

INTRODUCTION: DO COMPENSATION POLICIES MATTER?

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It has been clear for some time that although various theories exist about why firms choose the compensation policies they do and what the effects of these policies are likely to be, there is very little empirical evidence on whether compensation policies have their intended incentive effects at either the individual or corporate level.¹ The time was therefore ripe in 1987 for a major interdisciplinary research effort on this subject. Such an effort was made possible by the generous support of the Alfred P. Sloan Foundation, including the support necessary to produce this volume.

A group of leading academic economists, industrial relations researchers, and personnel and human resource scholars from around the country was assembled in 1987 to conduct, individually and in teams, empirical research on compensation issues. A working conference of these researchers was held in Cambridge, Massachusetts, in November 1988 at the offices of the National Bureau of Economic Research, which also provided supplementary financial support for the project. At this meeting, the researchers and a few invited guests debated the

technical merits of preliminary versions of the researchers' papers.

The project's final conference was held at Cornell University on May 23 through May 25, 1989. Attendance at this conference was limited to about 85 people, split roughly in thirds among project researchers, other (primarily young) academics doing research on the subject, and corporate executives who are at the forefront of compensation practices.² The major goals of the conference were to give the corporate practitioners a sense of current academic research on this subject, to get from the practitioners a sense of the relevance of the research to them and their views on aspects of the subject in which new research is needed, and, most important, through the interaction of the researchers and the corporate professionals, to stimulate further research on compensation issues. It is fair to say that all these goals were achieved.

This volume is an attempt to convey to a broad audience the exciting empirical research that has recently taken place on compensation topics and to try to stimulate still further research on these topics. Included in the volume are revised versions of 13 of the 15 papers presented at the conference that referees felt warranted publication in the *Industrial and*

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¹ This point is developed in Ehrenberg and Milkovich (1987).

² A list of conference participants appears in the appendix. I am grateful to both the academic discussants (Edward Lazear, Henry Farber, Katharine Abraham, Charles Brown, Daniel Hamermesh, and Barry Gerhart) and corporate discussants (Michael Guthman, Robert Ochsner, Robert Burg, Jean Baderschneider, Stephen O'Byrne, Sharon Smith, and Ray Olsen) at the conference for their comments, many of which led to substantial improvements in the papers that appear here.

Labor Relations Review. A paper on managerial pay and performance that was not presented at the conference, but that had been submitted to the *Review* and accepted for publication, is also included because it fits into the volume so well.³ Finally, a commissioned paper on data sets available to people interested in doing research on compensation issues is included to facilitate future research.

Executive and Managerial Compensation and Performance

The first three papers—one by Jonathan Leonard, one by Robert Gibbons and Kevin J. Murphy, and one by John Abowd—deal with the level and structure of executive and managerial compensation. Of key concern to the authors is whether executive and managerial compensation changes are related to measures of corporate performance; two of the papers also address whether firms in which compensation changes have been closely related to performance have outperformed other firms.

The Leonard and Abowd papers analyze compensation practices affecting over 25,000 executives at a large number of major companies, using data that are collected annually by a major compensation consulting company. Leonard focuses on accounting measures of performance, whereas Abowd examines not only accounting measures (for example, net income/assets) but also economic return on asset measures (such as return on equity) and financial or stock market-based measures (such as shareholder total return). Using different methodologies, both studies find weak evidence that firms that tie their executives' compensation changes to accounting measures of performance tend to have better financial performance. Abowd finds stronger results for economic return on asset measures and market-based performance. That is, he finds that firms that tie their executives' compensation to either of these two measures tend

to have better performance on that measure in the future.

Gibbons and Murphy study the relationship between the compensation of chief executive officers (CEOs) and stock market measures of corporate performance, using a longitudinal sample of over 1,600 CEOs in large publicly held corporations. The authors' theoretical analysis suggests that CEOs' compensation changes should be related to measures of corporate performance relative to some comparison group rather than to measures of absolute corporate performance. Empirically, they find that CEO compensation increases are in fact positively related to their corporations' relative financial performance and that the probability that a CEO leaves his corporation is negatively related to his corporation's relative financial performance. In both cases, their evidence suggests that CEO performance is more likely to be evaluated relative to aggregate market measures than relative to industry measures of performance.

In the discussion of this set of papers at the Cornell conference, it was pointed out that the definition of compensation used by all the authors excludes benefits and long-term incentives. Because these forms of compensation have become increasingly important under current tax laws, their omission from these studies is unfortunate. Indeed, this omission may help explain why all the authors find relatively low elasticities of compensation changes with respect to performance. The authors were all well aware of this limitation in their data sets, and at least one author is currently working to value long-term incentives and include them in his compensation measures.

Do Pay Structures Have Incentive Effects at the Individual Level?

Economists and compensation specialists often assume that pay policies can influence employee behavior and have desirable incentive effects. Yet, little empirical testing by economists has been directed at whether incentive effects actually exist at the individual employee level.

³ Lawrence Kahn and Peter Sherer (this volume).

The next four papers in the volume address this issue from very different perspectives. The paper by Michael Bognanno and myself and that by Beth Asch deal with occupations that, at first glance, appear far removed from the corporate world, namely, professional golfers and military recruiters. In both situations, however, one can measure with precision both the incentive structure the individuals face and the output they produce. Thus, data from these occupations permit strong tests of whether pay structures have incentive effects at the individual level.

Much attention has been devoted to studying models of tournaments or situations in which an individual's payment depends only on his or her output relative to that of other competitors.⁴ Under certain assumptions tournaments are postulated to be a desirable way to structure compensation because of the incentive structure they provide.

The Ehrenberg-Bognanno paper uses data from professional golf to investigate whether tournaments actually elicit desired effort responses. The study focuses on golf because information on the incentive structure (prize distribution) and measures of individual output (players' scores) are both available for golf. Under suitable assumptions, players' scores can be related to players' effort and inferences drawn as to how both players' overall tournament scores and their scores on the last round of a tournament should depend upon the level and structure of prizes. In addition, data are available to control for factors other than the incentive structure that should affect scores, such as player quality, the quality of the rest of the field, and the difficulty of the course. Using data from the 1987 European Men's Professional Golf Association Tour, the authors find strong support for the proposition that both the level and structure of prizes in PGA tournaments influenced players' performance.

Asch examines how U.S. Navy recruiters, who are assigned to recruiting duty

for three-year tours and whose output (the number and quality of recruits generated) is perfectly observed, respond to the compensation structure they face. Key components of this structure include the presence of recruitment station quotas, piece rates, and prizes that individual recruiters are eligible to win every 12 months. Although her study focuses on military employees, Asch stresses its relevance to private sector employees, such as production workers or sales persons who compete each year for prizes, nontenured college professors competing for tenure, and workers nearing retirement (that is, approaching the end of their "tours").

Analyzing data on recruiters in the Chicago area during a five-month period in 1986, Asch finds that recruiters increase their output in the months immediately prior to qualifying for a prize and decrease it in later months. Since prizes are based at least partially on the number of recruits generated, those who have performed poorly (produced few recruits) in the early part of the year produce more recruits, but generally of lower "quality" as measured by educational achievement and AFQT scores, in later months in an attempt to increase their chances of winning a prize. Finally, recruiters near the end of their tour who have little chance of winning a prize appear to reduce their work effort. This last finding suggests the need for employers to consider ways to motivate employees who are nearing retirement.

The third paper in this group, by Lawrence Kahn and Peter Sherer, analyzes data for a single company that employs workers in a number of different locations. Bonus pay policies for this company vary across locations, positions in the managerial hierarchy, and worker seniority levels. The authors first estimate the extent to which the relationship between bonuses and supervisors' subjective productivity ratings varies across these three dimensions and then test whether the improvement in an individual's rating over time is positively related to the steepness of the bonus-productivity schedule he or she implicitly faces (that is, the

⁴ See, for example, Lazear and Rosen (1981).

extent of bonus pay). They find that the steeper the bonus-productivity relationship, the more an employee's rating improves over time.

Finally, Daniel Hamermesh's paper focuses on a different type of incentive, namely, how the provision of "break time" (defined to include lunch breaks, coffee breaks, and other breaks) to workers affects their productivity per hour of work for which they are *paid*. He analyzes data collected by the University of Michigan Institute for Social Research in several household time use studies. Since information on productivity is not available, he assumes that the earnings workers are paid is a reasonable proxy for their productivity. On average, he finds that providing workers with additional break time has no effect on their earnings, suggesting that further growth of on-the-job leisure will not increase the productivity of most workers. On the other hand, additional break time does increase the productivity of the minority of workers with very short break times.

Do High-Wage Policies Pay?

Recently there has been extensive discussion in the academic literature concerning why firms might choose to be high-wage employers. Among the reasons suggested are increased ability to attract high-quality employees, increased ability to retain workers (lower turnover), increased work effort by workers and reduced shirking on the job by them (to reduce their chances of being fired from the high-paying jobs), and, because of the last reason, a reduced need for firms to closely supervise workers. This discussion often goes under the rubric of "efficiency wage" theories.⁵ Surprisingly, there is very little empirical evidence that firms pursuing high-wage strategies actually outperform other firms. Indeed, in contrast to his findings on the relationship between executive and managerial compensation changes and corporate performance, Leonard also finds in

his paper in this volume that there is no correlation across firms between executive and managerial pay *levels* and accounting measures of performance.

The next two papers in the volume use different data bases to investigate the question of whether "paying high wages pays." Erica Groshen and Alan Krueger use data drawn from the Bureau of Labor Statistics' 1985 *Hospital Industry Wage Survey* to study the trade-off between the wages paid to various occupational groups and the intensity with which staff workers are supervised. They find that hospitals that pay higher wages to staff nurses tend to employ fewer nurse supervisors; no similar trade-off between supervision and pay is found, however, for other hospital occupations.

The authors' data do not permit them to determine whether the higher wages for staff nurses reduce the need for supervisory nurses because higher-quality staff nurses are attracted or because staff nurses of average quality work harder. The authors also do not provide any analysis of whether the high-wage hospitals have reduced costs of nursing services, because they cannot measure all of the benefits that the high-wage policies may bring (such as reduced turnover costs and higher-quality nurses). The direct cost saving (in terms of decreased supervisory costs) does, however, appear to be less than the increased costs of the higher wages for staff nurses.

Harry Holzer uses data from the 1982 wave of the national *Employment Opportunity Pilot Project* survey of firms—specifically, data on starting salaries, worker characteristics, and job characteristics for a market that is predominantly comprised of workers with a high school education in clerical, sales, and service jobs. He finds that firms that pay higher wages spend fewer hours on informal training; their workers have longer current job tenure, more years of previous job experience, and higher subjective performance ratings; and the firms have lower job vacancy rates and a higher perceived ease of hiring new employees. The magnitudes of these relationships, however, are quite sensitive

⁵ See, for example, Akerlof and Yellen (1986).

to the specific statistical models used. Using admittedly crude measures of the overall benefits and costs to the firm of paying higher wages, he finds that some, but not all, of the costs of higher wages are offset by reduced costs in other areas.

Determinants of Firms' Compensation Policies

Each of the papers discussed so far focuses on the effects of firms' compensation policies rather than on the reasons compensation policies vary across firms. For example, neither the Groshen-Krueger paper nor the Holzer paper explains why some firms in their samples chose to pursue a high-wage policy while others chose to pursue a low-wage one. The next two papers are directed at exploring why compensation policies vary across firms and across establishments within a single firm.

Charles Brown distinguishes among three types of pay-setting methods: piece rates, in which pay is "mechanically" linked to output; merit pay, in which subjective ratings by supervisors determine salary levels; and standard rates, in which pay depends upon a worker's seniority but not his or her performance. His theoretical discussion suggests that a firm's choice among these methods depends on balancing the gains from more precise links between performance and pay against the costs of having to make precise or judgmental estimates of workers' performance.

Based upon this discussion, Brown hypothesizes that piece rates will be more common and merit pay less common in larger establishments; that the fewer the occupations in an establishment of a given size, the more likely it will adopt piece rates; and that work in which quality is easily verifiable is amenable to piece rates. Institutional considerations also suggest that standard rates should be more common in unionized establishments. Brown tests these and other hypotheses using both individual- and establishment-level data obtained from various governmental

sources. His results are generally in line with his theoretical predictions.

The importance of this paper for compensation research cannot be stressed enough. If pay policies are systematically chosen by firms, then analyses of the effects of pay policies cannot treat these policies as exogenous. Put another way, Brown's findings suggest that researchers must simultaneously analyze the causes and effects of pay policies.

Casey Ichniowski and John Delaney's paper analyzes union contract data from a single large company in the retail food industry that operates in a national market but that bargains at the local or regional level with its unionized employees. Their interest is in the factors that are correlated with whether the company won a *reduction* in the average rate of total compensation in a contract negotiation.

The authors find that unions were more likely to agree to concessions in situations in which accounting measures of store profits were low or negative. The largest concessions came from reductions in straight-time hourly earnings; the authors show, however, that a wide variety of provisions in the union contracts, not only wages, were changed to reduce costs. Finally, they show that wage concessions did serve to increase store profits on nearly a dollar-for-dollar basis. The last result implies that, at least in the short run, worker productivity was not seriously affected by the wage concessions.

Do Compensation Policies Matter?

The next two papers adopt novel (to many readers of the *Industrial and Labor Relations Review*) approaches to analyze "whether compensation policies matter." The first addresses the question of whether financial markets act as if compensation policies matter by analyzing how stock market prices react to announced changes in compensation and other human resource policies. The second paper uses micro-simulation models to gain an understanding of the extent to which various "pay for performance" systems (such as bonuses and merit increases) are trans-

lated into observed relationships between pay levels and productivity.

John Abowd, George Milkovich, and John Hannon investigate whether public announcements of selected human resource management decisions, including those involving compensation and benefit increases and decreases, staffing changes, and relocations or shutdowns, have any effects on the stock market performance of major corporations. They use an event study methodology, borrowed from finance theory, that enables them to estimate the effect of these announcements on the level and variability of abnormal total shareholder return (the movements in a corporation's stock market prices and dividends that cannot be predicted from what is happening to the stock market as a whole) around the announcement date.

The authors find no consistent pattern of increased or decreased valuation of a company's stock in response to such announcements. They do find, however, an increased variation in abnormal total shareholder return in response to announcements of permanent staff reductions and shutdowns or relocations. Thus, announcements of such policy changes do provide information that influences stock market prices.

Donald Schwab and Craig Olson's contribution is the only one in the volume that does not analyze "real-world" data. Rather, using simulation techniques, they investigate relationships between employee pay and performance produced under varying organizational practices among managerial and professional employees just below the levels of those studied by Leonard, Gibbons and Murphy, and Abowd. They study these relationships both cross-sectionally and longitudinally over ten time periods.

Among the more interesting outcomes, Schwab and Olson find that, contrary to a common supposition, bonus systems are generally not superior to conventional merit systems in linking pay to performance. They also find that error in the measurement of performance is not as serious a problem in pay-performance relationships as is typically believed. Their

study is unusual for the methodology used and permits the authors to address several issues that have not been amenable to previous empirical research.

Profit Sharing

Group incentive plans, such as profit sharing or gain sharing, are of interest for at least two reasons. On the one hand, it is often postulated that they create incentive effects for workers that will lead to improved firm performance. On the other hand, some economists have argued that firms with profit-sharing plans will have compensation levels that are more flexible than other firms' compensation levels over a business cycle, and thus firms with profit-sharing plans should exhibit fewer layoffs and greater employment stability than firms without such plans.⁶

The final research paper in the volume, that by James Chelius and Robert S. Smith, addresses the latter issue. The authors analyze the effects of profit-sharing on the employment of nonsupervisory workers in firms facing reduced demand using data from a special survey they conducted of small businesses and other data from a national sample of employees obtained from the 1977 Michigan *Quality of Employment Survey*. The authors first use the employer data base to test whether profit sharing increases employment stability in the face of negative demand shocks and then use the employee data base to test whether it reduces layoff probabilities. In both cases, they find weak support for their hypotheses.

Data Bases for Research on Compensation Issues

A major goal of this volume is to stimulate further research on compensation issues. To facilitate such research, the volume concludes with an annotated bibliography prepared by Julie Hotchkiss of machine-readable data bases that are available to people interested in doing

⁶ See, for example, Weitzman (1984).

research on compensation issues. Each entry in this bibliography contains detailed information on a data base, including where it can be obtained and whom to contact for further information. Hotchkiss also includes information on several data bases that are not machine readable, usually collected either by the Bureau of Labor Statistics or by private compensation consulting firms.

Concluding Remarks

The papers in this volume should give the reader a sense of the exciting empirical research that has recently taken place on compensation-related issues. As a set, these papers considerably expand our empirical evidence on the effects of compensation policies. Several papers show that executive compensation is structured in a way that at least implicitly ties executive compensation changes to measures of corporate performance, and—crucially—that doing so leads to improved corporate performance (Leonard, Murphy/Gibbons, Abowd). Others show that compensation systems that pay workers for performance, in the sense of providing explicit or implicit incentives for high levels of performance, can motivate individuals to increase their effort levels (Ehrenberg/Bognanno, Hamermesh, Asch, Kahn/Sherer). Still others show that high-wage policies do have some of the effects that proponents of efficiency wage theories claim for them (Krueger/Groshen, Holzer). Finally, one shows that profit-sharing plans appear, at least weakly, to increase employment stability (Chelius/Smith).

The papers also make important methodological contributions. One shows that compensation policies are systematically chosen by firms and thus that analyses of the effects of pay policies cannot treat these policies as exogenous (Brown). Others introduce to the readers of this volume two somewhat novel methodological approaches that can be used to study compensation-related issues, namely, event study methods borrowed from finance

theory (Abowd/Milkovich/Hannon) and microsimulation methods (Schwab/Olson).

Even a set of 14 research papers, however, can only begin to touch on the range of interesting issues in the field of compensation. Notably missing from this volume are discussions of how employee ownership, employee participation, profit-sharing, and other group incentive plans (such as gain-sharing) can affect the performance of firms. Fortunately, the Brookings Institution recently commissioned survey papers that deal with these topics, and these papers will shortly appear in published form.⁷

Also missing from this volume is any mention of employee benefits, such as pensions, and the roles that the level and mix of benefits play in helping firms to attract, motivate, and retain workers and in helping firms to encourage older employees to either retire or stay on the job. Although much research has been done on these topics, this subject is likely to be of increasing importance as the proportions of older workers and women in the work force continue to expand. Increasingly, through voluntary corporate action, through collective bargaining, and through state and proposed federal legislation, the growth of the proportion of women in the work force will lead to increased interest in family leave and child care policies. Research is clearly needed on the incentive effects of such policies and on what types and mixes of such policies are cost-effective.

Similarly, none of the papers in this volume discusses the implications for compensation policies of the changing corporate environment in the United States, where fewer managers or employees can count on spending their entire careers with one firm than in the past. Some research has been conducted on how mergers and corporate acquisitions, including leveraged buy-outs, affect union and nonunion compensation and employment levels, but there have been no studies of how these restructurings will affect the set of compensation policies

⁷ Blinder (forthcoming).

firms should offer.⁶ For example, in a world in which the long-term attachment of workers to firms can no longer be presumed, does it still make sense for firms to offer their employees defined-benefit pension plans based on final salaries?

The papers in this volume should also give the reader a sense of the wide variety of data bases that can be used to conduct research on compensation. Several of the papers make use of corporate stock market data or accounting performance data and merge these data with either data on executive or managerial compensation collected by *Fortune Magazine* and a compensation consulting company or data on "human resource events" obtained from the *Wall Street Journal* (Abowd, Leonard, Murphy/Gibbons, and Abowd/Milkovich/Hannon). Two other papers use data for specialized occupational groups (Ehrenberg/Bognanno and Asch), and two use data from a single large corporation based on union contracts or corporate personnel records (Ichniowski/Delaney and Kahn/Sherer). Two use Bureau of Labor Statis-

tics data at the establishment level (Brown and Krueger/Groschen), three use survey data on firms or individuals collected by nongovernmental agencies for other purposes (Hamermesh, Holzer, Chelius/Smith), and one paper employs data from the authors' own survey (Chelius/Smith). Finally, the authors of one paper generate their data via microsimulation models (Schwab/Olson). Taken together, these papers suggest that a researcher's ability to study compensation issues is limited only by his or her ingenuity.

Corporate participants at the Cornell conference encouraged researchers to become more involved with the corporate world so that the researchers can learn the rapidly changing issues that corporate practitioners are confronting. Once these issues are known, the corporate participants stressed, there will be a need for more cooperation between economists and behavioral scientists in framing hypotheses and research designs, and subsequently between these researchers and corporations to produce data bases that will both be of use to the researchers and aid in corporate decision-making. I hope that some readers of this volume will act on these considerations.

⁶ See Brown and Medoff (1988), Lichtenberg and Siegel (1989), and Rosett (1989).

Appendix

Participants in the ILR-Cornell Research Conference, "Do Compensation Policies Matter?"

John Abowd*	Charles Brown*	Ann Davis
ILR-Cornell	University of Michigan	Marist College
Katharine Abraham*	Walton Burdick	John Delaney
University of Maryland	IBM Corporation	Columbia University
Beth Asch	Robert Burg	Anita Denning
Rand Corporation	Colgate-Palmolive	Mobil Corporation
Ronald Ash	Richard Chaykowski	Joseph Duggan
University of Kansas	Queen's University	Data General Corp.
Jean Baderschneider	James Chelius	E. G. Egea
Mobil Oil Corporation	Rutgers University	AT & T
Chris Berger	Yuri B. Chernyak	Ronald Ehrenberg*
Purdue University	Auburndale, Mass.	ILR-Cornell
Michael Bognanno	Michael Conte	Henry Farber*
ILR-Cornell	University of New Orleans	Mass. Inst. of Technology
Rene Broderick	James H. Curnow	Charles Fay
ILR-Cornell	3M Company	Rutgers University

Beth Florin-Thuma Data General Corp.	Douglas Kruse Rutgers University	Robert Ochsner Hay Group
Richard Freeman* Harvard University	Edward Lazear* University of Chicago	Ray Olsen TRW, Inc.
William N. Geary UNISYS Corporation	Dan C. Leach U S WEST, Inc.	Craig Olson University of Wisconsin
Barry Gerhart ILR-Cornell	Michael Lee San Jose State University	C. Thomas Parker Air Products and Chemicals, Inc.
Bob Gibbons* Mass. Inst. of Tech.	Jonathan Leonard* University of California	Bonnie Rabin University of Illinois
I. Dwight Greenspan GTE Corporation	Kathleen Malmgren Welch Allen, Inc.	Walter Read IBM Corporation
Erica Groshen Federal Reserve Bank of Cleveland	Carl Marinacci AMOCO Corporation	Albert Rees Sloan Foundation
Michael Guthman Hewitt Associates	William J. Meaken Morgan Guaranty Trust Co.	Daniel Rees ILR-Cornell
Daniel Hamermesh* Michigan State University	John M. Mercier Digital Equipment Corp.	Michael G. Reiff Citibank, N.A.
John Hannon ILR-Cornell	George Milkovich ILR-Cornell	Charles W. Rogers Pepsico, Inc.
Harry Holzer Michigan State University	Olivia Mitchell* ILR-Cornell	Vida Scarpello University of Florida
Julie Hotchkiss Georgia State University	Robert D. Mulkey Digital Equipment Corp.	Donald Schwab University of Wisconsin
Casey Ichniowski* Columbia University	Janice D. Murphy Bureau of Labor Statistics	Peter Sherer University of Illinois
Derek Jones Hamilton College	Kevin J. Murphy University of Rochester	Robert Smith ILR-Cornell
Larry Kahn University of Illinois	Haig Nalbantian National Economic Research Assoc., Inc.	Sharon Smith Princeton University
Robin Kaiser Sony Corp. of America	Stephen P. Neun Utica College	Jan Svejnar University of Pittsburgh
Jeffrey Keefe Rutgers University	Jerry Newman SUNY-Buffalo	Michael A. Thompson Hay Management Consultants
Richard Killeen NYNEX Corporation	David Nurenberg Exxon Corporation	Lexie L. Walton Morgan Guaranty Trust Co.
Morris Kleiner University of Minnesota	Roberta F. Obler Johnson & Johnson	Yoram Weiss NORC
Alan Krueger* Princeton University	Stephen F. O'Byrne TPF & C	

* Denotes participant also affiliated with the National Bureau of Economic Research.

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