The Opportunity Structure for Discrimination[1]

Trond Petersen
University of California, Berkeley

Ishak Saporta
Tel Aviv University

Gender disparities in wages and attainment caused by employer discrimination can come about by three very different processes: allocative discrimination, within-job wage discrimination, and valuative discrimination. For the United States, it has been established that within-job wage discrimination no longer is a major source of wage differences, while valuative discrimination potentially is. Less known is the role of allocative discrimination, especially in the hiring process, which we identify as the point where discrimination is most feasible. Our analysis uses personnel data on all entrants into a large U.S. service organization in the period 1978–86, focusing on managerial, administrative, and professional employees. We study the placement at initial hire and then follow job levels, wages, promotions, as well as departures, in years subsequent to hire.

I. INTRODUCTION

Wage differences between men and women caused by discrimination from employers can come about by several mechanisms. In a first instance,

women are differentially allocated to occupations and establishments that differ in the wages they pay. This involves discrimination in the matching process at the point of hire, in subsequent promotions, and through differential dismissal. We call these processes "allocative discrimination." In a second, women receive lower wages than men within a given occupation within a given establishment. We call this process "within-job wage discrimination." In a third, female-dominated occupations are paid lower wages than male-dominated ones, although skill requirements and other wage-relevant factors are the same. It is the issue addressed by comparable worth initiatives. We call this process "valuative discrimination."

Empirical studies of these three processes show that within-job wage discrimination currently is unimportant (Petersen and Morgan 1995), while valuative discrimination probably accounts for a substantial part of the gender wage gap (e.g., England 1992; Nelson and Bridges 1999). What is less understood is the role of allocative discrimination: how the differential allocation of men and women to positions at the point of hire and differences in subsequent rates of promotion create a gender gap in attainment.

Analytic frameworks for the processes mostly address the motivations for employers to discriminate, such as prejudice, stereotypes, and statistical discrimination (e.g., England 1992, chap. 2). While these are important and relevant, our theoretical goals are different. We take as a central premise that employers discriminate and that discrimination, consciously or nonconsciously, in fact is widespread.[2] We then proceed from a massive fact, much discussed but not from the current vantage point, that such actions take place in an extensive legal environment making them illegal. This creates considerable variations across contexts in opportunities to discriminate. So rather than looking into the specific motivations for discriminatory behaviors, it becomes relevant and even critical for understanding these processes to ask, if employers discriminate, for whatever reasons, where would they most likely succeed in this? In our conceptual analysis we thus elucidate where in the employment relationship discriminatory behaviors most likely would occur, addressing, so to speak, the

---

on to a significant career in another large firm. Direct correspondence to Trond Petersen, Department of Sociology, University of California, Berkeley, California 94720–1980. E-mail: trond@haas.berkeley.edu

[2] Many researchers will also attest to the empirical correctness of this assertion (e.g., Reskin 1998, p. 88; Rhode 1997, chap. 7). Others will strenuously deny it (e.g., Epstein 1992, chap. 18). We use it as a device for theorizing.

"opportunity structure" for discrimination in the current legal environment.[3]

Against this background we make two contributions to the study of gender discrimination from employers. First, our conceptual errand is to provide a framework identifying the structural conditions under which discrimination is feasible, leading to a comparative analysis of the relative importance of the three forms of discrimination in contemporary organizations. We call for increased efforts in studying some relatively neglected parts of the employment relationship. The framework further identifies a specific temporal pattern for differences between men and women, where these, once both sexes work for the same employer, should decline over time because opportunities to discriminate decline as more information becomes available, an outcome different from what the prevalent glass-ceiling literature would predict. Ours is thus a structural approach, focusing not on motives but on opportunities for discrimination. Not necessarily at odds with, it contrasts sharply to recent theorizing on gender inequality in the workplace, which emphasizes cognitive psychological processes and the role of nonconscious biases, such as stereotypes and schemas (Valian 1998; Reskin 2000).

Second, we implement part of the ideas in an organizational case study, presenting the kinds of data needed to study potential employer discrimination, engaging in what can be called quantitative ethnography. We analyze five processes: (1) the initial job level and wage at time of hire, (2) job level and wages in years subsequent to hire, (3) promotions, (4) the glass ceiling, and (5) departures. We thus follow entire careers from beginning to end in an organization, including departures as these relate to a possible "commitment" gap and differential turnover by sex, which in turn may impact careers and the wage gap. Dismissals turned out to be empirically very rare in the company, so our analysis of this form of discrimination will be limited to giving the central numbers.

Although a few empirical papers (about 10) using firm-level data address one or two of the processes we report results for, such as wages or promotions, no research integrates the various processes as done here, or does as comprehensive an analysis, or provides evidence on the temporal pattern of differences. We pull together, strengthen, and expand on existing findings in addition to providing a framework for interpreting these and for structuring data collection and research.

---

[3] There may also be discrimination from coworkers and customers, not addressed here. There are also supply-side mechanisms that create differences in labor force outcomes for men and women, such as educational choices and adaptations to family circumstances through working part- vs. full-time. These are not in focus here but undoubtedly have major effects, especially among managerial and professional employees (Epstein et al. 1999).

854

We focus our empirical analyses on the managerial, administrative, and professional employees in the organization. For this group concerns about gender inequity have been the most pronounced, the sense being that in these types of jobs the obstacles to advancement for women are most severe, so that even if men and women start out on an equal footing, women lose ground as careers unfold and end up being barred from higher positions (Valian 1998, p. 198). This is also the group for which Petersen and Morgan (1995) found the larger wage gaps. The sentiment is stated clearly in *A Report on the Glass Ceiling Initiative* (U.S. Department of Labor 1991, p. 6): "Minorities and women have made significant gains at the entry level of employment into the first levels of management. Yet, they have not experienced similar gains into the mid and senior levels of management, notwithstanding increased experience, credentials, overall qualifications, and a greater attachment to the workforce."

The organization we studied is large and visible. At the time it was mainly a construction and engineering company, male dominated with a strong technical and male culture. It was subject to external pressures in the equal employment and opportunity (EEO) area, but with much resistance at many levels internally, so that it was liable to both conscious and nonconscious discrimination. This potentially exacerbates the problems for female managerial and professional careers, making the organization a reasonable test case for the propositions developed.

Our goals then are, first, to provide a framework for analyzing where the problem of employer discrimination is most severe and, second, to investigate the issues around allocative discrimination in more depth than previous research had accomplished.

II. THE OPPORTUNITY STRUCTURE FOR DISCRIMINATION

In six subsections we outline the three central dimensions in our conceptual analysis (IIA), apply these to the three forms of discrimination (IIB, IIC, and IID), derive a set of implications (IIE), and, last, review the empirical evidence (IIF).

Before proceeding, we emphasize that our conceptual analysis is considerably broader than the empirical analysis. The strategy is to identify three dimensions that may generate variations in the prevalence of gender discrimination. But we do not measure these. Instead we use them to derive implications for the pattern of gender inequality that we might expect to observe at various stages of the employment process. Then in the empirical analysis we investigate a subset of the implied patterns. We have no data on the entire applicant pool, needed for addressing discrimination in who gets offers. The issue of valuative discrimination is already

855

well understood, with limited need for further analyses.[4] Our empirical analysis thus focuses on conditions at initial hire, subsequent wages, job levels, promotions, and departures.

A. Three Central Dimensions

In order to understand the relative prevalence and importance of the three forms of discrimination, the central step is to identify the conditions required for discriminatory practices to be feasible and successful. We reason under the assumption that discrimination is widespread, that employers discriminate if they can get away with it, as asserted by Reskin (1998, p. 88) and others. Rather than elucidating why this occurs—in terms of the motives for discrimination, the role of cognitive biases, whether it is conscious or not—our aim is to explicate the circumstances under which one should expect to observe variations in its prevalence. One then needs to theorize not primarily the behaviors of employers but the ability of employees, firm-internal adjudication organs, and the judicial system to fight and withstand instances of employer discrimination. To this end we distinguish three dimensions that may inhibit or facilitate unjustified differential treatment of men and women.

The *first* dimension that may mitigate against discriminatory behaviors is the ease with which information about such practices can be assembled and documented. When information is hard to collect and document, discriminatory practices are more likely to succeed. The importance of information—its availability, amount, and type—has been extensively researched in the social-psychological literature on stereotypes (e.g., Tosi and Einbender 1985; Heilman 1995). It addresses how employers may be more likely to stereotype employees when acting on limited information.[5] Our objectives are different. We discuss how the ease of assembling documentation may limit the degree to which employers can succeed in discriminating and facilitate attempts to counter discrimination by employees and legal or quasi-legal bodies.

The *second* dimension concerns the ambiguity of assembled documentation. Unless a piece of information can be interpreted in a relatively unambiguous manner across potential evaluators with different orientations and values, it may not be helpful for establishing the existence of discrimination. This will hold for firm-internal adjudication procedures,

---

[4] We did the relevant regression analyses. Among women, the wage is about 4% lower in the most than in the least female-segregated occupation. Results are available from authors.

[5] The information environment also played an important role in a case about stereotyping that reached the Supreme Court (Fiske et al. 1991, p. 1050).

856

through affirmative action boards, which, when the evidence is ambiguous, may not follow up complaints from employees. But it will hold even more so for external agencies, such as the legal system, who may be asked to pass judgment on the basis of ambiguous information.[6] Again, there is an extensive social-psychological literature addressing how ambiguity of information may lead to the use of stereotypes and hence to discrimination, with a focus on motives rather than opportunities for discrimination (Fiske et al. 1991, p. 1050; Heilman 1995, pp. 11–12; see also Reskin 1998, pp. 29–31).

The *third* dimension concerns the availability of a plaintiff or complainant that may press charges regarding discrimination. If such individuals or groups of individuals are not forthcoming, discriminatory practices are more likely, as one might expect to be the case in employment relationships involving illegal immigrants. The number of instances of discrimination probably far outnumber those that are brought to the attention of the courts or other parties. At issue presently is the proposition that discrimination will be more prevalent when the party discriminated against is less likely to complain. So it may even obtain that the fewer cases of a given type that are brought to the courts the more prevalent this form of discrimination may be.

The first two dimensions pertain to aspects of the information needed—ease of documentation and ambiguity of information—while the third pertains to the availability of a complainant. Each of these is a prerequisite for a complaint to be made and are thus fundamental. But clearly other factors are important as well, such as costs of complaining, be they monetary, psychological, or social; the expected payoffs to complaining; what the available redress procedures are; whether firm-internal organs or the judicial system is involved, and more.

Even so, by focusing on essentials only, we can from the three dimensions provide a forceful conceptual analysis of what to expect in terms of the relative importance of the three forms of discrimination. The central step is to identify the opportunity structure for discrimination in an environment where discrimination is illegal.

This framework is applicable to most large and many midsized employers. In these there is the external threat of lawsuits, initiated for example through the Equal Employment and Opportunity Commission

---

[6] Cases reaching the legal system will rarely be factually simple but will rather contain elements of ambiguity and will call for interpretation. Otherwise, they should in principle be possible to settle through firm-internal grievance procedures. At stake conceptually and empirically is thus the level, not the presence, of ambiguity. Sometimes there may be more ambiguity than the courts are willing to accept, as when they were asked to pass judgments on the correct rate of pay for male- and female-dominated work in early comparable-worth litigation (e.g., Nelson and Bridges 1999, pp. 12–13).

857

(EEOC), but also the internal threat from personnel and legal departments. Smaller firms are not exempt from such pressures. But then they mostly come from individual complainants rather than larger external or internal entities.[7]

We use the conventional definition of discrimination as it pertains to gender. Differential treatment discrimination occurs when applicants and employees with equal qualifications and productivities are differentially treated because of their sex (Reskin 1998, p. 23). Disparate impact or structural discrimination occurs when men and women are treated equally within the given set of rules and procedures but where the latter are constructed so that they favor one sex over the other (Reskin 1998, p. 32). Our principal concern is with differential treatment, though we also address disparate impact discrimination, such as in recruitment procedures and in valuative discrimination. As always, it is difficult empirically to assess whether discrimination occurs or not, but where it does, one should expect to observe differences in hiring rates, wages, and promotions.

B. Within-Job Wage Discrimination

As for within-job wage discrimination, where a man and a woman, equally qualified and productive and doing the same work for the same employer, are paid unequally, the situation is straightforward. Such cases are in principle easy to document, the evidence is mostly unambiguous, and there is a clear potential complainant—the woman discriminated against. This form of discrimination is illegal, has been so since 1963, and is likely to be infrequent, simply because it is the most transparent form of differential treatment and the most easily pursued in the legal system and elsewhere. For example, such disparate treatment may be pursued through firm-internal grievance procedures, which is much less costly than litigation (Westin and Feliu 1988). As Freed and Polsby (1984, p. 1080) write, "Such cases certainly must arise, but as a practical matter they are undoubtedly settled before litigation."

The main difficulty arises when pay depends not only on the job occupied but also on the qualifications, merit, or productivity of the incumbent. These can justify wage differences even within jobs. But they can be hard to assess. Sometimes it may also be difficult to identify whether two jobs are substantially equal or not and hence whether the Equal Pay

---

[7] In 1999 almost 40,000 private workplaces employing more than 51 million employees filed EEO-1 reports to the EEOC, required from workplaces with more than 100 employees and from federal contractors with more than 50 employees.

Act applies, in which case it may be easier for the employer to pay unequal wages (Freed and Polsby 1984).

C. Allocative Discrimination

As for allocative discrimination, the situation is more complex. This is the form that gives rise to sex segregation on jobs and firms (see Bielby and Baron 1986; Petersen and Morgan 1995; Reskin 1998). It involves three types: in hiring, in promotion, and in dismissal or firing.

Discrimination at the point of hire entails the most intricate set of issues, with three processes to be analyzed. The first concerns the recruitment process itself, for example, whether it occurs through newspaper ads, employment agencies, or social networks (e.g., Bloch 1994; Granovetter [1974] 1995). The second concerns who gets offers or gets hired and who does not when a job is being filled (Bloch 1994). The third concerns the quality of offers and conditions—pay, level, and so on—under which those hired get hired.

In terms of the recruitment process, discrimination is hard to document (Collinson, Knights, and Collinson 1990; on race, see Turner, Fix, and Struyk 1991). For example, if recruitment to a large extent takes place through information networks, these may operate in a manner discriminatory against women, as in referrals from male employees or male job networks (Blau and Ferber 1987, p. 51; Hanson and Pratt 1991). But these processes are very difficult to document, and there is the complex issue of whether one can show discriminatory intent, not only so-called disparate impact, which often is important in the United States (England 1992, chap. 5). With limited documentation, its level of clarity versus ambiguity is irrelevant and incentives to complain are weak.

In terms of who gets offers or is hired, discrimination is also difficult to document. Information on the applicant pool is rarely available and all that may be accessible to outsiders is information on those hired. Even in large firms, information on the hiring process tends to be incomplete.[8] But even if the relevant information were available, it likely is ambiguous, open to many interpretations. Jewson and Mason (1986, p. 59), citing a report by R. Jenkins, provide that "there remains great scope for subjective decisions about 'personality,' etc., in even the most elaborate selection

---

[8] For example, in two service firms we currently study, with 25,000 and 110,000 employees, one lacks records on a substantial portion of the applicant pool and the other lacks sex and race information on about 35% of applicants.

859

plans."[9] As for the availability of a complainant, this is most problematic. Those not hired and possibly discriminated against will rarely know what occurred, and even when they do, it may be impossible to gather the relevant evidence. And those turned down often have applied for other jobs and may have gotten those, in which case the incentives for complaining or filing suits are small, in particular when this kind of discrimination typically requires litigation. Jencks (1992, p. 53) writes, " laws and regulations that bar discrimination in hiring are harder to enforce than those that bar discrimination against workers who are already on a firm's payroll."[10]

When it comes to quality of offers made and to placement at hire, it is easy to document the identities of the parties hired, and often also the conditions under which they were hired, but less so the conditions offered to those who declined the offers. But the subjective element in deciding which conditions to offer is usually high, simply because less is known at the point of hire than at later promotion. As Gerhart (1990, p. 419) writes, "Differential treatment in salary setting is more likely for new hires than for longer-tenure employees, for whom observation of actual performance is possible." So unless an employer determines the conditions offered at initial hire exclusively on the basis of formal qualifications such as degree, grades, and experience, this is a stage where differential treatment of men and women easily can occur in that it will be relatively easy to justify. And even when conditions are determined primarily on the basis of formal qualifications, there is still the difficulty of lack of comparability. For example, it is well known that it is harder to get good grades at good schools, but "there is no general formula to translate grades from one school into their equivalents at another" (Stinchcombe 1990, p. 247). The subjective element is thus likely to be pronounced. But one should expect less disparate treatment here than in who gets offers and who does not. This is so because conditions at initial employment among those hired often become known among colleagues and may hence form

---

[9] After reviewing 21 field and laboratory studies of gender bias, Tosi and Einbender (1985, pp. 720–21) conclude: "Judges faced with limited information about competence or job requirements tended to make biased or stereotyped judgements; those with more information did not." Or as Heilman (1995, p. 20) writes: "Unfortunately, in many instances, assessors have only minimal information to review, forcing them into the default position of having to use category membership in making assessments."

[10] Bloch (1994, p. 1) writes, "Employees are far more likely than applicants to file discrimination lawsuits, and damages awarded to them tend to be greater than those received by applicants." Or as Jencks (1992, p. 53) writes about those not receiving job offers: "They seldom know much about a firm's other applicants, so if a firm does not hire them, they cannot tell whether they have been victims of discrimination."

860

the basis for comparison processes and feelings of injustice as well as complaints, which management likely wants to avoid.

The second type of allocative discrimination, in promotion, is easier to analyze. Although deciding which employee is more qualified for promotion usually involves some amount of subjective judgment, on which there may be disagreements among various assessors, one is typically still in a position to document in a comparatively unambiguous manner the relative qualifications of those promoted and those passed over, given the promotion rules of the organization (e.g., Spilerman 1986). As long as the relative qualifications can be compared and verified vis-à-vis a third party, claims about the occurrence of discrimination can in principle be settled. Potential complainants are readily available—those passed over for promotion. And again, many firms have internal due-process and grievance procedures that can deal with such cases, rather than through costly litigation (Westin and Feliu 1988). Once employees are in the "system," there are strong incentives for firms to treat them equally. Promotion discrimination is no doubt more difficult to deal with than within-job wage discrimination, but it is not fraught with major complications.

The third type of allocative discrimination, in dismissal, is more straightforward to analyze. Here, the information is usually easy to assemble and less ambiguous, and there is a clear complainant, the person fired. The matter can be dealt with either through firm-internal grievance procedures or through litigation, and the incentives to pursue wrongful dismissal are usually high. By 1985 most lawsuits in the civil rights area were filed by fired employees, followed by current employees (about 10% of cases), while the fewest cases originated with those not hired (see Donohue and Spiegelman 1991, pp. 1016, 1031). This may well reflect the greater difficulty of pursuing discrimination in hiring, not differences in the prevalence of the types of discrimination.

D. Valuative Discrimination

Turning to the third form, valuative discrimination, the situation is the most complex (e.g., Nelson and Bridges 1999, chap. 2). Here the discrimination is not against any specific individual but against classes of jobs held primarily by women. Documentation of such cases is difficult, the evidence is highly ambiguous, and the availability of a complainant can but need not be lacking, depending on whether a group of employees or a party acting on their behalf will press for reevaluation of wages. The employer and sometimes the courts are asked to assess the relative worth of various jobs, a task that is difficult and on which there typically will be disagreements. The legal status of valuative discrimination is unclear, and it is by many not considered discrimination at all, arising rather from

861

market processes that in principle should be fair (e.g. Rhoads 1993). Precisely for these reasons one should expect valuative discrimination to be quite prevalent. This is where employers are most likely to succeed in differential treatment of men and women in that their actions consist of treating classes of jobs in a differential manner, but classes on which the sexes are unequally distributed.

There is a subtle connection between allocative and valuative discrimination. It is sometimes claimed that without allocative discrimination, occupational sex segregation will also vanish, and hence valuative discrimination will cease to be a factor; the former is thus a necessary condition for the latter. But this claim requires two other processes to occur: first, that there is no sex segregation on educational field, which there clearly still is, and second, that there are no sex differences in preferences over occupations, work schedules, and the like, which there still may be, in part due to the unequal distribution of labor in the household. With sex differences in educational choices and in preferences, occupational sex segregation will persist, even in the absence of allocative discrimination, and valuative discrimination will hence continue to be a factor.

E. Implications

We now summarize, in the text and in table 1, the ranking of the three forms of discrimination in terms of prevalence and importance for explaining the gender wage and attainment gap in employment. This gives the relevant predictions and hypotheses for what to expect to find in empirical investigations (col. 4).

Within-job wage discrimination should be the least prevalent and least important: it is easy to document, the evidence is relatively unambiguous, and plaintiffs are available. Allocative discrimination in promotion as well as dismissal should be more important, but still not the most prevalent, for the same reasons. The main difference from within-job wage discrimination is that the evidence often is more ambiguous. Allocative discrimination at the point of hire, in contrast, should be considerably more widespread. This holds for recruitment procedures, for who gets offers and who does not, and for quality of offers made. Finally, valuative discrimination should be the most widespread. Here the documentation is most difficult to assemble and most ambiguous, and the availability of a plaintiff can be lacking.

All of this leads to the conclusion that with respect to discrimination against identifiable individuals as opposed to classes of jobs, the point of hire is where differential treatment should be most widespread.[11] This

---

[11] Lazear (1991, pp. 13–14) provides the same sentiment: "My view is that hiring is

862

TABLE 1
Dimensions Facilitating Discrimination, Result Thereof, and Research Evidence, by Type of Discrimination

Type of Discrimination	Dimensions for Discrimination			Result	Research Evidence	
	Ease of Documentation (1)	Clarity of Evidence (2)	Availability of Plaintiff (3)	Ease of Discrimination (4)	Amount of Evidence (5)	What It Shows (6)
Within-job wage	High	High	High	Low	Some	Little
Allocative:						
Recruitment	Low	Medium	Low	High	None	Unknown
Who gets hired	Low	Medium	Low	High	Some	Little
Conditions at hire	Medium	Medium	Low	High	Some	Some
Promotion	High	Medium	High	Medium	Some	Little
Dismissal	High	High	High	Low	None	Unknown
Valuative	Low	Low	Medium	High	Much	Much

Note.—See Sec. IIE for discussion. The heading "Dimensions for Discrimination" provides in cols. 1–3 the three dimensions that facilitate or hinder discriminatory practices, where each dimension is ranked high, medium, or low with respect to how easy it is to document, the clarity of documentation, and the availability of a plaintiff. Col. 4 gives the net result from the three dimensions with respect to how easy it is to discriminate on the basis of gender. Cols. 5 and 6 summarize the research evidence. Col. 5 indicates the amount of evidence available, from none, to some, to much. Col. 6 reports what the research shows with respect to the amount of discrimination of a given type, ranked from little, to some, to much, as well as unknown in the cases where there is no research.

view is also found among legal practioners. Wymer and Sudbury (1992, p. 624) comment that "employers have been forced to become more systematic and careful when making their promotion, demotion, salary, and discharge decisions. In most cases, employers have developed and implemented fairly reliable procedures to reduce—if not eliminate—the extent to which nonjob-related biases and prejudices enter into these decisions." They continue, "Simply because discharged employees are far more likely to sue than rejected job applicants, employers historically have not been quite so careful in the *hiring* process. Although the possibility of a failure-to-hire lawsuit is not new, it has not been the type of claim with which employers are confronted frequently in the employment discrimination arena."

And as is well understood, whatever discrimination takes place at initial hiring and assignment may have effects for subsequent career developments. Blau and Ferber (1987, p. 51) write, "Once men and women are channeled into different types of entry jobs, the normal everyday operation of the firm will virtually ensure sex differences in productivity, promotion opportunities, and pay." Observed differences in wages may thus largely be a result of differential hiring and initial placement. An overall gender wage gap will remain even with fair promotion and wage-setting policies within firms as long as there is differential treatment in the hiring process (see also Stinchcombe 1990, p. 259).

One controversial prediction emerging from this framework is that women do not necessarily face more severe career disadvantages as they progress within an organization, precisely because it becomes more difficult to discriminate as more information becomes available. This contrasts to much current thinking, where female career blockages are thought to increase with seniority, the classic glass-ceiling hypothesis, as well as the recent social-psychological theorizing stressing that "a succession of small events, such as not getting a good assignment, result in large discrepancies in advancement and achievement" (Valian 1998, p. 18). The two views lead to opposite orderings of the interaction between gender and seniority, one hypothesizing a declining gender effect with seniority, the other an increasing effect.

---

most important; promotion is second; and wages are third." He gives no sustained argument why this likely is the case. Or as Epstein (1992, p. 58) writes, "Most firms prefer to run the risk of litigation with initial hires, instead of with promotion and dismissal." Olson (1997, p. 61) states, "One should expect bigotry to manifest itself more in refusals to hire people than in the self-defeating practice of hiring them only to turn around and fire them."

864

F. Research Evidence

As alluded to above and as stated in table 1, the amount of research evidence regarding the various forms of discrimination varies considerably. Before discussing it, one issue requires attention. It is employers or their representatives who discriminate, at least in within-job wage and allocative discrimination, abstracting from possible coworker or customer discrimination. An essential requirement of relevant data, therefore—making them, so to speak, admissible evidence—is that one gets access to information on how employers treat the sexes in hiring, wages, promotions, etc. The relevant sampling unit is the employer and her decisions for men and women, potentially treating them differentially, thus sampling the possibly discriminatory actions. Hence we restrict attention to studies using data sets with information on these decisions or their outcomes. Such data usually come from personnel records of firms or from in-depth case studies. A large and mostly quantitative research stream comparing the outcomes for men and women working for different employers, but not as they face the same employers, is thus ignored, not because it lacks value, but because it is inconclusive in assessing possible discrimination. From standard surveys of atomistically sampled employees one cannot disentangle whether differential outcomes were caused by unequal opportunity, through employer discrimination, by equal opportunity unequally taken, through employee preferences for different kinds of work and work schedules, or from some combination thereof.

On within-job wage discrimination, the evidence is not extensive, but it is unambiguous and is based on analysis of unusually extensive data, first of all in Petersen and Morgan (1995) and to some extent in Groshen (1991; see also Tomaskovic-Devey 1993). It shows that this is not a form of discrimination that is important in explaining the gender wage gap.[12]

On discrimination in the hiring process the research evidence is limited, for each of the three stages. As for the first stage, recruitment practices, there is a limited but growing number of studies (see Marsden 1994a). But very little has been written about gender-based processes at this stage.

---

[12] One careful and extensive study claims this is incorrect, reporting instead wage gaps at the occupation-establishment level of about 12% (Bayard et al. 1999). It relies, however, on inexact measurements of central variables. Occupation and establishment are measured for 1990, with only minor error. But hourly wages are measured for the prior year, 1989, imputed from annual earnings divided by imputed annual hours worked, the latter obtained as weeks worked times usual hours worked per week in the year—an imputation from an imputation, likely quite imprecise. The earnings data may come from several jobs held at different and same times during the year. They need not reflect the pay rate of a given employer, but rather what a person earned from several different employers. They may also pertain to a job or jobs different from the one held at the time occupation and establishment were measured in 1990.

As for the second stage, who gets offers and who does not, much the same is the case. There are a few studies of selection procedures (e.g., Marsden 1994b), but little on discrimination at this point. One study addresses both recruitment and the process of who gets hired and who gets turned away, based on direct observations of the hiring process in several British organizations around 1985 (Collinson et al. 1990). They show a considerable amount of discrimination at this stage.[13] DiPrete (1989, chap. 8) reports the extent to which a job is filled by a woman or a man, but does not base this on which person from the applicant pool succeeded. Three studies using data on entire applicant pools in a large bank and a high-technology company find either a female advantage in getting hired or no differences between men and women (Fernandez and Weinberg 1997; Fernandez, Castilla, and Moore 2000; Petersen, Saporta, and Seidel 2000). An earlier study uses data on all 20,576 applicants to the Prudential Insurance Company in 1981 (Kirnan, Farley, and Geisinger 1989). It finds that while 26.6% of males are hired, only 17.6% of females are. There is no control for education, age, or other personal characteristics in this study. The findings may reflect less favorable conditions faced by women in the early 1980s. In an audit study, Neumark (1996) finds that women are less likely to be hired for waiter jobs in high-priced restaurants but more likely in low-priced ones. Goldin and Rouse (2000), analyzing hiring into eight major U.S. symphony orchestras, find mixed effects for sex, with women sometimes at an advantage, other times at a disadvantage.

As for the third stage of the hiring process, quality of offers and placement at hire, Petersen et al. (2000) find no sex effects on salary offers or salaries at hire after controlling for age and education in a midsized high-technology firm. DiPrete (1989, chap. 9) finds that women tend to be placed lower in the grade hierarchy than men in the U.S. federal bureaucracy. Gerhart (1990) finds that women received lower starting salaries than men among employees who remained in a large firm, hence based on a self-selected sample.

Studies of hiring thus exhibit an interesting discrepancy between theorizing and actual findings. Most theorizing concludes that discrimination in hiring should be prevalent, in fact more important than other forms of discrimination (Gerhart 1990; Lazear 1991; Epstein 1992; Jencks 1992; Bloch 1994; Olson 1997). Our conceptual analysis also led to this conclusion. Experimental studies show a small effect of sex in hiring decisions

---

[13] There are a number of psychological studies addressing the role of gender in recruitment interviews, for example, how the genders of interviewer and interviewee affect the interactions, but little in terms of how this affects the outcomes (for a review, see Graves 1999).

866

(Olian, Schwab, and Haberfeld 1988; Bartol 1999, p. 153). Field studies are mixed, documenting either no or some effect. It may be too early to give firm conclusions here, but the evidence points slightly in the direction that conditions at hire appear more problematic than rates of hiring.

Regarding discrimination in promotion, there is some evidence, but not extensive. The basic thrust can perhaps best be summarized as follows. Some studies show that women suffer a net disadvantage in lower levels of organizational hierarchies while enjoying a net advantage at higher levels (e.g., DiPrete 1989, chap. 9; Spilerman and Petersen 1999; see also Rosenfeld 1992). Similar results are found in Lewis (1986) for the federal bureaucracy and Tsui and Gutek (1984) for a large corporation, the latter using less appropriate data. Other studies, such as Gerhart and Milkovich (1989) and Hartmann (1987), find little evidence of differential promotion rates between men and women, once one takes into account their jobs within an organizational hierarchy, while Paulin and Mellor (1996) report some nonsignificant negative effects for white females in a financial services firm. Powell and Butterfield (1997) find a nonsignificant female advantage in promotion to top management in a federal bureaucracy department from 1987 to 1994. Barnett, Baron, and Stuart (2000) report higher promotion rates for women in the California Civil Service system from 1978 to 1986.[14] As for salary increases within organizations, much the same has been documented: few differences or women at an advantage (see Gerhart and Milkovich 1989; Tsui and Gutek 1984). Barnett et al. (2000) find that at time of promotion men receive the higher increases. But since women are promoted at a higher rate, average monthly salary increases end up being identical.[15]

Regarding discrimination in dismissals, surprisingly little has been written, with more research on layoffs. Using survey data, Valletta (1999, table 3) reports much higher dismissal rates for men than women in the 1982–91 period. A case study of an insurance company shows no sex differences in dismissal rates in the 1971–80 period (Sicherman 1996, tab. 1). There is much discussion of dismissal in legal scholarship (e.g., Edelman, Abraham, and Erlanger 1992), but little that addresses sex discrimination explicitly.

---

[14] Halaby (1982) addresses sex differences in promotions but uses data collected in 1960, while White and Althauser (1984) report promotion rates separately for men and women in two banks but give no estimates of the sex effect net of other variables. There are also studies not based on firm-level data, such as Stroh, Brett, and Reilly (1992), that find no sex differences in promotion rates. But these are less decisive as evidence for or against discrimination.

[15] Prior to promotions there are often performance appraisals. Reviewing several field and experimental studies of gender bias in performance appraisals, Bartol (1999) reports that findings are contradictory: some find a bias, others do not.

867

On valuative discrimination the evidence is extensive, as summarized in England (1992, chap. 3), showing that this probably is important for explaining the gender wage gap. Precisely how important is difficult, if not impossible, to assess, and estimates vary considerably, from a negligible and uncertain (Weiler 1986) to a substantial impact (Willborn 1989, pp. 140–43). Tam (1997) has challenged this view. He shows that the central variable in comparable worth regressions, the percentage female in an occupation, has a negligible effect on the wage once one controls for the amount of specialized training required in an occupation, contradicting a claim of valuative discrimination. It may still be the case that valuative discrimination is built into the wage structure of some firms (Nelson and Bridges 1999). Regardless of what is the case, there is much disagreement on whether and how it should be dealt with.

III. DATA

We use data from the personnel records on all external hires into managerial, administrative, and professional ranks in a large regulated firm engaged in producing and delivering services. Its organizational structures and employment systems are similar to those in other large U.S. organizations across a wide array of industries (see Spilerman 1986). The data come from the period 1978–86, when annual employment ranged from 26,000 to 31,000. Employees are assigned to four broad occupational groups: blue-collar (44%), clerical (20%), technical (8%), and managerial, administrative, and professional employees (28%).

We focus on the managerial, administrative, and professional employees, the group for which concerns about gender inequity have been most pronounced, and for which Petersen and Morgan (1995) found the larger wage gaps. Blue-collar and clerical employees are from our point of view less interesting, since, as officials in the organization explained, assignment at the time of hire is based on formal qualifications rather than on subjective assessments of suitability for the work and promotions are based primarily on seniority.

Managerial, administrative, and professional employees are hired into a hierarchy of 13 job levels, from 1 (low) to 13. Few make it to the top. In 1986, with 7,329 such employees, only 42 or about .5% were placed in level 11 or higher. A promotion occurs when a higher job level is reached.

A central part of our conceptual analysis focused on the processes at initial hire, including an emphasis on placement at time of hire. Addressing this requires an analysis of entrants into the organization, not on conditions at time of entry among those who subsequently remained in the

868

organization. The latter group would give rise to a survivorship bias (Petersen 1995, sec. 15), as in Gerhart and Milkovich (1989), where survivors in the period 1980–86 were analyzed, or as in Gerhart (1990), analyzing entrants in the period 1976–86 who remained in the organization to 1986. For employees who entered into the positions in focus in 1978 or later, including only external entrants, not internal promotions, we analyze both placement at hire and subsequent promotion.

In the 1978–86 period, 3,752 managerial, administrative, and professional employees were hired. Table 2 gives descriptive statistics on entrants at the time of hire. The number of entrants vary by year, from 188 (low) in 1978 to 693 in 1980. The percentage female also varies, from 22% to 33%.

Table 3 gives the number of employees by year of hire and seniority. In the oldest cohort, 188 employees were hired in 1978 and 126 (two-thirds) were still present in 1986. Table 4 reports, among other things, the percentage promoted by sex and by years of seniority; it is high at the lower seniority levels but then declines. At the lowest seniority level, we have information on 3,752 employees, a number that declines as seniority increases, mostly because the higher seniority levels can be reached only by those who entered early in the nine-year period, but also because some people left.

We also collected qualitative information. One author worked two years in the human resources department of the firm, observing its operations and interacting with members at all levels in many units. Additionally, we conducted structured interviews with four central people present during the period of the data: the vice president of operations, who later became the CEO; the vice president of human resources; the head of the research unit within the human resources department; and a middle-level human resource manager who went on to a significant career in another large firm. We are restricted in the information we can reveal; suffice it to say that it is a visible employer. The qualitative information helped structuring the analysis and making sense of the results.

A. Procedures for Promotion and Merit Reviews

We were unable to obtain documents explaining the procedures by which managerial, administrative, and professional employees are promoted. Verbal accounts from the organization's research department provided that promotion is based on merit rather than seniority.[16] One of our in-

---

[16] In the employee manual, one section states that the "company's policy is to attract and promote highly qualified, motivated employees who, working together, will achieve the company's financial and service objectives."

869

TABLE 2

CHARACTERISTICS OF EMPLOYEES AT INITIAL HIRE, BY HIRE YEAR

Variable	1978 (1)	1979 (2)	1980 (3)	1981 (4)	1982 (5)	1983 (6)	1984 (7)	1985 (8)	1986 (9)
% female	24.5	26.0	27.1	22.4	32.7	32.8	30.6	32.7	25.8
% with master's:									
Men	33.8	30.6	25.0	19.7	23.9	26.6	20.6	23.4	16.9
Women	26.1	40.6	21.3	23.9	28.7	30.8	17.8	21.3	12.9
% with Ph.D.:									
Men	7.0	4.6	4.0	3.6	4.5	3.4	3.5	5.3	2.4
Women	10.9	2.9	2.1	4.4	2.8	6.3	2.0	4.3	7.1
% professionals:*									
Men	47.2	57.6	45.0	49.9	45.0	53.0	49.7	56.1	60.6
Women	28.3	36.2	25.5	30.1	31.5	31.5	45.4	44.5	62.5
% minority:									
Men	28.2	23.0	22.2	18.9	23.0	20.8	28.8	29.1	22.8
Women	17.4	14.5	20.2	27.4	34.3	31.5	30.3	29.3	34.1
Age:									
Men	28.5	29.0	28.8	28.1	29.8	29.8	31.4	32.0	32.5
Women	25.7	27.6	26.3	27.0	28.0	28.7	27.9	28.6	29.9
N (hired)	188	265	693	503	330	436	496	501	339

NOTE.—The data are taken from a large regulated company, covering all entrants into managerial, administrative, and professional ranks in the period 1978–86. For further description of data see Sec. III. For description of procedures see Sec. IV. For discussion of results see Sec. V. The table gives characteristics of employees at initial hire. The statistics are given separately by hire year.

* This gives the percentage of employees that were hired into the four professions, lawyer, accountant, engineer, or computer specialist. Across the nine years, the distribution of men and women at time of hire on six broad occupations were, respectively: management 17.3% and 24.7%, administration 31.7% and 38.4%, accounting 4.1% and 5.1%, computer specialist 5.3% and 10.7%, lawyer 0.9% and 2.2%, and engineer 40.7% and 18.7%.

formants stressed that we would learn more about their practices by scrutinizing the quantitative record than by studying their formal procedures, which varied, were not always followed, and were not consistent across units.

Merit reviews were done every year by one or more of an employee's supervisors. It combined formal and informal elements, with engineers usually being more formal. Sometimes a human resource or higher-level manager would go over the evaluations. The human resource department and its research unit would go through the statistical personnel records, but only after merit increases had been implemented. The legal department would become involved only when there was evidence of wrongdoing. In years with high inflation, such as the early 1980s, there would be an across-the-board salary increase. There was always a merit component. Each unit would get a budget for merit increases and would then allocate it across its employees.

Careers were not constrained within occupational internal labor mar-

870

TABLE 3
NUMBER OF EMPLOYEES PRESENT BY HIRE YEAR AND SENIORITY

Seniority	1978 (1)	1979 (2)	1980 (3)	1981 (4)	1982 (5)	1983 (6)	1984 (7)	1985 (8)	1986 (9)
0 years ...	188	265	693	503	330	436	496	501	339
1	160	262	580	425	294	391	439	422	
2	160	245	531	382	270	360	391		
3	144	225	501	356	257	324			
4	135	214	462	340	238				
5	132	207	440	312					
6	132	201	411						
7	129	192							
8	126								

NOTE.—For description of data and results see Sec. III. Col. 1 gives the number of individuals by each year of seniority for the 1978 cohort of entrants into managerial, administrative, and professional ranks in the organization. In col. 1 for the 1978 cohort, the first line shows that 188 people entered in 1978, and the last line shows that 126 of these 188 entrants were still in the organization by 1986. Cols. 2–9 give the same numbers for cohorts of entrants in each of the years 1979–86.

kets. Typically employees would work within their educational specialization for a few years, but then would start rotating through various functions so as to enlarge their competencies. Some occupations had strong identities, especially among lawyers, and participated less in such programs.

B. Regulatory Environment of the Organization

We interviewed extensively the person who used to represent the organization in pretrial procedures with plaintiffs, with 30 years seniority, to ensure our analysis is not at odds with perceived practices. His view was that the organization, as most large and visible employers, was under considerable scrutiny from the EEOC at the time. As a federal contractor, they reported every year and were required to have an affirmative action plan. They knew they had a high level of sex segregation. They also knew that it would be best to do something about it. At the time it was a construction and engineering company, male dominated with a male culture. They were clearly concerned with discrimination lawsuits and had in place programs for developing women and minorities, including more training for women and a rotation plan between jobs to make future promotion more likely. This was typical of many large employers.

Unusual at the time was their extensive personnel database. They started to build and analyze this in the early 1970s. It allowed them to keep track of their personnel. It also enabled them to fight complaints with statistics. Their policy was to investigate any complaint thoroughly.

871

TABLE 4
PERCENTAGE FEMALE, RELATIVE SALARY, JOB LEVEL, PROMOTION, AND DEPARTURE
RATE BY GENDER AND SENIORITY

| | | | | JOB LEVEL | | % PROMOTED | | % DEPARTED | |
SENIORITY	N (1)	%W (2)	w_r (3)	M (4)	W (5)	M (6)	W (7)	M (8)	W (9)
0 years ...	3,752	28.5	85.4	2.0	1.5	33.6	34.6	11.4	11.6
1	2,983	28.7	87.5	2.4	1.8	27.6	36.3	7.3	8.8
2	2,341	27.4	89.2	2.7	2.2	25.0	27.3	5.5	5.3
3	1,807	27.0	90.4	2.9	2.4	18.0	18.1	4.2	5.7
4	1,389	25.3	91.7	3.1	2.6	14.3	15.4	3.9	3.4
5	1,091	24.0	92.9	3.4	2.9	14.0	15.3	3.3	2.7
6	744	25.1	93.4	3.6	3.1	10.6	8.6	1.8	2.7
7	321	23.7	96.0	4.0	3.8	8.6	17.1	.0	.0
8	126	22.2	94.8	4.2	3.9	2.0	3.6	.0	.0

NOTE.—For description of data see Sec. III. For discussion of results see Secs. III and VI–IX. Col. 1 gives the number of individuals over which the statistics are computed. Col. 2 gives the percentage female at that level of seniority, across the nine hire years 1978–86. Col. 3 gives the relative wages between women and men multiplied by 100. This was obtained by first computing the relative wages separately for each year of seniority separately for each cohort. Then the number reported gives the average of the seniority-specific wage gaps across the cohorts that have reached that level of seniority. In columns 4–9, 'M' denotes men and 'W' denotes women. Cols. 4 and 5 give the average job level for men and women separately. Cols. 6 and 7 give the percentage promoted for men and women separately. Cols. 8 and 9 give the percentage departed for men and women separately.

If they thought it had merit, they would move fast to settle. If it lacked merit, they would fight it vigorously and would "harass" lawyers and civil rights groups with endless statistics. At one time during the 1980s a major complaint arose in their legal department. The EEOC decided to investigate, acquired the relevant personnel files, ran regressions, and proposed a settlement. The firm refused, ran additional regressions, presented the results, and successfully fended off the EEOC and the internal complainants. The same department raised a complaint in the early 1990s and a settlement above $1 million was reached without litigation. Most complaints were thus either settled or successfully fought without going to court. According to one informant, the organization was less lenient in accommodating civil rights demands in the EEO area than other large organizations were at the time, organizations with which he had extensive contacts in the human resources area. This was in part due, he claimed, to the company's human resources department to a larger extent being run by white males less sympathetic to many EEO demands.

So even though the merit reviews varied considerably in degree of formality, the organization had one tool that in principle enabled them to monitor the situation: their extensive and carefully analyzed personnel data base.

872

IV. METHODS

Our goal is to document in as plain as possible a manner what goes on in an organization of this type and to relate those findings to a straight-forward understanding of the processes at work. We thus use, when defensible, simpler rather than more complicated statistical techniques.

The subscripts in equations (1)–(5) below are i, y, and s, for individuals, years, and seniority. Subscript iys denotes individual i in year y with seniority s. The explanatory variables are given in the vector x_{iys}. It includes a constant term, the person's sex (1 = man, 0 = woman), and other variables, such as age, education, and occupation.

A. Conditions at Initial Hire

We report results for five variables characterizing the conditions at hire: the job level, the annual salary, the maximum and minimum job levels of job hired into, and whether the job had attached to it only one versus two or more job levels. For the annual salary, we use the full-time equivalent in order to standardize for differences in number of weeks and months worked during the year. We also report regression analyses for two of these variables—the job level and annual salary at time of hire. Note that we analyze conditions at hire among those hired, not conditions in all job offers made.

For the job level at hire, L_{iy0}, the regression equation is

$$L_{iy0} = \beta_0 x_{iy0} + \delta_{y0} D_{iy0} + \epsilon_{iy0,} \tag{1}$$

for all years y and individuals i. Here, D_{iy0} is a dummy variable indicating the year in which the person was hired, where the subscript 0 indicates that this is at seniority level 0, δ_{y0} is its effect, and ϵ_{iy0} is an error term. These allow for variations in the mean job level at time of hire across years. We pool all hires across the nine years, estimating one common set of effect parameters β_0 for sex and other variables.[17]

For the annual salary at time of hire, w_{iy0}, we specify the regression equation:

$$\ln w_{iy0} = \alpha_0 x_{iy0} + \psi_{y0} D_{iy0} + \varepsilon_{iy0}, \tag{2}$$

for all years y and individuals i, using the natural logarithm of the annual salary so that a coefficient is interpretable roughly as the proportional change in the dependent variable for a one unit increase in the indepen-

[17] We also estimated an ordered probit model for this dependent variable (job level), as explained in Winship and Mare (1984). The results were qualitatively the same but more difficult to interpret because the threshold parameters in these models need to be taken into account.

873

dent. Again, we pool all hires across years into one regression equation, estimating one common effect parameter α_0 for sex and other variables at seniority 0, letting the dummy variables for year of hire (D_{iy0}) account for increases in salary levels between years.

We also estimated these two regression equations separately for each calendar year, with no difference in overall results, only yielding a greater number of sex coefficients to be reported (for the wages, 36 rather than 4).

B. Temporal Pattern of Salary Grade Levels and Wages

For the job level and wages in years subsequent to initial hire, when seniority is bigger than 0, we estimate job-level and wage equations as in equations (1) and (2), one per level of seniority, with dummy variables capturing the effects of year. Again, we pool individuals with the same seniority across years. As explicated in Section IIE, our conceptual framework implies a declining gender gap with seniority, while the well-known glass-ceiling hypothesis implies the opposite. Estimating separate sex effects by level of seniority allows us to investigate this.

For the job level we then get at seniority level 1 the equation

$$L_{iy1} = \beta_1 x_{iy1} + \delta_{y1} D_{iy1} + \epsilon_{iy1}, \tag{3}$$

for all years y and individuals i. This gives the coefficients at seniority level equal to one year, controlling for the calendar year in which the employee obtained this seniority (D_{iy1}), since some started in 1978, others in 1979, and so forth, as documented in table 3. The first year in this analysis is 1979, because those hired in 1978 reached seniority level of 1 year in 1979. At the other end, the cohort who entered in 1986 does not contribute to this analysis at all, because they had not reached seniority level of 1 year by the end of the last year in our data (1986). The equations for seniority levels 2–8 are identical, except that the subscripts for the coefficients change to 2–8 and that we only analyze the data from year 1980 and later, as the oldest cohort reached seniority level of 2 years in 1980. The same kinds of equations are estimated for annual salary, one per level of seniority. Note again that we do not make separate analyses per calendar year, as one would do in traditional cross-sectional analysis, but separate analyses by level of seniority.[18]

---

[18] We also estimated these regression models separately by year for each level of seniority within year, with no difference in pattern of results, only yielding a greater number of sex coefficients to report (for the wages, 216 rather than the 48 reported in table 7).

874

C. Promotions

For the promotion process, the dependent variable is the time that elapses before a promotion in the organization occurs, or, more precisely, whether the employee gets promoted or not in the next time interval (i.e., month), given no promotion prior to entry into the time interval. Each promotion spell for an employee contributes with as many time intervals as elapsed before he or she got promoted, left the organization, or end of study occurred (December 1986). The value of the explanatory variables at duration t in a job level is given in $x_i(t)$, which may include elements of the past history of the covariates. A person can be promoted several times, this thus being a repeatable-event process. The rate is specified as a proportional-hazards log-logistic model, allowing it to follow a bell-shaped function of time, which seems reasonable for promotions (e.g., Petersen, Spilerman, and Dahl 1989). The parameters of the hazard rate are assumed to be the same across seniority levels and all repetitions of the process:

$$\lambda_p[t|x_i(t^-)] = \frac{\exp(\gamma_{0p} + \gamma_p \ln t)}{1 + \exp[\gamma_{0p} + (\gamma_p + 1)\ln t]} \times \exp[\theta_p x_i(t^-)], \qquad (4)$$

where $\gamma_p > -1$ and θ_p is a vector of parameters conforming to $x_i(t)$, where the value of the covariates in the month prior to t enters; thus the notation t^-.

D. Departures

For the departure process, where we look at voluntary departures, the dependent variable is the time that elapses before a departure from the organization occurs, or more precisely, whether the employee leaves or not in the next time interval (i.e., month), given no departure prior to entry into the time interval. Each employee contributes with as many time intervals as elapsed before he or she left the organization or end of study occurred (December 1986). The value of the explanatory variables at seniority s in a job level is given in $x_i(s)$, which may include elements of the past history of the covariates. Again, the rate is specified as a log-logistic model:

$$\lambda_d[s|x_i(s^-)] = \frac{\exp(\gamma_{0d} + \gamma_d \ln s)}{1 + \exp[\gamma_{0d} + (\gamma_d + 1)\ln s]} \times \exp[\theta_d x_i(s^-)], \qquad (5)$$

where the value of the covariates in the month prior to s enters, thus the notation s^-. Together, the two hazard-rate models (4) and (5) form a competing risks model.

875

V. CONDITIONS AT INITIAL HIRE

Table 5 gives employment conditions at initial hire, and table 2 gives characteristics of hires, separately for each of the nine cohorts of entrants in the period 1978–86.

Focusing on table 5, the raw female wage gap ranges from 12% to 22%, depending on the year. On average, women are hired half a job level below men. Women are also on average hired into jobs with a lower top level, a lower bottom level, and more often into jobs with only one level attached to it, when we use information on several hundred detailed job titles.

As for characteristics of hires (see table 2), men and women enter with about the same amount of education, with some annual fluctuations. Men are on average one to three years older. The percentage in professional occupations is much higher for men, except in the last year, with engineers and lawyers being highly paid.

In summary, there are clear and nontrivial differences in employment conditions at initial hire: men come out better on all five dimensions considered. The extent to which these differences may reflect differential treatment we explore further below. There are also differences in characteristics of those hired.

The differences in job levels and wages at point of hire are explored further in regression analyses in tables 6 and 7. In table 6 the dependent variable is the job level, in four different specifications (cols. 1–4). Each specification is estimated separately for each of the 9 years of seniority (0–8), using ordinary least squares. Only the effects of being male are presented, but each coefficient comes from a regression controlling for additional variables. In column 1, the regressions contain in addition to the sex effect (male = 1), the effects of hire year (as a set of dummy variables, the number of which varies by the years of seniority). The regressions in columns 2–4 sequentially add the following variables to those in column 1: in column 2, education (four dummy variables) and age (one continuous variable); in column 3, occupational group (five dummy variables); in column 4, estimated only for seniority levels of one year and above, the job level at hire (one continuous variable). In table 7, the dependent variable is the logarithm of the annual salary. Otherwise the regressions in columns 1–4 contain the same variables as in table 6. Column 5 adds the current job level to the variables in column 3. Column 6 adds both the starting and current job levels to the variables in column 3, only estimated for seniority of one year or more.

In the regressions, note that except for the sex variable, we include only variables that can be considered legitimate for setting rewards, such as age, education, occupation, and seniority, but not all variables that de-

876

TABLE 5
EMPLOYMENT CONDITIONS AT INITIAL HIRE, BY HIRE YEAR

Variable	1978 (1)	1979 (2)	1980 (3)	1981 (4)	1982 (5)	1983 (6)	1984 (7)	1985 (8)	1986 (9)
Relative wages* ...	88.7	87.7	86.9	84.4	87.1	88.2	84.3	83.1	78.3
Job level:[†]									
Men	1.8	2.0	1.9	1.7	2.0	2.1	2.1	2.3	2.5
Women	1.5	1.5	1.4	1.4	1.5	1.7	1.6	1.6	1.7
Max(job level):[‡]									
Men	3.4	3.8	3.2	3.2	3.5	3.7	3.6	3.9	4.2
Women	3.4	2.6	2.5	2.7	3.2	3.4	3.3	3.6	4.2
Min(job level):[§]									
Men	1.2	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.6
Women	1.1	1.1	1.1	1.0	1.1	1.2	1.2	1.2	1.1
% one job level:[‖]									
Men	15.5	10.2	22.8	19.9	18.0	9.2	15.7	10.4	9.1
Women	23.9	27.5	39.9	36.3	10.2	15.4	21.1	17.1	9.4
N (hired)	188	265	693	503	330	436	496	501	339

NOTE.—For description of data see Sec. III. For discussion of results see Sec. V. The organizational hierarchy runs from job level 1 (low) to 13. Most entrants are hired into the lower levels. The table gives conditions of employment at initial hire. The statistics are given separately by hire year.

* This gives the ratio of the full-time equivalent average salaries of women to men multiplied by 100.
[†] This gives the average job level hired into.
[‡] This gives the average of the maximum job level of the job the person was hired into.
[§] This gives the average of the minimum job level of the job the person was hired into.
[‖] This gives the percentage of employees that were hired into jobs with only one job level.

termine salaries; for example, we exclude race.[19] Our objective is to assess whether there still is, once one has controlled for legitimate factors, a gender job-level or wage gap. This is thus not a standard job-level or wage equation, where one tries to control for all relevant variables. Ours is however the correct procedure for assessing potential discrimination: Beyond the variable for which one suspects discrimination, only legitimate factors should be included (Gunderson 1989, pp. 48–49). This is also often the practice in court cases.

In tables 6 and 7, focus on line 0 in both tables, pertaining to seniority of zero years, corresponding to equations (1) and (2) respectively. From column 1 we see that men on average are placed half a job level above women and earn 15% more. From columns 2 and 3, where we control for several relevant variables, but not for prior work experience on which we have no information, we see that men are placed at about a quarter of a job level above women and earn about 7% more. Controlling also for the job level at hire (table 7, col. 4), men earn about 3.6% more than women. So the raw differences of half a job level and 15% in pay get

[19] We also did these analyses controlling for race, with almost identical results.

877

TABLE 6
ESTIMATES OF EFFECT OF SEX (MALE = 1) ON JOB LEVEL AMONG FULL-TIME
EMPLOYEES, BY YEARS OF SENIORITY

	(1)		(2)		(3)		(4)	
SENIORITY	β	R^2	β	R^2	β	R^2	β	R^2
0 years ...	.514	(.048)	.303	(.357)	.266	(.374)		
1	.590	(.048)	.404	(.273)	.259	(.329)	.080	(.815)
2	.494	(.036)	.361	(.248)	.195	(.312)	.027*	(.732)
3	.528	(.039)	.424	(.252)	.238	(.336)	.038*	(.690)
4	.504	(.047)	.400	(.238)	.187	(.312)	.002*	(.619)
5	.457	(.045)	.343	(.244)	.145*	(.322)	−.006*	(.594)
6	.503	(.052)	.389	(.245)	.294	(.322)	.104*	(.544)
7	.232*	(.004)	.235*	(.237)	.226*	(.325)	.020*	(.497)
8	.333*	(.008)	.447*	(.382)	.407*	(.437)	.254*	(.515)

NOTE.—For description of data see Sec. III. For discussion of results see Secs. V–VI. Within each column, the first number gives the estimated coefficient for being male and the second number in parentheses gives the explained variance of the model from which the coefficient comes. The dependent variable in the four regression equations in cols. 1–4 is the job level, for each of nine years of seniority. Each regression is estimated separately by level of seniority, using ordinary least squares. An ordinary probit analysis yielded for all practical purposes the same substantive results. The regressions in col. 1 contain, in addition to the sex effect (male = 1) and a constant term, the effects of hire year (as a set of dummy variables, the number of which varies by the years of seniority). In line 1 of col. 1 the number .514 means that men on average are hired at about half a job level above women. The next three regressions sequentially add more variables. The regressions in col. 2 add, to those in col. 1, variables for education (four continuous dummy variables) and age (one continuous variable). The regressions in col. 3 add, to those in col. 2, variables for occupational group (five dummy variables). The regressions in col. 4 add, to those in col. 3, a variable for the job level at hire (one continuous variable), estimated only for seniority levels of one year and above, because at seniority 0 the dependent variable is the job level at hire.

* Not significantly different from zero at the 5% level (two-tailed tests). The estimated SEs of coefficients are for col. 1, .047, .052, .062, .075, .087, .107, .137, .224, .365; col. 2, .039, .046, .055, .067, .079, .097, .125, .201, .300; col. 3, .039, .046, .054, .065, .078, .096, .123, .183, .298; col. 4, .024, .034, .045, .059, .075, .101, .162, .273.

reduced to about a quarter of a job level and 3%–7% in pay once the control variables are introduced.

At seniority level zero, the percentage explained variance in salaries starts at 36.7% with controls only for sex and hire year, increases to 60.6% once education and age are added, to 64.5% after adding occupation, and finally to 82.5% with controls for the job level at hire. The pattern is similar in table 6 with job level as the dependent variable, where it ranges from 4.8% to 37.4%. A few and basic variables explain most of the variation in salaries.

In these regressions, and those below, we control only for six broad occupational groups: a reference group of managerial occupations, the administrative positions, and the four professions law, accounting, engineering, and computer sciences. We know the several hundred detailed job titles for these employees. But even with control for only six groups, the differences between men and women are relatively small. And the control for occupation reduces the wage gap only marginally, at the point

878

TABLE 7

ESTIMATES OF EFFECT OF SEX (MALE = 1) ON LOGARITHM OF ANNUAL SALARY AMONG FULL-TIME EMPLOYEES, BY YEARS OF SENIORITY

SENIORITY	(1) β	(1) R^2	(2) β	(2) R^2	(3) β	(3) R^2	(4) β	(4) R^2	(5) β	(5) R^2	(6) β	(6) R^2
0 years	.149	(.367)	.104	(.606)	.072	(.645)	.036	(.825)	.036	(.825)		
1	.130	(.325)	.090	(.547)	.061	(.600)	.036	(.797)	.027	(.842)	.027	(.844)
2	.110	(.218)	.083	(.454)	.055	(.518)	.032	(.753)	.031	(.833)	.029	(.838)
3	.103	(.112)	.083	(.361)	.051	(.445)	.024	(.712)	.022	(.855)	.020	(.861)
4	.095	(.069)	.073	(.301)	.041	(.382)	.016	(.668)	.020	(.856)	.016	(.868)
5	.086	(.047)	.064	(.295)	.034	(.370)	.015*	(.635)	.018	(.875)	.015	(.882)
6	.083	(.043)	.060	(.276)	.044	(.345)	.020*	(.576)	.012*	(.868)	.009*	(.874)
7	.035*	(.012)	.026*	(.262)	.021*	(.336)	−.007*	(.537)	−.008*	(.856)	−.009*	(.865)
8	.060*	(.014)	.061*	(.274)	.054*	(.321)	.030*	(.426)	.001*	(.859)	−.002*	(.862)

NOTE.—For description of data see Sec. III. For discussion of results see Secs. V–VI. Within each column, the first number gives the estimated coefficient for being male and the second number in parenthesis gives the explained variance of the model from which the coefficient comes. The dependent variable in the six regression equations in cols. 1–6 is the natural logarithm of annual salary at full-time employment, for each of nine years of seniority. Each regression is estimated separately by level of seniority, using ordinary least squares. The regression equations in cols. 1–4 contain the same independent variables as the regression equations in cols. 1–4 of table 6 (see note to the table). In line 1 of col. 1, the number .149 means that at the time of hire men on average earn about 15% more than women. Col. 5 adds, to the variables in col. 3, the current job level (as one continuous variable). Col. 6 adds, to the variables in col. 3, both the starting job level and the current job level, estimated only for seniority levels of 1 year and above, because at job level 0, the starting and current job levels coincide.

* Not significantly different from zero at the 5% level (two-tailed tests). The estimated SEs are for col. 1, .009, .009, .010, .011, .012, .014, .017, .027, .049; for col. 2, .008, .008, .009, .010, .011, .012, .015, .025, .044; for col. 3, .008, .008, .009, .010, .012, .015, .023, .043; for col. 4, .005, .005, .006, .007, .008, .009, .012, .020, .040; for col. 5, .005, .005, .005, .005, .005, .007, .011, .020; and for col. 6, .005, .005, .005, .005, .005, .007, .011, .020.

of hire from about 10% to 7% (table 7, col. 3). So sex segregation on broad occupational groups cannot account for the gender wage gap that exists. Part of the sex gap at hire is, however, due to underrepresentation of women among engineers (see table 2, asterisked note).

VI. TEMPORAL PATTERN OF JOB LEVELS AND WAGES

There are thus clear and significant differences between men and women in conditions at initial hire, perhaps not large, but differences nevertheless.

What happen to these differences as the men and women pursue their careers within the organization? Do they decline with seniority, as the current framework implies, or do they grow, as implied by the glass-ceiling hypothesis? The answers are given in tables 4, 6, and 7. Table 4 gives the raw relative wages and average job level by sex, each by years of seniority. Tables 6 and 7, lines 1–8, for seniorities of 1 through 8 years, give the results from regression analyses for job level and wages, respectively. Line 1 in table 6 corresponds to equation (3). Lines 2–8 correspond also to equation (3) but with the subscript 1 replaced with 2 in line 2, with 3 in line 3, and so on.

The evidence is unambiguous. First, as reported in column 1 of tables 6 and 7 and columns 3–5 of table 4, the overall gaps in both job level and wages decline with seniority, from about a half to a third of a job level and from about 15% to 6% in wages. The overall job-level gap, unlike the salary gap, is, however, stable from seniority level 0 to 6, but then clearly declines at seniority 7 and 8 years. At the two highest levels of seniority, there is no longer a significant difference between men and women. But this partly reflects the small number of observations. Conducting a formal test of the decline, for the job level, an interaction effect between sex and years of seniority is insignificant and substantively small at −.016. This indicates, in a linear specification, a minuscule decline of one tenth of a job level as seniority increases from 0 to 8. For the salary gap this is different. The interaction effect is −.013 and statistically significant. It means that the salary gap declines from about 15% to 4% as seniority increases from 0 to 8, a major decline.[20]

Second, we control for relevant variables in columns 2–6 of tables 6 and 7. For the job-level gap there appears to be no clear pattern with seniority, though it drops to insignificance at the higher seniority levels. The finding then is really a stable job-level gap by seniority, once controls

---

[20] In the tests we pooled all levels of seniority, specifying the same models as in tables 6 and 7, with all implied interaction terms. But instead of having separate effects of sex by level of seniority, we estimated a main effect plus an interaction effect between sex and years of seniority.

880

have been added. A formal test shows the same, a small and nonsignificant interaction effect of sex and years of seniority, in a linear specification. For the salary gap there is, however, a clear decline with seniority. By year five of seniority there is virtually no difference between men and women in wages, once the variables are controlled. This gets confirmed in a formal test, with a subtantively large and significant interaction effect of sex and years of seniority, indicating that the gap goes toward zero as seniority increases.

Contrary to what many would expect, then, there is no widening of the gaps between men and women with seniority. For the job level, there is a small overall decline, but not when controlling for other variables. For the salary, there is both an overall decline and one net of other variables. There is a convergence in attainment between men and women, when viewed in overall terms, slightly so in the job level and much so in the salary. This is likely the case because it becomes more difficult to discriminate as seniority grows, as implied by the framework developed here, but also because more information is available about current employees than about new hires, leading to less use of stereotypes. Gerhart (1990, p. 419) writes, "One reason to expect a larger disadvantage for women in starting rather than current salary is that less productivity information is available for applicants than for current employees." He also reports from firm-level data that the salary gap narrowed with seniority (p. 427).

The explained variance gives additional insight into the temporal pattern of sex differences. In column 1, table 7, with controls for only sex and hire year, the percentage explained variance for salary drops from 36.7% at time of hire to 1.4% at seniority 8 years. It follows the same pattern in columns 2–4 as variables are added to the regressions, dropping about 30–40 percentage points as seniority increases. Once one controls for the current job level in column 5 there is however no drop in the explained variance with seniority; it remains stable at about 80%, not surprising since salary is closely related to position in the job-level structure. The pattern is similar in table 6 with job level as the dependent variable.

Thus, as seniority grows and the employer learns more about its hires, there is more residual variation in salaries, with wages less tied to formal characteristics and probably more directly to observed productivity differences. Even so, the sex gap in salary declines with seniority.

One might object that the narrowing of the gaps with seniority may not be a process related to seniority but rather to a changing climate both internally and externally to the organization where men and women are treated more equally as one gets closer to 1986. To assess whether this was the case we estimated regression equations with job level and salary

881

as dependent variables, pooling the nine cohorts of employees across the years, with a main effect for sex, main effect for calendar year (coded 0–8), interaction effects of sex and dummy variables for calendar year, plus years of seniority as well as the set of other variables used in tables 6 and 7. If the interaction effects of sex and calendar year are negative and significant, there is support for this alternative contention. The results of these analyses are unambiguous: none of the interaction effects in none of the models estimated was significantly different from zero at the .10 level. Moreover, all the coefficients were small and often positive with a size of about .01 or less, with explained variance for the models ranging from 40.4 to 88.0. There is hence no evidence of a shift in how men and women are treated over the nine-year period. The waning of the gender gaps in job level and salary with seniority probably reflects more equal treatment as men and women stay in the organization, not a changing climate over time in how they are treated.

VII. PROMOTIONS

The central finding in Sections V and VI was that the overall job-level and salary differential between men and women decline with seniority in the organization, especially the salary. Once controls were added for education, age, and occupation, the salary gap still declined strongly with seniority while the job-level gap did not. Salary is probably the more salient reward for the employees. The attainments of men and women thus converge rather than diverge as they remain in the organization. One way the salary convergence could come about would be if the employer treats men and women more equally as seniority grows, which we showed to be the case. Another way would be if women were promoted at a higher rate than men. We turn now to promotions. By doing so we also gain insight into the widely held opinion that women face increasingly larger obstacles for career advancement as they climb organizational hierarchies within managerial, administrative, and professional rungs, the glass-ceiling hypothesis.

Table 4 gives the percentages promoted by sex separately for each seniority level. For eight of the nine levels the percentage promoted is higher among women than men. Elaborating on this analysis, table 8 reports a series of promotion analyses, using hazard-rate models. As above, we use data only on entrants into the organization in the period 1978–86. In column 1 the model contains a constant plus the effect of sex. The models in columns 2–6, in addition to controlling for seniority in the organization, sequentially add the same variables as in columns 2–6 of table 7 (see notes to table 6 and table 7). Column 7 adds interaction terms

882

TABLE 8

ESTIMATES OF EFFECT OF SEX ON PROMOTION RATE WITHIN THE ORGANIZATION

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male (= 1) ...	−.158	−.081	−.066*	−.053*	−.014*	−.009*	.116	.114
	(.038)	(.036)	(.037)	(.037)	(.038)	(.037)	(.055)	(.052)
Level × male[a]:								
2							−.311*	−.127*
							(.219)	(.086)
3							−.072*	−.237
							(.088)	(.108)
4							−.212	−.551
							(.111)	(.156)
5							−.523	−.631
							(.158)	(.226)
6+							−.646	−.741
							(.230)	(.243)

NOTE.—For description of data see Sec. III. For discussion of results see Sec. VII. In the analyses we include only employees who entered the organization in 1978–86 in managerial, administrative, and professional positions. The hazard-rate models predict promotions within the organization. In col. 1 the exponential model is used, while in cols. 2–8 the proportional hazards version of the log-logistic model is used (see Petersen 1995, sec. 7). The role of seniority in predicting promotions is taken into account as a time-dependent covariate, updated every 12 months. Cols. 2–6 add the same explanatory variables as cols. 2–6 in table 7 (see notes to tables 6 and 7). Col. 7 adds, to the variables in col. 5, interaction terms between the currently occupied job level and sex, thus excluding the job level at hire. Col. 8 adds, to the variables in col. 6, the same interaction terms as in col. 7, thus including also the job level at hire. Except for the variables sex and job level at hire, all variables may change over time.

[a] This gives, in cols. 7 and 8, the interaction term between sex and the currently occupied job level. The reference group is job level 1, captured by the main effect of sex in line 1, with estimates of .116 and .114. The top group is job level 6 and higher, denoted 6+, capturing the differential effect of being female in job level 6 and above.

* Not significantly different from zero at the 5% level (two-tailed tests).

between sex and the job level occupied to the variables in column 3. Column 8 adds the same variables but now to the variables in column 6. These models are, unlike those in tables 6 and 7, not estimated separately by year of seniority. Instead we have included seniority as a time-varying covariate in predicting the promotion rate.

The evidence is clear. Overall, from column 1, men are promoted at about a 15% lower rate than women. This means that if 20% of the women were promoted in a given year, 17% of the men were. Controlling for the variables in columns 2–6, there is no sex difference in the promotion rate: the sex coefficient is close to and not significantly different from zero, except in column 2. Considering the evidence in columns 7–8, where interaction terms between sex and the currently occupied job level are included, we get a more subtle result. In the lowest level, 1, men are promoted at a slightly higher rate than women. But then in levels 2 and above, with the exception of level 3 in column 7, women are promoted at a higher rate than men, and in levels 4 and above significantly so (at

883

the .05 level). Moreover, in levels 5 and above the promotion rate is considerably higher for women than men. This corresponds to results found in other organizations (Spilerman and Petersen 1999).[21]

In conclusion, not taking individual characteristics into account, women are promoted at a higher rate than men. Taking such variables into account, there is no difference between men and women in promotion rates. Finally, taking into account the possibility that the promotion rates for men and women may depend on the job level, the contention put forth by the glass-ceiling hypothesis, women are promoted at a lower rate in the lowest level and at a higher rate in the higher levels. This is exactly opposite of what the hypothesis puts forth.

Note again that in these analyses we have not included elaborate controls for occupational group or career ladder, distinguishing only six broad occupational groups. So even in the absence of extensive controls for career ladder slotted into, there are few or no differences between men and women in promotion rates.

Some of the decline in the gender wage gap with seniority, as reported in tables 6 and 7, is therefore due to differential promotion rates, where women are at an advantage in the higher levels. But some of the decline is due just to more equal treatment of men and women as seniority increases, because also when we control for the current job level in the wage equation, thus removing the effect of job-level promotion, there is a decline in the wage gap with seniority (see Sec. VI, table 7, col. 5). The overall job-level gap changes much less, due to the two opposing processes, a higher female promotion rate in higher levels, and a lower in the lowest level. These processes pull in opposite directions.

It is instructive to explore further why the salary gap declines so strongly with seniority. Table 9 shows the main mechanism. Women on average receive higher percentage salary increases than men, of 0.6 to 2.6 percentage points at 7 of 8 seniority levels and the same at one. Among promoted employees women received larger increases at 6 of 8 seniority levels, of 0.8 to 2.7 percentage points more than men, the same at one, and a lower at one. At seniority 7 years, where the female salary increase was 1.3 percentage points lower, their promotion rate was twice that of men, 17.1% versus 8.6%. Also among nonpromoted employees women receive higher percentage salary increases. Multivariate analyses show the same (available from authors). As for absolute increases, these are higher

---

[21] Among all managerial, administrative, and professional employees, entrants and existing ones, the annual promotion rate over the 1978–86 period is fairly stable, ranging from 15.9% to 20.4%. It appears not to be affected by fluctuations in departures and net growth. The departure rate hovers around 4%–7%, reaching 8.5% in 1981. The net growth rate in employment is mostly between 5%–7%, but reached 13.5% in 1980 and a low of –0.3% in 1986.

884

TABLE 9
PERCENTAGE PROMOTED BY SEX AND SENIORITY LEVEL AND PERCENTAGE CHANGE IN
SALARY BY SEX AND SENIORITY LEVEL

| | | % PROMOTED | | % SALARY CHANGE | | | | | |
| | | | | All | | Promoted | | Not Promoted | |
SENIORITY	N	M (1)	W (2)	M (3)	W (4)	M (5)	W (6)	M (7)	W (8)
0 years ...	3,752	33.6	34.6	14.1	16.6	17.8	20.5	12.6	14.2
1	2,983	27.6	36.3	13.6	14.6	16.2	17.7	12.7	13.4
2	2,341	25.0	27.3	11.1	11.7	13.7	14.5	10.4	10.9
3	1,807	18.0	18.1	9.1	9.8	10.9	12.2	8.8	9.4
4	1,389	14.3	15.4	7.3	8.3	9.7	11.1	7.0	7.7
5	1,091	14.0	15.3	6.4	7.0	9.4	12.0	6.1	6.4
6	744	10.6	8.6	5.2	7.8	7.8	7.8	5.4	7.8
7	321	8.6	17.1	5.2	5.1	12.4	11.1	4.9	4.6
8	126	2.0	3.6						

NOTE.—For description of data see Sec. III. For discussion of results see Sec. VII. Cols. 1–2 give the percentage of employees at a given seniority level that got promoted while still at that seniority level, regardless of whether they remained in the organization to the next seniority level or not. Cols. 3–8 compare the salaries between two subsequent seniority levels. It takes the salary at the beginning of the calendar year that a given seniority level was reached, or for newly hired employees at the time of hire, and compares it to the salary at the beginning of the next calendar year, the year in which the next seniority level was reached. It looks at the percentage at which the salary was changed, computed separately for each employee. This computation is based on employees who remained in the organization from one year to the next. At seniority level 0, the %change gives the change as the employee goes from seniority level 0 to level 1, and so forth for higher levels. For seniority level 8 we have not computed the %change in salary for the 126 employees who started in 1978 and were still in the organization by 1986. That would involve comparing the salary in 1986 with that in 1987, beyond the period in our study. The reason we do it this way is that the best measure of the full-time salary equivalent is the one that the organization records at the beginning of each calendar year. This measure does not include differences in hours worked, compensation for overtime, etc. It is given as the full-time equivalent in salary. The earnings attached to each employee's job within the year will reflect differences in hours worked and other labor supply behaviors, but not necessarily the rate at which employees are paid. The number of employees over which the percentage changes are computed is smaller than the number of employees over which the percentage promoted is computed since some employees left within a calendar year so that we cannot compare their full-time salary from one year to the next.

for women at 5 of 8 seniority levels. This differs from the California Civil Service system in the same period, where promotion rates were higher for women, but mean salary increases upon promotion were lower (Barnett et al. 2000).

In conclusion, not only do women get promoted at a higher rate than men, they also receive higher salary increases, regardless of promotion status. The combined forces of these two processes lead to the sharp decline in the salary gap by seniority, both overall and net of other variables.

885

A. Discussion of Results

We discussed the result of a higher promotion rate for women with a human resource manager who had been present at the time. As already mentioned, they knew they were an overwhelmingly white and male company with startling sex segregation. They could defend it statistically by the availability pools at the time most of their employees were hired. But that could not solve an image problem. It appeared best to change the situation. Thus, he claimed, they paid attention to the situation of women, who, once hired, were promoted quickly, as our analysis shows.[22] According to our informant, this was common in large firms. It was still his impression that they were less proactive in this area than other large and visible firms.[23]

Writing on African-Americans, but in the present company probably of relevance to women as well, Jencks (1992, p. 53) argues, "Blacks who already work for a firm are in a good position to monitor the way it distributes pay and promotions. If they think their employer is mistreating them, they may well take legal action. This possibility gives their employer a strong incentive to treat them fairly. Indeed, firms have an incentive to treat their black employees somewhat better than their white employees, because blacks who think they have been mistreated can sue more easily than whites with similar grievances." This is consistent with the promotion patterns by sex observed in the present company.

From Jencks's remarks one may raise the question why the organization treats women worse at time of hire but better thereafter. According to our framework this is due to a better opportunity structure for discrimination at time of hire. But other processes may also operate. One obvious possibility is that men and women differ in the amount of experience they bring to the company. This will induce a gap at the time of hire. But as women gain experience in the company and prove to be valuable employees, the organization compensates for the initially lower placement by higher promotion rates and higher salary increases. We have no measure of prior experience. But it clearly is correlated with age. Among younger hires, the sex differential in experience should be small, holding education constant. But among older entrants, the experience differential likely increases with age; most men will have had continuous careers

---

[22] Another piece of evidence on this is in the age distribution of new hires. At each job level, the average age of entrants was much lower among women, especially in the higher levels, where women on average were 5–10 years younger.

[23] Bielby (2000) argues that formality in procedures is important for achieving gender equality. As discussed in Sec. III, the procedures in the present company were at the time not consistently formal. But the attention paid to the situation of women may have compensated for some lack of formality.

886

while women on average will have taken more time off to tend for children.

To explore this, we estimated separate regression models for job level and salary at time of hire where we included interaction terms between being male and age. The results from the analyses are given in tables 10 and 11. Table 10 corresponds to table 6, and table 11 to table 7.

The results are clear. For job level at hire, the sex differential is strongly age dependent: No or a small difference up until age 34, and then a steeply rising gap from age 35 to 50, to about 2.0 levels. For salary at hire, the results are similar. In the three first regressions (cols. 1–3), the male premium increases from about 5% to 60% as age goes from 18–24 to 50+. In column 4, which also controls for the job level at hire, the male premiums are smaller: about 2%, 10%, and 36% among the age groups 18–34, 35–40, and 50+ respectively.

This pattern of job-level and salary differentials may clearly reflect differences in experience. Younger men and women will have about the same experience, but then with age, men on average accumulate more experience than women. This yields a payoff in placement at initial hire.

This then provides an alternative interpretation to the discrimination hypothesis from which we have reasoned: the larger gap observed at time of hire is due to a gender gap in experience, not to discrimination. From this viewpoint, not only is there no evidence of discrimination against women in post-hire outcomes, but perhaps none even with respect to placement at initial hire.

VIII. THE GLASS CEILING

At this point two objections to our analysis of promotions arise, namely first that even though there is a narrowing of average job-level and salary differentials between men and women with seniority, in part brought about by higher promotion rates for women, this may mask one central but less easily researched concern: There may be a major differential in who reaches the upper echelons of the hierarchy, the parts thought inaccessible to women and in focus of the glass-ceiling literature. A second and related objection is that a nine-year period is too short for assessing these processes of reaching the very highest levels. Responding to these objections requires meticulous attention to detail as the number of affected employees becomes small, thus being less amenable to broad statistical analysis, moving us almost into the realm of "thick description."

As for the first objection, table 12 gives a distribution of the nine cohorts of entrants on the job level reached by sex and by years of seniority, where we have collapsed the job levels into six groups: 1, 2–3, 4–5, 6–8, 9–10,

887

TABLE 10
Estimates of Effect of Sex (Male = 1) on Job Level among Full-Time
Employees at Time of Hire (Seniority = 0), Separately for Each of Seven Age
Groups

Age Group	(1)	(2)	(3)
18–24	−.024*(.026)	−.017*(.026)	.000*(.026)
25–29	.195 (.058)	.225 (.054)	.200 (.056)
30–34	.340 (.107)	.391 (.104)	.271 (.102)
35–39	.876 (.183)	.883 (.178)	.795 (.179)
40–44	1.515 (.356)	1.635 (.346)	1.518 (.364)
45–49	1.746 (.640)	2.260 (.585)	2.296 (.623)
50+	1.986 (.699)	1.568 (.662)	1.406 (.862)

Note.—Estimated SEs in parentheses. For description of data see Sec. III. The dependent variable in the three regression equations in cols. 1–3 is the job level at time of hire (i.e., seniority 0 years). Each regression is estimated using ordinary least squares. An ordinary probit analysis yielded for all practical purposes the same substantive results. The regression in col. 1 contains, in addition to the sex effect (Male = 1) and the interaction terms between sex and the six dummy variables for age, a constant term, main effects for age (six dummy variables), and the effects of hire year (as eight dummy variables). The reference group for age is 18–24 years old at time of hire. In line 1 of col. 1 the number −.024 means that among those of 18–24 years men on average are hired at a job level of about a fortieth below that of women, that is, at the same level. In line 4, for age 35–39, the number .876 means that among those 35–39 years old, men are hired at almost a full job level above women. The next two regressions sequentially add more variables. The regression in col. 2 adds, to those in col. 1, variables for education group (four dummy variables). The regression in col. 3 adds, to those in col. 2, variables for occupational group (five dummy variables).
* Not significantly different from zero at the 5% level (two-tailed tests).

and 11 (no one made it into levels 12 and 13). The pattern is simple. At the time of hire, women do relatively worse than men, being mostly concentrated in the lower job levels and with few assigned to job level 6 or above: 2.6% of the men versus 0.8% of the women. However, by seniority of five years, 6.8% of the men and 5.8% of the women are in job level 6 or above, with 0.9% and 0.8% in job levels 9–11, a pattern that holds also for seniority of six–eight years. As noted above, among entrants in the 1978–86 period no one made it into the two top job levels, 12 and 13, and only men made it into level 11. At the two highest seniority levels, no women but about 1.0% of the men are in job levels 9–11: three with seniority of seven years and one with seniority of eight. This need not be due to women being kept out of the top job levels. If the proportion of women reaching those levels were to be the same as the proportion of men doing so, there would, at seniority of seven and eight years, be three-fourths and one-third of a woman in those job levels, due to a small pool of women to draw from at the two highest seniority levels, 76 and 28 respectively.

Thus at the time of hire among entrants in the 1978–86 period, the proportion in the top job levels is lower for women than men. But by

888

TABLE 11

ESTIMATES OF EFFECT OF SEX (Male = 1) ON LOGARITHM OF ANNUAL SALARY AMONG
FULL-TIME EMPLOYEES AT TIME OF HIRE (Seniority = 0), SEPARATELY FOR EACH OF
SEVEN AGE GROUPS

Age Group	(1)	(2)	(3)	(4)
18–24	.047 (.011)	.055 (.010)	.024 (.008)	.023 (.008)
25–29	.077 (.013)	.082 (.013)	.053 (.013)	.023 (.010)
30–34	.102 (.021)	.112 (.020)	.077 (.019)	.035 (.012)
35–39	.216 (.028)	.214 (.028)	.183 (.027)	.077 (.014)
40–44	.307 (.048)	.320 (.047)	.289 (.049)	.111 (.025)
45–49	.345 (.077)	.406 (.069)	.415 (.072)	.173 (.032)
50+	.480 (.086)	.464 (.082)	.429 (.105)	.282 (.056)

NOTE.—Estimated SEs in parentheses. For description of data see Sec. III. For discussion of results see Sec. VII. The dependent variable in the four regression equations in cols. 1–4 is the natural logarithm of annual salary at full-time employment. Each regression is estimated using ordinary least squares. The regression equations in cols. 1–3 contain the same independent variables as in cols. 1–3 of table 10 (see note to the table). In line 1 of col. 1, the number .047 means that at the time of hire 18- to 24-year-old men on average earn about 5% more than women. Col. 4 adds, to the variables in col. 3, the job level at hire (as one continuous variable).

seniority of five years and above, there is little or no difference between the sexes.

Turning to the second objection, that a longer time frame than nine years is needed; table 13 gives the distribution of all managerial, administrative, and professional employees present in 1986 on job level by sex and years of seniority. This includes those hired prior to 1978 and those promoted internally to these positions, while employees who left before 1986 are excluded.

The story is overwhelmingly simple. There is no question that there is a glass ceiling at job level 11: not a single woman is employed above job level 10. It is, furthermore, no question that this to a large extent is due to the very small number of women with high seniority levels. To see why, note first that only about 0.5% of these 7,329 employees are placed in job levels 11–13. Of the 42 men in those levels, 7 have seniority of 11–20 years, and 25 have seniority of 21 years or more. Of the 3,410 men with seniority of 11 years or more, 0.93% are placed in job levels 11–13. The number of women with seniority of 11 years or more is 299. But 70% of them started their careers in the organization at its very lowest level, the entry-level clerical position, whereas only 14% or 43 women entered the organization in managerial, administrative, and professional ranks. Very few men in the top managerial job levels 11–13 started their careers in nonmanagerial ranks, and of the seven (17%) that did, six have 26 years or more seniority in the organization.

Taking the longer time frame, then, shows that the main problem is that the pool of women with high seniority is very small. Additionally,

889

TABLE 12

DISTRIBUTION (PERCENTAGES) OF MANAGERIAL, ADMINISTRATIVE, AND PROFESSIONAL
EMPLOYEES ON JOB LEVEL, BY SENIORITY AND GENDER: ENTRANTS INTO THE
ORGANIZATION IN 1978–86

	JOB LEVEL							
SENIORITY	1	2–3	4–5	6–8	9–10	11	SUM	N
0:								
Men	51.5	36.2	9.7	2.0	.3	.3	100.0	2,684
Women ...	69.0	25.7	4.5	.7	.0	.0	99.9	1,068
1:								
Men	25.4	60.1	11.6	2.4	.3	.2	100.0	2,127
Women ...	47.2	47.0	4.5	1.3	.0	.0	100.0	856
2:								
Men	16.5	65.2	14.6	3.1	.4	.2	100.0	1,700
Women ...	30.7	59.6	7.8	1.9	.0	.0	100.0	641
3:								
Men	13.5	62.6	19.0	4.1	.6	.2	100.0	1,320
Women ...	26.5	58.7	11.5	3.3	.0	.0	100.0	487
4:								
Men	10.3	58.5	25.8	4.7	.7	.1	100.0	1,038
Women ...	23.6	55.0	17.7	3.4	.3	.0	100.0	351
5:								
Men	8.2	53.2	31.9	5.9	.8	.1	100.0	830
Women ...	21.5	49.4	23.3	5.0	.8	.0	100.0	261
6:								
Men	8.4	42.9	39.3	8.3	.9	.2	100.0	557
Women ...	18.7	49.2	24.6	6.4	1.1	.0	100.0	187
7:								
Men	3.3	36.7	45.3	13.1	1.6	.0	100.0	245
Women ...	18.7	49.2	24.6	6.4	1.1	.0	100.0	76
8:								
Men	4.1	28.6	54.1	12.2	1.0	.0	100.0	98
Women ...	3.6	42.9	32.1	21.4	.0	.0	100.0	28

NOTE.—For description of data see Sec. III. For discussion of results see Sec. VIII. Not all the per-centages sum to 100.0 due to rounding errors. The job-level structure among managerial, administrative, and professional employees goes from level 1 (low) to 13. The table pertains to entrants into the organ-ization in managerial, administrative, and professional positions in the period 1978–86. Among entrants into the organization, level 11 was the highest level reached. A person enters into the table as many times as he or she had years of seniority in the organization in the period 1978–86. Thus, for someone who entered the organization in 1978 and stayed the entire period, he or she will show up at each level of seniority 0 through 8 years, with 0 years in 1978 and 8 years in 1986. For someone who entered in 1986, he or she will show up in the table only once, with 0 years of seniority in 1986. There were 3,752 entrants in the period, of whom 1,068 were women and 2,684 were men.

TABLE 13

DISTRIBUTION (Percentages) OF MANAGERIAL, ADMINISTRATIVE, AND PROFESSIONAL
EMPLOYEES ON JOB LEVEL, BY SENIORITY AND GENDER: ALL SUCH EMPLOYEES
PRESENT IN 1986

	JOB LEVEL							
SENIORITY	1	2–3	4–5	6–8	9–10	11–13	SUM	N
0–4								
Men	19.1	60.5	15.9	3.7	.5	.4	100.0	1,312
Women ...	36.8	51.7	9.9	1.4	.2	.0	100.0	573
5–8:								
Men	11.6	47.5	33.6	6.5	.8	.1	100.0	1,064
Women ...	33.0	40.8	20.5	4.9	.8	.0	100.0	370
9–10:								
Men	6.6	37.8	39.0	12.0	2.9	1.7	100.0	241
Women ...	35.0	45.0	13.3	5.0	1.7	.0	100.0	60
11–15:								
Men	9.6	45.7	29.3	12.4	2.5	.6	100.1	670
Women ...	35.9	42.3	18.3	2.1	1.4	.0	100.0	142
16–20:								
Men	7.0	44.8	30.7	14.4	2.7	.5	100.0	848
Women ...	40.7	46.5	11.6	1.2	.0	.0	100.0	86
21–25:								
Men	6.7	52.4	27.8	10.4	2.2	.5	100.0	822
Women ...	32.4	51.4	13.5	2.7	.0	.0	100.0	37
26–30:								
Men	7.6	48.9	28.0	13.2	.9	1.4	100.0	536
Women ...	18.7	49.2	24.6	6.4	1.1	.0	100.0	18
31–35:								
Men	6.8	44.0	32.1	14.8	1.0	1.3	100.0	293
Women ...	18.7	49.2	24.6	6.4	1.1	.0	100.0	8
36+:								
Men	7.5	39.0	39.0	15.8	5.0	3.7	100.0	241
Women ...	62.5	37.5	.0	.0	.0	.0	100.0	8

NOTE.—For description of data see Sec. III. For discussion of results see Sec. VIII. Not all the percentages sum to 100.0 due to rounding errors. The job-level structure among managerial, administrative, and professional employees goes from level 1 (low) to 13. The table pertains to everyone present in managerial, administrative, and professional positions in 1986, irrespective of when they entered the organization. There were 7,329 such employees in 1986, 1,302 women and 6,027 men. The table also includes employees internally promoted to managerial, administrative, and professional positions, for example, from blue-collar jobs.

most of that pool entered the organization in positions from which top-level managers rarely are recruited.[24] For each woman with seniority of 11 years or more, there are 11 men. For each woman with seniority of

[24] For the 43 women with 11 years or more seniority who started their careers in the organization in managerial, administrative, and professional positions, the average number of years spent in each job level was 9.4, whereas for the same group of 763 men it was 13.5. So there is no evidence of a lower rate of promotion for these women.

891

21 years or more, there are 27 men. Had women with these levels of seniority reached the top job levels in the same percentages as men do, we should find exactly one woman in job levels 11–13. That we find zero women is within the realm of what to expect from chance.

Among employees with 0–10 years of seniority present in 1986 (in table 13), there is also a clear glass ceiling. There are no women but 10 men in job level 11 or above—eight in 11 and two in 13. If the percentage of women in job level 11 or above were the same as the percentage of men, we would find four women in those job levels—about 29% of these employees would be female. Of the 10 men in job level 11 or above, five were recruited from the outside directly into level 11, being visible high-level appointments, while the other five were recruited from the outside into job levels 4–7 and three of them were subsequently promoted to job level 11 and two to 13. Only about 12% of newly hired men are placed above job level 3, so also for those five men we see some relatively high-level appointments. The 10 men in job level 11 or above were all hired into positions for which searches had been conducted, requiring specific qualifications from the incumbent and for which the pool of relevant candidates likely was limited. For women, such high-level appointments from the outside are even rarer.

In summary, the empirical claim of the glass-ceiling hypothesis is unquestionably correct: there are very few women in the top job levels and no women at all in the three highest levels. But this crude observation masks that as the careers unfold among the younger cohorts the percentage of the women who reach higher positions is very close to the percentage of men who do so. The low number of women in the top echelons in the present company seems to come about by two processes. The first we saw among entrants, where women do worse than men at time of hire and no appointments are made directly into the upper echelons. It takes about four years of seniority to make up for the average disadvantage at initial hire. However, at seniority of five years women attain equal access to higher positions.

The second process we saw among older employees, with seniority of 11 years or more: the number of women eligible for promotion to the top job levels just gets very small as seniority increases. A major obstacle is thus the limited pool of women from which to promote.

The only way to overcome the problem of a limited pool is to provide a sufficient "pipeline" of women from which to draw managers. This requires hiring more women into managerial, administrative, and professional ranks. The ability to do so depends on the number of women in the applicant pool. On this we have no information, as do few other studies (see Fernandez and Weinberg 1997; Petersen et al. 2000). Furthermore, the number of women in the applicant pool depends on the

892

entry in the past of men and women into MBA, engineering, and other educational programs from which employees in these ranks typically are recruited.

IX. DEPARTURES

Section VI showed that the job-level and especially the wage gaps decline with seniority in the organization. The last two sections explored one possible reason for this, beyond just more equal treatment of men and women with seniority. A main mechanism behind the convergence in attainment was the higher promotion rates for women in the higher job levels and the higher salary increases. This compensates for their somewhat lower initial placement.

Another possible reason for this reduction in the gaps could be differential turnover rates for men and women, where either "underpaid" women quit at a higher rate than "underpaid" men or "overpaid" women quit at a lower rate than "overpaid" men. This would lead to a decline in the wage gap with seniority without the decline being due to the employer treating men and women more equally as seniority grows.

In the final set of analyses we address this concern, as well as the issue of a possible commitment gap between men and women. Table 4 gives the percentage departed by sex for each year of seniority. For seven of the nine years of seniority, namely years 0–6, there is a positive departure rate, and in four of these seven years the percentage who departed was higher for women, but only negligibly so, and for the other three seniority years the female rate was below the male. Elaborating on this analysis, table 14 reports a series of quit models, using hazard-rate analysis, again based on the data on entrants into the organization in the period 1978–86. In column 1 the model contains a constant plus the effect of sex. Columns 2–6 sequentially add the same variables as in columns 2–6 of table 7 (see notes to tables 6 and 7). The models are here not estimated separately by year of seniority. Instead, we have included seniority as a duration dependence term in the quit rates. These five models (cols. 2–6) address most straightforwardly the possibility of a commitment gap between men and women. Column 7 adds measures of being "over-paid" and "underpaid" as well as interactions between these and sex to the variables in column 3. Column 8 adds the same variables but now to those in column 6.

No matter which model is considered, there is no evidence of a commitment gap between men and women, at least not when measured by turnover. In none of the eight quit models is the coefficient for male significantly different from zero at the .05 level and the effect is small.

893

TABLE 14
ESTIMATES OF EFFECT OF SEX AND OF BEING OVERPAID VERSUS UNDERPAID AND
THEIR INTERACTIONS WITH SEX ON DEPARTURE RATE FROM THE ORGANIZATION

	(1)	(2	(3)	(4)	(5)	(6)	(7)	(8)
Male (= 1) ...	−.108*	.004*	.107*	.108*	.142*	.096*	.066*	.061*
	(.067)	(.072)	(.074)	(.074)	(.077)	(.074)	(.125)	(.125)
Overpaid[a]							−.239*	−.717*
							(.747)	(.862)
Underpaid[b] ...							−3.307	−3.603
							(.385)	(.385)
Overpaid × male[c]							−.055*	−.161*
							(.786)	(.804)
Underpaid × male[d]							−.700*	−.738*
							(.420)	(.419)

NOTE.—For description of data see Sec. III. For discussion of results see Sec. IX. The hazard-rate models predict departures from the organization. In col. 1 the exponential model is used, while in cols. 2–8 the proportional hazards version of the log-logistic model is used (see Petersen 1995, sec. 7). The role of seniority in predicting departures is taken into account through the so-called duration dependence term, where seniority enters. Cols. 2–6 add the same explanatory variable as in cols. 2–6 of table 7 (see notes to tables 6 and 7). Col. 7 adds, to the variables in col. 3, measures of whether one is overpaid versus underpaid as well as interaction terms between these and sex. Col. 8 adds, to the variables in col. 6, the same measures as added in col. 7. Except for the variables sex and job level at hire, all variables may change over time.

[a] The variable "Overpaid" gives, for those employees that are paid above the average salary in the given year, the proportion by which their salary lies above the average salary in the year. A value of .10 means that a person is paid 10% more than the average salary in the year. For those that are paid below the average salary the value of the variable is 0.

[b] The variable "Underpaid" gives, for those employees that are paid below the average salary in the given year, the proportion by which their salary lies below the average salary in the year. A value of −.10 means that a person is paid 10% less than the average salary in the year. For those that are paid above the average salary the value of the variable is 0.

[c] This variable gives the interaction term between the value on the variable "Overpaid" and the variable "Male." A negative coefficient for the variable, in either col. 7 or col. 8, means that the more a person is "overpaid" the lower is the quit rate.

[d] This variable gives the interaction term between the value on the variable "Underpaid" and the variable "Male." The variable "Underpaid" is 0 or negative with bigger negative values measuring bigger amounts of underpayment. A negative coefficient for the variable, in either col. 7 or col. 8, means that the more a person is "underpaid" the higher is the quit rate.

* Not significantly different from zero at the 5% level (two-tailed tests).

In column 1, the male effect is negative, meaning that men quit at a lower rate. In the seven other models, the sex coefficients are positive, meaning that men quit at a higher rate once other variables are controlled. To the extent there is a commitment gap, it is men who are less committed.

Turning to columns 7 and 8, which address differential turnover relative to position in a wage distribution, the evidence is clear. "Underpaid" employees quit at a higher rate, whereas the amount of being "overpaid" does not decrease the quit rate. Being "underpaid" by 10% relative to the average salary increases the quit rate by about 43%: [exp(−3.603 × −.10) = 1.43]. If 10% of those paid the average salary quit each year, an entire 14% of those "underpaid" by 10% will depart; a big impact for

894

a moderate change in the wage. There is no evidence that "underpaid" women quit at a higher rate than "underpaid" men, but evidence for the opposite. Neither is there evidence that "overpaid" women quit at a lower rate than "overpaid" men, but rather for the opposite, though wholly nonsignificant.

In conclusion then, there is no evidence of (1) a gender commitment gap, or of (2) differential turnover leading to a lowering of the wage gap with seniority. This leads us to conclude that the narrowing of the wage gap with seniority is caused in part by more equal treatment of men and women as seniority increases, as shown in Section VI, but in part also by higher promotion rates for women in the higher job levels, as shown in Section VII. Differential self-selection through quits of high- and low-paid employees does not account for the narrowing of the wage gap with seniority. To the extent there is an effect, it is the "underpaid" men who quit at a higher rate. This should by itself lead to an increase, not a decrease, in the gender wage gap.

The analysis just completed dealt with voluntary departures. We end by giving the relevant information on involuntary departures, dismissals. These are very rare in the company. Of the 3,752 entrants into managerial, administrative, and professional positions analyzed here, 1.2% of the women and 2.2% of the men were dismissed (13 women and 58 men). This translates into about 1 dismissal per 200 employees per year. In addition to a very low dismissal rate, the sex difference is minuscule, with women coming out somewhat better. Sex discrimination in dismissal is thus not an issue here.

X. CONCLUSION AND DISCUSSION

For the three forms of discrimination—within-job wage, allocative, and valuative—giving rise to a gender wage gap and differential attainment, it has been established that within-job wage discrimination no longer is an important source (Petersen and Morgan 1995), while valuative, the lower pay in occupations held primarily by women, potentially is a major source (England 1992). What is less known is the role of allocative discrimination, particularly in the hiring process, but also with respect to promotion and dismissal.

Our conceptual analysis identified the hiring process as the point where discrimination is most feasible, focusing not on motives for but on the opportunity structure for discrimination. The process consists of three parts: first, the recruitment procedures; second, who gets offers and who does not; and, third, quality of offers. Because of difficulties in assembling information, considerable ambiguity of assembled information, as well as

895

frequent lack of a complainant to press charges, these were identified as the three decision nodes where differential treatment most likely would occur. And whatever happens at the point of hire has implications for later attainment. Even with fair wage-setting and promotion policies within firms there will be differential outcomes if women are not hired into the firms and occupations with good wages and promotion opportunities.

We used data on all entrants into a large U.S. service organization in the period 1978–86, focusing on managerial, administrative, and professional employees, the group for which there has been the most explicit concern about inequitable treatment and glass-ceiling effects. We studied one aspect of the hiring process, placement at initial hire, and then followed job levels, wages, promotions, as well as departures in years subsequent to hire, addressing not only differential placement but also its impact on later career outcomes.

Our findings are unambiguous. The largest gender differential in attainment we find in conditions at hire, in terms of hierarchical position hired into and salary, a difference of half a job level and 15% in wages. Then, as the employees remain in the organization and their seniority grows, these initial differences in job levels and salaries erode to the extent of disappearing, especially for salary. This result is expected from the current framework but is the opposite of what the glass-ceiling hypothesis and recent social-psychological theorizing would suggest. Two mechanisms appear to bring this about. One is that with increasing seniority in the organization, there is more equal treatment of men and women, given education, age, and occupation, caused in part by higher percentage salary increases for women. Another is that rates of promotion are higher for women in the higher echelons of the hierarchy. Only in the bottom job level are women at a slight disadvantage with respect to promotion. For promotion rates there is hence no evidence of a glass-ceiling effect, but evidence for the opposite.

Our interpretation of the findings is that they reflect the better opportunity structure for discrimination at the point of hire. But we could not rule out an alternative interpretation, that the gap at time of hire reflects differences in workforce experience between men and women. In either case, with or without discrimination at the point of hire, there is no evidence of female disadvantage in posthire outcomes.

At the very top level of the organization there were no women. But this seems to be as much due to a "pipeline" problem as to differential percentages of men and women reaching those ranks, because at the higher seniority levels, the levels from which top managers typically are recruited, the pool of female employees is very small. Among employees with 11 or more years of seniority, for each woman there are 11 men.

896

These employees potentially compete for the top .5% of positions for managerial, administrative, and professional employees in this organization. This concurs with a central conclusion from *A Report on the Glass Ceiling Initiative* (U.S. Department of Labor 1991, p. 19): "In looking at recruitment practices used in these pilot studies, the Department understood the reality that tenure would explain why corporations have few minorities and women at the most senior levels in management." And in the closing letter to the Department of Labor, a CEO spoke of their procedures for ensuring more minorities and women in top management in the future (p. 19): "Most of these actions are designed to increase the flow of qualified minority and female candidates into the 'pipeline.' This is critical to us, as you know, because of our very strong promotion from within policy."

The extent to which the "pipeline" problem can be solved depends on several factors. One is how proactive the employer is at time of hire in influencing the sex composition of new hires, a process over which the employer has some control. But who applies and thus who one eventually may get to hire depends also on the composition of the potential and actual applicant pool. This in turn depends on the current and past flow of men and women out of educational tracks from which managerial, administrative, and professional employees are recruited, processes over which the employer has little control.

It is difficult to say how generalizable the findings are to other organizations, in part because no other study addresses these processes in as much detail as here, particularly not the conditions at initial hire. The results on promotion are, however, similar to those found in other studies. Spilerman and Petersen (1999), in an analysis of a large U.S. insurance company in the period 1970–78, show that women experience lower promotion rates in lower job levels and higher rates in the upper levels. Barnett et al. (2000) report higher promotion rates for women and overall same monthly salary increases in the California Civil Service system in 1978–86. Gerhart and Milkovich (1989), analyzing a sample of employees who were present in a large manufacturing organization both in 1980 and 1986, thus having a somewhat self-selected sample, show that women receive more promotions and higher salary increases than men. Similarly, Gerhart (1990), using data on entrants into the same organization in the period 1976–86 who were still present in 1986, finds that the wage gap is smaller in 1986 than at the time of hire. Hartmann (1987) also found small differences in wages and promotion rates, as did other studies cited in Section IIF above. So the company analyzed is not atypical when it comes to gender differences in promotions and wages. For that reason, one should expect our results on the hiring process, as well as its impact on later attainment, to be typical of other large organizations as well.

897

That is the process previously less extensively investigated and where we found the larger differences.

The implications of these findings are straightforward. For data collection and analysis, more attention to the temporal pattern of differences is needed, as suggested by the present as well as the glass-ceiling and social-psychological literature, though with opposite predictions for the patterns. But more important, theorizing and studies of gender inequality would be well advised to focus on the hiring process, the process where most of the action is likely to take place, partly for conceptual reasons, partly for empirical reasons, as shown for the present organization. Of the processes leading to differential attainment by gender, hiring is no doubt the most difficult to study, in particular when it comes to who gets hired and who gets turned away. Such analyses require not only access to information about those hired, but also about those turned away. This information is difficult to collect, but it will be crucial for furthering our understanding of employer-initiated processes creating differences in outcomes.

REFERENCES

Barnett, William P., James N. Baron, and Toby E. Stuart. 2000. "Avenues of Attainment: Occupational Demography and Organizational Careers in the California Civil Service." *American Journal of Sociology* 106 (1): 88–144.

Bartol, Kathryn M. 1999. "Gender Influences on Performance Evaluations." Chap. 10 (pp. 165–78) in *Handbook of Gender and Work*, edited by Gary N. Powell. Thousand Oaks, Calif.: Sage.

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 7003. Cambridge, Mass.: National Bureau of Economic Research.

Bielby, William T. 2000. "Minimizing Workplace Gender and Racial Bias." *Contemporary Sociology* 29 (1): 120–29.

Bielby, William T., and James N. Baron. 1986. "Men and Women at Work: Sex Segregation and Statistical Discrimination." *American Journal of Sociology* 91 (4): 759–99.

Blau, F., and M. Ferber. 1987. "Occupations and Earnings of Women Workers." Pp. 37–68 in *Working Women: Past, Present, Future*, edited by K. S. Koziara, M. H. Moskow, and L. D. Tanner. Washington, D.C.: Bureau of National Affairs.

Bloch, F. 1994. *Antidiscrimination Law and Minority Employment*. Chicago: University of Chicago Press.

Collinson, David L., David Knights, and Margaret Collinson. 1990. *Managing to Discriminate*. London: Routledge.

DiPrete, T. 1989. *The Bureaucratic Labor Market*. New York: Plenum Press.

Donohue, John J. III, and Peter Siegelman. 1991. "The Changing Nature of Employment Discrimination Litigation." *Stanford Law Review* 43 (5): 983–1033.

Edelman, Lauren B., Steven E. Abraham, and Howard S. Erlanger. 1992. "Professional Construction of Law: The Inflated Threat of Wrongful Discharge." *Law and Society Review* 26 (1): 47–83.

898

England, Paula. 1992. *Comparable Worth: Theories and Evidence*. Hawthorne, N.Y.: Aldine de Gruyter.

Epstein, Cynthia Fuchs, Carroll Seron, Bonnie Oglensky, and Robert Sauté. 1999. *The Part-Time Paradox. Time Norms, Professional Life, Family and Gender*. New York: Routledge.

Epstein, Richard A. 1992. *Forbidden Grounds. The Case against Employment Discrimination Laws*. Cambridge, Mass.: Harvard University Press.

Fernandez, Roberto M., Emilio J. Castilla, and Paul Moore. 2000. "Social Capital at Work: Networks and Employment at a Phone Center." *American Journal of Sociology* 105 (5): 1288–1356.

Fernandez, Roberto M., and Nancy Weinberg. 1997. "Sifting and Sorting: Personal Contacts and Hiring in a Retail Bank." *American Sociological Review* 62 (6): 883–902.

Fiske, Susan T., Donald N. Bersoff, Eugene Borgida, Kay Deaux, and Madeleine E. Heilman. 1991. "Social Science Research on Trial: Use of Sex Stereotyping Research in Price Waterhouse v. Hopkins." *American Psychologist* 46 (10): 1049–60.

Freed, Mayer G., and Daniel D. Polsby. 1984. "Comparable Worth in the Equal Pay Act." *University of Chicago Law Review* 51 (4): 1078–1111.

Gerhart, Barry. 1990. "Gender Differences in Current and Starting Salaries: The Role of Performance, College Major, and Job Title." *Industrial and Labor Relations Review* 43 (4): 418–33.

Gerhart, Barry A., and George T. Milkovich. 1989. "Salaries, Salary Growth, and Promotions of Men and Women in a Large Private Firm." Pp. 23–42 in *Pay Equity: Empirical Inquiries*, edited by Robert T. Michael, Heidi I. Hartmann, and Brigid O'Farrell. Washington, D.C.: National Academy Press.

Goldin, Claudia, and Cecilia Rouse. 2000. "Orchestrating Impartiality: The Impact of 'Blind' Auditions on Female Musicians." *American Economic Review* 90 (4): 715–41.

Granovetter, Mark. (1974) 1995. *Getting a Job: A Study of Contacts and Careers*, 2d ed. Chicago: University of Chicago Press.

Graves, Laura M. 1999. "Gender Bias in Interviewers' Evaluations of Applicants: When and How Does It Occur." Pp. 145–64 in *Handbook of Gender and Work*, edited by Gary N. Powell. Thousand Oaks, Calif.: Sage.

Groshen, Erica L. 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* 26 (3): 457–72.

Gunderson, M. 1989. "Male-Female Wage Differentials and Policy Responses." *Journal of Economic Literature* 27 (1): 46–72.

Halaby, Charles N. 1982. "Job-Shift Differences between Men and Women in the Workplace." *Social Science Research* 11 (1): 1–29.

Hanson, Susan, and Geraldine Pratt. 1991. "Job Search and the Occupational Segregation of Women." *Annals of the Association of American Geographers* 81 (3): 229–53.

Hartmann, Heidi I. 1987. "Internal Labor Markets and Gender: A Case Study of Promotion." Pp. 59–92 in *Gender in the Workplace*, edited by Clair Brown and Joseph Pechman. Washington, D.C.: Brookings Institution.

Heilman, Madeline E. 1995. "Sex Stereotypes and Their Effects in the Workplace: What We Know and What We Don't Know." *Journal of Social Behavior and Personality* 10 (6): 3–26.

Jencks, Christopher. 1992. *Rethinking Social Policy*. Cambridge, Mass.: Harvard University Press.

Jewson, Nick, and David Mason. 1986. "Modes of Discrimination in the Recruiting Process: Formalisation, Fairness and Efficiency." *Sociology* 20 (1): 43–63.

Kirnan, Jean Powell, John A. Farley, and Kurt F. Geisinger. 1989. "The Relationship

899

between Recruiting Source, Applicant Quality, and Hire Performance: An Analysis By Sex, Ethnicity, and Age." *Personnel Psychology* 42:293–308.

Lazear, E. P. 1991. "Discrimination in Labor Markets." Pp. 9–24 in *Essays on the Economics of Discrimination*, edited by E. Hoffman. Kalamazoo, Mich.: Upjohn Institute.

Lewis, G. B. 1986. "Gender and Promotion." *Journal of Human Resources* 21:406–19.

Marsden, Peter V. 1994*a*. "The Hiring Process: Recruitment Methods." *American Behavioral Scientist* 37 (7): 979–91.

———. 1994*b*. "Selection Methods in U.S. Establishments." *Acta Sociologica* 37 (3): 287–301.

Nelson, Robert L., and William P. Bridges. 1999. *Legalizing Gender Inequality. Courts, Markets, and Unequal Pay for Women in America*. New York: Cambridge University Press.

Neumark, David (with Roy J. Blank and Kyle D. Van Nort). 1996. "Sex Discrimination in Restaurant Hiring: An Audit Study." *Quarterly Journal of Economics* 111(3): 915–41.

Olian, J. D., D. P. Schwab, and Y. H. Haberfeld. 1988. "The Impact of Applicant Gender Compared to Qualifications on Hiring Recommendations: A Meta Analysis of Experimental Studies." *Organizational Behavior and Human Decision Processes* 41:180–95.

Olson, Walter K. 1997. *The Excuse Factory: How Employment Law Is Paralyzing the American Workplace*. New York: Free Press.

Paulin, Elizabeth A., and Jennifer M. Mellor. 1996. "Gender, Race, and Promotions within a Private-Sector Firm." *Industrial Relations* 35 (2): 276–95.

Petersen, Trond. 1995. "Analysis of Event Histories." Pp. 453–517 in *Handbook of Statistical Modeling for the Social and Behavioral Sciences*, edited by G. Arminger, C. C. Clogg, and M. E. Sobel. New York: Plenum Press.

Petersen, Trond, and Laurie Morgan. 1995. "Separate and Unequal: Occupation-Establishment Segregation and the Gender Wage Gap." *American Journal of Sociology* 101 (2): 329–65.

Petersen, Trond, Ishak Saporta, and Marc-David Seidel. 2000. "Offering a Job: Meritocracy and Social Networks." *American Journal of Sociology* 106 (3): 763–817.

Petersen, Trond, Seymour Spilerman, and Svenn–Åge Dahl. 1989. "The Structure of Employment Termination among Clerical Employees in a Large Bureaucracy." *Acta Sociologica* 32 (4): 319–38.

Powell, Gary N., and D. Anthony Butterfield. 1997. "Effect of Race on Promotions to Top Management in a Federal Department." *Academy of Management Journal* 40 (1): 112–28.

Reskin, Barbara F. 1998. *The Realities of Affirmative Action in Employment*. Washington, D.C.: American Sociological Association.

———. 2000. "The Proximate Causes of Employment Discrimination." *Contemporary Sociology* 29 (2): 319–28.

Rhoads, Steven E. 1993. *Incomparable Worth: Pay Equity Meets the Market*. Cambridge: Cambridge University Press.

Rhode, Deborah L. 1997. *Speaking of Sex: The Denial of Gender Inequality*. Cambridge, Mass.: Harvard University Press.

Rosenfeld, Rachel A. 1992. "Job Mobility and Career Processes." *Annual Review of Sociology* 18:39–61.

Sicherman, Nachum. 1996. "Gender Differences in Departures from a Large Firm." *Industrial and Labor Relations Review* 49 (3): 484–505.

Spilerman, Seymour. 1986. "Organizational Rules and the Features of Work Careers." *Research in Social Stratification and Mobility* 5:41–102.

Spilerman, Seymour, and Trond Petersen. 1999. "Organizational Structure,

900

Determinants of Promotion, and Gender Differences in Attainment." *Social Science Research* 28:203–27.

Stinchcombe, Arthur L. 1990. *Information and Organizations*. Berkeley and Los Angeles: University of California Press.

Stroh, Linda K., Jeanne M. Brett, and Anne H. Reilly. 1992. "All the Right Stuff: A Comparison of Female and Male Managers' Career Progression." *Journal of Applied Psychology* 77 (3): 251–60.

Tam, Tony. 1997. "Sex Segregation and Occupational Inequality in the United States: Devaluation or Specialized Training?" *American Journal of Sociology* 102 (6): 1652–92.

Tomaskovic-Devey, Donald. 1993. *Gender and Race Inequality at Work: The Sources and Consequences of Job Segregation*. Ithaca, N.Y.: ILR Press.

Tosi, Henry L., and Steven W. Einbender. 1985. "The Effects of the Type and Amount of Information in Sex Discrimination Research: A Meta-Analysis." *Academy of Management Journal* 28 (3): 712–23.

Tsui, A. S., and B. A. Gutek. 1984. "A Role Set Analysis of Gender Differences in Performance, Affective Relationships, and Career Success of Industrial Middle Managers." *Academy of Management Journal* 27:619–35.

Turner, Margaret A., Michael Fix, and Raymond J. Struyk. 1991. *Opportunities Denied, Opportunities Diminished: Racial Discrimination in Hiring*. Washington, D.C.: Urban Institute Press.

U.S. Department of Labor. 1991. *A Report on the Glass Ceiling Initiative*. Washington, D.C.: Government Printing Office.

Valian, Virginia. 1998. *Why So Slow? The Advancement of Women*. Cambridge, Mass.: MIT Press.

Valletta, Robert G. 1999. "Declining Job Security." *Journal of Labor Economics* 17 (4/2): S170–S197.

Weiler, Paul. 1986. "The Wages of Sex: The Uses and Limits of Comparable Worth." *Harvard Law Review* 99:1728–1807.

Westin, Alan F., and Alfred G. Feliu. 1988. *Resolving Employment Disputes without Litigation*. Washington, D.C.: Bureau of National Affairs.

White, Robert W., and Robert P. Althauser. 1984. "Internal Labor Markets, Promotions, and Worker Skill: An Indirect Test of Skill ILMs." *Social Science Research* 13 (4): 373–92.

Willborn, Steven L. 1989. *A Secretary and A Cook: Challenging Women's Wages in the Courts of the United States and Great Britain*. Ithaca, N.Y.: ILR Press.

Winship, Christopher, and Robert D. Mare. 1984. "Regression Models with Ordinal Variables." *American Sociological Review* 49 (4): 512–25.

Wymer, John F. III, and Deborah A. Sudbury. 1992. "Employment Discrimination 'Testers'—Will Your Hiring Practices 'Pass.'" *Employee Relations Law Journal* 17 (4): 623–33.