Who's Displaced First? The Role of Race in Layoff Decisions

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We test empirically the proposition that race significantly affects an employee's layoff chances. Using data from a financial firm ($N = 8918$), we find that whites are less likely to be laid off than nonwhites and that, among nonwhites, Asians are less likely to be laid off than blacks or Hispanics. These findings are statistically significant after controlling for structural factors (business unit, occupation, and job level) and individual characteristics (tenure and performance rating). A similar pattern of racial differences exists in other employment practices more actively monitored by the firm, including promotions, pay raises, and performance ratings. Yet these differences are smaller than those in layoffs and are significant for blacks only, not for Hispanics. Our findings suggest that monitoring personnel decisions can reduce racial inequality. Furthermore, our findings highlight that racial differences in employment outcomes vary among minority groups.

IN THE LAST DECADE, ORGANIZATIONS HAVE LAID OFF THOUSANDS OF EMPLOYEES to cut costs and improve efficiency (Cappelli et al. 1997). Historically, layoffs have resulted from shifting demand patterns and business losses, but recent layoffs have been caused by cost-cutting and restructuring strategies within profitable firms (Osterman 1999). For workers, these layoffs have often meant definitive—not temporary—loss of employment

(Brown et al. 1997).[1] This downsizing trend has coincided with a growing number of ethnic minorities entering the workforce (Johnston and Packer 1987; Cox and Nkomo 1990). Yet little empirical research has examined the effects of race on layoffs for minority employees. In this study we explore the relationship between race and layoff probabilities for Asians, blacks, Hispanics, and whites using 3 years of personnel data from a large financial firm.[2]

Studies in economics and sociology have focused mostly on the consequences of layoffs for displaced workers and relied on market-level data (Spalter-Roth and Deitch 1999). Concerning layoff chances, data are somewhat conflicting. On the one hand, statistics from the Glass Ceiling Commission Report (1995) suggest that blacks have suffered net job losses from downsizing, whereas Asians, Hispanics, and whites enjoyed net job gains. Economy-wide data at the employee level also indicate that whites were displaced less frequently than blacks and Hispanics during the last two decades (Herz 1991; Kletzer 1991). On the other hand, white middle managers have been affected substantially by recent cutbacks (Cascio 1993), especially when layoffs have spread through the financial industry and corporate headquarters (Farber 1997). These mixed reports on race and layoffs may result from using economy-wide or aggregate data when layoff decisions occur mostly *within* firms. The few studies that do use firm-level data have examined voluntary layoffs in unionized workplaces (Cornfield 1982, 1983). Building on Cornfield's work, our study of layoffs in a nonunionized financial firm considers (1) how race correlates with layoff chances through changes in business unit or occupational structure and through seniority and performance rules and (2) how demographic similarity in business units yields individual race effects. The evidence suggests substantial racial differences in layoff chances. We then examine whether these differences extend to other personnel practices, including promotion, wage growth, and performance rating. This pattern of racial differences remains, but in attenuated form, possibly because the human resources department of the firm monitors these practices more explicitly than layoffs.

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[1]Following Cornfield (1983), we define layoff as the permanent termination of an employee motivated by a firm's decision to reduce staff in the face of declining labor demand or to cut costs, which is the primary reason in the firm we study. Thus layoffs are distinguished from discharges due to employee incompetence. Firms may lay off employees directly or provide incentives to encourage resignations. The firm in this article used both methods as a means to reduce the workforce, but our study focuses exclusively on *involuntary* displacements (clearly distinguished in the data from voluntarily-induced exits).

[2]Our firm records classify employees into four categories: black, Asian, Hispanic and white. While the term *Hispanic* is usually considered an ethnic category, white, black, and Asian are considered racial groups. We refer to the demographic variable as *race* for simplicity.

Theoretical Framework

When conducting layoffs, firms typically first determine which jobs to eliminate and then decide which individuals to let go (Cornfield 1983). Structural reasons for layoffs often follow changes in strategy. For example, mergers dictate which divisions and jobs have a greater chance of being eliminated. During the early 1990s, restructuring resulted mostly from increasing efficiency pressures, consolidation and cost-cutting strategies spreading across industries (Osterman 1999). This restructuring disproportionately affected a group of people whose survival was granted in earlier downturns: white-collar workers, especially managers (Cappelli et al. 1997). The financial industry in particular experienced an intense wave of mergers and consolidations, partly due to interstate competition and partly due to various financial institutions entering each other's market. Because of mergers and technological advances, many administrative and supervisory jobs became redundant. Further, multiple layers of management became unnecessary to supervise shrinking staff sizes. In fact, economy-wide studies indicate that managers were more likely to be laid off than lower-level employees (Cappelli 1992). Therefore, to account for the effect of restructuring on layoffs, we control for occupation, business unit, and job level in our analyses.

Once the firm has decided which jobs to cut, specific individuals have to be laid off. Factors that typically determine layoffs include seniority and performance (Thurow 1975; Reagan 1992). Procedures such as the last-hired, first-fired rule are predicted by both human capital and internal labor market theories (Parsons 1972; Feldstein 1976). Human capital theories posit that firms prefer to retain those employees whose greater firm-specific knowledge and training make them more productive. Internal labor market theories attribute seniority-based layoffs to efficient bureaucratic procedures within organizational structures that protect workers from managerial arbitrariness in firing.

Seniority may not be as relevant for permanent layoffs as it is for temporary ones; in restructuring, employers may prefer to keep employees with updated skills over those with longer tenure, especially in the absence of unions. Over and above seniority, we expect managers to rely on employee performance for layoff decisions (Cornfield 1983; McCune, Beatty, and Montagno 1988; Sussens-Messener 1998). We therefore control for employee tenure and performance rating to distinguish the effects of race.

After structural and individual factors are considered, racial differentials in layoff chances may occur because of cognitive processes that affect employment decisions. For example, the use of subjective criteria in

performance evaluations may affect minorities by allowing conscious or unconscious cognitive biases to enter layoff decisions (Cornfield 1983; Reskin 2000). To prevent this confounding effect, we control for performance ratings. Yet Cornfield (1983) found little evidence of direct race effects in an in-depth case study of induced layoffs. This finding can be the result of several factors, including the voluntary nature of the exits (prompted by severance pay and early retirement incentives) and the unionized workers in his sample. Both the option to quit voluntarily and the presence of unions would have reduced the role of managerial discretion in layoffs. Currently, however, most workers are not unionized, and many layoffs are involuntary. To understand how race can affect layoff decisions in this context, we turn to psychology and sociology, where demography research has studied the effects of racial similarity on employment outcomes such as promotion (James 2000; Powell and Butterfield 1997) and intentions to stay (Tsui, Egan, and O'Reilly 1992). We apply this research to layoffs.

Self-Categorization and Similarity-Attraction Theories. Self-categorization theory posits that individuals use various characteristics to identify themselves within social categories (Tajfel 1981; Turner 1987). Individuals not in that category, i.e., members of the "out-group," are perceived as less attractive. Similarity-attraction research suggests that workers often are recruited through networks of similar race, ethnicity, or gender and that work relationships among individuals improve with similarity along various characteristics and attitudes (Byrne 1971). Sharing common life experiences and beliefs facilitates communication and integration (Lincoln and Miller 1979). Similarity in demographic characteristics is also considered in organizational research as a proxy for productivity or ability to fit in (Reskin 1998). Empirical studies indicate that social integration is indeed greater in more homogeneous work groups (O'Reilly, Caldwell, and Barnett 1989) and that emotional cohesion in work groups hinders a group's capacity for expelling members (Zander 1977).

For layoffs, therefore, similarity-attraction and self-categorization theories imply that where whites are the majority in decision-making positions, they would be more likely to form closer relationships with similar others and would choose out-group members (i.e., nonwhites) for layoffs.[3] In the firm we study, personnel manuals indicate that upper management makes most layoff decisions. Employees in executive-level jobs are mostly white (91 percent). Furthermore, because it is a nonunion

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[3]Although these theories imply symmetrical effects whether whites or minorities are decision makers, in our case study, 77 percent of managers are white.

setting, the decisions are less likely to be scrutinized by employee organizations. Therefore, we hypothesize that after controlling for job level, seniority, and performance, whites will be less likely to be laid off than nonwhite employees.

Stereotype Theories. Recent research suggests that the effects of race on outcomes such as performance evaluations, wages, and turnover vary among different racial groups (Riordan and Shore 1997; Elvira and Zatzick 1998; Weinberger 1998). Layoff patterns among minority groups also may differ, but to our knowledge, no layoff studies have used data that include substantial proportions of Hispanic and Asian employees.

Work in sociology addresses the diversity within the collective minority, suggesting that stereotypes still influence outcomes for particular racial groups despite the changing social and political environment (Dworkin, Chafetz, and Dworkin 1986). Stereotypes can be defined as "cognitive categories that are used by the social perceiver in processing information about people" (Hamilton and Trolier 1986). For example, the *model minority stereotype* suggests that because some Japanese-Americans have achieved high levels of education and median family income, all Japanese-Americans can be successful and that discrimination does not inhibit the success of minorities in the United States (Petersen 1966; Herrnstein and Murray 1994). Recently, the model minority stereotype has been applied to all Asian-Americans and spread into common knowledge (Min 1995; Cheng 1997).[4] As a result, various perceptions of Asian-Americans persist, including those associated with key principles of Confucian teachings such as respecting authority, being hard working and dedicated to educational achievement, valuing collectivism above individualism, and maintaining emotional self-control in public (Hofstede and Bond 1988; Yoon 1995; Oyserman and Sakamoto 1997).

In layoff decisions, the model minority perception might benefit Asian-Americans. Managers might perceive Asian employees as having a stronger work ethic and higher commitment to the organization as well as being uncritical of management and possessing greater emotional restraint than other racial groups. This last attribute is important because those who

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[4]Critics of the model minority stereotype refer to it as the *model minority myth*. For example, Cheng (1997) points out that returns to education are lower for Asian-Americans than for whites. Additionally, Tang (1997) finds that Asian-Americans have difficulty getting into management in science and engineering fields. This debate is beyond our study's scope.

survive company layoffs often feel guilt and anger, which can reduce their subsequent work effort (Brockner 1988).

Contrary to Asian stereotypes, whites view the work attitudes of blacks and Hispanics as more negative (Ramirez 1988; Wilson 1996). Thus we hypothesize that among the three minority groups, Asians will be less likely to be laid off than blacks or Hispanics.

Note that we do not propose that racial minorities are always displaced first. Human resources practices have changed over time for different reasons, including legal requirements (e.g., affirmative action) and voluntary employer policies regarding diversity. Government and firm oversight has helped override cognitive biases and contributed to racial integration (Leonard 1984, 1996). In fact, some argue that affirmative action pressures have provoked the pendulum to swing too far in the opposite direction and caused reverse discrimination. An oft-cited article on this workplace trend condenses this view: "White, Male, and Worried" (Galen and Palmer 1994). Researching baseball players' salaries, Johnson (1992) found that whites on teams with few blacks actually earn less than blacks of comparable ability; yet blacks' salaries decrease as the proportion of blacks on the team increases. Although reverse racism is an important consideration, it is not likely to affect our propositions because layoff decisions in the firm studied are scarcely monitored for diversity compliance.

The Firm and Its Layoff Practices

To determine the role of individual race in layoffs, we collected 3 years of personnel data from all 10 business units of a U.S. financial firm. The organization consists of 10 distinct units operating independently across multiple geographic locations but within the same state. Our data contain work histories of 8918 full-time managers, professionals, supervisors, and clerical employees from January 1990 to January 1993.

Besides personnel data, we gathered documents regarding personnel practices (e.g., internal reports and supervisor and employee manuals) and conducted interviews with human resource managers at the firm. Further, to place the firm in the context of financial industry trends, we documented the market conditions based on industry and popular press articles. This mix of quantitative and qualitative data helps distinguish the effects of race on layoff chances from those of structural and individual factors.

The supervisor manual states that employment has no specified length and may be terminated with or without cause, especially when necessary for business reasons, such as job elimination or reorganization of job

responsibilities. The manual offers little guidance on how to conduct the layoffs. Top management decides which business units require workforce reduction, but lower-level managers receive little training for determining which employees to lay off. Managers generally are advised to plan workforce reductions carefully, giving employees as much advance notice as possible and helping them locate other jobs within the firm. Since no unions are present, outside involvement in managers' layoff decisions is limited. In contrast, the manual contains lengthy chapters on promotion, merit pay, and performance-evaluation procedures. Additional internal documents and interviews highlight the firm's concern with hiring and promoting minorities, yet no similar concern is mentioned for layoffs.

In several rounds, the firm permanently laid off about 9 percent of the employees who were present at the beginning of the 3-year period.[5] All 10 business units lost jobs, although layoffs were not proportionately distributed throughout the firm because restructuring or consolidations affected specific areas more than others.

Within this firm and the financial sector as a whole, consolidation and cost-cutting strategies were prompted by deregulation combined with the region's economic decline during the entire period studied. Megamergers and consolidations in the industry created a domino effect, partly due to interstate and foreign competition and partly because other financial institutions entered the same market. In fact, the industry's workforce was reduced by about 15 percent in the 5 years preceding our data collection. In the first 2 years of data, our firm expanded geographically by acquiring several smaller companies. Consolidation after these acquisitions, in turn, led to layoffs in redundant offices.

A second cause of industry-wide layoffs was the economic downturn; layoffs in the geographic region where our firm operates totaled hundreds of thousands during the data-collection period, and unemployment rates were higher than in the rest of the United States. Key jobs targeted for cutbacks included administrative positions to reduce overhead, especially after mergers. Additionally, improvements in technology led to outsourcing various functions, diminishing the need for clerical and supervisory employees. In this firm, automation caused job losses during the study period.

Layoff procedures in the firm varied according to the reason for staff reduction. Some layoffs were carried out by attrition and transfer, some by forced exit, and some by induced exit. Generally speaking, the firm offered

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[5]The firm acquired several companies, so its workforce increased overall during this period. We have not included the new employees in our analyses.

outplacement services as well as transfer possibilities but not always and not to all employees. Note, however, that for the purpose of our analysis, only involuntary displacements are considered layoffs. Because downsizing was a cost-cutting move, severance payments were small and rarely offered. Seniority was not a major consideration, partly because of the technology-replacement nature of some layoffs.

In summary, the economic environment during our data period was constant in terms of consolidation trends, bad economic conditions, high unemployment, and frequent layoffs. Throughout, the firm remained competitive and aggressive in cutting cost. Since this environment reflects market conditions common to many industries since the early 1990s, our results may have fairly general applicability.

Data

To study racial differences in layoffs, we created a panel dataset including one observation for each of the 8918 employees present at the beginning of the 3-year period. We first merged all employee records for 1990–1993. Records were matched by employee number, and the matched files were searched for full-time employees active at the beginning of 1990; we removed those employees who turned over voluntarily during that year because we could not determine whether they had left before layoffs occurred. The resulting sample consists of 5664 whites (64 percent), 832 blacks (9 percent), 1550 Asians (17 percent), and 872 Hispanics (10 percent). Table 1 presents descriptive statistics for six different groups: all employees, Asians, blacks, Hispanics, whites, and nonwhites (where we pool all minorities).

Based on this sample, we predict the probability of an employee being laid off during 1990, 1991, or 1992 using all predictor and control variables as of the beginning of 1990. The layoff dummy takes value 1 for employees laid off anytime from 1990 to 1992; it takes value 0 for all other employees. The data permit two important distinctions in measuring employee turnover. First, personnel records clearly distinguish between voluntary and involuntary turnover (Shaw et al. 1998). Second, employees who were fired for poor job performance or misconduct are distinguished from those who were laid off for company reasons. Thus our dependent variable contains only involuntary layoffs related to company restructuring and cost-cutting efforts. The high unemployment rate in the state discouraged voluntary turnover, especially for employees most affected by these layoffs: managers and professionals. This fact increases our confidence that our

layoff variable really reflects involuntary turnover. In total, 807 employees were laid off during the 3-year period (9 percent of the sample).

Descriptive statistics in Table 1 illustrate substantial layoff differences among the various samples. On average, 8 percent of whites were laid off compared with 11 percent of nonwhites. Among minority groups, 8 percent of Asian employees are laid off, whereas 15 percent of black and 12 percent of Hispanic employees were. T tests confirm that whites were significantly less likely to be laid off than nonwhites. Similarly, mean layoffs for Asians were significantly lower than mean layoffs for blacks and Hispanics. These results suggest preliminarily support for hypotheses 1 and 2 but do not account for important controls present in our dataset.

Control Variables. As explained earlier, minorities would be disproportionately more vulnerable to layoffs if they were overrepresented in jobs or work units that were reorganized (Cornfield 1982). Thus our model includes dummy variables to control for occupation (with clerical as the reference group) and business unit (with the first unit as reference group). We also control for the job level occupied by an employee within the organizational hierarchy. As in most internal labor markets, full-time jobs were assigned to 1 of 20 hierarchical levels through an automated job-evaluation system that related the responsibilities of each job to those of industry benchmarks. Within each level there were hundreds of job titles, although many had only one or a few incumbents, rendering this variable useless for our analyses. Fortunately, jobs were classified into four major functional categories: manager/executive, professional, clerical, and supervisor. The distribution of employees across occupations was 13 percent managers, 33 percent professionals, 12 percent supervisors, and 41 percent clerical. Whites occupied 77 and 63 percent of the managerial and supervisory positions, respectively.

In Table 2 we present layoff percentages for each racial group by (1) business unit, (2) occupation, and (3) job level. We also show the differences between proportions of employees laid off within a business unit, occupation, or level and the proportions of each racial group laid off in the same unit, occupation, or level. Although many more whites were laid off in absolute numbers, the proportion of whites laid off was smaller than that of blacks and, to a lesser extent, Hispanics. The proportion of employees laid off by business unit varied between 5 and 15 percent. In all business units, the proportion of blacks laid off was between 3 and 10 percent higher than the unit's layoffs. For example, in business unit 6, 22 percent of black employees were laid off compared with 13 percent laid off in the whole unit.

TABLE 1
MEANS AND STANDARD DEVIATIONS OF SELECTED VARIABLES

	All Employees		Asians		Blacks		Hispanics		Whites		Nonwhites	
	Means	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Layoffs	0.09	(0.29)	0.08	(0.27)	0.15	(0.35)	0.12	(0.33)	0.08	(0.27)	0.11	(0.31)
Asian[a]	0.17	(0.38)	1.00	(0.00)	—	—	—	—	—	—	0.48	(0.50)
Black[a]	0.09	(0.29)	—	—	1.00	(0.00)	—	—	—	—	0.25	(0.44)
Hispanic[a]	0.10	(0.30)	—	—	—	—	1.00	(0.00)	—	—	0.27	(0.44)
White[a]	0.64	(0.48)	—	—	—	—	—	—	1.00	(0.00)	—	—
Female	0.73	(0.44)	0.76	(0.43)	0.83	(0.38)	0.79	(0.41)	0.70	(0.46)	0.78	(0.41)
Incentive pay	0.26	(0.44)	0.19	(0.39)	0.17	(0.38)	0.19	(0.39)	0.30	(0.46)	0.19	(0.39)
Tenure	9.88	(7.79)	10.49	(6.68)	9.86	(7.08)	9.93	(7.03)	9.70	(8.27)	10.18	(6.88)
Tenure^2	158.2	(227)	154.5	(172)	147.3	(172)	148.1	(188)	162.4	(253)	150.9	(177)
Tenure^3	3231	(7029)	2711	(4480)	2621	(4070)	2721	(5138)	3542	(8097)	2690	(4567)
Age	37.72	(10.26)	37.82	(9.61)	35.65	(8.15)	35.45	(9.55)	38.35	(10.72)	36.63	(9.31)
Married	0.61	(0.49)	0.69	(0.46)	0.50	(0.50)	0.63	(0.48)	0.60	(0.49)	0.63	(0.48)
Lagged performance	3.74	(0.82)	3.71	(0.77)	3.58	(0.81)	3.66	(0.81)	3.78	(0.83)	3.66	(0.79)
Performance rating = 1[b]	0.00	(0.06)	0.00	(0.04)	0.01	(0.10)	0.00	(0.05)	0.00	(0.06)	0.00	(0.06)
Performance rating = 2	0.04	(0.19)	0.02	(0.15)	0.06	(0.23)	0.05	(0.22)	0.04	(0.19)	0.04	(0.19)
Performance rating = 3	0.32	(0.47)	0.33	(0.47)	0.39	(0.49)	0.34	(0.47)	0.30	(0.46)	0.35	(0.48)
Performance rating = 4	0.45	(0.50)	0.49	(0.50)	0.40	(0.49)	0.43	(0.50)	0.45	(0.50)	0.45	(0.50)
Performance rating = 5	0.19	(0.39)	0.16	(0.36)	0.14	(0.35)	0.18	(0.38)	0.21	(0.41)	0.16	(0.36)
Job level (1 to 20)	8.95	(3.71)	7.82	(3.16)	7.72	(3.05)	7.65	(3.14)	9.64	(3.85)	7.75	(3.13)
Clerical	0.41	(0.49)	0.56	(0.50)	0.55	(0.50)	0.51	(0.50)	0.34	(0.47)	0.54	(0.50)
Manager	0.13	(0.34)	0.07	(0.26)	0.09	(0.29)	0.10	(0.30)	0.16	(0.37)	0.08	(0.28)
Professional	0.33	(0.47)	0.25	(0.43)	0.22	(0.42)	0.25	(0.43)	0.38	(0.49)	0.24	(0.43)

Supervisor	0.12	(0.33)	0.11	(0.32)	0.13	(0.34)	0.15	(0.35)	0.12	(0.33)	0.13	(0.33)
Salary Quartile = 1	0.27	(0.44)	0.27	(0.44)	0.28	(0.45)	0.31	(0.46)	0.26	(0.44)	0.28	(0.45)
Salary Quartile = 2	0.26	(0.44)	0.26	(0.44)	0.28	(0.45)	0.25	(0.44)	0.25	(0.43)	0.26	(0.44)
Salary Quartile = 3	0.24	(0.42)	0.23	(0.42)	0.23	(0.42)	0.23	(0.42)	0.24	(0.43)	0.23	(0.42)
Salary Quartile = 4	0.24	(0.43)	0.24	(0.43)	0.22	(0.41)	0.20	(0.40)	0.25	(0.43)	0.22	(0.42)
Business unit 1	0.34	(0.47)	0.26	(0.44)	0.24	(0.43)	0.38	(0.48)	0.37	(0.48)	0.28	(0.45)
Business unit 2	0.01	(0.10)	0.01	(0.10)	0.02	(0.12)	0.01	(0.12)	0.01	(0.10)	0.01	(0.11)
Business unit 3	0.11	(0.31)	0.16	(0.37)	0.08	(0.27)	0.11	(0.31)	0.10	(0.30)	0.13	(0.33)
Business unit 4	0.02	(0.13)	0.05	(0.21)	0.01	(0.09)	0.02	(0.13)	0.01	(0.09)	0.03	(0.17)
Business unit 5	0.04	(0.21)	0.10	(0.30)	0.05	(0.22)	0.05	(0.22)	0.03	(0.16)	0.08	(0.26)
Business unit 6	0.05	(0.21)	0.04	(0.20)	0.03	(0.17)	0.03	(0.17)	0.05	(0.23)	0.04	(0.19)
Business unit 7	0.21	(0.41)	0.14	(0.35)	0.26	(0.44)	0.20	(0.40)	0.22	(0.42)	0.19	(0.39)
Business unit 8	0.07	(0.26)	0.06	(0.23)	0.03	(0.18)	0.06	(0.24)	0.08	(0.28)	0.05	(0.22)
Business unit 9	0.07	(0.26)	0.10	(0.30)	0.08	(0.35)	0.07	(0.25)	0.06	(0.24)	0.08	(0.28)
Business unit 10	0.08	(0.28)	0.09	(0.28)	0.20	(0.40)	0.07	(0.25)	0.07	(0.25)	0.11	(0.31)
Promotion[c]	0.27	(0.46)	0.27	(0.44)	0.24	(0.43)	0.30	(0.46)	0.27	(0.45)	0.27	(0.44)
Salary increase (percentage over lagged base salary)	0.05	(0.05)	0.05	(0.04)	0.04	(0.04)	0.05	(0.06)	0.05	(0.05)	0.05	(0.05)
N	8,918		1,550		832		872		5,664		3,254	

[a] Asian, Black, Hispanic, and White are dummy variables taking value 1 if the individual is a member of the race or 0 otherwise.
[b] Lowest performance rating level = 1; highest level = 5.
[c] Promotion = 1 if employee's job level increased during the study period; 0 otherwise.

TABLE 2
Layoff Percentages by Race by Business Unit, Occupation, and Job

	Percentage of layoffs by race in business unit, occupation, and job level					Percentage of race in business unit, occupation, job level				Difference between racial percentage of layoffs and mean layoffs			
	Asian	Black	Hispanic	White	Total	Asian	Black	Hispanic	White	Asian	Black	Hispanic	White
Business unit 1	0.08	0.15	0.11	0.07	0.08	0.13	0.07	0.11	0.69	0.00	0.07	0.03	−0.01
Business unit 2	0.07	0.21	0.00	0.17	0.14	0.15	0.14	0.13	0.59	−0.07	0.08	−0.14	0.03
Business unit 3	0.04	0.11	0.07	0.09	0.08	0.26	0.07	0.10	0.57	−0.04	0.03	−0.01	0.01
Business unit 4	0.14	0.25	0.31	0.10	0.15	0.50	0.05	0.11	0.34	−0.01	0.10	0.16	−0.06
Business unit 5	0.13	0.15	0.23	0.05	0.11	0.39	0.11	0.11	0.38	0.01	0.03	0.12	−0.06
Business unit 6	0.04	0.22	0.35	0.13	0.13	0.16	0.06	0.06	0.71	−0.10	0.09	0.22	0.00
Business unit 7	0.07	0.11	0.05	0.06	0.07	0.12	0.12	0.09	0.67	0.00	0.04	−0.02	−0.01
Business unit 8	0.04	0.14	0.13	0.08	0.08	0.14	0.05	0.09	0.73	−0.04	0.06	0.06	0.00
Business unit 9	0.13	0.15	0.13	0.10	0.12	0.23	0.10	0.10	0.57	0.01	0.03	0.02	−0.01
Business unit 10	0.02	0.10	0.11	0.03	0.05	0.17	0.22	0.08	0.53	−0.03	0.05	0.06	−0.02
Manager	0.10	0.13	0.09	0.06	0.07	0.09	0.07	0.07	0.77	0.03	0.06	0.02	−0.01
Professional	0.08	0.13	0.12	0.07	0.08	0.13	0.06	0.08	0.73	0.00	0.05	0.04	−0.01
Clerical	0.07	0.13	0.09	0.08	0.08	0.23	0.12	0.12	0.53	−0.01	0.05	0.01	−0.00
Supervisor	0.08	0.15	0.17	0.08	0.10	0.16	0.10	0.12	0.63	−0.01	0.05	0.08	−0.02
Job level 1	0.25	0.00	0.20	0.11	0.14	0.22	0.11	0.14	0.53	0.11	−0.14[a]	0.06[a]	−0.03
Job level 2	0.00	0.29	0.11	0.14	0.14	0.21	0.25	0.16	0.38	−0.14	0.14	−0.03	0.00
Job level 3	0.08	0.35	0.32	0.20	0.21	0.20	0.10	0.14	0.56	−0.13	0.15	0.11	−0.01

Job level 4	0.11	0.18	0.06	0.09	0.10	0.22	0.09	0.15	0.54	0.01	0.08	−0.04	−0.01
Job level 5	0.10	0.16	0.17	0.09	0.12	0.29	0.20	0.15	0.36	−0.02	0.04	0.05	−0.03
Job level 6	0.05	0.14	0.10	0.10	0.10	0.22	0.12	0.13	0.53	−0.05	0.05	0.00	0.01
Job level 7	0.09	0.18	0.00	0.07	0.08	0.20	0.09	0.11	0.60	0.00	0.09	−0.08	−0.02
Job level 8	0.09	0.08	0.11	0.09	0.09	0.19	0.10	0.10	0.60	0.00	−0.01	0.01	0.00
Job level 9	0.10	0.06	0.13	0.05	0.07	0.17	0.10	0.09	0.64	0.03	0.00	0.06	−0.02
Job level 10	0.00	0.16	0.00	0.08	0.08	0.17	0.10	0.12	0.61	−0.08	0.07	−0.08	−0.01
Job level 11	0.07	0.08	0.18	0.07	0.08	0.15	0.07	0.07	0.72	0.00	0.00	0.11	−0.01
Job level 12	0.09	0.16	0.10	0.07	0.08	0.12	0.08	0.06	0.74	0.01	0.08	0.02	−0.01
Job level 13	0.12	0.27	0.00	0.10	0.11	0.16	0.07	0.06	0.71	0.00	0.15	−0.11	−0.01
Job level 14	0.08	0.06	0.08	0.05	0.06	0.09	0.05	0.06	0.81	0.02	0.00	0.02	0.00
Job level 15	0.10	0.20	0.13	0.07	0.08	0.05	0.03	0.04	0.88	0.02	0.12	0.04	−0.01
Job level 16	0.00	0.00	0.00	0.08	0.08	0.06	0.01	0.03	0.90	−0.08	−0.08[a]	−0.08	0.01
Job level 17	0.13	0.00	0.00	0.03	0.04	0.07	0.00	0.00	0.93	0.09	−0.04[a]	−0.04[a]	−0.01
Job level 18	0.20	0.00	0.00	0.12	0.13	0.05	0.01	0.02	0.93	0.07[a]	−0.13[a]	−0.13[a]	−0.01
Job level 19	0.00	0.00	0.00	0.13	0.12	0.00	0.04	0.04	0.92	−0.12[a]	−0.12[a]	−0.12[a]	−0.01
Job level 20	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.00	1.00	−0.09[a]	−0.09[a]	−0.09[a]	0.00

[a] For job levels where a particular race has five or fewer employees, the difference between racial percentages of layoffs and mean layoffs is not very meaningful because few employees were susceptible to layoffs.

Similarly, Hispanics were laid off in proportions greater than the mean in 7 out of 10 business units.

As Table 2 shows, the same pattern appears within occupations: Both blacks and Hispanics were laid off in greater relative proportions than the proportion of layoffs for each occupation. Thus, although absolute numbers indicate that whites were laid off more than any other group, relative proportions indicate that layoffs were skewed toward minority groups when any meaningful number of minorities was present in a business unit, occupation, or job level. Specifically, these descriptive measures suggest that blacks were more likely than whites to be laid off no matter which occupations, business units, or job titles were targeted for layoffs. The pattern was somewhat consistent for Hispanics.

Because productivity and seniority are important determinants of layoffs, we control for performance ratings and tenure. Performance is rated by supervisors every year, relying on a plan written jointly by superior and employee at the beginning of the performance review period. Evaluations use a scale from 1 to 5, where rating 1 means "performance requires significant improvement because requirements in key areas of responsibility were not met" and rating 5 means "performance exceeds all requirements." This evaluation system is similar to those used in prior studies (e.g., Abraham and Medoff 1981; Kahn and Sherer 1990; Paulin and Mellor 1996) and applies to all employees in the firm. We include dummy variables for the three highest performance ratings (3, 4, and 5), leaving individuals with ratings of 1 and 2 in the reference group. As an additional control, we also include a linear measure of performance rating in the year prior to the study (i.e., 1989).[6] The lowest mean lagged rating is for blacks (3.58), followed by Hispanics (3.66) and Asians (3.71). Whites received the highest ratings (3.78). A simple comparison of means reveals that blacks' ratings are significantly lower and whites' ratings are significantly higher than those for all other groups.

Tenure is taken directly from personnel records and reflects the number of years with the firm. We include tenure squared and cubed in the logit models to capture nonlinear effects. Mean tenure was highest for Asians (10.49 years), followed by Hispanics (9.93 years), blacks (9.86 years), and whites (9.70 years). Comparing means reveals that Asians' tenure was significantly higher than that of whites and blacks, whereas tenure of white

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[6]For employees present at the beginning of 1989 and 1990, we lag forward the 1989 performance rating to the panel data in 1990. For employees who joined the firm during 1989, we capture trends in performance by lagging back performance from 1991. A comparison of means reveals no significant difference between ratings taken from 1989 and 1991.

employees was significantly less than that for all other groups. These figures might reflect better employment opportunities in the labor market for whites. Voluntary turnover rates in this organization support this claim: Whites' turnover was 9.5 percent during this period, with 8.8 percent for blacks, 7.7 percent for Hispanics, and 6.8 percent for Asians.

While we have no data on *job* tenure, we try to control for it with firm tenure, age, and salary quartiles. Firm tenure partly reflects the accumulation of firm-specific skills, whereas age arguably could be a proxy for the accumulation of general skills and attributes outside the firm. Salary quartiles, which measure where an employee falls on the pay gradation compared with other people at the same job level (Sicherman 1996), also might indicate successful experience within a given job level because the wages of those with greater job tenure should be in the higher end of the pay range for each level. By including these three variables, combined with performance rating measures in the model, we believe we control adequately for job experience.

We also control for demographic characteristics such as gender and marital status. Women comprise the overall majority of the sample (73 percent, 6510 employees), as is consistent with the industry norm. Finally, incentive pay (measured as receiving a bonus greater than 0) captures organizational cost-cutting efforts, which may systematically target highly paid salaried employees rather than those receiving contingent pay (salaries are fixed personnel costs, whereas bonuses can be reduced based on performance). Additionally, incentive pay can be considered an indicator of individual performance beyond supervisor evaluations, offering another control for employee value to the firm. Incentive pay opportunities vary within and between occupational categories. Most incentive plans offer individual-based incentives; only a few are based on team performance. The reason for differences in opportunities to earn bonuses among people in the same job level, occupation, and business unit is that within these cells some employees work on projects or products that have special bonus programs.

Logit Model of Layoffs

Because the layoff dependent variable is dichotomous, we used logistic regression models to test hypotheses about how race affects layoffs. We used the following model:

$$P(LAYOFFS = 1/X) = \exp(b_0 + b_1 X)/[1 + \exp(b_0 + b_1 X)]$$

TABLE 3

REGRESSIONS RELATING RACE TO LAYOFFS, PROMOTIONS, SALARY INCREASE, AND PERFORMANCE RATING[a,b]

Variable	Layoffs		Promotions		Salary increase		Performance	
	(1)[d]	(2)[c,d]	(3)[d]	(4)[c,d]	(5)[c]	(6)[c,e]	(7)[e]	(8)[c,e]
Constant	0.997**	0.739*	−0.593**	−0.505*	0.043**	0.045**	2.626**	2.681**
Asian	—	−0.146	—	−0.090	—	−0.000	—	0.027
Black	—	0.527**	—	−0.193*	—	−0.007**	—	−0.164**
Hispanic	—	0.246*	—	0.005	—	0.002	—	−0.022
White	−0.172**	—	0.088	—	0.001	—	0.036*	—
Female	−0.198*	−0.225*	−0.023	−0.023	0.001	0.001	0.133**	0.139**
Eligibility for Incentive pay	−0.732**	−0.729**	0.065	0.068	−0.001	−0.001	0.029	0.029
Tenure	−0.059	−0.052	−0.017	−0.019	0.001*	0.001*	−0.037**	−0.039**
Tenure^2	0.005	0.004	−0.001	−0.001	−0.000**	−0.000**	0.002**	0.002**
Tenure^3	−0.001*	−0.001	0.000	0.000	0.000**	0.000**	−0.000**	−0.000**
Age	−0.017*	−0.016**	−0.033**	−0.033**	−0.00**	−0.001**	−0.008**	−0.008**
Married	−0.196*	−0.164*	0.193**	0.189**	0.001**	0.003**	0.046**	0.037*
Lagged performance	−0.113*	−0.106*	0.166**	0.165**	0.005**	0.005**	0.278**	0.275**
Performance rating = 3	−1.178**	−1.145**	0.405**	0.405**	0.019**	0.018**	—	—
Performance rating = 4	−1.1628**	−1.576**	0.678**	0.677**	0.028**	0.027**	—	—
Performance rating = 5 (Highest)	−1.101**	−1.051**	0.601**	0.597**	0.024**	0.024**	—	—
Job level	−0.055**	−0.057**	−0.089**	−0.089**	−0.001**	−0.001**	0.032**	0.033**
Manager (= 1 if manager; 0 if not)	0.481*	0.450**	0.261*	0.260*	0.003	0.003	−0.051	−0.045
Professional (= 1 if professional; 0 if not)	0.207	0.195	0.161*	0.161*	0.001	0.001	−0.159**	−0.157**
Supervisor (= 1 if supervisor; 0 if not)	0.312*	0.295*	0.011	0.011	0.011**	0.011**	−0.083**	−0.079**
Salary quartile 2[1] (= 1 if 2nd quartile = 1; 0 if not)	−0.102	−0.105	0.427**	0.429**	—	—	0.189**	0.190**
Salary quartile 3[1] (= 1 if 3rd quartile = 1; 0 if not)	−0.221*	−0.224*	0.666**	0.666**	—	—	0.284**	0.285**
Salary quartile 4[1] (= 1 if 4th quartile = 1; 0 if not)	−0.284*	−0.289*	0.873**	0.875**	—	—	0.382**	0.383**
ln(L)^g	419.64**	441.16**	721.60**	724.60**	—	—	—	—
R^2	—	—	—	—	0.086	0.087	0.184	0.188
N	8,918	8,918	8,918	8,918	8,251	8,251	8,918	8,918

[a]Standard errors available from authors. **Significant at the 1% level (two-tailed test). *Significant at the 5% level (two-tailed test).
[b]Control dummies for business units were included in all models. Business unit 1 served as the reference group.
[c]White served as the reference group for models with race dummies.
[d]Logistic regression analyses were used for models 1–4.
[e]Linear regression analyses were used for models 5–8.
[f]Salary quartiles measure where an employee falls on the pay gradation compared to other people at the same job level. Higher salary quartiles indicate higher salaries.
[g]ln(L): the natural log of the value of the maximum likelihood function.

where P is the likelihood of an employee being laid off, b_0 is the intercept, b_1 is the vector of effect parameters, and X is the vector of predictor (i.e., race) and control variables.

Table 3 reports logistic regression estimates. In column (1) we see that whites were less likely to be laid off than nonwhites ($B = -0.17$, $p < 0.01$), even after controlling for multiple structural and individual factors. The odds ratio for this coefficient is 0.84. An odds ratio of less than 1 indicates that the chance of being laid off decreases for whites compared with the reference group (Menard 1995). Specifically, the probability of layoff for whites was 16 percent less than that for nonwhites. To illustrate the magnitude of this effect, consider the impact of performance on layoffs: A 1-point increase in lagged performance results in only 11 percent smaller layoff chances.

We also find support for our second hypothesis: Blacks and Hispanics were more likely to be laid off than whites, whereas the probability of being laid off for Asians did not differ significantly from that of whites. In fact, similar models run holding Asians as the reference group confirm that blacks ($B = 0.67$, $p < 0.01$) and Hispanics ($B = 0.39$, $p < 0.01$) were more likely to be laid off than Asians. Odds ratios for these logistic coefficients indicate that blacks were twice as likely and Hispanics were 1.5 times as likely to be laid off as Asians. These results are strong compared with other variables traditionally important in layoffs. For example, a one-unit increase in job level decreased layoff chances by 6 percent. Thus race effects not only were statistically significant but also were sizable relative to other layoff determinants.

We also tested whether the likelihood of layoff for Hispanics was lower relative to blacks and obtained a coefficient of -0.28 with an odds ratio of 0.76. This difference appears substantial, although it is only marginally significant ($p < 0.10$).

To compare the raw gaps in mean layoffs among different minority groups with the regression-adjusted gaps, we converted the logit coefficients to natural units.[7] We found that 79 percent of the original 6.5 percent difference in mean layoffs between blacks and whites remained after controlling for all other layoff determinants (regression beta $= 0.05$; that is, 5 percent of the difference remained after controlling for all other factors). A smaller but substantial portion (59 percent) of the initial 4.1 percent differential between Hispanics and whites remained after controlling for all other factors (beta $= 0.024$; that is, 2.4 percent of the difference remains).

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[7]These calculations derive from coefficients obtained for an ordinary least square (OLS) model identical to our logit model but easy to convert into natural units without having to evaluate probabilities at the means.

Effects of Control Variables. Results for control variables were consistent with prior research. Performance rating had the strongest effect among all variables in the model, with individuals receiving a rating of 4 or 5 having the lowest chance of being laid off compared with individuals receiving a rating of 2 or less. Lagged performance also had a significant negative effect. Note that we assumed that performance ratings accurately measure an employee's true productivity. In this firm, we do find that blacks received lower performance ratings than whites. If this difference in performance ratings was due in part to supervisor discrimination unrelated to actual productivity, our results would underestimate the effect of race in layoffs. However, we have no information on employee "objective" performance and thus cannot determine whether the differentials in layoffs were still due to some unobservable component of productivity.

Age had a negative and significant effect on layoff chances, whereas tenure was only significant in the cubed transformation. These nonlinear effects probably related to the targeting of managerial and supervisory occupations. Additionally, we found that age and tenure were highly correlated ($r = 0.62$), so tenure achieves significance with age out of the analysis. However, since our key results did not change by removing age, it remained in the final model.

In terms of occupational effects, managers and supervisors were significantly more likely to be laid off than clerical workers and professionals. As expected, employees in higher salary quartiles were significantly less likely to be laid off than employees in the lowest (performance was higher for those in the upper quartiles). Incentive pay's negative effect on layoff chances most likely reflected the company's desire to cut fixed costs by retaining employees who received part of their compensation through discretionary bonuses instead of base salary. Alternatively, employees who received bonuses may have been high performers in ways not measured by performance evaluations and thus were more valuable to the firm.

Finally, female gender was negatively related to layoffs ($B = -0.20$, $p < 0.05$). We ran other models including the interaction of female with white, race dummies, marital status, and performance rating, respectively. No interaction was significant. Minorities did not appear to suffer a double penalty, probably because women constituted the numerical majority in this organization.

Case-Control Method. To further ascertain the existence of differential layoffs across races, we examined the raw data identifying all employees who were laid off and comparing them in terms of seniority and

performance with employees retained by the firm.[8] This allowed us to identify those cases more likely to represent differential treatment, i.e., those where the minority employee was dominant over some others in similar jobs. Specifically, for each black employee laid off, we looked in the raw data for someone of a different race in the same business unit of the same rank and occupation but with lower performance rating and/or seniority. Our primary criterion for defining dominance was current year performance, followed by tenure and finally by lagged performance. We performed similar searches for each laid-off Asian, Hispanic, and white employee. Then we calculated the rate of dominant employees being laid off for each of the racial groups. These rates are shown in Table 4 for all business units.

The rate of dominant blacks who were laid off exceeded that of whites in all but one business unit. The rate of dominant Hispanics exceeded that of whites in seven business units, whereas the rate of dominant Asian employees exceeded that of whites in all but two business units. A test comparing the rates across racial groups revealed that whites were significantly less likely to be dominant and laid off than either dominant blacks ($F = 32.65$, $p < 0.0001$) or dominant Hispanics ($F = 25.44$, $p < 0.0001$). These rates were not significantly different between Asians and whites. While we cannot explain why any dominant employee would be laid off, for the purpose of our study, this case-control evidence supports the logit estimates reported in Table 3.

Robustness Checks. The empirical results shown in Table 3 are robust to various specification changes including (1) adding interactions between race and other variables such as tenure and performance, (2) introducing additional low-tenure and low-performance dummy variables, (3) replacing linear job level with job-level splines, (4) controlling for business-unit racial composition, and (5) conducting analyses separately by occupation.

First, we interacted race with tenure and performance to determine whether racial differences varied with an individual's tenure or performance in the company. Interactions between each race group and tenure were not statistically significant. Similar results were found when interacting each race with performance rating. Most important, the interactions did not change the main effects of our predictor variables.

Second, we entered a dummy indicating tenure of less than 2 years. Our results remained unchanged. Additionally, we created a dummy variable for performance rating equal to or less than 2. The dummy variable for low

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[8]We are grateful to David Levine for this suggestion.

TABLE 4

Dominant Employees Laid Off by Race and Business Unit[a,b]

	Asians	Blacks	Hispanics	Whites
Business unit 1				
Number of employees laid off	32	33	37	152
Number of dominant employees laid off	30	29	30	131
Rate of dominant layoffs	94%	88%	81%	86%
Business unit 2				
Number of employees laid off	1	3	0	9
Number of dominant employees laid off	1	2	0	4
Rate of dominant layoffs	100%	67%	0%	44%
Business unit 3				
Number of employees laid off	12	9	7	50
Number of dominant employees laid off	10	6	5	30
Rate of dominant layoffs	83%	67%	71%	60%
Business unit 4				
Number of employees laid off	11	2	5	3
Number of dominant employees laid off	4	1	3	1
Rate of dominant layoffs	36%	50%	60%	33%
Business unit 5				
Number of employees laid off	21	7	10	8
Number of dominant employees laid off	17	5	7	4
Rate of dominant layoffs	81%	71%	70%	50%
Business unit 6				
Number of employees laid off	3	7	11	43
Number of dominant employees laid off	2	5	10	34
Rate of dominant layoffs	67%	71%	91%	79%
Business unit 7				
Number of employees laid off	16	25	10	82
Number of dominant employees laid off	13	22	8	70
Rate of dominant layoffs	81%	88%	80%	85%
Business unit 8				
Number of employees laid off	5	5	8	41
Number of dominant employees laid off	5	5	5	27
Rate of dominant layoffs	100%	100%	63%	66%
Business unit 9				
Number of employees laid off	21	11	9	36
Number of dominant employees laid off	19	10	9	24
Rate of dominant layoffs	90%	91%	100%	67%
Business unit 10				
Number of employees laid off	3	18	7	12
Number of dominant employees laid off	3	16	7	8
Rate of dominant layoffs	100%	89%	100%	67%

[a]T-tests comparing rates across racial groups indicate that whites are significantly less likely to be dominant and laid off than either dominant blacks ($F = 32.65; p < 0.0001$) or dominant Hispanics ($F = 25.44; p < 0.0001$).
[b]Some laid-off employees were not comparable to others to determine their dominant status. Thus they were omitted from this analysis.

performance was significant despite including linear performance but did not change any other key variables in our model. We opted to use lagged performance, which adds more information to the equation.

Third, instead of a linear measure for job level, we added job-level splines distinguishing between low-, middle-, and top-rank levels. We created three rank indicator variables based on the firm's occupational distribution. Each rank encompassed several comparable job levels: low rank (levels 1 through 8) included most clerical jobs; middle rank (levels 9 through 14) included most of the professional, supervisory, and lower-management employees; and top rank (levels 15 through 20) included only executive positions. We found that employees in the middle-rank levels were significantly less likely to be laid off than those in the lowest rank. Since our findings concerning racial differentials remained unchanged, for simplicity, we have kept the linear measure of job level.

Fourth, besides individual race, the racial composition of work units may affect employees' layoff chances. Racial segregation has long been associated with differential employment outcomes such as promotion and turnover (Kanter 1977; Tomaskovic-Devey 1995). For example, Paulin and Mellor (1996) used personnel data from a financial services firm (comparable with ours) and found that the greater the proportion of women and racial minorities in an occupation, the lower was the likelihood that an employee would be promoted except for white males. Thus racial composition also may affect layoff decisions. We included linear and categorical variables indicating the proportions of each race present in each business unit but found no significant effect on layoffs and no changes in the effect of individual race variables.

Finally, we conducted separate analyses by occupation to assess whether any occupation accounted for the effects in the entire sample. Results for each occupation—manager, professional, supervisor, and clerical—were similar: Whites were less likely to be laid off than nonwhites, except for clerical workers, where there is no difference. Among minority groups, the results were fairly consistent with the original model, except that results for Hispanic managers were not significant, probably due to their small number in our data. Interestingly, when we conducted the analyses separately by occupation, the gender effect lost significance, except for professionals. Since many layoffs in this firm occurred in managerial and supervisory ranks, the main effect for gender seemed more related to occupational segregation, whereas the racial differences remained within most of the occupational samples.

As an additional check, we assessed whether multicollinearity among some control variables deflated errors. We ran regressions with and without job level, salary quartiles, and occupational dummies: Regardless of how we combined these variables, our main results held. Further, we had done multiple iterations with different samples including and excluding people

who turned over voluntarily, year by year, and in multiple years with essentially the same results. Therefore, we present the more complete models with all variables included.

To summarize, our key finding is that layoffs in this firm were unequally distributed among employees of different races. Given a white and a minority employee working in the same job and receiving identical performance ratings, the minority employee had a higher probability of being laid off. Across racial groups, Asians were significantly less likely to be laid off than blacks and Hispanics, even after controlling for individual performance, tenure, job level, occupation, and age.

Given our data, we think that a likely explanation for the racial differences found lies in an organizational factor: managerial discretion in personnel policies. The firm seems to pay limited attention to layoff procedures and their impact on diversity, which may allow stereotypes and cognitive biases into the process. By contrast, as explained earlier, firm managers are actively concerned with increasing minority representation within the firm and regularly monitor hiring and promotion decisions to do so. We have no data to analyze hiring decisions but can examine racial differences in other employment outcomes including promotion, wage growth, and performance rating. The goal is to observe whether the inequality decreases or disappears where managerial discretion is lower. The results of these additional analyses are presented in Table 3, columns (3) through (8).

Analyses of Racial Differences in Employment Outcomes

Besides layoffs, we also analyzed promotions, wage growth, and performance ratings.

Promotion. We ran a logit model similar to the one for layoffs but with promotion as the dependent variable. Promotion is a dichotomous variable coded 1 if the employee's job level increased at any time during the study. In column (3) we find no significant racial differences in promotion chances when comparing whites and nonwhites. The firm's efforts to hire and promote minorities could explain these results. However, we do find a significant effect when introducing dummies for each minority group, with blacks ($B = -0.19$, $p < 0.05$) less likely to be promoted than either whites or Hispanics. Odds ratios indicate that blacks were 17.5 percent less likely to be promoted than whites with similar tenure, performance ratings, and positions. No significant difference existed in promotion chances among

Asians, Hispanics, and whites. These findings are consistent with studies of racial differences in promotion patterns. For example, Baldi and McBrier (1997) found that internal labor market criteria were less likely to be applied to whites than to blacks. Powell and Butterfield (1997) found no direct effect of race on promotion in U.S. federal agencies when promotion decisions were monitored by a review panel but found that race had indirect negative effects through lower performance evaluations for minorities. A more recent study of promotions among managers suggested the presence of both direct and indirect race effects on the rates of promotion: Black managers' reported slower promotion rates than white managers (James 2000). This seems the case in our data.

Wage Growth. We regressed many of the same predictor and control variables on the change in base salary from 1990 to 1991. The sample included employees who were present for the entire year; we removed employees who were laid off or left voluntarily during this year because we could not determine when they left, a factor that would have an impact on their salary. We calculated the difference between the log of salary in each year to determine wage growth from the beginning to the end of the period. The effect of race on wage growth was estimated via ordinary least squares (OLS), and results are shown in columns (5) and (6) of Table 2. As with promotions, no significant differences in wage growth were found between whites and nonwhites or among the three racial groups. We found that blacks' wage growth was only about 1 percent lower than that of similar whites. Here the guidelines established in the supervisor manual may help reduce the impact of race. Specifically, the merit-raise chart requires managers to allocate the pay raise budget based on workers' current salaries and performance levels. Since we controlled for performance and job level, the impact of race was negligible, suggesting that procedures for merit increases were being implemented.

Performance Rating. Performance ratings are not perfect productivity measures. Evaluations might be affected by factors such as ambiguous measures, imperfect judgments, and potentially racial stereotypes (March and Simon 1958; Greenhaus, Parasuraman, and Wormley 1990). We used OLS to estimate an individual's performance rating (measured as a linear variable) during 1990. Estimated coefficients are shown in Table 3, columns (7) and (8). We found that whites received significantly higher ratings than minority employees ($B = 0.04$, $p < 0.01$). In comparing effects across racial groups, the only significant difference was between whites and blacks ($B = -0.16, p < 0.01$), with blacks receiving significantly lower performance

ratings. The effect also was negative for Hispanics but was not significant. In analyses not shown here, we performed ordered logit analyses, which confirmed the OLS findings reported in Table 3. These results are consistent with past research concluding that raters evaluate job performance of blacks less favorably than that of whites (Mount et al. 1997; Elvira and Town 2001). In our study, this effect did not carry over to other minority groups.

Our data cannot directly measure race for supervisors or manager because we cannot identify who supervises whom. However, as discussed earlier, whites comprised 91 percent of the employees in executive-level jobs and a significant majority of managers and supervisors, so we can assume that the majority of raters were whites. Future studies would benefit from specific information on supervisors' race.

Overall, we found negative effects for blacks regardless of employment outcome, but the effects were particularly strong for layoffs, the focus of our study. Blacks (but not Hispanics) were less likely to be promoted, received slightly smaller salary increases, and were rated significantly lower than whites and other minority groups. Racial differences in layoffs may be stronger because of the limited monitoring of these decisions. Furthermore, affirmative action and other regulatory pressures focused on diversity do not directly apply to layoffs practices, and there was no union to oversee the outcomes. When decision makers are accountable for subjective evaluative judgments, research on accountability shows that outcomes are less likely to be biased (Tetlock 1992). The limited monitoring and the resulting increased discretion on the part of decision makers may have allowed conscious or unconscious cognitive biases—due to similarity-attraction or stereotypes—to influence layoff decisions (Reskin 2000).

Limitations

Although we tried to obtain an accurate measure of involuntary layoffs, it is possible that some exits coded as layoffs reflected voluntary turnover. If this were the case, endogeneity may enter our analyses. However, we do not think that this potential bias poses serious threat to our results, given the firm's careful codes for a person's termination and our numerous robustness checks. We have run multiple iterations with different samples, including and excluding people who turned over voluntarily, and the layoff results were virtually identical.

Layoffs relate to the economic environment and personal circumstances about which we have no information. For example, our dataset did not

include supply-side factors for different groups, such as the opportunity costs of working. The best we can do with the available information is to control for tenure. Instead of measuring tenure simply as the number of years with the firm, we introduced tenure squared and cubed in the logit models, hoping to capture potential group differences. The advantage of our data period is that in a job market characterized by frequent layoffs and high unemployment, voluntary turnover would be discouraged, reducing potential differences in the likelihood of changing jobs among the racial groups even if finding jobs is more difficult for minorities.

As for individual characteristics, this firm's personnel data did not include education. Although education is correlated with race and job loss (Boisjoly, Duncan, and Smeeding 1998), our analyses compared employees working in the same detailed occupation and work units, where differences in terms of education or human capital probably are small.

Despite these limitations, our firm-level data enable a strong test of our hypotheses. First, the extent of racial diversity is unusual in layoff studies. Second, the precise information on layoffs, performance, and tenure permits accurate testing of hypotheses with job- and individual-level information. Finally, focusing on a single firm controls for many of the structural variations across firms and industries that would confound layoff analyses (Cornfield 1982). That the firm is quite representative of large financial companies enhances the generalizability of our results: We can reasonably assume that managers making similar decisions are affected by some of the same social factors discussed. Thus racial differences in layoff outcomes found here could exist in other firms, particularly in large bureaucracies lacking union representation (Cornfield 1983).

Conclusion

Analyzing 3 years of personnel data, we found that employee race significantly affected layoff probabilities and that such effects differed among minority groups. Whites were less likely to be laid off than nonwhites. Furthermore, Asians were significantly less likely to be laid off than blacks and Hispanics. We argue that cognitive processes may influence layoff decisions: Asians may benefit from perceptions that they are hard working, highly educated, and committed to the firm. By contrast, blacks and Hispanics are most negatively affected by downsizing.

We do not mean to imply that all layoff decisions are biased but that the general pattern of layoffs exhibits inequitable differences across race. Given what we know about the firm and its policies, it appears that when monitoring of employment decisions is greater, racial differentials diminish or disappear. The negative results for blacks in other employment outcomes where firm monitoring is stronger, such as performance ratings and promotions, are smaller than those in layoffs and do not extend to Hispanics. The findings therefore highlight the pivotal role of employer practices to reduce opportunities for cognitive biases in employment decisions. As Reskin (2000:321) affirms: "We cannot rid work organizations of discrimination until we recognize both that much employment discrimination originates in automatic cognitive processes and that it occurs because of work organizations' personnel practices."

Our findings have important implications for both firms and employees. Layoffs and restructuring have become a permanent feature in the labor market and are expected to continue (Koretz 1997; McKinley, Mone, and Barker 1998). Firms should be advised to monitor layoff practices to reap the benefits of minority gains in hiring and promotion due to affirmative action programs. These results also matter for certain employees because job displacement has more negative consequences for minorities than for white men. Longitudinal studies indicate that being laid off has a negative impact on minorities, who experience longer unemployment spells, lower earnings, and downward career mobility as a consequence (Ong and Mar 1992; Spalter-Roth and Deitch 1999). Those minorities laid off end up in mostly-minority jobs, which usually have lower job stability and shorter job tenure than mostly-white jobs (Farber 1995, 1997). Equality in layoff chances therefore is paramount.

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APPENDIX

TABLE A1

	Variables	1	2	3	4	5	6	7	8
1	Layoffs	1.00	—	—	—	—	—	—	—
2	Asian	−0.01	1.00	—	—	—	—	—	—
3	Black	0.06	−0.15	1.00	—	—	—	—	—
4	Hispanic	0.04	−0.15	−0.11	1.00	—	—	—	—
5	White	−0.05	−0.61	−0.42	−0.43	1.00	—	—	—
6	Female	−0.02	0.03	0.07	0.04	−0.09	1.00	—	—
7	Incentive pay	−0.08	−0.07	−0.06	−0.05	0.12	−0.11	1.00	—
8	Tenure	−0.08	0.04	−0.00	0.00	−0.03	0.13	0.02	1.00
9	Age	−0.08	0.00	−0.06	−0.07	0.08	0.04	−0.01	0.62
10	Married	−0.05	0.08	−0.07	0.01	−0.03	0.03	0.02	0.12
11	Lagged performance	−0.07	−0.02	−0.06	−0.03	0.07	−0.00	0.11	−0.10
12	Performance Rating = 1	0.05	−0.02	0.03	−0.01	−0.00	−0.01	0.01	0.01
13	Performance Rating = 2	0.11	−0.04	0.03	0.02	−0.01	−0.02	−0.02	0.03
14	Performance Rating = 3	0.03	0.01	0.05	0.02	−0.05	−0.01	−0.09	0.04
15	Performance Rating = 4	−0.10	0.04	−0.03	−0.01	−0.00	0.02	0.08	0.08
16	Performance Rating = 5	0.02	−0.04	−0.04	−0.01	0.06	0.00	0.02	−0.16
17	Job level	−0.05	−0.14	−0.11	−0.12	0.24	−0.28	0.33	0.18
18	Clerical	0.03	0.14	0.09	0.06	−0.20	0.15	−0.37	−0.14
19	Manager	−0.02	−0.08	−0.04	−0.03	0.11	−0.07	0.11	0.20
20	Professional	−0.01	−0.08	−0.07	−0.06	0.14	−0.15	0.35	−0.04
21	Supervisor	0.01	−0.01	0.01	0.02	−0.01	0.07	−0.06	0.07
22	Salary quartile = 1	0.06	−0.00	0.01	0.03	−0.02	0.04	−0.09	−0.14
23	Salary quartile = 2	−0.00	0.00	0.02	−0.00	−0.01	−0.01	0.01	−0.07
24	Salary quartile = 3	−0.02	−0.00	−0.01	−0.00	0.01	−0.01	0.01	0.01
25	Salary quartile = 4	−0.04	0.00	−0.02	−0.03	0.03	−0.01	0.07	0.20
26	Business unit 1	−0.01	−0.08	−0.07	0.03	0.09	0.12	0.13	0.02
27	Business unit 2	0.02	−0.00	0.02	0.01	−0.02	−0.01	0.14	0.01
28	Business unit 3	−0.01	0.08	−0.03	−0.00	−0.04	−0.04	0.15	0.09
29	Business unit 4	0.03	0.11	−0.02	0.01	−0.08	−0.03	−0.05	0.04
30	Business unit 5	0.02	0.12	0.01	0.01	−0.11	−0.03	−0.08	0.10
31	Business unit 6	0.05	−0.01	−0.02	−0.03	0.04	−0.02	−0.00	−0.09
32	Business unit 7	−0.03	−0.08	0.04	−0.01	0.04	−0.01	−0.14	−0.07
33	Business unit 8	−0.00	−0.03	−0.05	−0.01	0.06	−0.08	0.07	0.06
34	Business unit 9	0.04	0.05	0.01	−0.00	−0.05	−0.03	−0.13	−0.04
35	Business unit 10	−0.04	0.00	0.14	−0.02	−0.07	0.01	−0.11	−0.07

Coefficients greater than 0.025 are significant at $p \leq 0.01$.

9	10	11	12	13	14	15	16	17	18
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1.00	—	—	—	—	—	—	—	—	—
0.10	1.00	—	—	—	—	—	—	—	—
−0.11	0.03	1.00	—	—	—	—	—	—	—
0.02	−0.03	−0.07	1.00	—	—	—	—	—	—
0.04	−0.03	0.18	−0.01	1.00	—	—	—	—	—
0.05	−0.03	−0.26	−0.04	−0.14	1.00	—	—	—	—
0.03	0.05	0.16	−0.05	−0.18	−0.62	1.00	—	—	—
−0.12	−0.01	0.20	−0.03	−0.10	−0.33	−0.44	1.00	—	—
0.15	0.09	0.19	0.01	−0.05	−0.13	0.12	0.04	1.00	—
−0.05	−0.06	−0.07	−0.03	−0.02	0.05	−0.05	0.03	−0.61	1.00
0.13	0.08	0.09	0.02	−0.01	−0.08	0.04	0.04	0.53	−0.33
−0.05	−0.02	−0.01	0.02	0.01	0.02	0.00	−0.03	0.23	−0.59
0.01	0.04	0.02	−0.00	0.03	−0.01	0.04	−0.04	0.04	−0.32
−0.20	−0.02	−0.09	0.02	0.06	0.10	−0.03	−0.12	0.01	−0.05
−0.06	−0.01	0.00	−0.01	−0.04	0.01	0.02	−0.02	0.00	0.03
0.04	0.00	0.03	−0.00	−0.00	−0.05	0.00	0.06	−0.00	0.01
0.22	0.03	0.05	−0.01	−0.02	−0.06	0.00	0.09	−0.01	0.01
−0.07	0.01	−0.07	0.04	0.08	0.02	−0.05	−0.02	−0.13	−0.29
0.01	−0.02	0.03	−0.01	−0.02	−0.03	0.04	−0.01	0.07	−0.03
0.08	−0.02	−0.01	−0.01	−0.03	0.00	0.01	0.00	0.13	0.02
0.06	0.04	−0.03	−0.01	0.00	0.02	−0.00	−0.03	0.02	0.03
0.05	−0.01	0.01	−0.01	−0.01	0.09	0.03	−0.04	0.02	0.08
−0.04	−0.02	0.01	−0.00	−0.02	−0.01	−0.00	0.02	0.12	−0.04
−0.01	−0.01	0.04	−0.01	−0.02	−0.01	−0.00	0.03	−0.08	0.20
0.03	0.05	−0.01	−0.02	−0.00	−0.01	0.04	−0.03	0.16	−0.09
−0.01	−0.02	0.02	−0.00	−0.01	0.03	−0.00	−0.03	0.03	0.03
−0.02	0.00	0.05	−0.01	−0.03	−0.05	0.01	0.07	−0.11	0.20

TABLE A1 (cont.)

	Variables	19	20	21	22	23	24	25	26
1	Layoffs	—	—	—	—	—	—	—	—
2	Asian	—	—	—	—	—	—	—	—
3	Black	—	—	—	—	—	—	—	—
4	Hispanic	—	—	—	—	—	—	—	—
5	White	—	—	—	—	—	—	—	—
6	Female	—	—	—	—	—	—	—	—
7	Incentive pay	—	—	—	—	—	—	—	—
8	Tenure	—	—	—	—	—	—	—	—
9	Age	—	—	—	—	—	—	—	—
10	Married	—	—	—	—	—	—	—	—
11	Lagged performance	—	—	—	—	—	—	—	—
12	Performance Rating = 1	—	—	—	—	—	—	—	—
13	Performance Rating = 2	—	—	—	—	—	—	—	—
14	Performance Rating = 3	—	—	—	—	—	—	—	—
15	Performance Rating = 4	—	—	—	—	—	—	—	—
16	Performance Rating = 5	—	—	—	—	—	—	—	—
17	Job level	—	—	—	—	—	—	—	—
18	Clerical	—	—	—	—	—	—	—	—
19	Manager	1.00	—	—	—	—	—	—	—
20	Professional	−0.27	1.00	—	—	—	—	—	—
21	Supervisor	−0.15	−0.26	1.00	—	—	—	—	—
22	Salary quartile = 1	0.07	−0.09	0.13	1.00	—	—	—	—
23	Salary quartile = 2	−0.02	0.01	−0.03	−0.36	1.00	—	—	—
24	Salary quartile = 3	−0.02	0.03	−0.05	−0.34	−0.33	1.00	—	—
25	Salary quartile = 4	−0.03	0.05	−0.05	−0.34	−0.33	−0.31	1.00	—
26	Business unit 1	0.12	0.11	0.15	0.12	−0.04	−0.05	−0.03	1.00
27	Business unit 2	0.00	0.05	−0.03	−0.05	−0.02	0.01	0.06	−0.07
28	Business unit 3	−0.02	0.05	−0.08	−0.03	−0.02	0.00	0.05	−0.25
29	Business unit 4	0.01	−0.02	−0.03	−0.01	0.01	0.03	−0.02	−0.09
30	Business unit 5	0.01	−0.07	−0.02	−0.04	−0.01	0.01	0.05	−0.15
31	Business unit 6	−0.01	0.07	−0.03	−0.07	−0.05	0.03	0.09	−0.16
32	Business unit 7	−0.11	−0.14	−0.00	0.03	0.05	−0.02	−0.07	−0.37
33	Business unit 8	0.02	0.11	−0.04	−0.03	0.02	0.01	−0.00	−0.20
34	Business unit 9	−0.02	0.01	−0.03	0.04	0.03	−0.02	−0.05	−0.20
35	Business unit 10	−0.05	−0.14	−0.04	−0.11	0.03	0.08	0.01	−0.22

27	28	29	30	31	32	33	34	35
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−0.01	−0.04	1.00	—	—	—	—	—	—
−0.02	−0.08	−0.03	1.00	—	—	—	—	—
−0.02	−0.08	−0.03	−0.05	1.00	—	—	—	—
−0.05	−0.18	−0.07	−0.11	−0.11	1.00	—	—	—
−0.03	−0.10	−0.04	−0.06	−0.06	−0.14	1.00	—	—
−0.03	−0.10	−0.04	−0.06	−0.06	−0.14	−0.08	1.00	—
−0.03	−0.10	−0.04	−0.07	−0.07	−0.16	−0.08	−0.08	1.00