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THE EFFECT OF CEO PAY DEVIATIONS ON CEO WITHDRAWAL, FIRM SIZE, AND FIRM PROFITS

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We build upon previous work on the effects of deviations in CEO pay from labor markets to assess how overcompensation or undercompensation affects subsequent voluntary CEO withdrawal, firm size, and firm profitability, taking into account the moderating effect of firm ownership structure. We find that CEO underpayment is related to changes in firm size and CEO withdrawal, and that the relationship between CEO underpayment and CEO withdrawal is stronger in owner-controlled firms. We also show that when CEOs are overpaid, there is higher firm profitability; a relationship that is weaker among manager-controlled firms. We then discuss the implications that these findings have for future research.

INTRODUCTION

CEO compensation has been a topic of great interest for several decades in the business press (i.e., articles in *Fortune* magazine and surveys in *Business Week*) as well as the academic literature (see, for example, Bebchuk and Fried [2004] for one of the more recent inquiries). Typically this research addresses the 'hot' question of whether CEOs are overpaid, and is based upon the convention that the financial performance of the firm is the basic determinant of appropriate levels of CEO compensation. Recently, however, some scholars have argued that inquiries regarding the proper level of CEO compensation should give more consideration to 'relative evaluation within an industry' (Miller, 1995: 1381) and to the role that the 'executive labor market' (Ezzamel and Watson, 1998: 221) plays in CEO compensation.

Though few in number, studies that have utilized this relative evaluation, or labor market, approach have produced some interesting findings; for example, it has been shown how the compensation of board of director members is related to the pay of CEOs in the focal firm (e.g., O'Reilly, Main, and Crystal, 1988; Porac, Wade, and Pollock, 1999). Also, studies have shown that CEO under- and/or overpayment (i.e., relative to the going rate of the executive labor market) has effects on

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future levels of CEO compensation (Ezzamel and Watson, 1998) as well as on the compensation and turnover of lower-level managerial employees (Wade, O'Reilly, and Pollock, 2006). In other words, these studies show that considerations of fairness, or equity, play a role in the determination of CEO pay. At the same time, this research has highlighted the importance of looking at the potential consequences of CEO under- and/or overpayment.

The current study builds upon this body of research to investigate how the under- and overpayment of CEOs relative to the CEO labor market rate may lead to actions that could theoretically help CEOs to resolve their own sense of equity. Specifically, both increasing the size of the firm as well as voluntarily withdrawing from the firm present underpaid CEOs with viable and fair alternatives for redressing their underpayment situation. An overpaid CEO, on the other hand, would seek to improve firm profitability as the most desirable and fair alternative for redressing the situation. Furthermore, extant theory and research regarding the managerial discretion conferred by different types of ownership structure would suggest that the firm's ownership structure may moderate each of these relationships.

We investigate these questions using a sample of approximately 3,000 observations with respect to 900 CEOs from large U.S. publicly held firms covering 30 industries over a 10-year time period. We follow previous research that has investigated the effects of CEO pay differentials, and thus start with the notion that the CEO labor market is an important referent that affects CEOs' perceptions of fairness and how they react to it (Wade *et al*., 2006; Watson *et al*., 1996). Our findings support the premise that CEOs react to fairness considerations in ways that have major implications for the firm and its objectives.

THEORETICAL BACKGROUND

Previous research suggests that significant deviations in CEO pay from the 'going market rate' (i.e., in the executive labor market) will have equity-oriented effects. Theoretically, to the extent that an informationally efficient executive labor market exists, then the substantial underpayment of an executive relative to the market rate would result in that executive being bid away by other firms prepared to pay the market rate (Ezzamel and Watson, 1998; Fama, 1980). In other words, boards of directors must consider market pay when determining the CEO's compensation because 'for motivational, recruitment, and retention reasons, a firm's compensation committee has to ensure that its senior executives are paid. . .the compensation level typically paid by similar firms to comparable individuals occupying similar posts' (Ezzamel and Watson, 1998: 221). Miller (1995) found that changes in CEO compensation were more directly tied to industry referents (i.e., industry-relative evaluations of performance) than to firm referents (i.e., prior firm performance), leading him to conclude that equity theoretic concerns may be the next logical step in developing our understanding of CEO compensation.

These studies, and others, suggest that the level of CEO pay, among other effects, may be explained by social comparison processes (e.g., Festinger, 1957), which underlie equity theory oriented concerns (Adams, 1965). O'Reilly *et al*. (1988) found a positive association between CEO compensation (in a sample of large U.S. firms) and the compensation of compensation committee directors, which led them to conclude that social comparisons occur in the CEO compensation setting process. Porac *et al*. (1999) found that boards of directors (of a sample of S&P 500 firms) use social comparison processes in a somewhat political manner, and thus suggest that such processes operate in the setting of CEO compensation. Though boards generally use within-industry comparisons in setting CEO pay, it was also found that when those comparisons placed focal firms in an unfavorable light (e.g., poor performance relative to comparison organizations), then their boards expanded their comparisons beyond industry boundaries seemingly to protect both the CEO and the board from criticism.

Social comparison processes have also been the underpinning of studies that examine the relationship that under- and overpayment deviations from the going executive labor market rate have with such outcomes as managerial job satisfaction (Watson *et al*., 1996), as well as subordinates' pay and turnover (Wade *et al*., 2006). Watson *et al*. (1996) investigated the relationship between the compensation and job satisfaction of nonowner managers (of small and medium-sized U.K. firms), examining whether under- and overpayment (as calculated by taking the difference between the managers' actual pay and their predicted pay based upon

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their human capital, firm, and industry characteristics) was related to job satisfaction. They found that 'though the absolute level of pay was not related to job satisfaction. . .overpayment (underpayment) relative to their estimated comparison level is reflected by significantly higher (lower) levels of job satisfaction' (Watson *et al*., 1996: 576).

The study by Wade *et al*. (2006) examined whether the under- and overpayment of CEOs relative to the going executive labor rate (as measured by the residuals of a 'CEO wage equation') affected the compensation of lower-level managers within the CEOs' firms (in a sample of large, U.S. publicly held firms). In essence, their results suggest that CEOs recognize that they themselves are under- or overpaid (relative to other CEOs) and that this influences the wage-setting process of their subordinates such that the latter are also paid above or below their respective labor market rates (i.e., that equity prevails within the firm) and this affects firm effectiveness (via reduced employee turnover, etc.). Indeed, their findings also show that 'inequity, expressed as comparative underpayment with the CEO (internal underpayment inequity) and with the average wage for the job in other organizations (external underpayment inequity), was associated with higher levels of [subordinate] turnover' (Wade *et al*., 2006: 539). Thus, their study highlights the inherent role that social comparison processes play in the workings of any labor market, including that of CEOs. Furthermore, it suggests that in addition to the assumption of the economic matching of wages to ability, the workings of the labor market also implicitly requires 'that there should not be strong feelings of injustice' (Hicks, 1963: 317; cf. Wade *et al*., 2006: 528).

In short, these studies show that social comparison processes—and thus norms of fairness and concerns with equity—are integral to the workings of the executive labor market and that they operate among those who are setting wages (i.e., boards of directors, compensation committees, and CEOs) as well as those who receive them (i.e., CEOs and employees). This assumes, then, that 'in order to determine how a person evaluates a reward, he must first compare his own inputs and outcomes to others' and that social comparison 'theories assume that judgments of fairness matter a great deal in determining peoples' responses to the comparative evaluations' (Wade *et al*., 2006: 529). We build upon the findings of this research and its premises, to develop several hypotheses pertaining to the actions that CEOs may take to resolve dissonance created when their pay deviates from the going executive labor market rate.

CEO underpayment, firm size, and CEO withdrawal

Organizational approaches to fairness (see Wade *et al*., 2006) suggest that CEOs whose pay deviates substantially from the labor market should be motivated to reduce the dissonance caused by this situation. Underpaid CEOs can reduce dissonance by (1) increasing their outcomes (i.e., rewards; Greenberg, 1990), (2) altering their situation either materially (i.e., withdrawal; Greenberg, 1990) or cognitively (i.e., rationalization; Greenberg, 1989), or (3) reducing their effort (Adams, 1965; Cowherd and Levine, 1992). We believe that the last alternative, despite the suppositions of 'effort minimization' or 'shirking' posited in agency theory, is generally at odds with theoretical accounts of CEO dispositions and their motivations, which suggest that CEOs tend to have high power motivation as well as reasonably high levels of achievement motivation (Simon, 1947; Marris, 1964; McClelland and Boyatzis, 1982; Davis, Schoorman, and Donaldson, 1997). Thus, CEOs will seek to remedy the dissonance created in underpayment situations by attempting to affect their rewards, to the extent that any increase in rewards is greater than the increases in effort necessary to obtain them (Adams, 1965), and through seeking alternative situations rather than through simply 'shirking' in their present situation.

As to dissonance reduction via affecting outcomes, both theory and evidence suggest that increasing firm size provides a vehicle through which CEOs can increase their rewards monetarily (i.e., salary; Gomez-Mejia, Tosi, and Hinkin, 1987; Hambrick and Finkelstein, 1995) *as well as* nonmonetarily (i.e., power, prestige, status, and job security; Marris, 1964; Simon, 1947; Williamson, 1964). Increasing the size of the firm most likely requires more effort by the CEO and thus this marginal product should also result in corresponding increases in financial rewards (Roberts, 1959; Henderson and Fredrickson, 1996; Finkelstein and Boyd, 1998). Thus, from a purely extrinsic standpoint, firm growth may not redress the inequity

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situation—as both CEO effort and financial outcomes will increase, possibly in a manner that may maintain the current inequity. Firm growth stands to reduce dissonance, nonetheless, because it also leads to increases in highly valued rewards that go well beyond financial gains. Indeed, in addition to fulfilling CEOs' power and security needs (Barnard, 1938; Simon, 1947; Marris, 1964), growing the firm also provides an opportunity for CEOs to fulfill their higher order needs (i.e., achievement; self-actualization) given that they are at the apex of the organization and have limited opportunities for such self-fulfillment (Marris, 1964; Williamson, 1964; Davis *et al*., 1997). At the very least, this increasing of nonmonetary rewards should alter the situation in a manner that greatly enhances the possibility for CEOs to change their cognition regarding its fairness (Greenberg, 1989). Furthermore, in terms of fairness, because the growth of large publicly held firms serves the interests of the CEOs and their subordinates and may come at the expense of shareholders (Marris, 1964; Mueller, 1972), such an action is completely consistent with considerations of norms of fairness. While increasing the outcomes for the underpaid CEO, firm growth doesn't help those 'responsible' for the underpayment condition (i.e., shareholders as represented by boards of directors). In short, when CEOs are underpaid, increasing the size of the firm presents a means by which CEO outcomes can be increased in a manner that addresses their fairness concerns. Thus, we hypothesize that:

Hypothesis 1: CEO underpayment is associated with subsequent increases in firm size.

Firm growth, however, is not the only route open to underpaid CEOs for dissonance reduction, as the 'decision to participate in the organization—or to leave the organization' (March and Simon, 1958: 48) is, in part, a function of the existing alternatives available to the CEO. Therefore, to the extent that there are desirable external alternatives, some CEOs may reduce their dissonance by voluntarily withdrawing from the firm. Although this issue has not been examined previously with regard to CEOs, there is evidence to suggest that inequity in pay does lead to voluntary turnover among lower-level employees. For example, Wade *et al*. (2006) show that as subordinate underpayment inequity increased relative to a CEO's pay, subordinate turnover also increased. Also, Zenger (1992) found that in organizations where the emphasis was on rewarding *only* the best performers, moderately high performers were more likely to leave given their relative underpayment to the best performers. Therefore, we hypothesize that:

Hypothesis 2: CEO underpayment is associated with voluntary CEO withdrawals.

CEO overpayment and firm profitability

Being overpaid relative to the going labor market rate should result in dissonance, and although theoretically this may lead to actions that seek to increase inputs and/or decrease rewards (Adams, 1965), existing evidence tends to support the former (Brockner *et al*., 1986; Greenberg, 1988). For example, Greenberg (1988) found that when managers were assigned to offices of higher status than their position warranted, they increased their performance rather than give up their offices. This tendency to increase inputs or effort and not to reduce outcomes would also be expected among overpaid CEOs, given the CEO's motivational structure as discussed above. High power motivation individuals have the need to establish and maintain prestige (McClelland, 1975), a need clearly not conducive to the reduction of financial rewards (i.e., outcomes). Furthermore, individuals with achievement needs take personal responsibility for success; they must feel that success comes from their own efforts. Thus, they tend to seek feedback about success and are concerned with how their efforts lead to it (McClelland, 1953; 1961; 1965). In an overpayment situation, wherein the feedback is that a CEO's financial rewards are more than for comparable CEOs with similar firm profitability, CEOs will subsequently seek to increase their efforts toward profitability as opposed to attempting to reduce their outcomes because this should work toward reducing overpayment in a manner consistent with their power and achievement needs.

Norms of fairness would also suggest that CEOs increase their efforts toward the interests of the principals (i.e., shareholders as represented by the board of directors) for whom they are agents. In short, when overpaid, CEOs should work toward increasing firm profitability. Here too, equity theory points to how CEO compensation involves more than simply extrinsic motivations and

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rewards. Given that virtually all CEO compensation packages incorporate some type of mechanisms that link pay to performance (Bebchuk and Fried, 2004; Jensen and Murphy, 1990), and thus the overpayment (as does the underpayment) condition occurs in the presence of this 'incentive alignment,'then the overpaid CEO's increased effort toward firm profitability may also lead to increase the CEO's financial rewards, thereby potentially perpetuating the overpayment situation. Nevertheless, the increase of effort toward the expectations of those rewarding the CEO should work toward appeasing the CEO's felt dissonance in the overpaid situation (i.e., the judgment that his or her financial rewards are more than warranted for the level of his or her inputs) because such dissonance is necessarily based upon a belief that he or she is not inputting enough effort (i.e., otherwise the CEO would have no fairness-based concerns). Moreover, to the extent that overpaid individuals are only moderately dissatisfied with their overpayment condition (Adams, 1965; Walster, Walster, and Berscheid, 1978)—as they are confronted with the conflict between self-interested and fairness-based concerns when forming their judgments about being overpaid (Messick and Sentis, 1983; Peters, van den Bos, and Bobocel, 2004)—then the potential that the overpayment condition may be perpetuated by an increase in effort toward profitability would not seem to deter such a CEO action. That is, by increasing his or her efforts toward profitability, the overpaid CEO is doing all that he or she can be expected to do (by themselves or shareholders) toward making the payment inequity more just. In short, increasing effort toward profitability should mollify the overpaid CEO, as taking such action addresses the CEO's fairness-based concerns in a manner consistent with the CEO's motivational structure (i.e., taking responsibility for his or her success), even if doing so may potentially produce a subsequent overpayment condition (which, incidentally, would rest easily with his or her own self-interest). Thus, we predict that:

Hypothesis 3: CEO overpayment is associated with subsequent increases in firm profits.

The moderating effect of ownership structure

The foregoing arguments presume that CEOs have the latitude to alter conditions in a manner that reduces dissonance. In particular, the assumption is that CEOs have the discretion to pursue managerial objectives even if they are at the expense of equity holders' objectives. Scholarship grounded in managerial capitalist theory suggests that the separation of firm ownership from firm control is the essential factor that affords CEOs such discretion (Berle and Means, 1932; Marris, 1964; Williamson, 1964; McEachern, 1975). Evidence suggests that CEOs in firms lacking a dominant ownership position (i.e., 'manager-controlled' or 'MC' firms) have more leeway to pursue managerial objectives than do CEOs of firms in which there is a dominant ownership position (i.e., 'owner-controlled' or 'OC' firms). For instance, studies have found differences across MC and OC firms in accounting practices (see Tosi *et al*., 1999), firm diversification (Amihud and Lev, 1981; Hill and Snell, 1988, 1989), firm performance (see Hunt, 1986), board of director monitoring (Tosi and Gomez-Mejia, 1989, 1994), and the source of annual CEO pay raises (Gomez-Mejia *et al*., 1987; Hambrick and Finkelstein, 1995). Furthermore, several studies have established the importance of a third category of ownership control structure: that of 'owner-managed' (OM) firms in which the CEO is the dominant stockholder (McEachern, 1975, 1978; Salancik and Pfeffer, 1980). Therefore, managerial capitalist theory suggests that these differences in firm ownership structure moderate the above hypothesized relationships.

First, such differences moderate the relationship between CEO underpayment and subsequent increases of firm size. Although all CEOs may value growth for both extrinsic and intrinsic reasons as described above, CEOs in MC firms will have more discretion to pursue this course of action than will their counterparts in OC firms (Marris, 1964; Williamson, 1964). As an example, studies by Gomez-Mejia *et al*. (1987) and Hambrick and Finkelstein (1995) have found that annual pay raises for CEOs in MC firms were based more upon changes in firm size than were pay raises of CEOs in OC firms, as the raises for the latter were more dependent upon changes in performance. Several theorists have also argued that owner-managers may have a tendency to 'build empires' (Knight, 1921; Schumpeter, 1942; Simon, 1947) and the findings of McEachern (1978) are supportive of this contention. Based on these arguments, we hypothesize that CEOs of OC firms are less likely to pursue growth than are CEOs of MC

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or OM firms when faced with an underpayment situation:

> *Hypothesis 4: Ownership structure moderates the relationship between CEO underpayment and subsequent increases in firm size, such that the positive relationship between CEO underpayment and increases in firm size is weaker among OC as compared to MC or OM firms.*

Second, ownership structure moderates the relationship between CEO underpayment and voluntary CEO withdrawal. Tosi and Gomez-Mejia (1994) show that CEOs in OC firms face more monitoring than CEOs in MC firms. Additionally, studies by McEachern (1975) and Salancik and Pfeffer (1980) show that CEO tenure is more contingent on the firm's profit performance in OC firms than in MC firms, while CEO tenure is 'virtually buffered from performance concerns' in OM firms (Salancik and Pfeffer, 1980: 662). Thus, because underpaid CEOs in OC firms face the greatest board vigilance, it would appear that they would be more likely to voluntarily withdraw than would underpaid CEOs of MC or OM firms:

> *Hypothesis 5: Ownership structure moderates the relationship between CEO underpayment and CEO voluntary withdrawal, such that the positive relationship between CEO underpayment and CEO voluntary withdrawal is stronger among OC firms as compared to MC or OM firms.*

Finally, firm ownership structure should also moderate the relationship between CEO overpayment and subsequent increases in firm profits. As argued above, existing theory and evidence suggests that CEOs in an overpayment condition will tend to address norms of fairness by increasing their efforts toward profitability. Theory also suggests, nevertheless, that individuals will redress inequities in the least costly manner, and thus may cognitively redefine their situation as equitable (Adams, 1965; Greenberg, 1989; Walster *et al*., 1978). Although there is no evidence to suggest that overpaid individuals cognitively redefine their situations, CEOs of MC firms would seem to have more leeway to reduce dissonance 'cognitively' when overpaid than will their counterparts. That is, because profitability concerns are very salient to CEOs of OC firms (via being highly monitored; Tosi and Gomez-Mejia, 1989, 1994) and to owner-manager CEOs (via their significant ownership stakes; Demsetz, 1983), these CEOs are much more likely to redress their overpayment inequity through behavioral responses than are CEOs of MC firms. In short, to the extent that overpaid CEOs are torn between self-interested and fairness-based concerns (e.g., Messick and Sentis, 1983; Peters *et al*., 2004), CEOs of MC firms would seem to be more likely to be able to cognitively redefine their overpayment condition in a manner congruent with self-interested motivations, and thus less likely to increase firm profits than CEOs in OC firms or owner-manager CEOs, as the latter will be more likely to follow their concerns for fairness and thus increase their efforts toward profitability:

> *Hypothesis 6: Ownership structure moderates the relationship between CEO overpayment and subsequent increases in firm profitability, such that the positive relationship between CEO overpayment and increases in firm profitability is weaker among MC firms as compared to OC or OM firms.*

METHODS

Data and sample

The issues under study are most pertinent among large established companies and require observations over time, thus our initial sample was drawn randomly from the largest (total assets greater than $10 million) U.S. publicly traded corporations from the Compustat database in 1995, for which we then collected data for the time period of 1990—1999. The final sample for each analysis varied slightly due to data availability for the particular variables included in each model specification: the withdrawal analysis was based upon a final sample of 2,955 observations over time nested within 932 CEOs across 30 industries, after accounting for missing variables and removing observations of CEOs who were fired or died on the job. With respect to the analyses of changes in firm profitability and firm size, the final samples consisted of 2,690 observations within 912 CEOs and 2,666 observations within 908 CEOs, respectively, after accounting for any missing data.

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All data used in this study were obtained from the Compustat, Execucomp, and Compact Disclosure databases as well as proxy statements, 10-Ks, annual reports, and *Dun and Bradstreet Reference Book of Corporate Management* (Dun and Bradstreet, 1999). All firm financial and total CEO pay data is adjusted to 1990 dollars using the consumer price index.

Dependent variables

Change in firm size

We calculated *change in firm size* as $(\text{size}_t - \text{size}_{t-1})/\text{size}_{t-1}$, where size_t represents firm size in any given year t and size_{t-1} represents firm size in the previous year. This relative measure of change in firm size helps to control for the fact that larger organizations have greater resources to put forth to growth (Weinzimmer, Nystrom, and Freeman, 1998). Following previous research (e.g., Tosi and Gomez-Mejia, 1989; Tosi *et al*., 2004), firm size is measured as a composite index represented by the single factor resulting from a principal components analysis (PCA) of two commonly used indicators of firm size: the natural log of firm sales (e.g., Boeker, 1997) and the natural log of the number of employees (e.g., Miller and Chen, 1994).

Voluntary CEO withdrawal

Following previous research (Parrino, 1997; Shen and Cannella, 2002), we operationalized *voluntary CEO withdrawal* as a categorical variable such that situations in which the CEO left the position and either became a director or retained a previously held directorship were coded as equal to 1, and 0 otherwise. Shen and Cannella (2002) suggest that retaining a director position does not represent dismissal; a CEO who resigns the position but retains a director position has likely voluntarily withdrawn from being the CEO. To determine whether a CEO became a director or retained the directorship after a turnover event, we examine firm proxy statements around a CEO's departure to determine the cause for departure. The initial number of observations of CEO turnover was 259, from which six observations were removed where turnover was caused by death or where the cause of turnover was clearly labeled as a dismissal. Of the 253 remaining turnover observations, 155 involved the CEO becoming a director, or retaining a directorship, after the turnover event.

Change in firm profitability

Firm profitability was measured using return on assets (ROA), calculated as the firm's net income divided by total assets for each year. Similar to change in firm size, change in firm profitability was calculated as $(\text{ROA}_t - \text{ROA}_{t-1})/\text{ROA}_{t-1}$, where ROA_t represents firm profitability in any given year t and ROA_{t-1} represents firm profitability in the previous year.

Independent variables

CEO under- and overpayment

Consistent with previous studies, CEO under- and overpayment was measured by using the residuals resulting from the regression of the natural log of total CEO pay on a set of theoretically relevant human capital, organizational, and industry factors shown in previous research to be determinants of CEO pay (i.e., a 'CEO wage equation'; Wade *et al*., 2006; Watson *et al*., 1996). The appendix contains a full description of the measures and methodology used in this estimation procedure. In short, a positive residual represents a condition in which the CEO was overpaid because the CEO's actual total pay was greater than his or her predicted total pay, whereas a negative residual suggests underpayment because the CEO's actual total pay was less than his or her predicted total pay.

Because the hypothesized effects of under- and overpayment are not symmetrical, and because it is likely that individuals make comparisons with others who are better and more expert than themselves (O'Reilly *et al*., 1988), we used these residuals to construct two categorical variables to capture those CEOs who were clearly under- or overpaid with respect to the going labor market rate. *CEO underpayment* was coded as equal to 1 when the CEO's residual wage score was in the lowest quartile of all CEO residual scores in the sample, and 0 otherwise. *CEO overpayment* was coded as equal to 1 when the CEO's residual wage score was in the highest quartile in the sample, and 0 otherwise. Thus, the omitted reference group comprises those CEOs who were paid more closely to the executive labor market rate (i.e., 'fairly paid'; CEOs in the sample whose residuals were in the second and third quartiles).

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Ownership structure

Consistent with previous research, ownership structure of the firm was measured using a five percent equity-holding threshold (Tosi and Gomez-Mejia, 1989; Hambrick and Finkelstein, 1995) to sort organizations into our previously mentioned three categories (McEachern, 1975): (1) *MC* is measured as a dummy variable equal to 1 in which no single equity holder owns five percent or more of the organization's common stock, 0 otherwise; (2) *OM* is measured as a dummy variable equal to 1 in which the CEO owns five percent or more of the common stock, 0 otherwise; and, (3) *OC* is measured as a dummy variable equal to 1 in which at least one equity holder, who is not the CEO, owns five percent or more of the common stock, and 0 otherwise. Given the hypotheses, OC firms are the omitted reference category in the tests of the hypotheses for voluntary CEO withdrawal and firm size, and MC firms are the omitted reference category in the tests of hypotheses pertaining to firm profitability.

Control variables

We controlled for several CEO and organizational characteristics as well as corporate governance variables shown by previous research to be pertinent to the current analyses. First, with regard to CEO characteristics, we controlled for *CEO age* and near retirement in the analysis of CEO withdrawal to further distinguish voluntary turnover (withdrawal) from nonvoluntary turnover. *Near retirement* was measured as a dummy variable equal to 1 if the CEO was age 63 or older, and 0 otherwise. Controlling for CEO age and near retirement should help to isolate voluntary withdrawal because they account for turnover due to age (DeFond and Park, 1999) and forced retirement (Shen and Cannella, 2002). *CEO tenure* was also incorporated into all of the analyses, measured as the number of years the CEO has held his or her current position, as this has been shown to be a proxy for the political processes (i.e., CEO power) that may affect CEO compensation (e.g., Finkelstein and Hambrick, 1989; Hill and Phan, 1991) and withdrawal (Salancik and Pfeffer, 1980).

In terms of organizational characteristics, *resource availability* was incorporated as a control variable in all of the analyses under the assumption that greater organizational slack (Cyert and March, 1992) offers more opportunities for CEOs to take actions that affect organizational outcomes (Hambrick and Finkelstein, 1987). It was measured as a composite index of the firm's average retained earnings (net of depreciation) and dividend payout ratio (dividends per share divided by earning per share) (Bourgeois, 1981). *Firm profitability*, measured as ROA, was included as a control in the analyses of voluntary CEO withdrawal and change in firm size. *Firm size,* measured as described earlier (i.e., PCA composite index), was entered as a control in the analyses of withdrawal and change in firm profitability. We also controlled for *prior change in firm size* and *prior change in firm profitability*, which capture these respective changes prior to the initial year we observe under- or overpayment for a given CEO, in the change in firm size and the change in firm profitability analyses, respectively. Thus, our analyses account for these types of changes prior to the initial observation of under- or overpayment. The degree of *total diversification* was also included in the analysis of the change in firm size, as this may be related to firm growth. It was measured using the entropy measure of diversification (Jacquemin and Berry, 1979),

$$TD = \sum_{i=1}^{N} P_i \ln(1/P_i),$$

where N is the number of industry segments in which the firm does business (defined by the four-digit standard industrial classification [SIC] code), and P_i is the percentage of firm sales in the ith industry segment.

Finally, we controlled for several corporate governance variables, as the discretion to pursue managerial objectives is purported to be constrained by a 'bundle of governance mechanisms' (Rediker and Seth, 1995: 87; Jensen, 1993). *Director ownership* was included because shareholdings by board members other than the CEO may also represent a powerful check on the CEO (Fama, 1980). Director ownership is measured as the total percentage of shares held by the directors (less the percentage of shares held by the CEO, since the CEO is included in this total). *Institutional ownership* may also constitute a potential check on managerial discretion (Davis and Thompson, 1994). To eliminate any overlap between the Security Exchange Commission's 13(f) reporting of the percentage of a firm's common voting shares held by institutions

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and institutional holdings captured in the owner-controlled ownership category (i.e., institutional holdings of 5% or more), we used the residuals of a regression of the average percentage of a firm's common voting shares held by institutions on the average percentage of five percent block-holding to measure institutional ownership. The *outsider ratio*, the most commonly used indicator of board power in corporate governance research (Dalton *et al*., 1998), was calculated as the number of outside directors divided by the total number of directors. *CEO duality* was measured with a dummy variable equal to 1 if the CEO holds both the chief executive officer and chairman of the board positions, and 0 otherwise, because such, duality should afford CEOs more power (Finkelstein, 1992). *Incentive pay*, measured as the proportion of CEO total pay that comprises long-term incentive pay (i.e., long-term incentive pay, stock options, restricted and unrestricted stock grants, and deferred compensation), was also included as it is a key governance mechanism used by boards to help align managerial interests with shareholders' interests.

Analytical method

The data of our study consists of a panel design in the form of repeated observations over time nested within firms, which are in turn nested within industries. Therefore, we used hierarchical linear modeling (HLM) (Raudenbush and Bryk, 2002) as our statistical analytic technique because it affords a modeling of the relationship over time that CEO under- and overpayment has with the outcome in question while simultaneously accounting for the nesting of these relationships within firms and industries, thereby providing unbiased and efficient estimates of the regression coefficients and their standard errors despite the dependence among observations (Bryk and Raudenbush, 1989). It does so by simultaneously modeling three levels of analysis (for illustration purposes, we present the model specification for the change in firm size analysis as all other analyses are of a similar nature):

$$Y_{tij} = \pi_{0ij} + \pi_{1ij}(ROA)_{t-1,ij} + \pi_{2ij}(CEO\ underpayment)_{t-1,ij} + \pi_{3ij}(CEO\ overpayment)_{t-1,ij} + \pi_{4ij}(CEO\ tenure)_{t-1,ij} + \pi_{5ij}(Incentive\ pay)_{t-1,ij} + \varepsilon_{tij} \quad (1)$$

$$\pi_{0ij} = \beta_{00j} + \beta_{01j}(MC) + \beta_{02j}(OM) + \beta_{0Qj}(Control\ Variables) + r_{0ij} \quad (2)$$

$$\pi_{1ij} = \beta_{10j} \quad (2a)$$

$$\pi_{2ij} = \beta_{20j} + r_{2ij} \quad (2b)$$

$$\pi_{3ij} = \beta_{30j} + r_{3ij} \quad (2c)$$

$$\pi_{4ij} = \beta_{40j} \quad (2d)$$

$$\pi_{5ij} = \beta_{50j} \quad (2e)$$

$$\beta_{00j} = \gamma_{000} + \mu_{00j} \quad (3)$$

$$\beta_{01j} = \gamma_{010} \quad (3a)$$

$$\beta_{02j} = \gamma_{020} \quad (3b)$$

$$\beta_{0Qj} = \gamma_{0Q0} + \mu_{0Qj} \quad (3c)$$

$$\beta_{10j} = \gamma_{100} \quad (3d)$$

$$\beta_{20j} = \gamma_{200} + \mu_{20j} \quad (3e)$$

$$\beta_{30j} = \gamma_{300} + \mu_{30j} \quad (3f)$$

$$\beta_{40j} = \gamma_{400} + \mu_{40j} \quad (3g)$$

$$\beta_{50j} = \gamma_{500}, \quad (3h)$$

where the indices t, i, and j denote time, firms, and industries with $t = 1, 2, \ldots, n_{ij}$ time periods within firm i in industry j; $i = 1, 2, \ldots, I_j$ firms within industry j; and $j = 1, 2, \ldots, J$ industries.

In this modeling, Equation 1 models the time level in which the change in firm size in the focal year (i.e., year t) of firm i in industry j (Y_{tij}) is regressed upon the previous year's *CEO underpayment* and *CEO overpayment* (i.e., both in year $t-1$) of firm i in industry j as well as the previous year's firm *ROA, CEO tenure*, and *incentive pay* (i.e., year $t-1$) of firm i in industry j. All of these time-level relationships were grand mean centered (see Hofmann and Gavin, 1998), and thus the intercept of Equation 1, π_{0ij}, represents the mean change in firm size across time for firm i in industry j, adjusted for the effect of the time-varying variables.

The intercept of Equation 1, π_{0ij}, is modeled simultaneously as the outcome in Equation 2, and is regressed on the ownership structure variables (MC and OM) and control variables (*director ownership, institutional ownership, outsider ratio, duality, resource availability, prior change in firm size*, and *total diversification*); thus β_{0Qj} represents

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the vector of coefficients β_{03j} through β_{09j}) variables expected to explain between-firm variance. The intercept of Equation 2, β_{00j}, thus represents the mean change in firm size of all firms in industry j adjusted for these firm-level predictors (again, given grand mean centering).

Equation 3 simultaneously models β_{00j} as a dependent variable in a cross-sectional industry model, where γ_{000} is the grand mean of change in firm size. Furthermore, as shown in Equations 1, 2, and 3, each level of analysis has its own unique random error term: e_{tij} represents the *across-time* residual; r_{ij} the *between-firm* residual; and, μ_j the *between-industry* residual. Finally, as these equations also show, HLM models the slopes of the relationships at both the time and the firm levels as outcome variables at the higher levels of analysis (Equations 2a–2e and 3a–3h), and these were modeled at the subsequent levels as fixed or random based upon what best fit the data (Raudenbush and Bryk, 2002).

The above modeling demonstrates several advantages of using HLM for this analysis. First, the partitioning out of the variance (i.e., into across time, between-firm, and between-industry) effectively controls for industry effects and thus alleviates the need to adjust variables (i.e., subtracting out industry means, industry dummy variables, etc) in an attempt to control for such effects (Bloom and Milkovich, 1998). Second, the modeling of the slopes as outcomes allows for the testing of the moderating hypotheses regarding ownership structure by regressing the slope of the relationship proposed to be moderated (in this case, π_{2ij}, the relationship between $CEO\ underpayment_{t-1,ij}$ and change in firm size (Y_{tij})) on the ownership structure variables. This is accomplished by modeling the ownership structure variables in Equation 2b above:

$$\pi_{2ij} = \beta_{20j} + \beta_{21j}(MC) + \beta_{22j}(OM) + r_{2ij} \tag{2b}$$

Finally, because the analysis of CEO withdrawal involves a binary outcome, we used a hierarchical generalized linear model (HGLM); this procedure has the positive attributes of HLM as well as appropriately tests binary outcomes using a Bernoulli sampling model and logit link (Raudenbush and Bryk, 2002).

RESULTS

The simple correlation matrix of the variables included in the tests of the hypotheses appears in Table 1.

Tables 2–4 report the results of the hypothesis testing. All of the tables have the same format: Model 1 reports the models containing just the control variables, Model 2 reports the main effects of CEO under- and overpayment on the dependent variables, and Model 3 reports the results pertaining to the moderating effect of ownership structure on these relationships. The measure of model fit is reported in the form of a likelihood ratio (LR) test comparing the more restrictive model to the null model (model with no predictors) (Raudenbush and Bryk, 2002).

Table 2 shows the results with regard to the relationship between CEO underpayment and change in firm size. The results shown in Model 2 suggest that there is a significant positive relationship between CEO underpayment and change in firm size ($p < 0.05$), thus supporting Hypothesis 1. Compared to CEOs paid more closely to the labor market rate, significantly greater increases in firm size are observed from underpaid CEOs. As Model 3 in Table 2 shows, however, ownership structure does not moderate the relationship between CEO underpayment and change in firm size. Contrary to Hypothesis 4, the relationship between CEO underpayment and change in firm size does not differ across ownership structures.

Hypothesis 2 predicted a positive relationship between CEO underpayment and voluntary CEO withdrawal. As Model 2 in Table 3 shows, this hypothesis is supported: there is a significant relationship between CEO underpayment and voluntary CEO withdrawal ($p < 0.05$), which suggests that underpaid CEOs are more likely to voluntarily withdraw from the CEO position than are CEOs who are paid more closely to the labor market rate. Model 3 in Table 3 shows that Hypothesis 5 is also supported as ownership structure moderates this relationship as predicted: underpaid CEOs in OC firms are more likely to voluntarily withdraw than are underpaid CEOs in MC ($p < 0.001$) and OM ($p < 0.001$) firms.

Finally, Table 4 reports the results of the tests of the relationship between CEO overpayment and change in firm profitability. As Model 2 shows, the results are consistent with Hypothesis 3:

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Table 1. Means, standard deviations, and correlations for variables

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. CEO overpayment	0.25	0.43	1.00																			
2. CEO underpayment	0.26	0.43	−0.34*	1.00																		
3. Change in firm size	−0.08	2.68	0.01	−0.01	1.00																	
4. Change in firm profitability	−0.18	19.37	0.01	−0.03	0.01	1.00																
5. CEO withdrawal	0.05	0.23	−0.02	0.06*	0.00	−0.04	1.00															
6. Prior change in firm profitability	1.33	38.76	0.00	−0.02	0.03	0.00	0.00	1.00														
7. Prior change in firm size	0.00	1.82	0.01	0.02	−0.01	0.00	0.00	0.00	1.00													
8. Manager-controlled	0.05	0.22	0.01	0.00	0.01	0.00	0.01	−0.01	0.00	1.00												
9. Owner-managed	0.23	0.42	0.02	−0.02	−0.01	−0.03	−0.04*	−0.02	0.03	−0.08*	1.00											
10. Institutional ownership	0.01	0.23	0.00	−0.06*	0.05*	−0.02	0.00	0.00	0.00	−0.11*	−0.20*	1.00										
11. Director ownership	0.12	0.16	−0.01	0.09*	0.01	0.00	0.03	0.00	−0.04*	−0.12*	0.08*	−0.27*	1.00									
12. Duality	0.69	0.46	−0.02	−0.06*	0.01	0.00	−0.11*	0.05*	0.03	0.10*	0.18*	0.06*	−0.11*	1.00								
13. Outsider ratio	0.73	0.15	−0.08*	0.01	−0.01	−0.01	0.05*	0.02	0.02	0.04*	−0.28*	0.21*	−0.07*	−0.06*	1.00							
14. Resource availability	0.01	0.99	0.08*	−0.10*	0.00	0.00	−0.02	0.01	0.00	−0.27*	0.08*	0.04*	0.08*	−0.08*	−0.07*	1.00						
15. Firm profitability	0.01	0.20	−0.06*	0.04*	−0.01	−0.31*	−0.04*	0.02	0.01	0.04*	0.09*	0.26*	0.03	0.06*	0.00	0.04*	1.00					
16. Firm size	0.10	1.73	−0.09*	0.10*	0.02	−0.01	0.02	0.01	0.05*	0.33*	−0.17*	0.27*	−0.15*	0.13*	0.17*	−0.33*	0.26*	1.00				
17. Total diversification	0.17	0.30	−0.03	−0.01	0.01	−0.01	−0.01	−0.03	0.01	0.05*	−0.07*	0.09*	−0.15*	0.04*	0.07*	−0.07*	0.07*	0.26*	1.00			
18. Incentive pay	0.36	0.32	0.09*	−0.09*	0.00	0.00	−0.02	−0.02	0.02	0.07*	−0.25*	0.24*	−0.14*	−0.04*	0.16*	−0.04*	0.01	0.11*	0.03	1.00		
19. Nearing retirement	0.16	0.37	−0.02	−0.02	0.02	−0.01	−0.09*	0.06*	−0.05*	−0.05*	0.15*	−0.10*	0.00	0.14*	−0.15*	0.01	0.03	−0.04*	0.05*	−0.17*	1.00	
20. CEO age	54.45	8.47	−0.02	−0.05*	0.03	0.01	−0.10*	0.05*	−0.12*	0.03	0.09*	−0.07*	−0.07*	0.19*	−0.08*	−0.04	0.03	0.05*	0.12*	−0.18*	0.68*	1.00
21. CEO tenure	8.27	8.17	−0.02	−0.01	0.01	−0.02	−0.23*	0.02	−0.07*	0.01	0.34*	−0.08*	−0.10*	0.28*	−0.21*	0.07*	0.09*	−0.06*	0.01	−0.19*	0.42*	0.44*

* $p < 0.05$, two-tailed.

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Table 2. Results of the tests of the change in firm size hypotheses[a]

Variables	Change in firm size		
	Model 1	Model 2	Model 3
Intercept	−0.09*	−0.11*	−0.11*
	(0.05)	(0.05)	(0.05)
Resource availability	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)
Manager-controlled	0.04	0.03	0.11†
	(0.04)	(0.05)	(0.07)
Owner-managed	−0.04	−0.05	−0.02
	(0.03)	(0.03)	(0.04)
Director ownership	−0.13	−0.18	−0.03
	(0.19)	(0.18)	(0.17)
Institutional ownership	0.16	0.17	0.23
	(0.13)	(0.13)	(0.14)
Duality	0.08†	0.10*	0.08†
	(0.05)	(0.05)	(0.05)
Outsider ratio	−0.13	−0.15	−0.12
	(0.14)	(0.16)	(0.14)
Total diversification	−0.03	−0.01	−0.03
	(0.06)	(0.06)	(0.06)
Firm profitability	0.05	0.04	0.03
	(0.07)	(0.07)	(0.07)
CEO tenure	0.00	0.01	0.00
	(0.01)	(0.01)	(0.01)
Incentive pay	0.22	0.19	0.20
	(0.18)	(0.16)	(0.16)
Prior change in firm size	−0.11	−0.05	−0.09
	(0.08)	(0.03)	(0.08)
CEO overpayment		−0.08	−0.09
		(0.05)	(0.06)
CEO underpayment		0.14*	0.15†
		(0.06)	(0.08)
Slope of the relationship between CEO underpayment and change in firm size			
Manager-controlled			−0.16
			(0.10)
Owner-managed			−0.11
			(0.12)
χ^2	30.53	96.04***	91.93***

[a] Robust standard errors in parentheses.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed.

there is a significant positive relationship between CEO overpayment and change in firm ROA ($p < 0.05$), suggesting that greater increases in ROA are observed from overpaid CEOs as compared to CEOs paid more closely to the labor market rate. Model 3 in Table 4 shows the results with regard to Hypothesis 6, which predicted a moderating effect of ownership structure on the relationship between CEO overpayment and change in firm ROA. The results show that the relationship between CEO overpayment and change in firm ROA is weaker in MC firms compared to OC firms ($p < 0.05$), thus supporting Hypothesis 6. The results comparing MC firms to OM firms are only weakly supported ($p < 0.10$; two-tailed test); because the results are in the predicted direction, however, they suggest support for Hypothesis 6 based upon a one-tailed test ($p < 0.05$).

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Table 3. Results of the tests of the CEO voluntary withdrawal hypotheses[a]

Variables	CEO withdrawal		
	Model 1	Model 2	Model 3
Intercept	−2.87***	−2.82***	−2.64***
	(0.17)	(0.14)	(0.11)
Resource availability	−0.14***	−0.13***	−0.11***
	(0.03)	(0.02)	(0.02)
Manager-controlled	−0.07	−0.05	0.39†
	(0.34)	(0.21)	(0.15)
Owner-managed	−0.48*	−0.39*	−0.06
	(0.24)	(0.16)	(0.13)
Director ownership	0.11	0.04	−0.03
	(0.60)	(0.43)	(0.32)
Institutional ownership	−0.72	−0.66*	−0.53*
	(0.45)	(0.32)	(0.23)
Duality	−0.66***	−0.52***	−0.45***
	(0.17)	(0.13)	(0.11)
Outsider ratio	0.45	0.34	0.18
	(0.61)	(0.45)	(0.33)
Firm profitability	−0.44	−0.42*	−0.38*
	(0.28)	(0.21)	(0.16)
Incentive pay	0.89*	0.84**	0.80***
	(0.35)	(0.28)	(0.21)
Firm size	0.13*	0.14***	0.12***
	(0.06)	(0.04)	(0.03)
CEO age	−0.03*	−0.03**	−0.03**
	(0.01)	(0.01)	(0.01)
CEO tenure	−0.37***	−0.31***	−0.22***
	(0.04)	(0.03)	(0.02)
Nearing retirement	0.15	0.37	0.51*
	(0.38)	(0.28)	(0.21)
CEO overpayment		0.15	0.12
		(0.14)	(0.10)
CEO underpayment		0.27*	0.39**
		(0.13)	(0.12)
Slope of the relationship between CEO underpayment and withdrawal			
Manager-controlled			−0.73***
			(0.21)
Owner-managed			−1.01***
			(0.27)
χ^2	371.33***	388.93***	394.45***

[a] Robust standard errors in parentheses.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed.

DISCUSSION

The findings of the current study demonstrate an important aspect of how the CEO labor market works—CEO pay that deviates too far above or below labor market rates has significant consequences with regard to firm outcomes. As such, our findings contribute to the growing literature that has shown that CEO pay inequity not only impacts the CEO compensation setting process, but also that there are subsequent outcomes that are influenced by such deviations. Although previous

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Table 4. Results of the tests of the change in firm profitability hypotheses[a]

Variables	Change in firm performance		
	Model 1	Model 2	Model 3
Intercept	−0.28	−0.04	0.13
	(0.53)	(0.43)	(0.39)
Resource availability	−0.15	−0.09	−0.10
	(0.11)	(0.07)	(0.07)
Owner-controlled	0.76	0.13	−0.04
	(0.50)	(0.38)	(0.34)
Owner-managed	1.25*	0.47	0.28
	(0.56)	(0.46)	(0.44)
Director ownership	−0.71	−0.55	−0.55
	(0.65)	(0.51)	(0.52)
Institutional ownership	−1.34†	−0.80	−0.80
	(0.79)	(0.66)	(0.65)
Duality	−0.50*	−0.36	−0.36
	(0.25)	(0.23)	(0.23)
Outsider ratio	0.69	0.14	0.14
	(0.70)	(0.67)	(0.67)
Incentive pay	0.27	−0.01	−0.01
	(0.46)	(0.35)	(0.36)
Firm size	0.09	0.10	0.09
	(0.06)	(0.06)	(0.06)
CEO tenure	0.02	0.01	0.01
	(0.02)	(0.02)	(0.02)
Prior change in firm profitability	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
CEO overpayment		0.67*	−0.95
		(0.29)	(0.83)
CEO underpayment		−0.01	0.36
		(0.35)	(0.40)
Slope of the relationship between CEO overpayment and change in firm profitability			
Owner-controlled			1.67*
			(0.86)
Owner-managed			1.78†
			(1.08)
χ^2	15.15	303.34***	304.49***

[a] Robust standard errors in parentheses.
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two tailed.

studies have examined how boards of directors (i.e., CEO compensation committee members) react to CEO pay deviations (Ezzamel and Watson, 1998; O'Reilly *et al*., 1988; Porac *et al*., 1999) and how the overpayment of CEOs affects lower-level managers' pay and turnover (Wade *et al*., 2006), our study is among the first to investigate whether CEO under- and overpayment has effects with regard to CEOs themselves (see also Watson *et al*., 1996). We did so by examining whether CEO pay deviations are related to firm outcomes that would theoretically help CEOs to resolve their own sense of equity.

Our results suggest that when there is CEO pay inequity, as assessed by comparing CEO compensation to a compensation equation that represents the CEO labor market rate for the CEO, CEOs may take actions to resolve their own equity considerations. Organizational theories of equity and fairness suggest that people are motivated to maintain

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fair relationships with others and to rectify unfair relationships by making them fair. In the current case, this means that CEOs compare themselves to other CEOs in similar conditions, and finding themselves overpaid or underpaid, take actions to rectify this condition. The explanation is similar to that put forth by Wade *et al*. (2006), who suggest CEOs may be interested in resolving fairness issues concerning their own pay and other people's outcomes. By increasing firm profits or firm size to a greater extent than do more fairly paid CEOs, over- and underpaid CEOs, respectively, are following norms of fairness by rectifying their unfair relationship with those who are ultimately responsible for the CEO's compensation—shareholders. Because the growth of the firm provides the CEO with intrinsic rewards, in addition to extrinsic rewards and quite possibly at the expense of shareholders, our findings suggest that the situation may be made more equitable for an underpaid CEO through increasing firm size. Another way it appears that underpaid CEOs can resolve their dissonance is through the voluntary withdrawal from their firms, presumably to pursue what they perceive to be more equitable alternatives. On the other hand, our results clearly suggest that increasing firm profitability may make the situation fairer for the overpaid CEO. Given that there is a clear expectation that CEOs, be they owner-managers or hired professional managers, exert their efforts toward the interests of shareholders, increasing their efforts toward firm profitability resolves dissonance in a manner congruent with CEO motivational needs.

Our findings with regard to the moderating effect of ownership structure further suggest that the discretion to pursue managerial objectives plays a role in these relationships. With regard to CEO voluntary withdrawal, we found that underpaid CEOs in OC firms were more likely to withdraw than were CEOs in either MC firms, as the latter are not constrained by a dominant owner, or CEOs of OM firms, who are the dominant owners themselves. We found no differences across ownership structures, however, with regard to increases in firm size among underpaid CEOs. The main effect in this regard, nevertheless, still tends to confirm managerialist psychological contentions: it appears that increases in firm size, regardless of the degree of discretion afforded CEOs, is a viable means for resolving underpayment inequity. Finally, in the case of firm profitability, our findings are consistent with the notion that CEOs in MC firms may reduce their overpayment dissonance through cognitive means more so than do CEOs in OC and OM firms. To the extent that overpaid CEOs are conflicted between self-interested and fairness-based concerns (Messick and Sentis, 1983; Peters *et al*., 2004), and because the latter concerns are likely to weigh more heavily in the judgments of CEOs of OC or OM firms thereby resulting in behavioral responses (i.e., increased efforts), overpaid CEOs of MC firms may simply cognitively redefine their overpayment in a manner congruent with self-interested motivations. Our results were supportive: we found that MC firms with overpaid CEOs were less likely to increase firm profits than OC or OM firms with overpaid CEOs.

The asymmetry in results between the under- and overpaid conditions, as well as these moderating effects of ownership structure, point to some of the important insights that the equity lens brings to the study of CEO compensation. That is, although all CEOs of publicly traded corporations have compensation packages that tie their financial rewards to firm profits, from a norms of fairness standpoint the increasing of effort toward firm profitability doesn't resolve dissonance for an underpaid CEO (i.e., where rewards are not requisite to inputs). Because the underpayment payment condition already incorporates the presence of pay-for-profits mechanisms, any increases in effort toward such firm performance by the CEO in this situation would not tend to increase outcomes in a manner that would resolve the CEO's underpayment inequity. Thus, CEOs who are underpaid, instead, appear to focus their efforts toward increasing firm size in an attempt to increase their own outcomes (Marris, 1964; 1998; Tosi *et al*., 1999; Williamson, 1964) or toward pursuing other employment. Overpaid CEOs (i.e., where rewards are more than requisite to inputs), in contrast, will exert more effort toward firm profitability because such an action is congruent not only with norms of fairness, but also with the power and achievement motivational needs likely to characterize CEOs (Simon, 1947; Marris, 1964; Williamson, 1964; McClelland and Boyatzis, 1982; Davis *et al*., 1997). In short, once equity considerations are taken into account, the workings of CEO compensation mechanisms, such as incentive alignment, appear to be much more complex than portrayed

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by economic accounts that rely solely upon extrinsic motivations and rewards. Rather than simply being shirkers, our study suggests that CEOs facing payment inequity will tend to increase their efforts, but to what ends these efforts are directed seems to be a function of the inequity condition: when overpaid, CEOs direct their efforts toward shareholders' interests, whereas when underpaid, CEOs don't adhere to this conventional wisdom as they direct their efforts toward their own interests.

Given our findings, it may be tempting to simply conclude that much of the worry concerning excess CEO compensation is overblown. After all, isn't the labor market (in tandem with fairness norms) working if overpaid CEOs are putting forth effort toward increasing firm profits (and, furthermore, that underpaid CEOs are the ones more likely to pursue managerial interests)? We resist such an interpretation of our results. If nothing else, the social comparison processes apparently at work in the executive labor market may tend to have a *ratchet effect* on CEO compensation—extant evidence suggests that CEO pay is already being 'ratcheted up' through a continuous cycle of compensation committees increasing CEO pay in their effort to keep up with the CEO labor market rate (Bebchuk and Fried, 2004; Ezzamel and Watson, 1998). Thus, to interpret our findings here as a reason to overpay CEOs would only further contribute to such a ratcheting effect, and such ratcheting can only lead to excessive CEO pay from a societal standpoint (see Walsh, 2008). Our findings with respect to the moderating effect of ownership structure only serve to further highlight the complexity involved in CEO compensation in the face of equity concerns. If overpaid CEOs with unconstrained discretion (i.e., MC firms) redress their overpayment through cognitive means, then not all overpayment situations are alike. It appears that the presence of financial incentives is not the essential ingredient for increased CEO effort—such rewards appeal to the self-interested side of the conflicted feelings that an overpaid CEO may experience. Instead, what is required is a mechanism that triggers the fairness-based concerns of overpaid CEOs (i.e., the presence of a dominant owner). In the end, our study and its findings, along with previous research on CEO payment inequity (Wade *et al*., 2006), clearly point to the need for an increased understanding of how CEOs' fairness concerns affect both the CEO compensation setting process as well as other firm outcomes.

Limitations and future research implications

When evaluating these results, nevertheless, there are a few limitations to be kept in mind. For the most part, these pertain to the difficulties surrounding the measurement of the phenomena under study. We do not measure dissonance directly. Instead we infer that CEOs recognize when their pay deviates from the going labor market rate. Also, it is not such a leap to say that CEOs care about their compensation given the research showing they can, and may, influence consultants (Tosi and Gomez-Mejia, 1989), that organizations should be concerned over the bidding away of CEOs (Ezzamel and Watson, 1998; Fama, 1980), and that CEOs are concerned with fairness issues surrounding pay (Wade *et al*., 2006). Future research that examines CEO perceptions of the managerial labor market, if possible, and in particular that which investigates the processes underlying the link between social comparisons, dissonance, and organizational outcomes would therefore stand to greatly enhance our understandings of the workings of this labor market. We have also embraced the assumptions, based upon previous theory and research, that CEOs characteristically possess relatively high power and achievement needs (e.g. Simon, 1947; Marris, 1964; Williamson, 1964; McClelland, 1975; McClelland and Boyatzis, 1982; Davis *et al*., 1997), and moreover, that the dissonance felt by overpaid CEOs is a function of both self-interested and fairness-based concerns (Walster *et al*., 1978; Messick and Sentis, 1983; Peters *et al*., 2004). Future research that could tap into the degree to which these motivations characterize CEOs of publicly traded companies are thus clearly required to further our understanding of CEOs' fairness judgments, particularly when they are overpaid.

Also noteworthy is that although our model specifications afforded a time lag in the tests of the hypotheses, as with any study utilizing archival data we can only infer causality from the current findings. Furthermore, our study's design investigated whether there was a relationship between CEO under- and overpayment and a selection of subsequent firm outcomes—we did not examine the specific initiatives taken by these CEOs to address their dissonance. For instance, future

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research in this regard could examine whether underpaid CEOs tend to employ particular strategic actions (i.e., diversification) to effect firm growth. Moreover, our choice to examine firm profitability, specifically ROA, was guided by previous research as well as because accounting-based indicators are more directly attributable to CEO actions than are other more market-based proxies (i.e., shareholder returns, earnings per share; Fryxell and Barton, 1990). Thus, future research could investigate whether other measures of firm performance play a role in CEOs' attempts to resolve payment inequity. For example, MC firms have been found to be associated with income smoothing, and the manipulation of earnings and accounting methods (i.e., versus OC firms; for reviews see Hunt, 1986; Tosi *et al*., 1999). Thus, there may be an alternative means to that studied here by which underpaid CEOs of MC firms may resolve their underpayment condition—by increasing profitability via accounting manipulation, thereby increasing their outcomes without an increase in effort. For that matter, since CEOs of OC firms are also hired managers, such manipulation of performance indicators also plausibly stands as a means by which, relative to owner-manager CEOs, they too could affect their payment inequity. Future research could therefore investigate whether or not the manipulation of performance indicators serves as a mechanism by which CEOs faced with payment inequity resolve their dissonance.

With respect to the measurement of CEO payment inequity, while it is unknown as to what constitutes an under- or overpayment condition to CEOs themselves, it would appear that employing some type of threshold when studying the effects of CEO pay inequity is warranted given that perceptions of equity in this realm may involve idiosyncratically defined comparison groups (Porac *et al*., 1999) and that there may be a tendency to make social comparisons to 'others who are seen as slightly better or more expert' (O'Reilly *et al*., 1988: 262). We followed previous research to measure pay inequity via a CEO wage equation (Ezzamel and Watson, 1998; Wade *et al*., 2006; Watson *et al*., 1996)—which uses the 'going market rate' as the referent for inequity. We captured under- and overpayment conditions as being those CEOs paid in the lower and upper quartiles of the sample firms, respectively, thereby accounting for any potential idiosyncratic, or upward, comparisons. To the extent that CEOs personalize their social comparison groups or choose to compare themselves to those slightly more expert than themselves, a focus upon extremely under- or overpaid CEOs for their requisite abilities should compensate for such occurrences. For instance, the dissonance of CEOs paid in the upper quartile should not be alleviated simply by comparing themselves to slightly more expert peers. Given our findings, focusing upon these extremes appears to serve as a good proxy, at least when it comes to the study of how CEOs attempt to resolve their own pay inequity. Indeed, we performed a *post hoc* analysis in which we reestimated the models using continuous measures of under- and overpayment and the results were not robust to this alternative specification. Thus, although it appears that some type of threshold is warranted, future research is needed to develop a better understanding of whether there is any potential asymmetry in the limits to the threshold across the two different inequity conditions (i.e., under- versus overpayment) as well as to understand the degree to which idiosyncrasy plays a role in CEOs equity judgments.

Whether or not CEOs who are underpaid resolve their dissonance through changing the outcomes of their present situation via firm growth or through voluntarily withdrawing from their firms is, in part, a function of the desirability of the alternatives that are available to each CEO. Thus, one of the major limitations of the current study is that we were not able to measure or evaluate these alternatives. Furthermore, although we have hypothesized that CEOs resolve their dissonance either through increasing firm size or voluntarily withdrawing, it is plausible that a third alternative exists that combines these two options: CEOs may initially opt to grow their firms and subsequently decide to withdraw if this fails to reduce their dissonance. To investigate this possibility, we performed a *post hoc* analysis in which we examined whether or not the relationship between increases in firm size and CEO underpayment is stronger among those CEOs in the sample who stayed with their firms throughout the study period as compared to those CEOs who voluntarily withdrew. The results of this *post hoc* analysis tend to support such a third scenario—while this relationship was positive ($p < 0.05$) among those firms wherein the CEO stayed, the relationship was not significant among those firms in which the CEO voluntarily withdrew. Thus, given the longitudinal nature of

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our data and analyses, these findings along with those in support of Hypotheses 1 and 2 would suggest that the alternatives of staying and affecting outcomes versus pursuing alternative situations are not mutually exclusive over time and that both are viable options. In the end, although tapping into the set of alternatives available to CEOs may be an intractable issue for any research effort, as the true nature of such an alternative set would seem unknowable to anyone other than to the CEOs themselves, future research that could investigate this is surely warranted.

Finally, related to this last issue is our operationalization of CEO withdrawal—because our hypotheses clearly pertain to voluntary withdrawal, we chose a measure that only considered those CEOs who left their position and also became a director or retained a previously held directorship on the firm's board of directors (e.g., Shen and Canella, 2002). Thus, our study represents a very strict test of voluntary withdrawal, and although this only serves to strengthen our analysis, it does not examine those cases where CEOs voluntarily left the firm to take other opportunities outside of the firm and did not also retain a directorship. Given our conservative approach, we performed several *post hoc* analyses to explore the potential boundaries of our findings. The results with regard to the relationship between CEO underpayment and CEO voluntary withdrawal (Hypothesis 2) and the moderating relationship of ownership structure to this relationship (Hypothesis 5) were robust across all of the following *post hoc* tests: the reestimation of the models wherein CEO withdrawal excluded all CEOs who are near retirement (i.e., 63 years old or older); the reestimation of the models wherein CEO withdrawal excluded retirements identified through proxy statements; the reestimation of the models wherein CEO withdrawal included the CEOs who simply left the firm but did not stay on the board; and the reestimation of the models wherein CEO withdrawal excluded those withdrawals that occurred in firms performing below the industry average. In total then, the findings of this study support the notion that CEOs may use withdrawal to resolve the dissonance created by an underpayment situation. Again, given that we did not capture the alternatives faced by exiting CEOs, future research directed toward investigating this issue are greatly needed to further develop an understanding of CEO voluntary withdrawals.

CONCLUSION

The work of social comparison processes in the executive labor market has received increasing attention from researchers interested in understanding CEO compensation. The findings of our study contribute to this understanding by suggesting that CEOs may take actions to resolve their own equity considerations, and because the observed outcomes are in a manner consistent with managerial capitalism and organizational theories of fairness, these actions have significant consequences for CEOs and shareholders alike. Our findings clearly suggest that both of the outcomes associated with the underpayment of CEOs tend to help CEOs resolve this inequity, resolutions that come at the expense of shareholders. Furthermore, this study suggests that a focus upon relative labor market pay in the study of CEO compensation, rather than the conventional approach of using firm performance as the referent, provides additional insight into the excess of CEO compensation. Indeed, it suggests that overpaying CEOs may have some beneficial effect in that this condition results in increased profitability relative to that gained by CEOs who are not overpaid. But, such a conclusion must also consider the *ratcheting effects* in CEO compensation that are very possible once we recognize the workings of social comparisons and discretionary processes within the labor market context. In the end, it appears that simply thinking about the magnitude of CEO pay or the alignment of CEO pay when studying CEO compensation misses a crucial aspect of CEO self-interest: CEOs may also care about their pay relative to the going rate in the labor market. Furthermore, it seems that not all payment inequity conditions are created equally in this regard: while self-interested and fairness-based concerns are consistent in the underpayment condition, they present a conflict in the overpayment condition. When overpaid, CEOs appear to follow their fairness-based concerns unless they have the discretion to indulge their self-interested concerns. Therefore, our study and its findings, which builds upon the growing amount of research that examines social comparison processes in CEO compensation, suggest that more future research into how CEOs address their own pay inequity is not only warranted, but can potentially shed much light upon the alignment of CEO and shareholder interests.

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APPENDIX: USING A CEO WAGE EQUATION TO ESTIMATE CEO UNDER- AND OVERPAYMENT

Similar to previous research (Wade *et al*., 2006; Watson *et al*., 1996), a CEO wage equation was constructed that regressed total CEO pay on several organizational, human capital, and structural variables that theory and evidence suggest are determinants of CEO compensation. Thus, the residuals from the regression represented CEO under- and overpayment relative to the labor market rate. Our sample included 6,076 observations over time within 1,342 CEOs—we used the Bayesian estimation afforded in the HLM analytical methodology, which allows for the use of all the available information from CEOs with missing data to develop residual scores for CEOs with full rank data (Raudenbush and Bryk, 2002). As expected with such a large dataset, there was missing data. Also, because we estimated CEO residuals in each year, we were able to use those CEOs with only one year of data in the estimation of residuals. In essence, we were able to incorporate all of the information contained in the initial sample of CEOs (i.e., the data we initially pulled before removing those instances that did not allow for lagged analysis and those with missing data—and thus the difference between the sample size here and the ones used for the tests of the hypotheses) to determine relative pay for those CEOs without missing data; although we were able to use the information from CEOs with missing data, no residual score was created for such CEOs.

Model specification

A two-level 'random coefficients' model was run to estimate CEO under- and overpayment in each year, which consisted of a firm level and an industry-level (grouped by four-digit SIC code). As explained in the analytical method section, this model specification accounts for any industry labor market effects (Bloom and Milkovich, 1998), and properly models firms' compensation committees use of comparable firms within the industry to set CEO pay (Porac *et al*., 1999).

Firm-level model

$$\begin{aligned} ln(CEO\ total\ pay)_{ij} &= \beta_{0j} + \beta_{1j}(Firm\ Size)_{ij} \\ &+ \beta_{2j}(Firm\ Profitability)_{ij} + \\ &\beta_{3j}(Owner - managed)_{ij} + \beta_{4j} \\ &(Manager - controlled)_{ij} + \beta_{5j}(Outsider \\ &Ratio)_{ij} + \beta_{6j}(Duality)_{ij} + \beta_{7j}(CEO\ Age)_{ij} \\ &+ \beta_{8j}(CEO\ Tenure)_{ij} + \beta_{9j}(Inside\ hire)_{ij} + \\ &\beta_{10j}(CEO\ Experience)_{ij} \\ &+ \beta_{11j}(Location)_{ij} + r_{ij} \end{aligned} \quad (A1)$$

Industry-level model

$$\beta_{0j} = \gamma_{00} + \mu_{0j} \quad (A2)$$
$$\beta_{1j} = \gamma_{10} + \mu_{1j} \quad (A2a)$$
$$\beta_{2j} = \gamma_{20} + \mu_{2j} \quad (A2b)$$
$$\beta_{3j} = \gamma_{30} + \mu_{3j} \quad (A2c)$$
$$\beta_{4j} = \gamma_{40} + \mu_{4j} \quad (A2d)$$
$$\beta_{5j} = \gamma_{50} + \mu_{5j} \quad (A2e)$$
$$\beta_{6j} = \gamma_{60} + \mu_{6j} \quad (A2f)$$
$$\beta_{7j} = \gamma_{70} + \mu_{7j} \quad (A2g)$$
$$\beta_{8j} = \gamma_{80} + \mu_{8j} \quad (A2h)$$
$$\beta_{9j} = \gamma_{90} + \mu_{9j} \quad (A2i)$$
$$\beta_{10j} = \gamma_{100} + \mu_{10j} \quad (A2j)$$
$$\beta_{11j} = \gamma_{110} + \mu_{11j}, \quad (A2k)$$

where the indices i and j denote firms and industries with $i = 1, 2, \ldots, n_j$ firms within industry j; and $j = 1, 2, \ldots, J$ industries; all variables are measured in a manner consistent with that described in the methods section; *CEO total pay* is measured consistent with previous research (e.g., Gomez-Mejia *et al*, 1987; Jensen and Murphy, 1990): it consists of CEO cash compensation plus all other types of rewards including long-term incentive pay, stock options, restricted and unrestricted stock grants, and deferred compensation. Stock options are valued using a modified version of the Black-Scholes (1973) method,

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which allows for the inclusion of dividend payments (Murphy, 1985). All long-term contingent pay including stock options are valued in the year they were granted. Data were obtained from both the Execucomp database as well as annual proxy statements; *inside hire* was measured as a dummy variable equal to 1 if the CEO was an inside hire and 0 otherwise (e.g., Buchholtz, Ribbens, and Houle, 2003); *CEO experience* accounts for the CEO's previous position within any given organization (chairman, president, etc.); and finally, *location* was accounted for in the estimation because CEOs in close proximity may be very salient to pay issues and more likely to make comparisons (Galaskiewicz, 1985, 1997). Location was measured as a dummy variable such that CEOs in the dataset were clustered based on proximity using a 50 mile radius. The location of any given CEO was based on the physical address of the CEO's organizational headquarters. From this clustering, locations were given a dummy coding based on having at least 10 CEOs within a cluster. Approximately 65 percent of the CEOs were located in one of the 17 location dummies specified using this method. For example, there were at least 10 CEOs located within a 50 mile radius of Washington, D.C. based on the physical address of the CEOs' organizational headquarters. Because dummy variables were used, the 35 percent of CEOs not in any given cluster were represented in the intercept (i.e., they make up the reference category).

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