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U.S. Equal Employment Opportunity Commission

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Glass Ceilings: The Status of Women as Officials and Managers in the Private Sector

Abstract

The main purpose of this report is to use data from the 2002 EEO-1 Survey of Firms in Private Industry to explore the status of women in management. The research will develop some new ways of analyzing the EEO-1 data that focus on access to management positions generally, and perhaps more importantly, access to management positions at headquarter facilities. The primary contribution of these analyses of the EEO-1 survey is the ability to raise important problems and questions about gender-based discrimination given the wide variations in the types of firms and industries in the American economy. While this initial report on glass ceilings focuses on the status of women, the analyses developed here can be applied to examine minority groups.

Keywords

Federal, key workplace documents, Catherwood, ILR, glass ceiling, women, status, officials, managers, private sector, employment, workers, industries, NAICS, economy

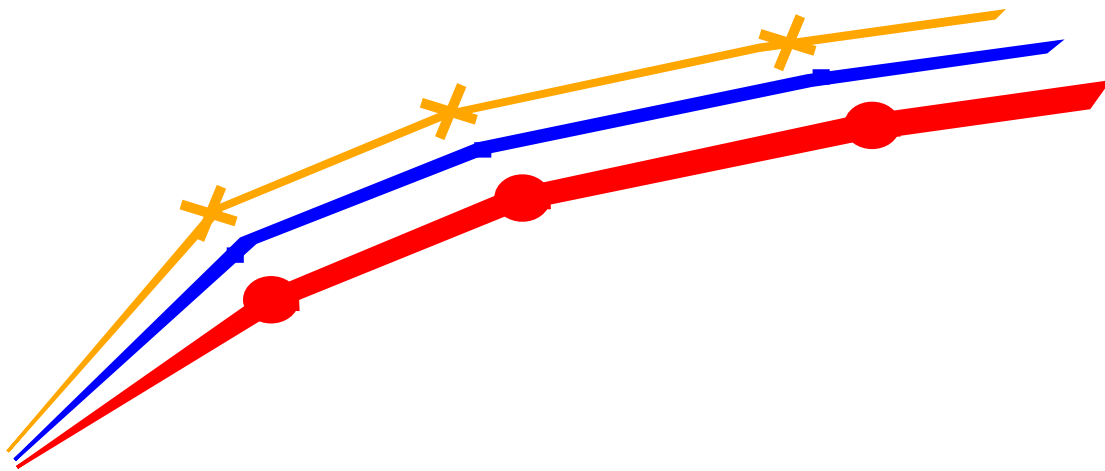
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GLASS CEILINGS: THE STATUS OF WOMEN AS OFFICIALS AND MANAGERS IN THE PRIVATE SECTOR



U.S. EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

2004

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AS OFFICIALS AND MANAGERS**



EXECUTIVE SUMMARY

An examination of EEO-1 data, primarily from the most recent 2002 reports, provides insights into the status of women as officials and managers in the private sector.

- The percent of women officials and managers in the private sector has increased from just over 29 percent in 1990 to 36.4 percent in 2002.
- Women represent 48 percent of all employment, but represent only 36.4 percent of officials and managers. Women make up 80.3 percent of office and clerical workers. Interestingly, women exceed their overall employment rates as professionals and sales workers and are quite close to their overall employment rate in technical jobs.
- Industries from the health care sector of the economy are the most likely to employ women as officials and managers.
- Manufacturing industries are least likely to employ women as officials and managers.
- Comparisons between officials and managers and white collar jobs (professionals, technicians and sales workers) indicate that women have the highest odds of being managers in the industries of Legal Services, Scheduled Air Transportation, Services to Building and Dwellings, and Offices of Physicians.
- Comparisons between officials and managers and white collar jobs indicate that women have the lowest odds of being managers in Nursing Care Facilities, Full-Service Restaurants, Pulp, Paper and Paperboard Mills, and Animal Slaughtering and Processing industries.
- Comparisons between officials and managers at headquarters and officials and managers at field establishments indicate that women have the highest odds of being managers at headquarter facilities in Motor Vehicle

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Manufacturing, Electrical Power Generation, Transmission and Distribution, Aerospace Product and Parts Manufacturing, and General Freight Trucking industries.

- Comparisons between officials and managers at headquarters and officials and managers at field establishments indicate that women have the lowest odds of being managers at headquarter facilities in industries from the health care sector of the economy.
- Comparisons between officials and managers at headquarters and white collar workers at headquarters indicate that women have the highest odds of being managers at headquarter facilities in Legal Services, Employment Services, Security Brokers, and Telecommunications industries.
- Comparisons between officials and managers at headquarters and white collar workers at headquarter facilities indicate that women have the lowest odds of being managers at headquarter facilities in Investigation and Security Services, Full-Service Restaurants, Other Fabricated Metal Product Manufacturing, and Motor Vehicle Body and Trailer Manufacturing industries.
- As a general rule, industries with a low proportion of women in headquarters management have a low proportion of women in their respective recruiting pools (field management and white collar jobs at headquarters). Conversely, industries with a high proportion of women in headquarters management have a high proportion of women in their respective recruiting pools (field management and white collar jobs at headquarters).
- Industries with a high proportion of women in headquarters management are more likely to have disparities between the men and women in field management pools and less likely to have such disparities in white collar pools. Conversely, industries with a low proportion of women in headquarters management are less likely to have disparities in field management pools and more likely to have disparities from white collar pools.

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-
- Employers may find it useful to explore their own employment practices in light of the findings of this report.
 - ▶ This self-evaluation could apply the statistical models and analytical techniques utilized in the report to their firm's actual promotion pools so that the entry of women and minorities into top management positions is assessed.
 - ▶ Employers can follow-up on such analyses with a review of their formal and informal personnel practices to identify those policies and procedures that foster the open and competitive selection of top management as well as those policies and procedures that restrict open competition.

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INTRODUCTION

While the presence and status of women in the work force have increased dramatically since the passage of the Civil Rights Act of 1964, there are still concerns about the relative absence of women in higher management ranks, which some have described as the “glass ceiling.” In 1995, the Federal Glass Ceiling Commission¹ concluded that “today’s American labor force is gender and race segregated – white men fill most top management positions in corporations.” The issue has taken on particular significance as women and minorities have increased their occupational status. The term “glass ceiling” is generally used to refer to instances where women and minorities have progressed within a firm but, despite their ambitions and qualifications, find it difficult to make the movement into key higher level management positions, or management positions at all. The social disadvantage of these glass ceilings is the inability of the most qualified employees to move into the most important positions due to irrelevant criteria such as race or gender. The selection of a less qualified employee negatively impacts both the employer and ultimately the economy as a whole. The successful elimination of glass ceilings requires not just an effective enforcement strategy but the involvement of employers, employees and others in identifying and reducing attitudinal and other forms of organizational barriers encountered by minorities and women in advancing to higher level management positions in different workplace settings.

The main purpose of this report is to use data from the 2002 EEO-1 Survey of Firms in Private Industry to explore the status of women in management. The research will develop some new ways of analyzing the EEO-1 data that focus on access to management positions generally, and perhaps more importantly, access to management positions at headquarter facilities. The primary contribution of these analyses of the EEO-1 survey is the ability to raise important problems and questions about gender-based discrimination given the wide variations in the types of firms and industries in the American economy. While this initial report on glass ceilings focuses on the status of women, the analyses developed here can be applied to examine minority groups.

¹ Federal Glass Ceiling Commission, *Good for Business: Making Full Use of the Nation’s Human Capital: the Environmental Scan*, Washington, D.C., March 1995.

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The report takes strides toward examining the glass ceiling problem within the boundaries of the EEO-1 survey, which historically has collected data on officials and managers in one large job group. By aggregating all managers with officials and reporting them in a single category, the data cannot be examined to show the various levels of responsibility. Despite this limitation, the results of an analysis of EEO-1 data in the Officials and Managers category as well as methodologies for examining entry into management positions can prove useful. A goal of this research is to stimulate readers, especially employers, to identify and reduce inappropriate obstacles women encounter in advancing to management in different workplace settings.

This research examines the issue of glass ceilings from various perspectives. The first perspective examines the critical initial selection into management positions broadly defined as any type of managerial position. To identify potential gender-based disparities, the employment of women as officials and managers is compared to the potential pool of managers from the white collar positions of professionals, technicians and sales workers. The second and third perspectives focus on the advancement of headquarters managers from two kinds of potential pools: managers in field operations and white collar employees at headquarters. Specifically, women employed as officials and managers at the headquarters facilities are compared to women employed as officials and managers at the firm's other establishments. Women employed as officials and managers at headquarters are also compared to women in white collar positions at headquarters.

These three approaches combine to provide an analysis that reflects how officials and managers are selected.² The behavior of firms within industries is summarized to provide insight into the characteristics of different industries.

Research into the glass ceiling and occupational barriers has included useful examinations of both public and private sector work forces. Research of note includes Reid, Kerr and Miller 2000; Lewis and Nice 1994; Tomaskovic-Devy 1993; Carrington and Troske, 1995 and 1998; Weeden, 1998 and Blau, Simpson and

² This paper does not address external hires from outside the firm. Such analyses are most practical at the firm level and not readily summarized by industry. It is also important to recognize that the EEO-1 Survey only has data on the numbers of employees in different types of job groups. It does not track the movement from one job to another.

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Anderson (1998)³. The issue of glass ceilings can also be viewed as a special case of occupational segregation.

The Equal Employment Opportunity Commission (EEOC) operates a data collection system that, in essence, collects data from all employers in the United States with 100 or more employees. The EEO-1 collects data from private employers. These annual reports indicate the composition of employers' workforces by gender and by race/ethnic category.⁴ In 2002, more than 39,000 employers submitted, as appropriate, individual establishment and headquarters reports for more than 225,000 reporting establishments with about 52 million employees. The EEO-1 collects data on nine major job categories: (1) officials and managers, (2) professionals, (3) technicians, (4) sales workers, (5) office and clerical workers, (6) craft workers, (7) operatives, (8) laborers and (9) service workers.⁵ Race/ethnic

³ Reid, Margaret, Brinck Kerr, and William Miller. 2000. "A Study of the Advancement of Women in Municipal Government Bureaucracies: Persistence of Glass Ceiling?" *Women and Politics* 21:35-53; Lewis, Gregory B. and David Nice. 1994. "Race, Sex and Occupational Segregation in State and Local Governments." *American Review of Public Administration* 24: 393-410; Tomaskovic-Devey, Donald. 1993. "The Gender and Race Composition of Jobs and the Male/Female, White/Black Pay Gaps." *Social Forces* 72(1): 45-76; Carrington, William J. and Kenneth R. Troske. 1995. "Gender Segregation in Small Firms." *The Journal of Human Resources* 30(3): 503-533; Carrington, William J. and Kenneth R. Troske. 1998. "Sex Segregation in U.S. Manufacturing." *Industrial and Labor Relations Review* 51(3): 445-464; Weeden, Kim A. 1998. "Revisiting Occupational Sex Segregation in the United States, 1910-1990: Results from a Log-Linear Approach." *Demography* 35(4): 475-487.; Blau, Francine D., Patricia Simpson and Deborah Anderson. 1998. "Continuing Progress? Trends in Occupational Segregation in the United States Over the 1970's and 1980's." National Bureau of Economic Research, *NBER Working Paper Series*, Working Paper 6716. <http://www.nber.org/papers/w6716>.

⁴ Private employers required to file are those with: (a) 100 or more employees, or (b) 50 or more employees and: (1) have a federal contract or first-tier subcontract worth \$50,000 or more, or (2) act as depositories of federal funds in any amount, or (3) act as issuing and paying agents for U.S. Savings Bonds and Notes. Single-establishment employers submit only one EEO-1 report, while those employers whose business was conducted at more than one location submit a company-wide consolidated report, a headquarters report, and individual reports for each establishment with 50 or more employees. Employment figures could be reported for any pay period in the third quarter (July through September).

⁵ See "Section 5, Description of Job Categories" in the EEO-1 instruction booklet at <http://www.eeoc.gov/stats/jobpat/e1instruct.html>

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designations used in the year 2002 EEO-1 reports are White (not of Hispanic origin), Black (not of Hispanic origin), Hispanic, Asian or Pacific Islander, American Indian or Alaskan Native. In addition to the work force data provided by the employer, information about each establishment is added to the database. This additional information includes the establishment's North American Industrial Classification System code, the establishment's county and its metropolitan area code. Firm level EEO-1 data are confidential.⁶

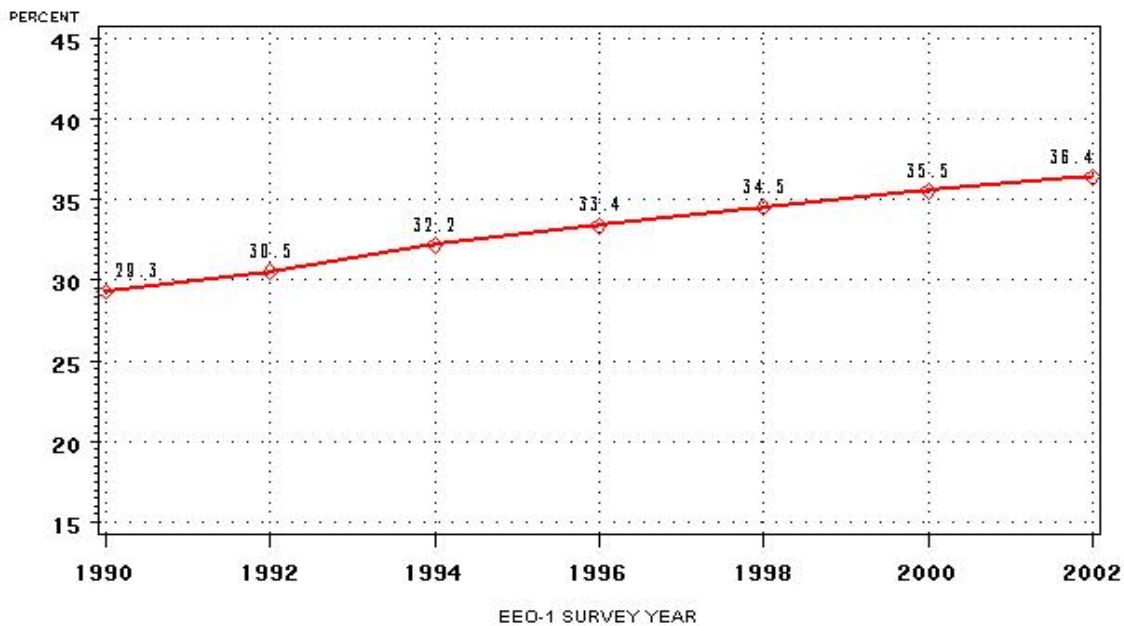
⁶ EEOC obtains and maintains EEO-1 reports pursuant to its authority under section 709 of the Civil Rights Act of 1964, as amended, 42 U.S.C. 2000e-8. Paragraph (e) of that section prohibits the EEOC and its employees from disclosing EEO-1 reports to the public. Violation of that section is punishable by fine and imprisonment. Aggregated data are available to the public.



THE EMPLOYMENT OF WOMEN AS OFFICIALS AND MANAGERS

The percentage of women officials and managers in the private sector has increased from just over 29 percent in 1990 to 36.4 percent in 2002 (Figure 1).

Figure 1
Employment of Women as Officials and Managers (1990-2002)



| YEAR | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2000 | 2001 | 2002 |
|---------------|------|------|------|------|------|------|------|------|------|------|------|------|
| WOMEN PERCENT | 29.3 | 29.8 | 30.5 | 31.5 | 32.2 | 33.0 | 33.4 | 34.0 | 34.5 | 35.5 | 35.9 | 36.4 |

Despite this increase in women officials and managers, a more detailed examination of the 2002 data shows that some job groups have more women than others. As Figure 2 displays, although women represent 48 percent of all EEO-1 employment,

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they only represent 36.4 percent of officials and managers. Office and clerical workers comprise the largest concentration of women at 80.3 percent. Interestingly, women exceed their overall employment rate as professionals and sales workers and are quite close to their overall employment rate in technical jobs.

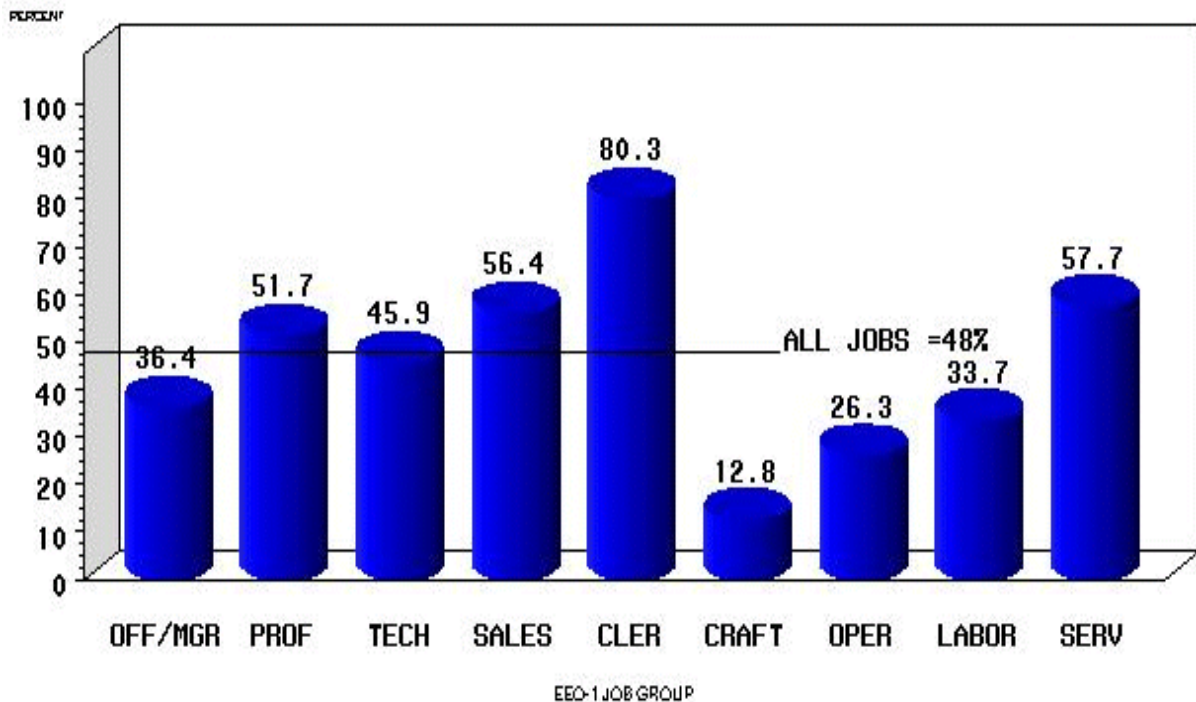


Figure 2
Distribution of Women Across EEO-1 Job Groups, 2002

| JOB GROUP | PERCENT |
|------------------------|---------|
| OFFICIALS AND MANAGERS | 36.4 |
| PROFESSIONALS | 51.7 |
| TECHNICIANS | 45.9 |
| SALES WORKERS | 56.4 |
| CLERICAL WORKERS | 80.3 |
| CRAFT WORKERS | 12.8 |
| OPERATIVES | 26.3 |
| LABORERS | 33.7 |
| SERVICE WORKERS | 57.7 |
| TOTAL EMPLOYMENT | 48.0 |

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Just as women are not employed evenly among job groups, they are not employed evenly in all industries. It is useful then to examine the employment of women as officials and managers by industry. For this purpose, the North American Industrial Classification System (NAICS) code at the industry (four digit) level is utilized. In order to summarize these results in a useful manner, only the 50 industries with the highest level of employment were examined.

Table 1 lists the highest ranked industries based on the percentage of women officials and managers from the 50 largest industries.

**Table 1
Industry Ranking: Highest Ten
Based on Employment of Women as
Officials and Managers
From the Top 50 Industries**

| INDUSTRY | MANAGERS | | | REPORTS FILED |
|---|----------|---------------|---------|---------------|
| | WOMEN | WOMEN PERCENT | TOTAL | |
| Nursing Care Facilities | 43,579 | 77.20 | 56,446 | 5,641 |
| Offices of Physicians | 11,952 | 67.65 | 17,668 | 1,143 |
| Community Care Facilities for the Elderly | 9,025 | 67.60 | 13,350 | 1,464 |
| General Medical & Surgical Hospitals | 156,734 | 67.53 | 232,103 | 3,782 |
| Other Ambulatory Health Care Services | 15,159 | 58.66 | 25,841 | 1,222 |
| Department Stores | 61,214 | 56.16 | 108,999 | 9,087 |
| Legal Services | 8,212 | 50.57 | 16,240 | 1,254 |
| Depository Credit Intermediation | 104,533 | 49.24 | 212,307 | 5,139 |
| Insurance Carriers | 74,321 | 48.49 | 153,256 | 3,584 |
| Nondepository Credit Intermediation | 20,357 | 46.99 | 43,325 | 858 |

Clearly, the health care sector of the economy is the most likely to employ women as officials and managers. It should be noted that Offices of Physicians includes Health

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Maintenance Organization (HMO) medical centers. However, other more commerce-type industries such as Department Stores, Legal Services, Banking (Depository Credit Intermediation and Nondepository Credit Intermediation) are also included.

Table 2 provides the list of industries employing the lowest percentages of women officials and managers. Here the manufacturing industries appear to be much less likely to hire women as officials and managers.

**Table 2
Industry Ranking: Lowest Ten
Based on Employment of Women as
Officials and Manager**

| INDUSTRY | MANAGERS | | | REPORTS FILED |
|---|----------|---------------|--------|---------------|
| | WOMEN | WOMEN PERCENT | TOTAL | |
| Motor Vehicle Body & Trailer Mfg | 2,737 | 13.84 | 19,781 | 493 |
| Aerospace Product & Parts Mfg | 6,204 | 14.73 | 42,119 | 754 |
| Motor Vehicle Parts Mfg | 5,736 | 15.14 | 37,888 | 1,195 |
| Elec Pwr Generation, Transmsn & Distribution | 8,468 | 15.16 | 55,874 | 1,899 |
| Other Fabricated Metal Product Mfg | 3,638 | 15.71 | 23,151 | 1,111 |
| Architectural, Engineering & Related Services | 12,237 | 16.08 | 76,090 | 2,881 |
| Motor Vehicle Mfg | 4,525 | 17.28 | 26,181 | 216 |
| Plastics Product Mfg | 6,200 | 18.11 | 34,236 | 2,235 |
| Converted Paper Product Mfg | 5,072 | 18.24 | 27,813 | 1,526 |
| General Freight Trucking | 4,396 | 18.45 | 23,824 | 1,532 |



USE OF ODDS RATIOS TO IDENTIFY DISPARITIES

The calculation and testing of an odds ratio provides a useful technique for assessing the possible existence of a glass ceiling.⁷ In examining glass ceilings, the odds ratio can be thought of as the odds of men being managers based on their employment in a promotion pool divided by the odds of women being managers based on their employment in the same promotion pool. (In the sections that follow, different definitions of promotion pools are utilized.) The odds for men would be the number of men reported as officials and managers divided by the sum of men reported in a possible promotion. The same calculation would be made for women, and the odds ratio would be the division of these two odds:

$$G = (F_m \times M_p) / (M_m \times F_p)$$

where

G= Odds ratio for a glass ceiling
M= Male
F= Female
m = Officials and Managers
p = Promotion pool

The term p can be modified to reflect appropriate pools as necessary. An example of the odds ratio calculation to a glass ceiling issue is provided in Table 3. When the odds ratio is 1, men and women have equal odds of being a manager. The data in Table 8, shows there are 271 men who are officials and managers and 357 men in a pool of potential officials and managers. At the same time, there are 52 women officials and managers and 159 women in a pool of potential officials and managers.

⁷ Fienberg, S. (1977) *The Analysis of Cross-Classified Categorical Data*, The MIT Press, Cambridge, pp. 17-18. Also see Agresti, A. (1990) *Categorical Data Analysis*, John Wiley and Sons, New York, pp. 14-15; Breslow, N. and Day, N. (1980) *Statistical Methods in Cancer Research*, IARC, Lyon, p. 125; Finkelstein, M. and Levin, B. (1990) *Statistics for Lawyers*, Springer-Verlag, New York, p. 2.

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The odds ratio of 0.431 indicates that men have higher odds of being a manager ($271/357=0.7591$) and women have lower odds ($52/159=0.3270$)⁸.

Table 3
Application of Odds Ratio to Glass Ceiling

| | PROMOTION POOL | MANAGERS |
|-------------------|----------------|----------|
| WOMEN | 159 | 52 |
| MEN | 357 | 271 |
| ODDS RATIO | 0.431 | |
| LOG OF ODDS RATIO | -0.842 | |

⁸ It should be noted that the odds for men and women are a ratio between two numbers. These ratios can become higher or lower for different reasons. A high odds can become lower either because the numerator decreases (for example, women managers decrease) or the denominator increases (women in the pool increase). Likewise, a low odds can become higher either because the numerator increases (women managers increase) or the denominator decreases (women in the pool decrease). These alternative possibilities will become important in the later discussion of rival hypotheses for field and white collar odds ratios.



COMPARISONS OF WHITE COLLAR TO MANAGEMENT EMPLOYEES

As a first step in examining work forces for glass ceilings, it is useful to deal with the threshold issue of the exclusion of women from management positions. When women experience relatively high employment status, it might be expected that they are as likely to occupy management positions as their male peers. This likelihood can be examined to some extent using EEO-1 data. The employment of men and women is divided between managers and white collar employees. White collar employees are defined as those in the EEO-1 job groups of professionals, technicians and sales workers. These white collar employees were treated as if they represent the pool of workers from which officials and managers are selected.

Steps are taken to eliminate those industries where this assumption is unlikely to be accurate.⁹ Further, it is not expected that job groups within the pool of white collar workers contribute evenly to management positions or that these relationships are the same in all industries. Therefore, the job groups are weighted based on their contribution.¹⁰ An odds ratio was computed for each firm within an industry. Firms are defined as all establishments with both the same headquarters and the same industrial classification. The odds for men is the number of men reported as officials and managers divided by the sum of men reported as professionals, technicians and sales workers using weighted values. The same calculation is made for women, and the odds ratio would be the division of these two odds. Once an odds ratio and its logged value is computed for individual firms, medians are then constructed for relevant industries. The distribution of the median log of the odds ratios is examined. Again, the analysis is restricted to the 50 industries with the largest EEO-1 reported employment.

⁹ Firms with more officials and managers than white collar workers were excluded as were firms with no officials and managers and firms with fewer than 100 employees. Once these firms were removed, aggregated industries with less than 15 companies were not included. Approximately 600 firms were removed due to these screens.

¹⁰ Weights are generated by using a canonical correlation of total officials and managers with total professional, total technical and total sales workers. The weights used are the standardized regression coefficients. If the regression coefficient is less than zero or is not statistically significant, the original unweighted values are used instead.

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Table 4 indicates firms where women have the highest probabilities of being managers based on their employment in the white collar job groups. These results suggest that women have a higher probability of being managers in selected service industries. Some of the industries where women are highly ranked are also industries where managers might have low status. For example, in Legal Services partners or associates in these firms may be the true managers. Here a number of “office managers” may have originally been employed as clerical workers.

Table 4
Industries Where Women Have the *Highest* Odds
of Being Officials and Managers Based on Their
Employment as Professionals, Technicians and Salesworkers
Selected From the Top 50 Industries
Based on Total Employment

| INDUSTRY | NUMBER OF FIRMS | PERCENT OF WOMEN MANAGERS | PERCENT OF WOMEN IN WHITE COLLAR POSITIONS | MEDIAN WEIGHTED ODDS RATIO (LOG) | TOTAL EMPLOYMENT RANK |
|--|-----------------|---------------------------|--|----------------------------------|-----------------------|
| Legal Services | 522 | 51.18 | 40.64 | 1.004 | 42 |
| Scheduled Air Transportation | 47 | 35.53 | 43.83 | 0.305 | 13 |
| Services to Buildings & Dwellings | 56 | 19.83 | 19.74 | 0.114 | 26 |
| Offices of Physicians | 411 | 68.95 | 73.67 | 0.111 | 44 |
| Investigation & Security Services | 58 | 24.63 | 19.46 | 0.098 | 20 |
| Computer & Peripheral Equipment Mfg | 135 | 25.66 | 27.01 | 0.084 | 29 |
| Employment Services | 145 | 41.33 | 51.56 | 0.077 | 41 |
| Telecommunications | 250 | 38.08 | 38.37 | 0.040 | 4 |
| Data Processing Services | 165 | 38.73 | 40.10 | 0.023 | 34 |
| Computer Systems Design & Related Services | 602 | 30.06 | 31.18 | 0.010 | 15 |

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Table 5 displays those industries where women have the lowest odds of being officials and managers. A fairly wide variety of industries are represented in this group, including some health care industries, where women tend to be well represented, Full-service and Limited-service Restaurants and Grocery Stores. In

Table 5
Industries Where Women Have the Lowest Odds
of Being Officials and Managers Based on Their
Employment as Professionals, Technicians and Salesworkers
Selected From the Top 50 Industries Based on Total Employment

| INDUSTRY | NUMBER OF FIRMS | PERCENT OF WOMEN MANAGERS | PERCENT OF WOMEN IN WHITE COLLAR POSITIONS | MEDIAN WEIGHTED ODDS RATIO (LOG) | TOTAL EMPLOYMENT RANK |
|---|-----------------|---------------------------|--|----------------------------------|-----------------------|
| Nursing Care Facilities | 1052 | 73.90 | 89.10 | -0.799 | 10 |
| Full-Service Restaurants | 45 | 38.17 | 65.63 | -0.738 | 6 |
| Pulp, Paper & Paperboard Mills | 52 | 17.67 | 34.79 | -0.732 | 49 |
| Animal Slaughtering & Processing | 53 | 17.51 | 27.48 | -0.706 | 23 |
| General Medical & Surgical Hospitals | 1644 | 67.25 | 81.26 | -0.691 | 1 |
| Grocery Stores | 292 | 36.47 | 56.13 | -0.679 | 2 |
| Community Care Facilities for the Elderly | 455 | 67.27 | 88.10 | -0.648 | 45 |
| Limited-Service Eating Places | 16 | 31.54 | 68.92 | -0.648 | 33 |
| General Freight Trucking | 61 | 24.67 | 60.71 | -0.619 | 32 |
| Printing & Related Support Activities | 310 | 28.21 | 42.23 | -0.603 | 35 |

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some of these industries there may be competing explanations for how individuals become managers, which might cause some industries to be lower ranked. For example, in grocery stores, managers might actually come from the EEO-1 job group of laborers (specifically, stockers). The same may be true of the restaurant industries, where managers might have been promoted from the service worker job category as well as from white collar positions. Also, note that an industry such as "Nursing Care Facilities" can be highly ranked based on the percentage of women managers but still exhibit low odds that women are managers because the employment of women in their white collar positions is very high.



EXAMINATION OF OFFICIALS AND MANAGERS AT HEADQUARTERS

In order to better analyze the glass ceiling issue under the limitations of EEO-1 data, officials and managers at a company's headquarters were examined in greater detail. This type of analysis is based on the concept that officials and manager jobs at the headquarters facility are thought of as higher level positions, much closer to the "glass ceiling." These positions are viewed as being more prestigious, higher paying and more powerful in the sense that headquarters facilities are often responsible for monitoring and directing other company establishments. The 2002 EEO-1 data are summarized to allow this type of analysis. Firm-level data are aggregated in a manner that allows the distinction between employees at headquarters and employees at other establishments.¹¹

A number of screens were also instituted so that the data are more likely to reflect those situations where assumptions about officials at headquarters are most likely to be valid. To be included a firm must (1) be a multi-establishment company, (2) have more than one official and manager at the headquarters facility, (3) have more than one official and manager in all field units combined, (4) have more officials and managers in the field than at headquarters, (5) have more than 50 employees at headquarters, and (6) have more than 50 employees in all other establishments combined. These requirements, though necessary to make certain that the analysis is appropriate, substantially reduce the number of firms analyzed.

There were 25,681 headquarter facilities that filed EEO-1 reports in 2002. Of these, 872 reported zero employment and were eliminated.¹² This reduces the number of observations from 25,681 to 24,809. There are 9,842 establishment reports where there are headquarters units but no field units. These firms have small facilities and thus are not required to file separate establishment reports. The requirement that the firm have at least one official and manager reduces the sample by 127; another

¹¹ For convenience, these other establishments will also be referred to as field establishments, but their actual geographic relationship with the headquarters facility is not examined.

¹² Zero employment is a valid response as some multi-establishment firms may operate without a headquarters facility.

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300 are removed by the requirement that there be at least one official and manager outside of the headquarters unit. The requirement that there be more officials and managers in the field than at headquarters reduces the firms analyzed to 6,667. The requirement that there be 50 employees at headquarters and at the other establishment reduces the sample size to 4,198 companies. While this is less than 20 percent of all possible firms, the reduction may be a good reflection of those employers where glass ceiling problems are likely to be the most relevant and have the largest impact.

It is important to keep in mind that the percentages reported below refer to the relevant firms in an industry rather than all firms in the industry. Additionally, industry designation comes from the headquarters unit which is the primary industry of the firm but the “field” establishments can come from other industries not captured in this summary data.

Two types of analyses are utilized. The first reflects those situations where managers at non-headquarters facilities represent the selection pool for managers at headquarters facilities. Under this scenario, officials and managers in lower level establishments are likely to become officials and managers at the headquarters facility. This can be thought of as a vertical analysis of management positions at headquarters.¹³ The second analysis reflects those situations where the white collar employees at headquarters represent the selection pool of managers at headquarters facilities. Under this scenario, it is the white collar workers already at headquarters who are likely to become the officials and managers at headquarters. This can be thought of as a horizontal analysis of management positions at headquarters.

Vertical Analysis

Firms are examined to compare officials and managers at headquarters to officials and managers at their field establishments. As before, an odds ratio test is utilized where the target position is officials and managers at headquarters and the pool is the officials and managers at their other establishments. Once the relevant odds

¹³ In private correspondence, Donald Tomaskovic-Devey of North Carolina State University and Alexandra Kalev of Princeton University pointed out the importance of this process and pointed out how EEO-1 data could be utilized to reflect this scenario.

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ratios are computed for each firm, the median odds ratio and its logged value for industry is computed (again, the four-digit NAICS code is utilized) and the log of this value is used to sort the industries. Also, as before, in order to provide more meaningful results, the analysis is restricted to those 50 industries with the highest levels of employment.

Table 6 displays those industries where women have the highest odds of becoming officials and managers at headquarters facilities based on their employment as officials and managers at field units.

Table 6
Industries Where Women Have the *Highest* Odds of Being
Officials and Managers at Headquarters Based on Their Employment
as Field Officials and Managers
Selected From the Top 50 Industries Based on
Total Employment, Relevant Firms Only

| INDUSTRY | NUMBER OF FIRMS | PERCENT WOMEN MANAGERS | | MEDIAN LOGGED ODDS RATIO FIELD |
|---|-----------------|------------------------|-------|--------------------------------|
| | | HEAD-QUARTERS | FIELD | |
| Motor Vehicle Mfg | 9 | 29.46 | 15.39 | 1.00484 |
| Elec Pwr Generation, Transmsn & Distribution | 49 | 25.43 | 13.94 | 0.95232 |
| Aerospace Product & Parts Mfg | 16 | 26.85 | 15.33 | 0.70066 |
| General Freight Trucking | 30 | 27.95 | 14.33 | 0.66480 |
| Services to Buildings & Dwellings | 18 | 35.86 | 21.41 | 0.52551 |
| Building Material & Supplies Dealers | 21 | 33.23 | 18.65 | 0.47957 |
| Scrty & Comdty Contracts Intermed & Brokerage | 11 | 40.37 | 36.33 | 0.46262 |
| Computer & Peripheral Equipment Mfg | 21 | 30.06 | 26.03 | 0.44178 |
| Architectural, Engineering & Related Services | 82 | 21.18 | 14.43 | 0.43054 |
| Scheduled Air Transportation | 14 | 39.88 | 30.68 | 0.42112 |

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The industries with a high ranking represent a variety of industrial sectors including manufacturing, service, finance, utilities and transportation. The highest ranked industry is motor vehicle manufacturing, where 29.46 percent of officials and managers at headquarters facilities are women compared to just 15.39 percent in their field units.

Table 7
**Industries Where Women Have the Lowest Odds of Being
Officials and Managers at Headquarters Based on Their Employment
as Field Officials and Managers**
**Selected From the Top 50 Industries Based on
Total Employment, Relevant Firms Only**

| INDUSTRY | NUMBER OF FIRMS | PERCENT WOMEN MANAGERS | | MEDIAN LOGGED ODDS RATIO FIELD |
|---|-----------------|------------------------|-------|--------------------------------|
| | | HEAD-QUARTERS | FIELD | |
| Nursing Care Facilities | 49 | 58.36 | 82.77 | -0.92316 |
| Community Care Facilities for the Elderly | 26 | 56.12 | 72.62 | -0.85599 |
| General Medical & Surgical Hospitals | 150 | 53.60 | 71.30 | -0.77979 |
| Other Ambulatory Health Care Services | 50 | 52.66 | 63.44 | -0.65155 |
| Offices of Physicians | 22 | 65.38 | 73.87 | -0.43167 |
| Agencies & Other Insurance Related Activities | 32 | 42.20 | 48.07 | -0.40129 |
| Depository Credit Intermediation | 116 | 42.12 | 49.43 | -0.33212 |
| Department Stores | 24 | 48.10 | 57.75 | -0.31380 |
| Insurance Carriers | 82 | 43.97 | 49.98 | -0.29951 |
| Data Processing Services | 25 | 36.09 | 39.30 | -0.26496 |

Table 7 displays those industries from the top 50 industries that have the lowest odds of women being officials and managers at headquarters locations based on their employment as officials and managers in the firm's other establishments. Here

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the industries are strikingly similar, as they are heavily represented by health care-based industries. However, some of the other industries on the list, such as Depository Credit Intermediation (such as commercial banking) and Department Stores, are interesting because the distinction between field and headquarters activity could be somewhat different. In examining the rankings, it can be somewhat difficult to distinguish those industries where there may be some consistent limitation of opportunities for women managers from those situations where the presumed model of movement of managers from field establishments to headquarter establishments does not capture functional practices. Therefore, the second analytic approach is added.

Horizontal Analysis

Firms are examined to compare officials and managers at headquarters to white collar workers at headquarters. This analysis recognizes that there are firms where there are unique qualifications for officials and managers at the headquarters facility and that these requirements are more likely to be found among the white collar workers at headquarters than managers in the field. Once the pool and target positions are limited to headquarters facilities, the analysis follows that is used above in comparing all officials and managers to all white collar employees. This includes the definition of white collar employees as professionals, technicians and sales workers and the weighting of those job groups based on their relationship with the official and manager positions. Table 8 displays the ten industries, of the 50 largest industries, ranked the highest with respect to the odds of women being officials and managers at headquarters based on their employment in white collar positions at headquarters.

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Table 8
**Industries Where Women Have the *Highest* Odds of Being
Officials and Managers at Headquarters Based on Their Employment as
Professionals, Technicians and Sales Workers at Headquarters
Selected From the Top 50 Industries Based on
Total Employment, Relevant Firms Only**

| INDUSTRY | NUMBER OF FIRMS | PERCENT WOMEN AT HEADQUARTERS | | MEDIAN LOGGED ODDS RATIO WHITE COLLAR |
|---|-----------------|-------------------------------|--------------|---------------------------------------|
| | | MANAGERS | WHITE COLLAR | |
| Legal Services | 37 | 49.75 | 45.24 | 0.61157 |
| Employment Services | 24 | 50.37 | 46.50 | 0.13853 |
| Scrty & Comdty Contracts Intermed & Brokerage | 11 | 40.37 | 40.03 | 0.08660 |
| Telecommunications | 53 | 39.47 | 42.57 | 0.04311 |
| Offices of Physicians | 22 | 65.38 | 76.79 | 0.03573 |
| Scheduled Air Transportation | 14 | 39.88 | 45.86 | 0.03153 |
| Computer Systems Design & Related Services | 53 | 31.14 | 30.95 | 0.02029 |
| Business Support Services | 85 | 36.84 | 39.36 | 0.00293 |
| Nav/Measuring/Medical/Control Instruments Mfg | 30 | 27.76 | 31.03 | -0.04486 |
| Nursing Care Facilities | 49 | 58.36 | 73.46 | -0.06558 |

The highly ranked industries here are somewhat consistent in their need for high-level professional workers. Legal Services is the highest ranked of the industries where women make up 49.75 percent of officials and managers at headquarters and 45.24 percent of the white collar work force. There may be some bias here to the extent that non-attorney office managers are classified in the official and manager category. It is interesting to note that Security Brokers and Scheduled Air Transportation are ranked high using either field manager and white collar pools.

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Table 9 shows the ten industries, of the 50 largest industries, ranked the lowest with respect to the odds of women being officials and managers at headquarters based on their employment in white collar positions at headquarters.

Table 9
**Those Industries Where Women Have the Lowest Odds of Being
Officials and Managers at Headquarters Based on Their Employment as
Professionals, Technicians and Sales Workers at Headquarters
Selected From the Top 50 Industries Based on
Total Employment, Relevant Firms Only**

| INDUSTRY | NUMBER OF FIRMS | PERCENT WOMEN AT HEADQUARTERS | | MEDIAN LOGGED ODDS RATIO WHITE COLLAR |
|--|-----------------|-------------------------------|--------------|---------------------------------------|
| | | MANAGERS | WHITE COLLAR | |
| Investigation & Security Services | 29 | 26.03 | 43.62 | -0.72051 |
| Full-Service Restaurants | 72 | 30.84 | 49.92 | -0.69916 |
| Other Fabricated Metal Product Mfg | 32 | 20.82 | 33.47 | -0.69755 |
| Motor Vehicle Body & Trailer Mfg | 14 | 16.97 | 26.31 | -0.65233 |
| Converted Paper Product Mfg | 37 | 22.53 | 35.80 | -0.64816 |
| Motor Vehicle Mfg | 9 | 29.46 | 43.63 | -0.64132 |
| Elec Pwr Generation, Transmsn & Distribution | 49 | 25.43 | 36.89 | -0.58657 |
| Professional & Commercial Equip & Supp Whsle | 29 | 27.81 | 39.82 | -0.54981 |
| Community Care Facilities for the Elderly | 26 | 56.12 | 76.29 | -0.54826 |
| Couriers | 7 | 28.49 | 25.02 | -0.54308 |

The lowest ranked industry is Investigation and Security Services, where women make up 43.62 percent of white collar jobs at headquarters but just 26 percent of officials and managers there. One of the striking characteristics of this ranking is that the two industries that were the highest ranked with respect to the odds of women being officials and managers at headquarters based on their employment as managers in the field are the lowest ranked when the pool becomes white collar

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employees at headquarters. These industries are Motor Vehicle Manufacturing and Electrical Power Generation, Transmission and Distribution.

It is useful, then, to examine all 50 of the largest industries to see those areas where the two alternative models are in agreement and where there is some consistency in their rankings. To simplify, the 50 industries were divided into thirds and classified as those having “high” odds ratios (women have high probabilities of being officials and managers), “low” odds ratios (women have low probabilities of being officials and managers) or they are rated between these two categories, “medium.” The industries are classified on the basis of the odds ratios where field managers are assumed to be the relevant pool and where headquarters white collar workers is the relevant pool. See Table 10.

It is interesting to note that those industries ranked the highest with respect to the employment of women as officials and managers at headquarters tend to have higher odds ratios for the headquarters white collar-based comparisons than the field managers-based comparisons. The opposite is true for those with the smallest percentage of women as officials and managers at headquarters. Those industries have higher odds ratios for the comparisons based on field officials and managers.

Table 10
Industries Sorted by Percent of Women Officials and Managers
Displaying Odds Ratio Ranking
Top 50 Industries Based on
Total Employment, Relevant Firms Only

| INDUSTRY | PERCENT WOMEN | | | ODDS RATIO RANKS | |
|---|------------------------------|-------------------|--------------------------------------|-------------------|--------------------------------------|
| | HEAD- QUARTERS MANGERS | FIELD MANAGERS | HEAD- QUARTERS WHITE COLLAR | FIELD MANAGERS | HEAD- QUARTERS WHITE COLLAR |
| Offices of Physicians | 65.38 | 73.87 | 76.79 | LOW | HIGH |
| Nursing Care Facilities | 58.36 | 82.77 | 73.46 | LOW | HIGH |
| Community Care Facilities for the Elderly | 56.12 | 72.62 | 76.29 | LOW | LOW |
| General Medical & Surgical Hospitals | 53.60 | 71.30 | 72.41 | LOW | LOW |
| Other Ambulatory Health Care Services | 52.66 | 63.44 | 64.26 | LOW | HIGH |
| Employment Services | 50.37 | 36.07 | 46.50 | MED | HIGH |
| Legal Services | 49.75 | 46.25 | 45.24 | LOW | HIGH |
| Department Stores | 48.10 | 57.75 | 55.25 | LOW | LOW |
| Traveler Accommodation | 46.39 | 43.01 | 50.75 | LOW | LOW |
| Insurance Carriers | 43.97 | 49.98 | 54.76 | LOW | MED |
| Agencies & Other Insurance Related Activities | 42.20 | 48.07 | 53.49 | LOW | MED |
| Depository Credit Intermediation | 42.12 | 49.43 | 49.99 | LOW | HIGH |
| Scrty & Comdty Contracts Intermed & Brokerage | 40.37 | 36.33 | 40.03 | HIGH | HIGH |
| Scheduled Air Transportation | 39.88 | 30.68 | 45.86 | HIGH | HIGH |

TABLE 10 Continued

| INDUSTRY | PERCENT WOMEN | | | ODDS RATIO RANK | |
|---|------------------------------|-------------------|--------------------------------------|-------------------|--------------------------------------|
| | HEAD- QUARTRS MANAGERS | FIELD MANAGERS | HEAD- QUARTERS WHITE COLLAR | FIELD MANAGERS | HEAD- QUARTERS WHITE COLLAR |
| Newspaper/Periodical/Book/Database Publishers | 39.51 | 38.18 | 50.55 | LOW | MED |
| Telecommunications | 39.47 | 42.09 | 42.57 | MED | HIGH |
| Other General Merchandise Stores | 39.34 | 33.12 | 46.22 | LOW | MED |
| Limited-Service Eating Places | 38.53 | 46.58 | 51.32 | LOW | MED |
| Nondepository Credit Intermediation | 37.45 | 47.16 | 51.76 | LOW | MED |
| Management, Sci & Tech Consulting Services | 36.98 | 35.38 | 41.09 | MED | HIGH |
| Printing & Related Support Activities | 36.95 | 31.13 | 48.56 | MED | MED |
| Business Support Services | 36.84 | 34.09 | 39.36 | MED | HIGH |
| Data Processing Services | 36.09 | 39.30 | 45.85 | LOW | HIGH |
| Pharmaceutical & Medicine Mfg | 36.07 | 34.31 | 51.80 | MED | MED |
| Services to Buildings & Dwellings | 35.86 | 21.41 | 38.94 | HIGH | MED |
| Scientific R&D Services | 34.87 | 27.98 | 44.71 | MED | HIGH |
| Building Material & Supplies Dealers | 33.23 | 18.65 | 48.87 | HIGH | LOW |
| Medical Equipment & Supplies Mfg | 32.12 | 34.93 | 44.67 | MED | MED |
| Grocery Stores | 32.06 | 37.57 | 45.17 | MED | MED |
| Computer Systems Design & Related Services | 31.14 | 32.36 | 30.95 | MED | HIGH |
| Full-Service Restaurants | 30.84 | 29.52 | 49.92 | MED | LOW |
| Computer & Peripheral Equipment Mfg | 30.06 | 26.03 | 32.94 | HIGH | HIGH |
| Motor Vehicle Mfg | 29.46 | 15.39 | 43.63 | HIGH | LOW |
| Other Miscellaneous Mfg | 28.60 | 25.88 | 46.90 | MED | MED |

Table 10 Continued

| INDUSTRY | PERCENT WOMEN | | | ODDS RATIO RANK | |
|--|-------------------------------|-------------------|----------------------------|-------------------|----------------------------|
| | HEAD- QUARTERS MANAGERS | FIELD MANAGERS | HEAD- QUARTERS WHITE | FIELD MANAGERS | HEAD- QUARTERS WHITE |
| Couriers | 28.49 | 24.90 | 25.02 | HIGH | LOW |
| General Freight Trucking | 27.95 | 14.33 | 47.13 | HIGH | MED |
| Professional & Commercial Equip & Supp Whsle | 27.81 | 28.04 | 39.82 | MED | LOW |
| Nav/Measuring/Medical/Control Instruments Mfg | 27.76 | 20.28 | 31.03 | HIGH | HIGH |
| Grocery & Related Product Whsle | 27.02 | 25.02 | 37.70 | MED | MED |
| Aerospace Product & Parts Mfg | 26.85 | 15.33 | 36.60 | HIGH | LOW |
| Investigation & Security Services | 26.03 | 21.01 | 43.62 | HIGH | LOW |
| Elec Pwr Generation, Transmsn & Distribution | 25.43 | 13.94 | 36.89 | HIGH | LOW |
| Semiconductor & Oth Electronic Component Mfg | 24.22 | 20.81 | 29.85 | HIGH | HIGH |
| Converted Paper Product Mfg | 22.53 | 17.98 | 35.80 | MED | LOW |
| Animal Slaughtering & Processing | 22.50 | 19.17 | 42.71 | HIGH | MED |
| Architectural, Engineering & Related Services | 21.18 | 14.43 | 27.10 | HIGH | MED |
| Other Fabricated Metal Product Mfg | 20.82 | 15.59 | 33.47 | MED | LOW |
| Plastics Product Mfg | 19.64 | 16.41 | 30.31 | HIGH | LOW |
| Motor Vehicle Parts Mfg | 18.25 | 13.89 | 25.25 | HIGH | MED |
| Motor Vehicle Body & Trailer Mfg | 16.97 | 15.38 | 26.31 | MED | LOW |
| N = 50 | | | | | |



RELATIONSHIPS AMONG THE RECRUITING POOLS

The previous section indicates that the top 50 industries can be viewed in several different ways, many of which overlap. Do the EEO-1 data suggest any general patterns in the access to headquarters management for women? This section examines the relationships among the recruiting pools for upper-level management (field management and headquarters white collar employees) and explore how these relationships can be explained by the characteristics of an industry's workforce.

Some of the key characteristics appear to be reflected in the differences between manufacturing industries with a high proportion of blue collar workers in field operations and service industries with a low proportion of blue collar workers in field operations. Although it would be difficult to prove, it seems plausible that the distinction between manufacturing and service industries captures, in part, some important differences in how employees become headquarters managers. For example, blue collar industries may place a greater priority on operational experience, a culture that values hands-on exposure to specific mills or assembly lines where women may lack that experience. Service industries, on the other hand, may place a greater priority on educational skills and training, especially in legal and medical contexts where women may be better represented.

Table 11 summarizes the overall relationships among the variables in this study using correlation coefficients. Correlation coefficients measure the strength and direction of the relationship between two variables. The correlation values range from +1.0 to -1.0. Values approaching 1.0 indicate a strong, positive relationship, i.e., increases in one variable are associated with increases in the other variable. Values approaching -1.0 indicate a strong negative relationship, that is, increases in one variable are associated with decreases in the other variable. Values approaching 0.0 indicate little or no relationship between the variables. Correlation coefficients are designed to capture "straight-line" or linear associations that move up or down in a uniform fashion as the values of the variables become larger or smaller. Correlation coefficients are also symmetric. The correlation between variables A and B is the same as the correlation between variables B and A.

Table 11 describes selected summary measures for the top 50 industries as measured by total employment. There are three major types of variables: the proportion of women in selected field and headquarters job groups, the odds ratios

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between the number of men and women in the different job groups, and the proportion of blue collar workers in field operations. To simplify the exposition, Table 11 only displays a given correlation once. The duplicate correlation values in the lower-left section of Table 11 have been eliminated. All of the correlation values in Table 11 are statistically significant at probability levels of 0.05 or less except for two values in the right-most column (-0.017 and -0.181).

**Table 11
Headquarters Management
Versus Field Management and Headquarters White Collar
Correlation Matrix**

| Pearson Correlation Coefficients, N = 50 | | | | | | |
|---|------------------------------|-------|----------------------------------|-------------------|--------------------------|----------------------------|
| | PROPORTION OF WOMEN MANAGERS | | PROPORTION | | MEDIAN LOGGED ODDS RATIO | |
| | HEAD-QUARTERS | FIELD | HEAD-QUARTERS WHITE COLLAR WOMEN | BLUE COLLAR FIELD | FIELD MANAGERS | WHITE COLLAR HEAD-QUARTERS |
| | | | | | | |
| HEADQUARTERS MANAGERS PROPORTION WOMEN | 1.000 | 0.915 | 0.809 | -0.670 | -0.726 | 0.446 |
| FIELD MANAGERS PROPORTION WOMEN | | 1.000 | 0.820 | -0.654 | -0.893 | 0.316 |
| HEADQUARTERS WHITE COLLAR PROPORTION WOMEN | | | 1.000 | -0.459 | -0.717 | -0.017 |
| PROPORTION BLUE COLLAR FIELD OPERATIONS | | | | 1.000 | 0.518 | -0.409 |
| MEDIAN LOGGED ODDS RATIO FIELD TO HEADQUARTERS | | | | | 1.000 | -0.181 |
| MEDIAN LOGGED ODDS RATIO WHITE COLLAR TO MANAGERS | | | | | | 1.000 |

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There appear to be strong positive relationships among the target population and the two recruiting pools identified in this study. The correlations range from 0.809 to 0.915. The greater the proportion of women in headquarters management, the greater the proportion of women in field management and the greater the proportion of women in white collar job groups. As a general rule, industries with a low proportion of women in headquarters management have a low proportion of women in their respective recruiting pools (field management and white collar jobs at headquarters). Conversely, industries with a high proportion of women in headquarters management have a high proportion of women in their respective recruiting pools (field management and white collar jobs at headquarters).

Although it may not be surprising to find upper-level women managers in industries with a high proportion of women, this does not mean that all industries employ women in similar ways. Different industries appear to have different kinds of employment disparities. Industries with a high proportion of women in headquarters management are more likely to have disparities from field management sources and less likely to have disparities from white collar sources. Conversely, industries with a low proportion of women in headquarters management are less likely to have disparities from field management sources and more likely to have disparities from white collar sources. These relationships reflect opposite signs between the two odds ratio disparity measures. The correlation between the proportion of women in headquarters management and the field odds ratio has a negative value of -0.726; that is, as the proportion of women managers at headquarters increases, the odds of women becoming headquarters managers based on their employment as field managers decreases. The correlation between the proportion of women in headquarters management and the white collar odds ratio has a positive value of 0.446; that is, as the proportion of women managers at headquarters increases, the odds of women becoming headquarters managers based on their employment as white collar workers at headquarters increases. In other words, the source of potential gender inequalities tends to shift from white collar disparities to field disparities as the proportion of women in headquarters management increases.

Many of the relationships in Table 11 appear to be strongly affected by the proportion of blue collar workers in field operations. In absolute terms (disregarding plus and minus signs), the correlations with the proportion of field blue collar workers range from 0.409 to 0.670. Perhaps the most important relationship is the negative association between the proportion of women in headquarters management and the proportion of blue collar workers in the field. The correlation value is -0.670,

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indicating an inverse relationship: the greater the proportion of blue collar workers in the field, the smaller the proportion of women in headquarters management. The proportion of blue collar workers also affects the relative salience of the different employment disparities. Industries with a high proportion of blue collar workers in the field have a low proportion of women in headquarters management and a higher likelihood of white collar recruitment disparities. Industries with a low proportion of blue collar workers in the field have a high proportion of women in headquarters management and a higher likelihood of field employment disparities. Analogous to headquarters results discussed above, these relationships reflect opposite signs between the two odds ratio disparity measures. The correlation between the proportion of blue collar workers in field operations and the field odds ratio has a positive value of 0.518. The correlation between the proportion of blue collar workers in field operations and the white collar odds ratio has a negative value of -0.409. In other words, once one recognizes that the proportion of blue collar workers is inversely related to the proportion of women in headquarters management, both variables have similar effects on field and white collar employment disparities.

While both of the odds ratio measures are related to the proportion of blue collar workers in field operations, it is important to recognize that the odds ratio measures are not closely associated with each other. The correlation between the field odds ratio measure and the white collar odds ratio measure is -0.181, a value that could arise by chance about one time out of five (a probability value of 0.208). This general lack of association can be interpreted in various ways. It is possible that industries might not be expected to use both types of selection pools for headquarters managers. Alternatively, it may be that neither recruitment perspective is appropriate for selected industries. For example, some industries may rely extensively on external hires rather than internal promotions for filling management positions at headquarters. It is also possible that the underlying relationships does not fit a simple "straight-line" model. For example, the measures may be negatively related in some industries and positively related in other industries. In any case, readers should recognize that the field and white collar measures used in this study tend to operate somewhat independently when applied to a wide variety of different industries.



Blue Collar Industries

In order to clarify these relationships, it is helpful to examine specific industries in more detail. Table 12 reports selected statistics for the ten industries with highest proportion of blue collar workers in field operations. Not surprisingly, most of these industries are in the manufacturing sector (for example, Plastics, Paper Products, Motor Vehicles, Fabricated Metals). The percentage of blue collar workers in field operations ranges from 65 percent to 86 percent. The percentage of women in headquarters management is substantially lower, ranging from 17.3 percent to 29.5 percent. Even though the proportion of women in these industries is relatively low, there is always a higher proportion of women in headquarters management than in field management. The ratio of headquarters management to field management in each of the ten industries is consistently greater than 1.0. For example, in the Motor Vehicles Manufacturing industry, the percentage of women in headquarters management and field management is respectively 29.5 percent and 15.4 percent (a ratio of 1.9). Likewise, in the Fabricated Metal Products Manufacturing industry, the percentage of women in headquarters management and field management is respectively 21.5 percent and 15.7 percent (a ratio of 1.4). Consequently, all of these industries have positive median logged odds ratios ranked in the middle or upper-end of the field odds ratio distribution, indicating results more favorable to women employees.

On the other hand, the opposite pattern can be found among white collar workers at headquarters in Table 12. Nine out of ten of these industries have a smaller proportion of women in headquarters management than in headquarters white collar positions. With the exception of the courier industry, the ratio of management at headquarters to white collar jobs at headquarters is consistently less than 1.0. For example, in the Plastics Products Manufacturing industry, the percentage of women in headquarters management and headquarters white collar is respectively 20.3 percent and 29.9 percent (a ratio of 0.7). Likewise, in the Converted Paper Products Manufacturing industry, the percentage of women in headquarters management and headquarters white collar positions is respectively 23.1 percent and 33.3 percent (also, a ratio of 0.7). Consequently, all of these industries have negative median logged odds ratios ranked in the middle or lower end of the white collar odds ratio distribution, indicating results less favorable to women employees.

For blue collar industries, the industry rankings suggest that women in field management jobs are more likely to become headquarters managers than those women working in white collar jobs at headquarters. There are many ways of

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interpreting these relationships. It is possible that blue collar industries place a high priority on operational experience at the field level. It is possible that managers at headquarters have negative stereotypes about the skills and abilities of women who come from white collar positions. It is possible that corporate officials often perform

**Table 12
Headquarters Officials and Managers Versus
Field Officials and Managers and Headquarters White Collar
Industries with the Highest Proportion of
Blue Collar Workers at Field Establishments
Selected From the Top 50 Industries Based on
Total Employment, Relevant Firms Only**

| INDUSTRY | PER- CENTAGE BLUE COLLAR FIELD | PERCENTAGE WOMEN | | | MEDIAN LOGGED ODDS RATIO | | ODDS RATIO RANK | |
|------------------------------------|--|-------------------------------|-------------------|--------------------------------------|-----------------------------|-----------------|-----------------|-----------------|
| | | HEAD- QUARTERS MANAGERS | FIELD MANAGERS | HEAD- QUARTERS WHITE COLLAR | FIELD | WHITE COLLAR | FIELD | WHITE COLLAR |
| Animal Slaughtering & Processing | 86.0 | 22.8 | 19.2 | 46.3 | 0.376 | -0.350 | HIGH | MED |
| General Freight Trucking | 77.1 | 28.3 | 14.4 | 43.4 | 0.665 | -0.431 | HIGH | MED |
| Motor Vehicle Body & Trailer Mfg | 75.6 | 17.3 | 15.5 | 28.0 | 0.122 | -0.652 | MED | LOW |
| Motor Vehicle Parts Mfg | 75.4 | 18.6 | 14.0 | 25.6 | 0.304 | -0.277 | HIGH | MED |
| Plastics Product Mfg | 74.9 | 20.3 | 16.7 | 29.9 | 0.243 | -0.511 | HIGH | LOW |
| Couriers | 72.5 | 28.5 | 24.9 | 25.0 | 0.406 | -0.543 | HIGH | LOW |
| Converted Paper Product Mfg | 71.4 | 23.1 | 18.1 | 33.3 | 0.154 | -0.648 | MED | LOW |
| Motor Vehicle Mfg | 67.9 | 29.5 | 15.4 | 43.6 | 1.005 | -0.641 | HIGH | LOW |
| Other Fabricated Metal Product Mfg | 66.5 | 21.5 | 15.7 | 32.6 | 0.234 | -0.698 | MED | LOW |
| Other Miscellaneous Mfg | 65.0 | 29.1 | 26.1 | 43.6 | 0.111 | -0.462 | MED | MED |

specialized tasks that are centralized at the headquarters level. For example, many corporate headquarters, particularly in a manufacturing context, house white collar functions (such as human resources, marketing, and long-range planning) not found in field operations. At least some of these specialized corporate functions may have

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career paths favorable to women (either because they represent what is traditionally viewed as women's occupations or because women have recently entered jobs previously dominated by men). If so, it is likely that a certain number of management jobs at headquarters will oversee or supervise these white collar jobs, producing openings for women to move from white collar to management positions at headquarters. As a result, the proportion of women in headquarters management positions is likely to be higher than the proportion of women in field management. In situations where women are rarely promoted from field positions to corporate headquarters, one would then have the somewhat paradoxical result that the proportion of women in management positions at headquarters could well exceed the proportion of women in field management positions, producing an odds ratio favorable to women (i.e., proportionately more women in headquarters management than field management). By contrast, the proportion of women in headquarters white collar positions is likely to exceed, often by a large amount, the proportion of women in headquarters management, producing an odds ratio unfavorable to women (i.e., proportionately fewer women in headquarters management than headquarters white collar jobs). Thus, in the absence of the data on individual firms (especially the career paths to upper-level management and relative frequency of internal versus external recruiting), one could easily misinterpret white collar recruitment (where mobility for women may be high) as a more serious obstacle to gender advancement than field recruitment (where mobility for women may be low).

Non-Blue Collar Industries

Table 13 reports similar statistics for the ten industries with lowest proportion of blue collar workers in field operations. Most of these industries are in the service sector (e.g., legal services, insurance, data processing, nursing care). The percentage of blue collar workers in field operations ranges from 0.2 percent to 3.1 percent. The percentage of women in headquarters management is substantially higher, ranging from 26.6 percent to 65.0 percent. Although the proportion of women in these industries is relatively high, seven out of ten of industries have a higher proportion of women in field management than in headquarters management. For example, in the nursing care industry, the percentage of women in headquarters management and field management is 58.2 percent and 82.7 percent respectively (a ratio of 0.7). Consequently, eight out of ten industries have negative median logged odds ratios ranked in the lower end of the field management odds ratio distribution, indicating results less favorable to women employees.

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The relationships among the three types of measures (job group proportions, median logged odds ratios, and the rankings for the logged odds ratios) are less clear-cut for white collar employees. The industry rankings in Table 13 for the white collar median logged odds ratio tend to be higher than the field median logged odds ratios. Seven out of ten of the non-blue collar industries have median logged odds ratios ranked in the upper end of the white collar odds ratio distribution, indicating results more favor to women employees. It should be noted, however, that eight out of ten of the non-blue collar industries have a higher proportion of women in headquarters white collar positions than in headquarters management positions. In addition, half of the non-blue collar industries have field and white collar median logged odds ratios with the same sign (i.e., both have negative values).¹⁴ These relationships among the different types of measures are due, in part, to the relatively large proportion of women in headquarters white collar positions which range in size from 34.7 percent to 66.3 percent.

For non-blue collar industries, the industry rankings suggest that women in white collar jobs at headquarters are more likely to become headquarters managers than those women working as field managers. Again, there are many ways of interpreting these results. For example, it may be easier for women in the field to move into management positions, thus producing a relatively large pool of women field managers, particularly in nursing care. Since the proportion of women in field management tends to be higher than the proportion of women in headquarters management, the logged odds ratio statistics are negative, indicating disparities unfavorable to women. Conversely, white collar positions at headquarters may include many positions typically held by men (e.g., in finance or in-house counsel) leading to a lower proportion of white collar women employees in headquarters. If so, the proportion of women in white collar positions at headquarters would be somewhat reduced, leading to odds ratio statistics that are more favorable to women.

¹⁴ The field logged odds ratio distribution for all 50 industries has a mean value of 0.095, and the white collar logged odds ratio distribution has a mean of -0.3098. Non-blue collar industries in the lower end of the field logged odds ratio distribution and the upper end of the white collar logged odds ratio both have negative values. For example, three non-blue collar industries, data processing, other ambulatory health care, and nursing care, all ranked high on the white collar logged odds ratio distribution even though their absolute logged odds ratio values are less than zero (-0.108, -0.155, and -0.06 respectively).

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In short, while the EEO-1 data provide a powerful tool for screening potential barriers to advancement by women, its application to any given firm or industry needs to be supplemented with more detailed information on actual career paths and promotion practices. Employers might find it useful to explore the findings provided above to examine their own practices.

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Table 13
Headquarters Officials and Managers Versus
Field Officials and Managers and Headquarters White Collar
Industries with the Lowest Proportion of
Blue Collar Workers at Field Establishments
Selected From the Top 50 Industries Based on
Total Employment, Relevant Firms Only

| INDUSTRY | PER- CENTAGE BLUE COLLAR FIELD | PERCENTAGE WOMEN | | | MEDIAN LOGGED ODDS RATIO | | ODDS RATIO RANK | |
|---|--|-------------------------------|-------------------|--------------------------------------|--------------------------------|-----------------|-----------------------|-----------------|
| | | HEAD- QUARTERS MANAGERS | FIELD MANAGERS | HEAD- QUARTERS WHITE COLLAR | FIELD | WHITE COLLAR | FIELD | WHITE COLLAR |
| Legal Services | 0.2 | 49.8 | 46.3 | 44.6 | -0.129 | 0.612 | LOW | HIGH |
| Scrty & Comdty Contracts Intermed & Brokerage | 0.3 | 40.5 | 36.4 | 34.7 | 0.463 | 0.087 | HIGH | HIGH |
| Offices of Physicians | 0.4 | 65.0 | 73.8 | 66.3 | -0.432 | 0.036 | LOW | HIGH |
| Depository Credit Intermediation | 0.6 | 42.2 | 49.4 | 46.6 | -0.332 | -0.183 | LOW | HIGH |
| Insurance Carriers | 0.7 | 44.0 | 50.0 | 52.0 | -0.300 | -0.335 | LOW | MED |
| Agencies & Other Insurance Related Activities | 0.8 | 42.3 | 48.1 | 50.2 | -0.401 | -0.369 | LOW | MED |
| Data Processing Services | 2.3 | 36.2 | 39.3 | 43.4 | -0.265 | -0.108 | LOW | HIGH |
| Other Ambulatory Health Care Services | 2.6 | 52.6 | 63.4 | 57.2 | -0.652 | -0.155 | LOW | HIGH |
| Investigation & Security Services | 2.9 | 26.6 | 21.1 | 43.7 | 0.307 | -0.721 | HIGH | LOW |
| Nursing Care Facilities | 3.1 | 58.2 | 82.7 | 62.7 | -0.923 | -0.066 | LOW | HIGH |



CONCLUSION

The main purpose of this report has been to use data from the 2002 EEO-1 Survey of Firms in Private Industry to explore the status of women in management. The research attempted to develop some new ways of analyzing the EEO-1 data, especially by focusing on potential differences between management at headquarters and management in the field. While there are a number of specific findings, the primary contribution of these analyses of the EEO-1 survey is the ability to raise important problems and questions about gender-based discrimination given the wide variations in the types of firms and industries in the American economy.

Gender discrimination is likely to be manifested in different (and often very subtle) ways, depending on work force characteristics. For example, the American economy has many multinational corporations with large headquarters staff as well as extensive operations in the field. It also has a substantial number of firms with either small field operations or few employees located at the firm's headquarters. Likewise, the American economy has manufacturing establishments with a high percentage of blue-collar workers and service establishments with few, if any, blue-collar workers. While it is difficult to specify the precise causes, it seems evident that management recruitment patterns in blue-collar industries differ substantially from management recruitment patterns in service industries.

This report should provide a "springboard" that will encourage readers to discuss, identify and reduce attitudinal and other forms of organizational barriers women and minorities encounter in advancing to management in different kinds of workplace settings.

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ADDITIONAL INFORMATION

For additional information, visit our web site at <http://www.eeoc.gov>. Click on *STATISTICS* and *JOB PATTERNS FOR MINORITIES AND WOMEN* (<http://www.eeoc.gov/stats/jobpat/jobpat.html>) for sample copies of the EEO-1 form, an instruction booklet and aggregate statistics.

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