Working for Female Manager:
Gender Hierarchy in the Workplace*

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Abstract

This paper analyzes how the number of women (or men) at top managerial positions affects other male or female workers in the workplace. Despite growing gender quota policies, either explicit or implicit, for top managerial positions in many organizations, the effects of such policies on other female or male workers are largely unexplored. Using personnel data from more than four hundred mergers and acquisitions in Sweden, we find that (i) when men face more female managers after M&A, they become more likely to quit; (ii) when female workers face more female managers, they become less likely to quit; (iii) when male workers face more male managers after M&A, they become less likely to quit; and (iv) when female workers face more male managers after M&A, they don't seem to care. The same gender attraction is the strongest when one's own gender is a minority. However, the opposite gender aversion is the strongest when neither gender group strongly dominates the other.

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1. Introduction

Women have made striking advances in higher education, labor market participation, and wages. However, women are still severely underrepresented in top positions in corporations, governments, and in academics[1]. For example, women held only 14.7% of all Fortune 500 board director positions in 2005, 16.3% of seats in the US Congress in 2007, and 20% of all tenured faculty positions in Ivy League schools in 2003. Moreover, the growth of these numbers has slowed down dramatically in the last several years[2].

In response, there has been growing political and social pressure to promote gender parity at top positions via explicit or implicit gender quotas. For example, since 1988, Norway legislation requires a minimum of 40% of each gender in publicly appointed committees, boards, and councils. More than 22 countries have passed similar laws in the last decade[3], and many corporations and non-profit organizations are explicitly pursuing gender diversity at the top management. However, it is still unclear whether these policies will break the glass ceiling and advance the careers of other women. For example, Bagues and Esteve-Volart (2007) suggests that female managers may be less favorable to female workers. Moreover, it is also unclear how these policies will affect male workers[4].

In this paper, we investigate detailed personnel records of white-collar workers in various corporations in Sweden, and study how women's share in top positions affects the career paths of other male and female workers in the company. In particular, we use mergers and acquisitions (M&A) of corporations as a natural experiment. For example, suppose that a

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[1] See, for example, Connolly and Long (2007).

[2] Catalysis Survey (2009) "Women in U.S. Management", available from www.catalyst.org/file/192/qt_women_in_us_management.pdf

[3] For latest information, check http://www.quotaproject.org.

[4] Recent studies have focused on the effectiveness of gender quota at top positions, and largely ignored the effect of gender quota on lower ranked male or female workers. See, for example, Dahlerup and Freidenvall (forthcoming) and Squires (2004).

firm with few women in top positions has acquired another firm with many women in top positions. Then, workers in the acquiring firm will suddenly find relatively more women at the top of their hierarchy in the newly merged company. Then, we study how the careers of men and women in the merged firm respond to this change after the acquisition. In particular, we study whether men and women in the merged firm become more likely to stay or to quit.

The related theoretical models are diverse, and the predictions are ambiguous. On one hand, if top female managers favor other female workers (*similarity attraction paradigm*[5]) or if female workers see top female managers as their role models (*social identity theory*[6]), of if top female managers correct the biased stereotype of females as leaders (*social belief theory*[7]), female workers will be less likely to quit in the newly merged company, and their wages and ranks should advance faster, while male workers may become more likely to quit. On the other hand if top female managers identify with male managers and turn less favorable to other females (*self-enhancement drive*[8]), or if there are limited quotas for female top managers (*tournament theory*[9]), or if top female managers impose lower social status or relative deprivation on other women (*social status theory*[10]), female workers will be more likely to quit[11], while male workers may be less likely to quit.

An important advantage of our empirical approach is that M&A can generate significant changes in women's share in top positions, but that an M&A decision itself is typically *not* driven by gender-related issues. Therefore, we can establish a possible causal link between the changes in women's share in top positions and the subsequent response of other female or male workers without worrying about other compounding gender factors that

[5] See, for example, Byrne (1971).
[6] See, for example, Akerlof and Kranton (2000)
[7] See, for example, Boldy, Wood, and Kashy (2001).
[8] Also related to social identity theory. See, for example, Graves and Powell (1995).
[9] For example, see Niederle and Vesterlund (2006).
[10] For example, see Ridgeway and Balkwell (1997).
[11] See Bagues and Esteve-Volart (2007) for related evidence.

could generate a spurious relationship[12].

We find that when the number of top female managers within the same occupation increases, female workers, on average, become *less* likely to quit (called *same gender attraction*), while male workers become *more* likely to quit (called *opposite gender aversion*). In other words, top female managers have a positive effect on females, but a negative effect on males. This result is important for gender (managerial or political) policies such as gender quotas, as it suggests that gender quotas may indeed help other female workers' careers, but can have the cost of negatively affecting male workers' career.

More importantly, we find large heterogeneity across occupations, especially due to the difference in average share of female workers. In occupations where female share is less than 10% on average, the increase in the number of female top managers *reduces* the male workers' turnover rates. In other words, in occupations where female is a weak minority group, male workers seem to welcome additional female top managers. However, in occupations where female share is in between 10% and 50%, an additional female top manager increases male workers' turnover rates significantly. Thus, when female is a strong minority, male workers seem to resist to additional female top managers. Interestingly, once the average female share goes above 50%, an additional female top manager has relatively small effect on male turnover rates. We find the similar patterns of non-monotonicity in the response of female workers to male top managers but in much lesser degree[13].

This heterogeneity is important for several reasons. First, it explains why the female share at top positions has grown fast initially but slowed down rapidly in recent years[14].

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[12] Outside lab experiments (e.g. Niederle and Vesterlund 2006), few studies have used natural experiments (e.g. Joy and Lang 2007). See Bagues and Esteve-Volart (2007) for an exception.

[13] Allmendinger and Hackman (1995) finds the similar non-monotonicity (called threshold effect) between female share and group performance. However, he does not control for the endogeneity of female share, and does not distinguish male and female responses.

[14] Catalyst 2007 Census of Women Corporate Officers and Top Earners of the Fortune 500, available from (as of 05-07-2009)

Initially, when women are a weak minority, male workers would not resist to top female managers. But as the female share increases, male workers would resist to additional top female managers, which would slow down the growth of female share at top positions.

Second, even though the patterns of the same gender attraction and the opposite gender aversion are similar between male and female, we find that the same gender attraction is much stronger for female workers, and the opposite gender aversion is much stronger for male workers. These results suggest that gender quota or gender parity policies cannot be considered in a general model of majority vs. minority relationship, and requires gender-specific models.

Third, this heterogeneity may explain why previous studies (that have focused on a single occupation) found different results from ours. For example, Bagues and Esteve-Volart (2007) uses a random assignment of female evaluators to an evaluation committee as a natural experiment, and show that female evaluators are relatively more favorable to male candidates than to female candidates[15]. But female evaluators are a small minority in most committees in their sample. Recall that we also find that when women are a weak minority, male workers welcome top female managers, which is consistent with their results. But our analysis shows that their results do not generalize to other occupations with larger female share or to larger complex corporations.

2. Data and Measurement

2.1 Data

Our analysis is based on the Swedish employer–employee matched data. The data cover

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http://www.catalyst.org/publication/13/2007-catalyst-census-of-women-corporate-officers-and-top-earners-of-the-fortune-500 .

[15] This effect is sometimes called as "queen bee syndrome". Giuliano, Levine, and Leonard (2006) also find similar results in race and age, based on a single US retail firm.

almost the entire population of white collar workers in the private sector of Sweden during the period 1970-1990, excluding financial sectors and CEOs. For each worker, the data contain annual information on wage, age, education, gender, geographic region, work-time status, firm ID, plant ID, industry ID, occupation code, and rank. Because all the IDs are unique, we can track each individual worker within and across firms and occupations throughout his/her career.

The unique feature of this Swedish data is the BNT code. BNT code is a four-digit code, where the first three digits (occupation code) describe types of tasks and the fourth (rank code) describes the degree of skill[16] needed to fulfill the tasks. The white-collar workers' occupations cover 51 three-digit occupation groups such as construction, personnel work, or marketing. For more details, see appendix A and B. Within each occupation, the rank code runs from 1 (lowest) to 7 (highest)[17].

As described below, the occupation and rank codes served as the input to the centralized wage negotiations, and were gathered and monitored both by The Swedish Federation of Employers and the labor unions. Thus, the occupation classification is of very high quality with minimal potential errors. Most importantly, the occupation and rank codes are comparable cross firms. Thus, we can analyze workers' promotion patterns even when a worker changes firms.

From this data, we focus on the firms involved in mergers and acquisition. Our data do not firms' financial information. Therefore, we identify mergers and acquisition based on the changes in workers' firm IDs. That is, if more than 50% of workers change firm ID[18], say from A to B, and if the old firm ID, A, disappears from the data, then we say "B has

[16] Rank also reflects the number of employees and type of skill needed for decisions at that level.
[17] Not all occupations span the entire 7 ranks, some start higher and some do not have the top ranks. For more details, see appendix B.
[18] Even when we require more than 90% of workers to change firm ID, there is very little change in our results.

acquired A". We also refer to B as 'acquirer' and to A as 'acquired'. We also restrict our attention to firms with more than ten white-collar workers[19]. There are only a few clearly identified merger cases where more than 50% of workers from both firm A and B move to a new firm C, and firm A and B disappear. Therefore, we focus on clearly identified acquisition cases only.[20]

This sample contains 443 acquisitions cases and 186,679 workers. Table 1 shows the summary statistics of selected variables. Firm size is measured by the number of white-collar workers, and it shows that acquiring firms are, on average, much larger than acquired firms. The average ratio of acquired to acquirer firm size is 0.61, but there are large variations. The wage is measured by monthly total compensation in 1970 Kronor. The wage of the acquiring firms is slightly larger than that of acquired firm, but the difference can be mostly explained by the fact that acquired firms have more highly-ranked positions.

[Table 1 here]

Status measures the relative ranking of each worker's wage within his/her firm, where 0 is the lowest and 1 is the highest. Note that the average status of female is very similar between acquiring and acquired firms. In fact, most other characteristics such as rank, age, and part time ratio of female workers are very similar between acquiring and acquired firms. This is important to note because our analyses will be based on the assumption that acquisition decision is independent of gender aspects of the firms.

[19] Focusing on firms with more than 100 white-collar workers does not change the qualitative results of the paper.

[20] Some firms are involved in more than one M&A during our sample period. Excluding M&As where the same firm is involved in more than one M&A within 6 years does not change our qualitative results.

2.2 Institution

Beginning in 1966, wage setting for most private sector white collar workers in Sweden was determined through negotiations between the Swedish Employers' Confederation (SAF) and PTK, the main cartel for the private sector white collar union. After 1983, the central wage bargaining system started to dissolve despite the government's attempts to save it. For the vast majority of all employees after 1988, wages were determined by industry- and plant-level bargaining (Calmfors and Forslund 1990), while local plant unions continued to represent workers. The occupation codes (called BNT code) were developed to facilitate the wage negotiation. One of the goals was to pay the same wages for the same tasks, resulting in wage compression within each occupation.

However, in practice, there existed significant wage variations within an occupation. As Figure 1 shows, the highest-paid workers in a given rank often received larger wages than the lowest-paid workers in a rank above. Also, the wage variation increases with ranks. Such patterns are consistent with those observed in US firms. (see Baker et al. 1994, Kwon 2006)

[Figure 1 here]

Employers are also allowed to decide autonomously when it comes to hiring and promotion. But firing workers is strictly regulated by law and is monitored by the labor union.[21]

2.3 Gender Gap in Wages and Promotions

As a general background, we first describe gender gaps in wages and promotions briefly. Table 2 shows a series of wage regressions with and without controlling for occupations and

[21] For more details on the data and institution, see Kwon and Meyersson Milgrom (2006).

ranks. The dependent variable is the log of monthly total payment in 1970 Kronor. For these regressions, we use *all* the white-collar workers (including those who are not involved in acquisitions) in our data between 1986 and 1989[22].

[Table 2 here]

Column [1] shows that on average, female workers receive 39.6% lower wages than male. However, once we control for occupation and rank, the gender wage gap reduces to 7.4%. Note that comparison between column [3] and [4] shows that 'rank within occupation' explains 10% differences in wages between two genders. It implies that women receive lower averages wages than male because they are mostly placed in lower ranks, suggesting the existence of potential 'glass ceiling' for women (see Meyersson Milgrom et al. 2001 for more details).

Figure 1 shows that female represents about 30% of white-collar workers and that its share has been slowly increasing.

[Figure 1 here]

However, Figure 2 shows that women are severely under-represented at higher ranks. On average, at the highest rank (rank=7), female share is only 1.15%, while at the lowest rank (rank=1), female share is 78%.

[Figure 2 here]

[22] Using other time periods does not change our results.

Furthermore, Figure 3 shows that women's shares at higher ranks have not increased significantly during the period 1970-1990.

[Figure 3 here]

To investigate the 'glass-ceiling', we also look at the first-time labor market entrants and analyzed their promotion patterns.

In Table 3, we construct rank transition matrix between the time of labor market entry and ten years later. We constructed the matrices for each labor market entry cohort between 1971 and 1980, and took the average.

[Table 3 here]

For example, if we focus on workers who started at rank 4, 34.97% of male have moved up to rank 5 after 10 years, but only 26.73% of female have moved up to rank 5. Also, 9.02% of male moved up to rank 6, but only 3.58% of female moved up rank 6.

Table 4 shows the gender gap in the number of promotions within ten years since the first labor market entry, controlling for education, starting occupation and rank. Column [1] shows that in raw average, female has 0.1 times less promotions than male. However, once we control for individual characteristics, especially the starting occupation and rank, female has 0.57 times less promotions than male during the first ten years of their career. Given that there are only seven ranks, this difference is economically significant.

[Table 4 here]

It is interesting to note that unlike gender wage gap, gender promotion gap increases as we control for more individual characteristics. This is partly explained by the fact that women tend to start at lower ranks where they have more room to get promoted.

Overall, we find that men and women receive similar wages within the same occupation and rank, but women, on average, start their career at lower ranks and get promoted more slowly than men. Especially, women's representation at the top rank is minimal. Therefore, women at top rank in this period can signify an important role model for other women.

2.4 Acquisitions

As discussed earlier, we use acquisitions as a natural experiment, and study how the changes in gender hierarchical structure during an acquisition affect female (or male) workers' careers. Thus, for our analysis, it is important that acquisition decisions are independent of gender aspects of a company such as female share, or female status.

Table 5 shows that after controlling for firm size, primary industry, and primary occupation of each firm[23], the correlations between acquiring and acquired firms in gender share and status are quite small. For example, correlation in overall female share is 20%, and the correlation in average female status (=relative ranking of wages) is only 5.8%. Though the correlation in female share at top rank is relatively large, it is mostly because female share at the top ranks is zero for most firms. Thus, if one of two merged firms has some female at the top ranks, it generates the negative correlation.

[Table 5 here]

[23] We first regress, for example, female share on firm size, primary industry and occupation, then measure the correlation of residuals between acquiring and acquired firms.

Therefore, it appears that an acquirer does not specifically look for a firm with smaller (or larger) female share or a firm where women ranked relatively higher (or lower) than men. Moreover, in our main analyses, we control for the gender compositions within firm and within occupation between two merging firms. Then, a remaining concern is whether the number of female at top managerial positions affects the merger decision. However, it appears highly unlikely that a firm would merge with another firm because there are more top female managers in the other firm, when the firm can simply hire new female managers.

Another potential problem of using acquisition as a natural experiment is that acquisitions are quite heterogeneous. Firms may acquire very similar firms in another geographic market for its market expansion. Or firms may acquire their competitors in the same market to increase their market power. Or firms may acquire very different firms for complementarity or for business line expansions.

In order to classify different types of acquisitions, we construct a distance measure between two firms in various aspects. The distance is measured by 1 – uncentered correlation, as proposed by Jaffe (1986). For example, to measure the distance in occupation structure, we construct a vector of occupation shares for an acquired firm, $f_i=(s_{1i,}, s_{2i}, \ldots, s_{54i})$ where s_{ki} is occupation k's share in firm i (in terms of number of workers)[24]. Then, we construct the same vector for its acquiring firm j, f_j. Then, the distance in occupation structure is measured as $1-\frac{f_i f_j'}{(f_i f_i')(f_j f_j')^{\frac{1}{2}}}$. This distance measure is zero if the composition of occupation is the same between the two firms, and is one if two firms do not share any occupation.

[24] We used 54 different occupations, 44 different industries, 24 different counties, 9 different education codes, 6 different age groups (11-20, 21-30, etc.), 7 rank codes, 2 gender codes, and 2 part time codes.

[Figure 4 here]

Figure 4 shows the histogram of each distance measures for 436 acquisitions in our sample. The histogram for the distance in occupation structure shows large variations. In other words, some firms are very close in terms of occupation structure, some firms are semi-close, and some firms are completely different in occupation structure. On the other hand, if we look at the distance in industry structure, and county location, firms are either close or far way. Firms are always similar in most other dimensions[25]. Therefore, we classify acquisitions as shown in Table 6.

[Table 6 here]

For example, if the acquired firm is similar in occupation and industry structures, and in the same region, we call it as a horizontal merger. Also, as they are similar, we expect that workers and business functions of two firms are substitutable. This classification is admittedly arbitrary. However, this classification can give us some sense of whether our results depend on different types of acquisition.

2.5 Changes in Gender Hierarchy

We measure gender hierarchy in the workplace in two ways: (i) the number of female (or male) managers at the highest rank within a firm regardless of their occupations (henceforth simply 'within firm') and (ii) the number of female (or male) managers at the highest rank within the same occupation as a worker's (henceforth simply 'within occupation'). For example, female (and male) workers in the marketing department may care the gender of

[25] The variation in the rank distance can be mostly explained by the difference in size.

both the top managers within the marketing department (i.e. same occupation) and the top managers within the firm as a whole.

Our analysis focuses on how the changes in female (and male) top managers affect female (or male) workers' turnover behaviors after an acquisition. However, for those who quit during an acquisition, we don't observe the number of their top managers after the acquisition even though they are the ones who may respond to the changes most sensitively. Moreover, the actual changes in the number of top managers can be correlated with other structural changes during an acquisition.

Therefore, we use *expected* changes in the number of top managers instead of actual changes. More specifically, we merge an acquiring firm's and the acquired firm's data right *before* an acquisition and treat them as a single firm. Then, for each worker, we measure, for example, the number of female at the top rank. We call this as *expected* post-merger number of female at the top rank. The difference between the expected post-merger and actual pre-merger number of female at the top rank is called the expected change in the number of female at the top rank.[26]

[Table 7 here]

Table 7 shows an example of how expected post-merger measures are computed. In this example, between the two firms, the top rank (within firm) is rank 5. Before the acquisition, the acquiring firm has one female at the top rank, but the acquired firm has no female at the top rank. If we merge the data between the two firms, then workers in the acquired firm would also have one female at the top rank (worker 3). Therefore, the expected-post merger number of female at the top rank changes from zero to one for worker 4 and 5.

[26] For more details on these measures, see Kwon and Meyersson Milgrom (2007).

Other measures are computed in a similar way. We repeat the same computation for each occupation to construct 'within occupation' measures.

Table 8 shows the summary statistics of expected changes in female hierarchy both within firm and within occupation. As discussed above, for an average worker, the number of female at top rank within his/her firm is very small. As a result, it does not change much even with acquisitions. Therefore, later, we will use a dummy variable for whether the number of female at top rank has increased or not. The number of female at one rank above is relatively large, especially for female. It suggests that women tend to work for women. The changes in the share of female or relative ranking of wages can be either positive or negative. Therefore, the average is close to zero. However, note the relatively large standard deviation.

[Table 8 here]

2.6 Turnovers

We focus on how the changes in female hierarchy affect workers' firm turnover decisions. If, for example, the number of female at top rank decreases female turnover rates, we infer that female at top rank raises other female workers' (expected) utility.

The advantage of this approach is that we can infer workers' preference from their behavior without relying on often-problematic survey responses. Also, unlike other behavior, such as consumption, the turnover decision does not rely upon an assumption on how the changes in gender hierarchy affect *marginal* utility of workers.

The disadvantage of this approach is that some workers may get fired during acquisitions, and that it is difficult to distinguish empirically between voluntary and involuntary turnovers. In Sweden, however, it is generally difficult for firms to fire workers

without consent from labor union. Thus, we expect that the number of involuntary turnovers would be small.

The average turnover rate is 12.4% for acquiring firms and 15.4% for acquired firms, while the average turnover rate for all the firms (including those not involved in acquisitions) in our full data is 14%. In other words, compared with an average firm, acquiring firms have lower turnover rates, but acquired firms have higher turnover rates[27]. Thus, there is a concern that some workers in acquired firms may get systematically fired during acquisitions. Table 9 confirms the same pattern using turnover regressions using 20% random sample of full data.

[Table 9]

For those who change firms, we also check how their wages have changed. If workers got fired involuntarily, one can expect that they will have lower wages in another firm than those who quit voluntarily. In Table 10, for those change firms only, we regress the change in real wages on various individual and firm characteristics.

[Table 10]

As suspected, those who quit from acquired firms have much lower wage increase than the average, while those who quit from acquiring firms have similar wage increase to the average workers. Therefore, while most quits from acquiring firms are voluntary, most quits from acquired firms appear to be involuntary.

[27] Turnover regressions controlling for individual and firm characteristics yield the same results, and not reported.

We address this problem in two ways. First, whenever possible, we check whether our results are robust when we use the acquiring firms only. Second, we classify turnovers as involuntary if (i) real wage falls from turnovers or (ii) real wage growth rate falls from turnovers. Though none of these definitions are perfect, if our results are robust to various definitions of involuntary turnovers, it is unlikely that involuntary turnovers from structural changes of M&As are driving our results.

3. Gender Hierarchy and Turnover

We are now ready to study how the expected changes in the number of female (or male) managers at top ranks affect other female (or male) workers' turnover decision. Recall that the top rank within firm is defined as the highest rank within an acquiring firm and an acquired firm combined right before a merger. Thus, one firm may not have the top rank before the acquisition, and that the top rank may differ across different acquisitions. We also measure the top rank within occupation for each worker by the highest rank in the same occupation within an acquiring firm and an acquired firm combined.

[Table 11 here]

In Table 11, we estimate the effect of expected changes in the number male/female top managers on workers' turnover decision within three years after acquisitions, controlling for various individual and firm characteristics right before acquisitions, including pre-merger number of male/female top managers both within firm and within occupation, acquired dummy, age, age squared, part time dummy, firm size, firm size squared, real wage, firm size change, occupation size change, ratio of workers who change regional code during

acquisition, female share within firm and within occupation, changes in female shares, dummy variables for rank, occupation, industry, county, and year.

3.1 Female (or Male) Managers at Top Rank within Firm

From Table 11 column [1] and [2], when the expected number of *male* managers at a top rank *within firm* increases, both male and female workers become more likely to quit. The same pattern emerges even when the expected number of *female* managers at a top rank within firm increases.

One explanation is that the increased number of male or female managers at top rank implies less chance of future promotions or the decreased status of other workers, which can induce larger turnover rates.

Note that the coefficients are almost the same between male and female workers. In other words, there is no gender difference when it comes to the way workers respond to the number of male (or female) managers at the top rank within firm. Later, we confirm this result more explicitly using difference-in-difference estimation.

3.2 Female (or Male) Managers at Top Rank within Occupation

With respect to the expected changes in the number of top female or male managers *within the same occupation*, however, column [3] and [4] show clear difference between male and female. When the expected number of *male* managers at a top rank within the same occupation increases, male workers become less likely to quit, but female workers become more likely to quit. Similarly, when the expected number of *female* managers at a top rank within the same occupation increases, male workers become more likely to quit, but female workers become less likely to quit. Column [5] and [6] show the same pattern when we control for both top rank within firm and top rank within occupation.

From column [5] and [6], both male and female workers seem to equally like to have more same-gender top managers within the same occupation (called *same gender attraction*). However, both male and female workers do not like to have the opposite gender top managers within the same occupation (called *opposite gender aversion*). It is interesting to note that opposite gender aversion is particularly strong for male workers.

These results are noteworthy for several reasons. First, these results differ from the findings of recent studies that are based on a single firm or a single occupation. For example, Bagues and Esteve-Volart (2007) finds that female evaluators are relatively more favorable to men than to women, which would at least partially undermine a goal of gender quota policy. In a related study, Giuliano, Levine, and Leonard (2006) find that black (young) managers are relatively more favorable to white (older) workers. In contrast, we find that on average, female workers do prefer having more female top managers and less male managers. Our results do not necessarily mean that female top managers are relatively more favorable to female workers. Instead, our results imply that the positive effects of having more female top managers on female workers (such as aspiration, role model) dominate other possible negative effects.

Second, the gender policies, including gender quota, typically do not explicitly consider its effect on male workers. However, our results show that the largest effect of adding an additional top female manager would be the increased quits by the male workers. Therefore, such negative effect on male workers' careers should be considered in the gender policy decision process.

Third, female workers, on average, do *not* respond to the increased number of male top managers within the same occupation. One explanation is that female workers may take male top managers for granted as a social norm. Later we show that in occupations where female share is large (that is, having female top managers is a norm), female workers do

respond negatively (i.e. quit more) to the increased number of male top managers within occupation.

Finally, as we show in next subsection, these different responses between male and female workers imply that our qualitative results would be robust even in difference-in-difference (between before and after merger and between male and female workers) estimation. In other words, our qualitative results are robust to unobserved M&A characteristics or firm characteristics.

3.3 Robustness

■ *Acquiring vs. Acquired Company*

Workers' turnover in acquired firms may not be voluntary, as discussed above. Also, workers in acquiring firms may respond more strongly to the top managers from acquired firms, if they consider acquiring firms as a higher-status group. Therefore, we repeat the same analysis for acquiring firms and acquired firms separately.

[Table 12 here]

Table 12 shows that within acquiring firms only, we find essentially the same patterns as before. However, for acquired firms, the changes in the number of top managers within occupation, regardless of its gender, are not significant. Moreover, the changes in the number of top female managers within firm have very different effects.

It is not clear whether this difference between acquiring firms and acquired firms is due to the fact that many turnovers within acquired firms are involuntary or to the fact that workers in acquired firms feel less secure about their identity. This is an interesting topic for

future research but outside the scope of this paper. Instead, we will focus on either all firms or acquiring firms only.

■ *Alternative Measure*

Given that the number of female at top rank is very small, the expected changes in the number of female, especially within firm, are typically either zero or one. Therefore, in Table 12A, we use a dummy variable (equal to one if the expected change is positive) for the expected changes. Table 12A shows essentially the same qualitative results as Table 12. One difference is that female workers' response to the expected changes in the number of male managers at top rank within occupation becomes statistically significant. In other words, female workers also become more likely to quit when the opposite gender managers at top rank within occupation increases (= opposite gender aversion).

[Table 12A here]

■ *Involuntary Turnovers*

We can infer workers' preference from their voluntary turnover decisions. However, during an M&A, workers may get dismissed involuntarily due to structural changes from M&A. For example, some top managers may get dismissed because they have become redundant. Note that these structural changes should affect both male and female workers. Therefore, involuntary turnovers or structural changes during M&As don't necessarily explain different responses by male and female workers.

Still, in order to check the robustness of our results, we classify turnovers as involuntary if (i) real wage falls from turnovers, or (ii) real wage growth rate falls from

turnovers compared with those who are remaining in the firm. Then, in Table 13, we estimate the probit model for voluntary turnovers only.

[Table 13 here]

Table 13 shows that the qualitative results from all turnovers (see Table 11) do not change even when we omit involuntary turnovers.

■ *Types of M&A*

As discussed above, M&As are heterogeneous in various dimensions. Thus, in Table 14 we control for different types of M&As. First, we control M&A types according to the classification in Table 6. Then, we control for all 8 distance measures (shown in Figure 4).

[Table 14 here]

The first two columns in Table 14 show that different types of M&A have different effect on workers' turnover rates. For example, 'growth' type increases workers' turnover rates, but 'horizontal merger' decreases workers' turnover rates[28]. In the third and fourth columns, we control for distance measures between acquiring and acquired firms in various dimensions.

In all cases, however, note that the qualitative effect of the expected changes in top male/female managers within occupation on male and female workers' turnover rates remain the same. In fact, the estimates become statistically more significant.

[28] This difference is not the primary focus of this paper, but is certainly interesting for future research.

■ Difference-in-Difference

So far, we have estimated the probit models separately for male and female. The difference between male and female is easy to observe from our results. However, our estimates of the marginal effect (dP/dx) for male and female are evaluated at different points. Thus, technically, the direct comparison of the coefficients between male and female is potentially biased. Thus, in Table 15, we estimate a difference-in-difference (between before and after merger and between male and female) model more explicitly using interaction terms between the changes in the number of male/female top managers and female dummy variable.

[Table 15 here]

Column [1] of Table 15 shows that as expected, when the number of top male or female managers within firm increases, there is no (either statistically or economically) differential effect on male and female workers. However, when the number of top male managers within occupation increases, female workers become more (relative to male) likely to quit. Also, when the number of top female managers within occupation increases, female workers become relatively less likely to quit.

These results do not change even when we control different types of M&A interacted with female dummy variable, as shown in column [2]. Since it is not always straightforward to interpret interaction terms in a probit model, we also estimate a linear probability model in column [3]. The results remain the same.

In column [4] and [5], we estimate the model separately for acquiring firms and acquired firms. Like before, the results remain the same for acquiring firms, but not for acquired firms.

In summary, our results are largely robust to various specifications and measures. Note, however, that the results in this section measure the *average* effect for male and female workers. As we show in next section, it turns out that the average effect does not apply to all workers or occupations.

4. Majority vs. Minority

There exists large heterogeneity in the share of female workers across occupations. For example, in production management (BNT codes 100, 110, 120, 140, and 160), the average share of female workers is less than 3%. However, in personnel work (BNT codes 600, 620, and 640) and office services (BNT codes 970 and 985), the average share of female workers is larger than 60%.

[Table 16 here]

Therefore, in Table 16, we first classify occupations into three groups: (i) the share of female workers is less than 10%, (ii) the share of female workers is between 10% and 50%, and (iii) the share of female workers is larger than 50%, and estimate our model separately for each group. Note that in the first group, women are a weak minority. In the second group, women are a strong minority, and in the third group, women are a majority. In this section, we primarily focus on the effect of the (expected) change in top male/female managers *within occupation*.

4.1 Same Gender Attraction

In the previous section, we show that on average, both male and female workers exhibit same gender attraction. In other words, when the number of the same gender top managers increases, workers become less likely to quit.

Table 16 shows that this same gender attraction is particularly strong for female workers, and that it is the strongest when one's own gender is a (weak) minority. More specifically, from the fourth row and female columns in Table 16, an additional increase in the number of female top managers within occupation reduces female workers' turnover rates by 18.9, 8.7, and 0.5 percentage point, in occupations where the female share is less than 10%, between 10% and 50%, and larger than 50%, respectively.

For male workers (from the third row and male columns in Table 16), the same gender attraction is much smaller, and is not monotonic to the female share. However, it is still true that the largest same gender attraction is observed in occupations where female share is larger than 50% (i.e. male share is less than 50%). Figure 5 illustrates these results clearly.

[Figure 5 here]

It is worth emphasizing that in occupations where women are a weak minority, an additional female top manager has very large (positive) effect on female workers. Even though this effect is not statistically significant (because there are too few top female managers in these occupations), it suggests that a gender quota policy can have significant effect on female workers in occupations where women are traditionally a weak minority.

4.2 Opposite Gender Aversion

In the previous section, we show that both male and female exhibit opposite gender aversion. In other words, when the number of opposite gender top managers increases, workers become more likely to quit. Table 16 shows that this opposite gender aversion is particularly strong for male workers, and that it is the strongest when the female share is between 10% and 50% (or when women are a strong minority).

More specifically, from the fourth row and male columns of Table 16, an additional female top manager within occupation increases male workers' turnover rates by -17, 14.5 and 2.8 percentage point in occupations where the female share is less than 10%, between 10% and 50%, and larger than 50%, respectively.

For female workers (from the third row and female columns), an additional male top manager within occupation increases female workers turnover rates only in occupations where female share is between 10% and 50%. These results can be also seen in Figure 6.

[Figure 6 here]

It is interesting to note that in occupations where female share is less than 10%, male workers do *not* show the opposite gender aversion. In fact, in these occupations where women are a weak minority, if the number of female top managers within occupation increases, male workers' turnover rates decrease as if they welcome female top managers. However, male workers' response changes completely in occupations where women are a strong minority, as they become more likely to quit when the number of female top managers increases. Interestingly, male workers' opposite gender aversion becomes smaller when

women are a majority. Female workers show the same non-monotonicity but in much lesser degree.

4.3 Discussion

This heterogeneity of the same gender attraction and the opposite gender aversion provides several important implications. First, it can explain why the growth of female share at top managerial positions in U.S. has slowed down recently. For example, Figure 7 shows that the women's share in the board or in corporate officer positions in fortune 500 firms has grown steadily in 1990s. However, as the women's share passes over 10%, the growth rate has slowed down significantly. In fact, the women's share in corporate officer positions has decreased after 2005.

[Figure 7 here]

Our results show that when female share is less than 10%, male workers welcome (and do not resist to) an additional female top managers. Also, female workers respond very positively (by reducing their turnover rates) to an additional female top manager. These findings can explain the steady growth of the share of women at top managerial positions in 1990s when the women's share at top managerial position was less than 10%.

However, our results suggest that when female share is between 10% and 50%, male workers would strongly resist to an additional female top managers, while the positive effect of an additional female top managers for female workers decreases. These findings provide a potential explanation why the growth of female share at top managerial positions has slowed down after 2000 when the women's share at top managerial position passed over 12%.

Second, from the policy perspective, if the goal is to achieve gender parity at top managerial positions, our results suggest that a gender quota policy may be necessary. Without a gender quota policy, women share at top managerial positions may not increase due to male resistance. On the other hand, as discussed above, our results show that the gender quota policy would have potentially negative effect on male workers' careers. Therefore, such costs must be taken into account in the policy decision process.

Third, as shown in Figure 5 and 6, even though the general relationship between same gender attraction (or opposite gender aversion) and the share of one's own gender is similar between male and female workers, there exist clear asymmetry between male and female. The same gender attraction is much stronger for female workers. And the opposite gender aversion is much stronger for male workers. These results imply that gender issues, such as gender quota or gender parity policies, cannot be fully explained by a general model of majority vs. minority, and require gender-specific models.

5. Conclusion

To be written.

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Appendix A Three-Digit Occupation Codes

BNT Family	BNT Code	Levels	
0			**Administrative work**
	020	7	General analytical work
	025	6	Secretarial work, typing and translation
	060	6	Administrative efficiency improvement and development
	070	6	Applied data processing, systems analysis and programming
	075	7	Applied data processing operation
	076	4	Key punching
1			**Production Management**
	100	4	Administration of local plants and branches
	110	5	Management of production, transportation and maintenance work
	120	5	Work supervision within production, repairs, transportation and maintenance work
	140	5	Work supervision within building and construction
	160	4	Administration, production and work supervision within forestry, log floating and timber scaling
2			**Research and Development**
	200	6	Mathematical work and calculation methodology
	210	7	Laboratory work
3			**Construction and Design**
	310	7	Mechanical and electrical design engineering
	320	6	Construction and construction programming
	330	6	Architectural work
	350	7	Design, drawing and decoration
	380	4	Photography
	381	2	Sound technology
4			**Technical Methodology, Planning, Control, Service and Industrial Preventive Health Care**
	400	6	Production engineering
	410	7	Production planning
	415	6	Traffic and transportation planning
	440	7	Quality control
	470	6	Technical service
	480	5	Industrial, preventive health care, fire protection, security, industrial civil defense
5			**Communications, Library and Archival Work**
	550	5	Information work
	560	5	Editorial work – publishing
	570	4	Editorial work – technical information
	590	6	Library, archives and documentation
6			**Personnel Work**
	600	7	Personnel service
	620	6	The planning of education, training and teaching

	640	4	Medical care within industries
7			**General Services**
	775	3	Restaurant work
8			**Business and Trade**
	800	7	Marketing and sales
	815	4	Sales within stores and department stores
	825	4	Travel agency work
	830	4	Sales at exhibitions, spare part depots etc.
	835	3	Customer service
	840	5	Tender calculation
	850	5	Order processing
	855	4	The internal processing of customer requests
	860	5	Advertising
	870	7	Buying
	880	6	Management of inventory and sales
	890	6	Shipping and freight services
9			**Financial Work and Office Services**
	900	7	Financial administration
	920	6	Management of housing and real estate
	940	6	Auditing
	970	4	Telephone work
	985	6	Office services
	986	1	Chauffeuring

Appendix B Sample Description of Four-Digit Occupation Codes

Occupation Family 1: Occupation # 120- Manufacturing, Repair, Maintenance, and Transportation
11% of 1988 sample
There is no rank 1 in this occupation.
Rank 2 (4% of occupation # 120 employees) - Assistant for unit; insures instructions are followed; monitors processes
Rank 3 (46%) -In charge ofa unit of 15-35 people
Rank 4 (45%) - In charge of 30-90 people; does investigations of disruptions and injuries
Rank 5 (4%) - In charge of 90-180 people; manages more complicated tasks
Rank 6 (0.3%) - Manages 180 or more people
There is no rank 7 in this occupation.

Occupation Family 2: Occupation #310- Construction
10% of the 1988 sample
Rank l (0.1%) - Cleans sketches; writes descriptions
Rank 2 (1%) - Does more advanced sketches
Rank 3 (12%) - Simple calculations regarding dimensions, materials, etc.
Rank 4 (45%) - Chooses components; does more detailed sketches and descriptions; estimates costs
Rank 5 (32%) - Designs mechanical products and technical products; does investigations; has 3 or more subordinates at lower Ranks
Rank 6 (8%) - Executes complex calculations; checks materials; leads construction work; has 3 or more subordinates at rank 5
Rank 7 (1%) - Same as rank 6 plus has 2-5 rank 6 subordinates

Occupation Family 3: Occupation #800- Marketing and Sales
19% of 1988 sample
Rank l (0.2%) - Telesales; expedites invoices; files
Rank 2 (6%) - Puts together orders; distributes price and product information
Rank 3 (29%) - Seeks new clients for 1- 3 products; can sign orders; does market surveys
Rank 4 (38%) - Sells more and more complex products; negotiates bigger orders; manages 3 or more subordinates
Rank 5 (20%) - Manages budgets; develops products; manages 3 or more rank 4 workers
Rank 6 (7%) - Organizes, plans, and evaluates salesforce; does more advanced budgeting; manages 3 or more rank 5 workers
Rank 7 (1 %) - Same as rank 6 plus 2-5 rank 6 subordinates

Occupation Family 4: Occupation #900- Financial Administration
5% of 1988 sample
Rank 1 (1%) - Office work; bookkeeping; invoices; bank verification
Rank 2 (7%) - Manages petty cash; calculates salaries
Rank 3 (18%) - More advanced accounting; 4-10 subordinates
Rank 4 (31 %) - Places liquid assets; manages lenders; evaluates credit ofbuyers; manages 3 or more rank 3 employees
Rank 5 (28%) - Financial planning; analyzes markets; manages portfolios; currency transfers; manages 3 or more rank 4 employees
Rank 6 (12%) - Manages credits; plan routines within the organization; forward-looking budgeting; manages 3 or more rank 5 employees
Rank 7 (2%) - Same as rank 6 plus 2-5 rank 6 subordinates

Table 1 Summary Statistics

	acquirer			acquried		
	total	male	female	total	male	female
firm size	362.627	273.283	90.533	51.463	37.168	14.457
female ratio	0.302			0.282		
wage	1532.499	1717.705	1054.538	1493.726	1661.137	1015.019
status	0.510	0.623	0.238	0.521	0.633	0.232
rank	3.322	3.715	2.380	3.279	3.630	2.349
age	40.955	42.247	37.446	40.964	42.442	36.753
part time	0.103	0.021	0.280	0.102	0.019	0.293

Note: Wage is a monthly total payment measured in 1970 Kronor. Status is measured as each worker's relative ranking of wages within a firm where zero is the lowest and one is the highest.

Table 2 Gender Wage Gap
(dependent variable = log(real wage))

	[1]	[2]	[3]	[4]	[5]
female	-0.396	-0.199	-0.177	-0.074	-0.065
	(0.001)**	(0.000)**	(0.001)**	(0.000)**	(0.000)**
age		0.057	0.053	0.034	0.034
		(0.000)**	(0.000)**	(0.000)**	(0.000)**
age2		-0.001	-0.001	0	0
		(0.000)**	(0.000)**	(0.000)**	(0.000)**
tenure		0.018	0.018	0.008	0.009
		(0.000)**	(0.000)**	(0.000)**	(0.000)**
tenure2		-0.001	-0.001	0	0
		(0.000)**	(0.000)**	(0.000)**	(0.000)**
occupation	no	no	yes	yes	yes
rank	no	no	no	yes	yes
job	no	no	no	no	yes
other controls	no	yes	yes	yes	yes
Observations	1204643	1204643	1204643	1204643	1204643
R-squared	0.28	0.63	0.68	0.81	0.82

Standard errors in parentheses.
* significant at 5%; ** significant at 10%.

Note: Observations include only all the white-collar workers between 1987 and 1990. Tenure is measured by the number of years since the first labor market entry. Occupation is the first-three digits of BNT code, rank is the fourth digit of BNT code. Job is the full four digit BNT code. Other controls include part time dummy, 8 education dummies, 44 industry dummies, 24 county dummies, and 4 year dummies.

Table 3 Transition Matrix between Starting Year and 10 Years Later

(Male)

starting rank	rank after 10 years 1	2	3	4	5	6	7
1	10.77	29.01	36.82	20.29	2.97	0.14	0.00
2	0.85	20.80	37.04	33.56	7.15	0.56	0.04
3	0.14	2.66	35.87	44.75	14.55	1.90	0.12
4	0.03	0.70	7.38	47.02	34.97	9.02	0.87
5	0.00	0.28	2.04	12.64	54.60	26.76	3.68
6	0.00	0.12	0.82	3.94	19.64	62.54	12.94
7	0.00	0.00	0.42	2.16	11.10	25.63	60.69

(Female)

starting rank	rank after 10 years (cross occupation) 1	2	3	4	5	6	7
1	15.73	53.91	26.08	3.98	0.29	0.01	0.00
2	2.89	47.12	39.31	9.63	1.00	0.05	0.00
3	0.64	9.92	53.23	30.17	5.78	0.26	0.01
4	0.13	2.41	9.61	57.46	26.73	3.58	0.15
5	0.11	1.56	7.65	26.56	50.11	13.33	1.12
6	0.00	6.67	0.00	7.50	32.08	47.08	10.67
7	0.00	0.00	0.00	100.00	0.00	0.00	0.00

Note: The table reads as follows. For example, for male, for those who started at rank 4, after 10 years, 7.38% fell to rank 3, 47.02% remains in rank 4, 34.97% moves up to rank 5, 9.02% moves up to rank 6, 0.87% moves up to rank 7. For each gender, transition matrices for each starting year from 1971 and 1980 are computed, and then averaged over years to produce these tables.

Table 4 Gender Promotion Gap
(dependent variable = number of promotions in the first ten years)

	[1]	[2]	[3]	[4]	[5]
female	-0.121	-0.139	-0.276	-0.578	-0.563
	(0.004)**	(0.005)**	(0.006)**	(0.006)**	(0.006)**
age		-0.082	-0.066	0.011	0.012
		(0.002)**	(0.002)**	(0.002)**	(0.002)**
age2		0.001	0.001	0	0
		(0.000)**	(0.000)**	(0.000)**	(0.000)**
occupation	no	no	yes	yes	yes
rank	no	no	no	yes	yes
job	no	no	no	no	yes
other controls	no	yes	yes	yes	yes
Observations	167664	167664	167664	167664	167664
R-squared	0	0.16	0.18	0.34	0.35

Standard errors in parentheses.
* significant at 5%; ** significant at 10%.

Note: Observations include only those who entered the dataset between 1971 and 1980, and those who stay after 10 years. All the independent variables are measured at the time of entry. Other controls include part time dummy, education dummies, industry dummies, county dummies, and year dummies.

Table 5 Correlations between Acquiring and Acquired Firms

	Female Share			Female Status	
	Overall	At Top Rank	At Top Rank within Occup.	Within Firm	Within Occup.
corr(acquiring, acquired)	0.200	−0.325	0.131	0.058	0.064

Note: The correlations after controlling for firm size, firm size squared, primary industry dummy, and primary occupation dummy.

Table 6 Classification of Acquisition

Occupation	Industry	Region	Description	Classification	Complementarity
Similar	Similar	Similar	Acquisition of Competitor	Horizontal Merger	-5
Similar	Similar	Different	Regional Expansion	Growth Merger	-3
Different	Similar	Similar	Functional Extension	Vertical Merger	5
Different	Similar	Different			3
Similar	Different	Similar	Product Line Extension	Growth Merger	-3
Similar	Different	Different	Product/Region Expansion	Growth Merger	-1
Different	Different	Similar	Business Line Expansion	Conglomerate Merger	3
Different	Different	Different			0

Occupation: *similar* if occupation distance measure is less than 0.2, *different* otherwise.
Industry: *similar* if industry distance measure is less than 0.5, *different* otherwise.
Region: *similar* if regional distance measure is less than 0.5, *different* otherwise.

Table 7 Computation of Expected Post-Merger Measures: An Example

					Pre-Merger			Expected Post-Merger		
firm	worker	gender	rank	wage	Number of Female at Top Rank	Number of Female at a Rank above	Relative Ranking within Gender	Number of Female at Top Rank	Number of Female at a Rank above	Relative Ranking within Gender
Acquiring	1	male	4	1500	1	1	1/1	1	1	2/2
	2	female	4	1600	1	1	1/2	1	1	2/3
	3	female	5	1800	1	.	2/2	1	.	3/3
Acquired	4	male	3	1200	0	1	1/1	1	2	1/2
	5	female	4	1300	0	0	1/1	1	1	1/3

Table 8 Changes in Female Hierarchy

	Male		Female	
	Pre-Merger	Expected Change	Pre-Merger	Expected Change
Number of Female at Top Rank	0.028	0.011	0.067	0.013
	(0.189)	(0.123)	(0.317)	(0.132)
Share of Female at Top Rank (%)	0.269	0.087	0.637	0.045
	(2.259)	(1.695)	(3.522)	(2.566)
Number of Female at Rank above	22.100	2.834	90.722	10.613
	(48.680)	(14.159)	(110.541)	(33.381)
Share of Female at Rank above (%)	5.846	0.035	26.976	-0.245
	(10.232)	(2.505)	(21.874)	(3.786)
Relative Ranking within Gender	0.499	0.000	0.503	0.000
	(0.286)	(0.029)	(0.287)	(0.038)
number of observation	142,176		44,503	

(a) Within Firm

	Male		Female	
	Pre-Merger	Expected Change	Pre-Merger	Expected Change
Number of Female at Top Rank	0.071	0.012	2.910	0.372
	(0.765)	(0.205)	(6.732)	(1.839)
Share of Female at Top Rank (%)	1.056	0.083	32.775	0.851
	(7.662)	(2.930)	(44.374)	(10.034)
Number of Female at Rank above	2.222	0.346	24.196	3.547
	(13.188)	(4.335)	(45.342)	(15.281)
Share of Female at Rank above (%)	3.990	0.035	53.370	0.002
	(11.896)	(2.728)	(37.801)	(5.987)
Relative Ranking within Gender	0.511	-0.002	0.527	-0.003
	(0.289)	(0.043)	(0.291)	(0.049)
number of observation	142,176		44,503	

(b) Within Occupation

Note: Standard deviations are in parenthesis.

Table 9 Turnover Pattern: Probit Analysis
(dependent variable = 1 if quit)

	[1]	[2]	[3]
	all	male	female
age	-0.027	-0.027	-0.023
	(0.000)***	(0.001)***	(0.000)***
age_sq	0	0	0
	(0.000)***	(0.000)***	(0.000)***
part time	0.033	0.102	0.019
	(0.001)***	(0.004)***	(0.002)***
firm size	0	0	0
	(0.000)***	(0.000)***	(0.000)***
firm size_sq	0	0	0
	(0.000)**	(0.000)**	(0.000)*
acquirer	-0.03	-0.031	-0.025
	(0.005)***	(0.005)***	(0.008)***
acquired	0.871	0.877	0.856
	(0.002)***	(0.002)***	(0.003)***
female	-0.013		
	(0.001)***		
Observations	1,283,996	902,656	381,320

Note: 20% random sample of full data (including those not involved in acquisitions) is used. Each regression includes education, rank, occupation, industry, county, and year dummies.

Table 10 Wage Changes After Quit
(dependent variable = log(wage_new)-log(wage_old))

	[1]	[2]	[3]
	all	male	female
age	-13.988	-23.312	-16.755
	(1.321)***	(2.055)***	(1.739)***
age_sq	0.019	0.099	0.136
	(0.017)	(0.025)***	(0.023)***
part	300.552	301.648	280.949
	(10.195)***	(27.510)***	(9.782)***
fsize	0.015	0.020	-0.003
	(0.010)	(0.011)*	(0.008)
fsize2	-0.000	-0.000	-0.000
	(0.000)*	(0.000)**	(0.000)
acquirer	-0.749	-2.462	-10.609
	(14.559)	(18.287)	(25.635)
acquired	-55.019	-51.938	-42.908
	(10.159)***	(12.081)***	(13.149)***
female	-223.104		
	(7.652)***		
Observations	92803	65356	27447
R-squared	0.13	0.14	0.12

Note: Among 20% random sample of full data, only those who change firms (including those not involved in acquisitions) are used. Each regression includes education, rank, occupation, industry, county, and year dummies.

Table 11 Number of Female at Top Rank and Turnover: Probit Analysis
(dependent variable =1 if quit within three years after acquisitions)

	Male	Female	Male	Female	Male	Female
expected change in number of Male at top ranks	**0.002**	**0.003**			**0.003**	**0.003**
	(0.000)***	(0.000)***			(0.000)***	(0.000)***
expected change in number of Female at top ranks	**0.073**	**0.055**			**0.061**	**0.056**
	(0.012)***	(0.023)**			(0.012)***	(0.024)**
expected change in number of Male at top ranks within the same occupation			**-0.004**	**0.008**	**-0.005**	0.003
			(0.000)***	(0.002)***	(0.000)***	(0.002)
expected change in number of Female at top ranks within the same occupation			**0.025**	-0.001	**0.025**	**-0.005**
			(0.009)***	(0.002)	(0.009)***	(0.002)***
pre-merger number of Male at top ranks	0.000	0.001			0.001	0.000
	(0.000)***	(0.000)*			(0.000)***	(0.000)
pre-merger number of Female at top ranks	-0.026	-0.069			-0.027	-0.067
	(0.008)***	(0.012)***			(0.008)***	(0.012)***
pre-merger number Male at top ranks within the same occupation			-0.001	-0.001	-0.001	-0.001
			(0.000)***	(0.001)**	(0.000)***	(0.001)*
pre-merger number Female at top ranks within the same occupation			-0.004	0.002	-0.005	0.002
			(0.002)**	(0.001)***	(0.002)**	(0.001)***
Acquired dummy	-0.018	-0.045	0.032	-0.025	-0.005	-0.047
	(0.006)***	(0.011)***	(0.006)***	(0.010)**	(0.006)	(0.011)***
age	-0.070	-0.046	-0.070	-0.046	-0.070	-0.046
	(0.001)***	(0.002)***	(0.001)***	(0.002)***	(0.001)***	(0.002)***
(age)^2	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
part time dummy	0.228	0.033	0.228	0.032	0.229	0.033
	(0.014)***	(0.010)***	(0.014)***	(0.010)***	(0.014)***	(0.010)***
firm size (in thousands)	-0.056	-0.055	-0.054	-0.048	-0.058	-0.052
	(0.003)***	(0.007)***	(0.003)***	(0.007)***	(0.004)***	(0.007)***
firm size_sq	0.002	0.003	0.003	0.004	0.003	0.003
	(0.000)***	(0.001)***	(0.000)***	(0.001)***	(0.000)***	(0.001)***
Observations	142108	44165	142108	44165	142108	44165
Predicted Probabiliy (at mean)	0.294	0.367	0.294	0.368	0.294	0.367
pseudo R-square	0.153	0.130	0.153	0.128	0.154	0.130

Note: Reporting marginal effect dP/dx. Each regression includes real wage, firm size change, occupation size change, average female share, change in average female share, ratio of workers who moved regional code, rank, occupation, industry, county, and year dummies.

Table 12 Acquirer vs. Acquired: Number of Female at Top Rank: Probit Analysis
(dependent variable =1 if quit within three years after acquisitions)

	Acquirer		Acquired	
	Male	Female	Male	Female
expected change in number of Male at top ranks	**0.008**	**0.008**	**0.005**	**0.022**
	(0.000)***	(0.001)***	(0.001)***	(0.004)***
expected change in number of Female at top ranks	**0.224**	**0.248**	**-0.151**	-0.067
	(0.022)***	(0.049)***	(0.024)***	(0.054)
expected change in number of Male at top ranks within the same occupation	**-0.014**	0.002	**-0.002**	-0.001
	(0.001)***	(0.005)	(0.001)*	(0.003)
expected change in number of Female at top ranks within the same occupation	**0.055**	**-0.008**	0.007	-0.002
	(0.013)***	(0.003)***	(0.014)	(0.003)
pre-merger number of Male at top ranks	-0.000	-0.000	-0.006	0.000
	(0.000)	(0.000)	(0.002)***	(0.006)
pre-merger number of Female at top ranks	-0.029	-0.057	-0.069	-0.158
	(0.009)***	(0.013)***	(0.043)	(0.064)**
pre-merger number Male at top ranks within the same occupation	-0.000	-0.001	0.004	0.019
	(0.000)***	(0.001)**	(0.002)**	(0.008)**
pre-merger number Female at top ranks within the same occupation	-0.008	0.002	-0.011	0.007
	(0.002)***	(0.001)***	(0.026)	(0.008)
age	-0.070	-0.044	-0.071	-0.046
	(0.001)***	(0.002)***	(0.004)***	(0.006)***
(age)^2	0.001	0.001	0.001	0.001
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
part time dummy	0.225	0.033	0.214	0.023
	(0.014)***	(0.008)***	(0.057)***	(0.029)
firm size (in thousands)	-0.049	-0.037	0.057	-0.094
	(0.004)***	(0.008)***	(0.025)**	(0.059)
firm size_sq	0.002	0.002	-0.012	-0.019
	(0.000)***	(0.001)**	(0.003)***	(0.007)***
Observations	130558	40559	11485	3565
Predicted Probabiliy (at mean)	0.288	0.359	0.351	0.451
pseudo R-square	0.157	0.137	0.237	0.193

Note: Reporting marginal effect dP/dx. Each regression includes real wage, firm size change, occupation size change, average female share, change in average female share, ratio of workers who moved regional code, rank, occupation, industry, county, and year dummies.

Table 12A Acquirer vs. Acquired: Number of Female at Top Rank: Probit Analysis
(dependent variable =1 if quit within three years after acquisitions)
[Use Dummy Variables for the Expected Changes; = 1 if positive.]

	Acquirer		Acquired	
	Male	Female	Male	Female
expected change in number of Male at top ranks > 0	**0.033**	**0.036**	**-0.066**	-0.089
	(0.004)***	(0.008)***	(0.031)**	(0.057)
expected change in number of Female at top ranks > 0	**0.309**	**0.331**	**-0.139**	-0.036
	(0.025)***	(0.039)***	(0.023)***	(0.056)
expected change in number of Male at top ranks within the same occupation > 0	**-0.020**	**0.021**	0.005	0.045
	(0.004)***	(0.010)**	(0.018)	(0.038)
expected change in number of Female at top ranks within the same occupation > 0	**0.068**	**-0.049**	**-0.130**	**-0.167**
	(0.028)**	(0.011)***	(0.039)***	(0.043)***
pre-merger number of Male at top ranks	0.000	0.000	-0.003	-0.003
	(0.000)	(0.000)	(0.002)*	(0.006)
pre-merger number of Female at top ranks	-0.022	-0.051	-0.209	-0.177
	(0.009)**	(0.013)***	(0.049)***	(0.070)**
pre-merger number Male at top ranks within the same occupation	-0.000	-0.001	-0.002	0.019
	(0.000)***	(0.001)	(0.002)	(0.008)**
pre-merger number Female at top ranks within the same occupation	-0.002	0.001	0.056	0.014
	(0.003)	(0.001)**	(0.030)*	(0.008)*
Observations	121694	38350	10578	3437
Predicted Probabiliy (at mean)	0.285	0.360	0.346	0.453
pseudo R-square	0.157	0.137	0.245	0.189

Note: Reporting marginal effect dP/dx. Each regression includes age, age squared, real wage, firm size, firm size squared, firm size change, occupation size change, average female share, change in average female share, ratio of workers who moved regional code, dummy variables for part time, rank, occupation, industry, county, and year.

Table 13 Voluntary Turnovers Only

Definition of Involuntary Turnovers	Real Wage Drop		Wage Growth Rate Drop	
	Male	Female	Male	Female
expected change in number of Male at top ranks	0.002	0.002	0.003	0.002
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
expected change in number of Female at top ranks	0.103	0.109	0.130	0.159
	(0.013)***	(0.025)***	(0.015)***	(0.031)***
expected change in number of Male at top ranks within the same occupation	**-0.006**	**0.007**	**-0.007**	**0.006**
	(0.001)***	(0.002)***	(0.001)***	(0.002)***
expected change in number of Female at top ranks within the same occupation	**0.023**	**-0.004**	**0.046**	**-0.005**
	(0.009)***	(0.002)***	(0.010)***	(0.002)***
pre-merger number of Male at top ranks	0.000	-0.000	-0.000	-0.000
	(0.000)***	(0.000)	(0.000)	(0.000)*
pre-merger number of Female at top ranks	0.010	-0.017	0.018	-0.003
	(0.008)	(0.012)	(0.008)**	(0.012)
pre-merger number Male at top ranks within the same occupation	-0.000	-0.001	-0.000	-0.001
	(0.000)***	(0.000)	(0.000)***	(0.000)*
pre-merger number Female at top ranks within the same occupation	-0.003	0.002	-0.005	0.002
	(0.002)	(0.001)***	(0.002)**	(0.001)***
Number of Observations	122939	34797	117724	33119

Note: Reporting marginal effect dP/dx. Involuntary turnovers are omitted. The other specifications are the same as those in column [5] and [6] in Table 11.

Table 14 Controlling for M&A Types

	M&A Type		Distance Measures	
	Male	Female	Male	Female
expected change in number of Male at top ranks	**0.003**	**0.003**	**0.002**	**0.003**
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
expected change in number of Female at top ranks	**0.048**	**0.050**	**0.073**	**0.069**
	(0.012)***	(0.024)**	(0.012)***	(0.023)***
expected change in number of Male at top ranks within the same occupation	**-0.005**	**0.004**	**-0.004**	**0.005**
	(0.000)***	(0.002)**	(0.000)***	(0.002)**
expected change in number of Female at top ranks within the same occupation	**0.029**	**-0.004**	**0.029**	**-0.004**
	(0.009)***	(0.002)**	(0.009)***	(0.002)**
pre-merger number of Male at top ranks	0.001	0.001	-0.000	0.001
	(0.000)***	(0.000)***	(0.000)	(0.000)**
pre-merger number of Female at top ranks	-0.046	-0.070	-0.006	-0.035
	(0.008)***	(0.012)***	(0.009)	(0.013)***
pre-merger number Male at top ranks within the same occupation	-0.001	-0.001	-0.000	-0.001
	(0.000)***	(0.001)*	(0.000)***	(0.001)*
pre-merger number Female at top ranks within the same occupation	-0.005	0.002	-0.004	0.003
	(0.002)**	(0.001)***	(0.002)**	(0.001)***
M&A Type = Conglomerate	0	0		
M&A Type =Growth	0.026	0.018		
	(0.005)***	(0.009)*		
M&A Type = Horizontal	-0.092	-0.096		
	(0.006)***	(0.012)***		
M&A Type = Vertical	0.002	0.031		
	(0.005)	(0.010)***		
distance measures	no	no	yes	yes
Observations	142108	44165	142108	44165
Predicted Probabiliy (at mean)	0.293	0.365	0.293	0.366
pseudo R-square	0.157	0.136	0.167	0.142

Note: Reporting marginal effect dP/dx. See Table 6 for the definitions of M&A types. Each regression includes age, age squared, real wage, firm size, firm size squared, firm size change, occupation size change, average female share, change in average female share, ratio of workers who moved regional code, dummy variables for part time, rank, occupation, industry, county, and year.

Table 15 Difference-In-Difference

	Probit		OLS	Probit	
	[1]	[2]	[3]	[4]	[5]
	All	All	All	Acquirer	Acquired
expected change in number of Male at top ranks * female	**0.001**	**0.001**	0.000	0.000	**0.004**
	(0.000)***	(0.000)***	(0.000)	(0.001)	(0.001)***
expected change in number of Female at top ranks * female	0.013	0.003	0.006	-0.030	**0.076**
	(0.022)	(0.021)	(0.022)	(0.026)	(0.043)*
expected change in number of Male at top ranks within the same occupation * female	**0.007**	**0.008**	**0.009**	**0.017**	**0.006**
	(0.002)***	(0.002)***	(0.002)***	(0.004)***	(0.003)**
expected change in number of Female at top ranks within the same occupation * female	**-0.020**	**-0.025**	**-0.026**	**-0.066**	0.004
	(0.010)**	(0.011)**	(0.009)***	(0.016)***	(0.019)
pre-merger number of Male at top ranks * female	0.000	0.000	0.000	0.001	-0.005
	(0.000)***	(0.000)***	(0.000)	(0.000)***	(0.003)**
pre-merger number of Female at top ranks * female	-0.012	-0.015	-0.005	-0.009	0.074
	(0.012)	(0.012)	(0.009)	(0.013)	(0.049)
pre-merger number Male at top ranks within the same occupation * female	0.001	0.001	0.001	0.001	0.008
	(0.000)**	(0.000)*	(0.001)**	(0.000)	(0.004)*
pre-merger number Female at top ranks within the same occupation * female	0.008	0.009	0.007	0.014	-0.001
	(0.003)***	(0.003)***	(0.002)***	(0.003)***	(0.029)
M&A Type = Conglomerate * female		0	0	0	0
M&A Type = Growth * female		0.018	0.021	0.027	-0.087
		(0.009)**	(0.008)**	(0.010)***	(0.040)**
M&A Type = Horizontal * female		0.022	0.022	0.030	-0.022
		(0.013)*	(0.011)**	(0.013)**	(0.049)
M&A Type = Vertical * female		0.002	0.003	0.009	0.051
		(0.009)	(0.009)	(0.010)	(0.048)
Observations	174154	174154	174165	160049	14038

Note: Reporting marginal effect dP/dx. See Table 6 for the definitions of M&A types. Each regression includes all the variables in the table without interaction with female dummy, female dummy, age, age squared, real wage, firm size, firm size squared, firm size change, occupation size change, average female share, change in average female share, ratio of workers who moved regional code, dummy variables for part time, rank, occupation, industry, county, and year.

Table 16 Heterogeneity: Share of Female Workers
(dependent variable =1 if quit within three years after acquisitions)

Female Share	female share<0.1		0.1<female share<0.5		female share>0.5	
	Male	Female	Male	Female	Male	Female
expected change in number of Male at top ranks	0.003	0.003	0.003	0.005	0.003	0.003
	(0.000)***	(0.002)*	(0.001)***	(0.002)***	(0.001)***	(0.000)***
expected change in number of Female at top ranks	0.141	0.053	-0.009	0.082	0.434	0.131
	(0.022)***	(0.113)	(0.020)	(0.045)*	(0.088)***	(0.036)***
expected change in number of Male at top ranks within the same occupation	-0.005	0.008	0.010	0.022	-0.011	-0.003
	(0.000)***	(0.009)	(0.002)***	(0.005)***	(0.005)**	(0.003)
expected change in number of Female at top ranks within the same occupation	-0.170	-0.189	0.145	-0.087	0.028	-0.005
	(0.058)***	(0.162)	(0.054)***	(0.055)	(0.014)**	(0.002)***
Observations	86524	2385	43536	11657	12027	30091

Note: Reporting marginal effect dP/dx.. The other specifications are the same as those in column [5] and [6] in Table 11.

Figure 1 Percentage of Female among White-collar Workers

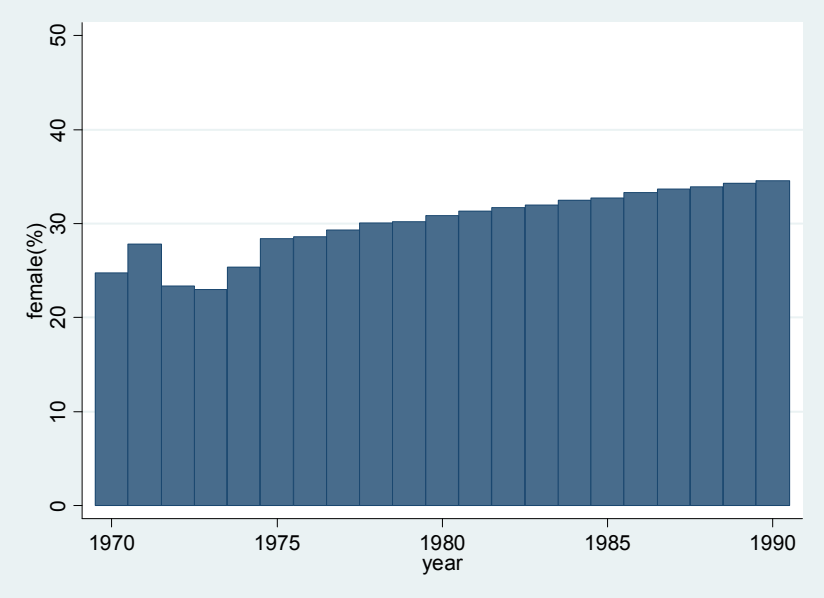


Figure 2 of Males and Females in Each Rank
(sum over years and occupations)

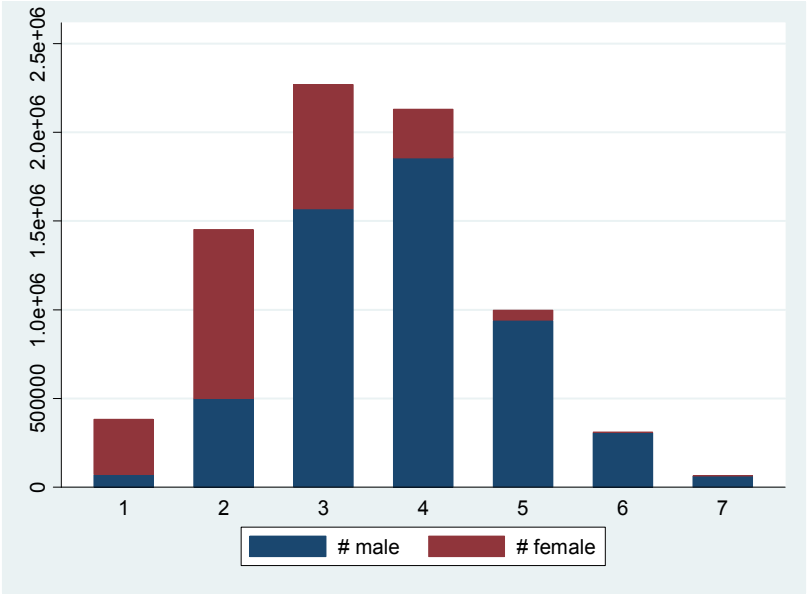


Figure 3 Share of Female in Each Rank over Years

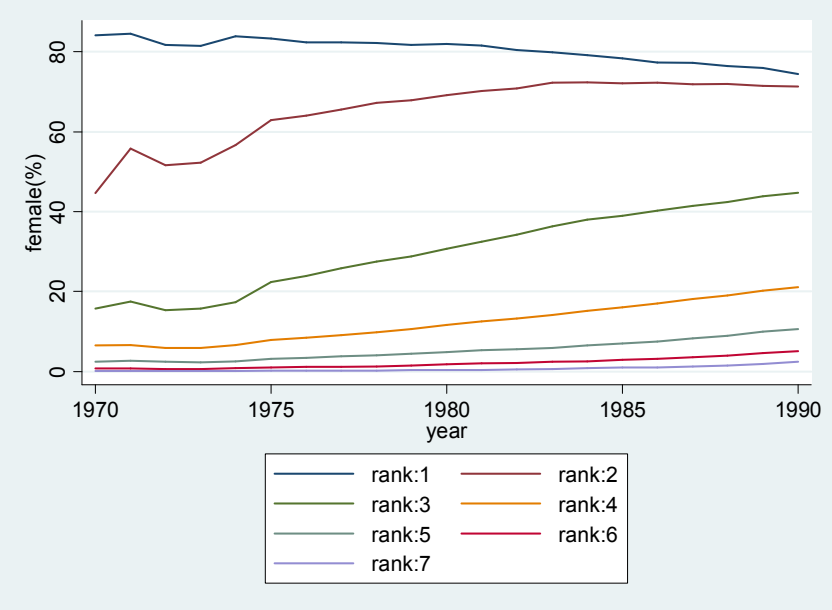
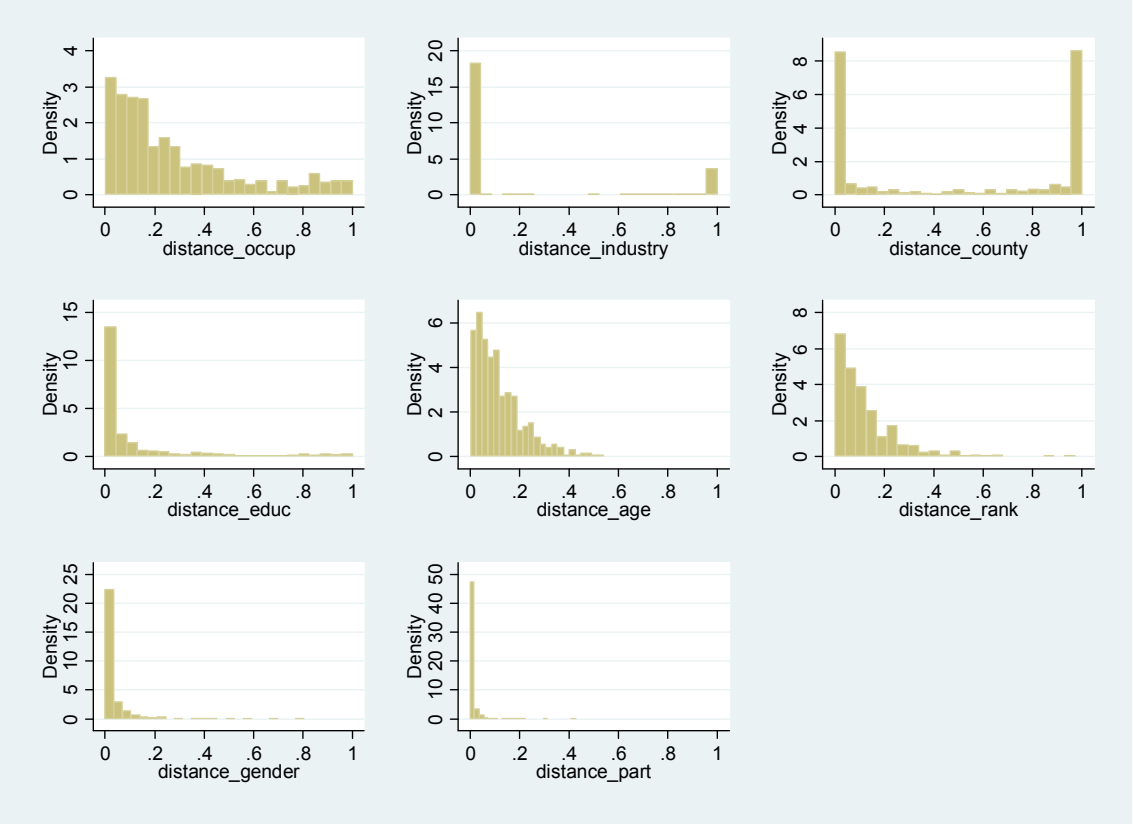
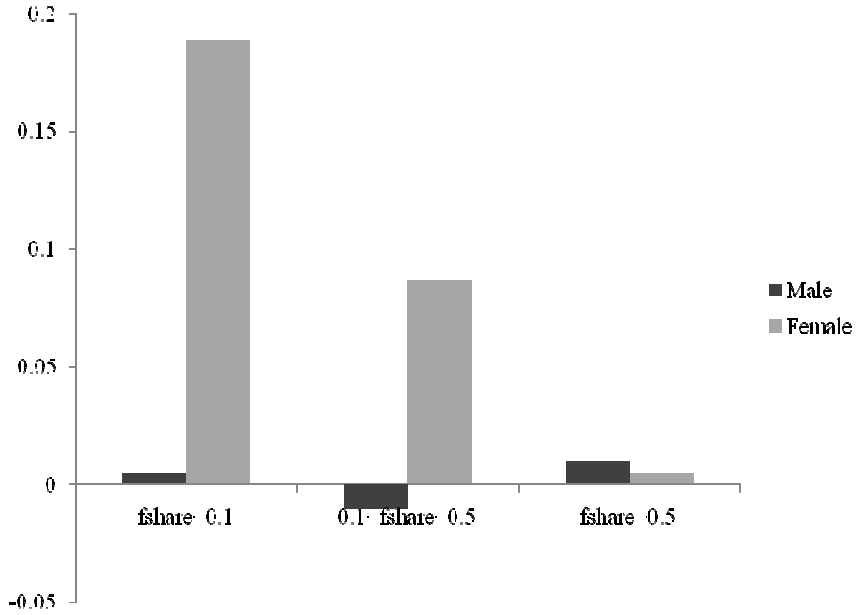


Figure 4 Distance between Acquirer and Acquired



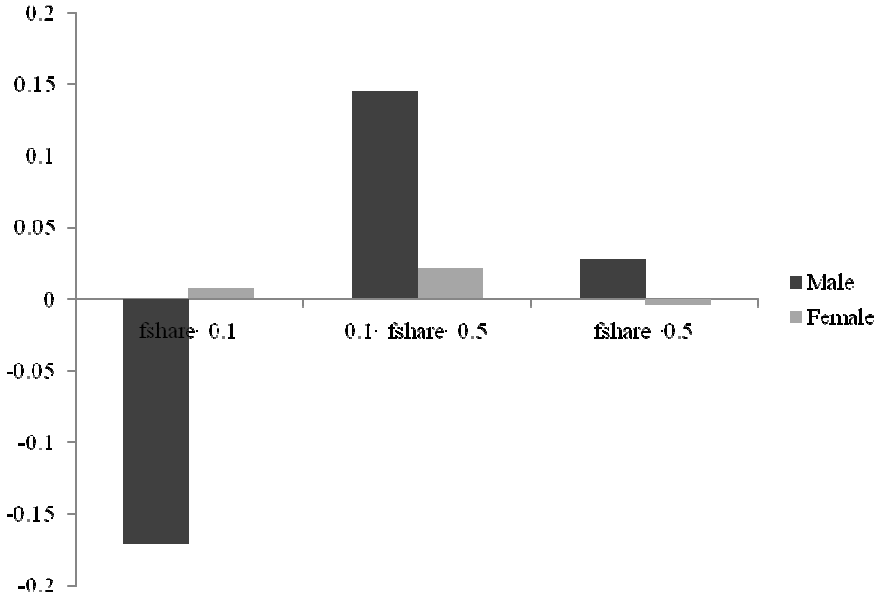
Distance in each dimension is measured as 1 - uncentered correlation. For example, to construct a distance measure in occupation structure, for an acquired firm i, we construct a vector $f_i=(s_{1i,}, s_{2i}, \ldots, s_{54i})$ where s_{ki} is occupation k's share in firm i (in terms of number of workers). Then, we construct the same vector for its acquiring firm j, f_j. Then, the distance in occupation structure is measured as $1-\frac{f_i f_j'}{((f_i f_i')(f_j f_j'))^{\frac{1}{2}}}$. This distance measure is zero if the composition of occupation is the same between the two firms, and is one if two firms do not share any occupation.

Figure 5 Same Gender Attraction



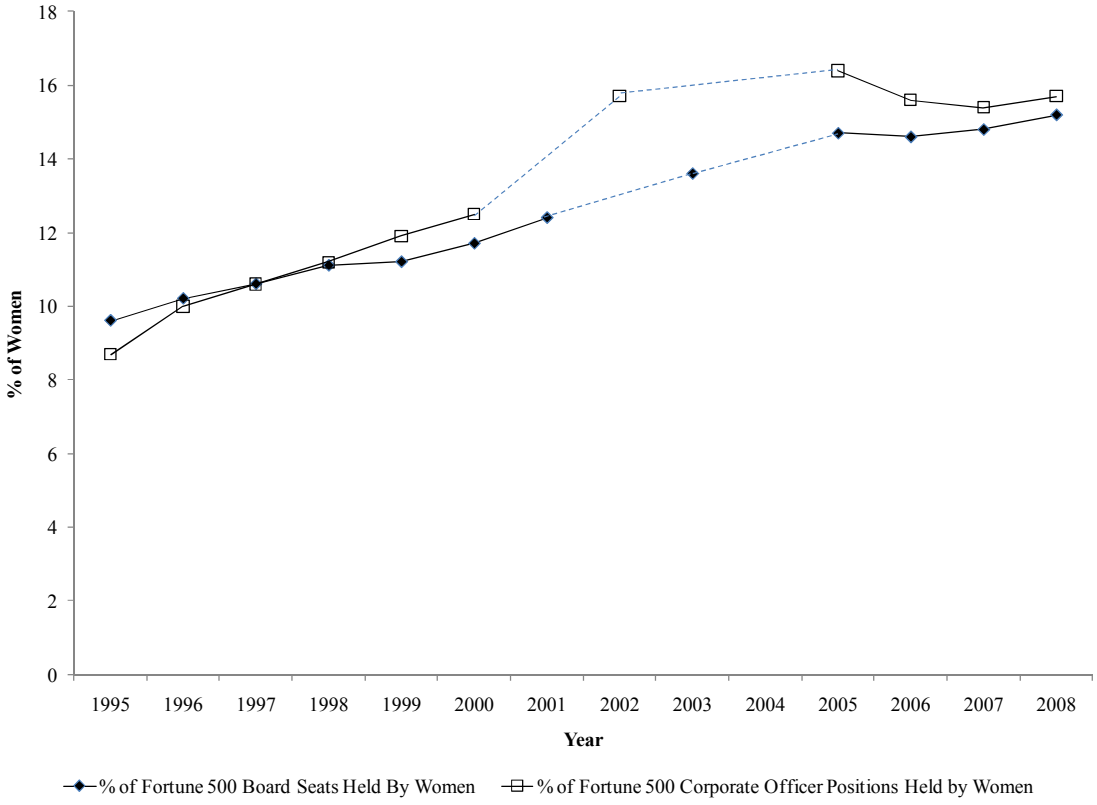
Note: fshare = female share in an occupation.

Figure 6 Opposite Gender Aversion



Note: fshare = female share in an occupation.

Figure 7 Share of Women in Top Fortune 500



Source: Catalysis (2009) "Women in U.S. Management", (http://www.catalyst.org/file/192/qt_women_in_us_management.pdf)