

THE JOURNEY OF WOMEN UP THE CORPORATE LADDER: A STUDY OF THE REPRESENTATION OF WOMEN IN TOP CORPORATE POSITIONS IN NEW YORK STATE

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ABSTRACT

In order for women to be equally represented on corporate boards, they must first be represented equally among officers and other managerial occupations within companies. The low percentage of women on the board of directors is a reflection of the low number of women in the highest positions within New York State corporations. This paper explores the factors that influence whether or not there is female representation in the top levels of New York State publicly traded corporations as well as the level of representation of women in these corporations. It appears that in 1999, women are still under-represented in the highest positions in business in New York State. Only 11.6 percent of corporate officers and a mere 6.3 percent of directors in this sample are female. However, the analysis suggests that women may be promoted at higher rates than men in some male-dominated industries such as high-tech industries, while it appears that women are not represented at higher rates in top corporate offices among corporations in female-dominated industries, including retail and services. Region and industry do not seem to play a large role in the representation of women. Finally, the research suggests that there is a positive relationship between the total number of officers within a corporation and the percentage of female officers. The same relationship holds with the total number of directors and the percentage of female directors in New York State based corporations. This would indicate that, overall, the representation of women at lower positions within a firm influences their representation at higher levels.

INTRODUCTION

Over the last forty years, there has been a growing awareness of the difficulties that women face in the workplace as they have been increasing their share of labor market participants. Some of the earliest research to explore the inequalities that women face in the workplace was focused on pay differentials within the same occupation. Much of this research suggested that women were being paid

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less than men with the same job title. In an attempt to resolve this discrepancy, the Equal Pay Act was passed in 1963¹. This law required that men and women be paid equally for the same job. However, as pay disparities persisted between genders, research began to focus on occupational segregation or crowding of women into “female” occupations as an explanation for these differences. Results that suggested women who were crowded into these occupations were paid less than men in similar types of jobs led public policy to move toward a concept of comparable worth in the late 1970’s and 1980’s in order to equalize these pay disparities. This policy goes beyond equal pay for equal work and requires women to be paid the same as men for work of equal worth to the employer.

This new view of how women should be compensated for their workforce participation addresses one of the major drawbacks of the Equal Pay Act. The Equal Pay Act does not deal with the effects of crowding of women into “female” occupations since it only explores wages within a particular job title. Through comparable worth, women are paid the same as men who perform work of equal worth; therefore, the value of work, not the occupation itself, is the major factor in determining the wage. Although comparable worth has yet to be implemented on a national level, research suggests that it has been successful on both state and local levels in equalizing wages earned by men and women.² Nonetheless, comparable worth, although a more effective policy than equal pay, does not address the problem of segregation within occupations. Comparable worth falls short of helping women advance past the “glass ceiling”, an invisible barrier that prevents women from reaching the top of the corporate ladder. An examination of the representation of women in the highest corporate positions is necessary to determine the real effects of this glass ceiling. There has been some recent research in this area. Most of this research, however, examines the overall under-representation of women in top corporate offices among corporations in general. One area in which there has not been extensive research is the characteristics of the companies that have women in top corporate positions to determine what types of corporations are more likely to hire or promote women to top positions. Often the justification for the unequal promotion of women is that women do not have the experience, education, and qualifications that men have. If this were the case, we would expect that there would be no difference in the representation of women in top corporate positions across different types of corporations because if women truly did not have the qualifications necessary for top positions they would not hold these positions in any corporations.

This paper will examine the characteristics of corporations to determine whether there are differences between corporations with female representation in top positions and those without. This will be done by examining characteristics of all of the publicly traded corporations that were based in New York State in 1999 (1068 corporations). We will examine various factors that may influence the rates of representation of women among corporate officers and directors including industry, region, and firm size. Logistic regressions will be employed to analyze the data and determine the degree of influence each corporate characteristic has on the representation of women in top positions.

Overall, women appear to be underrepresented both on the boards of directors and among officers in New York State Corporations in that they represent a far lower percentage than men among both directors and officers. This research also suggests that women are represented among officers at different rates based on the region in which the company is headquartered. While the percentage of female employees is lower at all levels in high tech companies, this analysis suggests that the relationship between high tech companies and the representation of women among officers and directors is not statistically significant. Additionally, in female dominated industries, there again appears to be no significant relationship between industry and the representation of women. Finally, it appears that the number of female officers has a statistically significant influence on the representation of women on the board of directors and the number of female directors has a statistically significant influence on the representation of women among officers within New York State corporations.

LITERATURE REVIEW

Most studies on employment differentials between men and women focus on differences in pay by gender. A relatively recent group of articles attempts to examine differences in promotional rates and discrimination within individual occupations. Most research on this topic is limited to studies of a single industry or a handful of corporations. Very few studies examine promotional rates across different industries and occupations.

One of the earliest studies on promotional rates within corporations is entitled "Men and Women in Fiduciary Institutions: A Study of Sex Differences in Career Development" (Robert Cabral, et al, 1981). This research examined the impact of employment decisions on the pattern of occupational distribution and salaries. The research concludes that there are gender differences in both wages and job assignments, which cannot be explained by differing characteristics of male and female workers. As a result, the authors conclude that the differential in both salary and job assignments can probably be attributed to gender discrimination.

Another study that explores gender differences in evaluations for promotional opportunities is entitled "Subtle Gender Bias in the Assessment of Managerial Potential" (Ted H. Shore, 1992). This study examines a group of 375 men and 61 women between 1980 and 1985. Assessments of all individuals in the sample were conducted examining intellectual ability, performance and interpersonal skills, and overall management potential. This research suggests that men and women are promoted at almost the same rate despite women receiving higher ratings on average on these evaluations. Another disparity is that evaluators seem to emphasize all variables equally when evaluating men for promotion, whereas in the evaluation of women the categories on which they generally score higher, performance skills, tend to receive less emphasis than other variables. Overall, this study finds that there is a gender bias in the evaluation of women with regard to managerial potential and promotional opportunities.

One study of promotional rates that examines data on a variety of corporations and industries was conducted by Craig A. Olsen and Brian E. Becker (1983). This study examines promotional rates

within occupations based on data from the Quality Employment Panel from 1973-1977. Data included individual occupations and wages for the four-year period. They tested the hypothesis that women are discriminated against in the promotion process in two ways, and that this discrimination adversely affects their wages. The first explanation is that women are not paid at the same rate as men in spite of being equally represented across different occupations. The second explanation is that women are not promoted at the same rate as men and, as a result, their wages are lower. While the research found little evidence to support the first explanation, the authors found that women were not evaluated for promotion based on the same standards as men and, therefore, experienced lower rates of promotion. The data also suggest that a portion of the gender wage differential can be attributed to lower promotional rates that women experience. Overall, it appears that women's promotional rates and resulting wages are adversely influenced by discrimination that women experience in their evaluation for promotion.

In a more recent study, Rudolph Winter-Ember and Joseph Zweimillec (1997) use Austrian micro census data to determine whether gender influences the likelihood of promotion. This study overcomes many of the shortcomings of earlier studies. It looks at statistics across different occupations and has a larger sample size than most other studies. The research concludes that unequal career advancement is a major factor contributing to gender inequities in the labor market. This study further demonstrates that differences in characteristics can explain only a small portion of the inequity in gender distribution across job titles. In conformity with the earlier studies, the authors argue that the difference in the representation of women in different job titles is due to discrimination.

Within the last few years there has been further research on this topic, Seymour Spilerman and Trond Peterson (1999) analyzed data from a large insurance company to determine differences in promotional rates by gender. They divided cases of promotion into two groups, those resulting from a vacancy and those based solely on merit. The data they had access to permitted them to control for several potential influential variables such as ethnicity, education, age, and seniority. Based on regression analysis, they determine that there is a difference in the attainment of promotions based on gender even after controlling for these factors, namely that women are promoted at lower rates than men are.

Another article, entitled "Managerial Momentum: A Simultaneous Model of the Career Progress of Male and Female Managers", looks exclusively at managerial promotion rather than promotion across different levels within a company as the previous studies have done (Kathleen Cannings and Claude Montmarquette, 1991). This study examines the factors that influence promotional rates of middle managers in a large corporation in Canada. The research determines that for women there is "a significant simultaneous interaction of performance, ambition and rewards". However, despite this interaction, women do not experience higher promotional rates because once a woman receives an offer of promotion she is less likely to demand subsequent promotions. This study suggests that, despite having lower performance scores than men, men are offered more promotions per year of service. Men overcome differences in performance and formal bidding through the use of informal networks

through which they have an opportunity to discuss promotional opportunities with their superiors and, therefore, are offered more promotions than women.

All of the aforementioned studies have discussed the existence of discrimination in the evaluation and recommendation of employees for promotion. A study of promotion within financial institutions, which was conducted by David R. Jones and Gerald H. Makepeace (1996), contradicts these previous studies. It concludes that discrimination does not play a major role in inequities in the promotion process. This study examined a sample of 4,379 full-time employees in a large financial institution in Great Britain. The authors find that women are evaluated by more difficult standards than their male counterparts when they are being considered for a promotion. This difference does not, however, appear to explain the majority of the difference in promotional rates of men and women. The authors find that a large portion of the difference in promotional rates of men and women is based on differing characteristics of men and women with respect to labor market participation. This study finds that there would be a two-percentage point differential in the representation of women among managers if they had been evaluated based on the same standards as men. If women had the same workplace experience as men, however, their representation among managers would rise by 17 percentage points. These results suggest that discrimination does not play a major role in the under-representation of women among managers as is suggested by most other studies on promotional rates and the representation of women in the top positions in business.

Some of the previous studies have examined promotion of women at all levels within corporations while others have exclusively looked at managers. A 1990 study of the legal profession conducted by Stephen Spurr found that women are less likely to be promoted to partner in a law firm than equally qualified men. This research examined two cohorts of lawyers: one that entered law firms between 1969 and 1973 and a second that entered law firms in 1980. The study followed both cohorts through 1987. The data indicates that women were half as likely to be promoted to partner as men were during this period. The conclusion of this research is that there is not a significant difference in attributes or productivity of male and female lawyers that could explain this difference. The data did reveal that a higher standard of promotion applies to women than men. Estimates are that 56-72 percent more women would have been promoted if they were rated by the same criteria as men. As was the case in many of the previously discussed studies, the results suggest that discrimination is a probable explanation for the difference by gender in the rate of promotion to partner among law firms in this sample.

While most previous studies have used regression analysis to analyze promotional rates within occupations, some studies rely exclusively on descriptive statistics to explore the representation of women among managers, officers, and directors. In 1972, only 20 percent of managers in the United States were women (Blau et al., 1998); in 1995, that number had grown to 43 percent of all managerial positions (Federal Glass Ceiling Commission, 1995). These figures show that there has been a significant improvement in the representation of women in management; however, women are still significantly under-represented in the top management positions. In 1995, women comprised only 3-5

percent of senior management in the Fortune 1000 industrial and Fortune 500 service corporations (Blau et al., 1998). These findings would suggest that women are not being promoted at the same rates to positions at the top of the corporate ladder as they are at lower management positions.

Another study conducted by Catalyst, a not-for-profit research and advisory corporation examines the representation of women in the most influential positions in business (Catalyst: Corporate Officers, 1998). This study looks at the representation of women among officers of the Fortune 500 corporations. Overall, the data reveal that there were female officers in 75 percent of the Fortune 500 companies; however, they represented only 11.2 percent of all corporate officers in these companies in 1998. Additionally, only .8 percent or 4 out of 500 chief executive officers in these companies were female. The diminishing share of women as we proceed up the corporate ladder suggests unequal rates of promotion.

A second important study conducted by Catalyst examined the representation of women on boards of directors (Catalyst: Directors, 1998). The preceding studies of female representation at differing levels of management do not examine the presence of women on corporate boards. Becoming a director of a corporation is not necessarily a position that would be in the line of promotional opportunities within a corporation since it is an elected position; nonetheless, it provides important insight into the role of women at the most influential levels within the corporate world. This study examined the boards of directors of the Fortune 500 corporations. The data revealed that 86 percent or 429 out of the top 500 revenue-producing corporations in the United States had at least one female director. Although the vast majority of the Fortune 500 boards have at least one female director and 38 percent have more than one female director, a mere 11.1 percent of the total number of board seats are occupied by women, translating into only 671 female board members out of 6,064 total seats.

According to Catalyst, over the past five years there has been significant progress in the representation of women on the boards of directors of the Fortune 500 companies. There has been a 17 percentage points increase in the share of Fortune 500 companies with at least one woman on the board from 69 percent in 1993 to 86 percent in 1998. Catalyst's research also shows that among the Fortune 500 companies, those corporations with the highest revenues have a much higher proportion of female directors than companies with lower revenues (Catalyst: Directors, 1998).

Some of the limitations of the Catalyst studies are that they only examine Fortune 500 corporations. These are the largest corporations in the country, and, as a result, it is difficult to generalize the results to all corporations since the size of the corporation may be a major influence on the representation of women. This study includes revenues of the corporations in the analysis; however, they imply that the relationship between the presence of female directors and officers and increasing revenues is a causal one. I doubt that this is the case because the revenues of a corporation do not change overnight because of a change in the composition of the board, but rather in most corporations revenues increase gradually as result of years of growth and corporate decisions. It would take time for the influence of one person to have any large affect on the revenues of the corporation and without variables measuring how long a woman has been represented in the corporation and the amount of the

corporation's revenues before that woman was added to the board or officers, I believe the implication of the causal relationship is incorrect. Instead, I believe revenues work better as a measure of the size of the firm. Catalyst also did not examine the relationship between female representation among officers and that of women on the board of directors.

EXPLANATION OF PRESENT RESEARCH

All of the aforementioned studies provide important insights into the differences in promotional rates by gender and the representation of women in top corporate offices. There are, however, some limitations. One limitation of these studies is that they do not examine the influence of industry on promotional rates and representation of women. There may be differences in the representation of women in male-dominated industries since there are fewer women at all levels within those corporations and as a result, there are fewer female candidates for promotion. In addition, women may be more likely to be discriminated against in those industries where they are represented in very low numbers. Further research is needed to examine the representation of women across different industries.

Since most of these studies rely on data from a small sample of corporations or industries, they may not reflect promotional rates and representation of women across different sectors. Furthermore, it may be difficult to conduct similar studies across a broader range of companies and industries, since the studies discussed here present data on industries and corporations with very clearly defined job titles, classes, and promotion levels. In these corporations, it may be more difficult to discriminate against women since the path of promotion within the corporation is transparent. It may be more difficult to detect disproportionate representation of women caused by unequal promotional rates by gender in industries and corporations with less clearly defined promotional levels since the differences between men and women may not be as obvious. Another difficulty with studies that exclusively examine managers is that none of them makes a distinction between managers and officers. As a result, we cannot compare the representation of women in the highest and most influential positions within corporations relative to those in lower levels of management. Further research is needed in order to determine the representation of women in all types of corporations and to identify those levels within corporations at which disparities in promotional rates are greatest.

Some of these studies explore the representation of women among corporate officers and directors; however, to date there has not been a comprehensive study of the representation of women among officers and directors over a broad range of companies, which are heterogeneous in a range of different characteristics. For example, the Catalyst study only examines Fortune 500 companies, which share many of the same characteristics with regard to size, revenues, etc. Additional research is needed to explore the representation of women in top corporate officers among a varied sample of corporations. Also, further research is needed to examine whether those corporations that do have women in top corporate positions have different characteristics than those corporations without women in top positions. This would provide insight into the types of corporations that may be more likely to promote women to top

positions or elect women as directors. This paper will examine the representation of women in top corporate offices over a broad range of heterogeneous companies. Additionally, it will explore differences in characteristics such as industry, region, firm size, and revenues among corporations with women in top positions versus those with only men in these positions.

DISCUSSION OF DATA

This study will use data on female officers and directors in New York State corporations, as well as data about these companies in order to determine the representation of women in top corporate offices and the differing characteristics of companies with women in these positions as opposed to those without. The research uses data on the population of New York State public corporations in 1999.

The data for this research was gleaned from both Moody's Company Data and Standard and Poors' Compustat databases. Both sources include information about all of the publicly traded corporations in the United States.

Moody's database was the source of the list of names of the directors and officers of these corporations as of August 31, 1999. The list of female directors and officers was compiled by reviewing the names of directors and officers and determining the number of women that were represented in each company. In the case of ambiguity, the gender was confirmed either through the company's SEC filings or through direct contact with the company. The list of corporate officers from Moody's included all officers who are chosen by each corporation to be listed in any of the company's SEC filings, in general this includes only management at or above the level of senior and executive vice presidents of the corporation. Most corporations have between 4 and 6 officers with 75 percent of corporations having 7 or fewer officers. The range, however, goes as high as 44 with one corporation having this number of officers.

Standard and Poors' Compustat database was the source of data on the SIC Codes, region and revenues of each corporation. The SIC codes are used to classify the companies into various industries. Dummy variables were included for all of the major industry classifications as well as high-tech companies and companies in female dominated industries. High-tech companies were determined by including companies that were described as machinery, electronic, computer and engineering by their SIC codes. High tech companies comprise 17.3 percent of the corporations in this sample. Female dominated industries included service and retail industries, which were identified by the Bureau of Labor Statistics as having more than 50 percent female employees; 15.9 percent of corporations in this sample are in female dominated industries. The major industry classification called "Finance, Insurance and Real Estate" (FIRE) contained 48.1 percent of all companies in the sample; therefore it was broken down further into subcategories: Depository Institutions, Real Estate, Insurance Agents, Brokers and Holding and Other Investment Offices. Categories were also included for Business Services, Electrical and Other Equipment and Chemical and Allied Products.

The corporations were divided into five regions, Long Island, Manhattan, New York City Boroughs (other than Manhattan), Westchester and Upstate New York. Upstate New York was also divided into 4 sub-regions: Syracuse, Ithaca, Buffalo, and Albany. The area code of the company was used to place each company into a region. Dummy variables were used to indicate the region in which the company belonged. Dummy variables were also used to classify the revenues of each company. Because of the range in revenues among corporations, (a difference of over \$300 million between the smallest and largest) the data were divided into three categories based on revenues. Natural breaks in the range of revenues were used to group the corporations into three groups with approximately the same number of corporations in each. The categories are: high revenue, which includes any company with over \$42.5 million of revenues; medium revenue, which includes any company with between \$5.75 and \$42.5 million in revenues; and low revenue, which included companies with revenues of \$5.75 million or less.

**Descriptive Analysis
General Data on New York State**

	Overall percentage of female officers/directors	Percentage of corporations with at least one female officer/director	Percentage of corporations with multiple female officers/directors
Officer	11.6	42.0	14.4
Director	6.3	33.3	10.4

The data in table 1 demonstrates that, by and large, New York State based public corporations have very few women on the board of directors. Only 33.3 percent of these 1068 corporations have at least one female director. While the percentage of corporations with at least one female board member illustrates the problem, it understates the absence of women on corporate boards. In 1999, only 10.4 percent of these corporations had multiple female directors. Despite an overall decline in occupational segregation, in 1999 a mere 6.3 percent of corporate board members are female.

In addition, the percentage of female officers is low within these corporations. Only 42.0 percent of companies have at least one female officer and women represent only 11.6 percent of all officers. Only 14.4 percent of corporations have multiple female officers. The small share of female officers makes it more difficult for a corporation to have female candidates with the qualifications necessary to be elected to the board of directors.

As the data in table 2 demonstrates, Long Island has considerably lower representation of women on boards of directors than any other region with only 4.8 percent of all directors being women and 27.8 percent of corporations having at least one woman on the board. In contrast, in the New York City Boroughs (excluding Manhattan), there is a much higher representation of women on boards of directors

Regional Differences

	Overall percentage of female officers	Overall percentage of female directors	Percentage of corporations with at least one female officer	Percentage of corporations with at least one female director	Percentage of corporations with multiple female officers	Percentage of corporations with multiple female directors
Manhattan	13.1	6.3	49.0	33.5	17.3	11.0
Other Boroughs	12.9	8.8	40.5	37.8	11.8	13.5
Westchester	10.5	7.1	40.5	39.7	13.8	8.6
Upstate	10.3	6.7	32.9	39.2	11.9	12.6
Long Island	8.1	4.8	29.8	27.8	9.1	4.0

with 8.8 percent of directors being female. In Westchester, 39.7 percent of all corporations have at least one female director. Moreover, on Long Island, there are no companies with more than two women on the board and only 4.0 percent of Long Island based corporations have multiple female directors; whereas, in New York City boroughs (excluding Manhattan) 13.5 percent of corporations have multiple female board members. Long Island is also the region with the lowest rate of female representation among corporate officers. Women represent only 8.1 percent of all officers in Long Island based companies.

	Overall percentage of female officers	Overall percentage of female directors	Percentage of corporations with at least one female officer	Percentage of corporations with at least one female director
Syracuse	7.6	6.5	38.5	26.9
Buffalo	9.1	6.2	53.1	25.0
Albany	9.9	7.2	45.0	55.0
Ithaca	18.1	7.2	30.8	32.3

In the different regions of Upstate New York there also appears to be a range in the representation of women as seen in table 3. Only one-quarter of Buffalo based firms have at least one female director whereas more than half of the companies in Albany have some female representation on the board of directors (55.0 percent). Among officers, 30.8 percent of Ithaca corporations have at least one woman whereas in Buffalo 53.1 percent of corporations have at least one female officer. Looking at the total percentages of officers and directors who are female, Ithaca again stands out with 18.1 percent of officers being female which is almost double the average of the other Upstate regions. Among corporate directors, there is not a great difference among the different regions with a range of 6.2 percent to 7.2 percent of all directors being female.

On the whole, there appears to be a range in the representation of women on the board of directors and among corporate officers based on the region in which the company is located. The relationship between region and representation of women among both directors and officers will be tested with regression analysis to determine the presence of a statistically significant relationship between region and the representation of women in top corporate positions.

Differences by Industry

	Overall Percentage of female officers	Overall Percentage of female directors
Mining	0.0	0.0
Construction	7.1	0.0
Wholesale Trade	7.2	5.3
Manufacturing	7.9	6.4
Transportation	10.4	8.6
Business Services	11.6	5.2
FIRE	14.5	5.9
Retail Trade	16.9	10.0
Electrical Equipment	8.7	7.7
Chemical and Allied Products	10.9	11.5

There is a range in the representation of women in top corporate positions based on industry. As table 4 shows, values range from zero to 16.9 percent women among officers and zero to 10.0 percent among directors. It appears that those industries that have historically been male dominated (such as mining and construction) have the lowest rates of female representation; whereas traditionally female dominated industries such as retail, finance, insurance and real estate, and services have a higher percentage of women in top positions.

	Overall percentage of female officers/directors	Overall percentage of female officers/directors
Real Estate	11.7	4.3
Broker	7.3	9.1
Insurance Agent	11.1	6.8
Holding and Other Investment Services	18.1	4.7
Depository Institution	13.3	6.8

There is also a difference in the representation of women among officers and directors in subcategories of the finance, insurance, and real estate industry. Table 5 shows there is a range from

4.3 percent and 4.7 percent female directors in real estate and holding and other investment services companies respectively to over 9.0 percent female directors in brokerage companies, almost a 200 percent difference. Interestingly, brokerage companies have the highest percentage of female directors, but have the lowest percentage of female officers with only 7.3 percent. On the other hand, holding and other investment services have the highest percentage of female officers (18.1 percent), but one of the lowest percentages of female directors (4.7 percent).

MODELS AND RESULTS

More than half of the corporations in New York State do not have a single woman on the board of directors or among officers. As a result, I will be doing a two-pronged analysis of the data. First, I will use logistic regressions with a dependent variable, which is a dummy variable coded 1 if the corporation has at least one woman on the board and zero if there are no women on the board. The same analysis will be repeated using a dummy variable for whether or not a company has at least one woman among directors. Next, I will employ ordinary least squares regressions on the sample of corporations with at least one woman on the board and will use as a dependent variable the natural log of the percentage of female directors. The same analysis will be duplicated with the sample of corporations with at least one female officer using as the dependent variable the natural log of the percentage of female officers. By using this two pronged approach I will be able to isolate the differences in corporate characteristics that lead to female representation (using logistic regressions) as well as the marginal effects of each additional woman that is included on the board or among corporate officers (using ordinary least squares regressions). The analysis will explore the relationships between the dependant variables and industry, region, number of female officers, number of female directors and size of the company, as measured by both the total number of officers or directors, and revenues. In addition, to better clarify the influence of women on the board and among officers I have excluded mutual fund companies from this analysis. There are 159 mutual funds in the population of publicly traded companies, many are sponsored by the same parent company and often have the same directors and officers or a subset of the directors and officers of the parent company. The inclusion of these companies could bias the results because their inclusion would amount to counting the same company multiple times. It is more accurate to only include the parent companies in the analysis and exclude the individual mutual funds.

For all of the models, we are interested in both the level of significance and direction of the relationships, whether positive or negative. The following equations are used in the analysis of the variables previously discussed and the relationships that exist between them.

MODEL 1 – LOGISTIC REGRESSION DIRECTORS

$$\begin{aligned} \text{Logit(DD)} = & \beta_0 + \beta_1(\text{NFO}) + \beta_2(\text{TND}) + \beta_3(\text{MR}) + \beta_4(\text{LR}) + \beta_5(\text{W}) + \beta_6(\text{BO}) + \beta_7(\text{LI}) + \beta_8(\text{A}) \\ & + \beta_9(\text{I}) + \beta_{10}(\text{BU}) + \beta_{11}(\text{S}) + \beta_{12}(\text{HI}) + \beta_{13}(\text{BS}) + \beta_{14}(\text{BR}) + \beta_{15}(\text{TN}) + \beta_{16}(\text{CA}) + \beta_{17}(\text{CN}) + \beta_{18}(\text{IA}) \\ & + \beta_{19}(\text{MA}) + \beta_{20}(\text{EE}) + \beta_{21}(\text{MI}) + \beta_{22}(\text{WT}) + \beta_{23}(\text{DI}) + \beta_{24}(\text{RE}) + \beta_{25}(\text{HT}) + \beta_{26}(\text{FI}) \end{aligned}$$

Where:

DD=Dummy Variable whether there is at least one female director	BS=Business Services
NFO=Number of Female Officers	BR=Broker
TND=Total Number of Directors	TN=Transportation
MR=Medium Revenue	CA=Chemical and Allied Products
LR=Low Revenue	CN=Construction
W=Westchester	IA=Insurance Agent
BO=Boroughs	MA=Manufacturing
LI=Long Island	EE=Electrical Equipment
A=Albany	MI=Mining
I=Ithaca	WT=Wholesale Trade
BU=Buffalo	DI=Depository Institutions
S=Syracuse	RE=Real Estate
HI=Holding and Other Investment Services	HT=High Tech
	FI=Female Industries

Base Variables (For Dummy Variables)

Revenue: High Revenue
 Region: Manhattan
 Industry: Retail Trade

The results from this analysis reveal that whether or not a corporation has a female director is indeed influenced by the size of the board of directors, the size of the revenues of the company, as well as the number of female officers within the company. In this model, industry is not a significant predictor of whether a company will have a female director. The most important predictors are the total number of directors and the number of female officers. The addition of one director, all else constant, would translate increase by 1.3 times the odds³ that there will be at least one woman on the board of directors. For every additional female officer, all else constant, the odds of having a female director are doubled. The final significant variable in this equation is whether the company has medium revenues (between \$5.75 and \$42.5 million). The analysis reveals that a company with medium revenues is 50 percent less likely to have female representation than other corporations, all else constant.

Logistic Regression Dependent: Female Director Dummy Variable

Deviance:908.11 d.f.:882

**** denotes highly statistically significant variable * denotes statistically significant variable**

Variable	Coefficient	Standard Error
**Constant	-3.182	0.426
** Total Number of Directors	0.251	0.031
**Number of Female Officers	0.701	0.101
**Medium Revenues	-0.739	0.216
Albany	0.829	0.437
Westchester	0.488	0.260
Low Revenues	0.345	0.220
Boroughs	0.504	0.438
Business Services	-0.426	0.386
Broker	0.552	0.581
Female Industries	0.263	0.395
Construction	-5.981	9.093
Chemical and Allied Products	-0.260	0.398
Ithaca	-0.309	0.594
Manufacturing	0.190	0.376
Insurance Agent	0.445	0.897
Electrical Equipment	-0.190	0.454
Mining	-0.522	1.323
High tech	-0.114	0.290
Buffalo	-0.135	0.351
Long Island	0.071	0.237
Wholesale Trade	0.138	0.526
Transportation	0.421	0.437
Holding and Other Investment Company	0.024	0.488
Real Estate	-0.011	0.588
Syracuse	0.005	0.488
Depository Institutions	0.004	0.432

Model 2 - Logistic Regression Officers

$$\begin{aligned} \text{Logit}(\text{DO}) = & \beta_0 + \beta_1(\text{MR} * \text{TNO}) + \beta_2(\text{LR} * \text{NFD}) + \beta_3(\text{LR} * \text{TNO}) + \beta_4(\text{TNO}) + \beta_5(\text{NFD}) + \beta_6(\text{MR}) + \beta_7(\text{LR}) + \beta_8(\text{A}) \\ & + \beta_9(\text{W}) + \beta_{10}(\text{BO}) + \beta_{11}(\text{LI}) + \beta_{12}(\text{I}) + \beta_{13}(\text{BU}) + \beta_{14}(\text{S}) + \beta_{15}(\text{HI}) + \beta_{16}(\text{BS}) + \beta_{17}(\text{BR}) + \beta_{18}(\text{TN}) \\ & + \beta_{19}(\text{CA}) + \beta_{20}(\text{CN}) + \beta_{21}(\text{IA}) + \beta_{22}(\text{MA}) + \beta_{23}(\text{EE}) + \beta_{24}(\text{MI}) + \beta_{25}(\text{WT}) + \beta_{26}(\text{DI}) + \beta_{27}(\text{RE}) + \beta_{28}(\text{HT}) + \beta_{29}(\text{FI}) \end{aligned}$$

Where:

DO=Dummy variable whether there is at least one female officer

MR*TNO=Interaction term Medium Revenue * Total Number of Officers

LR*NFD=Interaction term Low Revenue * Number of Female Directors

LR*TNO=Interaction term Low Revenue * Total Number of Officers

TNO=Total Number of Officers

NFD=Number of Female Directors

MR=Medium Revenue

LR=Low Revenue

A=Albany

W=Westchester

BO=Boroughs

LI=Long Island

I=Ithaca

S=Syracuse

HI=Holding and Other Investment Services

BS=Business Services

BR=Broker
 TN=Transportation
 CA=Chemical and Allied Products
 CN=Construction
 IA=Insurance Agent
 MA=Manufacturing
 EE=Electrical Equipment
 BU=Buffalo

MI=Mining
 WT=Wholesale Trade
 DI=Depository Institution
 RE=Real Estate
 HT=High Tech
 FI=Female Industries

Base Variables (For Dummy Variables)

Revenue: High Revenue
 Region: Manhattan
 Industry: Retail Trade

**Logistic Regression Dependent: Female Officer Dummy Variable
 Deviance: 937.57 d.f.:881**

**** denotes highly statistically significant variable * denotes statistically significant variable**

Variable	Coefficient	Standard Error
**Constant	-3.183	0.417
**Medium Revenue	-0.779	0.199
**Number of Female Directors	0.666	0.081
**Total Number of Officers	0.250	0.030
*Albany	0.887	0.436
*Westchester	0.504	0.254
Low Revenue	0.373	0.202
Holding and Other Investment Services	-0.558	0.380
Boroughs	0.548	0.437
Business Services	-0.414	0.384
Broker	0.553	0.579
Transportation	0.414	0.436
Long Island	0.167	0.233
Chemical and Allied Products	-0.266	0.395
Female Industries	0.264	0.392
Construction	-5.965	9.118
Insurance Agent	0.435	0.895
Manufacturing	0.181	0.375
High tech	-0.136	0.289
Electrical Equipment	-0.198	0.453
Ithaca	-0.253	0.591
Mining	-0.517	1.323
Wholesale Trade	0.109	0.525
Syracuse	0.049	0.486
Depository Institutions	-0.031	0.430
Real Estate	0.016	0.584
Buffalo	-0.007	0.344

The results from this analysis reveal that as with directors, revenue is a significant predictor. The total number of officers and number of female directors and two regions, Albany and Westchester, are also significant predictors. Once again, industry is not a significant predictor of female representation.

For every additional officer a company has, its odds of having at least one female officer increase by 1.3 times and for every additional female director a company has, its chances of having a female officer increase by 1.9 times, holding other variables constant. A company's location is also a significant predictor with companies in Albany being 2.4 times more likely to have at least one female officer and those located in Westchester being 1.7 times more likely to have female representation among officers. Finally, as was the case with female directors, whether a company has medium revenues is a significant predictor of whether there is female representation among officers, with these companies being 50 percent less likely to have female representation.

Next, we will limit our sample to those companies within New York State that have at least one female officer or director in order to ascertain what factors are significant predictors of having an increased number of women in top offices within these companies. In this case we will use a natural log transformation of both the dependent variables, the percentage of female directors and officers and several independent variables, the number of female officers and directors and total number of officers and directors because this transformation approximates a normal distribution of the data which is one of the assumptions of ordinary least squares regression. In addition, by using the percentage figure as the dependent variable rather than the absolute number, we are adjusting for the potential influence of women. A corporation with one female director on a board of five members would translate into potentially more influence for that one woman, as compared to a corporation with twenty total directors and one woman on the board.

MODEL 3 - ORDINARY LEAST SQUARES REGRESSION DIRECTORS

$$\begin{aligned} \text{LNPFDF} = & \beta_0 + \beta_1(\text{LNNFO}) + \beta_2(\text{LNTND}) + \beta_3(\text{MR}) + \beta_4(\text{LR}) + \beta_5(\text{A}) + \beta_6(\text{W}) + \beta_7(\text{BO}) \\ & + \beta_8(\text{LI}) + \beta_9(\text{I}) + \beta_{10}(\text{BU}) + \beta_{11}(\text{S}) + \beta_{12}(\text{HI}) + \beta_{13}(\text{BS}) + \beta_{14}(\text{BR}) + \beta_{15}(\text{TN}) + \beta_{16}(\text{CA}) + \beta_{17}(\text{IA}) + \beta_{18}(\text{MA}) \\ & + \beta_{19}(\text{EE}) + \beta_{20}(\text{WT}) + \beta_{21}(\text{DI}) + \beta_{22}(\text{RE}) + \beta_{23}(\text{HT}) + \beta_{24}(\text{FI}) \end{aligned}$$

Where:

LNPFDF=LN(Percent Female Directors)	BO=Boroughs
LNNFO=LN(Number of Female Officers)	LI=Long Island
LNTND=LN(Total Number of Directors)	I=lthaca
MR=Medium Revenue	BU=Buffalo
LR=Low Revenue	S=Syracuse
A=Albany	HI-Holding and Other Investment Services
W=Westchester	BS=Business Services

BR=Broker
 TN=Transportation
 CA=Chemical and Allied Products
 IA=Insurance Agent
 MA=Manufacturing
 EE=Electrical Equipment

WT=Wholesale Trade
 DI=Depository Institutions
 RE=Real Estate
 HT=High Tech
 FI=Female Industries

Base Variables (For Dummy Variables)

Revenue: High Revenue
 Region: Manhattan
 Industry: Retail Trade

**Ordinary Least Squares Regression Dependent: LN(Percent Female Directors)
 Adjusted R-squared: .44**

**** denotes highly statistically significant variable * denotes statistically significant variable**

Variable	Coefficient	Standard Error
**LN(Total Number of Directors)	-0.835	0.087
**LN(Number of Female Officers)	0.195	0.057
**Long Island	-0.257	0.097
*Albany	-0.384	0.184
*Real Estate	-0.486	0.248
Westchester	-0.168	0.089
Chemical and Allied Products	0.237	0.139
Depository Institutions	-0.243	0.146
Female Industries	-0.226	0.136
Transportation	-0.183	0.144
Holding and Other Investment Company	-0.188	0.168
Manufacturing	-0.144	0.132
Boroughs	0.152	0.157
Ithaca	-0.178	0.205
Business Services	0.131	0.172
Constant	0.102	0.220
Broker	-0.077	0.183
Syracuse	-0.097	0.257
Electrical Equipment	-0.079	0.223
Medium Revenue	-0.032	0.091
Low Revenue	-0.024	0.086
Insurance Agent	-0.055	0.443
High tech	-0.014	0.132
Buffalo	-0.006	0.137
Wholesale Trade	-0.004	0.217

These results indicate that the number of female officers has a significant positive influence on the percentage of female directors within a company. For every additional director on the board, however there is a decrease in the percentage of female board members. If a company is in the real estate industry, it decreases the percentage of female directors on average. Two regions were also significant, Long Island and Albany. A company in either of these regions has a lower percentage of female directors on average.

MODEL 4 - ORDINARY LEAST SQUARES REGRESSION OFFICERS

$$\begin{aligned} \text{LNPFO} = & \beta_0 + \beta_1(\text{LNNFD}) + \beta_2(\text{LNTNO}) + \beta_3(\text{MR}) + \beta_4(\text{LR}) + \beta_5(\text{A}) + \beta_6(\text{W}) + \beta_7(\text{BO}) \\ & + \beta_8(\text{LI}) + \beta_9(\text{I}) + \beta_{10}(\text{BU}) + \beta_{11}(\text{S}) + \beta_{12}(\text{HI}) + \beta_{13}(\text{BS}) + \beta_{14}(\text{BR}) + \beta_{15}(\text{TN}) + \beta_{16}(\text{CA}) + \beta_{17}(\text{IA}) + \beta_{18}(\text{MA}) \\ & + \beta_{19}(\text{EE}) + \beta_{20}(\text{WT}) + \beta_{21}(\text{DI}) + \beta_{22}(\text{RE}) + \beta_{23}(\text{HT}) + \beta_{24}(\text{FI}) \end{aligned}$$

Where:

LNPFO=LN(Percent Female Officers)	BS=Business Services
LNNFD=LN(Number of Female Directors)	BR=Broker
LNTNO=LN(Total Number of Officers)	TN=Transportation
MR=Medium Revenue	CA=Chemical and Allied Services
LR=Low Revenue	IA=Insurance Agent
A=Albany	MA=Manufacturing
W=Westchester	EE=Electrical Equipment
BO=Boroughs	WT=Wholesale Trade
LI=Long Island	DI=Depository Institutions
I=Ithaca	RE=Real Estate
BU=Buffalo	HT=High Tech
S=Syracuse	FI=Female Industry
HI=Holding and Other Investment Services	

Base Variables (For Dummy Variables)

Revenue: High Revenue
 Region: Manhattan
 Industry: Retail Trade

Ordinary Least Squares Regression Dependent: LN(Percent Female Officers)
Adjusted R-squared: .38

**** denotes highly statistically significant variable * denotes statistically significant variable**

Variable	Coefficient	Standard Error
**Constant	-0.747	0.181
**LN(Total Number of Officers)	-0.524	0.066
**LN(Number of Female Directors)	0.257	0.085
**Holding and Other Investment Company	0.529	0.189
Chemical and Allied Products	-0.308	0.163
Female Industries	0.270	0.156
Manufacturing	0.236	0.150
Medium Revenue	0.153	0.107
High tech	-0.199	0.152
Buffalo	0.193	0.156
Wholesale Trade	0.300	0.249
Low Revenue	-0.117	0.101
Depository Institutions	0.171	0.169
Ithaca	0.224	0.236
Transportation	0.116	0.167
Boroughs	-0.113	0.180
Albany	0.130	0.211
Long Island	-0.038	0.114
Electrical Equipment	0.042	0.257
Broker	0.032	0.212
Real Estate	0.041	0.281
Westchester	-0.014	0.104
Business Services	0.009	0.199
Insurance Agent	-0.014	0.508
Syracuse	0.003	0.297

The results of this analysis show that the number of female directors, the total number of officers and whether a company is in the holding and other investment services industry are all significant predictors of the percentage of female officers of the corporation. On average, as the number of female directors increases, the percentage of female officers also increases. In contrast, an increase in the total number of officers within the corporation, on average, leads to a decrease in the percentage of female

officers. Companies classified as holding and other investment services have a higher percentage of female officers. In this case, region was not a significant explanatory variable.

EXPLANATION OF RESULTS

RELATIONSHIP BETWEEN OFFICERS AND DIRECTORS

After completing the regression analysis, it was determined that the presence of female officers is a positive and highly significant predictor of both the presence and percentage of female directors on the boards of directors of New York State corporations. These results suggest that corporations with more female officers tend to have a greater percentage of women on the board of directors than other firms. There are two reasons why this may be the case. Those corporations with a higher percentage of women as officers may be more progressive in the representation of women and may, therefore, be more likely to have women as directors. Also, these corporations have experience with women working in high level positions and knowing that a female officer does not have an adverse effect on the company may be less apprehensive about having a female director than other companies may be.

The analysis also revealed that the number of female directors was also a significant predictor of whether or not a company had at least one female officer. This may be because companies with female directors may have chosen these women from within the company, as many directors are chosen. As a result, the female officers of the company may be the same women as the females on the board of directors. In addition, since directors have some influence over the policies and operations of a corporation, women on corporate boards may advocate the hiring and promotion of women.

INDUSTRY AND FEMALE REPRESENTATION

Surprisingly, there was not a statistically significant relationship between the dummy variable representing high tech industries and the representation of women among officers and directors. Since data indicate that women are represented at a lower percentage than men among managers in high tech industries, these results would suggest that in New York, women might actually be promoted to the positions of officer and director at a higher rate in high tech companies than in low tech companies. The difference in promotional rates would lead to the insignificant difference in the percentage of women in these positions in high and low tech companies. This result contradicts the common perception that women are discriminated against at higher rates in male dominated industries such as high-tech with reference to promotional rates.

Another surprising result was that female industry was not a significant predictor. It would be intuitive that since in the aggregate these companies have women representing the majority of both managers and lower level employees these corporations would be more likely to have women represented at top positions than corporations with a lower level of female representation at all levels. These may indicate that in New York women are promoted at an unequal rate in these corporations. If

Table 6	
Percent Female Managers across all Employees in Northeast	
Major Industry	Percent Female Managers
Agriculture*	45
Mining*	26
Construction	21
Manufacturing Durable	25
Manufacturing Non-Durable	33
Transportation	31
Communications	34
Utilities and Sanitary	38
Wholesale	36
Retail	36
FIRE	47
Business, Auto and Repair Services	33
Personal Services Exc. Private Households	39
Entertainment and Recreation Services	56
Hospitals	76
Medical Services Excluding Hospitals	70
Educational Services	58
Social Services	63
Other Professional Services	41
Public Administration	45

*sample too small for northeast, statistics taken for United States as a whole

Source: 1998 Current Population Survey, March Supplement

women were, in fact, promoted at equal levels in these companies, we would expect that there would be a significant difference in the representation of women among companies with a majority of women employees compared to other companies. Data from the Bureau of Labor Statistics in 1999 show that women represent more than half of the employees in retail industries. The present analysis along with data from the Current Population Survey data indicates that women are not highly represented among managers, officers, and directors. This data would therefore support the occupational segregation argument that women are forced into lower level jobs while men are employed in the top positions. In contrast, in most service industries women represent more than half of the managers according to the Current Population Survey. This would suggest that women in these companies might only have a problem reaching the highest levels within corporations since they are represented in more than half of

the lower management positions in these companies. These results suggest a glass ceiling effect in these types of companies, where women are promoted until they reach a certain level and then find it nearly impossible to advance further.

Industries that did prove to be significant determinants of the representation of women on the board and among officers were holding and other investment services and real estate. In no case was industry a significant predictor of whether or not there was at least one woman on the board of directors or among officers.

Companies in the holding and other investment industry have a significantly higher percentage of female officers than companies in other industries. However, the holding and other investment industry is not a significant predictor of whether or not there is a woman on the board of directors or the percentage of female directors. The results for female directors and officers seem contradictory. Overall the variable representing the number of female officers in a company has proven to be a significant predictor of whether or not there is at least one woman on the board of directors and the percentage of female directors, but in this case being in the holding and other investment industry predicts only percentage of officers and not percentage or the existence of female directors. One explanation is that director is a position only achieved by few officers within a company. If women have only relatively recently reached the top positions within these companies, they may have achieved representation among officers, but have not yet been able to achieve representation among directors. A time-series analysis with data both before and after 1999 would help settle this issue.

The real estate industry is the only significant predictor of the percentage of female directors. A company in the real estate industry has a lower percentage of female directors, on average. The relationship could be explained by the fact that in these industries there are a greater percentage of men among managers. In the real estate industry; however, there are more women than men at lower levels, this may indicate that women are not promoted at the same rate as men to top positions within these companies.

RELATIONSHIP BETWEEN FIRM SIZE AND FEMALE OFFICERS AND DIRECTORS

In this study, two measures of size were used. The first measure is revenues. Revenues are used as a proxy for the overall size of the firm since other data such as the number of employees were not available for most companies. On the whole, in reference to both whether or not there is a woman on the board of directors and among officers, companies with medium revenues are less likely to have female representation than high revenue companies. This would indicate that larger companies are more likely to have female representation on the board of directors than smaller companies. It is interesting to note, however, that low revenues are not a significant predictor. This would indicate that companies with low revenues are not significantly different from those with larger revenues. The surprising result, therefore, appears to be that both very small and very large companies are more likely to have female representation in top positions than mid-size corporations. There is no relationship, however, between revenues and the percentage of female directors or the percentage of female officers in a company.

Therefore, it appears that the size of the company influences whether or not there is female representation, but not the degree of this representation.

It was expected that larger corporations would tend to have more women represented in these positions than smaller corporations. Larger companies may face increased pressure to have some female representation on the board of directors and among officers, since their size makes them better known. They may, therefore, be more likely to have at least one woman on the board and among officers as a token, to show that they are not against having female representation and are not discriminatory. This would also explain why in general revenue is not a significant predictor in the percentage of female representation. Even though there is at least one woman on the board and among officers, the overall influence of women within the company is not great. An explanation for the insignificant difference between low and high revenue firms with respect to female representation may be that small firms are more likely to be small family owned businesses and therefore the entire family, including the women, may be involved in the company. Smaller corporations may also have better records or better access to data on individual employee performance because there are fewer employees to keep track of. As a result, women may be evaluated in a more objective manner when up for promotion. Companies with low revenues may also be more likely to have been founded recently since in general they are smaller companies. Therefore, they may have been established in an era when women are treated more equally than they were in the past when some of the large corporations were founded. In recently founded companies, women may have held high positions since its inception because of the social atmosphere, as a result these women did not have to work their way up through the company facing unequal opportunities that they may have encountered in older companies.

The second measure of the size is the total number of directors and officers for each corporation. In the logistic regression, the results indicate that as the number of directors and the number of officers increase, the odds of having at least one female director or officer increase. This indicates that women are more likely to be represented in companies with larger boards and a large number of officers than they are in other companies.

There are several possible explanations. Assuming the rates of promotion are the same for women in both large and small firms, the larger firm is likely to have a greater number of women in top management positions from which to choose a candidate for the board of directors. As a result of this larger pool, it is easier to have a greater range of personal characteristics, which could increase the chance that there is at least one woman that the company believes would fit the tastes and preferences of the voters and therefore could be on a slate that would be approved by the shareholders. However, as the size of the board increases, each director has less impact on the policy decisions of the corporation. Therefore, having a token on a larger board is less threatening than on a smaller board where a woman could have more influence on the outcome of a vote. The same can be said with respect to officers; with a large number of officers, the impact that each individual can have on the operations of the corporation is not as great as it would be with fewer officers. Therefore, it is easier to have a woman represented among officers as a token since her impact has been minimized by the large group of officers.

In the results from the ordinary least squares regression that looks at the sample of companies with at least one female officer/director, we see the opposite relationship. As the number of total officers and directors increases, the percentage of women decreases. Since the companies that do not have any women have been eliminated, this result is not surprising. As the number of officers and directors increases, the percentage of the total that each individual represents is lower. As a result, a large board with one woman would have a lower percentage of female directors than a small board that has one woman. The results suggest that companies with larger numbers of officers and directors, while more likely to have at least one woman represented, actually have women playing less of a role than those companies with lower numbers of officers and directors, since each individual has less influence among a larger group.

RELATIONSHIP BETWEEN REGION AND FEMALE REPRESENTATION

The results of this analysis suggest no region is a significant predictor of whether or not a company has a female director or the percentage of female officers. In the case of whether or not a company has at least one female officer, Albany and Westchester both have increased odds of female representation. Long Island and Albany are significant predictors in relation to the percentage of female directors, both having a lower percentage of women on average. It is interesting to note that Albany has the opposite effect on the representation of women among officers and directors. It is unclear why some regions are significant predictors of the odds and percentage of female representation while others are not. Further analysis looking into the influence of the community and residents of the region, the qualifications of the women in the region for top-level jobs, and the types of educational opportunities that exist for women in the region needs to be undertaken to understand these differences. It could be that some regions have more qualified women in their hiring pool than others or that in some regions there is more pressure from the community to have female representation in top corporations, but none of these conclusions can be drawn from the data available in the present analysis.

LIMITATIONS OF RESEARCH

Some limitations of this data are that information about the total number of employees and the number of employees by gender was unavailable for these corporations. As a result, revenues were used as a proxy for the size of the corporation. Usually larger corporations have higher revenues than smaller corporations and therefore revenue was the best available measure of size, although a more accurate analysis could be performed with a better measure of the size of the companies. If we had data regarding the number of employees by gender, we would have been able to better pinpoint at what level within the corporation the representation of women becomes disproportionate. Being able to pinpoint this level would help us to better understand occupational segregation and the glass ceiling effect in New York State based corporations. Another shortfall is that data were not available on the education, experience, and tenure of the employees in these corporations. As a result, we could not control for these variables in the analysis. It is possible that there may be differences in these characteristics by

region, industry, or firm size, which may explain some of the significant differences with respect to the representation of women in top offices.

There are also some limitations of the statistical analysis used in this research. These regression analyses assume independence among the explanatory variables. Although interaction terms were used (and found to be insignificant) to help test this assumption, it has not been entirely met. With respect to regions, for example, neighboring regions are most likely related in some way in that an event in one region will have an impact on an adjacent region. This may also be true among related industries. Finally, there is the assumption of constant variance. The models were also checked to see if they met this assumption and constant variance was closely but not perfectly approximated with the data. All of these slight departures from the assumptions of regression analysis can limit the effectiveness of this analysis in interpreting and analyzing the data. In addition, departures from assumptions mean that the results and their implications cannot be generalized.

CONCLUSION

One explanation for the absence of women in top corporate positions is the presence of discrimination. Sometimes business decisions affecting women are based on the perception that each woman is the statistical “average woman”, or the “stereotypical woman” rather than an individual. This “average” or “stereotypical” woman is portrayed as being less committed to the company, willing to work fewer hours because of family responsibility and more discontinuous in her labor force participation than men. Even women who do not fit this profile may be judged based on these perceptions. Since the “average female” is not a desirable candidate for election to the board of directors, it is possible that qualified female candidates are overlooked as a result of the stereotypical way in which corporations may view women. Although the characteristics of the “average woman” are unfavorable for the board of directors, this average does not reflect the characteristics of all women in the workforce and the differences in male and female patterns of labor force participation are diminishing. For example, the gaps between male and female commitment to the labor force, loyalty to employer, and number of hours worked have decreased over the last forty years.⁴ Contributing to this trend is the decrease in fertility rates over the last thirty years and the increased assistance from men with family responsibilities.⁵ This increases the ability of women to devote more time to their careers.

A potential determinant of the lack of female officers is that women may be less likely than men to be promoted from lower positions within the company as has been documented in a number of studies mentioned earlier.⁶ There are several theories that explain the factors that may contribute to men being promoted more than women within a corporation. One explanation is that women have fewer opportunities for on-the-job training than men. Another possible factor is that women have a greater proclivity to leave the workforce to raise children or care for their family than men and may, therefore, have increased discontinuity in their labor force participation. A third theory which attempts to explain the absence of women in the highest positions within corporations is occupational segregation, wherein

women are crowded into female dominated occupations that often provide fewer advancement opportunities than male-dominated occupations.

In order for women to be represented equally on corporate boards, they must first be represented equally among officers and other managerial occupations within companies. The low percentage of women on the board of directors is a reflection of the low number of women in the highest positions within this population of companies.

This paper explores the issue of female representation with respect to officers and directors in the population of publicly traded companies based in New York State. As opposed to prior research that has focused on a single industry or corporation or an elite group of corporations this paper adds to the literature on the representation or discrimination of women in the workplace by being unique in that it explores the representation of women across corporations with a wide ranges of industries, revenues and size. It is important to take all of these considerations into account when exploring the under-representation of women so that we can better pinpoint the corporate characteristics that may influence the representation of women. By understanding the exact types of corporations where women are underrepresented in influential positions we may be better able to determine whether women are underrepresented due to the lack of qualified candidates, influence of industry norms or labor unions, discrimination, etc. Once we understand why women are underrepresented we can focus on how to ameliorate the problem. Some possibilities are targeting women in promoting available positions within these types of corporations attempting to recruit women into educational and training programs that would help them attain the qualifications needed to be employed in top positions, influencing public policy to provide incentives to corporations to hire or train women, and providing incentives to women to encourage them to pursue careers in these types of corporations.

It appears that in 1999, women are still under-represented in the highest positions in business. Only 11.6 percent of corporate officers and a mere 6.3 percent of directors in this sample are female. However, the analysis suggests that in New York, women may be promoted at higher rates than men in some male dominated industries such as high tech industries because there is no difference in the representation of women in high tech corporations compared to low tech corporations. Since women are represented in lower percentages at all levels in high tech corporations, if they were promoted at an equal rate as low-tech companies we would expect that they would have a lower representation of women among officers and directors reflective of their lower representation at all levels in these corporations. Surprisingly, the results suggest that there is no significant difference between the representations of women in top corporate positions depending on whether the corporation is in a female dominated industry. On the whole, region and industry do not seem to play a large role in the representation of women. Finally, the research suggests that there are positive relationships between the representation of female officers and female directors between percent female officers and directors. This would indicate that, overall, the representation of women at lower positions within a firm influences their representation at higher levels.

ENDNOTES

1. See Blau (1998); Reynolds (1998).
2. See Blau (1998); Rix(1990), Cook (1990)
3. Odds ratio for variable in logistic regression equals $e^{\text{coefficient of the variable}}$
4. See Blau (1998); McGratten (1998).
5. See Blau (1998); Reynolds (1998).
6. See Cabral (1981); Becker (1983); Spurr (1990); Winter-Ember (1991); Cannings (1991); Shore (1992).

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