

# **EMPLOYEE DISCRIMINATION AGAINST FEMALE EXECUTIVES**

Naomi Kodama \*  
Hitotsubashi University  
Research Institute of Economy, Trade and Industry

Kazuhiko Odaki  
Nihon University

\* Corresponding author.

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## **ABSTRACT**

The theory of employee discrimination gives a possible explanation for the scarcity of female executive officers. This paper tests the employee discrimination hypothesis by measuring the wage premium received by employees working with female executives against their tastes for discrimination. Using a fixed effects analysis of establishment-level panel data on Japanese employees, we separate the discrimination premiums that would otherwise cause a bias from the establishment-level unobserved productivity and unobserved employee characteristics by gender of executives. Our findings reveal that both male and female employees receive small but significant wage premiums (0.6–0.9 percent) when working for female executives.

**Keywords:** employee discrimination, female executive, compensating wage differential.

**JEL classification:** J31, J33, J71.

## I. INTRODUCTION

There are fewer female employees than male employees in many countries. However, female executives are much fewer than their male counterparts.<sup>1</sup> In OECD countries, on average, while females account for 44.0 percent of employment in 2012 (OECD 2012a), they accounted for only 10.3 percent of board members in 2009 (OECD 2012b). The 2007 Survey of Business Owners in the USA shows that though the ratio of the number of female-owned firms to total firms is 28.8 percent, the sales ratio of female-owned firms is only 4.0 percent. Female executives are particularly scarce in large firms. In the United States, Small Business Administration (2005) reports that 44.4 percent of firms with sales worth less than \$5,000 have female executives while only 20.4 percent of firms with sales worth more than \$200,000 have female executives. In Japan, 50.0 percent of all companies in 2009 had at least one female executive, but only 19.8 percent of firms with more than 1000 employees did (Kodama 2012). Females account for 27.6 percent of the total number of executives, but they account for only 7.3 percent of firms with more than 300 employees (Ministry of Economy, Trade and Industry 2004).

Female executives receive smaller compensation packages than do male executives. Taekjin (2012) shows that female executives received 42 percent less than males in the U.S. Elkinawy and Stater (2011) found that the salaries of female executives are about 5 percent lower than those of male counterparts and that larger firms pay women less relative to men than do smaller firms. Top female executives earn between 8–25 percent less than male executives after controlling for differences in company size, occupational title, and industry (Bell 2005).

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<sup>1</sup> The terms “executive”, “executive officer” and “employer” are used interchangeably in this paper. We mainly use the term “employer” in explaining the model.

Economists often apply discrimination models to gender issues in labor markets. The model of discrimination by employers against employees, in particular, has been used to explain wage differentials between males and females. However, the employer discrimination model proposed by Becker (1957), has difficulty in explaining both the scarcity of female executives and their low compensation. The theory of employee discrimination against female employers, another version of the discrimination model, can explain the scarcity of female employers, particularly in large firms, and the low compensation of female executives. The employee discrimination theory, proposed and developed by Becker (1957) and Arrow (1973), assumes employees have a taste to discriminate against other groups of employees, supervisors or employers. Employees who work with the group discriminated against will receive a wage premium to compensate for their undesirable tastes for discrimination.<sup>2</sup>

Market discrimination and market segregation quite often occur together. Segregation does not necessarily accompany discrimination and will do so only if different groups have different tastes for discrimination and perfect substitution. On the other hand, if most employees have a common taste for discrimination, or if the discriminating and discriminated against members are not perfectly substitutable, segregation will remain partial. In the case of partial segregation, employees who work with the discriminated group will receive a wage premium to compensate for their undesirable tastes for discrimination.

In cases where many workers prefer not to work for female executives, the workers

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<sup>2</sup> Numerous studies of the compensating wage differential for risk or amenity in workplaces can be found in the labor economics literature, for example, Ehrenberg and Schumann (1984); Kniesner and Leeth (1991); McCrate (2005); Usui (2009); and Green and Heywood (2011).

employed by female executives require a wage premium. The workers who work for female executives against their tastes receive the wage premium. If the premium is very large, the workers with this taste for discriminating will not be employed. Unless the premium is very large, the wage premium increases the cost of the firms that have female executives; consequently, there are fewer female executives. The wage premium received by the discriminatory employees will eventually be financed either by the productivity gain contributed by female executives or by discounting their compensation. The employee discrimination model has the theoretical advantage of being able to explain the scarcity of female executives. It is also compatible with competitive market assumptions.

The employee discrimination hypothesis has a clear theoretical appeal, but its empirical application is hindered by identification problems. A straightforward approach to testing this hypothesis is to measure the wage premium of employees who work with the groups discriminated against, i.e., with female executives. For example, if male employees earn higher wages in firms that have more female executives, this could be evidence of a wage premium due to employee discrimination. However, this wage differential might be caused by another mechanism: that employees working for female executives are on average more productive, even after controlling for all available characteristics. In this case, the observed difference in wages may not be evidence of employee discrimination but may merely reflect their unobserved productivity. If these unobserved productivity characteristics of employees differ across establishments and correlate with the explanatory variables of the wage equation, the coefficients of the explanatory variables will be biased, including the coefficients for the existence of female executives. Because these explanatory variables are establishment-level ones, a cross-sectional analysis cannot distinguish between the wage premium for tastes for discrimination, and the productivity

differences caused by unobserved characteristics.

The literature on the empirical analysis of employee discrimination is limited. Chiswick (1973) uses the state-level variation of workers in racial density in the US, and finds that white employee discrimination was important in explaining racial differentials. Ragan and Tremblay (1988), using data from the National Longitudinal Survey of Youth in the United States, observe that young American employees discriminate against coworkers of other races. They also examined employee discrimination against coworkers by sex and employee discrimination against supervisors by sex or race, but find little evidence of such discrimination. Buffum and Whaples (1995) use historical data on workers' attributes from Michigan's furniture industry and show evidence of employee-based discrimination in the form of a compensating wage differential. Using British employer–employee matched data, Frijters et al. (2003) find that white employees receive a wage premium to work with a higher concentration of minority coworkers. However, the existing literature could be criticized on the grounds that these cross-sectional analyses might not have measured the wage premiums but rather the unobserved employee characteristics that correlate with the explanatory variables.

This is the first paper that tests employee discrimination against female executives to distinguish the discrimination premium from establishment-level unobserved productivity and unobserved employee characteristics. We focus on the wage premiums received by employees working in conditions that go against their tastes for discrimination. Our analysis uses Japanese employer–employee matched panel data. One advantage of using Japanese data is that employee discrimination on the basis of sex is conspicuous in Japan where female executives are particularly scarce in large firms and the gender wage differential is large and differs across organizations (Tachibanaki 1996; Abe 2005; Cabinet

Office 2013; Siegel et al. 2013). Among all the developed countries, Japan bears the reputation of having the most gender discrimination.<sup>3</sup>

Another advantage of our study is the use of the panel analysis with fixed effects. For the first time this allows us to control for establishment-level differences in unobserved productivity and unobserved employee characteristics by the gender of the executives. This would otherwise generate a bias in the measurement of the wage premium.

## **II. A BASIC MODEL OF EMPLOYEE DISCRIMINATION**

The theory of employee discrimination assumes that employees have tastes for discrimination. Suppose members of one group prefer to discriminate against members of another group. If members of a small group discriminate against members of another small group and there is no complementarity between the two groups, the two groups will work in different workplaces and will reach perfect segregation. When a large group of employees has a common taste for discrimination against another group, the segregation between the discriminating group and the discriminated group will remain partial.

Compensating wage differentials, established by Rosen (1974), are defined as the additional amount of income that must be offered in order to motivate a given worker to accept a given undesirable job. We apply this theory to explain both the scarcity and the low compensation of female executives.

We begin with the utility function of worker  $i$  at workplace  $k$  as being a function of individual wage ( $w_{ik}$ ), a dummy variable that takes one if the firm has at least one female executive in the workplace ( $FD_k$ ), a set of characteristics of the workplace ( $z_k$ ), and a set of

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<sup>3</sup> The global Gender Gap Report 2013 shows that the gender gap index (GGI) of Japan ranks 105th of all 136 countries (UNEP 2013).

individual characteristics ( $x_i$ ). The individual wage ( $w_{ik}$ ) is a function of a dummy variable of female executives ( $FD_k$ ), a set of characteristics of the workplace ( $z_k$ ), and a set of individual characteristics ( $x_i$ ).

$$u_{ik} = U(w_{ik}, FD_k, z_k, x_i)$$

$$w_{ik} = W(FD_k, z_k, x_i)$$

In a free-mobility equilibrium, individuals are indifferent about working at a workplace with female executives or at another workplace without female executives. This means that at the margin:

$$\frac{d(u_{ik})}{d(FD_k)} = 0$$

and hence:

$$\frac{\partial(w_{ik})}{\partial(FD_k)} = -\frac{\left(\frac{\partial U}{\partial FD_k}\right)}{\left(\frac{\partial U}{\partial w_{ik}}\right)} \geq 0$$

because  $\left(\frac{\partial U}{\partial w_{ik}}\right)$  is always positive, and  $\left(\frac{\partial U}{\partial FD_k}\right)$  is positive if there is discrimination and zero if there is no discrimination.

Thus, employees eventually working with the members of the discriminated group, in this case female executives, are paid a premium as a compensating wage differential. This

premium can be observed as the wage differential between workplaces. For example, if male employees prefer not to work for female executives, the wages of the male employees working in a firm that has a female executive will be higher than the wages of male employees with the same attributes who work in a firm without a female executive.

The wage premium is financed by the decrease in the wages of the members of the discriminated against group who work with the discriminatory employees. In a competitive labor market, the decrease in the wages of discriminated against members is prevalent across the labor market, including workplaces where there are no discriminatory employees.

### III. EMPIRICAL SPECIFICATIONS

The theory of employee discrimination predicts that employees working in environments that go against their tastes for discrimination will receive a compensating wage premium in the labor market. We focus on this compensating wage premium in the context of tastes for discrimination against female executives. We begin with a standard wage equation combined with the compensating premium:

$$\log w_i = \beta X_i + \gamma Z_k + (\delta + \delta_f \text{Sex}_i) FD_k + u_i. \quad (1)$$

Here,  $\log w_i$  is the log hourly wage and  $X_i$  denotes the attributes of employee  $i$ , including age, tenure, education, and sex.  $Z_k$  denotes the attributes of establishment  $k$ , including industry, location, total workforce size, total number of executive officers, and age of the firm. A time-specific dummy variable is also added in order to control for the

changes of prices and other environments.  $FD_k$  is a female executive dummy variable that takes the value of 1 if there is at least one female executive in establishment  $k$ .  $Sex_i$  is a female employee dummy variable that takes 1 when the employee  $i$  is female. The compensating premium for working under female executives is  $\delta$  for male employees and  $(\delta + \delta_f)$  for female employees.

As stated earlier, the problem with this cross-sectional analysis is that the unobserved productivity characteristics of employees, which are not represented by proxies  $X_i$  or  $Z_k$ , would correlate with the explanatory variables including  $FD_k$ . For example, on average, male employees working in firms with female executives might be more productive than their counterparts even after controlling for  $X_i$  and  $Z_k$ . In this case, the coefficient of a female executive dummy variable can be overestimated as male employees discriminating against female executives.

The establishment-level fixed effect could represent the average level of unobserved productivity characteristics of employees at the establishment. If the average levels of such unobserved productivity characteristics differ across establishments and generate a bias, the standard solution is to construct panel data and control for the fixed effects using establishment-specific dummy variables. A panel analysis with establishment-level fixed effects can identify the wage premium that is generated when a female executive is added to the firm. The log wage of employee  $i$  of establishment  $k$  at time  $t$  is then:

$$\log w_{it} = \beta X_{it} + \gamma Z_{kt} + (\delta + \delta_f Sex_i) FD_{kt} + v_k + u_{it} \quad (2)$$

where  $v_k$  represents the average level of the unobserved characteristics of the employees of establishment  $k$ . This panel analysis will distinguish the effects of the establishment-level

explanatory variables,  $FD_{kt}$ , from the establishment-level difference in the unobserved characteristics,  $v_k$ , by controlling for the latter as the establishment-level fixed effects.

Another problem that should be noted is that the establishment-level fixed effects might be different between male and female employees of the same firm. For example, consider a machinery plant and a sewing plant. The machinery plant employs only high-skilled workers, the female employment rate is low, and the gendered wage differential is small. The sewing plant employs a small number of high-skilled workers and a large number of low-skilled workers. Here, assume that many of the high-skilled workers are males and many of the low-skilled workers are females. Even when all of these male and female workers are paid based on their skills, the gender wage differential is larger in the sewing plant where the female employment rate is higher.

To distinguish between the differences in human capital by sex accompanying establishment-level technology, and the wage premiums due to employee discrimination, we introduce establishment-level-by-sex fixed effects as follows:

$$\log w_{it} = \beta X_{it} + \gamma Z_{kt} + (\delta + \delta_f \text{Sex}_i) FD_{kt} + v_{mk} + v_{fk} + u_{it} \quad (3)$$

where  $v_{mk}$  and  $v_{fk}$  are the average levels of the unobserved productivity of male and female employees respectively in establishment  $k$ , and are assumed to have different values.

Furthermore, if we allow all parameters to differ between males and females, wage equations should be estimated separately as follows:

$$\begin{aligned} \log w_{it} &= \beta_m X_{it} + \gamma_m Z_{kt} + \delta_m FD_{kt} + v_{mk} + u_{it} && \text{for male employees, and} \\ \log w_{it} &= \beta_f X_{it} + \gamma_f Z_{kt} + \delta_f FD_{kt} + v_{fk} + u_{it} && \text{for female employees.} \end{aligned} \quad (4)$$

We will estimate the compensating wage premiums using the following four settings. The first cross-sectional regression follows the approach of Ragan and Tremblay (1988) and the second is a standard panel fixed effects analysis. The third and fourth regressions allow different establishment-level-by-sex fixed effects, which are expected to control for the unobserved characteristics more effectively.

## **IV. DATA**

This study combines Japanese employee data on wages and attributes with establishment data that includes information on the executives' sex in the workforce. The employee data are obtained from the Basic Survey on Wage Structure collected by the Ministry of Health, Labour and Welfare. This annual survey includes data on approximately 1.5 million employees from approximately 70,000 establishments. The Basic Survey on Wage Structure includes data on wages, age, tenure, education, and sex of each employee. The hourly wage rate is calculated as the sum of the monthly regular wage, overtime and other allowances, and one twelfth of the annual bonus divided by the actual monthly working hours. We use the data from the Basic Survey on Wage Structure conducted in 1996 and 2001. In this study, our sample is limited to full-time, regular workers.

The sources of the executive data are the Establishment and Enterprise Censuses of 1996 and 2001. Each census included all six million Japanese establishments. The census collected information on each establishment concerning its total workforce size by sex, industry, location, the year of corporate foundation, the total employment of the firm, and

a dummy variable indicating whether the firm had at least one female executive officer.

In the censuses of 1996 and 2001, we cannot distinguish between the board directors and executive officers, because only a few firms like Sony divide the board directors and the executive officers. In almost all Japanese firms, executive officers also serve as board directors.

The executive data are then matched to each employee sample to construct an establishment-level unbalanced panel of the 1996 and 2001 waves. This panel includes 1,620,621 regular, full-time employees from 60,674 establishments. This panel does not identify individual employees between the two waves, but does identify individual establishments. We assume that the unobserved characteristics are stable for each establishment over time. The establishment-level fixed effects analysis is quite suitable to control for such unobserved characteristics. TABLE 1 presents the descriptive statistics of our sample.

The dataset highlights the fact that female executives are scarce in Japan: the percentage of female executives was 10.0 in 1996, and 10.4 in 2001. It is also evident that female executives were especially scarce in large firms—53.7 percent of firms with fewer than 30 employees had at least one female executive, whereas only 22.3 percent of firms with 1,000 or more employees had at least one female executive (TABLE 2). It should also be noted that female executives were not segregated in female-only firms, but scattered across firms—61.5 percent of total female executives were the sole female in the firm and 29.0 percent were one of only two female executives in the firm (TABLE 3).

## V. RESULTS OF TESTING EMPLOYEE DISCRIMINATION

The results of the analysis are shown in TABLE 4. Column 1 of TABLE 4 shows the results of the cross-sectional regression of the pooled 1996 and 2001 samples of employee wages with specification (1) of section III. Male employees earn 2.2 percent lower wages when working for female executives. Female employees also earn wages that are lower by 4.8 percent ( $= -2.21-2.62$ ) when working for female executives.

If we believe that the cross-sectional regression gives an unbiased estimator of the discrimination premiums, these results imply that both male and female employees prefer working for female executives and accept lower wages in doing so. If female executives are thus able to reduce wages because they are preferred by employees, their competitiveness should be greater, particularly in firms with a larger number of employees and higher total wages. This inference is inconsistent with the tendency that there are few female executives in large companies. Thus, we should suspect that the cross-sectional approach might be biased in measuring the employee discrimination premium.

In the next step, we perform a fixed effects panel analysis, which controls for the establishment-level averages of the unobserved productivity and unobserved employee characteristics. If the cross-sectional regression is biased, the panel fixed effects analysis using the empirical specification (2) given in section III is a standard approach to control for the unobserved characteristics. Column 2 of TABLE 4 presents the results. Male employees earn a 1.3 percent positive premium if they work for female executives. Female employees working for female executives earn wages that are lower by 1.4 percent ( $= +1.32-2.76$ ). The changes in the directions and magnitudes of the coefficients indicate that the unobserved productivity characteristics correlated with the explanatory variables and

caused a bias in the cross-sectional regression.

As explained in section III, one problem still persists with regard to this fixed effects analysis. The standard fixed effects settings assume that the unobserved productivity characteristics differ across establishments. The settings do not allow for the difference of the unobserved characteristics across establishments to differ between male and female employees.

We proceed to the establishment-level fixed effects that are different for male and female employees. The results are shown in columns 3 and 4 of TABLE 4. The empirical specification (3), shown in column 3, includes establishment-level-by-sex fixed effects, whereas specification (4), shown in column 4, divides the samples by sex. When working for female executives, male employees earn a 0.6 percent wage premium in specification (3) and specification (4) and female employees earn a 1.2 percent ( $= +0.59 + 0.59$ ) premium in specification (3) and a 0.5 percent premium in specification (4).<sup>4</sup> These premiums appear small, but are large enough to deter large firms from having female executives because these firms pay several billion dollars as wages to thousands of employees.<sup>5</sup> The finding that a positive and significant wage premium is required for both male and female employees when employed by female executives is consistent with the observed tendency that, in the years studied, female executives were scarce in large firms and that the compensation of female executives was lower than that of male counterparts.<sup>6</sup>

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<sup>4</sup> The interaction term of female executive and female employee is positive but not significant in specification (3). That means the difference of male and female employees is not necessarily confirmed.

<sup>5</sup> Furthermore, because this analysis is based on changes that occurred between 1996 and 2001, the wages may not be fully adjusted after a female executive appears. Thus, we cannot deny the probability that the premium is underestimated.

<sup>6</sup> We control for the total number of executive officers because the removal of female executive officers in a firm between 1996 and 2001 may have been caused by the

The biases in the cross-sectional analysis in column 1 and in the standard fixed effects analysis in column 2 are worth discussing. The wage premium to work for female executives measured in column 1 is downward biased when compared with the wage premium in columns 3 and 4. The unobserved employee characteristics are negatively correlated with the probability that the firm has a female executive. In other words, a female executive tends to be found in the firm where the unobserved employee productivity level is originally low.

The fixed effects analysis in column 2 indicates that the wage premium to work for a female executive is upward biased for male employees and downward biased for female employees. Therefore, even after controlling for the average level of unobserved productivity characteristics at the establishment level, the characteristics are still correlated positively for male employees and negatively for female employees, with the probability that the firm has a female executive. This implies that a female executive tends to appear in the firm where the gender differential of the unobserved productivity level is originally large. When the establishment-level fixed effects have different levels for male and female employees as in this study, the analysis should be performed with establishment-level-by-sex fixed effects. This is because the standard fixed effects analysis cannot control for the difference in gender difference across establishments.

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downsizing of the total number of executive officers of the firm. The coefficient of the total number of executive officers, which is equal to the board size, is positive in specification (3) and is positive for females in specification (4). A pioneering work of Miyajima (2007) shows that the corporate governance reform in large Japanese firms is related to the human resource management system. Our result that the decrease in board size correlates with the decrease in wage levels would be a new finding supporting the research on corporate governance including that of Miyajima (2007).

## VI. CONCLUSION

This paper examines the discrimination against female executives by employees through measuring compensating wage premiums. This is the first attempt to distinguish the discrimination premium from unobserved employee characteristics that would cause a bias. Because not only the unobserved productivity characteristics, but also the gender differential of the characteristics differs across establishments, both cross-sectional analysis and standard fixed effects analysis will be biased.

Using a panel analysis with establishment-level-by-sex fixed effects, we find that both male and female employees receive small but significant wage premiums (0.6–0.9 percent) when working for female executives. This finding is consistent with the employee discrimination model and the observed facts that female executives are scarce, especially in large firms, and their compensations are low. This marginal wage rate is so low that it does not entail a penalty for the discriminatory employees or cause a decrease in their survival rates.

The employee discrimination theory suggests that if female executives are discriminated against, the wage premium received by the discriminatory employees will eventually be financed either by the productivity gain contributed by the female executives or by discounting their compensation. In large firms, the sum of the estimated wage premium is too large to be financed by discounting the remunerations of the female executives. Therefore, only exceptionally talented females who are able to increase corporate productivity to a level that enables the financing of the premium can be nominated as executives in large firms.

If a large number of male and female employees are sexually discriminatory and prefer

gendered roles in their workplaces, there will be a distortion in the allocation of human resources. When competing for a position as an executive in a large firm, a male candidate will have an advantage over a female candidate. Conversely, a female applicant may be more likely to be granted an assistant's job than a male applicant.

If employee discrimination is prevalent, it might be necessary to take affirmative action.<sup>7</sup> However, it should be noted that even in such cases, affirmative action would reduce the satisfaction of employees as long as they have a taste for discrimination. The nature of employee discrimination outlined in this study should attract the attention of researchers and encourage policy discussions on this issue.

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<sup>7</sup> In 2005, Norway required that the board of publically held companies have at least 40 percent women, and France and Spain recently committed to the same quota. It is also proposed by a Directive of the European Council on improving the gender balance among non-executive directors of companies listed on stock exchanges.

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**TABLE 1**  
Descriptive Statistics

Variable	Mean	Std. Dev.
(Employee)		
Sex (female)	26.7%	
Log of hourly wage	7.65	0.52
Log of monthly working hours	5.18	0.14
Tenure	12.6	10.5
Age	39.4	12.3
Age <= 29	28.1%	
30-39	22.9%	
40-49	24.2%	
50-59	21.1%	
60<=	3.7%	
Junior high school degree	12.2%	
High school degree	53.9%	
Associate's degree	11.2%	
Bachelor's degree	22.7%	
(Establishment)		
Female employment rate	0.30	0.23
Mining	0.8%	
Construction	6.6%	
Manufacturing	43.2%	
Electricity, Gas, Heat Supply and Water	3.0%	
Transport and Communications	9.2%	
Wholesale, Retail and Restaurant	8.5%	
Finance and Insurance	6.4%	
Real estate	1.0%	
Other Services	21.3%	
(Firm)		
Age of firm	40.36	20.39
Regular Employment size >5000	15.9%	
1000-4999	15.8%	
500-999	8.6%	
300-499	8.0%	
100-299	17.1%	
30-99	21.6%	
10-29	13.0%	
Number of executive officers (2001)	13.4	23.7
Number of executive officers (1996)	16.6	30.7
Number of female executive officers (2001)	1.4	9.9
Number of female executive officers (1996)	1.7	9.8
Percentage of female executive officers (2001)	10.4	
Percentage of female executive officers (1996)	10.0	

*Notes* : The sample size is 1,620,621.

**TABLE 2**

Ratio of Firms with at least one Female Executive by Employment Size

	Ratio
1000 or more employees	22.3%
500-999 employees	16.5%
300-499 employees	18.5%
100-299 employees	28.4%
30-99 employees	42.7%
10-29 employees	53.7%
Total	37.8%

**TABLE 3**

Percentage by Number of Female Executives in a Firm

	Percent	At Least One Female Executive
No female executives	62.2%	
1 female executive	25.1%	66.5%
2 female executives	9.0%	23.9%
3 female executives	2.1%	5.5%
4 or more female executives	1.6%	4.2%
Total	100.0%	100.0%

**TABLE 4**  
Wage Premium Due to Employee Discrimination by Sex

Specification	(1)	(2)	(3)	(4)	
	<i>OLS</i>	<i>FE(id)</i>	<i>FE(id×sex)</i>	<i>FE(id, M)</i>	<i>FE(id, F)</i>
Female employees (/ 100)	-21.156 (0.109)	-21.981 (0.089)			
Female executives (/ 100)	-2.214 (0.629)	1.320 (0.131)	0.586 (0.140)	0.589 (0.139)	
Female executives × Female employees (/ 100)	-2.616 (0.114)	-2.757 (0.095)	0.592 (0.313)		0.874 (0.267)
Female employment rate (/ 100)	-12.666 (0.159)	2.584 (0.724)	-1.897 (0.841)	-1.463 (0.833)	
Female employment rate × Female employees (/ 100)	-13.075 (0.236)	-13.727 (0.207)	2.709 (1.520)		-0.623 (1.217)
Tenure (/ 100)	3.301 (0.009)	3.192 (0.007)	3.215 (0.007)	3.036 (0.008)	3.918 (0.013)
Tenure × Tenure (/ 10000)	-3.196 (0.024)	-3.717 (0.018)	-3.829 (0.018)	-3.765 (0.020)	-5.672 (0.041)
Age 30-39	0.135 (0.001)	0.146 (0.001)	0.154 (0.001)	0.201 (0.001)	0.051 (0.001)
40-49	0.201 (0.001)	0.246 (0.001)	0.260 (0.001)	0.337 (0.001)	0.065 (0.001)
50-59	0.195 (0.001)	0.256 (0.001)	0.275 (0.001)	0.372 (0.001)	0.026 (0.001)
60<=	-0.023 (0.001)	0.071 (0.001)	0.087 (0.001)	0.154 (0.001)	-0.092 (0.002)
Bachelor's degree	0.255 (0.001)	0.152 (0.001)	0.153 (0.001)	0.149 (0.001)	0.136 (0.001)
Associate's degree	0.130 (0.001)	0.065 (0.001)	0.064 (0.001)	0.050 (0.001)	0.054 (0.001)
Junior high school degree	-0.163 (0.001)	-0.115 (0.001)	-0.115 (0.001)	-0.116 (0.001)	-0.097 (0.001)
Age of firm (/ 1000)	-0.241 (0.014)				
Year (2001=1,1996=0)	-0.001 (0.001)	-0.022 (0.001)	-0.023 (0.001)	-0.023 (0.001)	-0.016 (0.001)
Constant	7.079 (0.001)	7.248 (0.002)	7.171 (0.002)	7.231 (0.002)	7.001 (0.006)
Number of obs.	1,620,621	1,620,621	1,620,621	1,188,633	431,988
Number of groups		60,674	116,019	59,817	56,202
F	103289.7	199379.0	151483.2	163456.5	24505.0
Prob > F	0.000	0.000	0.000	0.000	0.000
R-squared	0.671	0.657	0.585	0.635	0.439

*Notes* : Standard errors are given in parentheses. Column 1 shows the cross-sectional regression result that controls for the industry and region of the establishment and total employment of the firm (not reported); column 2 presents the establishment-level fixed effects regression; column 3 controls for the establishment-level-by-sex fixed effects; and column 4 divides the samples by sex and applies the establishment-level fixed effects regression. The reference group is high school graduates and those younger than 30 years old.