AN EXAMINATION OF THE DETERMINANTS OF EXECUTIVE COMPENSATION LEVELS IN LARGE MANUFACTURING FIRMS OVER TIME

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The major thrust of this analysis is to examine the factors which influence the levels of pay received by our nation's highest paid corporate executives.

The basic hypotheses tested are that the levels of compensation received by top corporate executives will vary according to the size of the firm they direct, corresponding corporate profitability, and the amount of human capital possessed by the executive.

The sample for which this analysis was conducted consisted of eighty of the nation's largest manufacturing firms. These firms were analyzed over the time period from 1961 to 1975, thus yielding a pooled sample of 1,200 observations. Multiple regression analysis was used to examine the relationship between vectors of variables, measuring corporate size, profitability, the executive's stock of human capital, and the level of compensation the executive received.

As a result of this analysis it was discovered that the various components of the executive pay package are influenced by different corporate and individual characteristics. Specifically, the salary component of the pay package was found to be significantly correlated with the size of the firm managed and the individual manager's stock of human capital. When examining changes in the level of base salary it was found that the profitability of the firm was the only vector which exerted a significant influence on the amount of this change.

Changes in the bonus component of the executive pay package were found to be positively and significantly correlated with changes in both the size of the firm and its corresponding level of profitability. The value of the stock options awarded to the executive were discovered to be contingent upon only the change in corporate size in the year of the stock award.

The conclusions drawn from the above results are that firms utilize the various components of the executive pay package to reward different types of executive performance. Changes in base salary levels are used to reward executive behavior which results in an increase in the level of corporate profitability. Changes in the amount of the stock option award are contingent upon the executive's ability to increase the scale of the firm's operations. Finally, executive bonuses are tied to

the performance of the corporation in terms of both profitability and growth in size.

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INTRODUCTION

The major thrust of this study is to discover and to analyze the factors which influence the level of pay received by the top managers of the nation's largest industrial firms. Given that the top executives of modern corporations are thought to have the power to guide the firm down the road of financial success or to blindly lead it to the brink of corporate ruin, it is of great interest to examine the extent to which the level of pay received by this group of managers is associated with the performance of the firm. It has become common practice for the managers of large corporations to command levels of pay which are in the six-figure range and to receive a comprehensive and imaginative array of fringe benefits covering every contingency of living from long-term disability to financing the college education of their children (Forbes, p. 3). In light of these tremendously large pay levels received by the top management group, one may be drawn to ask on what basis these compensation decisions are made. The analysis presented in this study will attempt to answer this question.

There are basically two approaches in conducting a study of this nature. One approach would be to gather

information from a sample of firms via use of a survey questionnaire as to the factors which the board of directors considers in the decision-making process for executive compensation levels. Although representing a possible approach, the use of a survey questionnaire is plagued with several problems which render this method of data collection impractical for the compensation researcher. One of the major drawbacks of the survey questionnaire approach comes in gaining the cooperation of corporations in revealing information on the rather sensitive area of executive pay. Further, large corporations are generally so inundated with survey questionnaires from governmental agencies, trade associations, private research firms, and fund raising organizations that the likelihood of the corporation providing a prompt and thoughtful response to the inquiries of a graduate student would be greatly reduced. In the event that one were able to secure a sufficient amount of participation in a data gathering effort of this nature, the likely result of such an inquiry would provide the researcher with responses which reflect the formal statement of corporate pay policies immured in pages of some dusty policy book and which may be more representative of how pay decisions should be made rather than how they actually are made.

An alternative and more viable approach to gaining information concerning the pay determination process for top corporate executives is to engage in a form of "policy capturing." In this approach, the researcher first develops a model which is thought to be descriptive of the pay determination process and then goes about the task of collecting the relevant data to make an empirical testing of the model developed possible. Hence, the emphasis in policy capturing is not to examine what organizations say they do with respect to executive pay decisions but rather what they actually do. The methodology employed in this policy capturing effort is presented and discussed in Chapter IV of this study.

At this juncture, it is appropriate to emphasize what the scope of this analysis encompasses and to identify the areas of research on executive compensation which are not explored in this study. The intent of this study is to develop and test a model of the pay determination process which identifies and measures the relationship between the levels of compensation received by top corporate executives and the relevant corporate and personal characteristics specified in the model. The formal development and statement of the model utilized in this analysis is presented in Chapter I. The focus of this analysis is not to develop and test a theory of managerial motivation or to derive results which will tell

organizations how to "correctly" develop and implement an executive pay structure. The importance of properly integrating the executive pay plan with overall corporate planning, tieing pay to individual performance toward predetermined goals and objectives, and the importance of tax considerations in making executive pay decisions have all been prescribed by writers in the areas of organizational behavior and executive compensation as constituting the proper approach to designing an executive pay system (Moore, 1968). The emphasis of the approach taken to the study of executive compensation by earlier authors is that of a normative nature, i.e., telling organizations what they should do with respect to pay determination. The approach taken in this current analysis is that of a positive nature, analyzing the pay determination process as it actually exists, rather than a prescriptive statement of how executive pay decisions should be made.

The research efforts to date which have examined the factors influencing executive compensation levels will be reviewed in Chapters II and III of this study. A careful and thorough critique of these earlier studies will demonstrate the efforts which have been made to model the behavior of organizations with respect to executive pay decisions as well as point out areas in which additional research is needed on this topic.

The value of any study rests not only with the results obtained, but also with the manner in which the analysis is conducted. Chapter IV contains a statement of the model upon which this study is based, the methodology employed to test this model, and the sample over which the analysis was conducted. It is hoped that by revealing the theoretical, methodological, and empirical bases of this study that the results reported herein will be given greater reliability and increase the ability to generalize from the findings.

The statistical analysis and the empirical results derived from this study are presented in Chapter V. The corresponding inferences and conclusions drawn from these results are presented in the final chapter, Chapter VI. The benefits to be accrued from a study of this nature are that new insights will be gained into the process utilized by large corporations in making pay decisions for top corporate officers. Further, the findings for this top group in management may be generalized and applied to successively lower levels of management in an attempt to identify the factors which influence the levels of pay received by the individuals in various levels of corporate management.

CHAPTER I

DEVELOPMENT OF A MODEL OF THE PAY DETERMINATION PROCESS FOR TOP CORPORATE EXECUTIVES

In this section, I will present a discussion of the process whereby firms set the level of compensation received by the top corporate executives. This process will be examined in terms of the relevant economic and behavioral models of wage determination. The major focus of this study is not to develop a model of executive motivation with respect to financial rewards, but rather to provide a conceptual and methodological framework through which the policies of large corporations about executive pay decisions may be captured and analyzed. The end result of conducting a study of this nature will be to discover which characteristics of the corporation influence the level of pay received by top executives as well as to gain insights into the goals and objectives established and pursued by large publicly held corporations.

When attempting to develop and test a model of the pay determination process for top corporate officers,

it is necessary to first have an understanding of the institutional aspects of this process within the modern corporation. Historically, when the typical firm was owner-managed, the task of determining which factors affected the level of compensation received by the owner-manager was quite simple. One merely looks at the level of net profits to gauge what the return to the owner-manager would be for his services. Under this type of control structure within the firm, the question of the determinants of the level of executive compensation was a moot issue. However, with the growth of the giant corporation came the phenomenon of the professionally managed firm. Typical of this structure is the use of the board of directors of the corporation to set corporate policies and objectives which are to be pursued by the management of the firm. Along with this policy setting task, the directors of the corporation are mandated the responsibility of insuring that the level of pay awarded to the executives of the corporation reflect the corporate objectives established by the board of directors. Hence, it is through the use of the board of directors, in concert with the input of the corporate compensation staff, that pay decisions for top executives are made.

The aim of this study is to capture through empirical analysis which objectives the directors of the

modern professionally managed corporation elect to pursue, and which characteristics of the firm most strongly influence the level of compensation received by the top corporate executives. With respect to this undertaking, David Belcher, a noted writer in the field of compensation administration, has stated that compensation theorists face a "huge task" (Belcher, 1974, p. 17). Belcher defines this task as being "to specify the factors that determine compensation, the manner in which they do so, and the relative and absolute importance of each factor" (Belcher, 1974, p. 17).

Traditional economic theory of the firm states that the rational employer will follow a profit-maximizing course of behavior. Given that the large corporation is not owner-managed, profit-maximization may not represent an accurate description of the actions of the directors of the professionally managed corporation. There is a possibility that the utility function of the directors of the corporation may contain goals and objectives other than strict profit-maximization which they may elect to pursue. Oliver Williamson in his writings on the theory of the firm points out that the modern large firm is characterized by a separation of ownership from management, and further given the existence of a degree of monopoly power in the product market, traditional theories of the firm may fail to explain adequately the behavior

of the individual firm and the behavior of the management within that firm. On this point Williamson notes:

> Where the range of behavior that is consistent with survival is narrowly bounded (because of a purely competitive market) the question of motivation is of small importance. However, some (most) firms appear to have access to advantages that bring substantial relief from extinction. Here an understanding of motivation may be essential (Williamson, 1967, p. 129).

In terms of Williamson's writings, motivation is expressed in relation to the goals and objectives which the corporate managers set for the firm to achieve.

An understanding of the objectives of the corporation is essential to the analysis of the determinants of executive compensation. Regardless of the model employed to study the determinants of executive remuneration (be it derived from the behavioral sciences or economics), the basic construct of the model is that there should be a relationship between the level of pay an individual receives and the performance of the individual as measured against a specific goal or standard of performance. As was pointed out earlier in this section, the focus of this present study is to capture the policies of corporations with respect to the setting of executive compensation levels. Hence, the appropriate model of the pay determination process to be utilized is that of an economic model. The specific model examined is that of the marginal productivity theory of wage determination. At

this time it is appropriate to point out that the decision to employ the marginal productivity theory in no way denies the validity of the behavioral scientists' approach to the study of compensation. The major difference between the economists' model of the pay determination process and that of the behavioral scientists' is in terms of the focus of the analysis. The behavioral scientists direct their study of pay upon the motivational aspects of pay and the individual worker's perceptions of the effort-reward linkage (Lawler, 1971, p. 119). Therefore, the appropriate variables for this level of analysis are the individual's feeling of equity, the likelihood of favorable outcomes, and the linkage between effort and performance. Economists on the other hand, direct their attention toward the economic measures of value and productivity. These variables represent the basic concepts upon which the employment transaction are built. The employer compensates the worker in accordance with the value of the individual's productive services to the output of the firm, assuming that the worker is equally productive across firms. Given that the emphasis of this present study is to examine the extent to which various economic characteristics of the firm influence the level of pay received by corporate executives, it appears more appropriate to utilize the marginal

productivity approach to studying pay than to employ a behavioral science approach in this policy capturing effort.

The name most commonly associated with the marginal productivity theory is that of John Bates Clark (Clark, 1899). Simply stated, the marginal productivity theory of employment holds that the economically rational employer will employ labor at a wage rate which is commensurate with the value of that worker's contribution to the functioning of the firm.[1] Expressed in the notation of the theory, the rational employer will compensate the worker at a level of pay (W) which corresponds to the worker's value of marginal product (VMP). Hence, the employer will set the level of compensation so as to satisfy the identity: W=VMP. The economic rationale for setting the level of pay such that it is equal to the value of the worker's marginal physical product is that this method of pricing inputs corresponds to the least cost means of production. To pay the worker a higher wage level would be to compensate the individual at a rate which was greater than he could command in the market, and thereby result in an unnecessary addition to the

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[1]While the marginal productivity theory, as developed by Clark, is a theory of labor demand it may be utilized as a theory of wage determination if one ignores the problem of causality between employment and wage levels.

costs of the firm. Likewise, to pay the worker a lower wage rate would result in an unnecessary amount of labor turnover as a result of other employers bidding away from the firm's employ these underpaid workers.

In order to utilize the marginal productivity theory outlined above for the examination of the pay determination process for top executives, certain assumptions about the behavior of the firm, and the board of directors who makes the pay decisions within the firm, must be made. The assumptions needed to make the marginal productivity theory applicable to the analysis of executive pay are: (1) that the board of directors of the corporation, who have the responsibility for making pay decisions, behave in an economically rational manner, i.e., are utility maximizers, and (2) that the executives of the firm are rewarded in accordance with the objectives of the corporation. By making these assumptions, then the relationship between various measures of executive performance and the level of compensation received can be examined. Before one can measure the relationships between the level of executive pay received and the individual executive's contribution to achieving the goals and objectives of the firm, an identification and description of the actual goals of the firm is necessary.

Virtually all of the large firms in the United States conform to the control structure of the

professionally managed firm. Under this structure, the owners of the firm are the shareholders who voice their interests in the operations of the firm through the annual meeting of the corporation. It is the directors of the corporation who guide the operation of the firm's activities and thus decide which policies will be implemented and pursued. Therefore, given this separation of ownership from the day-to-day management of the firm, there exists the opportunity that the goals and objectives which the directors of the corporation establish and actively pursue may not always represent the best interests of the shareholders.

As was alluded to earlier, traditional theories of the firm assume that the objective of the firm is that of maximizing profitability. There would be no questioning of this view of the firm if ours were a perfectly competitive economy. However, since our economy is not a purely competitive one, this relaxation of the competitive assumption allows a degree of latitude in that the professional managers of the corporation may elect to establish corporate policies aimed at goals other than that of strict profit-maximization. This situation has led William Baumol, for example, to conclude from his studies of the firm that the typical large corporation seeks not to maximize its profits, but rather to maximize the growth of the scale of the firm's operations.

When referring to the growth of the firm Baumol speaks in terms of the sales revenues of the firm as being representative of its size. "The typical large corporation in the United States seeks to maximize not its profits but its total revenues which the businessman calls his sales (Baumol, 1958, p. 187). The rationale offered by Baumol as to why managers would depart from pursuing a course of behavior aimed at profit-maximization is that it is in their own best self-interest to do so: "executive salaries appear to be far more closely correlated with the scale of the operations of the firm than with its profitability" (Baumol, 1959, p. 46). Based upon the assumption that executives are rewarded in accordance with the objectives of the firm, one is afforded the opportunity not only to examine the determinants of the levels of compensation received by corporate executives, but also to test the growth-maximization hypothesis offered by Baumol as being characteristic of the objectives established by the large corporation.

By utilizing the marginal productivity model of the wage determination process one can make specific predictions as to the nature of the relationship between executive compensation levels and organizational characteristics. If one were to assume that the typical large corporation is a profit maximizer, as is asserted by the traditional theories of the firm, then one would be drawn

to predict that the level of pay received by the top corporate executives would be positively and significantly correlated with the level of profitability of the firm. Under this assumed profit maximizing course of behavior, one would expect the rational firm to set the level of pay such that W=VMP: where W represents the level of executive compensation, and VMP is measured in terms of the individual executive's contribution to the profitability of the firm.

Likewise, if one were to adhere to the Baumol hypothesis that the firm is not a profit-maximizer but rather a growth-maximizer then one would expect that the rational firm would set the level of executive compensation such that W=VMP, where VMP is measured in terms of the growth of the firm. Hence, given that one views the objectives of the firm to be the promotion of growth, the variables expected to bear a strong relationship to executive compensation levels would be measures of the corporation's scale rather than its profitability.

In order to apply the marginal productivity theory to the determination of wage levels, one must take the assumption that the individual is equally productive across firms. Under this assumption the marginal productivity theory, which is most often utilized to determine the level of employment of an input, can be utilized to analyze the determination of wage levels.

Under the marginal productivity approach to the analysis of wages, one would ideally want to measure the value of the individual's direct contribution to the output of the firm. However, when examining the contributions of the individual executive, it becomes exceedingly difficult, if not impossible, to identify and to quantify specific actions which constitute the performance of the executive. Therefore, in order to utilize the marginal productivity theory of wages to analyze executive compensation, one is forced to find proxies for the direct contributions of the executive to the functioning of the firm. Several writers in the areas of executive compensation and organizational behavior have suggested that one may use corporate performance to proxy the performance of the individual executive. On this point, Belcher notes that "the job contributions of top management are assumed to represent an identity between the individual and the organization" (Belcher, 1974, p. 524). This point is echoed by Kenneth E. Foster when in reference to executive pay decisions he states that "pay at this level cannot be equated to direct contributions to output; and the broad, diffuse nature of the tasks performed makes it difficult to evaluate and compare the requirements of various managerial positions" (Foster, 1969, p. 80). This suggests that since one cannot clearly measure the direct contributions of the individual

executive to the performance of the corporation, one may utilize measures of corporate performance to proxy for the performance of the individual. Although utilizing corporate measures of performance to proxy for those of the individual executive may tend to overstate the impact of the individual executive's actions on the functioning of the firm, the use of such measures may still be acceptable given that the actions and decisions of the top executives so strongly and so ubiquitously affect the functioning of the organization.

One must take great care in specifying the manner in which the characteristics of the organization relate to the performance of the executive and the demands placed upon the executive. It can be reasonably assumed that it is a more demanding task to direct the operations of a large corporation than it is to manage a relatively smaller one. Thus, one would expect to find that larger firms would pay higher levels of executive compensation than would smaller firms because the executive managing the larger firm would be perceived to have a greater value of marginal product, given his greater managerial responsibilities, than would his counterpart in the smaller organization. Likewise, it would be expected that the manager who can direct his organization to a higher level of profitability is performing at a higher level and contributing at a greater rate than

his counterpart in a less profitable corporation. In terms of the marginal productivity theory, the contribution of the individual executive to the functioning of the firm may be viewed in terms of the scope of the job he holds (organizational size) and the contribution he makes to the realization of organizational goals and objectives (whether they be of a growth or profitability nature). It is expected that these different types of performance (job scope vs. the achieving of organizational goals) may be reflected in the various components of the pay package. On a cross-sectional basis it is expected that the level of base salary received by the top executives of large corporations will be directly related to the size of the firm's operations, i.e., scale, and therefore the magnitude of the resources over which the executive exercises responsibility. The direction of this relationship should be that the executives of larger firms will receive larger base salaries than those in relatively smaller firms. Corporate size also enters into the executive pay decisions of the firm by virtue of the manner in which organizations compare themselves in the labor market. Large corporations compete with other large corporations in the labor market to attract and retain high caliber managerial personnel. To insure their competitiveness, firms periodically sample the labor market via the use of

executive compensation surveys. The various executive compensation surveys (American Management Association, Forbes, Business Week, Hay, and Sibson) categorize the results of their analysis on the basis of sales level and the particular industry of which the firm is a member (Rock, 1972, pp. 3-30). Therefore, given that corporations make extensive use of compensation survey results, and also that level of firm sales is a key organizational evaluation benchmark in these surveys, one would expect executive compensation levels to bear a strong relationship to the scale of the firm's operations, of which sales revenues is one measure.

The second type of performance which would be expected to influence the level of compensation received by top executives is the achieving of organizational goals and objectives. As was pointed out earlier, there are basically two major objectives which the directors of the corporation may elect to pursue, either maximization of profitability or growth-maximization. If the goals which the board of directors of the corporation chooses to pursue correspond to a maximization of the growth of the scale of the firm's operations, then it would follow that the level of pay received by the top corporate officers would change in accordance with changes in the scale of the firm's operations. This would indicate that the changes in the level of pay

received by the executive would relate to the changes in the value of his contributions to the performance of the firm, which conforms to the marginal productivity model of the wage determination process. Likewise, if the directors of the corporation elect to follow a profitability-maximization goal for the firm's operations, then one would expect that changes in the level of executive compensation received would be positively and significantly related to changes in the level of profitability of the firm.

If we assume that the total pay package received by the executive is built upon the level of base salary awarded, then there are two ways in which the amount of compensation received by the executive may vary. Firstly, if the performance of the individual is perceived to have increased he may be granted an increase in base salary. This would indicate that the determination of base salary levels is contingent upon the results of the executive as well as the magnitude of the resources which he manages. The second way in which the level of pay received by the executive may increase to reflect increased performance would be through the use of what is termed incentive compensation. For top corporate executives the most common forms of incentive compensation are cash bonuses and stock option awards. Under this type of compensation, performance toward organizational goals

may be rewarded by granting more cash, through the bonus or by awarding shares of stock.

When conducting this type of analysis there are potential problems in using measures of changes in corporate growth and corporate profitability to proxy the performance of the individual executive in that the growth in the firm's scale of profitability may be significantly influenced by the state of the general economy or of the specific industry in which the firm operates. What is needed is a procedure by which to separate this broader economic influence on the performance of the firm so as to get a better measure of the contributions of the individual executive toward achieving corporate goals and objectives. In order to adjust for this general economic effect on the performance measures of the firm, I will specify the corporate performance variables as a ratio to the industry average for that variable. For example, if one were looking at the correlation between executive compensation and corporate performance in the automobile industry, the measures of the characteristics of the firm should be expressed as a ratio to the median value of those variables for the automobile industry. Such a specification of performance measures in their relative values would serve to more accurately measure the contribution of the individual by factoring out the influence of the external economy or the state

of the specific industry upon the performance of the individual firm.

The preceding paragraphs presented an analysis of the wage determination process in terms of the marginal productivity theory of wages. The emphasis of the model concerns the relationship between the performance of the individual and the level of compensation received. There is also a likelihood that the personal characteristics of the executive will influence the level of compensation received. The analysis of the relationship between personal characteristics of the worker and the level of pay received is termed the study of "human capital" in the employment transaction. Individuals invest in themselves through the accumulation of human capital based on the belief that they will reap a positive return in the form of higher wages as a result of this investment. The traditional human capital variables of age, education, and experience will be examined in an attempt to discover the extent to which these personal characteristics affect the level of pay received by the top corporate executives in large U.S. firms.

Within the context of the marginal productivity approach to wage determination, there are basically two ways in which the individual's stock of human capital can influence the level of pay received. Firstly, if the board of directors of the corporation feel that it

cannot accurately identify and measure the contribution of the individual executive to the functioning of the firm, then the amount of human capital possessed by the executive may be used as an indicator of the individual's potential to perform within the organization. In this situation, the firm would be rewarding the individual for his perceived value of marginal product rather than his actual contribution to the firm. Within a particular firm there may be present enough indicators of the individual executive's performance so as to make the resorting to the use of perceived marginal product unlikely. The situation in which perceived marginal product will most likely be the basis for compensation decisions is by other firms who are competing for the executive's employment and corresponding productive services. These potential employers will not have access to measures of the individual's productivity by which to make employment and compensation decisions; therefore, they will be forced to rely on the use of human capital measures to gauge the potential contributions which the executive may make to the functioning of their particular corporation.

The second way in which personal characteristics of the executive may influence the level of pay received is if the firm is in some manner actually "consuming" the human capital of the individual and compensate him

accordingly. If the utility function of the board of directors is such that having highly educated executives from the "best schools" is deemed to be desirable, then one would logically expect that there would be a positive correlation between level of formal education and executive pay. Similarly, one may also expect that school type (Ivy League, Big Ten, etc.) may also influence the level of pay received. This would be the case if the directors felt that the firm would be viewed more favorably by stockholders or investors if the corporation were headed by a "Harvard man." In this example, the type of school which the executive attended would represent part of the individual's contribution to the functioning of the firm in that it would measure the value of the individual's marginal product toward the output of the firm termed status. If the individual executive can bring more prestige to the firm as a result of his educational background, it is only logical that the firm should set the wage level so as to reflect this contribution of the individual. Therefore, one would predict by use of the marginal productivity approach to this analysis that the level of executive pay would be positively correlated with educational level and type of school attended as a result of this "credentialism" effect. Chapter III of this study will present a review of the literature concerning the

relationship between human capital and executive compensation.

The discussion presented above concerning the relationship between the scale of the firm, the profitability of the firm, the executives' stock of human capital, and the level of compensation received can be expressed in the form of specific hypotheses which lend themselves to empirical testing. Underlying each of these hypotheses is the assumption that the appropriate model to be employed when analyzing the determinants of executive compensation is that of the marginal productivity theory of wages, i.e. that firms set the level of the executive's compensation in accordance with, and to correspond to the value of his contribution to the performance of the firm.

H-1. The level of compensation received by top corporate executives in the form of base salary will be positively and significantly correlated with the scale of the firm's operations. This positive relationship between base salary and size will reflect a reward to the executive who has greater amount of responsibility than the manager of a smaller firm.

H-2. Changes in the level of executive compensation received will be positively and significantly correlated with changes in the level of performance of the firm. This relationship between pay changes and changes in corporate performance will be reflected in changes in the level of base salary received as well as the level of bonus and stock option grant awarded.

H-3. Changes in the level of executive compensation received will be more strongly related to changes in the performance of the firm relative to the performance of other firms in the industry of which the individual firm is a member than just the absolute level of performance of the firm.

H-4. There is a positive relationship between the amount of human capital possessed by the individual executive and the level of compensation he receives. This positive relationship between pay and human capital will reflect the effect of human capital on perceived marginal productivity and in addition may reflect a positive return to credentialism on the part of the individual.

The methodology to be employed in testing these hypotheses is that of multiple regression analysis. A discussion will be presented in Chapter IV of the specific sample to be examined and the measures of performance to be included in the analysis.

The following chapter, Chapter II, contains a review of the studies which have been conducted to date in an attempt to uncover which factors influence the pay determination process relative to top corporate executives. By reviewing these studies one may see areas where fruitful analysis has been made and also be alerted to areas which need to be more thoroughly explored and the analysis of which needs to be refined.

CHAPTER II

A REVIEW OF THE LITERATURE CONCERNING THE RELATIONSHIP BETWEEN EXECUTIVE COMPENSATION AND CORPORATE CHARACTERISTICS

In this chapter, a critique and review of the existing body of literature concerning the relationship between corporate characteristics and executive compensation levels in large U.S. corporations will be presented. By carefully analyzing the research efforts to date which have attempted to discern which characteristics of the modern corporation most strongly influence the level of pay received by top corporate executives, one can not only gain insights into the approaches taken by previous researchers, but also identify areas in which further research is needed. Hence, by gleaning the positive contributions from each of these earlier studies one can adopt the posture of "standing on the shoulders of giants" when attempting to advance the body of knowledge which currently exists as to the pay determination process for top executive positions.

The question as to the determinants of the incomes received by top corporate executives was examined very early in the economic literature of the twentieth century by F. W. Taussig and W. S. Baker. In their 1925 Quarterly Journal of Economics article the authors posed the fundamental issue in the study of executive incomes as being, "Are the driving motives the same for the executives, as for the individual proprietors of older days?" (F. W. Taussig and W. S. Baker, 1925, p. 2). In an attempt to answer this question Taussig and Baker conducted a survey of a large number of firms representing twenty-four different industries in the American economy. Based upon the results of this survey the authors concluded that executive salaries in the United States were generally rigid downward and further were not adjusted upward year by year on the basis of annual earnings of the firm (Taussig and Baker, 1925, p. 2). Contrary to what was witnessed in European and British firms during this time, the authors found that firms in the United States made relatively little use of incentives for executives based upon corporate earnings. The attitudes that prevailed during the early 1900s in American corporations was that executive incomes were fixed in advance and that resulting profits were to be divided among the shareholders of the firm (Taussig and Baker, 1925, p. 22).

The authors did, however, assert that over the long-run changes in executive compensation were associated with changes in the profit level of the firm, but no hard evidence was presented to support this claim.

The issue of the determinants of executive compensation lay relatively dormant from the 1920s until the early 1950s. During this period other pressing matters filled the business and economic journals as a result of the disruptions injected into the functioning of the economy as a result of the great depression of the 1930s and the war-related activities during the decade of the 1940s.

The issue of executive compensation resurfaced in the literature in the early 1950s. In 1951 Arch Patton, a since noted writer in the field of executive compensation, published the results of a study he conducted on the trends in the administration of executive compensation during that period (Arch Patton, 1951, p. 50). Patton utilized data derived from the American Management Association's survey of executive compensation levels within major U.S. firms. Patton combined this compensation data with Security and Exchange Commission data on the performance of SEC reporting firms in order to analyze the relationship between corporate performance and executive compensation levels. The matching of firms represented in both the AMA and SEC

data resulted in a sample of 411 companies spanning 22 major industrial categories.

Patton found executive compensation levels to vary by industry, and to vary between companies within a given industry according to the profit levels of the firms. On an industry by industry basis, the author discovered that executives receiving above average levels of compensation were concentrated in very competitive industries (like retail sales, textile, and department stores). Industries characterized by slow rates of technological and product change (like public utilities, heavy machinery, and nonferrous metals) were found to pay their executives below average levels of compensation. From this finding Patton concluded that firms in industries requiring substantial innovative and creative thinking on the part of management had to offer higher levels of compensation to attract and retain such individuals.

Between companies within the same industry, Patton found that executive compensation levels varied positively with profit levels. This discovery led the author to the conclusion that "Profit level of the individual company was by far the most important determinant of executive compensation" (Patton, 1951, p. 58). Patton went on to more positively assert that "Broadly speaking, this survey points to a basic principle of

compensation that is frequently overlooked: salary increases can only come from profit increases. Only after executives have increased the profits of their company can they anticipate higher salaries. It does not appear to be a question of which came first, the chicken or the egg. The profit apparently must come first" (Patton, 1951, p. 58).

Patton's analysis of executive compensation aroused the interests of other writers during this period. Later research efforts, however, failed to support the conclusions observed by Patton in his path-breaking study. Specifically, David Roberts, using the same data sources as Patton did earlier, arrived at polar conclusions from Patton's. Roberts found executive compensation to be significantly related to only one factor, corporate size (David Roberts, 1956, pp. 270-295).

Roberts' study covered the years 1945, 1948, 1949 and 1950. For this period data were gathered on the size and profitability of 410 major companies. Size of the firms was measured by total sizes. Roberts basically tested two conclusions offered by Patton that (1) executive compensation levels are subject to an industry effect and (2) within industries executive compensation levels vary directly and positively with the profit level of the individual firm.

With respect to the hypothesized industry effect on executive compensation levels, Roberts found such an industry differential to exist. Roberts also pointed out, however, that industries differ in the size firms of which they are composed and that when this variance in firm size is adjusted for the industry effect on compensation disappears (Roberts, 1956, p. 274).

Using correlation analysis, Roberts tested the relationship between executive compensation, profits, and sales. A cross-sectional analysis was made of a subsample of 77 or the 410 firms in the survey. The resulting coefficients revealed that the intercorrelation between sales and profits was so high (+ .91) as to make the separate effect of size and profits on executive compensation indistinguishable. Switching to a time-series mode of analysis for these same firms over the period 1935-1950 Roberts found the variability in compensation levels to more closely approximate that of sales than that of profits. Thus, the author concluded that executive compensation was more closely related to the size of a firm (its sales) than to its profitability (Roberts, 1956, p. 276).

The conclusion as to the strong relationship between executive compensation and sales which Roberts derived from his research is echoed by W. J. Baumol in his writings on the activities of management in large

American corporations. Baumol advanced the hypothesis that, "the typical large corporation in the United States seeks to maximize not its profit but its total revenues which the businessman calls his sales" (Baumol, 1958, p. 187). The rationale offered by Baumol as to why managers would depart from pursuing a course of profit maximization is that it is to their best self interests to maximize sales because, "executive salaries appear to be far more closely correlated with the scale of operations of the firm than with its profitability" (Baumol, 1959, p. 46). Although offering no formal testing of this hypothesis, Baumol's observed relationship between corporate sales and executive compensation is consistent with the findings of Roberts' earlier statistical analysis.

Expressing the view that the question as to the determinants of the level of compensation received by corporate executives was not clearly and unambigiously answered in earlier studies, McGuire, Chiu, and Elbing conducted a study which represented a continuation of the previous works of Patton and Roberts (McGuire, Chiu, and Elbing, 1962, pp. 753-761).

McGuire, Chiu and Elbing conducted a time-series analysis of the correlations between executive incomes, sales and net profits for 45 of the largest 100 industrial firms in the United States. Their analysis covered the

7-year period from 1953 - 1959. The authors' data sources were Fortune and Business Week magazines. Fortune reports, on an annual basis, data concerning the performance of the nation's 500 largest industrial firms (as ranked by total dollar value of current year's sales). The organizational characteristics reported by Fortune are sales, assets, net income, stockholders' equity, number of employees, and total return to investors. Business Week provides data concerning the total compensation of the top two executives of approximately 150 of the nation's largest business firms. These data are provided on an annual basis, usually reported in the May or June issues, and presents total compensation figures disaggregated into its salary and bonus components. By combining Fortune and the Business Week data, the authors were able to obtain performance measures as well as executive compensation figures for the 45 firms in their study.

The authors examined seven sets of correlations among the variables: sales, profits, and executive compensation. These seven sets of correlations are:

1. The gross relationships between sales, executive incomes and profits for identical years from 1953 through 1959.

2. Executive compensation lagged one year behind sales and profits.

3. Executive income lagged two years behind sales and profits.

4. Sales and profits lagged one year behind executive compensation.

5. Year-to-year incomes were correlated with year-to-year changes in sales and profits.

6. Year-to-year changes in executive incomes were lagged one year behind year-to-year changes in sales and profits.

7. Year-to-year changes in executive incomes were lagged two years behind changes in sales and profits (McGuire, et al., 1962, pp. 754-755).

The results of these correlations are presented in Table 1. As is evident from the coefficients and t values shown in Table 1, the correlations between executive income and sales (columns A and B) were consistently higher and more significant than those between executive compensation and profits (columns C and D). From these results, the authors were led to conclude that Baumol's hypothesis is supported, i.e., executive compensation does appear to be more closely correlated with sales than with profits (McGuire, et al., 1962, p. 758).

Baumol's suggested relationship between executive compensation and sales, rather than with profits, has great significance for an advanced economy such as that of the United States in which ownership of corporations is separated from management. If managers do in fact behave in a manner that does not maximize shareholders' well-being, then, many of the assumptions underlying economic analyses of the firm may no longer be

TABLE 1.--Values of Average Partial Correlation Coefficients and Corresponding Computed Values of t.

	(A) $\bar{r}_{YR}$	(B) t	(C) $\bar{r}_{YP}$	(D) t
(1) Current year	.6123	5.05	.5476	4.22
(2) Y, year 1; R and P, year 0	.5980	4.81	.5533	4.30
(3) Y, year 2; R and P, year 0	.5888	4.70	.5359	4.12
(4) Y, year 0; R and P, year 1	.5812	4.63	.5683	4.46
(5) ΔY, ΔR, ΔP, current years	.4198	2.99	.1980	1.31
(6) ΔY, years 2-3; ΔR and ΔP, years 1-2	.3298	2.26	.2006	1.32
(7) ΔY, years 3-4, ΔR and ΔP, years 1-2	.3477	2.42	.2907	1.97

SOURCE: McGuire, Chiu, and Elbing, 1962, p. 759.

valid. Wilbur G. Lewellen and Baine Huntsman in their 1970, American Economic Review article, entitled, "Managerial Pay and Corporate Performance," attempt to answer the question as to whether corporate managers' compensation is more closely correlated with total corporate revenues or with measures of shareholders' welfare (the authors utilize profits and equity market value as two measures of shareholders' well-being). Another objective of the Lewellen and Huntsman study is to correct and improve upon some of the statistical and measurement biases they felt were present in the McGuire, Chiu and Elbing study discussed earlier in this paper.

Lewellen and Huntsman examined a sample of 50 firms drawn from the top 100 firms listed in the Fortune survey of the nation's 500 largest industrial firms. The authors examined the cross-sectional relationships between executive compensation and the performance of the corporations at three-year intervals from 1942 to 1963. The authors constructed the following equation to examine the relationship between executive compensation (C), corporate profits (P), and corporate sales (S):

$$(1)\quad C_{it} = a_0 + a_1 P_{it} + a_2 S_{it} + U_{it}$$

Subscript i denotes the firm, and t represents the time period to which the measure corresponds. The random

disturbance term is denoted by U. The authors conclude that equation (1) may be used as "a basis for observing the magnitude of the coefficients, a_1 and a_2 and the levels of statistical significance attaching thereto, the above specification provides a natural vehicle for inferring the relative influence of the two independent variables upon compensation" (Lewellen and Huntsman, 1966, p. 712). In essence, this was the approach taken by McGuire, Chiu and Elbing in their earlier time series analysis. However, Lewellen and Huntsman warn that the use of equation (1) may lead to several sources of statistical bias. The authors found that the error terms of equation (1) were not random but rather, were in proportion to the dependent variable (executive compensation). Further, the authors discovered that those firms that were large in scale also had high sales and profits levels, thus, posing the threat of collinearity resulting from the scale-associated linkage between the independent variables (Lewellen and Huntsman, 1966, p. 712). Lewellen and Huntsman concluded that because "the error terms (of equation (1)) tended to vary directly with the dependent variable, an appropriate weighting procedure is to divide each variable in (1) by any one of the several scale-related deflators . . . Moreover, by creating ratios in which both numerator and denominator are associated with the firm's size, the weighted regression

approach eliminates the basic reasons for expecting high degree of correlation between the variables as a consequence of a common scale factor" (Lewellen and Huntsman, 1966, p. 713). The weighting factor selected was that established by Miller and Modigliani in an earlier study, viz., book value of assets (Miller and Modigliani, 1966). Aside from the Miller and Modigliani precedent of using assets as a weighting factor, the resulting deflated equation, equation (2), has a meaningful economic interpretation. Given that all the variables in equation (2) are expressed as a ratio of assets, this implicitly represents a process whereby management maximizes sales or profits subject to the available resource constraint, i.e., maximization of sales or profits per dollar of resources employed (Miller and Modigliani, 1966). The new deflated equation is as follows:

$$(2)\quad \frac{C_{it}}{A_{it}} = a_0 \left(\frac{1}{A_{it}}\right) + a_1 \left(\frac{P_{it}}{A_{it}}\right) + a_2 \left(\frac{S_{it}}{A_{it}}\right) + \frac{U_{it}}{A_{it}}$$

In equation (2), A_{it} is total book value of assets of the i^{th} firm in time period t. The authors found that by using the new deflated equation, the new error terms $\left(\frac{U_{it}}{A_{it}}\right)$ are roughly constant over the sample. This deflated equation was also found to reduce the collinearity problem among the independent variables.

In order to improve the measure of executive compensation over that utilized in earlier studies, Lewellen and Huntsman added "current income equivalents" (denoted by c*) of various deferred and contingent components of the total executive compensation package. Further, to reduce measurement problems, the authors used two measures of profitability--net profits (P) and equity market value (V)--in an attempt to adjust for any inconsistencies between short-run and long-run profit maximization concepts (Lewellen and Huntsman, 1966, p. 714).

Upon running equation (2) with the data for the years 1942 to 1963, it was revealed that the coefficients of the profit measure are positive for each cross-section, and the coefficients were also highly significant, for all of the runs (at the .05 level of significance). The coefficients for the sales variables were not significant in any run, and further, the sign of the coefficient was not consistent over the runs. It was also discovered that adding deferred and contingent components of compensation to the measure of total compensation did not improve the fit, rather, the multiple correlation coefficients were reduced when the expanded measure of total compensation were used. A similar result occurred when equity market value was substituted for profits in the equation, for it seemed to have no

effect on the findings. The results of this analysis are presented in Tables 2 and 3.

Based upon the findings of their study, Lewellen and Huntsman concluded that executive compensation is more closely correlated with profits, rather than sales as was hypothesized by Roberts and Baumol, and later supported by the work of McGuire, Chiu, and Elbing. A possible explanation for these contradictory findings may be the refinements in methodology introduced by Lewellen and Huntsman, as well as their use of a different time period over which the study took place.

Robert T. Masson in a 1971 Journal of Political Economy article presented his analysis of the relationship between the financial returns received by top corporate executives and firm performance (Masson, 1971). The author examined a relatively small sample of 39 firms in the electronics, aerospace, and chemical industries for the years 1947 to 1966. Masson looked at the relationship between changes in executive compensation levels and changes in corporate variables of sales, earnings per share, and rate of return on a share of stock over this 10-year period. The measure of executive compensation used by Masson was very comprehensive in that it included salary and bonus, as well as present value of stock options, pensions and other deferred

TABLE 2.--Regression Results: Profits, Sales, and Compensation.

	Regression Equation: $\frac{C_{i_t}}{A_i} = a_0 \left(\frac{1}{A_{i_t}}\right) + a_1 \frac{(P_{i_t})}{A_{i_t}} + a_2 \frac{(S_{i_t})}{A_{i_t}} + u_{i_t}$							Regression Equation: $\frac{C_{i_t}}{A_{i_t}} = a_0 \left(\frac{1}{A_{i_t}}\right) + a_1 \frac{(P_{i_t})}{A_{i_t}} + a_2 \frac{(S_{i_t})}{A_{i_t}} + u_{i_t}$						
Year	a_0	t	a_1	t	a_2	t	R^2	a_0	t	a_1	t	a_2	t	R^1
1942	95.3[a]	8.86	5039.5	2.35	-86.6	1.20	.806	40.1[a]	13.99	1928.1	3.37	-28.6	1.49	.912
1945	101.0	6.52	3307.2	1.98	-50.8	.81	.744	41.9	7.52	1610.8	2.68	-27.6	1.21	.798
1948	86.7	8.38	1413.9	2.48	12.6	.30	.833	73.0	9.63	447.7	1.07	6.6	.20	.830
1951	109.0	12.89	1397.0	3.04	- 5.6	.20	.927	68.1	9.58	1202.9	3.14	-14.6	.65	.880
1954	129.3	9.68	1192.5	3.27	-23.1	.97	.910	85.8	4.55	1188.7	2.13	- 8.7	.26	.751
1957	112.9	7.59	963.5	3.89	6.6	.40	.929	146.6	1.96	461.6	.37	30.6	.37	.439
1960	121.3	6.65	660.7	3.12	15.1	.88	.919	130.5	3.40	1181.2	2.65	1.8	.00	.761
1963	155.3	9.24	677.5	3.91	-15.6	1.08	.932	71.8	2.35	875.8	2.77	17.4	.66	.737

SOURCE: Lewellen and Huntsman, 1966, p.716.

TABLE 3.--Regression Results: Market Values, Sales, and Compensation.

	Regression Equation: $\frac{C_{i_t}}{A_{i_t}} = a_0 \frac{(1)}{A_{i_t}} + a_1 \frac{(V_{i_t})}{A_{i_t}} + a_2 \frac{(S_{i_t})}{A_{i_t}} + u_{i_t}$							Regression Equation: $\frac{C_{i_t}}{A_{i_t}} = a_0 \frac{(1)}{A_{i_t}} + a_1 \frac{(V_{i_t})}{A_{i_t}} + a_2 \frac{(S_{i_t})}{A_{i_t}} + u_{i_t}$						
Year	a_0	t	a_1	t	a_2	t	R^2	a_0	t	a_1	t	a_2	t	R^2
1942	98.0[a]	9.72	339.2	2.82	-25.3	.48	.815	41.5[a]	15.08	109.9	3.35	- 1.5	.10	.912
1945	98.9	6.63	263.9	2.78	-33.5	.63	.762	41.8	7.61	103.3	2.95	-13.6	.70	.803
1948	86.9	8.75	239.9	3.25	9.0	.24	.846	73.3	9.66	51.9	.92	12.9	.45	.829
1951	111.1	12.81	105.3	2.73	14.1	.58	.925	69.1	9.35	78.1	2.37	6.8	.33	.870
1954	128.6	9.78	101.0	3.55	- 4.3	.22	.913	85.2	4.49	88.6	2.16	13.6	.47	.748
1957	118.8	7.63	39.8	3.13	19.4	1.20	.922	148.7	2.01	26.6	.44	33.5	.44	.440
1960	126.7	6.99	23.5	3.07	17.7	1.05	.919	138.1	3.93	59.7	4.03	- 4.4	.14	.796
1963	160.1	9.68	28.9	4.12	-10.1	.74	.934	78.3	2.72	45.6	3.73	19.1	.81	.766

SOURCE: Lewellen and Huntsman, 1966, p.717.

compensation. The methodology utilized was that of multiple regression analysis.

Masson found that executive compensation levels tend to be more closely correlated with rate of return on stock than with any other variable (Masson, 1971, p. 1285). Masson further failed to find any support for the Baumol hypothesis, discussed earlier, that the compensation of executives is more closely correlated with sales-maximization than with profit-maximization. Based upon his analysis the author states, "it appears that stock market performance may be the most important determinant of executive returns" (Masson, 1971, p. 1285).

Although the analysis conducted by Masson attempted to improve upon the past studies to reveal the determinants of executive compensation the results of his analysis are suspect for three major reasons. First, the author selected to analyze a very small sample of firms. By utilizing only 39 firms in his sample the ability to generalize from his results is greatly reduced. Secondly, the generalizability of the results derived from this research are further reduced by the fact that the industries studied (electronics, aerospace, and chemicals) were all growing at a remarkably rapid pace during the period studied (1947-1966) and therefore may tend to distort the analysis.

Finally, the measure of executive compensation used included the stock option portion of the total compensation package, a very popular form of remuneration during this period. The problem comes in the way in which Masson computed the value of the stock option component. Rather than using value of stock when granted, the author calculated the present value, to the year granted, of the stock option when exercised. Utilizing the value of stock as exercised, rather than when granted, valuation of the stock component of the executive pay package would to a great extent measure the executives' ability to play the stock market rather than the relationship between corporate variables and the level of executive compensation. Given this method of valuing the stock component of the compensation package it is not surprising that the level of executive compensation was most highly correlated with the firms' stock market performance.

Steven R. Cox and Donald Shauger examine the relationship between executive compensation, firm sales, and profitability (Cox and Shauger, 1973). The authors attempt to test Baumol's sales-maximization hypothesis by conducting a cross-sectional analysis of the relationship between the level of executive compensation, firm sales, and profitability in 1969 and 1970 for a

sample of 100 American manufacturing corporations in 19 different industries.

The authors obtained data on executive compensation levels for the sample firms from the Business Week annual survey of executive compensation. Profit and sales figures were drawn from Moody's 1971 Industrial Manual. The measure of profitability used in this study was the ratio of gross profit before taxes to stockholders' equity. Three different measures of executive compensation were used in their analysis: (1) salary plus bonus, (2) salary plus bonus plus deferred and contingent compensation arrangements awarded in year t and (3) salary plus bonus plus deferred and contingent compensation plus stock options exercised in year t (Cox and Shauger, 1973, p. 31).

Upon regressing the various measures of executive compensation with sales and profitability the authors found compensation to be significantly correlated with both sales and profitability. However, although both were significant, profitability was more strongly correlated with compensation than was sales, especially when the more comprehensive measures of compensation were used. In the recessionary year of 1970 the importance of profitability in the explanation of variances in executive compensation levels is further increased, thus implying that the importance of the various

determinants of compensation are not constant over the business cycle.

The Cox and Shauger study described above represents an advance in the analysis of the determinants of executive compensation in that the authors test various specifications of the compensation, sales and profits relationship over a large sample of firms representing numerous industries. However, the study is severely limited by the fact that it uses a cross-sectional mode of analysis in a very atypical time period. The period studied, 1969 to 1970, encompassed a time of economic recession. The relative influence of corporate characteristics on executive compensation levels may be different during a recessionary period than during normal periods, especially given the fact that salaries are generally inflexible downward. Another problem with this study is the manner in which the authors computed their total compensation measure. The authors used as the valuation of the stock option component of the pay package the value of the options exercised in the observation year. Use of the value of the options exercised would tend to misrepresent the level of compensation received during that year because the stock options being exercised may have been granted up to five years in the past. Thus, what the authors were picking up in the total compensation measure by using options exercised was not

compensation received from the firms in that year, but rather the return to the executive's ability in the stock market. A more appropriate valuation of the stock option component of the total pay package would have been the value of stock options granted to the executive by the firm in the observation year.

David Ciscel in his 1974 article entitled "Determinants of Executive Compensation" reviews the earlier research efforts in this area and offers his own analysis on the topic (Ciscel, 1974). Ciscel selected as a sample 210 of the 250 largest industrial corporations in the United States. Corporate characteristics and performance data for this sample of firms were obtained from the Fortune ranking of the nation's 500 industrial corporations (ranked by sales). Executive compensation data for the executives of these 210 firms were derived from the Forbes listing of executive compensation levels for the "Forbes 500" firms. Two measures of executive compensation were used by the author. First, salary plus bonus of the chief executive was used, following the precedent of McGuire et al. Secondly, total executive group compensation was used. The rationale for examining this second measure of compensation is the hypothesis expressed by J. K. Galbraith that power and control in the modern large corporation has moved from a single executive to a whole executive

group (Galbraith, 1971, p. 171). The corporate variables examined were sales, assets, net income, and number of employees for the years 1969, 1970 and 1971. Ciscel defines the first two variables, sales revenue and assets, as representing managerial concern with corporate growth and size. After tax profits, net income is used by the author to proxy shareholders' interests. Following the Galbraithian hypothesis, employees are used to represent the corollary that total company employment is also a reward for successful management. Finally, executive compensation is examined as a function of the chief executive's tenure with the corporation. It was found, however, that length of service had no impact on the level of compensation received by the senior executive (Ciscel, 1974, p. 616).

Table 4 presents the simple correlation coefficients between executive compensation, sales, assets, net income and number of employees. As is evident from the table there seems to be no strong correlation between executive compensation and any of the variables. Further, the correlation coefficients demonstrate little variance across the independent variables.

Table 5 presents the results of the same analysis using executive group compensation in place of chief executive compensation. In each year the compensation level of the executive group appears to be more highly

TABLE 4.--Executive Compensation--Senior Officer (Correlation Coefficients, r).

	1971	1970
1971		
Years with Company	.161	
Sales	.329	.364
Assets	.374	.399
Net Income	.305	.280
Employees	.358	.364
1970		
Years with Company		.110
Sales	.350	.400
Assets	.376	.411
Net Income	.357	.364
Employees	.363	.376
1969		
Sales	.304	.350
Assets	.354	.391
Net Income	.287	.287
Employees	.323	.339

SOURCE: Ciscel, 1974, p. 614.

TABLE 5.--Executive Group Compensation (Correlation Coefficients, r).

	1971	1970
1971		
Sales	.575	.602
Assets	.573	.589
Net Income	.485	.471
Employees	.696	.714
1970		
Sales	.601	.642
Assets	.568	.590
Net Income	.473	.477
Employees	.716	.737
1969		
Sales	.570	.607
Assets	.555	.579
Net Income	.482	.485
Employees	.678	.701

SOURCE: Ciscel, 1974, p. 615.

correlated with sales and assets than with net income. Further, executive group compensation and the number of company employees were highly correlated.

The results reported in Table 5 lead the author to conclude that, "in general, the data seemed to confirm the Galbraithian hypothesis that the financial reward of management is closely tied to the growth and size of the mature corporation. Secondly, the number of employees--the size of the technostructure--seemed to be associated with the compensation of top management" (Ciscel, 1974, p. 617).

Upon reflection, however, I fail to see the significance of Ciscel's finding that executive group compensation is highly correlated with the number of employees of the firm. Given that an increase in the number of employees of a firm will usually result in an increase in the size of the management team needed to deal with this increased work force it is likely that the size of the executive group will increase given a significant increase in the size of the work force for which they are responsible. Since the measure of compensation employed in this analysis is executive group compensation, this measure is merely a product of the number of executives in this group times their average level of compensation. Hence, the total executive group compensation level may increase as a result of

either the number of executives increasing, the average level of compensation per executive increasing, or some combination of both of these effects. The form of Ciscel's analysis doesn't allow one to determine which of these effects--increasing number of executives, or increasing average compensation per executive--has taken place as a result of an increasing number of employees in the firm.

The stronger relationship found to exist between executive group compensation and sales and assets than with net income is also suspect. Table 6 shows the independent variables in the analysis to be highly intercorrelated. Ciscel himself notes this problem, although not attempting to correct for it, by stating that "this conclusion must be sharply tempered by the occurance of strong collinearity--collinearity that permanently obscures the identification of the hypothesized relationship" (Ciscel, 1974, p. 617).

Making note of the fact that earlier studies have failed to reach a consensus as to what the determinants of executive compensation levels are, John R. McKean and R. Joseph Monsen attempt to settle this controversy in their 1975 article entitled "Executive Compensation and the Theory of the Firm: an Empirical Study" (McKean and Monsen, 1975). The authors examined a sample of 37 of the "Fortune 500" industrial corporations

TABLE 6.--Correlation Coefficients Between Paired Independent Variables.

	1971				1970	
	Sales	Assets	Net Income	Employees	Sales	Assets
1971						
Sales	1.000					
Assets	.926	1.000				
Net Income	.891	.906	1.000			
Employees	.866	.717	.701	1.000		
1970						
Sales	.986	.937	.864	.840	1.000	
Assets	.904	.996	.874	.682	.929	1.000
Net Income	.757	.896	.887	.508	.787	.894
Employees	.855	.715	.689	.995	.841	.686
1969						
Sales	.995	.910	.869	.878	.984	.890
Assets	.916	.995	.879	.694	.934	.996
Net Income	.898	.924	.963	.719	.867	.894
Employees	.864	.713	.687	.992	.843	.680

SOURCE: McKean and Monsen, 1975, p. 128.

over the period from 1954 to 1965. A total of 428 observations was obtained by pooling data across firms and over time (McKean and Monsen, 1975, p. 126).

Executive compensation, as obtained from the Business Week annual survey of executive compensation, was measured by salary plus bonus plus stock bonus. (Although it is not clear how the value of the stock bonus was calculated.) This measure of compensation was regressed against the corporate variables of sales, assets, profits, stock prices, tenure, industry, and control of the firm, as well as change over time in these variables (McKean and Monsen, 1975, p. 126). Two models were tested to determine these relationships. First, executive compensation levels were regressed against current year characteristics of the firm. Secondly, executive compensation was related to the cumulative performance of the firm over the past 12 years.

The authors found, by using the first specification of the model as applied to the sample that sales in the current year was the most significant variable studied, and that profits are not statistically significant. Other variables found to be of significance were tenure of the chief executive (+), owner control (+), and industry type (McKean and Monsen, 1975, p. 130). Variables that failed to be significant were assets, profits,

trend, stock price, change in profits, or the company's previous year's levels of these measures (McKean and Monsen, 1975, p. 120). When executive compensation was related to cumulative performance of the firm over the past 12 years, sales and change in sales were found to be positively and significantly correlated with executive compensation levels. Type of control also had a significant effect on executive compensation over time, with owner controlled firms paying higher levels of compensation than manager controlled firms.

Based upon their analysis the authors conclude that their results are consistent with those of McGuire, Chiu and Elbing that executive compensation is more closely correlated with sales than with profitability. However, when McKean and Monsen make use of the weighted regression techniques introduced by Lewellen and Huntsman [1970 AER] to adjust for heteroscedasticity and multicollinearity of the independent variables, their results are changed. By using a weighted least squares approach (weighting by firm assets) the authors find that in the current year compensation is significantly correlated with only the variables profits and stock prices. Although when in their analysis WLS is used for the examination of the effect of cumulative past performance on executive compensation neither profits, nor sales, nor any other measure of performance is significant

(McKean and Monsen, 1975, p. 131). Thus the initial results reported in this study, that executive compensation was most closely correlated with sales, may have merely been a product of the methodology used which failed to consider statistical biases because of the variability of the error terms not being randomly distributed over the sample and as a result of the independent variables being highly intercorrelated.

David J. Smyth, William J. Boyes, and Dennis E. Peseau examine the relationship between executive compensation, sales and profits in 557 large U.S. corporations during the year 1971 (Smyth, Boyes, Peseau, 1975). The major objective of this study is not to identify the various corporate characteristics and performance variables that influence the level of compensation received by top corporate executives, but rather to examine the relationship between levels of executive compensation and sales-maximizing behavior or profit-maximizing behavior of the executive. Specifically, the authors stated that their intent in this study is to test the sales vs. profit-maximization hypotheses as being characteristic of the behavior of the large modern corporation. The vehicle through which their sales vs. profits question will be examined is via an analysis of executive compensation. "If executive remuneration is a function of profits but not of sales, then we conclude

that the evidence supports the profit-maximization hypothesis; if executive remuneration is a function of sales but not of profits, then the evidence would support the sales-maximization hypothesis; and if remuneration is a function of both profits and sales then we conclude that the evidence supports a managerial model in which the firm has a utility function in which both profits and sales are arguments and we are able to estimate the trade-off between profits and sales" (Smyth, Boyes, and Peseau, 1975, p. 72).

Smyth, Boyes, and Peseau draw their data from the Forbes Annual Directory Issue (1972) which provides data for the year 1971 concerning corporate profits, sales, total assets, and other characteristics of the nation's 500 largest firms, as ranked by dollar value of sales. Forbes also provides compensation information for the total remuneration of the top executive of the firm and for the top executive group in each firm. In the Forbes data total remuneration consists of salary, bonus and directors' fee, but excludes deferred compensation and the stock option component of the total pay package. The methodology employed by the authors is that introduced by Lewellen and Huntsman of weighted least squares, where the weighting factor is the total book value of corporate assets. The basic models utilized are:

$$\frac{EC}{A} = \frac{a}{A} + b\,\frac{P}{A} + C\,\frac{S}{A} + \frac{U}{A}$$

and $$\frac{EG}{A} = \frac{a}{A} + b\,\frac{P}{A} + C\,\frac{S}{A} + \frac{U}{A}$$

Where EC = executive compensation

EG = average executive group compensation

P = net profits of the firm

S = sales revenues

A = total assets

U = disturbance term

(Smyth, Boyes, Peseau, 1975, p. 76).

The corresponding regression coefficients and t-values (in parentheses) are given below for running the two models above for the year 1971.

$$\frac{EC}{A} = \underset{(28.81)}{100108}\ \left(\frac{1}{A}\right) + \underset{(9.42)}{1.0731}\ \left(\frac{P}{A}\right) + \underset{(4.48)}{0.0251}\ \left(\frac{S}{A}\right) \quad [R^2 = 0.651]$$

$$\frac{EG}{A} = \underset{(36.61)}{3.3578}\ \left(\frac{1}{A}\right) + \underset{(6.38)}{0.2030}\ \left(\frac{P}{A}\right) + \underset{(6.70)}{0.0105}\ \frac{S}{A} \quad [R^2=0.765]$$

(Smyth, Boyes, and Peseau, 1975, p. 78)

In the above equations, both the profits and the sales variables are highly significant. The evidence strongly

supports the hypothesis that sales and profits both significantly influence the level of compensation received by the top executive, as well as the top executive group of the large corporations studied. From these results the authors conclude that "the firm has a utility function that includes both sales and profits" (Smyth, Boyes, and Peseau, 1975, p. 79).

Smyth, Boyes and Peseau in their research effort have improved upon the earlier studies in this area in that they selected a very large sample to analyze, 557 firms. By utilizing a weighted least squares approach the authors also reduced the problems of heterosedasticity and collinearity of the independent variables in the model. However, this analysis fell short on several points. First the authors failed to utilize a comprehensive measure of executive compensation. Failure to include deferred components and the stock options would tend to ignore approximately one half of the total pay package (Lewellen, 1975, p. 168). Secondly, the authors looked at only two corporate variables in trying to explain variances in executive compensation levels, sales and profits. There is a wide array of corporate scale and profitability measures that may be correlated with compensation which were ignored in this analysis. Finally, the mode of analysis employed, cross-sectional analysis, greatly limits one's ability to generalize

from the results of this study. What would have been more preferable would have been for the authors to conduct a time-series analysis over a long enough period of time, say 15 years, so that the possibility of any one particular point of the business cycle affecting the relationship between the variables would have been reduced.

In a quite recent study (1975) Foster, Garro, and Rosario conduct an analysis to determine which corporate variables are most significantly correlated with executive compensation levels. The authors note the fact that many articles and surveys have shown that there is a strong correlation between executive compensation, sales and profits. They state, however, that they are interested in the analysis of other factors that contribute to the determination of executive compensation. Foster, et al., select the chief executive officer as the executive position to be analyzed. The basic issue explored in their study was: "does the total cash compensation of a chief executive officer vary significantly and positively with the business fortunes of his firm on any other measure than increased sales volume? . . . It is the intent of this article to explore such other determinants--or correlates--of CEO compensation" (Foster, Garro, and Rosario, 1975, p. 99).

Foster, et al. hypothesize that CEO compensation would tend to vary with the following variables:

1. Annual business results.
2. Long-term business results.
3. Managerial accountability (size of the firm managed) (Foster, et al., 1975, p. 102).

The authors describe the first two factors as representing short-term and long-term performance variables respectively, while the third factor is a key measure utilized in establishing the base salary ranges for chief executive positions. To test this hypothesis, the authors employ a multiple regression analysis on a cross-sectional basis by examining the 100 largest companies in the top Fortune 500 listing of U.S. manufacturing firms for the year 1972. As in earlier studies, Business Week's annual survey of executive compensation was used to obtain compensation data.

Foster, Garro and Rosario first constructed a multiple regression equation which contained 14 independent variables thought to be potentially beneficial in attempting to explain the level of CEO compensation. The 14 independent variables included represent various performance as well as responsibility measures. Upon performing the multiple regression analysis of these variables with CEO compensation, it was discovered, as had been pointed out in earlier studies, that the

independent variables were highly intercorrelated because of the existence of a scale effect. Taking the Lewellen and Huntsman approach, the authors created deflated variables, derived by dividing all variables by corporate assets, to control for the influence of size upon the correlation coefficients.

After regressing the "deflated" variables against CEO compensation, the authors found that the performance measures (net earnings, return on shareholders' equity, return on capital, and earnings per share growth) correlated in the high .70's and low .80's with CEO compensation. It was also found, however, that the size variables (sales, assets, and number of employees) were only correlated in the .50's with CEO compensation (Foster, et al., 1975, p. 104).

An analysis of the individual correlation coefficients for the deflated variables is presented in Table 7. As is evident from this table, CEO compensation is most highly correlated with five-year returns on capital (.81), next was five-year returns on equity (.80), following in correlation strength were the twelve-month measures of these variables. Sales, assets, sale growth, and number of employees were all correlated with CEO compensation in the .50 to .60 range.

Based on the results of the "deflated" multiple regression analysis presented in Table 7, Foster, et al.,

TABLE 7.--Correlation Table for Transformed Variables (Ratios to Assets).

	Sales	Net Earn	Assets	ROS	Growth	ROE5	ROC5	ROE12	ROC12	SGrow	Empls
COE	.57	.25	.55	.27	.24	.80	.81	.77	.78	.64	.50

SOURCE: Foster, Garro, and Rosario, 1975, p. 110.

conclude that the hypothesized relationship between CEO compensation, short-term or annual business results, long-term business results, and managerial accountability is supported.

This latest study represents a stride forward in the analysis of the determinants of executive compensation because of the wide range of performance and scale variables examined. Further, the methodology used--multiple regression techniques, deflated regressors, and stepwise variable inclusion--is much more appropriate than the single factor analysis utilized in earlier studies. Although the Foster, et al., study shows signs of refining the analysis of executive compensation, it stops short in its efforts. One may point to three flaws in this study that deserve attention.

Firstly, the use of the position of chief executive officer is somewhat misleading. An examination of corporate titles, as collected and published in the Dun and Bradstreet, Reference Book of Corporate Managers, reveals that the chief executive officer is almost invariably the chairman of the corporation. Because of the differing policies among corporations, there are many situations in which the title of chairman merely represents a figurehead position, or may merely serve as a place to maintain a senior level advisor on corporate policy. Thus, to assign the responsibility for corporate

performance to the chairman may many times overstate his role in determining the fate of the corporation. To overcome this problem of lack of comparability of positions across firms and industries I would propose that the authors should have adopted the approach used by Roberts, namely, that of examining the highest paid executive regardless of position title (Roberts, 1959, p. 274).

The second point upon which the authors failed in this analysis was in their measure and utilization of the executive pay package. One of the authors' hypotheses was that managerial accountability, i.e., the size of the firm managed, is "a key job evaluation variable used in establishing the base salary ranges for chief executive positions" (Foster, et al., 1975, p. 102). Although this hypothesis implies that salary may be contingent upon a scale variable, the level of analysis which the authors undertook examined total compensation (salary plus bonus) and no attempt was made to separately analyze the effects of different firm variables on salary and bonus independently. Further, the authors employed, as in earlier studies, an incomplete measure of executive compensation. By only looking at salary plus bonus the authors ignored the significant portion of the total executive pay package composed of stock options and deferred compensation.

Finally, the authors' observations for the compensation and performance measures were for the year 1972. As we know, during this period, the nation was subject to the wage and price controls of the Nixon administration. Further, during this period, the economy was on the upswing, rising from the mild recession the nation experienced during the period from 1969 to 1970. Thus, the time span observed by the authors was one characterized by gains in business performance while at the same time, there were political pressures to hold down increases in compensation levels. The effect of these two opposite influences may be to buffer or to partially negate the upward pull of good corporate performance on the level of executive compensation.

Upon review of the articles and corresponding research efforts to date concerning the determinants of executive compensation one is left with a general feeling of inconclusiveness. There are articles which assert that sales of the corporation is the controlling factor influencing the level of compensation received by top executives. However, there also exists a body of studies having found support for the hypothesis that corporate profitability exerts the greatest influence upon the level of remuneration received by top corporate officials. Finally, one can even find studies that

conclude that one cannot discern which factors, either of a scale or profitability nature, are the most important in the determination of executives' pay levels.

Of the articles critiqued in this chapter there are none which do not suffer from at least one of the following weaknesses:

- poor methodological foundation, especially with respect to collinearity of the explanatory variables.
- small or unrepresentative sample upon which the study was based.
- improper specification of corporate variables, especially those dealing with corporate profitability.
- failure to accurately measure the total executive pay package.
- selection of atypical years in which to conduct analysis.

The intent of this study is to reduce some of the confusion and inconclusiveness which currently exists in this area of inquiry. Further, many of the variable measurement problems, methodological biases, and sampling problems will be improved upon or corrected in this research effort.

CHAPTER III

A REVIEW OF THE LITERATURE CONCERNING THE RELATIONSHIP BETWEEN EXECUTIVE COMPENSATION AND HUMAN CAPITAL STOCK

In Chapter II, a review and critique of the existing body of literature concerning the relationship between structural variables, i.e., organizational characteristics, and the pay levels received by top corporate executives was presented. The emphasis in this section, however, is directed toward evaluating the relative impact of the executive's stock of human capital upon the level of pay received.

Individuals invest in themselves through the process of accumulating education, experience, and training. The aim of this investment is to enhance their productivity and hence employability and earning power. There have been numerous studies conducted attempting to measure the effects of different levels of human capital stock upon one's opportunities and ability to compete in the labor market. The focus of these analyses has primarily centered on lower level participants in

organizations--skilled, semi-skilled, and unskilled workers--while very few studies exist which have directed their analysis at higher level participants within the organization. The mission undertaken in this section is to present a review and critique of the existing body of literature concerning the application of human capital analysis to top corporate executives and to present a model of the manner in which one would expect executive pay levels to be influenced by human capital factors.

Organizations claim that top managers are rewarded on the basis of the position they hold within the corporation and their individual performance within that position. Belcher notes that organizations do not formally recognize the individual's personal characteristics, except the executive's tax situation, when making executive compensation decisions. "Organizations imply that top management is paid primarily for performance and secondly for the job to which they are assigned. Personnel characteristics are not assumed to be recognized" (Belcher, 1974, p. 532). Basing pay decisions on the scope of the position held, and the executive's performance within that position conforms to the prescription forwarded by E. E. Lawler as to how organizations may better utilize pay systems to elicit desired worker behavior (Lawler, 1971, p. 119).

Although it is stated by corporate directors and behavioral science researchers alike that it is desirable to base rewards on position and performance, and not to base pay decisions on the personal characteristics of the executive, there exists inconsistent evidence as to how closely the preceding statements describe the actual pay determination process for top executives.

Robert Sibson, based upon the results of his annual management compensation survey, presents results which tend to support the above statement that personal characteristics of the executive do not influence the level of pay received by the individual. As a result of his research, Sibson concludes that:

> - Length of service does not usually affect salary in any measurable way. Companies tend to pay a new man on the job the same as the man he succeeds.
>
> - Age does not correlate with salary level very well. Younger chief executives receive about the same as their older peers (Sibson, 1971, p. 30).

Thus, Sibson concludes that the two traditional human capital variables of age and tenure do not seem to exert any significant influence upon the pay decisions concerning top executives' compensation levels.

However, other studies into the relationship between pay and personal characteristics of top managers have failed to support the findings of Sibson. A study of McKinsey and Company on executive compensation found

that new chief executives generally were given lower levels of compensation than were afforded the individuals they succeeded (McKinsey and Company, 1970). This finding would tend to indicate that there is a seniority element which positively influences the level of pay an executive receives. Patton provides evidence to support the findings of the McKinsey study. Patton studied the relationship between executive pay, performance ratings received by the executives, and the executive's age across 86 large firms for the year 1967. What Patton found was that the pay differential between high and medium performers tended to increase with age (Patton, 1968). Patton notes that there is a positive relationship between age and pay level, especially for the top performers, and that specifically, "the 90th percentile executive is paid approximately $1,000 additional for each year of age until he 'peaks out' at age 62" (Patton, 1968, pp. 36-37).

To date the most thorough analysis of the relationship between executive compensation and human capital accumulation is that by Kenneth Foster in his 1969 article entitled "Accounting for Management Pay Differentials" (Foster, 1969). Foster's article was prompted by what he felt to be an absence of any significant work exploring the process of executive pay determination. In reference to the research previously

directed at this issue, Foster notes that, "there is virtually no empirical evidence available that provides any information as to which factors are important, or to what degree they are important over the broad spectrum of management pay practices" (Foster, 1969, p. 82). The aim of Foster's study is to correct this situation by examining the degree to which a number of variables, indicative of both the individual managers' and the corporations' characteristics, are related to managerial pay levels across organizations.

The sample examined by Foster consisted of 19 firms, with all of which the author had close business and professional ties. The time frame of this analysis consisted of studying these 19 firms on a cross-sectional basis for the year 1968. By use of a survey questionnaire, Foster collected data from the sample organizations concerning positions in their management hierarchy and the characteristics of the individual managers occupying these positions.

The focus of this analysis centered on three functional areas within management: (1) computer programming, (2) engineering/scientific, and (3) marketing management (Foster, 1969, p. 83). For these positions and their incumbents, information was obtained concerning the level of base salary and cash bonus, years of professional and supervisory experience, amount of payroll

and number of employees supervised, age and degree held by the manager, the total number of employees and dollar volume of sales for the organization.

By use of multiple regression analysis Foster found that years of professional experience was the variable which had the greatest explanatory power relative to the observed variance in the level of managers' base salary (Foster, 1969, p. 85). Further, Foster found that 85% of the variance in the base salary of managers could be accounted for by the four variables: (1) years of professional experience, (2) number of employees supervised, (3) dollar value of payroll supervised, and (4) average salary of personnel supervised (Foster, 1969, p. 86). With respect to the two traditional human capital variables included in his analysis, age and tenure, Foster found that managerial pay was correlated .64 with years of supervisory experience, .60 with years of professional experience, and .39 with age (Foster, 1969, p. 84). These findings have led Foster to conclude that seniority tends to be a highly influential factor relative to the pay decisions for managerial personnel.

Although Foster's analysis represents the most comprehensive study to date concerning managerial pay and personal characteristics, the results obtained are

suspect on the basis of the small sample studies and the methodology utilized.

Foster states that his sample size is 300 because this is the number of managerial positions studied. However, given that all of these managerial positions are within the 19 firms surveyed, the true sample examined is the 19 firms whose pay practices the author is monitoring. Further, given that Foster has restricted himself to studying technical managers (the vast majority of whom were computer programming and engineering/scientific managers) the results may be biased by the nature of this group. The common practice is to utilize "maturity curves" as a basis for the determination of pay levels for this group of employees and thus one would expect a strong correlation between experience and the pay level of these technical managers (Sibson, 1967).

The independent variables contained in the multiple regression analysis of Foster may be subject to severe problems of collinearity. The variables sales and number of employees are correlated to such a high degree (+ .70) as to make their inclusion in a single multiple regression equation result in their independent contributions being indistinguishable. The same criticism holds for the variables of number of employees supervised and the total dollar value of payroll

supervised. The author made no efforts to correct for these problems in the specification of his model.

Because of the methodological and sampling problems discussed above, the results of the Foster study tend to shed very little new light upon the question posed by Belcher concerning which variables affect the pay levels received by top management, and the degree to which they affect this determination. What is needed to improve and update the research in this area is a clearly specified model incorporating both human capital and organizational characteristics to be tested over a broad range of firms for a longer period of time.

The preceding review of the existing body of literature concerning the role of human capital in the pay determination process reveals the general lack of sound and thorough analytical analysis in this area. Rather, the major emphasis of the analyses which have been conducted concerning the personal characteristics of top corporate executives has been of a descriptive nature.

Lewellen has analyzed the age distribution of top corporate officials as part of his study of the characteristics of management within the modern corporation (Lewellen, 1975). Descriptive information of this type concerning the age, level of educational attainment, and business background of the top managers of large U.S.

firms is available through the annual survey efforts of both Standard and Poors as well as Dun and Bradstreet. Recently, Standard and Poors Corporation surveyed 74,000 executives for its 1977 Register of Corporations, Directors and Executives. Based upon the survey, it was found that 30 percent of these executives attended just 12 schools (Lansing State Journal, 1976, C-11). The most frequently attended school was Harvard University. The results of this survey suggest that type of school attended will have a bearing upon one's probability of achieving a top management position with the corporation. Hence, there appears to be a reward to type of school attended in the form of probability of acquiring a top management position. Likewise, one could question whether this is the only reward accrued by the individual as a result of schooling. It would also be of interest to examine the extent to which type of school attended influences the level of pay received by top managers. It is quite probable that type of school attended not only influences the individual's chance of entering the ranks of top management, but also may be reflected in higher level of pay either as a result of the individual having a higher perceived marginal product because of the type of school attended or as a result of the firm paying a higher return for "credentialism" within the firm.

In Chapter V, the level of formal educational attainment as well as the type of school attended will be examined in an attempt to determine the effect of education on the level of compensation received by the individual executive.

In an effort to depart from merely reporting and presenting an array of descriptive information concerning the personal characteristics of top corporate executives, a model is needed which explains the manner in which the personal characteristics of the individual impact upon and influence the pay decisions of the board of directors of the corporation. Such a model is provided by Yoran Weiss. Weiss, in his analysis of the return to investments in higher education, provides an excellent model depicting the role of human capital factors in the wage determination process (Weiss, 1971). The basic model developed represents an application of marginal productivity theory to the determination of wage levels. Weiss states that the variables in the individual's stock of human capital are the ability endowment of the individual (A), his accumulated work experience (H), and the amount of schooling the individual has acquired (E). The manner in which these human capital factors influence the wage level received by the individual is through their effect on the perceptions of the employer as to the individual's ability to contribute to the functioning of the firm.

> The basic elements of the wage function hypothesis seem self-evident. Employers are willing to offer higher wages to the able, educated, and experienced workers, who are presumably capable of doing anything the less able, educated, and experienced worker can do, and a little more. In other words, able, experienced and educated employees are more "productive" and in relatively limited supply. We assume, therefore, that the first order derivatives of the wage function are all positive (Weiss, 1971, p. 833).

It is acknowledged by the author that higher levels of educational attainment may yield the employee a higher level of income as a result of "credentialism." In the case of credentialism, the firm actually consumes the human capital of the individual in and of itself because it is deemed to be to the advantage of the corporation to have in its employ individuals with certain levels of education and experience. In this instance, the productivity of the individual and his contribution to the firm is expressed in terms of the status and prestige he brings to the organization as a result of his credentials.

Although the population which Weiss elected to study was that of scientists holding advanced degrees, the basic model he utilizes is applicable to the study of the executive pay determination process. The use of the marginal productivity theory of wages as postulated in Weiss' wage function hypothesis allows one to utilize the descriptive information on executives' age, education, and experience provided by the Dun and Bradstreet and the

Standard and Poors surveys to analyze the determination of executive compensation levels. The econometric statement of the marginal productivity approach as applied to the study of pay determination is presented in the following chapter.

The objective of this current study is to provide insights into the role which the executive's stock of human capital plays in the pay decisions of the corporate board of directors. The previous studies in this area have failed to construct a model of the executive pay determination process through which to analyze and interpret the results of their analysis. Further, by not limiting their analysis to top executive groups, and given the lack of sound methodological practices render the results of these previous studies to be of little practical usefulness for examining the pay determination process for top corporate executives. It is hoped that many of the theoretical and methodological deficiencies will be corrected in this current analysis.

CHAPTER IV

A PRESENTATION OF THE SAMPLE, METHODOLOGY, MODEL, AND HYPOTHESES TO BE TESTED AND EXPLORED

The basic objective of this study is to present a comprehensive and up-to-date analysis of the determinants of executive compensation. Earlier studies on this topic, discussed in the preceding chapters of this analysis, provide a conceptual and methodological launching pad from which to base further research and analysis. Although there will be similarities between the design of the study described herein and these earlier studies, several new considerations will be added in an attempt to refine the analysis.

Contrary to the focus of earlier studies of executive compensation, the primary goal of this study will not be to settle the question whether firms that are not owner-managed, as is the case of most large U.S. corporations, pursue a profit-maximizing or a sales revenue-maximizing course of action. The test of this sales-profit controversy as hypothesized by Baumol is beyond the scope of this analysis. Rather, as was

pointed out earlier, the intent of this study is to examine the relationship between executive compensation levels, corporate characteristics, and human capital variables in an attempt to discern which of these factors most strongly influence the executive pay determination process within large publicly held corporations.

In this chapter, a presentation will be made of the sample to be studied and the methodology to be employed. Further, the model to be utilized in testing the relationship between various structural and personal characteristics will also be formalized and presented.

Sample

In order to examine the pay determination process for top corporate management it was necessary to select firms of sufficient size and with a wide public distribution of their common stock so as to ensure that manager behavior may be viewed as a phenomenon relatively separate from ownership. Because of the ease of access, and the comparability of the data reported across firms, the sample of corporations for this study was drawn from the Fortune listing of the top 500 U.S. industrial firms.

The Fortune Directory of the 500 Largest U.S. Industrial Corporations was used to obtain data on corporate characteristics and measures. Data concerning top executive compensation was drawn from Business Week's

"Annual Survey of Executive Compensation." This survey provides data on executive compensation, disaggregated into salary, bonus and deferred compensation, and stock options (exercised as well as granted) for the two top executives, chairman and president usually, of approximately 150 of the nation's largest corporations. A matching of the corporations represented in both the Business Week and the Fortune surveys yields a sample of 80 firms. These 80 firms are examined in this analysis over the 15-year time period from 1961 to 1975. It is felt that selecting such a relatively long period of time to study would reduce some of the cyclical variations which may serve to confound the analysis. To overcome the problem of the lack of comparability of position titles across firms, alluded to in the Foster et al. study, I will utilize the concept introduced by Roberts of looking at the highest paid executive, regardless of position title (Roberts, 1959, p. 276).

Information concerning the personal characteristics of the top executives of the nation's largest firms is readily available from the Dun & Bradstreet Reference Book of Corporate Managements. This annual survey provides information on the age, education, experience, and tenure for approximately 75,000 top American executives. Combining the information on the personal characteristics of the executives represented

in the Dun and Bradstreet survey with the compensation information reported in the Business Week survey provides one with the necessary information in order to test the relationship between executive compensation levels and the stock of human capital possessed by these top executives.

The sample selected is very representative of the nation's top 500 industrial firms in that the firms selected range from number 1 in the Fortune rankings to as low as number 323. The 80 firms in the sample span approximately 20 different industries, therefore, increasing the representativeness of the sample. Further, given that the firms constituting the nation's largest industrial firms are generally regarded as the pace setters in personnel related activities, the results of studying this group may serve to provide insights into the compensation practices of smaller organizations as well.

Procedure

Three general groups of variables will be examined to test their relationship to the level of pay received by top management. These three groups of variables may be described as those (1) having to do with the demands placed upon the executive as a result of the size of the organization and hence the amount of

resources the executive must manage, (2) those factors measuring or representing the performance of the firm and of the executive, and (3) the personal characteristics of the executive, i.e., his stock of human capital.

The size of the organization serves as a job evaluation type factor for top executive positions. The size of the firm will, to a large extent, define the scope of the responsibilities placed upon the executive as a result of the amount of resources he must manage. Using the Wachtel and Betsey terminology, these structural characteristics represent "demand-side" variables in that they measure the demands placed upon the individual by the size of the firm (Wachtel and Betsey, 1972, p. 121). Characteristics of the firm which constitute size measures are total dollar value of sales, book value of assets, and total number of employees of the organization.

In terms of the marginal productivity theory developed and presented in Chapter I, this vector of scale variables will influence the pay decisions of the board of directors in that managing a large firm is perceived to represent a greater contribution on the part of the individual than managing a relatively smaller firm. Thus, the scope of the job the individual holds, i.e., the amount of resources managed, will represent a measure of the individual's contribution to the firm and

he will be rewarded accordingly. Equation (3) depicts this relationship between firm size and executive pay level.

$$(3)\ \text{Executive Pay}_{jt} = f(SE_{it}, AS_{it}, EE_{it})$$

where:

SE = total dollar value of sales revenues of the firm

AS = total book value of the firm's assets

EE = total number of employees of the firm

j = the jth executive

i = the ith firm

t = time period t.

Based upon the marginal productivity model of labor demand, one would expect that the coefficients for the relationship between executive pay and the scale characteristics of the firm will be positive. This would signal that those executives managing larger firms are performing at a higher level than their counterparts in smaller firms and are therefore rewarded at correspondingly higher levels.

The second vector to be analyzed in the pay determination process is that of the contribution of the individual to the achieving of organizational goals and objectives. As was pointed out earlier, there are

basically two goals which the organization may elect to pursue, growth-maximization or profitability-maximization. Performance of the firm, which is utilized to proxy the performance of the individual executive toward the achieving of desired goals and objectives, will be employed to analyze changes in executive pay. If the individual executive is rewarded in accordance with his contribution to the performance of the firm, one would expect pay levels to change in the same direction as changes in the measures of corporate performance. If the goals established for the corporation by the board of directors are to pursue a course of growth-maximization, then one would expect executive pay to be positively correlated with changes in the scale of the firm's operations, i.e.,

$$DPAY = f(Dscale),$$

where DPAY measures year-to-year changes in the level of compensation received by the highest paid executive. More specifically, in terms of the individual measures in the vector of corporate size, the relationship may be expressed as:[2]

$$DPAY = f(DSE, DAS, DEE).$$

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[2]Implicit in this analysis is the fact that I am ignoring inverse causation between the dependent and the independent variables.

Likewise, when employing the marginal productivity approach to the analysis of executive pay determination, one would expect pay to vary with changes in corporate profitability if the goals established by the board relate to a profit-maximization rather than a growth-maximization objective. In this situation:

$$DPAY = f(DNISE).$$

NISE represents net income as a percent of shareholders' equity. Earlier studies in this area have utilized net income of the corporation to represent and measure the profitability of the firm. However, this measure is far from a pure measure of corporate profitability in that it represents a scale factor as well.

A more meaningful and more easily comparable measure of profitability would be one which expresses profitability as a percent of resources employed, i.e., return on investment. Dividing net income by the amount of capital utilized, one adjusts for the scale component of the net income measure. Therefore, net income as a percent of shareholders' equity will be used in this analysis when examining the relationship between executive compensation and corporate profitability.

The personal characteristics of the individual executive have already been acknowledged as having the potential to influence the level of pay received. The

extent to which these human capital factors influence the pay determination process is discernable only after one has identified and measured the relevant personal characteristics which the executive brings to the labor market. These "supply-side" variables of the wage determination process have been the subject of numerous labor market studies (Mincer, 1970). The most commonly studied human capital factors are age, education, and experience. An examination will be made of the extent to which these factors correlate with the levels of pay received by top corporate executives. The specific form of this relationship between the executive's accumulated stock of human capital and the level of pay received is expressed in equation (4).

$$(4)\quad PAY = f(age, education, tenure)$$

The elements comprising this human capital vector are the age of the individual executive (AGE), the level of formal educational attainment (ED), the type of school attended (SCH), years with the present employer (YRS), years in current position (YICP), and whether the executive was recruited directly into his current position or worked his way up through the internal structure of the corporation (D5). To allow for the possibility that the effects of these human capital factors may vary in their degree of influence over the range of values they may

assume, the variables age, years with the present employer, and years in current position will be expressed in a quadratic form so that the rate of change in the dependent variable can be measured for changes in the independent variables. Thus, the vector of personal characteristics is given by equation (5).

(5) PAY = f(age, level of educational attainment, type of school attended, years with company, years in current position, AGESQ, YRSSQ, YICPSQ),

where AGESQ is age squared, YRSSQ is years with current employer squared, and YICPSQ is years in current position squared. Based upon a knowledge of human capital theory, one would expect that the correlation coefficients for the variables AGE, ED, YRS, and YICP would be positive representing a return, in the form of higher pay, to the executive for his investment in human capital accumulation. The signs of the coefficient for the squared human capital variables indicate the change in pay as the level of human capital possessed increases. For example, if the coefficient for the relationship between age of the executive and level of pay received were positive, this would indicate that the executive's level of earnings would increase as he got older. However, if the coefficient for the age squared term were negative, this

would indicate that the compensation level increases at a decreasing rate as the executive ages.

The methodology employed to test the relationship between executive compensation, corporate size, corporate profitability, and personal characteristics is that of multiple regression analysis. The model presented below will be tested over the 80 sample firms for the 15-year period from 1961 to 1975. Various specifications of the executive pay package were regressed against the corporate and personal characteristics in an attempt to determine which factors influenced the individual components of the pay package (salary, bonus plus deferred, and stock option grants). Previous studies on this topic tended to concentrate on the total level of pay received and no attempts were made to examine the pay package in a disaggregated form. Based upon an understanding of the institutional aspects of the pay determination process for top corporate executives, it is hypothesized that base salary will be more strongly influenced by the scale of the firm's operations and the individual executive's stock of human capital (Crystal, 1970). The more volatile components of the pay package, bonus and stock option grants, are thought to be more sensitive to the progression of the firm toward the achieving of corporate goals and objectives. Thus to merely focus the analysis on total compensation in its

aggregated form would tend to ignore the possibility that the different components of the executive pay package are differentially influenced by the vectors of corporate size, profitability, and human capital stock.

Earlier studies examining the determinants of top executive compensation levels suffered additional methodological problems in their analysis. The scope analysis in the previous studies on this topic have been based on a cross-sectional mode of analysis. Specifically, the research efforts of Patton, Roberts, McGuire, et al., Lewellen and Huntsman, Cox and Shauger, and Ciscel, all concentrated on studying the firms in their samples on a cross-sectional basis over a number of years. Before one can draw any statistical inferences from a study based upon this mode of analysis, one must check to determine whether the regression coefficients estimated by assigning subsets (year-to-year observations) of the total sample to two or more different subsets do in fact belong to the same population (Dutta, 1975, pp. 173-174). The appropriate test to determine if one is dealing with the same structure when analyzing subsets of a population is the Chow-test (Chow, 1960). None of the above studies made mention of utilizing such a test to determine the validity of inferences made about the population drawn from the subsets analyzed. However, for the analysis presented in the following chapter, a Chow-test was

performed and the result of this test indicates that the subsets of the structure (year-by-year analysis from 1961 to 1975) do in fact belong to the same overall structure (supported by the finding that at the 95% level the F-critical of 1.75 exceeded the F-calculated of 1.48 obtained from the Chow-test).

Finally, performance of the firm will also be expressed as a ratio to that of the median performance of firms in the industry to which it belongs. This measure of relative firm performance will be tested to see if executives are rewarded on the basis of absolute performance or relative corporate performance. The latter measure would have the advantage of controlling for the effect of the economy on the performance of the industry of which the individual firm is a member.

To adjust for this industry effect on the various corporate variables, I will specify the corporate performance variables not in their gross values to be compared across industries, but as a ratio to the industry average for that variable. An example would be if one were looking at the correlation between executive compensation and corporate performance in the automobile industry, that the sales, assets, net income, etc. measures of the firm be divided by the average value of these variables for the auto industry. Such a specification of the model would also serve to test to see if

executives are rewarded for performance relative to that of other firms in their particular industry.

Model

The basic model developed and utilized in this analysis is presented in equation (6) below. This model integrates into a single multiple regression equation the three vectors discussed above--organizational size, corporate performance, and the individual's stock of human capital--which are hypothesized to influence the level of pay received by the nation's top corporate executives.

$$(6)\quad C = a_0 + a_1SE + a_2AS + a_3EE + a_4NISE + a_5AGE + a_6AGESQ + a_7YRS + a_8YRSSQ + a_9YICP + a_{10}YICPSQ + a_{11}ED + a_{12}SCH + U$$

The variables contained in equation (6) are:

C = executive compensation level of the highest paid executive

SE = total sales revenues of the corporation

AS = book value of the corporation's assets

EE = total number of employees of the corporation

NISE = net income expressed as a percent of shareholders' equity

AGE = age of the highest paid executive

AGESQ = $(AGE)^2$

YRS = the number of years which the executive has been with the firm prior to assuming his current position, i.e., other years with the firm while not in current position

YRSSQ = $(YRS)^2$

YICP = the number of years which the executive has held his current position, where total years with the corporation-YRS =YICP

YICPSQ = $(YICP)^2$

ED = level of formal schooling beyond high school

SCH = type of college or university attended (ivy league, big ten, etc.)

U = the disturbance term of the equation.

As was noted in earlier studies, the use of equation (6) in its present form poses serious problems of collinearity among the variables in each of the three vectors (scale, profitability, and human capital). The result of this collinearity problem among the independent variables is that the individual contribution of each variable in explaining the observed variances in the dependent variable is rendered indistinguishable (Dutta, 1975, p. 44). The manner in which this multicollinearity problem in the specification of the model was handled in earlier studies was by utilizing a weighted least squares approach. As a result of dividing the variables in equation (6) by a measure of firm size (assets), it was discovered that the problem of multicollinearity was greatly reduced. Although utilizing a weighted least

squares approach may reduce the degree of collinearity present, this represents but one of the possible econometric techniques available to deal with the problem.

An alternative method for dealing with the problem of the independent variables in the regression equation being highly intercorrelated is to analyze the variables not in terms of their individual contributions to the explanatory power of the model, but rather to examine the significance of the vector which they represent. This is a preferable method for the purposes of this present analysis, for the emphasis of this inquiry is not focused on the significance of individual variables, but rather the significance of the firm and the individual characteristics which are represented by a combination of the individual variables. To clarify this point, an example may be drawn from equation (6). In equation (6) the variables of sales, assets, and number of employees all represent different measures of the size of the firm, i.e., the scale of the firm's operations. And since these three variables do measure the same characteristics of the firm, they are highly intercorrelated (.80+) so as to make their individual contributions to the explanatory power of the model indistinguishable. Therefore, it would seem logical to examine these variables as representing the vector called scale of the firm and to analyze the significance of this vector

rather than merely looking at the significance of the separate elements within this vector. This way of viewing the model, in terms of vectors representing corporate and individual characteristics, suggests that equation (6) be conceptualized as:

$$(6)\ \text{Executive Pay Level} = a_0 + a_1\,[\text{scale}] + a_2\,[\text{profitability}] + a_3\,[\text{human capital}] + U.$$

Where the elements of the scale vector are SE, AS, and EE, the profitability vector contains NISE, and the human capital vector is composed of AGE, YRS, SCH, ED, YICP, AGESQ, YRSSQ, and YICPSQ. (See page 117 for the definitions of these variables.)

An additional correction which will be made in this analysis as compared to earlier studies on this topic is that base salary, which is the more stable component of the executive pay package, will be regressed against values of the independent variables for the preceding year. The rationale for regressing salary in time period t against measures of corporate size, profitability, and human capital measures for time period t-1 is that this lagged specification conforms more closely to the actual timing of executive pay decisions by the board of

directors of the corporation. Given that the pay decisions regarding base salary are made at the beginning of the year, the only available measures of performance and corporate size are those which have been realized for the preceding year, as the performance measures of the coming year are not yet determined. Implicit in the assumptions of the earlier studies that have regressed salary in year t on measures of corporate characteristics also in year t is that the pay decisions for the executive are postponed until the board has had a chance to determine what the level of performance of the firm has been during that year. This specification of the pay model may be appropriate for the more volatile components of the pay package, bonus and stock option grant, but it is clearly inappropriate for the larger and more stable component of the pay package represented by base salary. Therefore, to examine the factors which influence the level of base salary received by executives in this sample, equation (6) will be specified such that the independent variables are lagged one year behind the measure of salary.

The basic hypotheses to be tested in this study were developed and presented in Chapter I of this analysis, and are restated below for the reader's convenience. An accurate statistical examination of these hypotheses will serve to alleviate some of the confusion and inconclusiveness one encounters when surveying the literature

and previous research efforts concerning the determinants of executive compensation.

Hypotheses

H-1. The level of compensation received by top corporate executives in the form of base salary will be positively and significantly correlated with the scale of the firm's operations. This positive relationship between base salary and size will reflect a reward to the executive who has greater amount of responsibility than the manager of a smaller firm.

H-2. Changes in the level of executive compensation received will be positively and significantly correlated with changes in the level of performance of the firm. This relationship between pay changes and changes in corporate performance will be reflected in changes in the level of base salary received as well as the level of bonus and stock option grant awarded.

H-3. Changes in the level of executive compensation received will be more strongly related to changes in the performance of the firm relative to the performance of other firms in the industry of which the individual firm is a member than just the absolute level of performance of the firm.

H-4. There is a positive relationship between the amount of human capital possessed by the individual executive and the level of compensation he receives. This positive relationship between pay and human capital will reflect the effect of human capital on perceived marginal productivity or may measure a positive return to credentialism on the part of the individual (although this distinction is not possible to empirically discern).

CHAPTER V

STATISTICAL ANALYSES AND RESULTS

The analysis presented in this chapter is based upon an in depth study of the pay received by the highest paid executives in 80 of the nation's largest industrial firms. This inquiry was conducted on a cross-sectional basis for these 80 firms over the time period from 1961 to 1975.

The components of the executive pay package which were analyzed are salary, bonus and deferred compensation, plus stock option grant.[3] The first two components of the executive pay package are rather straightforward and quite easy to measure. Salary and bonus are reported in their dollar values for the year in which they were earned and received. Stock option grants, however, are somewhat more difficult to assign a dollar value.

Stock option grants only become of value to the individual when the price of the stock increases over the life of the grant, therefore allowing the executive

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[3]Due to the manner in which the data were reported, bonus level and amount of deferred compensation can not be disaggregated into their individual components.

to realize a gain from the exercise of the option (Cheeks, 1974, p. 112). The approach taken when dealing with executive stock option grants in earlier studies has been to valuate the stock option at date of exercise discounted back to date of grant. This method of valuation tends to confuse the study of the determinants of executive compensation with that of the study of executive wealth. By valuing the stock option component of the pay package as of date of exercise, one is measuring to a large extent the executive's ability to play the stock market. This may be an interesting concept if one were attempting to measure the total income received by the executive as a result of his non-work, as well as work related behavior. The interest in this study, though, is to examine the levels of compensation received by executives as a result of their work related activities.

The focus here is upon the financial rewards offered to the individual executive by the organization in relation to the demands placed upon the executive by the firm and as a result of the personal characteristics the executive brings to the organization. To achieve this goal better, the proper valuation of the stock option component of the pay package would be that which would measure the cost to the organization of providing this form of reward.

Foster in his analysis of the cost-effectiveness of stock options as a form of executive compensation has suggested that the proper manner in which to view the value of a stock option grant is as an interest-free loan to the executive by the company (Foster, 1973, p. 13). Foster provides a good illustration of this point in the following example he constructs:

> If he [the executive] were to receive a grant of 1,000 shares with a fair market value of $100 per share, for all practical purposes he has been given a loan of $100,000 . . . But if the company elected to offer a new public stock issue on the date of the grant, the entire payment from the sale of shares ($100,000) would have been received at date of sale . . . From this point of view, then, the only expense to the company is the cost of foregoing the use of the $100,000 (opportunity cost) over the exercise period (Foster, 1973, pp. 13-14).

Foster further suggests that the proper interest rate at which to valuate this opportunity cost is the borrowing rate which corporations must pay on funds borrowed. Since in this study I am examining only the largest of the nation's corporations, the interest rate at which these organizations borrow is the prime lending rate. Hence, valuation of the stock option component of the pay package is computed by multiplying the number of shares received by the market value of these shares at date of grant times the prime interest rate, in the year of the grant, compounded over the life of the grant.

Analysis

The model developed in Chapter IV, and presented below as equation (7) was employed to analyze the relationship between levels of executive salary and various corporate and personal characteristics.

$$(7)\ \text{Salary}_t = a_0 + a_1\,\text{SE}_{t-1} + a_2\text{NISE}_{t-1} + a_3\text{AGESQ}_{t-1} + a_4\text{YRSSQ}_{t-1} + a_5\text{YICPSQ}_{t-1} + a_6\text{AGE}_{t-1} + a_7\text{YRS}_{t-1} + a_8\text{YICP}_{t-1} + a_9\text{ED}_{t-1} + \text{SCH} + U_{t-1}$$

The definitions of the variables contained in equation (7) are presented on page 117 of Chapter V. The reader will note that the independent variables in equation (7) are lagged one year behind the measure of base salary level. It is thought that this lagged specification of the salary equation more closely conforms to the actual process of compensation determination utilized by the boards of directors of large corporations.

Table 8 presents the results obtained from utilizing equation (7) to analyze the base salary levels received by the executives in the sample. Examining the coefficients contained in Table 8 tells the reader little

about the individual contribution of each variable in explaining variances in base salary due to the high degree of intercorrelation of the elements within each vector. Hence it would be of greater utility to examine the significance of each vector in explaining variances in the level of base salary received by the executives in the sample rather than concentrating on the individual elements.

If one were to restate the general hypotheses presented in Chapter IV into specific testable propositions one would have a natural vehicle for testing the significance of each of these vectors in the executive pay determination process. The first hypothesis to be tested states that the level of salary received is positively and significantly correlated with the scale of the firm's operations. One may express this postulated link between salary level and scale in a statistically testable form as the null hypothesis H_0 which states that the relationship between salary and scale is not significant:

$$H_O : B\ (SCALE) = 0$$

The value of the F-statistic which one obtains from this procedure is 38.19 (see Table 14). The value of the F-statistic as computed far exceeds the critical

value of F at the .05 level of significance, 2.60. Therefore, on the basis of the above test one must reject the null hypothesis that the scale of the firm's operation has no significant effect on the level of salary received by the highest paid corporate executive. This result would draw one to conclude that corporate size does significantly influence the level of base salary received. An examination of the coefficients of the individual variables contained in the scale vector reveals that the direction of this relationship between scale and salary is positive. The basis for asserting this positive relationship is that the scale variables of sales and assets have positive coefficients and are significant at the .05 level (see Table 8).

The hypothesized positive relationship between salary level and the individual executive's stock of human capital is also supported by the results reported in Table 14. Stating the null hypothesis as:

$$H_0 : B \text{ (HUMAN CAPITAL)} = 0$$

one is provided the opportunity to test the contention that the level of salary received is not significantly influenced by the amount of human capital the executive has accumulated.

The F-statistic for the vector of human capital variables is 37.14. As in the case of the scale vector, this value of F as computed far exceeds the value of F-critical at the .05 level. On the basis of this result one may reject the null hypothesis that the executive's stock of human capital does not significantly influence the level of pay received.

Within the human capital vector, the individual elements which achieve significance are age and type of school from which the executive graduated. Salary level appears to increase with the age of the executive. Additionally, those executives who graduated from the Big Ten (D11) experience greater earnings than do executives who graduated from other colleges or universities. This result indicates that those executives who graduated from the Big Ten are more likely to be employed by firms paying relatively higher base salaries than will their peers from other schools.

Although not specifically hypothesized, it was discovered in this analysis that the level of profitability of the firm does not significantly influence the level of salary received by the top executive group. Based upon the results reported in Table 14, one cannot reject the null hypothesis that the relationship between

level of profitability and salary level is not significantly different from zero.

$$H_0 : B \text{ (PROFITABILITY)} = 0$$

The computed F-statistic for the profitability vector is 1.84, whereas the critical value of F at the .05 level is 3.84, thus not allowing one to reject the null hypothesis.

When one examines the more volatile incentive based components of the executive pay package, bonus and stock option grant, one obtains results similar to those obtained for base salary.

The level of bonus received is significantly correlated with the scale of the firm's operations. The relationship between the vector of scale variables and bonus level is significant at the .05 level. This finding indicates that the larger firms are more likely to supplement base salary with cash and deferred bonuses than their smaller counterparts (see Tables 9 and 15). Likewise, level of bonus received was significantly correlated with the level of profitability of the firm, indicating that more profitable firms pay higher levels of bonus than did relatively less profitable firms.

Interestingly, Table 15 indicates that the level of bonus received is influenced by the amount of human capital possessed by the individual executive. Specifically, there is a negative relationship between years

with company and bonus level. This result signals that top executives who are recruited into the firm at a very high level within management are more likely to receive larger bonuses than those individuals who have worked their way up through the organizational structure over a longer period of years.

Another result which may be derived from Table 9 is that the level of bonus received increases with the age of the executive, but that it increases at a decreasing rate over the individual's working life. This relationship is demonstrated from the negative and significant coefficient associated with the AGESQ variable. The coefficient for age squared measures the rate of change in bonus increases as age increases, whereas the coefficient AGE measures the magnitude and direction of change in bonus with changes in the age of the executive.

The negative coefficients for the dummy variables D3 and D4, which represent bachelor's degree holders and advanced degree holders respectively, imply that the non-college-graduate in the ranks of top management receives higher levels of bonus than do their degreed counterparts. The negative coefficients corresponding to D12 and D14 indicate that executives holding degrees from the University of California and those from MIT are concentrated in firms that pay their top executives

lower bonus levels than those firms headed by graduates of other colleges and universities.

Finally, an analysis of the F-statistics presented in Table 16 reveals that the value of the stock option grant received by the executives in this sample is significantly influenced by both the scale and the profitability of the firm. The interpretation of this finding is that larger firms award their executives with higher stock option grants than do the smaller sized firms. Likewise, the more profitable the firm's operations, the greater the amount of the stock option grant awarded to top management. The vector of human capital elements was not found to influence significantly the value of the stock awarded the executive indicating that stock option decisions are based solely on corporate characteristics. Specifically, Table 10 reveals that the value of stock option grants received is positively influenced by the level of sales of the firm and the return to stockholders' equity. The only human capital variable to achieve significance was that of school type from which the executives graduated. Those executives who graduated from Big Ten colleges and universities are more frequently found to be in the employ of firms awarding larger stock option grants.

One of the hypotheses advanced in this study is that the level of compensation received by top corporate

executives will be positively and significantly correlated with the profitability of the firm relative to that of other firms in the industry of which it is a member. However, when measures of relative profitability are utilized in equation (7), the profitability vector fails to achieve significance at the .05 level for any of the components of the pay package (salary, bonus, or stock options). This result suggests that firms do not base executive pay decisions on relative profitability, but on the absolute profitability level of the firm (see Tables 14, 15 and 16).

The preceding analysis represents a "snap-shot" look at the sample firms at a point in time to see how pay level is related to the level of various organizational and personal characteristics. An interesting analysis would be to see how changes in the level of pay received by top management varies with changes in the level of firm size, performance, and personal characteristics of the executive. This level of analysis would measure the responsiveness of executive compensation levels to changes in growth and profitability of the firm. Equation (8) presents the model employed in the analysis of changes in executive compensation levels.[4]

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[4]When equation (8) was expanded by including dummy variables for year of observation, a positive time trend was discovered to exist for executive pay levels.

$$(8)\ DEC_{it} = a_0 + a_1 DSE_{it} + aDEE_{it} + aDAS_{it} + a_2 DNISE_{it} + a_3 YRS_{it} + a_4 YICP_{it} + a_5 D3_{it} + a_6 D4_{it} + a_7 AGE_{it} + U_{it}$$ [5]

Equation (8) shows change in executive compensation levels (DEC) from year t-1 to year t as a function of one-year changes in company sales (DSE), number of employees (DEE), value of assets (DAS), and company profitability (DNISE). The human capital measures were not expressed in change terms, however, given that their values for each executive change by one every year that the executive is in the sample.

By examining the relationship between changes in executive pay levels, changes in the scale of the firm's operations, and changes in profitability, one can test whether higher levels of performance by the individual executive, as proxied by corporate performance, are rewarded by increases in level of pay received as the marginal productivity theory would predict.

Table 17 reveals that change in the level of salary received by this group of top executives is significantly correlated with only one of the vectors of variables, that of change in profitability. This result

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[5] For the analysis of changes in salary levels, equation 8 was examined for changes from year t-2 to year t-1.

is further supported by the coefficients presented in Table 11 which show that change in the level of base salary received is significantly correlated with change in net income as a percent of shareholders' equity, but with no other characteristic of the firm or of the individual executive. This result indicates that those executives who can increase the profitability of their firm are rewarded in the form of increased salary levels.

Changes in the level of bonus received by top corporate executives are also found to be positively correlated with changes in the level of the firm's profitability (see Table 18). However, unlike base salary, changes in the level of bonus received are additionally influenced by changes in the scale of the firm's operations. It is further demonstrated in Table 18 that the vector of human capital measures does not influence changes in bonus level. Turning to the examination of the individual variables within each of these vectors, one finds in Table 12 that all of the scale measures are positively and significantly correlated with changes in the bonus component of the executive pay package.

Talbe 19 presents the analysis conducted in an effort to determine which factors influence observed changes in the level of stock option grant received by top corporate executives. Only the vector of scale variables was found to significantly affect changes in

the value of stock option grants received. This result indicates that large corporations utilize the stock option grant as a means of rewarding the executive's success in expanding the scale of the firm's operations. Referring to Table 13, the stock option is used to reward executives for achieving growth in the firm's sales revenues and dollar value of assets.

When change in relative corporate profitability is substituted into equation (8), changes in the profitability vector fail to be significantly related to changes in any of the components of the executive pay package (see Table 7). This confirms the findings for pay levels where level of relative corporate profitability represented an insignificant influence on the level of executive compensation awarded to this top executive group.

A summary of the results derived from the analysis presented in this chapter is outlined below:

- level of base salary received by top corporate executives is positively and significantly correlated with the scale of the firm's operations as well as with the individual executive's stock of human capital.
- level of bonus and deferred compensation received by the managers of large U.S. corporations is found to be significantly and negatively correlated with the scale of the firm's operations, its profitability, and the executive's accumulated stock of human capital.
- level of stock option grant awarded to top managers is positively related to firm size and profitability.

- relative levels of profitability have no significant influence on the level of executive pay.

- changes in the level of base salary received by top corporate managers are positively related to changes in the level of profitability of the firm.

- changes in the amount of bonus awarded to top executives is positively correlated with both changes in the size of the firm and changes in the level of profitability.

- the only vector of variables found to be significantly related to changes in the value of stock option grants was the vector of scale characteristics of the firm. Further, the nature of this relationship was discovered to be in a positive direction.

- changes in the relative level of profitability of the firm were found not to be significantly correlated with changes in the various components of the executive pay package.

A somewhat different level of analysis examines the distribution of the executive pay package across its various components (salary, bonus, and stock options). This approach represents more of a descriptive analysis of the executive pay package in that the focus is on the ratio of the bonus and stock option components to the total level of pay. However, from this descriptive analysis, one may gain insights into the manner in which the composition of the pay package changes as the level of compensation changes.

For the sample studied in this analysis, the average level of the total executive pay package was $294,430. Base salary accounts for 73% of the total

($214,785), bonus represents another 19% ($56,547), and stock option grant comprises the remaining 8% ($23,330) of the total package.

The latter two components of the executive compensation package (bonus and stock option grant) represent the incentive based portion of the executive's remuneration from the corporation. Given that these two forms of incentive pay are much more volatile than the more stable element of base salary, it is of interest to examine how this portion of the pay package changes as total pay changes, i.e., to examine how [(bonus and stock option grant)/TOTAL compensation] changes as total compensation changes. If we set bonus and stock option grant equal to I, and label total compensation T, the question becomes how does (I/T) change as T changes.

This question may be posed in a regression format by the following equation:

$$(9)\quad (I/T) = a + bT$$

However, to more accurately analyze changes in the dependent variable (I/T) as the independent variable (T) changes it is advantageous to express equation (9) as a log transformation:

$$(10)\quad \log (I) = a + b \log (T)$$

The resultant coefficient of this regression is 1.74 (which is significant at the .05 level). The interpretation of this result is that for every 1% change in T (total compensation), bonuses and stock options change by 1.74%. Based upon this finding one can assert that bonus and stock option grant as a percent of total compensation increases as the level of pay rises, thus indicating that at higher levels of pay the importance of base salary in the executive pay package is reduced.

Definitions of Variables Presented

in Tables 8 to 13

SE = total sales revenues of the corporation

AS = book value of the corporation's assets

EE = total number of employees of the corporation

NISE = net income as a percent of shareholders' equity

AGE = age of the executive

AGESQ = $(age)^2$

YRS = the number of years which the executive has been with the firm prior to assuming his current position

YRSSQ = $(YRS)^2$

YICP = total number of years the executive has held his current position

YICPSQ = $(YICP)^2$

D3 = 1 if the executive has a 4-year degree, 0 otherwise

D4 = 1 if the executive has an advanced degree, 0 otherwise

D5 = 1 if years with firm prior to current position equals zero, i.e. if YRS = 0, 0 otherwise

D10 = 1 if the executive graduated from an Ivy League university, 0 otherwise

D11 = 1 if the executive graduated from a Big Ten university, 0 otherwise

D12 = 1 if the executive graduated from the University of California, 0 otherwise

D13 = 1 if the executive graduated from Stanford University, 0 otherwise

D14 = 1 if the executive graduated from MIT, 0 otherwise

TABLE 8.--An Analysis of the Determinants of the Base Salary Component of Executive Pay.

Variable	B	t	Significant at the .05 level
SE	.26	2.78	*
AS	.30	3.87	*
EE	-.24	.65	
NISE	.50	1.36	
YRS	-.25	.52	
YRSSQ	.89	1.67	
YICP	-.25	.61	
YICPSQ	-.90	.55	
AGE	3.76	5.31	*
AGESQ	-.63	.63	
D3	2.75	.39	
D4	12.65	1.59	
D5	6.24	.54	
D10	8.47	1.46	
D11	17.55	2.07	*
D12	48.27	3.75	*
D13	-17.97	1.26	
D14	10.19	1.08	

Adjusted R^2 = .51397

TABLE 9.--An Analysis of the Determinants of the Bonus Component of Executive Pay.

Variable	B	t	Significant at the .05 level
SE	.33	2.98	*
AS	-.37	.40	
EE	.24	5.43	*
NISE	3.34	7.70	*
YRS	-1.85	3.29	*
YRSSQ	.82	1.32	
YICP	-.44	.93	
YICPSQ	.83	1.37	
AGE	2.35	2.84	*
AGESQ	-.31	2.69	*
D3	-27.58	3.28	*
D4	-41.89	4.49	*
D5	-14.96	1.10	
D10	10.68	1.57	
D11	-.49	.50	
D12	-33.02	2.19	*
D13	19.21	1.16	
D14	-27.04	2.44	*

Adjusted R^2 = .34138

TABLE 10.--An Analysis of the Determinants of the Stock Option Component of the Executive Pay Package.

Variable	B	t	Significant at the .05 level
SE	.32	3.36	*
AS	-.66	.90	
EE	-.20	.57	
NISE	.88	2.26	*
YRS	-.36	.79	
YRSSQ	.86	.55	
YICP	-1.10	.91	
YICPSQ	-.56	.36	
AGE	.28	.42	
AGESQ	.42	.45	
D3	-7.15	1.06	
D4	-5.89	.79	
D5	7.54	.69	
D10	-3.96	.73	
D11	23.05	2.91	*
D12	-7.52	.62	
D13	-16.35	1.23	
D14	5.73	.65	

Adjusted R^2 = .05427

TABLE 11.--An Analysis of the Determinants of Changes in the Salary Component of the Executive Pay Package.

Variable	B	t	Significant at the .05 level
DSE	-.12	1.14	
DEE	.43	.62	
DAS	-.20	.51	
DNISE	.36	1.98	*
YRS	-.16	.37	
AGE	-.10	.54	
YICP	.16	.51	
D3	1.06	.76	
D4	-1.06	.67	
D5	-6.08	1.01	
D10	-.61	.55	
D11	-6.06	1.06	
D12	1.29	.51	
D13	.53	.61	
D14	5.62	.97	

* DSE, DEE, DAS, and DNISE denote first differences in these variables

Adjusted R^2 = .00780

TABLE 12.--An Analysis of the Determinants of Changes in the Bonus Component of the Executive Pay Package.

Variable	B	t	Significant at the .05 level
DSE	.12	7.37	*
DEE	.44	3.41	*
DAS	.82	11.35	*
DNISE	1.03	2.92	*
YRS	-.21	.86	
AGE	.18	.33	
YICP	-.39	.67	
D3	-7.72	.97	
D4	-8.85	.95	
D5	-10.81	.98	
D10	2.85	.44	
D11	-23.30	2.41	*
D12	.67	.32	
D13	.22	.45	
D14	-4.92	.47	

*DSE, DEE, DAS, and DNISE denote first differences in these variables

Adjusted R^2 = .24994

TABLE 13.--An Analysis of the Determinants of Changes in the Stock Option Component of the Executive Pay Package.

Variable	B	t	Significant at the .05 level
DSE	.14	2.56	*
DEE	.34	.80	
DAS	.96	3.91	*
DNISE	-.51	.42	
YRS	-1.43	1.73	
AGE	-.10	.54	
YICP	.91	.46	
D3	-20.55	.76	
D4	-33.61	1.10	
D5	17.66	.47	
D10	-28.56	1.30	
D11	-68.78	2.10	*
D12	29.95	.61	
D13	24.62	.46	
D14	-58.25	1.63	

*DSE, DEE, DAS, and DNISE denote first differences in these variables

Adjusted R^2 = .03151

TABLE 14.--An Analysis of the Significance of the Relationship Between the Salary Component of the Executive Pay Package and the Vectors of Corporate Profitability, Corporate Size, and the Executive's Stock of Human Capital.

A. Ho: B(corporate profitability) = 0

F-calculated = 1.84
F-critical = 3.84 (at the .05 level)

Therefore, cannot reject Ho

B. Ho: B(human capital) = 0

F-calculated = 37.14
F-critical = 1.75 (at the .05 level)

Therefore, reject Ho

C. Ho: B(corporation size) = 0

F-calculated = 38.19
F-critical = 2.60 (at the .05 level)

Therefore, reject Ho

D. Ho: B(relative corporate profitability) = 0

F-calculated = .24
F-critical = 3.84 (at the .05 level)

Therefore, cannot reject Ho

TABLE 15.--An Analysis of the Significance of the Relationship Between the Bonus Component of the Executive Pay Package and the Vectors of Corporate Profitability, Corporate Size, and the Executive's Stock of Human Capital.

A. Ho: B(corporate profitability) = 0

F-calculated = 59.31
F-critical = 3.84 (at the .05 level)

Therefore, reject Ho

B. Ho: B(human capital) = 0

F-calculated = 6.67
F-critical = 1.75 (at the .05 level)

Therefore, reject Ho

C. Ho: B(corporate size) = 0

F-calculated = 79.79
F-critical = 2.60 (at the .05 level)

Therefore, reject Ho

D. Ho: B(relative corporate profitability) = 0

F-calculated = .36
F-critical = 3.84

Therefore, cannot reject Ho

TABLE 16.--An Analysis of the Significance of the Relationship Between the Stock Option Component of the Executive Pay Package and the Vectors of Corporate Profitability, Corporate Size, and the Executive's Stock of Human Capital.

A. Ho: B(corporate profitability) = 0

F-calculated = 736.76
F-critical = 3.84 (at the .05 level)

Therefore, reject Ho

B. Ho: B(human capital) = 0

F-calculated = 1.82
F-critical = 1.75 (at the .05 level)

Therefore, reject Ho

C. Ho: B(corporate size) = 0

F-calculated = 9.67
F-critical = 2.60

Therefore, reject Ho

D. Ho: B(relative corporate profitability) = 0

F-calculated = .30
F-critical = 3.84 (at the .05 level)

Therefore, cannot reject Ho

TABLE 17.--An Analysis of the Significance of the Relationship Between Changes in the Level of the Salary Component of the Executive Pay Package and the Vectors of Changes in Corporate Profitability, Changes in Corporate Size, and the Executive's Stock of Human Capital.

A. Ho: B(change in corporate profitability) = 0

F-calculated = 3.86
F-critical = 3.84

Therefore, reject Ho

B. Ho: B(human capital) = 0

F-calculated = .31
F-critical = 1.75

Therefore, cannot reject Ho

C. Ho: B(change in corporate size) = 0

F-calculated = .80
F-critical = 2.60

Therefore, cannot reject Ho

D. Ho: B(change in relative corporate profitability) = 0

F-calculated = .12
F-critical = 3.84

Therefore, cannot reject Ho

TABLE 18.--An Analysis of the Significance of the Relationship Between Changes in the Level of the Bonus Component of the Executive Pay Package and the Vectors of Changes in Corporate Profitability, Changes in Corporate Size, and the Executive's Stock of Human Capital.

A. Ho: B(change in corporate profitability) = 0

F-calculated = 8.54
F-critical = 3.84

Therefore, reject Ho

B. Ho: B(human capital) = 0

F-calculated = 1.06
F-critical = 1.75

Therefore, cannot reject Ho

C. Ho: B(change in corporate size) = 0

F-calculated = 169
F-critical = 2.60

Therefore, reject Ho

D. Ho: B(change in relative corporate profitability) = 0

F-calculated = 1.70
F-critical = 3.84

Therefore, cannot reject Ho

TABLE 19.--An Analysis of the Significance of the Relationship Between Changes in the Level of the Stock Option Component of the Executive Pay Package and the Vectors of Changes in Corporate Profitability, Changes in Corporate Size, and the Executive's Stock of Human Capital.

A. Ho: B(change in corporate profitability) = 0

F-calculated = .02
F-critical = 3.84

Therefore, cannot reject Ho

B. Ho: B(human capital) = 0

F-calculated = 1.53
F-critical = 1.75

Therefore, cannot reject Ho

C. Ho: B(change in corporate size) = 0

F-calculated = 6.34
F-critical = 2.60

Therefore, reject Ho

D. Ho: B(change in relative corporate profitability) = 0

F-calculated = .10
F-critical = 3.84

Therefore, cannot reject Ho

CHAPTER VI

SUMMARY AND CONCLUSIONS

In this chapter, an analysis and summary of the results obtained from the statistical analysis conducted in Chapter V will be presented. The conclusions and inferences which may be drawn from these empirical findings will be discussed in terms of the model of the executive compensation process developed in Chapter I. The specific model employed in this analysis is that of the marginal productivity theory of wage determination. Specific hypotheses were derived on the basis of this model and formally stated in a manner which affords the researcher an opportunity to test empirically the relationships postulated. In the text which follows, the findings of the empirical analysis of the preceding chapter will be examined in light of these specific hypotheses.

The first hypothesis advanced was that there exists a positive and significant relationship between the size of the corporation and the level of base salary received by the highest paid executive of the firm. The basis for this asserted relationship between salary

level and firm size is that it is assumed that the management of a large corporation represents a relatively more difficult and demanding task than the management of a smaller firm. Thus, the firm must compensate the executive in the larger corporation at a higher level of pay than his counterpart in a smaller corporation or the executive may be bid away from the firm's employ.

The results reported in Table 8 and Table 14 support this hypothesized relationship between firm size and the level of base salary received by the top corporate executive. Within the vector of firm size, the variables sales revenues of the firm and total book value of the firm's assets were positively and significantly correlated with the level of salary received by this top executive group. The multiple regression coefficients for the individual elements within the scale vector, however, do not measure the true magnitude of the relationship between the individual variable and the level of base salary received. Rather, due to the existence of a great amount of collinearity between the elements in the scale vector (see Appendix E) the explanatory power of each element in the vector will be understated. As a result of this collinearity problem one is barred from making exact estimates on the effect of a percentage change in the independent variables (i.e. those elements of the scale vector) on the magnitude of the dependent

variable, base salary. However, for the purposes of this analysis it is sufficient to note that the vector of scale variables is significantly correlated with the level of salary received, and the coefficients of the individual variables in this vector reveal that the direction of this relationship is positive.

The discovered relationship between firm size and executive salary level represents a logical finding based upon the common practice of using corporate size as a benchmark in the various executive compensation surveys which are conducted to gain information concerning the market for top executive talent. In addition to revealing that larger firms reward their executives with higher base salaries than do their smaller counterparts, this finding has great value to the executive when planning his career. If the executive is following a course of action which is hoped to lead to a maximization of the level of base salary received, which is the most stable and more predictable component of the executive pay package, then the executive should attempt to structure his career path so that position movements are made in the direction of moving always to a larger firm. The rationale for wanting to manage a larger firm is that the larger the scale of the firm's operations the more likely that the executive will receive a relatively

higher level of salary than is awarded his counterpart in a smaller corporation.

There is an additional point which is implied in the analysis concerning the level of base salary received by the executives in this sample. The inference which may be derived is that firms do not employ an ability-to-pay approach to the determination of top executive salaries. The basis for doubting the existence of an ability-to-pay policy with respect to executive salaries is the lack of any significant relationship between the profitability vector and level of executive salary (see Table 11). The finding that profitability does not significantly influence decisions with respect to base salary is consistent with the existence of a competitive market for top executive talent. The firm desiring to attract and retain high caliber managers must be willing to pay at least the market rate for these individuals regardless of the profitability situation of the firm.

The finding that firm size is a significant influence on the level of salary received is consistent with the findings of Roberts, McGuire, Elbing and Chiu, Ciscel, and McKean and Monsen. However, the interpretation given to this link between firm size and executive salary is not consistent with that of earlier studies. The finding that executive salaries are significantly correlated with firm size in no way supports or rejects

the hypothesis forwarded by Baumol that the modern corporation pursues a sales-maximization rather than a profit-maximization course of behavior. Rather, a more appropriate manner in which to test the sales vs. profit-maximization question would be to examine how the pay levels of top executives change as the level of profitability and level of firm sales change. By examining first differences in both pay and corporate characteristics one is afforded the opportunity to gauge the pay-off to executives for achieving either a growth in corporate size or profitability, and based upon the assumption that executives are rewarded in accordance with corporate goals and objectives, one can make inferences as to the goals which corporations actually choose to pursue.

The second hypothesis proposed in this study is that changes in the level of executive compensation received by the highest paid executives in the sample corporations will be positively and significantly correlated with changes in the performance of the firm. The performance referred to in this hypothesis is the ability of the executive to guide the firm along a course of operation which related to growth-maximization of the firm's scale or which relates to profit-maximization (depending on which view of the behavior and objectives of the modern professionally managed corporation is more

accurate). The hypothesized link between the performance of the organization toward established goals and objectives and the observed changes in the level of compensation received by the top executive would conform to the marginal productivity theory of wage determination in that the executive would receive increases in his level of compensation in response to the changes in the level of his contribution to the performance of the firm. Further, by examining the relationship between changes in corporate performance and executive compensation one is provided with a natural vehicle to determine whether the objectives of the typical large professionally managed organization relate to profit-maximization, or whether they are more closely aligned with a growth-maximization posture.

Table 17 shows the results of analyzing the relationship between changes in the level of base salary received and changes in the scale and profitability of the firm. Based upon this analysis it was discovered that changes in base salary level are significantly influenced by changes in the profitability of the firm's operations. Further, it is shown in Table 17 that changes in base salary level are not influenced to a significant degree by changes in the scale of the firm. This finding indicates that the typical large corporation follows a policy of basing changes in executive salary

levels on the profitability of the firm. Remembering that base salary represents only one component of the executive pay package, it is not possible on the basis of this finding to assert that the typical corporation pursues a profit-maximizing course of behavior. Rather, one must reserve any statements concerning the goals of the professionally managed corporation until the analysis of the remainder of the executive pay package (bonus and stock option grant) has been completed.

The relationship between changes in the level of bonus received by top corporate executives and the performance of the firm is presented in Table 18. It is revealed in Table 18 that changes in the level bonus awarded to this top executive group is significantly related to changes in both the scale of the firm and with its profitability. This finding may lead one to conclude that the decisions of the board of directors of the typical large corporation for executive bonus levels are based on the firm's performance in terms of both growth in scale and changes in profitability. In terms of the marginal productivity model, the finding that both growth in scale and growth in profitability influence the bonus decisions of the board signals that the board of directors value the contribution of the individual executive toward the achieving of both of these outcomes by the organization.

The final component of the executive pay package, stock option grant, changes in relation to changes in the size of the firm's operations. Table 19 demonstrates that the vector of scale variables is significantly correlated with changes in the value of the stock option grant awarded the executive. Unlike changes in the level of cash bonus received, policy decisions concerning stock option grants are not significantly influenced by the profitability of the firm.

The results of the preceding analysis concerning changes in the level of compensation received by top corporate executives lead one to the conclusion that the board of directors in its decision-making activities bases decisions for the various components of the executive pay package on different factors. Policy decisions concerning adjustments in salary level are based upon consideration of the performance of the firm in terms of profitability. Table 11 shows that the direction of this relationship is positive. Year-to-year adjustments in the level of cash bonus awarded to top executives is based upon a consideration of both the performance of the corporation in terms of growth and its performance in terms of profitability. Variation in the value of the stock option grant given by the board to the executive is based upon a policy which considers the growth in the scale of the firm's operations, but gives an insignificant

amount of attention to the performance of the firm in terms of profitability measures.

The policy stance of the typical large corporation for executive compensation decisions as revealed in the above discussion is to utilize the different components of the executive pay package to reward various types of performance on the part of the executive. Changes in base salary are employed to reinforce executive behavior which results in a growth in the profitability of the corporation. Similarly, year-to-year changes in the value of the stock options awarded to top management reflect the success of the executive in directing the corporation on a course of action which results in an increase in the scale of the firm's operations. And finally, the amount of cash bonus awarded to the executive reflects performance of the firm in terms of both increases in profitability and in growth in scale.

The conclusion which one infers from the above findings is that the goals and objectives pursued by the large professionally managed corporation are aimed at both firm growth and profitability. Hence, the utility function of the board of directors does not contain only one goal but rather encompasses a desire for both growth of the firm's operations as well as valuing increases in the profitability of the corporation. This finding is consistent with the earlier analysis of Smyth, Boyes, and

Peseau in which the authors found that both size and profitability are significant factors in the determination of executive compensation levels (Smyth, Boyes, Peseau, 1975, p. 79). Hence, to merely assert that large corporations pursue either a strict profit-maximization or a strict growth-maximization course of behavior is not possible based upon the results of this analysis of the executive pay determination process.

The finding that changes in executive pay levels are positively related to changes in corporate profitability and corporate growth is consistent with Lawler's views on how rational compensation systems should be administered (Lawler, 1971). The pay for performance link does appear to exist for this top managerial group. A possible reason why earlier studies in this area have failed to support the existence of this link has resulted from their focus on levels of pay as opposed to changes in pay levels, and the use of net income to measure performance without removing the scale component of this measure.

The third hypothesis, H-3, asserting that observed variances in executive compensation levels are better explained by variances in corporate performance relative to other firms in the same industry rather than relative to firms aggregated across industries is not supported by the findings of this analysis. The

substitution of relative profitability measures in place of net income as a percent of shareholders' equity in equation (8) resulted in the relative profitability vector not being significantly correlated with any of the components of the executive pay package (see Tables 14, 15, and 16), hence, indicating that executive pay decisions are not influenced by the performance of the firm relative to other firms in its industry.

When changes in executive compensation levels are regressed against changes in the relative profitability of the firm, the same results are obtained as were derived for the analysis of the relationship between pay levels and level of relative profitability. Tables 17, 18, and 19 show that the vector of changes in relative profitability fails to be significantly correlated with changes in any of the components of the executive's compensation level. The finding that the relative profitability of the corporation, i.e. relative to the profitability of other firms in the same industry, is not significantly related to the level of pay received by top executives, or to changes in the level of pay received, would signal that the policies established and pursued by large corporations for executive compensation decisions do not contain relative profitability as an important factor in the pay determination process.

This finding of the inability of relative performance measures to add to the explanatory power of the model may be to a large extent a function of the ownership process in large publicly held corporations. The shareholders of large publicly held corporations have a wide range of investment opportunities open to them which span many industries. Given that top management is ultimately responsible to the shareholders of the company, the relevant comparison when judging performance becomes how firms in general have performed, not merely the performance of a specific industry.

The fourth hypothesis offered in this study is that the level of human capital possessed by the individual executive will exert a positive and significant influence upon the level of compensation the executive receives. The rationale for postulating this positive link between the individual's stock of human capital and the level of compensation received is two-fold. Firstly, the board of directors may feel that they cannot adequately estimate the value of the individual executive's contribution to the functioning of the corporation and therefore seek to utilize indirect measures of the executive's potential to contribute to the organization. Such measures of executive ability are education, experience, and tenure in the organization. Secondly, the board may deem it to be desirable to directly "consume"

the human capital of the executive because the personal characteristics of the individual may be thought to be valuable to the organization in and of themselves. Rewarding individuals on the basis of their education and experience irrespective of any expected performance effects is termed "credentialism." Rewarding on the basis of credentialism represents a form of pay for the contribution of the executive to the output of the corporation in terms of status and prestige.

Table 8 shows that the level of human capital possessed by the individual executive does exert a significant influence upon the level of base salary he receives. Specifically, the age of the executive and the type of school attended positively and significantly influences the level of base salary he is awarded by the board. Level of base salary received is directly correlated with the age of the executive. However, this relationship may not be of the magnitude implied by the multiple regression coefficient (3.76) due to the fact that the human capital variables of years with the company, and years in current position are highly intercorrelated with the age of the executive. Despite this inability to distinguish the individual contributions of the age and tenure variables to explaining variations in the level of base salary paid across firms, one is still able to state with confidence that the level of human

capital possessed by the executive is positively and significantly correlated with the level of base salary earned by this sample of top executives.

It is further demonstrated in Table 8 that the type of college or university attended by the executive influences the level of base salary he will receive in the top management position he holds. The coefficient for the variable D11 measures the relationship between the level of base salary received and whether the executive graduated from a "Big Ten" university or not. What the coefficient for this variable says is that if the executive graduated from a Big Ten university he is more likely to receive a significantly higher level of base salary than those who graduate from other universities. This difference amounts to approximately $17,500 more in base salary than that commanded by executives with degrees from other universities. Thus it may be inferred from this result that graduates of the universities in the Big Ten who make it into the ranks of top management are more likely to elect a career path which results in their being a top executive in a relatively high paying firm. The same interpretation may be given to the coefficient for the variable D12 which measures the impact on base salary of the executive possessing a degree from a school within the California university system.

Although it was pointed out earlier that graduates from the Ivy League schools are more likely to be found in the ranks of top management, those who graduate from a Big Ten school or the California university system are more likely to earn higher salaries once they enter the top management group. A possible rationale for this finding is that during the observation years, 1961 to 1975, graduates from Big Ten and California universities were more likely to be employed by the aero-space, automobile, and chemical industries which were experiencing tremendous growth during this period. Therefore, the growth of the industry in which executives from these schools were concentrated may have resulted in their receiving higher base salaries.

The individual executive's stock of human capital was also found to influence the level of cash bonus received. Based upon the results reported in Table 9 one may conclude that the older the executive the more likely that he will receive a larger bonus award, but that there is a diminishing effect of age on level of bonus received as the level of the executives' age increases (see the coefficients for the variables age and age-squared, respectively). School background also exerts an influence on the level of bonus awarded to the executive by the board of directors. Graduates of the University of California school system (represented by D12) and

those executives who graduated from M.I.T. (D14) are more likely to be employed by corporations who pay lower levels of bonus than are graduates of other schools.

Unlike the two previous forms of compensation discussed (base salary and cash bonus) the level of stock option grant is not significantly correlated with the vector of human capital elements. Thus, one may conclude that the benefits gained from investment in one's self, i.e. accumulation of human capital by the executive, are realized in the form of higher salary and bonus levels but does not influence the value of the stock option grant award received. This would be consistent with the idea that corporate performance influences stock related pay-offs.

With respect to the compensation policies adopted by large corporations for executive compensation decisions it is evident that from the preceding analysis that the level of human capital possessed by the executive does influence the pay decisions of the board.

The analysis contained in this study provides the reader with several insights into the manner in which executive pay levels correlate with various corporate and personal characteristics. The focus of this inquiry, however, was limited to examining monetary rewards provided to the executive by the corporation in return for his services. The monetary compensation awarded to the

executive represents only a portion of the total rewards the executive receives as a result of the employment transaction. Absent from this current analysis is a valuation and examination of the nonpecuniary benefits which the corporation provides to the executive.

When discussing the failure of earlier analyses of the earnings function to consider the nonpecuniary rewards in their specification of the pay model, Greg J. Duncan points out that, "the addition of nonpecuniary factors may change these estimates" (Duncan, 1976, p. 463). Duncan states that the analysis of the determinants of pay needs to be expanded so as to focus not only on direct compensation but also to include fringe benefits, working conditions, and the amount of satisfaction derived from one's job (Duncan, 1976, pp. 467-468). Duncan suggests how the analysis of the earnings function may be expanded and improved, contains special significance for the study of executive earnings as a result of the vast array of power and status which accompanies their positions.

This author feels that additional research is needed into the area of executive motivation and the effects of various forms of both pecuniary and nonpecuniary rewards on the executive's motivation to achieve organizationally desirable goals and objectives. The motivational implications of executive reward systems

represent a key consideration which the board of directors must take into account when determining the level and form of compensation to give the top management group. The emphasis of this current study, and the research efforts which preceded it, is that of an economic rather than of a behavioral science orientation. By concentrating on the economic rather than the behavioral elements of the pay model, one is denied the ability to make prescriptive statements as to how corporations may more effectively structure executive pay systems. Hopefully, this will be corrected in future research efforts merging the economic and behavioral variables into a single model of the pay determination process.

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APPENDICES

APPENDIX A

A LIST OF THE CORPORATIONS REPRESENTED IN THE SAMPLE UPON WHICH THE ANALYSIS IN THIS STUDY WAS BASED

Boeing
General Dynamics
McDonnell Douglas
Rockwell International
United Technologies
Avco
Lockheed
Martin Marletta
American Motors Corporation
Bendix
Chrysler
Ford Motor Company
General Motors Corporation
TRW
Borg Warner
Armstrong Cork
Allied Chemical
Dow Chemical
E. I. du Pont de Nemours & Co.
Eastman Kodak
Monsanto
Union Carbide
American Cyanamid
American Telephone and Telegraph
Columbia Broadcasting Co.
General Telephone
American Can Co.
Continental Can Co.
Owens-Illinois
Pittsburgh Plate-Glass Co.
Johnson & Johnson
Eli Lilly Inc.
Merck Co.
General Electric
RCA
Westinghouse
Zenith
General Foods
Coca-Cola
Nabisco
Pepsi Co.
Alcoa
Anaconda
Kaiser
Kennecott
Reynolds
Phelps Dodge
International Business Machines
NCR
Xerox
Exxon
Gulf Oil
Phillips Petroleum Co.
Shell Oil
Standard Oil of California
Texaco
Crown Zellerbach
International Paper Co.
Mead Paper Co.
St. Regis
Caterpillar Tractor Co.
Deere & Co.
International Harvester
Allis Chalmers
Colgate Palmolive
Proctor & Gamble
Armco
Bethlehem Steel Co.
Inland Steel Co.
National Steel
Republic Steel Co.
United States Steel
Firestone Tire and Rubber
General Tire
B. F. Goodrich Tire and Rubber
Goodyear Tire and Rubber
Swift & Co.
General Mills

APPENDIX B

MEANS AND STANDARD DEVIATIONS OF THE

VARIABLES ANALYZED IN THIS STUDY

Variable	Mean	Standard Deviations
Salary ($000)	214.78	72.26
Bonus and Deferred ($000)	56.55	91.34
Stock Option Grant ($000)	23.33	82.65
Total Compensation ($000)	294.43	160.77
Sales Revenues ($0000000)	310.64	513.90
Assets ($0000000)	281.12	511.28
Net Income ($000000)	184.78	360.42
Employees (000)	86.81	118.94
Net Income as a Percent of Shareholders' Equity (%)	11.63	6.10
Age of the Executive	57.08	5.63
Years with Company	28.40	11.55
Years in Current Position	7.05	5.53

APPENDIX C

AN ANALYSIS OF THE SENSITIVITY OF LEVELS OF EXECUTIVE PAY TO CHANGES IN THE LEVEL OF CORPORATE PERFORMANCE

Presented below is an analysis of the responsiveness of the level of executive compensation received by top corporate executives to changes in the level of corporate activity. To measure this responsiveness a simulation was conducted whereby the minimum and maximum values of the relevant corporate variables were substituted into equation (1) below in an attempt to ascertain the resultant values of executive pay.

As is evident from the pay levels reported below which correspond to the minimum and maximum values of the corporate variables, executive pay levels are very responsive to changes in the level of corporate performance.

(1) Exec Pay = a + a SE + a AS + a EE + a NISE

	Minimum	Maximum
Salary	$68,800	$1,988,120
Bonus	4,080	428,740
Stock Option	3,120	869,440

APPENDIX D

DISTRIBUTION OF EXECUTIVES IN THE SAMPLE ACROSS SCHOOL TYPE

Reported below is the distribution of the executives in this sample over the types of schools represented in this analysis. The figures are for the year-by-year composition of the sample of 80 firms.

School	Frequency
Ivy League (D10)	33
Big Ten (D11)	10
Other Schools	22
Univ. of California (D12)	2
Stanford (D13)	2
MIT (D14)	3

APPENDIX E

SIMPLE CORRELATION COEFFICIENTS AMONG THE

VARIABLES IN THIS ANALYSIS

	Bonus	Salary	Stock Option	NISE	SE	AS	EE	AGE	YRS	YICP
Bonus	1.00000	.05790	.16047	.23370	.42174	.31814	.45520	-.09092	-.14390	.08876
Salary	.05790	1.00000	.13788	.02826	.33814	.34956	.29316	.26094	.13044	.05552
Stock Option	.16047	.13788	1.00000	.07491	.19779	.12451	.14715	.03255	-.00989	-.05891
NISE	.23370	.02826	.07491	1.00000	.04581	.01863	.00843	-.07375	.00735	-.01277
SE	.42174	.33814	.19779	.04581	1.00000	.76506	.83544	.10695	.09811	-.01275
AS	.31814	.34956	.12451	.01863	.76506	1.00000	.72775	.13640	.12347	-.04931
EE	.45520	.29316	.14715	.00843	.83544	.72775	1.00000	.07192	.06171	.04450
AGE	-.09092	.26094	.03255	-.07375	.10695	.13640	.07192	1.00000	.28879	.37340
YRS	-.14390	.13044	-.00989	.00735	.09811	.12347	.06171	.07192	1.00000	-.27421