individual			Firm	Industry
Acquisition	-0.003		-0.003	-0.005	-0.005	-0.005
	(7.63)***		(7.83)***	(12.53)***	(0.78)	(0.94)
Wom×Acq.	0.004		0.005	0.005	0.005	0.005
	(6.28)***		(8.24)***	(7.35)***	(1.00)	(1.02)
Competition		-0.003	-0.003	-0.003	-0.003	-0.003
		(58.24)***	(58.68)***	(55.69)***	(3.04)***	(1.91)*
Wom×Comp.		0.002	0.002	0.002	0.002	0.002
		(21.30)***	(22.52)***	(18.25)***	(2.38)**	(1.73)*
Experience^2				-0.000	-0.000	-0.000
				(303.51)***	(26.88)***	(15.16)***
Value added/L				0.002	0.002	0.002
				(10.08)***	(0.44)	(0.34)
Capital/L				0.005	0.005	0.005
				(30.71)***	(1.68)*	(1.31)
Ln(size)				0.004	0.004	0.004
				(45.15)***	(1.10)	(1.07)
Share high skill				0.138	0.138	0.138
				(64.39)***	(2.38)**	(2.62)**
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of spells	3,327,793	3,327,793	3,327,793	3,327,793	3,327,793	3,327,793
Observations	9,989,595	9,989,595	9,989,595	9,989,595	9,989,595	9,989,595
R-squared	0.42	0.43	0.43	0.45	0.45	0.45

The dependent variable is log wages. Acquisition takes the value of one in the acquisition period and thereafter, zero before. Competition is the industry level of product market competition. Individual control is the square of work life experience. Firm controls are the log of the number of employees, the capital-labor ratio, the share of employees with post-secondary education, value added per employee. All regressions include spell (individual×firm) and year fixed effects. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the individual level in columns (1)-(4), the firm level in column (5), and the 2-digit industry level in column (6). ***, **, * show significance at the 1, 5 and 10 percent level, respectively.

Table 11. The effect of takeovers and product market competition on women's relative wages. Individual-level estimates 1990-2002 on different educational groups.

	(1)	(2)	(3)	(4)	(5)	(6)
			Ln(wage)			
	High education		Medium education		Low education	
Acquisition	0.004	0.004	-0.004	-0.004	-0.007	-0.007
	(0.40)	(0.43)	(0.81)	(1.02)	(1.29)	(1.29)
Wom×Acq.	-0.015	-0.015	0.002	0.002	0.007	0.007
	(4.25)***	(3.51)***	(0.33)	(0.32)	(1.61)	(1.61)
Competition	-0.005	-0.005	-0.003	-0.003	-0.003	-0.003
	(3.95)***	(3.76)***	(2.98)***	(1.91)*	(2.82)***	(2.82)***
Wom×Comp.	0.004	0.004	0.002	0.002	0.001	0.001
	(4.09)***	(3.59)***	(2.28)**	(1.72)*	(0.63)	(0.63)
Ind. controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Spell FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	906875	906875	6291538	6291538	2410769	2410769
No. of spells	327832	327832	2183309	2183309	800765	800765
R-squared	0.65	0.65	0.45	0.45	0.40	0.40

The dependent variable is log wages for three educational groups. Acquisition takes the value of one in the acquisition period and thereafter, zero before. Competition is the industry level of product market competition. Individual control is the square of work life experience. Firm controls are the log of the number of employees, the capital-labor ratio, the share of employees with post-secondary education and value added per employee. All regressions include spell (individual×firm) and year fixed effects. Robust t-statistics are reported in parenthesis. Standard errors are adjusted for clustering at the firm level in columns (1), (3), and (5) and at the 2-digit industry level in columns (2), (4) and (6). ***, **, * show significance at the 1, 5 and 10 percent level, respectively.