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THE GENDER GAP IN TOP CORPORATE JOBS

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Using the ExecuComp data set, which contains information on the five highest-paid executives in each of a large number of U.S. firms for the years 1992–97, the authors examine the gender compensation gap among high-level executives. Women, who represented about 2.5% of the sample, earned about 45% less than men. As much as 75% of this gap can be explained by the fact that women managed smaller companies and were less likely to be CEO, Chair, or company President. The unexplained gap falls to less than 5% with an allowance for the younger average age and lower average seniority of the female executives. These results do not rule out the possibility of discrimination via gender segregation or unequal promotion. Between 1992 and 1997, however, women nearly tripled their participation in the top executive ranks and also strongly improved their relative compensation, mostly by gaining representation in larger corporations.

This paper analyzes gender differences among top executives in a large set of U.S. public corporations. Our motivation for undertaking this study is twofold. First and foremost is the fact that, notwithstanding the curiosity this topic raises both in the media and in policy circles,[1] we know of no systematic study to date of how well women are doing in top corporate jobs. We provide the first detailed description of the relative position of female top executives in the 1990s.

Our second motivation is more academic. Problems plaguing many past studies of the gender pay gap—in particular, unobserved characteristics of both workers and jobs—are likely to be less present in this specific occupational group. Most of the previous work has indeed identified an unexplained gender gap that cannot be attributed to

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[1]See, for example, Catalyst (1999), Morris (1998), Jones (1999), and Meyer (1999).

Some of the data used in this study are from Standard and Poor's ExecuComp data base and must be purchased from Standard and Poor's. Computer programs used in the analysis are available from the authors upon request. The first drafts of this paper were written while Bertrand was on the faculty at Princeton and Hallock was visiting the Industrial Relations Section at Princeton.

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observable differences between men and women.[2] While this unexplained gap could be due to labor market discrimination, it could also be attributable to differences between men and women that are unobservable (at least to the econometrician), such as a relative lack of long-term career commitment among women.[3] It is reasonable to assume that such unobservable differences are minimized in the group of top executives we propose to study. Men and women in this sample are likely to be similar in that both share a high level of job motivation and high career ambitions.

Several authors have previously examined gender pay differences among the highly paid. Examples include investigations of lawyers by Wood, Corcoran, and Courant (1993), and Biddle and Hamermesh (1998); of university faculty by Barbezat (1987), Barbezat and Hughes (1990), Ferber and Greene (1982), Gander (1997), Hoffman (1976), Johnson and Stafford (1974), Katz (1973), and Ransom and Megdal (1993); of engineers by Morgan (1998); of physicians by Baker (1995); and of firm managers in the United Kingdom by Gregg and Machin (1993).[4] No one before, however, has focused on gender compensation differentials among top executives. There have been two substantial barriers to conducting an investigation such as ours. First, the required data simply did not exist before. Second, it has been widely believed that too few women were in these top positions to carry out a formal analysis of their relative pay.

We use Standard and Poor's ExecuComp data, which contain information on compensation for the top five executives for all firms in the S&P 500, S&P Midcap 400, and S&P SmallCap 600 for the years 1992–97. Included is information on base salary, bonus, and the value of granted stock options in the current year.[5] The ExecuComp data set has three main advantages for our purpose. First, it is very large. The sample we use in most of our analysis includes more than 42,000 executive-year observations. All publicly traded firms are required to disclose the names and compensation of the "top five" highest-paid employees annually. This large sample size is especially important for us because we want to estimate gender differences with sufficient statistical precision in an economic sector where female representation is small. A second advantage of the data set is that it covers a variety of occupational categories among the top managerial jobs and not only Chief Executive Officers (CEOs). We are thus able to investigate the importance of occupational differences at the top. Finally, because the data set covers a wide cross-section of firms, the role of firm size and industrial specialization in the gender compensation gap can be assessed.

The Gender Gap

The ExecuComp data set is unique for many reasons, including its wide variety of measures of compensation, details concerning firm characteristics, and large sample size. We can also arrange the data as a

[2]An exception is Groshen (1991). Groshen showed that most of the gender gap can be attributed to sex segregation rather than wage differences by sex within occupation, industries, and establishments. Using a larger sample but a similar empirical methodology, Bayard, Hellerstein, Neumark, and Troske (1999), however, found that a large part of the sex gap remains unexplained after accounting for sex segregation.

[3]Of course, it is also possible that lower pay leads to lower career commitment. In addition, it could be that some compensating differential exists whereby women on average select lower-paying jobs than men and, at the same time, enjoy amenities on these jobs that the higher-paying jobs lack. We cannot explore this issue empirically in this paper.

[4]Gregg and Machin (1993) explored pay gaps for a much more general class of managers than the class we focus on. Another study that focuses on such lower-level managers for the United States is Jacobs (1992).

[5]Most studies of CEO pay do not include the value of stock options granted in a given year. Hall and Liebman (1998), however, documented the growing importance of granted options in the compensation of CEOs since the early 1980s. ExecuComp reports this information, and we have included it in our total compensation measure.

Table 1. Summary Statistics on Compensation, 1992–97.
(Standard Errors in Parentheses)

Characteristic	*(1) All Managers*	*(2) Men*	*(3) Women*	*(4) p-Value*[a]
	Panel A: High-Level Managers[b]			
Total Current Pay[c]	1,323.0	1,333.7	894.1	0.000
	(13.8)	(14.1)	(58.1)	
Salary	336.3	338.6	246.9	0.000
	(1.0)	(1.0)	(6.1)	
Bonus	257.6	260.7	136.1	0.000
	(3.8)	(3.8)	(8.4)	
Other Annual Pay[d]	20.6	20.8	12.7	0.006
	(0.7)	(0.7)	(2.8)	
Value Granted Options[e]	489.7	492.6	370.8	0.003
	(10.5)	(10.7)	(39.5)	
N	46,708	45,574	1,134	
	Panel B: Managers from CPS[f]			
Annual Labor Earnings	45.6	52.4	36.0	0.000
	(0.09)	(0.13)	(0.11)	
N	73,411	43,011	30,400	

Sources: The data on high-level managers in panel A are from Standard and Poor's ExecuComp database for 1992–1997. The data on managers from the CPS are from the 1992 to 1997 Merged Outgoing Rotation Groups of the Current Population Survey.

Notes: All data are reported in real 1997 thousands of dollars adjusted using the consumer price index.

[a]This is the p-value for the difference in sample means between men and women within each row.

[b]High-level managers include the top five highest-paid executives in each firm in the ExecuComp database.

[c]Total current pay is the sum of salary, bonus, other annual pay, and the value of stock options granted in the current year.

[d]Other annual pay includes the dollar value of annual compensation not categorized as salary or bonus.

[e]Value of granted options is the value of stock options granted in the current period. This is not the value of options cashed in in a given year.

[f]The managers from the CPS are the set of full-time workers who report an occupation category between 3 and 22 in the 1980 Census of Population Occupation Classification. Annual income is constructed from average weekly earnings.

panel, since we have multiple observations on a set of firms over time. Most crucial for our work, however, is the identification of the gender of each manager. Given the substantial discussion of a dearth of women in managerial positions in the United States (see, for example, Catalyst 1999), we were concerned that examining the question of a compensation gap would be difficult. However, due to ExecuComp's substantial size, we were able to identify more than 1,134 female executive-year observations (449 unique individuals) on the basis of the gender variable included in the data. This is roughly 2.4% of all observations in the sample.

Panel A of Table 1 summarizes mean compensation by gender for the basic ExecuComp sample. The table displays total compensation but also decomposes total compensation into its major elements: salary, bonus, other annual compensation, and the value of options granted in the current year. Pooling all the ExecuComp years together, total compensation was, on average, 33% lower for women than for men.[6] On average, women earned a little

[6]When we later control for year effects, the gender gap in total compensation reaches about 45%, the number reported in the introductory paragraphs.

less than $900,000 (1997 dollars) in total compensation, compared to more than $1.3 million for the average male executive.

How does the gender gap among top-level managers compare to that among lower-level managers? Panel B addresses this question. We use the Merged Outgoing Rotation Groups of the Current Population Survey (CPS) over the same period, 1992–97. Given that the ExecuComp data are so specialized, we define a manager as anyone reporting that he or she worked in an "executive, administrative and managerial occupation," excluding "management related occupations."[7] We focus on full-time workers only, that is, individuals who worked at least 35 hours per week. Annual salaries are constructed based on average weekly earnings. One can see that the gender earnings gap among middle-level managers is very similar to that among top managers: about 46%.

We now consider gender differences in the composition of the compensation package. Several features are worth noticing. First, women seem to have received a larger share of their compensation in the form of stock options than did men. This pattern may reflect the fact that the sample of women was larger in the later years, when the use of stock options was more common.[8] Also, compared to men, women received less compensation in the form of bonuses and more in the form of salary.

Decomposing the Gender Gap

In this section, we investigate how various characteristics of female top executive employment might account for the gender gap. We explore issues such as firm size, industrial segregation, occupational segregation, and individual demographic characteristics.

The Role of Firm Size

Women in top managerial positions tended to work for much smaller corporations than did men. Panel A of Table 2 clearly illustrates this fact. Female executives' firms were 35–45% smaller, whether size is measured as the value of shareholder wealth, sales, total assets, or number of employees.[9] In an analysis not reported here, we found that companies of extreme size were chiefly responsible for the relationship between firm size and gender. We computed the fraction of women by deciles of firm market value. Women constituted about 3.5% of top management employment in the bottom two deciles and only 1% in the top decile. In all the other deciles, the fraction of women fluctuated between roughly 2% and 3%, and the decline was not monotonic in size.

It is a well-known fact in the executive compensation literature that CEOs tend to be paid more the larger the firm's size (Murphy 1985; Kostiuk 1990; Rosen 1992). If this pay-size correlation also holds for other top executives, it is reasonable to ask how much of the gender gap can be attributed to the under-representation of women in large firms. The first columns of Table 3 answer this question.

The dependent variable for all regressions in Table 3 is the logarithm of real total compensation. All regressions in the paper (Tables 3, 6, 8, and 9) include yearly time indicators, and standard errors are White-corrected standard errors. One can see in column (1) that the gender gap is larger, 44%, when one controls for year effects

Controlling for year effects is crucial, because, as we will show below (in the section "Trends in Participation and Earnings"), the number of women was larger in the later years of the sample, when compensation levels were on average higher.

[7]This corresponds to categories 3–22 in the 1980 Census of Population Occupation Classification. Obviously, this definition formally also includes higher-level managers. But because this group is small, most of the individuals in the CPS sample are lower-level managers.

[8]See the section "Trends in Participation and Earnings."

[9]Shareholder wealth is the total number of shares times the year-end share price. The correlation between ln(shareholder wealth) and ln(assets) is 0.8; between ln(shareholder wealth) and ln(number of employees), 0.7; and between ln(assets) and ln(employees), 0.7.

Table 2. Firm and Manager Characteristics.
(Standard Errors in Parentheses)

Characteristic	*(1) All Managers*	*(2) Men*	*(3) Women*	*(4) p-Value*[a]
		Panel A: Firms		
Market Value (millions)	3,768.7	3,799.3	2,538.3	0.000
	(45.7)	(46.4)	(245.4)	
Sales[b] (millions)	3,423.6	3,470.9	1,893.5	0.000
	(42.1)	(43.0)	(117.9)	
Assets[c] (millions)	7,473.0	7,525	5,379.6	0.000
	(117.2)	(119.1)	(644.6)	
Employees[d] (thousands)	16.9	17.1	9.2	0.001
	(0.2)	(0.2)	(0.5)	
N[e]	46,708	45,574	1,134	
		Panel B: Managers		
Age	52.6	52.6	47.5	0.000
	(0.5)	(0.06)	(0.5)	
N	17,236	16,960	276	
Seniority	13.2	13.3	7.7	0.000
	(0.1)	(0.1)	(0.5)	
N	14,189	13,845	344	

Source: The data are from Standard and Poor's ExecuComp database for 1992–97.
[a]P-value for difference in sample means by gender for each variable.
[b]Sample sizes for sales are 46,665, 45,533, and 1,132.
[c]Sample sizes for assets are 46,703, 45,569, and 1,134.
[d]Sample sizes for employees are 45,581, 44,482, and 1,099.
[e]Sample size for Market Value. This size variable is used in most of the analysis below.

than the gap implied by Table 1, which does not control for any covariates. This can be explained by the fact that there are more observations for women in the later sample years. Column (2) shows that the gender gap is, as we had expected, substantially reduced when we control for the value of shareholder wealth. The elasticity of managerial compensation to the value of shareholder wealth is about 0.4.[10] About a third of the gender compensation differential, or 15 percentage points, can be accounted for by the lower participation of women in large firms.

The Role of Industrial Segregation

The female executives in our sample were not uniformly represented in all industrial sectors. This can be seen in Table 4. Women were more likely to be managing companies that specialized in health and social services and in trade. These were also sectors in which a disproportionate share of lower-level managers were women, as we can see from the CPS results in column 6. In contrast, very few women held top-level positions in agriculture, construction, mining, and "heavy" manufacturing industries.

The banking sector is an interesting case. While it had the largest share of women in lower-level management among all sectors, the share of women at the top was lower than in most other sectors.[11] Does the

[10]This elasticity is slightly higher than that documented in Rosen (1992) for CEOs only.

[11]Bird (1990) previously documented substantial growth of female employment in bank management starting in the 1970s, partly as a result of pressures by the Equal Employment Opportunities Commission (EEOC). She further noticed that these women

Table 3. Gender Pay Gap for High-Level Executives.
(Dependent Variable is the Log of Total Compensation;
White-Corrected Standard Errors in Parentheses)

Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*
Female	–0.44***	–0.28***	–0.44**	–0.43***	–0.27***
	(0.05)	(0.04)	(0.05)	(0.04)	(0.03)
Market Value		0.37***			0.39***
		(0.004)			(0.005)
Stock Return/1,000		0.04			0.02
		(0.03)			(0.03)
8 Industries	no	no	yes	no	no
115 Industries	no	no	no	yes	yes
Constant	6.48***	3.86***	6.48***	6.48***	3.89***
	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)
R^2	0.030	0.345	0.056	0.177	0.410
N	46,670	46,670	46,670	46,670	46,670

Source: The data are from Standard and Poor's ExecuComp database for 1992–97.
Notes: All regressions control for time indicator variables.
*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

apparent industrial segregation of female executives account for some of the gender gap in compensation? The data reported in Table 4 show no obvious pattern of a concentration of women in low-wage industries. While managers in health and social services as well as in trade were paid slightly less than the average manager in the sample, managers in the industries where women were very scarce were paid below average, too.

Columns (3)–(5) in Table 3 confirm this observation in a more rigorous statistical way. Columns (3) and (4) show that the female dummy variable stays unchanged whether we add 8 broad industry dummies or 115 finer dummies. Moreover, none of the gender gap remaining after controlling for firm size (column 2) can be accounted for by the differential representation of women in different industries (column 5). In summary, there is no evidence of a systematic allocation of women in low-paying industries.

tended to be mostly employed in retail banking and especially branch management, where chances of advancement were very low.

The Role of Occupational Segregation

Table 5 presents the share of women in various occupations. We constructed occupational categories based on the "title" variable in ExecuComp. There are more than 5,100 unique occupation titles in ExecuComp. Some of these titles clearly represent similar occupations. For example, "ex. vp" and "exec. vp" are just different ways of representing executive vice president. But many are more complicated and cannot naturally be merged together. We broke the occupation categories into 31 unique groupings, including Chair and CEO, Vice-Chair, President, Chief Financial Officer (CFO), Chief Operating Officer (COO), and so on. Because some of the executives in the sample reported more than one occupation in their job title, we constructed two different occupational categories for the first and second occupation reported for each manager in ExecuComp.

The occupational breakdown reported in Table 5 is a further consolidation of our 31 categories into only 11 based on the first occupation reported, except for the Chair and CEO category. Indeed, as most of the CEOs in the sample are also Chairs of their

Table 4. Relative Pay, Percent Female, and Female/Male Wage Gaps by Broad Industry Categories.

	High-Level Managers				*Managers from the CPS*			
Industry	*(1) Number in Industry*	*(2) % Female in Industry*	*(3) Industry Wage/ Market Wage*	*(4) Female/ Male Wage Gap in Industry*	*(5) Number in Industry*	*(6) % Female in Industry*	*(7) Industry Wage/ Market Wage*	*(8) Female/ Male Wage Gap in Industry*
Agriculture	222	0.00	0.60	—	312	42.63	0.77	.75***
Mining, Oil, Construction	3,197	1.38	0.93	0.47***	4,338	18.21	1.01	.72***
Food, Tobacco, Textile	6,361	2.63	0.99	0.81	3,953	31.77	1.08	.76***
Chemical, Concrete, Autos	10,252	1.11	0.93	0.49***	10,486	22.20	1.23	.76***
Transport, Communication	6,112	2.45	0.77	0.49***	6,495	31.25	1.10	.82***
Wholesale / Retail Goods	5,484	3.61	0.81	0.65***	10,671	40.72	0.76	.71***
Banking	5,593	2.34	1.49	0.61***	8,975	50.14	1.05	.69***
Personal & Business Serv.	5,378	3.18	1.20	0.89	9,296	39.46	0.88	.77***
Health and Social Services	4,109	3.87	0.95	0.62***	18,958	60.07	0.99	.74***

Source: The data on high-level managers are from Standard and Poor's ExecuComp database for 1992–97. The data on managers from the CPS are from the 1992 to 1997 Merged Outgoing Rotation Groups of the Current Population Survey.

***Significant at the 0.001 level or better.

companies and sometimes reported their title as "CEO and Chairman" and sometimes as "Chairman and CEO," all respondents who reported at least one of these occupations in their title were put in the "CEO/Chair" category. Finally, we ranked these occupations based on our intuitive assessment of their relative prestige. Column (3) of Table 5 reports the mean compensation for each occupation relative to the overall mean compensation in the sample. This confirms that our intuition was roughly correct except with respect to CFOs, whose relatively low compensation on average in our sample came as a surprise to us.

The most important fact in Table 5 is the under-representation of women in the top three occupational categories and top four occupations (Chair, CEO, Vice-Chair, and President).[12] Women who had made it into the top managerial level (that is, they were in the ExecuComp sample) were less likely to be at the very top than were men.[13] The fraction of women among CEOs, Chairs, and Vice-Chairs was much less than 1%. There were also fewer female presidents than there would have been if female top executives were randomly distributed across occupations.[14] Once we look beyond these

[12]This is an example of what is known as vertical segregation (see Blau, Ferber, and Winkler 1998). Also see Ferber and Loeb (1997) for a related example in higher education.

[13]Note, however, that in column 4 we report the ratio of the average pay of women to the average pay of men within occupations. For the CEO/Chair category, this ratio is positive and marginally significant (p-value 0.08). It appears that although very few women made it to this top spot, once they got there, their average compensation (without considering control variables) was quite high.

[14]This finding is consistent with a vast prior literature that has shown that a substantial part of the difference in pay between men and women is attributable to the fact that women are less likely to hold the higher-paying jobs. See, among others, Goldin (1990) and Blau and Ferber (1987). While sex segregation by occupation can be reconciled with some form of taste discrimination by employers, employees, or customers (Becker 1957; Arrow 1973), many authors have preferred to rely on human capital models to explain this fact. See Lazear and Rosen (1990) for one such model. Another interpretation is offered by Reskin and Ross (1990) and Strober (1984).

Table 5. Relative Pay, Percent Female, and Female/Male Compensation Gaps by Broad Occupation Groups.

Position	*(1) Number in Occupation*	*(2) % Female in Occupation*	*(3) Occupation Wage/ Market Wage*	*(4) Female/Male Wage Gap in Occupation*
CEO / Chair	8,987	0.52	1.93	1.75*
Vice Chair	2,000	0.85	1.53	0.50***
President	5,840	1.71	1.30	0.58***
CFO	326	6.44	0.61	0.67
COO	164	1.83	1.16	0.61
Other "Chief" Officer	2,155	1.58	1.48	0.47***
Executive VP	8,581	2.66	0.83	1.10
Senior VP	8,006	3.45	0.56	0.88**
Group VP	493	0.81	0.44	0.91
VP	7,468	4.27	0.37	0.79***
Other Occupations	695	2.88	0.55	0.40***

Source: The data are from Standard and Poor's ExecuComp database for 1992–97.

***Means for men and women are significantly different at the 0.01 level; **at the 0.05 level; *at the 0.10 level.

four top occupations, there is also an apparent negative correlation between the fraction of female executives in an occupation and relative compensation in that occupation, but the correlation is far from strong. For example, women were overrepresented among CFOs whose compensation was relatively lower than we initially expected, but CFOs were still paid more than most of the categories of Vice Presidents.

In Table 6, we turn to a regression analysis in order to more precisely quantify the impact of sex segregation by occupation on the gender earnings gap. The sample of executives for which we can construct occupation is about 9% smaller than the original sample. The unconditional gender gap in this sample is 47% (column 1 in Table 6) and is not statistically different from the 44% gap found in Table 3 (which covers the entire sample). The scarcity of female CEOs and Chairs only explains as much as 13% of the compensation differentials (column 2). Nearly half of the 47% gap can be explained by the scarcity of women in the top four occupations of Chair, CEO, Vice Chair, and President (column 4). If one further controls for firm size (column 5), the gender compensation differential falls to 12%. Interestingly, adding further occupational controls only very weakly reduces the remaining gender compensation gap (columns 6–8 relative to column 4). Adding more than 60 detailed controls for both first and second occupations in the job title (column 9) reduces the gender gap by another 7 percentage points compared to column (4).

Finally, columns (10) and (11) of Table 6 examine the combined effect of occupational segregation, industrial segregation, and firm size. As noted above, industry indicators do not reduce the coefficient on the female indicator at all (compare column 8 to column 10). Controlling for firm size after controlling for occupational categories (column 11) still has a large effect on the female dummy. The magnitude of the effect, however, is smaller than in Table 3. This very likely indicates that women were even less likely to hold the top jobs when they worked for larger corporations.

By constructing occupational categories based on the job title variable, we were also able to extract information on broad field of activity for a subsample of the observations (see Appendix table). Women's representation was highest in fields such as human resources, utility services, and retail

Table 6. Gender Pay Gap for High-Level Executives when Detailed Manager Occupation Is Considered. (Dependent Variable is the Log of Total Compensation; White-Corrected Standard Errors in Parentheses)

Independent Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
Female	–0.47***	–0.34***	–0.31***	–0.25***	–0.12***	–0.26***	–0.22***	–0.22***	–0.18***	–0.19***	–0.11***	–0.13***
	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.03)	(0.02)
CEO / Chair		0.82***	0.87***	0.99***	0.89***	0.99***	1.24***					
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.06)					
Vice Chair			0.77***	0.89***	0.51***	0.50***	0.50***					
			(0.04)	(0.04)	(0.03)	(0.12)	(0.12)					
President				0.64***	0.66***	0.65***	0.89***					
				(0.02)	(0.02)	(0.02)	(0.06)					
CFO						–0.07	0.17					
						(0.09)	(0.11)					
COO						0.48***	0.73***					
						(0.12)	(0.13)					
CO						0.39***	0.63***					
						(0.11)	(0.13)					
EVP							0.57***					
							(0.06)					
SVP							0.26***					
							(0.06)					
GVP							0.21***					
							(0.07)					
VP							–0.12**					
							(0.06)					
31 Occs.	no	no	no	no	no	no	no	yes	no	yes	yes	yes
31 + 35 Occs.	no	no	no	no	no	no	no	no	yes	no	no	no
115 Inds.	no	no	no	no	no	no	no	no	no	yes	yes	no
Firm Effects	no	no	no	no	no	no	no	no	no	no	no	yes
Log Value					0.36***						0.35***	0.27***
					(0.004)						(0.004)	(0.009)
Return/1k					0.06**						0.01	–0.04
					(0.02)						(0.03)	(0.03)
Constant	6.50***	6.29***	6.22***	6.09***	3.63***	6.09***	5.83***	6.64***	6.90***	6.63***	4.33***	4.95***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.06)	(0.09)	(0.10)	(0.09)	(0.08)	(0.07)
R^2	0.029	0.143	0.170	0.217	0.494	0.219	0.266	0.273	0.281	0.382	0.575	0.710
N	42,677	42,677	42,677	42,677	42,677	42,677	42,677	42,677	42,677	42,677	42,677	42,677

Source: The data are from Standard and Poor's ExecuComp database for 1992–97.
Notes: All regressions control for time indicator variables. The omitted occupation category in the final columns is all other occupations.
*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

banking. Controlling for field in addition to occupation did not affect the coefficient on the female indicator variable. We do not report these results in the tables.

In column (12) of Table 6, we allow for firm-specific effects in pay and add individual firm fixed effects to the regression.[15] The chi-squared value of the Hausman test of fixed-effects versus random effects is highly significant (p-value less than 0.001) and indicates that inferences based on the firm fixed effects specification in column (12) of Table 6 are most appropriate. In any event, the coefficient estimate on female when controlling for individual firm fixed effects (–0.13) is nearly identical to that in the previous specification with industry fixed effects (–0.11 in column 11).[16]

Oaxaca Decomposition

Another way to consider wage gaps between groups is described in Oaxaca (1973). This method decomposes the overall gap into a portion that is due to differences in observable skills between groups and a part that is still unexplained. This is easily done by running separate regressions for men and women and then rewriting the overall wage gap in various ways as described below. First, define α_f and β_f (a vector) as coefficient estimates from a regression of log compensation on a constant and a set of covariates for women only and $\bar{X}_f$ (a vector) as the mean characteristics of women. α_m, β_m, and $\bar{X}_m$ are similarly defined for men. The overall gap between men and women is

$$(1) \qquad \Delta w = \alpha_m + \beta_m \bar{X}_m - \alpha_f - \beta_f \bar{X}_f$$

There are two popular ways to re-write this equation. The first is based on adding and subtracting $\beta_m \bar{X}_f$, which yields

$$(2) \qquad \Delta w = (\alpha_m - \alpha_f) + (\beta_m - \beta_f)\bar{X}_f + \beta_m (\bar{X}_m - \bar{X}_f).$$

In this case we are assuming that the returns to male characteristics, β_m, are the baseline. The second common decomposition is found by adding and subtracting $\beta_f \bar{X}_m$ to equation (1), which yields

$$(3) \qquad \Delta w = (\alpha_m - \alpha_f) + (\beta_m - \beta_f)\bar{X}_m + \beta_f(\bar{X}_m - \bar{X}_f).$$

In this case we are assuming that the returns to female characteristics, β_f, are the baseline.[17] In both equations (2) and (3), the first two terms are the part of the total gap left unexplained and the third term is the part of the gap due to explained differences in skills.

We present results for a simple Oaxaca (1973) decomposition in Table 7. In this case, we use the covariates used in column (5) of Table 6: year indicators, indicators for the top three occupations, log stock market value, and stock return in the previous year. We chose this parsimonious specification because, as indicated by Table 6, these covariates alone account for nearly all of the explained variation in compensation. As stated above, we decompose the total gap assuming that the male wage structure is the true wage structure (as in equation 2) and then assuming that the female wage structure is the true wage structure (as in equation 3). The results in Table 7 confirm our previous findings. Most of the total gap in compensation by gender for these top managers (between 71% = 0.30/0.42 and 88% = 0.37/0.42) was due to observable differences between men and women.[18]

The Role of Age and Tenure

A major drawback of the ExecuComp data set is that it does not report age and tenure consistently for all observations.

[15]In this case, we cannot also control for industry, since industry does not vary within firms (for the most part).

[16]We also re-computed this specification with an individual person random effect model. In this case, the coefficient on female is nearly identical, –0.12.

[17]Of course, these are just extreme cases, and any combination of β_m and β_f could also be a possibility (see Ransom and Oaxaca 1994).

[18]Further details of the decomposition, including the separate regressions by gender, are available from the authors on request.

Table 7. Basic Oaxaca Decomposition.

Decomposition	*Total Gap*	*Unexplained Gap*	*Gap Due to Skill Differences*
Oaxaca Decomposition #1 (returns to male are baseline)	0.42	0.12	0.30
Oaxaca Decomposition #2 (returns to female are baseline)	0.42	0.05	0.37

Source: The data are from Standard and Poor's ExecuComp database for 1992–97.

Note: Separate regressions are run for men and women (see text). All regressions control for time indicator variables, status as CEO, Chair, Vice Chair, President, log(market value), and shareholder return.

These two variables are available for only a subset of the observations in the sample.[19] Focusing on that subsample of the data, Panel B of Table 2 shows that women in these top managerial jobs were very similar to men with respect to their labor force attachment and career commitment, but differed considerably from their male counterparts with respect to age and seniority in their corporations. Women in the subsample for which age and tenure are available were about 5 years younger than the men, on average (47.5 versus 52.6 years old), and had 5.6 fewer years of seniority in their company (7.7 versus 13.3 years). (It is interesting to note that the gaps in age and tenure are about the same.) Because returns to age and experience are large in the market for executives, we expect that the relative youth and low seniority of the female executives is another important determinant of the gender gap. This is formally shown in Table 8.

Because the sample used in this section is much smaller, we re-estimate the unconditional gender compensation gap for this group. As seen in column (1) of Table 8, the point estimate on the female indicator, –0.61, is substantially larger than in the previous larger samples. Yet, standard errors are large. Once we control for firm size (as in column 2), the remaining gender gap is again much smaller. If we further add the three top occupation dummies (column 3), the gap falls to 8%. However, standard errors are again large, and we cannot reject the possibility that the coefficient on the female indicator variable is either 0 or the same as the female dummy in the larger sample for the same set of controls (column 5 of Table 6). If we control for occupation effects (column 4), the point estimate for the female dummy drops to –0.05, and if we control for both occupation and industry effects (column 5), it drops to –0.09. Again, because standard errors are large, we cannot reject the possibility that the coefficients on the female dummies are the same as the corresponding ones in Table 6.

The women's relative youth cannot in itself fully explain the gender gap. Column (6) of Table 8 shows that a 33% difference in compensation still exists between men and women after we account for age and seniority. However, this is not precisely estimated. There is also a clear but imperfect correlation between executives' age and the size of the companies they managed. When age and tenure are included (last five columns of Table 8), the addition of a firm size control does not improve the R^2 as much, nor does it decrease (in absolute value) the coefficient on the female dummy as much (column 7 versus column 2). Whether or not we control for age and seniority, adding the three top occupation dummies (column 8) leads to about the same improvement in R^2 as in column (3),

[19]We are not aware of any reason why age and tenure are only reported for a subset of the data. We investigated how individual and firm characteristics differ between our basic sample and the sample in which age and tenure are available. We found that individuals in the subsample were slightly more likely to be female (2.4% of the overall sample was female, compared to 2.6% of the subsample) and worked for smaller firms.

Table 8. Gender Pay Gap for High-Level Managerial Pay when Age and Tenure of Manager Are Considered. (Dependent Variable is the Log of Total Compensation; White-Corrected Standard Errors in Parentheses)

	Not Controlling for Age and Tenure					*Controlling for Age and Tenure*				
Independent Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
Female	–0.61***	–0.25***	–0.08	–0.05	–0.09	–0.33	–0.14	–0.04	–0.006	–0.05
	(0.20)	(0.17)	(0.15)	(0.14)	(0.13)	(0.20)	(0.17)	(0.14)	(0.14)	(0.13)
Age						0.20***	0.08***	0.06***	0.06***	0.08***
						(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Age^2						–0.002***	–0.006***	–0.001***	–0.001***	–0.0007***
						(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Tenure						0.017**	–0.005	–0.02***	–0.019***	–0.022***
						(0.007)	(0.005)	(0.005)	(0.005)	(0.004)
Tenure^2						–0.0001	0.0000	0.0002*	0.0002*	0.0003***
						(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Log Value		0.45***	0.39***	0.38***	0.38***		0.424***	0.40***	0.389***	0.390***
		(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.011)	(0.013)
Return/1000		–0.02	0.03	0.04	–0.05		–0.01	0.02	0.02	–0.06
		(0.04)	(0.03)	(0.03)	(0.03)		(0.03)	(0.03)	(0.03)	(0.03)
CEO / Chair			0.90***					0.92***		
			(0.04)					(0.04)		
Vice Chair			0.43***					0.44***		
			(0.08)					(0.08)		
President			0.66***					0.66***		
			(0.04)					(0.04)		
31 Occs.	no	no	no	yes	yes	no	no	no	yes	yes
115 Inds.	no	no	no	no	yes	no	no	no	no	yes
Constant	6.92***	3.69***	3.49***	4.26***	4.25***	0.75	1.26***	1.86***	2.70***	2.18***
	(0.04)	(0.08)	(0.07)	(0.12)	(0.13)	(0.68)	(0.48)	(0.44)	(0.45)	(0.42)
R^2	0.016	0.427	0.533	0.544	0.609	0.136	0.449	0.544	0.556	0.612
N	7,379	7,379	7,379	7,379	7,379	7,379	7,379	7,379	7,379	7,379

Source: The data are from Standard and Poor's ExecuComp database for 1992–97.
Notes: All regressions control for time indicator variables.
*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

where we do not control for age and tenure at all. The female dummy decreases (in absolute value), from –0.14 to –0.04. These findings, while imprecise, indicate that the gender compensation gap could be less than 5% after all observables are controlled for.[20]

Trends in Participation and Earnings: Is the Glass Ceiling Cracking?

One of the major labor market trends in the United States in the past two decades has been the convergence in outcomes between men and women. Focusing on differences in earnings, Blau and Kahn (1997) showed that women's relative position considerably improved, especially during the 1980s, when men experienced a real decline in earnings while female real wages grew very rapidly. They showed that part of this shrinking gender pay gap could be explained by an improvement in female human capital, especially in the form of labor market experience, and by a smaller "unexplained" gender gap, that could reflect either a reduction in labor market discrimination or an improvement in women's unmeasured characteristics. Yet, another important factor in explaining the decline in the gender gap has been an important shift in occupational categories for women. More specifically, the representation of women in managerial and professional jobs has been growing while the share of women in low-paying clerical and related jobs has not.

In this section, we address the question of whether these trends also exist among top executives. In other words, we ask whether there is any evidence that the glass ceiling is cracking little by little in U.S. corporations. We ask whether the relative participation of women in these top managerial jobs has increased over time, and also study trends in relative compensation. It is important to note that because our data set only covers the period 1992–97, we are unable to investigate relative gains in the 1980s, the period during which most of the catch-up by women occurred, at least in the other segments of the labor market.

Table 9 reports trends over time in the fraction of women in top-level management. While the fraction of women in lower-level management only went from 40% to 43% over the sample period (column 9), the fraction of women in top-level management nearly tripled, going from 1.29% in 1992 to 3.39% (column 1) in 1997.[21] The fraction of firms with at least one woman in the top executive ranks (one of the top 5 most highly paid) grew from 5.4% in 1992 to 15.03% in 1997. Although the fraction of firms with strictly more than one woman in these top positions was much smaller, it also grew a great deal over the period, from 0.17% in 1992 to 1.95% in 1997.

Also note that the fraction of firms with no women in one year and at least one woman in the next year grew steadily over time, from 2.19% in 1993 to 3.85% in 1997 (column 4). Female top executives also seem to have improved their relative earnings quite substantially. While the ratio of average female to average male compensation in 1992 is a puzzle to us, it appears that female relative compensation rose extremely quickly between 1993 (52%) and 1997 (73%).[22] During these same years, we find that the ratio of average female to average male annual earnings in our CPS

[20]If we examine relatively new entrants to the top managerial jobs—that is, men and women with only five or fewer years of labor market experience—we find that the conditional wage gap is also statistically insignificant and the point estimate is not much different from our estimate on the complete set of data. If we estimate a specification like that in Table 6, column (11), for the 5,113 executives with 5 years of experience or less, the coefficient on the female indicator is –0.093 with a standard error of 0.134.

[21]See Catalyst (1999) for descriptive evidence that is consistent with this finding.

[22]Because we were concerned by possible changes in the set of companies covered by ExecuComp over time, we investigated the robustness of these findings by limiting the sample to the companies that were present in 1992. The findings were unaffected.

Table 9. Information over Time (1992–1997) for Two Sets of Managers. (White-Corrected Standard Errors in Parentheses)

	High-Level Managers from ExecuComp (columns 1–8)								*CPS Sample (columns 9–11)*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*
Year	*Fraction Female*	*Frac. Firms with ≥ 1 Woman*	*Frac. Firms with > 1 Woman*	*Frac. Firms with No Women in One Year and Then ≥ 1 in Next*	*F/M Compen-sation Gap*[a]	*Regression Adjusted Differential*[b]	*F/M Firm Size Gap*	*F/M Share Jobs in "Top" Group*[c]	*Fraction Female*	*F/M Compen-sation Gap*[d]	*Regression Adjusted Differential*[e]
1992	1.29	5.44	0.17	—	0.67*	–0.221** (0.091)	0.42***	0.64***	40.41	0.67***	–0.271*** (0.009)
1993	1.52	7.25	0.39	2.19	0.52***	–0.137*** (0.053)	0.52***	0.48***	40.25	0.69***	–0.254*** (0.009)
1994	2.22	10.25	1.13	3.44	0.56***	–0.163*** (0.053)	0.52***	0.36***	41.79	0.68***	–0.247*** (0.009)
1995	2.60	11.76	1.58	3.66	0.57***	–0.144*** (0.043)	0.56***	0.32***	41.20	0.68***	–0.260*** (0.009)
1996	3.01	13.42	1.72	3.92	0.61***	–0.085** (0.043)	0.61***	0.40***	42.07	0.70***	–0.249*** (0.009)
1997	3.39	15.03	1.95	3.84	0.73***	–0.013 (0.049)	0.77***	0.37***	42.86	0.72***	–0.225*** (0.009)

Source: The data are from Standard and Poor's ExecuComp database for 1992–97.

[a]***Difference in average female/average male compensation by year is significant at the 0.01 level; **at the 0.05 level; *at the 0.10 level.

[b]This is the coefficient on the female indicator from an annual regression of ln (pay) on an indicator for female, plus the other covariates included in Table 6, column (11). White-corrected standard errors are reported.

[c]By "top group" we mean those jobs classified as CEO/chair, vice chair, or president.

[d]Adjusting for hours. ***Difference in average female/average male compensation by year is significant at the 0.01 level; **at the 0.05 level; *at the 0.10 level.

[e]This is the coefficient on the female indicator from an annual regression on ln (pay) on an indicator for female, experience, experience-squared, a linear term for education, an indicator for black, and one digit industry indicators.

sample went from 67% to 72%. In addition, in column (6) we have reported coefficients on the female indicator from our specification in column (11) of Table 6 by running separate regressions by year. The substantial and statistically significant estimate of –0.221 from 1992 declined through the sample period to a statistically insignificant –0.013 in 1997.

Note, however, that the regressions-adjusted gap for managers in the CPS changed much less over time (column 11). What caused such a rapid decline in the gender gap for female managers at the top? In the previous section, we isolated two main factors that strongly hampered women's relative earnings: under-representation in large firms, and under-representation in the top four occupations. Were female top executives in 1997 doing better on either of these two fronts? Column (7) of Table 9, which displays the ratio of average female managers' company size to average male managers' company size, clearly indicates that female executives were steadily gaining access to larger U.S. corporations.[23] On the other hand, column (8) shows no evidence that women's representation in the top occupational group (CEOs, Chairs, Vice Chairs, and Presidents) was improving over time. If anything, women's representation in this group was declining, though not steadily.

Summary and Concluding Remarks

We have shown that, contrary to what some commentators have claimed, the "glass ceiling" is somewhat porous and some women, even if only a limited number, are involved in the top-level management of U.S. corporations. Over all years in the sample we examined, about 2.4% of the executives were women.[24] Although this number is small, it increased substantially in the later years of the sample period.

Our results further indicate that the gender gap in compensation among top executives was at least 45%. An important fact is that female managers were under-represented in large corporations. Because the returns to firm size are very high among top executives, this explains up to 15 percentage points of the gender gap. Interestingly, while female managers do not seem to have been distributed randomly across industries, there is no evidence that sex segregation by industry explains any of the observed gender gap. On the other hand, we found that sex segregation by occupation was important. The scarcity of female CEOs, Chairs, Vice-Chairs, and Presidents accounts for as much as half of the unconditional gender compensation gap. Once we look beyond these four top occupations, however, there is no significant evidence of a concentration of women in the lower-compensation occupations.

A last crucial factor is that women in the sample were much newer than their male counterparts in this top stratum of managerial jobs. Women in the sample were much younger, and had much less seniority in their company, than men. Part of the effect of age and seniority on the gender gap seems to be reflected in the size of companies women managed. All in all, we find that the unexplained gender compensation gap for top executives was less than 5% after one accounts for all observable differences between men and women.

Finally, we asked whether there is any evidence of a growing crack in the glass ceiling over the period under study. We found that the participation of women in the top corporate jobs was growing dramatically in the years we looked at, from 1.3% in 1992 to 3.4% in 1997. Also, the gender compensation gap declined, very much like in the other segments of the labor market. Most of the decline appears to have been correlated with a decline in sex segregation by firm size. Female top executives were heading larger and larger corporations.

Because top executives probably consti-

[23]This could be due to a lessening of employers' or customers' tastes for discrimination or to changing tastes on the part of the female executives themselves.

[24]This is still a small fraction relative to other forms of organization. For example, Hallock (1998) found that about 20% of public charities are headed by women.

tute a fairly homogeneous group with respect to job motivation, career commitments, and human capital, a finding of an unexplained gender compensation gap in this sample could have reasonably been interpreted as evidence for taste discrimination against women. In fact, we find that the conditional gender gap in this sample is very small. This obviously does not imply the absence of discrimination. Low general participation, sex segregation by firm size, and sex segregation by occupation could reflect some form of taste discrimination. The absence of a significant conditional gender gap simply means that women and men who held similar functions in firms of similar size received fairly equal treatment in terms of compensation.

Additional caveats should be stated here. First, the latter results should not be generalized to a claim that *all* female executives in the United States are paid like their male counterparts in the same occupation category and in firms of the same size. Investigating that issue would require a different data set that, to our knowledge, does not exist. Second, one might argue that the very few women who made it into our sample are truly exceptional and should not in fact be compared to the average man in the sample but rather to the highest-ability men in the sample.[25] Under that view, one might have expected that these women should have been paid more than the average male executives. The data clearly reject a positive female-male gender gap in earnings.

Future work might involve a more formal analysis of why some companies decide to promote women to top jobs while others do not.[26] For example, one might inquire whether various characteristics of the board of directors, such as the sex and age distribution of their members, are correlated with the selection of women into top executive positions. More fundamentally, one might try to understand what factors make small companies more likely to attract female top executives and why women are virtually absent from the "very top" of the U.S. corporate world.

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[25]Our analysis has assumed that men and women in our sample form a homogeneous group and that the distribution of unobservables is similar across genders.

[26]One might also investigate gender differences in mobility.

Appendix

Relative Pay, Percent Female, and Female/Male Wage Gaps by Broad "Field" Groups

	High-Level Managers Only			
Field	*(1) Number in Field*	*(2) % Female in Field*	*(3) Field Wage/ Market Wage*	*(4) Female/Male Wage Gap in Field*
Human Resources	343	14.86	0.89	0.60***
Finance/Accounting	1,682	2.02	1.01	1.41
Legal/Regulatory Affairs	258	10.85	1.28	0.51***
Sales	683	2.05	0.99	0.77
Marketing/Merchandising, Advertising	721	6.52	1.00	0.89
Product Devel.: R&D, Engin., Design	702	3.99	1.02	1.52
U.S. Operations	1,132	0.88	0.90	1.48
International Operations	332	1.20	1.25	1.81
Corporate Affairs	907	4.96	1.05	1.63
Customer Service	120	12.5	0.89	1.36
Product Management/ Manufacturing	268	4.10	0.96	0.78
Real Estate/Construction	66	4.55	0.81	0.62
Utility Services	26	30.77	0.34	1.33
Retail Banking, Credit	84	16.67	0.74	0.98
Sourcing, Procurement	21	9.52	1.03	1.23
Administration	299	5.69	0.88	0.46***
Communication, Information	89	6.74	0.70	0.78
Healthcare	59	1.69	1.36	0.53[a]
Mergers & Acquisitions	50	0.00	0.91	NA[a]
Computers	38	2.63	1.40	0.93[a]
Developed Markets	7	42.86	2.84	1.78
Investment	35	2.86	1.99	0.13[a]
Distribution	30	3.33	0.70	0.48[a]
Missing	38,756	2.04	2.27	0.67***

[a]Only one woman (or zero in the case of mergers) in these cases—no t test for differences in means.

REFERENCES

Arrow, Kenneth J. 1973. "The Theory of Discrimination." In Orley Ashenfelter and Albert Rees, eds., *Discrimination in Labor Markets.* Princeton: Princeton University Press, pp. 3–33.

Baker, Lawrence. 1996. "Differences in Earnings between Male and Female Physicians." *New England Journal of Medicine,* Vol. 334, pp. 960–64.

Barbezat, Debra. 1987. "Salary Differentials by Sex in the Academic Labor Market." *Journal of Human Resources,* Vol. 22, No. 3 (Summer), pp. 422–28.

Barbezat, Debra A., and James W. Hughes. 1990. "Sex Discrimination in Labor Markets: The Role of Statistical Evidence. Comment." *American Economic Review,* Vol. 80, No. 1 (March), pp. 277–86.

Bayard, Kimberly, Judith Hellerstein, David Neumark, and Kenneth Troske. 1999. "New Evidence on Sex Segregation and Sex Differences in Wages from Matched Employee-Employer Data." Working paper, March.

Becker, Gary S. 1957. *The Economics of Discrimination.* Chicago: University of Chicago Press.

Biddle, Jeff, and Daniel S. Hamermesh. 1998. "Beauty, Productivity, and Discrimination: Lawyers' Looks and Lucre." *Journal of Labor Economics,* Vol. 16, No. 1 (January), pp. 172–201.

Bird, Chloe. 1990. "High Finance, Small Change: Women's Increased Representation in Bank Management." In Barbara Reskin and Patricia Roos, eds., *Job Queues, Gender Queues.* Philadelphia: Temple University Press.

Blau, Francine, and Marianne Ferber. 1987. "Discrimination: Empirical Evidence from the United States." *American Economic Review,* Vol. 77, No. 2, pp. 316–20.

Blau, Francine, Marianne Ferber, and Anne Winkler. 1998. *The Economics of Women, Men, and Work,* 3rd edition. Englewood Cliffs, N.J.: Prentice Hall.

Blau, Francine, and Lawrence Kahn. 1997. "Swimming Upstream: Trends in the Gender Wage Differential in the 1980s." *Journal of Labor Economics,* Vol. 15, No. 1 (January), pp. 1–42.

Catalyst. 1999. *Catalyst Census of Women Corporate Officers and Top Earners.* New York.

Ferber, Marianne A, and Carole A. Greene. 1982. "Traditional or Reverse Sex Discrimination? The Case of a Large Public University." *Industrial and Labor Relations Review,* Vol. 35, No. 4 (July), pp. 550–64.

Ferber, Marianne, and Lane Loeb. 1997, *Academic Couples: Problems and Promise.* Urbana: University of Illinois Press.

Goldin, Claudia. 1990. *Understanding the Gender Gap: An Economic History of American Women.* New York: Oxford University Press.

Gander, James P. 1997. "Gender-Based Faculty-Pay Differences in Academe: A Reduced-Form Approach." *Journal of Labor Research,* Vol. 18, No. 3 (Summer), pp. 451–61.

Gregg, Paul, and Stephen Machin. 1993. "Is the Glass Ceiling Cracking? Gender Compensation Differentials and Access to Promotion among UK Executives." University College London Discussion Paper 94–05, July.

Groshen, Erica. 1991. "The Structure of the Female/Male Wage Differential: Is It Who You Are, What You Do, or Where You Work?" *Journal of Human Resources,* Vol. 26, No. 3 (Summer), pp. 457–72.

Hall, Brian, and Jeffrey Liebman. 1998. "Are CEOs Really Paid Like Bureaucrats?" *Quarterly Journal of Economics,* Vol. 113, No. 3 (August), pp. 653–91.

Hallock, Kevin F. 1998. "Gender Compensation Differences among Executives in Nonprofits." Working paper, University of Illinois, August.

Hoffman, Emily. 1976. "Faculty Salaries: Is There Discrimination by Sex, Race, and Discipline?" *American Economic Review,* Vol. 66, No. 1 (March), pp. 196–98.

Jacobs, Jerry. 1992. "Women's Entry into Management: Trends in Earnings, Authority, and Values among Salaried Managers." *Administrative Science Quarterly,* Vol. 37, No. 2 (June), pp. 282–301.

Johnson, George, and Frank Stafford. 1974. "The Earnings and Promotion of Women Faculty." *American Economic Review,* Vol. 64, No. 6 (December), pp. 888–903.

Jones, Terril Yue. 1999. "Gender Motors." *Forbes,* May 17, p. 50.

Katz, David. 1973. "Faculty Salaries, Promotions, and Productivity at a Large University." *American Economic Review,* Vol. 63, No. 3 (June), pp. 469–77.

Kostiuk, Peter. 1990. "Firm Size and Executive Compensation." *Journal of Human Resources,* Vol. 25, No. 1 (Winter), pp. 90–105.

Lazear, Edward, and Sherwin Rosen. 1990. "Male-Female Wage Differentials in Job Ladders." *Journal of Labor Economics,* Vol. 8, No. 1, pp. 106–23.

Meyer, Michael. 1999. "In a League of Her Own." *Newsweek,* August 2, p. 56.

Morgan, Laurie. 1998. "Glass-Ceiling Effect or Cohort Effect? A Longitudinal Study of the Gender Earnings Gap for Engineers, 1982 to 1989." *American Sociological Review,* Vol. 63, No. 4 (August), 479–93.

Morris, Kathleen. 1998. "The Rise of Jill Barad." *Business Week,* May 25, pp. 112–18.

Murphy, Kevin J. 1985. "Corporate Performance and Managerial Remuneration." *Journal of Accounting and Economics,* Vol. 7, Nos. 1–3, pp. 11–42.

Oaxaca, Ronald. 1973. "Male-Female Wage Differentials in Urban Labor Markets." *International Economic Review,* Vol. 14, No. 3 (October), pp. 693–709.

Ransom, Michael R., and Sharon Bernstein Megdal. 1993. "Sex Differences in the Academic Labor Market in the Affirmative Action Era." *Economics of Education Review,* Vol. 12, No. 1 (March), pp. 21–43.

Ransom, Michael, and Ronald Oaxaca. 1994. "On Discrimination and the Decomposition of Wage Differentials." *Journal of Econometrics,* Vol. 61 (March), pp. 5–51.

Reskin, Barbara F., and Particia A. Roos, eds. 1990. *Job Queues, Gender Queues: Explaining Women's In-*

roads into Male Occupations. Philadelphia: Temple University Press.

Rosen, Sherwin. 1992. "Contracts and the Market for Executives." In Lars Wein and Hans Wijkander, eds., *Contract Economics.* London: Blackwell.

Strober, Myra H. 1984. "Toward a General Theory of Occupational Segregation: The Case of Public School Teaching." In Barbara F. Reskin, ed., *Segregation in the Workplace: Trends, Explanations, Remedies.* Washington, D.C.: National Academy Press, pp. 144–56.

Wood, Robert G., Mary E. Corcoran, and Paul N. Courant. 1993. "Pay Differences among the Highly Paid: The Male-Female Earnings Gap in Lawyers' Salaries." *Journal of Labor Economics,* Vol. 11, No. 3 (July), pp. 417–41.