

EFFECTS OF DEREGULATION ON EXECUTIVE COMPENSATION REVISITED: THE EVIDENCE FROM THREE INDUSTRIES

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Abstract

This study examines the linkage between a heightened managerial discretion due to an environmental change on executive compensation. Specifically, we consider the impact of deregulation on three facets of executive pay: structure, level and the degree of disparity among the top executives. The results indicate mixed support for previous findings on the effects of an environmental shift on executive incentive system.

Keywords: executive compensation, corporate governance

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Introduction

During the past several decades, much research has been conducted on executive compensation, recognizing the importance of its role in motivating the managers to maximize shareholders' value (e.g., Baumol, 1967; Zajac and Westphal, 1995). Although many of the existing studies stem from economic-based arguments and tend to be confined to firm-level financial factors such as firm size and profit (e.g., Agarwal, 1981), researchers in this field are increasingly paying attention to other perspectives including sociopolitical factors that may affect executive compensation. For example, O'Reilly, Main and Crystal (1988) posited that social comparison process in the compensation committee is a significant factor in determining the CEO's pay. Zajac and Westphal (1995) argued that the amount of a CEO's power is reflected in how his compensation is structured. Although such efforts in expanding the literature beyond the economic argument have provided greater insight into this organizational phenomenon, the findings on the antecedents of executive pay are still limited. In particular, the role of environmental conditions remains largely unexplored. This is a conspicuous gap in the literature since environment has consistently been recognized as one of the important factors in numerous intra- and inter-organizational phenomena, such as executive cognition, decision-making and market competition (e.g., Milliken, 1990; Miller and Friesen, 1977).

This study attempts to extend this stream of literature on executive compensation through a systematic empirical examination of the effects of increased managerial discretion via environmental change on the senior managers' pay. Although a few

studies have considered managerial discretion as a determinant of executive compensation (e.g., Rajagopalan and Finkelstein, 1992), to our knowledge, all have been based on cross-sectional data that compare different industries with presumably different levels of discretion. A significant limitation of this approach, common in executive compensation literature, is that parameter estimates can be biased due to the strong possibility of omitted variables, even with multi-indicator controls such as firm size and prior performance (Finkelstein and Boyd, 1998). There seems to be a clear need for a systematic study on the linkage between discretion and executive pay based on a panel data. In this study, we attempt to address such need by using the context of a single focal industry that went through deregulation, thereby minimizing the aforementioned problem. We also utilize data from two other industries to control for any secular trends outside the focal industry.

We chose government deregulation as the context in which the executives were suddenly and exogeneously endowed with greater discretion in a fundamentally altered environmental condition. Deregulation serves as a natural venue for this study because it allows a greater range of strategic and competitive actions to become possible in a short period of time. With strict industry regulations eliminated, executives can draw upon a wider set of options in their efforts to meet the objectives of the firm. For instance, in airline industry, the Act of 1978 gave the airline companies almost complete freedom to set their own course of strategic and competitive actions. For the first time, the Civil Aeronautics Board would allow the airlines to set their own fares, enter new markets automatically certify entry, and merge with another airline unless proven anti-

competitive. In this light, deregulation is expected to affect many of the following environmental characteristics that determine the level of executive discretion: product differentiability, market growth, industry structure, demand instability, quasi-legal constraints, and powerful outside forces (Hambrick and Finkelstein, 1987). The basic premises of our study are as follows: Following a significant environmental shift that heightens their managerial discretion, the compensation scheme of top executives will change to reflect the altered task environment and to achieve a fit between their incentive system and the task environment. Our specific research questions are: How does a dramatic increase in managerial discretion affect executive compensation? To what extent, if any, do the level and the structure of compensation change following deregulation? How does the dispersion of pay among TMT members change?

Among these questions, the first one on the impact of environmental change on the level and structure of executive pay has been the topic of previous research. In this study we will thus attempt to revisit the question and replicate the findings by using a longitudinal data along with control industries that help to control for any secular effects. The linkage between environmental change and pay dispersion among top managers has never been examined to date, and the findings from our study may provide new insight into the phenomenon.

In order to explore our questions, we rely on data from three industries between 1973 and 1986: the airline industry, which underwent deregulation in 1978 and experienced a dramatic shift in managerial discretion, as well as two other control industries --- processed food (high-discretion) and natural gas (low-discretion) --- that did not experience a comparable environmental jolt, but maintained a relatively stable levels of discretion throughout the time period (Hambrick and Finkelstein, 1987). More details on the choice of these control industries will be provided in the methodology section.

Theoretical Background Managerial Discretion: The Conceptual Foundation

As an explicit attempt to bridge the two views of environmental determinism and strategic choice, Hambrick and Finkelstein (1987) have formally formulated the concept of *managerial discretion*, the latitude of actions that are available to the top decision makers. In this view, the polar views on strategic choice and environmental determinism can be reconciled by considering the extent to which the top executives can and do choose to shape the strategic course of the organization. Managers do matter in determining organizational outcomes, but only to the extent that they possess enough discretion to make a variety of strategic choices. With high discretion, managers are likely to draw from a wide

spectrum of options, so that their own set of values, skills, and experiences will be reflected in the outcome. On the other hand, if managers are bound by constraints, and have little discretion over the course of strategic actions, there would be no linkage between the managers and organizations would be nil. Thus, in order to achieve a better understanding of organizational phenomena, Hambrick and Finkelstein argue, it is important to consider the level of discretion available (Hrebiniak, Joyce and Snow, 1988; Finkelstein, 1988). As the "latitude of managerial action," (Hambrick and Finkelstein, 1987, p. 371), the significance of managerial discretion is two-fold: First, it serves as a moderator between strategic leadership and its external context. Namely, when there is little discretion, managerial impact on organizational outcomes is minimal. This particular situation would be congruent with the environment-deterministic perspective such as population ecology (e.g., Hannan and Freeman, 1977). In contrast, with high discretion, executives possess greater liberty to make the choices that they deem appropriate. Because the idiosyncratic characteristics of the executives --- including their background, previous experience, and cognitive limitations --- are then incorporated into the strategic decisions and their outcomes, the organization essentially becomes the "reflection" of its top managers (Hambrick and Mason, 1984). Second, and more importantly, discretion is a significant construct in its own right. Top managers have different degree of discretion, the options known and available to them. Three sets of factors that determine an executive's discretion are identified as the following: (1) the extent to which the environment allows variety and change, determined by product differentiability, market growth, industry structure, demand instability, quasi-legal constraints, and powerful outside forces; (2) the extent to which the organization and its constituents allow the top managers a range of choice, set by organizational inertia, capital intensity, and internal politics, and (3) the extent to which individual executive can identify or create a multiple course of actions on a personal level, determined by aspiration level, tolerance for ambiguity, cognitive complexity, power base, and political acumen. Given this context, we expect that certain industry-level shifts are capable of influencing all of these conditions. In particular, government deregulation, among all industry-level changes, is likely to heighten the degree of managerial discretion drastically.

The Effects of Heightened Discretion on Compensation

Given that deregulation alters the fundamental tasks and responsibilities of the executives by giving them greater discretion, while increasing their ability to affect shareholder wealth. Thus, both the level and the structure of executive rewards are expected to change in a deregulated environment. Researchers on

executive compensation have documented that compensation systems tend to have both behavioral and outcome components (Eisenhardt, 1989). In a relatively simple context where the link between executive action and outcomes is clearly known, such as in pre-deregulation period, firms tend to rely on the behavior-based compensation of a salary, but no performance-related incentive (Rajagopalan and Finkelstein, 1992). On the other hand, in contexts where such a link is harder to determine, such as in post-deregulation period, firms are more likely to adopt outcome-based reward systems. This is because such systems are designed to motivate managers toward higher performance, reducing the monitoring costs. Finkelstein and Hambrick (1987) also argued that the greater the level of managerial discretion, the greater the potential impact of managers on organizational outcomes, making the connection between pay and performance more significant. A study by Finkelstein and Boyd (1998) offered the first formal support for managerial discretion as a determinant of CEO compensation. Using a sample of Fortune 1000 companies with varying degrees of managerial discretion, they reported a positive relationship between the degree of discretion and CEO pay. They also found that firm performance is higher when discretion and pay are aligned than when they are not. The results of this study will provide an additional venue for testing such relationship using longitudinal data, within a single-industry context.

When a significant environmental shift such as deregulation alters the degree of managerial discretion for executives, the compensation element of the top team may change in response through three primary mechanisms: First, consistent with agency theory, the board of directors and other influential stakeholders may opt to align the executives' interests with the objectives of the firm in this new and uncertain task environment. This can be achieved by restructuring the pay system so that it will be more closely tied to firm performance. Secondly, now that the task environment requires greater cognitive complexity and information-processing ability, the board of directors may allow higher pay to all executives to compensate for the increased demand. Finally, the companies facing the new environment may be more likely to turn to the external labor market and recruit executives from other sectors. In general, enticing an executive from his current post requires at least a comparable reward package plus an additional premium to compensate for the heightened employment risk. Such increase in individual pay would subsequently place upward pressure on the pay scale of the whole executive team while heightening the differentials among the members.

Hypotheses

When a dramatic increase in managerial discretion occurs as a result of deregulation, we expect executive compensation to undergo fundamental changes.

Specifically, three facets of TMT-level compensation will change after deregulation: 1) the average level of total compensation, 2) the structure of the pay system in terms of the proportion of pay dependent on firm performance, and 3) the degree of pay dispersion among the top executives. We next explore each of these facets in greater detail and develop the hypotheses to be tested.

The Effects of Increased Discretion on Total Compensation

Although they did not consider the notion of managerial discretion explicitly, several studies have confirmed the notion of rewarding executives for their greater role in the context of heightened discretion. Joskow, Rose, and Shepard (1993) found that executives in regulated firms received less compensation than those in unregulated firms. Ezzell and Miles (1995) and Hubbard and Palia (1995) found greater pay-performance sensitivity in the post-deregulation banking industry. Furthermore, Rajagopalan and Finkelstein (1992) observed increasing level of executive pay and performance-contingent compensation in electric utility industry in the early 1980's, when regulation was being slowly lifted. Henderson and Fredrickson (1996) also confirmed that CEO compensation is indeed higher in firms with high information-processing demands. That is, an organizational environment characterized by greater degrees of diversification, utilization of technology and larger TMT size tended to be associated with higher chief executive pay. In addition, a study by Finkelstein and Boyd (1998) offered the first formal support for managerial discretion as a determinant of CEO compensation. Using a sample of Fortune 1000 companies with varying degree of managerial discretion, they reported a positive relationship between the degree of discretion and CEO pay. They also found that firm performance is higher when discretion and pay are aligned than when they are not.

In the post-deregulation context, the new task environment requires greater cognitive complexity and information-processing (Henderson and Fredrickson, 1996), as well as more firm-specific human capital (Harris and Helfat, 1997). In addition, increased employment uncertainty may necessitate greater total reward to compensate for the heightened risk. Thus, it is proposed that a higher level of executive pay, as well as more performance-based compensation, will be found in a deregulated environment. Thus, we propose the following:

Hypothesis 1) The level of total compensation for the TMT will increase following deregulation.

The Effects of Increased Discretion on Pay Structure

As we previously discussed, executive compensation systems tend to have both behavioral and outcome

components (Eisenhardt, 1989). Rajagopalan and Finkelstein (1992) argue that firms that rely on behavior-based compensation, with a salary and no performance-related incentive, tend to operate in relatively simple contexts where the link between executive action and outcomes is clearly known. On the other hand, more outcome-based reward systems are designed to motivate managers in contexts where the action-outcome link is harder to determine, thus effectively lowering monitoring costs. In the post-deregulation period, when the degree of complexity and uncertainty is substantially greater, top executives' pay should be based more on performance. In addition, Hambrick and Finkelstein (1987) argued that as the level of managerial discretion rises, the potential impact of managers on organizational outcomes also increases. Under this condition, the pay-performance link becomes even more important. A number of studies give partial support for this view. In their study, Balkin and Gomez-Mejia (1990) found more incentive pay plans among high-technology firms with great managerial discretion. Jensen and Murphy (1990) also suggest that pay-performance sensitivity is higher in smaller firms where CEO discretion is higher.

Based on previous findings, we expect that in post-deregulation environment, a greater portion of executive pay will depend on firm performance. As the agency theorists have argued, managers seek to maximize their own utility. Thus, the only way to align the interest of executives and owners of the firm in this new and uncertain task environment would be to tie pay system more closely to firm performance (Jensen and Meckling, 1970).

Hypothesis 2) The proportion of outcome-based compensation for the TMT will increase following deregulation.

The Effects of Increased Discretion on Pay Dispersion

As noted earlier, as government deregulation undoubtedly widens the latitude of choices and actions for top executives, each executive on the top team would play a larger and more specialized role in formulating and implementing strategic choices. In this light, deregulation offers a natural experiment for examining the effects of environment on the *dispersion* of compensation among the top team. Pay dispersion is an important topic that can affect how the team functions as a group; yet, it has been neglected by the researchers on executive compensation (Finkelstein and Hambrick, 1996).

As managerial discretion becomes heightened after deregulation, we believe that pay dispersion is likely to increase as well. Greater stratification of pay among the top team members is expected for the following reasons: First, as the amount of discretion increases, every executive has a greater ability to affect overall shareholders wealth. Within the team, however, some members will have more real or

perceived influence on the strategic course of the firm than others. Second, instead of relying on the incumbent executives to set the strategic course of action, companies may turn to the external labor market and recruit executives from other industries (Viotor, 1994). As the newly deregulated firms compete for human capital with greater specificity and value, the compensation for the executives hired after the 1978 deregulation is likely to be higher. Subsequently, the pay inequality among different members of the top team would also be greater. Lastly, the tournament theory also provides support for the hypothesized increase in pay dispersion (Lazear and Rosen, 1981; Rosen, 1986). As managerial discretion increases, monitoring executive actions would be extremely difficult. Therefore, in order to motivate the executives to behave in the interests of stockholders, the compensation system would be based more on rank than unobservable individual performances. Thus, substantial pay differentials would emerge between different hierarchical levels within the top team. Because each executive will then strive to work hard to obtain the ultimate prize of the CEO position, a particularly large pay difference would exist between the CEO and the next layer of executives. Drawing from the previous arguments, it is proposed that the degree of pay dispersion among the top executives would be greater in the post-deregulation environment.

Hypothesis 3) Pay dispersion among TMT will increase following deregulation.

Methodology

Sample

We chose the airline industry as our focal industry for a number of reasons: First, deregulation occurred quickly, allowing a relatively clean distinction between the pre- and post-deregulation periods. According to Business Week, the deregulation in this industry happened "almost overnight" (Deregulating America, 1983). Another deregulated industry such as banking would not have been as suitable for this study because its deregulation occurred at the state-level. For example, different states relaxed the restriction on interstate banking in different years, making it difficult to identify a particular point in time when the environment can be divided. Second, for the purpose of this study, it is necessary to select only single or dominant business firms, not diversified firms (Rumelt, 1974). Unlike heavily diversified firms in which deregulated industries may constitute only a minor portion of strategic operations, single or dominant business firms are likely to be greatly affected by the environmental shift. Only when the whole firm's survival is contingent upon strategic adaptation, can we observe the effects of increased discretion via deregulation on top executives and organizational outcomes. The airline industry was

ideal in the sense that almost all of the companies meet this criterion of relevance.

For the sample for the airline industry, we selected public companies with annual sales of at least \$100 million that operated in 1973 and at least until 1986. Using the Million Dollar Directory and COMPUSTAT, an initial list of potential sample firms was first drawn. We then made sure that the sample included only those that operated mainly in airline industry. It was also important that we select only companies that remained independent during the time period. Among these, the complete data were available for 30 airline companies.

To test our hypotheses examining the effects of deregulation on the executive team compensation, it was necessary to collect data from other industries which did not experience a similar shift in managerial discretion, as a way to control for any secular trends. After all, the hypothesized changes in executive compensation may also have occurred in other industries during the same period. If the predicted changes, such as greater performance-dependent pay or disparity among executive pay, were observed across all three industries, any observed changes in the airline industry could no longer be attributed to the drastic increase in discretion via the deregulation. For this reason, additional industries were selected to control for secular trends that may have happened outside the focal industry.

In order to choose the control industries, we first searched the COMPUSTAT data files for all 4-digit SIC's that met a number of criteria during the time period 1973-1986. As with the airline industry, we required at least 25 firms per year in the industry; we used the 20 largest in each year to calculate the discretion score for each year. Firms were only eligible for inclusion if they had more than \$25 million in annual sales, and at least 75% of their revenues were derived from the focal SIC code. Although this constraint sharply limited the set of potential industries but it ensured that diversified firms were not included. At the end, 16 industries met all the criteria. We then calculated the yearly discretion scores for each industry using the objective indicators of industry characteristics asserted by Hambrick and Finkelstein (1987) as determinants of discretion (e.g., the growth rate of the market, product differentiability) (Abrahamson and Hambrick, 1997). As the last step, we selected two industries among those that consistently remained within the lower and upper quartile, respectively, in terms of the discretion scores during the time period: natural gas (low-discretion) and processed food (high-discretion). At the end, complete data were available for 35 natural gas and 28 processed food companies.

First, the natural gas distribution industry provided an ideal control for the purpose of this study. Consisting of firms that transported and distributed natural gas from producers to consumers, the industry was under fairly consistent regulation between 1973-86, the time period of interest for this study.

Although the Congress passed an act in 1978 calling for a gradual deregulation of this industry, companies remained regulated as local monopolies with very little latitude for strategic actions during this time period (Finkelstein, 1988). For instance, the regulatory commission controlled all rate increases; costs were dictated by macroeconomic condition including oil prices; and the customer base was strictly confined by geographic boundaries (Sharma, 1996). As such, the level of managerial discretion endowed to the top managers in each firm was very low, with little fluctuations throughout the period. This context provided an ideal comparison to the airline industry which experienced a major increase in managerial discretion during time period.

As a second industry to control for any secular trends on shift in managerial discretion, the processed food industry was ideal. In general, the market for processed food products has never been under any regulatory forces, and provides a completely open field for the kind of fierce competition that is conducive to managerial input. Moreover, during the time period of our study the industry did not experience much exogenous environmental shift and maintained a relatively stable and high level of managerial discretion.

Data Sources

All data used in this study were derived from archival sources. Specifically, we collected data on compensation of the members of the top executive teams and firm performance, as well as other control variables from the annual proxy statements, 10-K corporate filings of individual firms, and COMPUSTAT files. Although we generally defined a TMT to be those executives at or above the senior VP-level and any other officers who served as directors, the compensation data were often unavailable for all members of the team but the top four or five highest-paid executives. However, we do not believe that this poses a serious problem since the selection rule applied systematically to all firms in the sample. In addition, firm size and TMT size, which were included as control variables, would capture all possible bias toward larger firms with more top team members.

Measurement

Executive compensation generally consists of total cash compensation and long-term or deferred income (O'Reilly, Main and Crystal, 1988). The data for top executive compensation were collected from the corporate proxy statements filed with the Securities and Exchange Commission during the entire time period, 1973-1986.

Total compensation was the sum of the following: (1) base salary in cash, (2) cash bonus, (3) long-term or deferred income, including stock options, performance unit or share plans and long-

term management incentive plans. These constructs have been used in many studies on executive compensation (e.g., O'Reilly, Main and Crystal, 1988; Rajagopalan and Prescott, 1990). In incorporating long-term compensation, two options were available. First, the Black-Scholes model has been used in previous studies to represent the discounted value of the exercise price. However, this approach may be unreliable, because of unstable assumptions on future interest rates, and the opportunity costs of holding stock options (Gomez-Mejia, 1994). A second method, used by Lambert, Lockart, and Weigelt (1993), is to value stock options at 25 percent of their exercise price, producing values in the same range as the Black-Scholes model. Compensation scholars have found that this method approximates the actual value of the options more closely (Lambert, et al, 1993). In addition, an increasing number of studies are using this measure to approximate the value of stock options (e.g. Finkelstein and Hambrick, 1989; Henderson and Fredrickson, 1996; Finkelstein and Boyd, 1998). In our sub-sample of airlines, the correlation between the Black-Scholes and discount valuation measures was high (.96). This analysis confirmed earlier findings of Finkelstein and Boyd (1998), which found a similarly strong correlation, as well as a better reliability indicated by factor loadings in the LISREL models. Thus, we chose the discount valuation method to estimate the value of stock options.

Proportion of outcome-based compensation was calculated as: (total compensation – base salary) / total compensation. This variable measured the extent to which executive pay depends on company performance and other incentive factors, as opposed to a fixed level of salary.

Pay dispersion among TMT members was defined as the coefficient of variation of total compensation among the executives. Using the coefficient of variation, instead of standard deviation, was necessary to control for the mean level of compensation in calculating the dispersion among different TMT's. Since compensation data were often available for a subset of the executives only, pay dispersion was calculated only when the data were available for four or more executives in order to reduce any potential bias. A dummy variable, (1979-84), was used to denote the post-deregulation period in some of the analyses comparing the pre- and post-deregulation periods. The variable was coded 1 for the years 1979-1984 and 0 for the years 1973-1978.

Analysis and Results

The Effects of Increased Discretion on Compensation

Table 1 shows the descriptive statistics for the variables. To examine the effects of deregulation on TMT compensation, we conducted a generalized least squares (GLS) regression on the three compensation variables of interest. Two dummy variables,

AIRLINE and FOOD, indicated airline and food industries, respectively; a dummy variable, (1979-84), indicated whether the focal year was between 1973-1978 or 1979-1984. The results are reported in Table 2. For the first model (1) with total compensation as the dependent variable, the results show that only the coefficient for AIRLINE X (1979-84) is positive at a marginally significant level. In other words, controlling for firm size and performance, the level of top executives' total compensation in the post-deregulation airline industry is only marginally different from the natural gas and processed food industries during 1979-1984. Thus, Hypothesis 1 received some support. It is noteworthy that the regression coefficient for the processed food industry, which consistently had the highest level of managerial discretion throughout the entire period, is positive and significant. Not surprisingly, strong positive relations were also found between the TMT compensation and firm-level control variables, firm size, ROE and the slack measures.²

Insert Table 1 about here

Insert Table 2 about here

Overall, the results seem to indicate a moderate support for the hypothesized effects of the environmental context on the total compensation of the TMT. As the results in the second column of Table 2 show, after controlling for secular trends, as well as firm size, slack and ROE, executive pay in the post-deregulation airline industry was generally higher than before, confirming our hypothesis that compensation would be greater in more turbulent and uncertain environment. However, this difference was significant only at the marginal level. Our finding somewhat contradicts the previous studies that found a significantly large increase in executive pay following deregulation (i.e. Rajagopalan and Finkelstein, 1992). It certainly is possible that the natural gas industry or the processed food industry was not a suitable control for secular effects; perhaps it was the gradual and invisible lifting of regulations over a long period of time in the natural gas industry, or the selected manufacturing industry also experiencing increased discretion during this period. In sum, it is likely that the general consensus on executive compensation has neglected the strong secular trend in management pay that has captivated the popular press. These results serve to caution researchers of the importance of including a control when attempting to attribute time series variation in compensation to deregulation.

Table 2 also reports the results from regression analyses on the effects of heightened managerial discretion on the proportion of

² We also ran a separate analysis with the log-linear transformation of the compensation variables. Because the results did not differ significantly, only the results from the nominal values are reported here.

performance-dependent compensation for all three industries. As the results reveal, Hypothesis 2 predicting a significant increase in the performance-pay linkage received strong support. The β -coefficient for the interaction term AIRLINE X (1979-84) was positive and significant ($\beta=.03$, $p<.01$). While the dummy variable FOOD was significantly and positively related to the proportion of performance-dependent pay, its interaction with the dummy variable denoting post-deregulation period, FOOD X (1979-84), was not significant. Overall, the results show that controlling for firm size, slack and performance, TMT compensation in the post-deregulation airline industry became much more dependent upon firm performance, even after taking the secular trend into consideration. This effect was not observed in the other two control industries. Therefore, Hypothesis 2 predicting increased pay-performance linkage for the TMT's following deregulation was supported.

The third hypothesis on TMT compensation concerned the effects of increased managerial discretion on pay dispersion among the top executives. We tested this linkage through GLS regression analysis using an fixed effects model. The results on Table 2 indeed confirm that the increase in pay differences among the top executives resulted from the change in discretion brought by the deregulation. The interaction effect between the industry dummy and the deregulation dummy variables was significant only for the airline industry ($\beta = 10.9$, $p<.01$). Hypothesis 3 was thus supported.

Conclusions and Discussion

The basic premises of this study were that a drastic increase in managerial discretion over a short period would lead to fundamental effects on different facets of executive compensation. The findings from this study generally supported the managerial discretion theory in this regard, while rendering additional insight into the dynamics of compensation change in the context of an environmental change. Overall, it is evident that top executive compensation underwent changes as a response to the environmental shift. The data on the linkage between the increased managerial discretion and pay-for-performance strongly support our prediction and confirm the findings from previous studies without control industries. Specifically, the results indicate that the structure of executive compensation changed in the airline industry following deregulation. The proportion of performance-dependent pay rose, suggesting that the industry as a whole adopted more performance-contingent rewards in response to deregulation. Since such change did not occur in the natural gas or processed food industry during the same period, this result seems to indicate the airline companies' attempt to respond to the environmental jolt. One way of aligning the incentives of managers with the interests of shareholders is to make managerial compensation

sensitive to firm value. Because deregulation simultaneously increased both the sensitivity of firm values to managerial decisions and the costs of observing managerial performance, greater pay-performance link was perhaps inevitable in order to control and reward the managers effectively.

In particular, this finding confirms the view of Finkelstein and Hambrick (1987), who argued that as the level of managerial discretion rises, the potential impact that managers have on organizational outcomes also increases. According to their perspective, the pay-performance link becomes even more important under this condition. The results of this study are also congruent with the view of the agency theorists, who argue that managers seek their own utility-maximization. Thus, the only way to align the agents' interest with the owners of the firm would be to structure the pay system so that it will be more closely tied to firm performance (Jensen and Meckling, 1970). In relatively simple contexts where the link between executive action and outcomes is clearly known, a behavior-based compensation with a salary and no performance-related incentive would be suitable. In contexts where this link is harder to determine, more outcome-based reward systems would motivate managers to higher performance, thus effectively lowering monitoring costs. In addition, the findings render some support for Henderson and Fredrickson (1996) who suggest that CEO compensation is higher in firms with high information-processing demands. Finally, this study also confirms in part the findings of Finkelstein and Boyd (1998). Looking at Fortune 1000 companies, they found that the level of discretion and the pay-performance linkage were closely related. In sum, our results reveal that, as the latitude of action became greater as a result of the deregulation, top executive pay became more closely tied to the firm performance.

An unexpected finding emerged from the analysis on the TMT total compensation. Contrary to expectations, the total compensation consisting of both cash and non-cash remuneration did not rise significantly, at least in relative terms. Although a substantial increase in absolute level did occur, the increase was only comparable to the trends in the control industries that did not undergo a deregulation. Two possible explanations exist for this absence of a significant relative increase in total compensation: Possibly, the market for managerial talent was such that a significant increase in compensation was not necessary to maintain and recruit executives into newly deregulated industry. Top managers who were willing to move into a new company that had just been delegated to an uncertain, risky environment may have found incentives other than money --- at least relative to the manufacturing sector. Alternatively, although there was a significant increase in the absolute pay level, when this change is compared to that of the control industry, particularly the processed food industry, the increase becomes

insignificant in relative terms. It may be that the rise in executive pay due to the environmental change could not be distinguished from the overall trend in executive compensation outside the airline industry that led to a greater dependence on the pay-for-performance system.

In addition, the results show that executives began to receive a wider range of remuneration, leading to a larger pay disparity among them. As the complexity and uncertain of the environment rose, a greater pay dispersion may have risen since the firms required a different set of skills and expertise that needed to be compensated differently. As the newly deregulated firms compete for human capital with greater specificity and value, a greater variance in executive compensation would emerge. The observed increase in pay dispersion also provides support for the tournament theory. As managerial discretion increases, monitoring executive actions would be extremely difficult. In order to align the interests of the executives with those of stockholders, the compensation system would be based more on rank than unobservable individual performances. Substantial pay differentials would subsequently emerge between different hierarchical levels within the top team. This is an interesting finding, given the nature of the post-deregulation environment. Some recent research has suggested that a higher level of inequity among the executives in a fast, volatile environment may be detrimental to the group dynamics within the TMT (Henderson and Fredrickson, 2001). It certainly raises an intriguing implication for the firms' ultimate task of maintaining effective group decision-making and cohesiveness while attracting new, competent executives from the outside of the firm.

Limitations and Future Directions

One limitation of this study stems from the measurement of the TMT-level compensation. Although we defined a TMT to be all executives including senior-vice presidents and above, the compensation data for the complete set of TMT members were sometimes unavailable. This may have created some upward bias in the compensation data, especially for the firms with a large executive teams. By omitting information on the lower-level executives, variables on the average TMT compensation or pay dispersion would have been affected. Unfortunately, it seems that this particular limitation cannot be overcome easily. The only reliable source of executive compensation data are the proxy filings with the Securities and Exchange Commission, especially for studies based on historical events. As long as we choose to expand the locus of research to a top executive team, rather than the CEO alone, the data availability will always be problematic.

This paper is an attempt to gauge how executive compensation changes in response to a dramatic shift

in managerial discretion via environmental change. Because our study was based on firms that underwent deregulation in late 1970's, we were limited to secondary sources for collecting all relevant data. The theoretical understanding of the processes underlying the data would surely be enriched if one could get an access to the inner workings of the compensation committee through interviews or surveys, for example. Future studies may benefit from focusing on an on-going environmental shift and considering a longitudinal, qualitative approach.

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Appendices

Table 1. Descriptive Statistics and Correlations

Variables	Mean	s.d.	1	2	3	4	5	6
1. Firm Size	6.72	4.24						
2. Slack (LTD/E)	.53	.46	.29***□	□				
3. Slack (CA/CL)	1.18	.57	.19**□	.05□				
4. Total Compensation	423,121	296,702	.28***□	.12*□	.09*□			
5. Performance-dependent Compensation	.21	.16	.21**□	.08*□	-.06□	.28***		
6. Pay Dispersion	35.23	17.45	.18**□	.08*□	.06□	.11**	.26***	
7. ROE	.083	.062	.14*□	.05□	.17**□	.19**□	.17**	.21**

+ p<.10; * p<.05; ** p<.01; *** p<.001

N = 87

Table 2. Regression Analysis on TMT Compensation

	Total Compensation ^a	Performance- Dependent Compensation	TMT Pay Dispersion ^b
	(1)	(2)	(3)
Intercept	119,421 *** (30,194)	.14 *** (.03)	38.2 *** (3.3)
(1979-84)	52,305 (42,286)	.04* (.02)	5.9+ (3.8)
AIRLINE	35,015 (26,502)	.03+ (.02)	7.2 *** (2.1)
FOOD	45,428* (22,501)	.06* (.03)	11.8** (4.0)
AIRLINE x (1979-84)	33,952+ (18,425)	.03** (.01)	10.9** (4.2)
FOOD x (1979-84)	17,935 (18,470)	.04 (.05)	8.2 (10.7)
Firm Size	.23 *** (.06)	.03** (.01)	.008 *** (.002)
ROE	.08 *** (.02)	.003** (.001)	.05 (.08)
Slack (CA/CL)	29,036** (11,852)	.014* (.006)	9.24 (11.05)
Slack (LTD/E)	15,228* (6,902)	.008 (.012)	12.84* (6.01)
F	36.3*	87.3*	74.0**
N	982	982	982
Adj. R ²	.138	.095	.117

^a in 1984 constant dollars^b in thousands of 1984 dollars

+p<.10, *p<.05, **p<.01, ***p<.001; standard deviations appear in parentheses.