

WHEN MUCH MORE OF A DIFFERENCE MAKES A DIFFERENCE: SOCIAL COMPARISON AND TOURNAMENTS IN THE CEO'S TOP TEAM

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We integrate the seemingly contradictory theoretical predictions of behavioral and economic perspectives about the relationship between pay disparity and firm performance and show that tournament and social comparison theories are more supplementary than contradictory in nature. Our results show that high levels of firm performance will be found around either meaningfully low or meaningfully high levels of pay disparity. Additional findings indicate that this curvilinear relationship is weakened in the presence of both an heir apparent and high CEO power, and strengthened when top management team members are more eligible as CEOs. These findings suggest that factors that increase or inhibit social comparison or tournament perceptions among TMT members play a role in the strength of the curvilinear relationship between pay disparity and firm performance. Copyright © 2013 John Wiley & Sons, Ltd.

INTRODUCTION

The distribution of executive rewards within organizations has long been a subject of research and debate in the organizational theory, economics, finance, and strategic management literatures. In this broad set of interconnected literatures, a pattern of seemingly contradictory theoretical traditions and results emerge about the relationship between pay disparity—or the size of the observed differences between chief executive officer (CEO) incomes and those of other executives in the top management team (TMT)—and firm performance. Some scholars, particularly within the economics and finance traditions, find that pay disparity is

positively related to firm performance (Eriksson, 1999; Lin and Lu, 2009; Mondello and Maxcy, 2009). However, pay disparity is also found to have a negative effect on firm performance by research primarily within the organizational theory and management traditions (Fredrickson, Davis-Blake, and Sanders, 2010; Henderson and Fredrickson, 2001; Siegel and Hambrick, 2005).

Given this inconsistency in findings, it could be concluded that the overall link between executive pay disparity and firm performance is either not meaningful or is contingent on the organizational context (Bloom and Michel, 2002; Henderson and Fredrickson, 2001; Pfeffer and Langton, 1993; Siegel and Hambrick, 2005; Wright *et al.*, 2005). While these views seem plausible, the question of the general relationship between pay disparity and firm performance still raises several theoretical and empirical issues that require additional research attention. First, there is scarce large-sample research evidence of the relationship

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because most empirical studies have been conducted on specialized samples (i.e., Bloom, 1999; Ehrenberg & Bognanno, 1990). Second, the theoretical background for arguing for either a positive or a negative relationship between pay disparity and firm performance may not have yet been addressed in full. In particular, researchers do not seem to have addressed some of the main theoretical propositions of the underlying theories (e.g., the similarity hypothesis in social comparison and the size of the prize in tournament theory) that point to an integrative rather than competitive utilization of both theories to explain the relationship between pay disparity and firm performance.

In this study, we seek to address these issues by first integrating the seemingly contradictory theories of the relationship between pay disparity and firm performance. Previous research in both the behavioral and economics traditions study social comparison and tournament theories as if they were steadily contradictory to each other—that is, as if one consistently damped firm performance through reduced collaboration in the TMT and the other consistently strengthened firm performance through increased competition in the TMT. To the best of our knowledge, no attempts have been made to integrate both views. We argue that economic logic (tournament theory as presented by Lazear and Rosen, 1981) is mostly relevant when the level of pay disparity is high enough to incite competition for a prized trophy (the CEO position). Also, behavioral logic (social comparison as presented by Festinger, 1954) is primarily relevant when the level of pay disparity is not high enough to disrupt comparison effects. Accordingly, social comparison and tournament theory can supplement each other at different levels of pay disparity while remaining internally consistent with their theoretical traditions. Specifically, we propose and find that high levels of firm performance will be found around either meaningfully low or meaningfully high levels of pay disparity.

We then address the important and tangible effects of several factors related to the perceived opportunity for succession of TMT members to the CEO position on the relationship between pay disparity and firm performance. Specifically, we consider the moderating effects of both structural aspects of the organization (having an heir apparent or CEO power) and various characteristics of TMT members that are relevant to their potential to be named CEOs (TMT members' eligibility for

promotion). For example, we expect limited if any tournament effects in organizations where an heir to the CEO position exists, because naming a successor symbolically ends the current tournament without starting a new one. These effects are fundamental to our understanding of the effect of pay disparity on firm performance not only because they extend our understanding of the main hypothesized curvilinear relationship, but also because they serve as empirical tests of the core assumptions of our theorizing (Miller and Tsang, 2011). As such, they may provide internal support to the mechanisms of tournament theory and social comparison theory as relevant explanations of the relationship between pay disparity and firm performance. We use longitudinal data on executive compensation, TMT members' characteristics, and organizational succession planning and performance among publicly traded North American firms listed in the *Fortune* 500 to help integrate management and economic explanations of the relationship between pay disparity and firm performance and provide quasi-experimental tests of the implied theoretical mechanisms.

WHEN TOO MUCH OF A DIFFERENCE MAKES A DIFFERENCE

Both social comparison and tournament theories speak directly to pay disparity (or size of the observed differences between CEO incomes and those of other executives in the top management team) and firm performance (Henderson and Fredrickson, 2001; Siegel and Hambrick, 2005). According to social comparison approaches (Crosby, 1976; Festinger, 1954), individuals engage in social comparisons to evaluate their rewards (Adams, 1965; Henderson and Fredrickson, 2001; Siegel and Hambrick, 2005) and experience relative deprivation when they perceive that they receive less in comparison to similar others (Cowherd and Levine, 1992; Crosby, 1976; Fredrickson, Davis-Blake, and Sanders, 2010; Siegel and Hambrick, 1996), particularly those in higher organizational ranks (Henderson and Fredrickson, 2001). Because of the public nature of the compensation of the CEO and the highest paid members of the TMT, across rank comparisons between CEO pay and the pay of the highest paid members of the TMT are likely to exist (Henderson and Fredrickson, 2001; Siegel

and Hambrick, 1996, 2005). When such comparisons exist, large pay gaps are likely to reduce commitment to organizational goals, cohesiveness, satisfaction, efficient information processing, coordination, and collaboration, leading to lower firm performance (Cowherd and Levine, 1992; Martin, 1981; Siegel and Hambrick, 2005). Therefore, according to theory and evidence on the social comparison tradition, large pay gaps between the CEO and the TMT diminish firm performance.

On the contrary, in tournament theory approaches, the high-paying CEO position is seen as the prize of a succession tournament to which members of the TMT have a claim. Because large prizes are inherently motivating (Becker and Huselid, 1992; Ehrenberg and Bognanno, 1990), higher paying differentials at the CEO level will result in improved efforts, reduced shirking, and better alignment between efforts and organizational interests (Green and Stokey, 1983; Henderson and Fredrickson, 2001; Lazear and Rosen, 1981; Main, O'Reilly, and Wade, 1993). Therefore, according to theory and evidence in the tournament theory tradition, large pay gaps between the CEO and the TMT increase firm performance.

We argue that research based on these theories can benefit from addressing some previously overlooked fundamental theoretical aspects that suggest they have complementary rather than opposing theoretical predictions for the relationship between pay disparity and firm performance. First, the core proposition in Festinger's (1954) social comparison theory is that individuals will compare themselves with similar others (Wood, 1989). This "similarity hypothesis" is not acknowledged by applications of social comparison theory to the relationship between pay disparity and firm performance. But it is a fundamental aspect of both social comparison theory and the relative deprivation theories used to make the connection between pay disparity and firm performance (Martin, 1981; Siegel and Hambrick, 1996). Relative deprivation is also theoretically targeted at a "similar other" so that individuals tend to want what similar others possess (Cartwright and Harary, 1956; Crosby, 1976). The issue with pay disparity and the similarity hypothesis is that pay disparity will dramatically affect perceptions of similarity. Top executives tend to have much in common (Hills, 1980; O'Reilly, Main, and Crystal, 1988; Wade, O'Reilly, and Pollock, 2006) and comparisons between them are strengthened or

weakened by perceptions of similarity in a variety of attributes like age, tenure, status, power, performance, and pay. A large pay disparity diminishes perceptions of similarity because it is indicative of differences in executives' perceived power (Finkelstein, 1992), status (Finkelstein, Hambrick, and Cannella, 2009; Frank, 1984), and inherent performance (Lambert, Larcker, and Weigelt, 1993). A CEO who is rewarded with very large pay disparity in comparison to the TMT may be an example of the powerful taking more for themselves (Finkelstein and Hambrick, 1996) or a recognition of performance expectations or status, that makes that CEO inherently different from his/her top team and therefore less relevant as a choice for social comparison. In line with the referent choices literature criteria, pay is a very visible, relevant, and available source of information (Kulik and Ambrose, 1992) about one executive's performance relative to others (e.g., the CEO) and is therefore readily available for people to use in selecting referents for comparison or targets for tournament.

We argue that this ease of use of pay as referent selection criteria combined with its implications for power, status, inherent performance or other differentiating characteristics makes it one more important criterion for referent choice. Since power, status, and perceptions of performance are relevant surrounding indicators of similarity available for comparison, and since objective standards are usually unavailable (Martin, Suls, and Wheeler, 2002) or mostly disregarded when comparing to others (Martin, 1981), high paid members of a TMT will not see CEOs who enjoy very large gaps in pay as "similar others." In fact, people tend to compare themselves with others who are above but close to them in rank order (e.g., Wheeler *et al.*, 1969). Therefore, social comparison and relative deprivation theories have limited predictive ability about the effects of pay disparity on performance when the levels of pay are high enough to reduce perceptions of similarity. A CEO who enjoys very large pay gaps compared to the highest paid members of the TMT is less likely to be seen as a social comparison target for them and therefore is less likely to result in relative deprivation perceptions for them.

Second, as Henderson and Fredrickson (2001: 98) discuss, tournament theory was developed to "explain the very large gaps typically observed between the pay of CEOs and the pay of

executives directly below them." By looking at a consistent effect of pay disparity on firm performance, researchers fail to address the fact that the theory only applies to the incentive effects of "large first-place prizes," "very large gaps" in pay, "extreme succession tournaments" in which there is significant pay inequality at the top level, and the "disproportionate weight in the purse" of the tournament (Lazear and Rosen, 1981; Main *et al.*, 1993; Rosen, 1986; Siegel and Hambrick, 2005). Therefore, tournament theory makes limited if any predictions for medium to low levels of pay disparity.

Consistent with these arguments, we see tournament theory as a complement to social comparison approaches at high levels of pay disparity. As the gap in pay between CEOs and the highest paid members of the top management team becomes large, the incentive to advance in the tournament will rule over the relative deprivation effects of social comparison in these high paid members of the TMT who have been shown to be achievement oriented, power seeking, and status driven (Finkelstein, Hambrick, and Cannella, 2009). We, therefore, combine the social comparison predictions of a negative relationship between pay disparity and firm performance at low to medium levels of pay disparity with the tournament theory predictions of a positive relationship between pay disparity and firm performance at high levels of pay disparity. Consistently we expect decreasing performance as pay disparity increases from small to moderate and increasing performance when pay disparity increases from moderate to high and tournament effects become active. This will result in high performance at both low and high levels of pay disparity and low performance at moderate levels of pay disparity, where the negative effects of social comparison have negatively affected performance levels and the tournament effects are yet not relevant to help organizational performance. Figure 1(a) shows the opposing predictions of social comparison and tournament theory about the relationship between pay disparity and firm performance. Figure 1(b) shows the complementary predictions of both theories according to this reformulation (shown in gray) and the expected combined curvilinear relationship between pay disparity and firm performance (shown in bold).

Therefore, we expect that high firm performance will be found around either meaningfully low or meaningfully high levels of pay disparity and

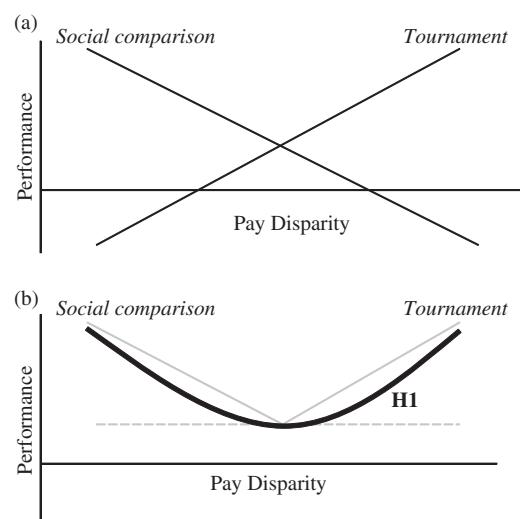


Figure 1. (a, b) Theoretical integration of social comparison and tournament theory

that performance will decrease consistent with social comparison theory until the point at which tournament effects reverse the trend creating low performance or the bottom curve of a U at moderate levels of pay disparity.

Hypothesis 1: Firm performance will have a U-shaped relationship with executive pay disparity.

Our hypothesis—that tournament theory-type incentives take over the relationship between pay disparity and firm performance as pay disparity becomes large can be further explored and tested by studying the conditions that may affect TMT members' participation in succession tournaments and their effect on performance. To the extent that a tournament may cease to exist as, for example, in the presence of an heir apparent, then we should not expect to see tournament-like incentives take over the relationship between pay disparity and firm performance. On the other hand, to the extent that TMT members can see themselves as more likely to be elected as, for example, when they share the characteristics of the CEO at the time of his/her appointment as CEO, then we would expect tournament-like effects to be stronger and at lower levels of pay disparity.

POSTPONEMENTS TO THE SUCCESSION TOURNAMENT: THE HEIR APPARENT

The most common form of succession planning in corporate America is the selection of an heir apparent (Vancil, 1987). This process is generally referred to as a “relay succession” in which the heir apparent is selected by the organization well in advance of a succession event and the subsequent time period is utilized to “groom” the heir apparent for the top job. The selection of an heir apparent has both substantive and symbolic consequences for TMT members (Cannella and Lubatkin, 1993; Cannella and Shen, 2001; Shen and Cannella, 2002; Zajac and Westphal, 1996). Consistent with Hypothesis 1 in which we argue for a positive tournament-like effect to take over the negative social comparison effects of pay disparity on firm performance at high levels of pay disparity, we argue here that, in the presence of an heir apparent, such tournament-like effects will either not exist or be greatly diminished.

When an organization implements a process of succession planning in which an heir apparent is crowned, the opportunity of advancement for other TMT members is obviously diminished. The heir apparent is selected by the CEO and is deemed to be the second-in-command, beginning a power transition period (Cannella and Lubatkin, 1993). While the heir apparent may not always be promoted in the end, the appointment of a successor will have political and behavioral implications for other TMT members (Cannella and Shen, 2001). In line with predictions from tournament theory, because the election of an heir apparent eliminates or at least significantly reduces the opportunity to win the CEO succession tournament for non-heir TMT members, the incentives to TMT members predicted by tournament theory (Lazear and Rosen, 1981) will thus be removed by the election of an heir apparent. In essence, the presence of an heir apparent signals an end of the current succession tournament and therefore diminishes or cancels the emergent tournament effects at high levels of pay disparity. Thus, we expect the presence of an heir apparent to eliminate or at least greatly reduce the tournament effects of pay disparity on firm performance. Additionally, we do not expect the presence of an heir apparent to affect feelings of deprivation based on social comparison effects. Therefore we expect that in the presence of an

heir apparent social comparison effects are going to reduce performance as pay disparity grows and will persist in the absence of positive tournament effects. In the presence of a heir apparent we expect a mostly negative rather than U-shaped relationship between pay disparity and performance. The presence of an heir apparent will moderate the U-shaped relationship between pay disparity and firm performance so that the presence of an heir apparent will reduce the increasing pattern of performance at high levels of pay disparity.

Hypothesis 2: Executive pay disparity will have a U-shaped relationship with firm performance in the absence of an heir apparent and a negative relationship with firm performance in the presence of an heir apparent.

CONSTRAINTS TO THE SUCCESSION TOURNAMENT: CEO POWER

We argue that power differential between the CEO and the CEO's top team will have a significant effect in terms of the tournament incentives of pay disparity for TMT members. CEO power will have meaningful implications for TMT member incentives as predicted in tournament theory. Powerful CEOs are reluctant to abdicate (Sonnenfeld, 1986; Vancil, 1987; Zajac and Westphal, 1996) and CEO power is visible to others in the TMT when there are, for example, significant differences in power in the form of different ownership positions, titles within the organization, or pay differentials between the CEO and the members of the CEO's top team (Finkelstein, 1992). In line with predictions from tournament theory, because CEO power constrains or postpones the opportunity to win the CEO succession tournament for less powerful TMT members, the incentives for TMT members predicted by tournament theory (Lazear and Rosen, 1981) will be lessened or invalidated in the presence of large power differentials between the CEO and the CEO's top team. Thus, CEO power implies a significant constraint to the succession tournament. The perceived time horizon for succession will significantly reduce tournament-type incentives for TMT members in the presence of powerful CEOs. Because we do not expect CEO power to affect feelings of deprivation based on social comparison effects, we expect that under high CEO power, comparison effects are going to

reduce performance as pay disparity grows and will persist in the absence of positive tournament effects. Therefore, under high CEO power, we expect a mostly negative relationship between pay dispersion and performance because, in organizations with powerful CEOs, tournament-like effects will be significantly weaker or even nonexistent. CEO power will moderate the relationship between executive pay disparity and firm performance weakening tournament effects.

Hypothesis 3: Executive pay disparity will have a U-shaped relationship with firm performance when CEO power is low and a negative relationship with firm performance when CEO power is high.

SIMILARITY ENHANCES SOCIAL COMPARISON AND TOURNAMENT PARTICIPATION: TMT MEMBER ELIGIBILITY

TMT eligibility or the similarity in relevant characteristics between the CEO and the CEO's top team, we argue, will have a significant effect in terms of both social comparison effects and tournament incentives of pay disparity for TMT members. First, the "similarity hypothesis", a core proposition in Festinger's (1954) social comparison theory states that individuals will compare themselves with similar others (Wood, 1989), implying that feelings of relative deprivation due to social comparison emerge from comparisons with a "similar other" so that individuals tend to want what similar others possess (Cartwright and Harary, 1956; Crosby, 1976). The issue with TMT eligibility to the CEO position and the similarity hypothesis is that TMT eligibility will dramatically affect perceptions of similarity between TMT members and the CEO. Previous research shows that insider succession potential (i.e., CEO eligibility) is positively related to the maintenance of CEO characteristics (Hambrick and Fukutomi, 1991) and that firms tend to repeat previous guidelines in electing their CEOs (Ocasio, 1999). Consistent with these findings, insider successors who would not imply changes in CEO characteristics would be more eligible as CEOs, but this similarity will make them more likely to compare socially their income to the income of the CEO. Eligible TMTs are more similar to the CEO in organizationally relevant

characteristics and are therefore more likely to experience relative deprivation in the presence of high pay disparity between them and the "similar" CEO. Therefore, social comparison and relative deprivation theories have strong predictive ability about the effects of pay disparity on performance when TMT eligibility is high enough to enhance perceptions of similarity. A CEO who is noticeably different compared to the highest paid members of the TMT is less likely to be seen as a social comparison target for them and therefore is less likely to result in relative deprivation perceptions for them. Having highly eligible, TMT members can increase feelings of relative deprivation in TMT members and their negative effects on commitment to organizational goals, cohesiveness, satisfaction, efficient information processing, coordination, and collaboration that reduce firm performance (Cowherd and Levine, 1992; Martin, 1981; Siegel and Hambrick, 2005). Therefore, we expect that social comparison effects, the downtrend in the U-shaped relationship between pay disparity and performance, will be stronger for firms with highly eligible TMTs.

Second, when looking at tournament effects, one important though under-researched aspect of tournament theory is that the chances of winning the tournament by being elected CEO affect the pay disparity needed to create significant tournament-like incentives for TMT members. Previous research has shown, for example, that a large pool of competitors will require larger pay disparities in order to incentivize participants because the number of competitors reduces each individual participant's chances of winning the tournament by becoming CEO (Henderson and Fredrickson, 2001; Main *et al.*, 1993; O'Reilly, Main, and Crystal, 1988). We focus here on how the TMT members' chances of winning the tournament by being promoted to the CEO position are affected by TMT member characteristics. As previously stated, firms tend to repeat previous guidelines in electing their CEOs (Hambrick and Fukutomi, 1991) and therefore TMT members who are most like the current CEO have an increased probability of becoming the new CEO (Ocasio, 1999). Consistent with these findings, TMT members who would not imply changes in CEO characteristics would be more eligible as CEOs and therefore more responsive to the tournament-like incentives of pay disparity. Since eligibility will increase tournament-like incentive

responsiveness to pay disparity, we argue that the more eligible the members of the TMT are for the CEO position, the lower the pay disparity needed to incentivize performance and the larger the incentive to perform at similar levels of relevant pay disparity. TMT eligibility reflects the comparison between the aggregated individual level characteristics at the team level and the same characteristics of the CEO. Applied to the curvilinear prediction of Hypothesis 1, in which we argue for a positive tournament-like effect to take over the negative social comparison effects of pay disparity on firm performance at high levels of pay disparity, we argue here that in TMTs with high member eligibility such tournament-like effects will be significantly stronger. TMT member eligibility will therefore moderate the U-shaped relationship between executive pay disparity and firm performance so that higher TMT member eligibility will strengthen both the social comparison effects of pay disparity on performance and the tournament effects of pay disparity on performance resulting in a significantly steeper U-shaped relationship. Therefore,

Hypothesis 4: Under conditions of high TMT member eligibility, the U-shaped relationship between pay disparity and firm performance will be more pronounced than under conditions of low TMT eligibility.

METHODS

Sample

The population for this study includes all traded firms listed in the *Fortune* 500 and based in North America from 2003 through 2006. Following prior research (e.g., Sanders, 2001; Wright *et al.*, 2005; Zajac and Westphal, 1996), (1) 197 firms were excluded from the final sample because complete demographics for CEO-TMT members or other data were unavailable for more than one quarter of the executives in each year (Jensen and Zajac, 2004; Westphal and Zajac, 1995) and (2) 76 firms were excluded from the final sample because they belonged to four-digit Standard Industrial Classification (SIC) categories for industries that are highly regulated (e.g., life insurance companies, financial institutions, utilities, government-owned corporations) because governmental oversight may

influence the strategic choices made by these firms and contribute to their unique data-reporting requirements (McNamara, Aime, and Vaaler, 2005; Wright *et al.*, 2005). The firms in our sample were selected from the Fortune 500 list in the starting period and then tracked for the rest of the study period, regardless of whether or not they stayed on the Fortune 500 list. Our resulting sample yielded 227 firms, and t-tests revealed no significant differences in size (measured as sales or number of employees) or performance (measured as return on assets) between our sample and the original population for the study. Data were collected for all years following the implementation of the Sarbanes-Oxley Act, and the final sample represents our sample of interest for the years 2003–2006 with lagged years collected for all predictor variables and additional lagged years included for instrumentation processes. Demographic data were gathered from Mergent Online; *Marquis Who's Who in Finance and Business*; and *The Dun and Bradstreet Reference Book of Corporate Management*. Data on executive compensation were gathered from the Standard and Poor's Execucomp database. Firm-level data were gathered from COMPUSTAT.

Measures

Dependent variable

Performance was measured as the firm's return on assets (ROA) in year $t + 1$. ROA is a common measure of organizational profitability that reflects operational performance and was especially relevant to our study for two reasons. We used ROA as the performance measure in our study because it captures the dimension of performance that is more closely related to top management team functioning—namely, whether management has effectively deployed firm assets (Geletkanycz and Hambrick, 1997)—and is independent of market preferences like market-based measures or financial efficiency considerations like equity-based measures (e.g., Return on Equity [ROE]). Therefore, ROA is a widely used measure of operational performance that is relevant to the hypothesized effects suggested by both social comparison and tournament theorizing and has been utilized in some recent studies that, like ours, look at the effects on performance of members of the CEO's top team (Carpenter and Sanders, 2002;

Fredrickson, Davis-Blake, and Sanders, 2010; Geletkanycz and Hambrick, 1997; Henderson and Fredrickson, 2001).

Independent variables

We follow previous research that defines pay disparity as the difference in pay between the CEO and the top four compensated executives in the TMT (Carpenter, 2002; Carpenter and Sanders, 2002; Fredrickson, Davis-Blake, and Sanders, 2010; Henderson and Fredrickson, 2001). This choice is consistent with previous research for comparison purposes and accounts for the fact that firms are required to report the compensation of the top five paid executives, including the CEO. As in previous research (Henderson and Fredrickson, 2001) this mode of identification of TMT members (i.e., the four top paid executives below the CEO) may either omit TMT members or include persons who are not part of the TMT. However, this should not present a serious problem because as Henderson and Fredrickson (2001: 103) point out the sample firms were large, meaning that "the difference in pay between a firm's CEO and the next highest-ranking executive is typically quite large, and subsequent pay gaps are much smaller and become smaller still if more executives are considered (Lambert *et al.*, 1993). Consequently, the teams studied here may have had other members, but including their pay would likely have had little impact on the calculated size of CEO pay gaps." Specifically, we operationalize *Pay Disparity* as total CEO compensation divided by average total compensation of these TMT members (Siegel and Hambrick, 2005). We defined total compensation as the sum of short-term and long-term compensation because the exclusion of long-term components of compensation would considerably underestimate the remuneration provided to each individual (Lambert *et al.*, 1993). Short-term compensation included salary and bonuses, while long-term compensation was calculated as the sum of restricted stock, stock options, and long-term accounting-based incentive plans (Fredrickson, Davis-Blake, and Sanders, 2010; Siegel and Hambrick, 2005). We used the modified Black-Scholes present value method computed by Execucomp to value stock options (Fredrickson *et al.*, 2010).

Heir Apparent is operationalized as a dichotomous variable with a value of 1 if two criteria are

satisfied if: (1) a TMT member other than the CEO holds the title of president or COO or both and (2) that person is more than four years younger than the CEO. The value is 1 if both criteria are satisfied and 0 otherwise (Hambrick and Cannella, 2004).

CEO Power is operationalized as both Titles and Ownership power. These are characteristics of the power of CEOs and TMT members suggested in the literature as reflecting power within the organization (Finkelstein, 1992). Specifically, we collected both the number of titles of each executive and CEO and the overall shares owned by each executive and CEO (excluding options) in each firm year. The power measures are then the aggregate distance between the CEO and each executive on both ownership level and number of titles, respectively (Westphal and Zajac, 1995; Zajac and Westphal, 1996). Our measure is a variant of the Euclidean distance measure providing a scale invariant indicator of distance between the CEO and TMT members on both ownership and titles. Therefore, *Title/Ownership Power* were measured as:

$$\left(\sum_{i=1}^n \frac{(S_i - S_j)^2}{n} \right)^{1/2}$$

where S_i is CEO title/ownership in the current year, S_j indicates TMT member j 's title/ownership in the current year, and n represents the total number of non-CEO TMT members. Titles power represents the distribution of structural power related to the assignment of formal positions and structures of decision control within the organization. A higher number of official titles has been associated with greater power (Harrison, Torres, and Kukalis, 1988). We constructed the measure as an Euclidian distance between the CEO's number of titles and TMT members' number of titles to represent that the difference in power between a CEO and his/her TMT increases as the difference in the amount of titles increases. The logic here is that a CEO will likely be more powerful over a TMT member who is simply a divisional senior vice-president than over a TMT member who is a divisional senior vice-president and also CFO. Similarly, TMT members will be relatively less powerful when the CEO is also president of a division. The measure combines number of CEO titles which ranges from 1 to 6 with a mean of 2.26 and a standard deviation

of 0.61, and TMT titles, which ranges from 1 to 4 with a mean of 1.65 and a standard deviation of 0.39. Ownership power follows a similar logic based on the traditional notion that shareholdings represent power because they can be either an outcome of power (Finkelstein and Hambrick, 1996) or a source of structural power, reducing board pressures on the executive because of the potential role in voting structures and coalitions.

Previous research has shown that new CEOs tend to resemble the prior CEO (Pfeffer, 1981; Smith and White, 1987; Vancil, 1987). One important aspect to consider in insider succession potential is that they are positively related to the maintenance of CEO characteristics (Hambrick and Fukutomi, 1991; Zajac and Westphal, 1996). Furthermore, because firms rely on past precedence and institutionalized actions in selecting successor CEOs (Ocasio, 1999), we conceive TMT eligibility as TMT characteristics that would maintain the characteristics of the CEO at the time she/he took office.

We examine three TMT eligibility measures based on functional background, age, and tenure characteristics of TMT members as compared to their firms' CEOs at the time they took office. These particular characteristics were chosen because they are considered to be significant references for insider eligibility for promotion to the CEO position and are very often used in the corporate governance literature (Cannella *et al.*, 2008; Carpenter and Fredrickson, 2001; Zajac and Westphal, 1996). To construct measures of eligibility based upon demographic characteristics (age and tenure), we use the distance formula previously presented with the alteration of subtracting each value from the highest value in the sample to convert it into a measure of eligibility (Westphal and Zajac, 1995; Zajac and Westphal, 1996). CEOs' organizational tenures were measured at the time they took office, and the tenure of TMT members was measured in the focal year t . Therefore, *Age Eligibility* and *Tenure Eligibility* provide a measure of similarity of the TMT to the CEO on both age and tenure at the time the CEO took office. Finally, *Functional Eligibility* was calculated as a variant of Blau's (1977) index of heterogeneity, modified following Zajac and Westphal (1996). It was thus defined as $(P_i)^2$, where P_i is the proportion of CEO-TMT member dyads sharing the i th category (Murray, 1989;

Westphal and Zajac, 1995; Zajac and Westphal, 1996). Therefore, the measure *Functional Eligibility* signifies the squared proportion of CEO-TMT member dyads in which both individuals have experience within the same functional area.

To determine functional area experience, functional areas were classified into three categories: throughput functions, (operations, R&D, and engineering); output functions (marketing and sales); and peripheral functions (functional backgrounds such as finance and law) (Hambrick and Mason, 1984; Westphal and Zajac, 1995). Following previous assessments of individuals' functional backgrounds, the categorizations were assessed by utilizing their current and prior job titles together with other aspects of their employment histories such as the organizations for which they worked in the past (e.g., Chaganti and Sambharya, 1987; Michel and Hambrick, 1992; Murray, 1989; Westphal and Zajac, 1995).

Control variables

We included in our analysis several control variables that have been shown to have an impact on firm performance. At the firm level, inertial tendencies associated with *Firm Size* could influence firm performance, and therefore it was included as the logarithm of sales (Hannan and Freeman, 1984). Also at the firm level, *Capital Investment Activity* (annual capital equipment expenditures divided by sales) has been shown to be indicative of coordination needs that influence executive pay disparity effects (Henderson and Fredrickson, 2001); it was included in the analysis. It has also been suggested that top executives in highly diversified companies may be effectively running autonomous businesses, therefore diminishing the amount of coordination of top executives needed in diversified organizations (Hill, Hitt, and Hoskisson, 1992; Michel and Hambrick, 1992). Therefore, *Diversification* was included as a control and measured with the entropy measure for total diversification (Palepu, 1985) such that $\text{diversification} = \sum P_{ia} \ln(1/P_{ia})$, where P_{ia} is the proportion of a firm's sales in business segment i . We additionally include a control for *industry ROA*, measured as the average return on assets for firms in the same two-digit SIC code as the focal firm. Finally, because firm performance may be related to prior performance, *Prior Performance*

was included as a control in our model and measured as the firm's ROA lagged one year.

We also control for executive level effects. First, CEOs who are outside successors may have differential impact on firm performance and TMT integration (Karaevli, 2007; Shen and Cannella, 2002). Outsiders are sometimes appointed to the corporation for a short period of time in preparation for becoming CEOs. Therefore, CEOs were coded as insiders if they had been employees of the company for at least two years *prior* to becoming CEO; otherwise they were classified as *outsiders* (Cannella and Lubatkin, 1993; Henderson and Fredrickson, 2001; Ocasio, 1999) and remain so in the data. Additionally, CEO *Duality* is included as a dichotomous variable with a value of 1 if the CEO also held the position of board chair and 0 otherwise (Zajac and Westphal, 1996). Also, we include the average *TMT Tenure* and *CEO Tenure* since this has been shown to affect firm-level performance. Because our focus is comparison of TMT members to the CEO, we control for possible comparison within the TMT by including *TMT Pay Dispersion*, measured as the coefficient of variation of the pay of the TMT (excluding the CEO; Fredrickson *et al.*, 2010) as well as *Educational Attainment* measured as the proportion of TMT members who have achieved an MBA. Similarly, we include a measure for TMT and CEO similarity in *Elite Education*, measured as the proportion of TMT member/CEO dyads in which both individuals possess a degree from an Ivy League university. Our final controls measure the average compensation of the TMT on both cash and long-term pay. *TMT Cash* is measured as the average cash compensation (cash and bonus) of the TMT, and *TMT long-term* is measured as the average long-term compensation (restricted stock, stock options, and long-term accounting-based incentive plans) of the TMT. Table 1 provides the means, standard deviations, and bivariate correlations for all data pooled.

Data analysis

We use dynamic panel techniques to analyze our data with firm and year fixed effects. In particular, we perform our analysis using the Arellano-Bond method. This dynamic panel technique is especially suited to analyzing autoregressive-distributed lag models from panels with cross-sectional units observed for relatively few time

periods like the panels that are typically used in this area of research. The Arellano and Bond estimator proceeds by transforming regressors through differentiation and using the Generalized Method of Moments (GMM) (Hansen, 1982) in its estimation (Arellano and Bond, 1991; Arellano and Bover, 1995; Greene, 2000). Our GMM estimators include robust standard errors in all models. The GMM estimator treats the model as a system of equations, one for each time period. The equations differ only in their instrument/moment condition sets. Relevant independent and endogenous variables in first differences are instrumented with suitable lags of their own first differences. There are several advantages to this dynamic panel approach in our estimation. First, it controls for lagged values of the dependent variable as performance outcomes are likely related to prior levels of performance. The Arellano and Bond estimator uses instrumental variables to address the classic issue in standard fixed effect models in which including a lagged dependent variable is problematic due to the large probability for that lagged dependent variable to be correlated with the error term (Greene, 2000). Second, GMM estimation with robust standard errors provides better estimates in the presence of unknown heteroscedasticity and autocorrelation in dynamic panels (Arellano, 2003). Finally, since any independent variables that are not strictly exogenous become potentially endogenous because they may be correlated to past and future realizations of the error, it uses deep lagged values of relevant regressors and exogenous variables as instruments of the independent variables to deal effectively with potential endogeneity in our model.

We performed Arellano-Bond tests for autocorrelation and Hansen tests for the validity of the instrumentation strategy. For all of the data included in the paper we failed to reject the null hypothesis of autocorrelation in the first-differenced errors, which means that the Arellano-Bond estimator in our application is asymptotically consistent. Arellano-Bond tests for autocorrelation were applied to the first-difference equation residuals of the balanced matrix following the generalized m_s (Arellano, 2003: 121–123) version of the original Arellano and Bond (1991) m_2 test. Second-order autocorrelation would indicate that some lags of the dependent variable that are used as instruments are endogenous, but the tests reveal no such problem in our models (Arellano, 2003;

Table 1. Means, standard deviations, and correlations

		Mean	S.D.	1	2	3	4	5	6	7	8	9
1	Firm performance (%)	6.43	7.67									
2	Prior performance (%)	6.56	8.03	0.48								
3	Pay disparity	3.12	1.68	0.07	-0.02							
4	Heir apparent	0.20	0.40	-0.04	-0.07	-0.03						
5	Titles power	1.43	0.47	-0.05	0.04	-0.19	0.14					
6	Ownership power ^a	7.76	73.30	0.05	0.05	-0.05	0.13	0.13				
7	Functional eligibility	0.21	0.20	-0.01	-0.01	-0.05	0.02	0.00	-0.07			
8	Tenure eligibility	23.15	5.97	-0.05	-0.11	0.04	0.04	0.08	0.00	0.00		
9	Age eligibility	27.43	5.03	0.11	0.07	0.12	-0.08	-0.05	-0.20	0.09	0.05	
10	CEO tenure	17.72	11.88	0.13	0.16	-0.09	0.25	0.03	0.07	0.01	-0.17	-0.19
11	Outsider	0.33	0.47	-0.04	-0.11	0.07	0.03	-0.01	0.11	-0.08	-0.06	-0.01
12	Duality	0.76	0.42	0.02	0.01	0.16	0.05	-0.14	-0.09	-0.04	-0.15	0.07
13	Pay dispersion	0.37	0.24	-0.01	-0.02	-0.05	0.09	0.04	0.00	-0.06	0.02	-0.20
14	TMT cash ^a	1.60	0.94	0.04	0.16	0.02	-0.01	0.09	0.14	0.02	-0.05	-0.13
15	TMT long-term ^a	2.86	2.58	0.13	0.18	0.21	0.05	0.07	0.12	0.05	-0.05	-0.13
16	TMT tenure	13.98	7.28	0.12	0.18	-0.05	0.04	0.03	-0.05	0.03	-0.41	-0.02
17	Educational attainment	0.37	0.26	0.00	-0.02	-0.01	-0.04	-0.03	0.05	-0.05	0.01	-0.09
18	Diversification	0.64	0.66	0.00	0.02	0.05	0.02	-0.05	0.04	0.01	0.03	0.10
19	Capital investment	0.06	0.05	-0.10	-0.09	-0.04	-0.01	0.02	-0.07	0.07	0.01	0.00
20	Industry ROA	6.05	3.98	0.43	0.57	0.03	-0.01	0.00	-0.04	-0.02	-0.07	0.11
21	Firm size ^b	9.44	0.92	-0.03	0.01	0.04	0.08	0.10	0.00	0.14	-0.11	0.02
22	Elite education	0.56	0.39	0.06	0.04	-0.02	-0.03	0.03	-0.02	0.08	0.02	0.09
		10	11	12	13	14	15	16	17	18	19	20
12	Duality	0.12	0.07									
13	Pay dispersion	0.04	0.00	-0.18								
14	TMT cash ^a	0.07	-0.03	0.00	0.13							
15	TMT long-term ^a	0.10	-0.03	0.04	0.17	0.46						
16	TMT tenure	0.49	-0.38	0.12	-0.04	0.02	0.09					
17	Educational attainment	0.02	0.06	0.05	0.00	0.02	0.02	-0.13				
18	Diversification	0.00	0.07	0.07	-0.04	0.05	0.04	-0.06	0.01			
19	Capital investment	-0.06	0.01	0.00	-0.04	0.02	0.05	0.00	0.04	-0.06		
20	Industry ROA	0.06	0.01	0.02	0.05	0.03	0.12	0.13	-0.07	0.03	-0.23	
21	Firm size ^b	0.16	-0.11	0.09	0.01	0.43	0.38	0.27	-0.02	-0.03	-0.06	0.06
22	Elite education	0.02	-0.12	-0.08	0.00	0.01	0.00	0.10	-0.16	-0.08	0.00	0.07
		21										

^a Scaled by 1,000.^b Logarithm.

Yamagata, 2008). Arellano-Bond tests are reported for all GMM models in Tables 1 and 2.

Also, Hansen test statistics showed that the moment restrictions in our models are valid or, in other terms, that the instruments are exogenous. The Hansen test is used to evaluate the validity of instruments when robust standard errors are used in the estimation of models to address potential heteroscedasticity in the data. The Hansen test was used to evaluate the validity of the moment restrictions or, more simply put, to test that the instruments are not correlated with the error and therefore that the instrumentation of the model is valid. This test actually tests the dual null that

(1) the instruments are not correlated with the errors and (2) the instruments should not have been included as explanatory variables in the model. The statistic for the test under the null hypothesis is distributed as chi-square with degrees of freedom equal to the number of instruments minus the number of predictors. Our tests show that our restrictions are valid (we failed to reject the null hypothesis) in all our models.

The combined results of our tests show that we do not have autocorrelation in the first differenced errors (i.e., the generalized m_s (Arellano, 2003: 121–123) and that our instruments satisfy the standard validity criterion, making us confident

Table 2. Results for pay disparity effects on firm performance

	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	14.197 (16.819)	28.320 (19.205)	29.999 (18.573)	26.403* (11.838)	12.932 (13.461)
Prior performance	0.057 (0.113)	0.049 (0.104)	0.175 (0.136)	0.140 (0.102)	0.153 (0.102)
CEO tenure	0.138 (0.107)	0.054 (0.114)	0.051 (0.120)	0.119 (0.102)	0.088 (0.097)
Outsider	1.956 (4.107)	-3.526 (4.358)	-1.336 (3.398)	-0.753 (2.308)	-1.938 (2.333)
Duality	-3.018 (2.549)	-1.843 (3.186)	-2.001 (1.430)	-1.786 (1.121)	-1.950 (1.420)
Pay dispersion	-2.965 (2.863)	-6.150 (5.003)	-1.273 (1.830)	-2.528 (1.648)	-2.619 (2.065)
TMT cash	0.452 (0.842)	0.720 (1.175)	0.605 (0.581)	0.631 (0.749)	0.249 (0.936)
TMT long-term	0.214 (0.260)	0.303 (0.305)	0.287 (0.197)	0.318 (0.240)	0.336 (0.211)
TMT tenure	0.121 (0.180)	0.190 (0.203)	0.062 (0.149)	0.099 (0.136)	0.062 (0.141)
Elite education	2.027 (4.342)	4.033 (6.384)	4.183 (3.144)	3.606 (3.338)	3.412 (3.926)
Educational attainment	3.391 (4.026)	1.158 (3.373)	0.985 (3.581)	0.459 (2.926)	-0.857 (3.277)
Diversification	-0.641 (2.882)	-0.136 (2.544)	-3.100* (1.438)	-2.243 (1.554)	-2.038 (1.345)
Capital investment	-26.533 (21.856)	-33.160 (24.805)	-23.282 (19.897)	-22.063 (17.713)	-23.189 (17.872)
Industry ROA	0.701* (0.287)	0.705* (0.283)	0.540* (0.253)	0.679** (0.221)	0.604* (0.265)
Firm size	-1.440 (1.543)	-1.639 (1.354)	-2.278† (1.273)	-2.122* (1.036)	-0.922 (1.106)
Functional eligibility	0.843 (4.387)	-1.015 (4.453)	-0.368 (2.942)	-0.086 (3.086)	-1.032 (4.230)
Tenure Eligibility	0.027 (0.168)	0.027 (0.220)	0.034 (0.204)	-0.027 (0.123)	0.016 (0.188)
Age eligibility	-0.101 (0.237)	-0.361 (0.338)	-0.144 (0.210)	-0.128 (0.188)	-0.004 (0.174)
Titles power	-1.670 (1.991)	-1.298 (1.496)	-2.246 (1.840)	-2.353 (2.043)	-1.880 (2.003)
Ownership power	-0.000 (0.003)	-0.000 (0.004)	0.001 (0.003)	0.001 (0.003)	0.009 (0.006)
Heir apparent	-0.563 (3.155)	-0.633 (3.709)	0.907 (2.755)	-0.332 (1.695)	0.800 (1.663)
Pay disparity		-0.962† (0.541)	-0.606 (0.455)	-0.911 (0.455)	-0.262 (0.412)
Pay disparity ²	0.137* (0.056)	0.091* (0.045)	0.164** (0.045)	0.164** (0.062)	0.089* (0.037)
Pay disparity × heir apparent		0.835 (0.935)	(0.088)	0.299 (0.553)	
Pay disparity × titles power		-0.159* (0.088)	-0.082** (0.040)	(0.040)	
Pay disparity ² × titles power				-0.002 (0.003)	
Pay disparity × ownership power				-0.002** (0.001)	
Pay disparity ² × ownership power				0.83 (0.83)	
AR (2)	0.42	0.40			
Hansen	56.82	51.66	69.45	62.49	77.80
Wald χ^2	100.78***	193.65***	1174.16***	423.62***	235.64***

Standard errors in parentheses.

n = 599.

^t—tests are two-tailed for controls and one-tailed for directional hypothesized tests in Models 2, 3, & 4.† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

about the validity of our results, the handling of potential endogeneity, and the adequacy of our use of the Arellano and Bond estimator in our models.

To test the curvilinear interactions of Hypotheses 2–4, we included product terms of our moderators of interest for the linear as well as the squared pay disparity terms (Cohen and Cohen, 1983). We focused on the moderation of the squared terms because they prevent misinterpretation of effect resulting from additivity and linearity in correlated variables (Cortina, 1993; George, 2005) in line with similar investigations of curvilinear interactions in the strategic management literature (e.g., Brown, Sturman, and Simmering, 2003; George, 2005; Richard, Murthi, and Ismail, 2007; Wu, Levittas, and Priem, 2005; Zhang and Rajagopalan, 2010). Since multicollinearity was a potential problem, we followed Aiken and West (1991) and mean-centered each of the variables prior to the creation of interaction terms. We further applied the residual centering procedure because some of our models included multiple two-way interaction terms and a three-way interaction term to minimize multicollinearity between the interaction term (e.g., X_1X_2) and its constituent parts (e.g., X_1 and X_2) in testing curvilinear interactions (Jong, Ruyter, and Wetzel, 2005; Lance, 1988). To do so, we first regressed each interaction term on its components and then saved the residuals for use in our data analyses (Jong *et al.*, 2005; Zhang and Rajagopalan, 2010).

RESULTS

Table 2 reports the results for Hypotheses 1–3. We first show the results for our base model (model 1), which includes all of our control variables. Hypothesis 1 posits that firm performance will have a U-shaped relationship with executive pay disparity. As shown in model 2, the results provide strong support for Hypothesis 1 with a negative linear coefficient and a positive squared term ($0.137, p < 0.05$). As illustrated in Figure 2, firm performance has a U-shaped relationship with pay disparity. These results are practically significant because they show that, as pay disparity moves two standard deviations above the mean in the sample, firm ROA grows by 1.11 percent resulting an additional 274 million dollars in profit for the average firm in the sample while, at two standard deviations below the mean in the sample,

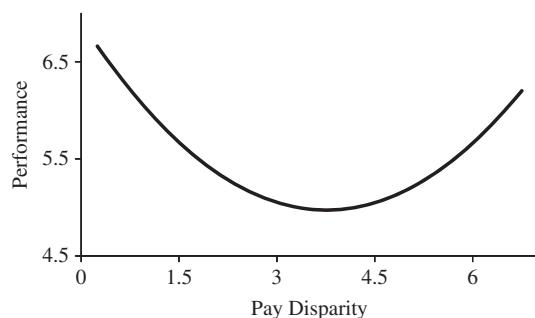


Figure 2. Association of pay disparity and firm performance

firm ROA grows by 1.90 percent resulting in 469 additional million dollars in predicted profit for the average firm in the sample. As the pay disparity between the CEO and TMT widens initially and consistent with social comparison perspectives, we found that firm performance suffers; but as pay disparity becomes meaningfully large, we observed tournament-type predictions for improved performance taking over the relationship between pay disparity and firm performance. In line with our theoretical development, high firm performance is found around meaningfully low or meaningfully high levels of pay disparity.

Hypothesis 2 addresses whether the presence of an heir apparent will reduce the increasing pattern of pay performance at high levels of pay disparity, effectively testing whether the pattern observed in Hypothesis 1 is due to tournament theory-type incentives taking over the relationship between pay disparity and firm performance as pay disparity enlarges. As shown in model 3, the interaction of the squared pay disparity terms and the presence of an heir apparent are statistically significant ($-0.159, p < 0.05$), providing strong support for Hypothesis 2 (Cortina, 1993; George, 2005). Our results indicate that for firms without an heir apparent, there is a tournament effect that will increase predicted ROA by 1.30 percent or an additional 321 million dollars in profits when pay disparity moves two standard deviations above the mean in the sample. In contrast, predicted ROA for firms in which an heir apparent is present is lower when pay disparity moves two standard deviations above the mean in the sample indicating the lack of a tournament effect in the presence of an heir apparent. Figure 3 illustrates this curvilinear interaction and shows that, in the presence of an heir apparent, the relationship between firm

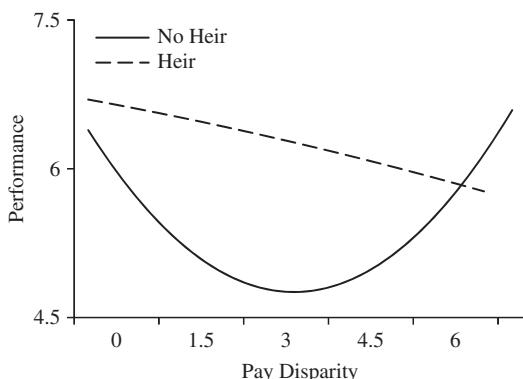


Figure 3. Heir apparent present

performance and pay disparity does not turn positive at high levels of pay disparity. This lends support to the logic of tournament effects as justification for the right arm of the U-shaped relationship in Hypothesis 1; in the absence of a tournament (when firms have an heir apparent), tournament-like effects are not noticeable.

Similarly, models 4 and 5 provide general support for Hypothesis 3. The negative and significant interactions of the curvilinear pay disparity term and both titles power ($-0.082, p < 0.01$) and ownership power ($-0.002, p < 0.01$) support the idea that CEO power attenuates the tournament effects in the relationship between pay disparity and firm performance. These results indicate that CEO power inhibits tournament effects and support our Hypothesis 3. Our results indicate that, for firms in which CEOs have low title power or low ownership power, there is a tournament effect that will increase predicted ROA by 1.38 or 6.4 percent, respectively, when pay disparity moves two standard deviations above the mean in the sample. In contrast, predicted ROA for firms in which CEO power is high (i.e., both title power and ownership power) is lower when pay disparity moves two standard deviations above the mean in the sample indicating the lack of a tournament effect under conditions of high CEO power. Figure 4a and b illustrate these effects.

Hypothesis 4 suggests that TMT member eligibility for the CEO position strengthens the U-shaped relationship between pay disparity and performance, effectively implying that it increases social comparison effects at low levels of pay disparity and also increases tournament effects at high levels of pay disparity. Models 6–8 in Table 3 provide general support for this hypothesis. We find

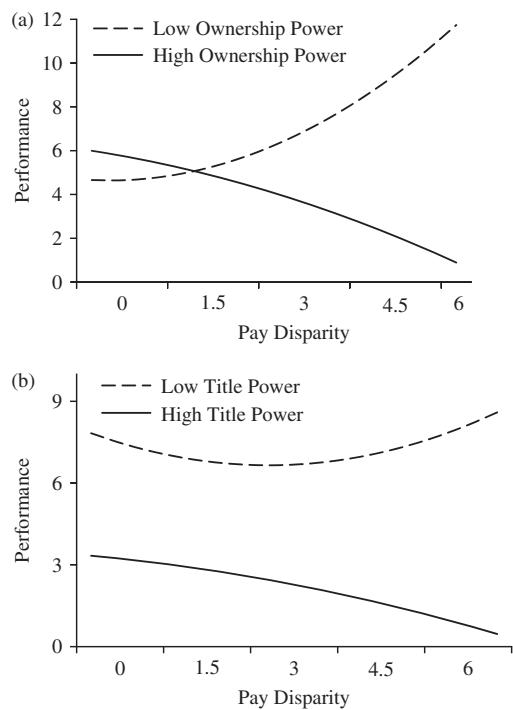


Figure 4. (a) Effects of ownership power. (b) Effects of titles power

positive and significant coefficients for the interaction terms between the squared pay disparity term and functional eligibility ($0.371, p < 0.05$), tenure eligibility ($0.009, p < 0.05$), and age eligibility ($0.015, p < 0.05$). Our results imply that the difference in social comparison effects between teams with high and low top management teams eligibility is practically relevant since it implies a nominal average difference in firm ROA of 1.40 percent (1.81, 0.16, and 2.23% respectively). Similarly, tournament effect differences between teams with high and low top management teams eligibility is practically relevant since it implies a nominal average difference in firm ROA of 3.8 percent (3.19, 4.19, and 4.04%, respectively) when pay disparity goes from the mean to two standard deviations above the mean. Figure 5(a–c) illustrate these curvilinear interactions and show that that the U-shaped relationship between pay disparity and firm performance is stronger for firms with top management teams with high eligibility. This is consistent with the logic that increased TMT member eligibility will result in both more social comparison effects and more tournament-like incentives (because of their potential to “win” the succession tournament). The implications are discussed next.

Table 3. Results for the effects of TMT eligibility on the relationship between pay disparity and firm performance

	Model 6		Model 7		Model 8	
Constant	13.725	(15.759)	16.470	(11.565)	21.426	(14.378)
Prior performance	0.335*	(0.157)	0.287 [†]	(0.154)	0.183	(0.127)
CEO tenure	0.188 [†]	(0.096)	0.190	(0.137)	0.169 [†]	(0.093)
Outsider	2.279	(3.167)	1.082	(2.754)	1.037	(2.889)
Duality	-3.596*	(1.824)	-3.212	(2.126)	-4.090**	(1.479)
Pay dispersion	-0.579	(1.597)	-1.162	(1.740)	-1.759	(1.967)
TMT cash	0.334	(0.786)	0.607	(0.785)	0.642	(0.806)
TMT long-term	0.182	(0.186)	0.220	(0.218)	0.235	(0.182)
TMT tenure	0.042	(0.153)	0.119	(0.106)	0.151	(0.117)
Educational attainment	3.257	(3.975)	2.533	(3.256)	3.936	(4.012)
Elite education	-2.036	(2.337)	-1.570	(2.976)	-0.963	(2.548)
Diversification	-0.092	(1.337)	-0.083	(1.506)	-0.423	(1.873)
Capital investment	5.392	(13.992)	11.013	(19.984)	-5.049	(16.951)
Industry ROA	0.444 [†]	(0.237)	0.505*	(0.222)	0.522*	(0.245)
firm size	-1.278	(0.982)	-1.527	(1.306)	-1.718	(1.186)
Functional eligibility	2.856	(4.890)	1.654	(3.579)	-0.406	(4.005)
Tenure eligibility	-0.059	(0.143)	0.029	(0.118)	-0.025	(0.140)
Age eligibility	0.050	(0.193)	-0.013	(0.158)	0.002	(0.213)
Titles power	-3.811	(2.739)	-4.625*	(2.124)	-4.911*	(2.321)
Ownership power	0.001	(0.003)	0.002	(0.004)	0.001	(0.002)
Heir apparent	-0.710	(2.424)	-0.463	(2.638)	-0.349	(2.437)
Pay disparity	-0.005	(0.428)	-0.404	(0.549)	-0.407	(0.472)
Pay disparity ²	0.032	(0.041)	0.088 [†]	(0.052)	0.073*	(0.034)
Pay disparity × functional eligibility	-0.585	(1.775)				
Pay disparity ² × functional eligibility	0.371*	(0.189)				
Pay disparity × tenure eligibility			-0.050	(0.042)		
Pay disparity ² × tenure eligibility			0.009*	(0.004)		
Pay disparity × age eligibility					-0.074	(0.071)
Pay disparity ² × age eligibility					0.015*	(0.007)
AR (2)	0.97		0.87		0.80	
Hansen	80.26		65.31		80.72	
Wald χ^2	369.27***		139.74***		314.70***	

Standard errors in parentheses.

t—tests are all two-tailed.[†] $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

DISCUSSION

Our main objective was to determine whether seemingly contradictory predictions and findings about the relationship between pay disparity and firm performance could be theoretically resolved and tested by integrating behavioral and economic perspectives. We revisited the basis for both tournament and social comparison theories and acknowledged that, in their complete formulation, they are more complementary than contradictory in nature. We proposed and found that the economic logic of tournament theory (Lazear and Rosen, 1981) is most relevant when the level of pay disparity is high enough to incite competition for a prized trophy and that the

behavioral logic of social comparison (Festinger, 1954) is primarily relevant when the level of pay disparity is not high enough to disrupt comparisons between similar others. Consistent with our theory, our results support a more complex, curvilinear relationship (see Figure 2) where high levels of firm performance are found around either meaningfully low or meaningfully high levels of pay disparity. Accordingly, the two theories can supplement each other at different levels of pay disparity while remaining internally consistent with their theoretical traditions.

Our secondary objective was to extend research on the effects of executive pay structures on firm performance by considering the impact of a series of conditions that might significantly affect social

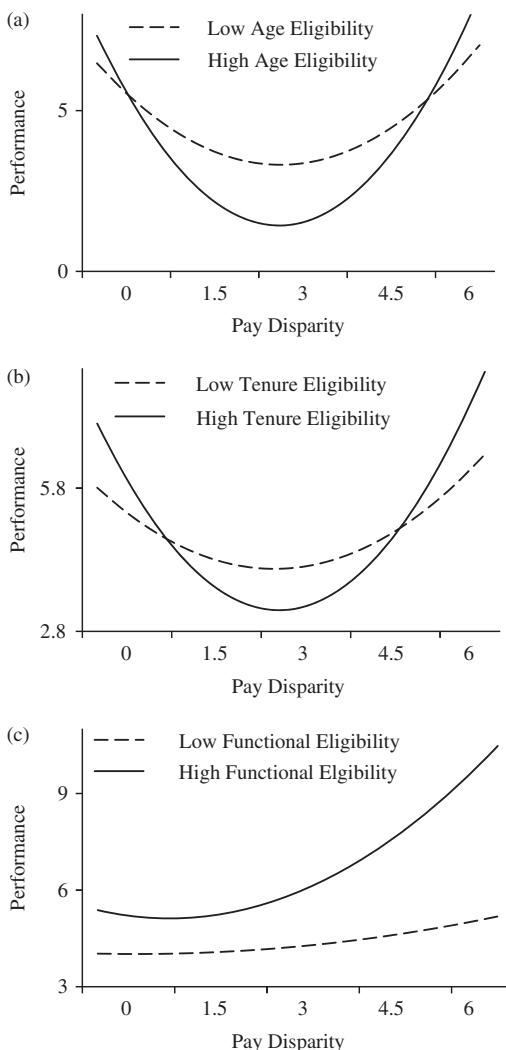


Figure 5. (a) Effects of TMT eligibility - age. (b) Effects of TMT eligibility - tenure. (c) Effects of TMT eligibility – functional background

comparison effects of the perceived existence of a succession tournament or the chances of TMT members winning the CEO position. We first considered sociopolitical firm-level effects that may imply a cancellation or postponement of the tournament. Consistent with our theory, our results demonstrated that the existence of an heir apparent (and therefore the implicit absence of a tournament) eliminates all tournament theory effects on the relationship between pay disparity and firm performance (see Figure 3). Similarly, we found support for the idea that CEO power attenuates the tournament effects in the relationship between pay disparity and firm performance.

We then considered executive characteristics' effects at the firm level that may imply an increased chance of TMT members' socially comparing themselves with the CEO because of their similarity in relevant characteristics and also being more willing to participate in the succession tournament because of their increased probability of winning it. We found that higher TMT eligibility in terms of functional background, tenure, and age results in both steeper social comparison effects and steeper tournament-type effects.

These findings are fundamental to our understanding of the effect of pay disparity on firm performance not only because they extend our understanding of the main hypothesized curvilinear relationship but also because they serve as empirical tests of the core mechanisms of our theorizing (Miller and Tsang, 2011). For example, by showing that when an heir apparent is present there are no tournament-like effects in the relationship between pay disparity and firm performance, we provide additional support to tournament-type incentives as mechanisms that increase firm performance at high levels of pay disparity.

Our findings have relevant managerial and governance implications for the design of compensation between hierarchical levels as well. In general, our results suggest that firms can afford large or small levels of pay disparity but should avoid intermediate levels. Furthermore, our research suggests that companies should pursue different compensation strategies contingent on their particular sociopolitical context or their TMT characteristics. For example, firms that engage in succession planning may benefit from minimizing pay disparity, and firms with many eligible TMT members may benefit from even small increases in pay disparity. Similarly, firms that have a consistent pattern of large pay disparity may benefit from avoiding explicit succession planning or the appointment of high-power CEOs.

It is important to note that this study speaks to a series of instabilities in the effects of pay disparity on performance as the socio-political mixes in CEO teams change. Going from a period of operation under an appointed heir apparent to a new situation in which the heir apparent is now the appointed CEO seems to imply changes in TMT behaviors that are quite responsive to their potential to be promoted to the CEO position. Since we are unable to track specific behaviors, it is impossible to acknowledge how these changes

happen, but an analysis of the sample shows that there is probably a combination of tournament reignition and TMT member changes engaging in tournament behaviors affecting such apparently volatile behavior. This is consistent with the fact that both the duration of CEO appointments and the period during which TMT members remain eligible may imply that, for some TMT members, the aspiration of promotion may not last more than a couple of CEO successions and therefore the tournament may be constrained in time.

The results of this study should be viewed in light of its potential limitations. One is that it was conducted within large North American firms. Also, while the longitudinal design provided some temporal stability to our results, our study was restricted to a particular time period. Extensions to this study should investigate whether firm size or cultural views of compensation influence these relationships and whether the findings vary under a variety of temporal economic scenarios. For example, pay structures may need to acknowledge the resources of particular members of the TMT to deal with situational environmental uncertainties for the firm because such uncertainty reduction resources have been shown to affect hierarchical structures in teams (Aime *et al.*, in press). Similarly, it is important to study the implications of pay, power, and similarity for executive departures (Bloom & Michel, 2002) because there is a growing interest in the relationship between key players mobility and firm performance (Aime *et al.*, 2010). Therefore, future extensions may benefit from considering the impact of both tournaments and social comparisons on the adjusting nature of TMT teams.

Limitations aside, to the best of our knowledge, this is the first study to address compensation from an integrated multidisciplinary approach that theoretically combines economic and behavioral views. We provide evidence that executive pay disparity has both social comparison and tournament theory implications for firm performance. Additionally, we extend research on executive compensation to show that a series of contingencies (the existence of an heir apparent, CEO power, or the characteristics of TMT members) can significantly affect the implications of pay disparity for firm performance. Our results suggest that beyond a certain level of pay disparity, TMT attention may switch from a focus on relative deprivation to a focus on the attraction of a valued

prize and that such a shift in attention may be influenced by a series of organizational contingencies. This ultimately provides researchers with new alternatives for investigating compensation differences and their relationship to performance. It also points to the need for more theory and research regarding the complementary effects of both social comparison and tournament theory at different levels in the pay structure and under a variety of alternative organizational contingencies.

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