Journal of Management
Vol. 42 No. 4, May 2016 862–885
DOI: 10.1177/0149206313503015


# Minding the Gap: Antecedents and Consequences of Top Management-To-Worker Pay Dispersion

Brian L. Connelly
*Auburn University*
Katalin Takacs Haynes
*University of Delaware*
Laszlo Tihanyi
*Texas A&M University*
Daniel L. Gamache
Cynthia E. Devers
*Michigan State University*

*Management researchers have long been concerned with the antecedents and consequences of managerial compensation. More recently, scholarly and popular attention has turned to the gap in pay between workers at the highest and lowest levels of the organization, or "pay dispersion." This study investigates the performance implications of pay dispersion on a longitudinal (10-year) sample of publicly traded firms from multiple industries. We combine explanations based on tournament theory and equity theory to develop a model wherein pay dispersion has opposing effects on a firm's short-term performance and their trend in performance over time. We also show that ownership is a key antecedent of pay dispersion. Specifically, transient institutional investors (who have short time horizons and equity stakes in a wide variety of firms) positively influence pay dispersion whereas dedicated institutional investors (who have longer investment time horizons and equity stakes in fewer firms) negatively influence pay dispersion. We discuss the wide-ranging implications of these findings for scholars, managers, and policy makers alike.*

*Acknowledgments: This article was accepted under the editorship of Deborah E. Rupp. The authors would like to thank our Action Editor, Patrick Wright, and the anonymous reviewers for their helpful guidance, and also gratefully acknowledge the support of the Center for Ethical Organizational Cultures at Auburn University.*

*Corresponding author: Brian L. Connelly, Auburn University, Raymond J. Harbert College of Business, Department of Management, Auburn, AL 36849, USA.*

*E-mail: bconnelly@auburn.edu*

***Keywords:*** *compensation, bonuses, and benefits; top management teams/upper echelon; justice/fairness; panel and repeated measure designs*

There is no shortage of news about how the excesses of Wall Street contrast with the belt tightening of Main Street (Krantz & Hansen, 2010; Whoriskey, 2011). The story goes that while top managers continue to enjoy large monetary rewards, lower-level employees suffer from stagnated pay and job losses (Davis & Cobb, 2010; Hoskisson, Castleton, & Withers, 2009). The gap between CEO and average employee pay in large publicly listed firms has risen steadily over the past two decades, from about 125:1 in 1992 up to 380:1 today (Mishel & Sabadish, 2012; Sahadi, 2007; see www.paywatch.org). The same holds true of the pay gap between top management team (TMT) members and non-top-level employees, which has also grown exponentially during the same period (Cowherd & Levine, 1992; Sapp, 2008). As a consequence, the issue of pay dispersion has captured the attention of the business press, raised the ire of watchdog groups, and even sparked large-scale protests (Patton, 2012). In partial response, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 requires all publicly listed U.S. firms to disclose their CEO–employee pay dispersion ratios (Paletta, 2010).

Considerable research suggests that pay dispersion has important implications for individuals and firms (Heyman, 2005; Winter-Ebmer & Zweimuller, 1999). Therefore, developing a deeper understanding of the antecedents and consequences of pay gaps has long been of interest to management scholars. Much of this research is grounded in tournament theory, which broadly describes scenarios wherein actors compete for prizes, such as better paying positions (Lazear & Rosen, 1981). Consistent with this research, we use the term *pay dispersion* to reflect intrafirm, interrank (i.e., vertical) differences between pay at two broad levels of the firm: the upper echelon level (average TMT pay) and the non-upper-echelon level (average employee pay).

Although much pay dispersion research exists, its effects remain unclear. For example, some research has shown that pay dispersion motivates greater effort and performance from individuals owing to healthy competition for higher positions and pay (Heyman, 2005; Main, O'Reilly, & Wade, 1993). Other work, however, has uncovered negative relationships between pay dispersion and those outcomes (Bloom, 1999; Grund & Westergaard-Nielsen, 2008; Siegel & Hambrick, 2005). In addition, an understanding of the possible antecedents of pay dispersion is also largely absent from the literature. Thus, extant research offers little clear guidance about the consequences of pay dispersion, and even less about its causes (Gupta, Conroy, & Delery, 2012; Jirjahn & Kraft, 2007).

In response, we develop and test theoretical explanations of the antecedents and performance consequences of pay dispersion in U.S. firms. With regard to consequences, we propose that the equivocal empirical findings of research examining the effects of pay dispersion may be due, in part, to varying temporal perspectives inherent in the literature. Specifically, some scholars emphasize competitive forces that have immediate effects on performance in their pay dispersion models (e.g., Heyman, 2005; Lallemand, Plasman, & Rycx, 2004; Main et al., 1993) whereas others focus on outcomes that take more time before they have an effect

on firm performance (e.g., Kepes, Delery, & Gupta, 2009; Messersmith, Guthrie, Ji, & Lee, 2011; Siegel & Hambrick, 2005). Therefore, as we explain in the following sections, an integrated model that investigates both short-term performance and the long-term performance trend could help resolve these findings.

With regard to antecedents, corporate governance research indicates that firm ownership structure has a key influence on firm practices and, in particular, compensation policies (Grossman & Hoskisson, 1998; Khan, Dharwadkar, & Brandes, 2005; Shin & Seo, 2011). Therefore, it is reasonable to suggest that powerful investors may influence pay dispersion in firms they own (David, Bloom, & Hillman, 2007; Yoshikawa, Phan, & David, 2005). Given our arguments about competing short-term and long-term influences, we expect that investors with different time horizons will have differential influence on pay dispersion in firms they own. For instance, investors who maintain concentrated holdings in a few firms held over time likely hold different attitudes toward pay dispersion than those with rapidly changing, dispersed holdings (e.g., David, O'Brien, Yoshikawa, & Delios, 2010).

In sum, we posit that pay dispersion influences short-term performance and long-term performance over time in different ways. We further predict that investors with varying preferences differentially influence pay dispersion within the firms in which they hold shares. We test our theoretical predictions using a longitudinal data set of intrafirm, interrank pay dispersion for 445 firms from 41 different industries over a ten year window. Our findings provide important insights for research on pay dispersion, corporate governance, strategic human resource management, and investor relations. First, our results show that although pay dispersion may initially result in positive short-term firm performance gains, those gains are fleeting, and are soon replaced by negative long-term performance over time. Second, we find that transient institutional investors (those with short investment time horizons and equity stakes in a wide variety of firms; Bushee, 1998) positively influence pay dispersion whereas dedicated investors (who have longer time horizons and equity stakes in fewer firms) negatively affect pay dispersion. We discuss the wide-reaching implications of these empirical findings for scholars, managers, and policy makers.

## Conceptual Development

### *Theoretical Underpinnings of Pay Dispersion*

Tournament theory has long served as the cornerstone of pay dispersion research (Connelly, Tihanyi, Crook, & Gangloff, 2014; Henderson & Fredrickson, 2001; Lazear & Rosen, 1981). Tournament theorists propose that employees compete against one another for high level positions and pay. Those who "win" the tournament are promoted to their firms' top levels and receive higher pay. Firms are resource-constrained with respect to pay, so compensation policies are essentially a zero-sum proposition; that is, increased pay at one level imposes limits at other levels (Bloom, 1999). For this reason, "tournaments are invariably present in common internal labor markets" (Grund & Westergaard-Nielsen, 2008: 486). Labor economists, therefore, originally developed and used tournament theory to help explain the presence of large differentials in prize structures, such as disproportionately high top manager salaries (Ehrenberg & Bognanno, 1990; Lazear & Rosen, 1981; Nalebuff & Stiglitz, 1983).

In organizational contexts, tournament theory's main prediction is that employee effort increases with differences in pay between organizational levels. Under this view, high upper echelon level pay is thought to effectively motivate employees at all levels to perform well. This view suggests that employees are inspired by the appeal of high pay at the top levels of their firms and, thus, will expend greater effort and commit themselves to organizational interests and priorities (Becker & Huselid, 1992). This is true not only of a final tournament for the CEO position (e.g., Henderson & Fredrickson, 2001), but also those employees striving to reach the upper echelon level (Cappelli & Cascio, 1991; DeVaro, 2006; Lambert, Larcker, & Weigelt, 1993). In support, scholars have shown that top managers and CEOs serve as salient referents to employees; thus, interrank pay differences have important consequences for employee attitudes and behaviors (Wade, O'Reilly, & Pollock, 2006).[1]

Although scholars have sought to understand the implications of widening pay dispersion for firms and the people they employ (Beaumont & Harris, 2003; Wade et al., 2006), this work has failed to reach consensus regarding its effects. One view, primarily using tournament theory arguments, espouses the benefits of large interrank pay differentials, by arguing that providing incentives to rise above others motivates healthy competition, high effort expenditure, and increased performance (Baker, Jensen, & Murphy, 1988; DeVaro, 2006; Ehrenberg & Bognanno, 1990). Some empirical studies have supported this view, finding a positive link between pay dispersion and firm performance (Heyman, 2005; Lallemand et al., 2004; Main et al., 1993).

A second body of research, that incorporates equity theory arguments, proposes the opposite. The assumptions underlying this perspective suggest that because employees look to pay to gauge the fairness of their rewards, pay imbalances motivate feelings of inequity, injustice, and jealousy, which reduces their satisfaction and commitment (see Finkelstein, Hambrick, & Cannella, 2009, for a comprehensive review). Thus, scholars taking this perspective generally assert that pay dispersion tends to reduce motivation, effort, and cooperation (Cowherd & Levine, 1992). Under this view, pay dispersion may also motivate careless risk taking, reduce employee safety (Becker & Huselid, 1992), and ultimately lead to turnover (Bloom & Michel, 2002; Dye, 1984; Gupta et al., 2012). Some empirical evidence supports this perspective, demonstrating a negative relationship between pay dispersion and a number of performance-related outcomes (Bloom, 1999; Fredrickson, Davis-Blake, & Sanders, 2010; Grund & Westergaard-Nielsen, 2008; Siegel & Hambrick, 2005).

As the work above suggests, scholars could draw on one set of prescriptions to explain results that positively link pay dispersion to firm performance or another set to explain negative performance effects. As a result, these two theoretical views are often viewed as competing. Taking a more nuanced perspective, we propose these theoretical assumptions can be reconciled by incorporating temporal effects.

### *Pay Dispersion and Short-Term Performance*

Some research has uncovered evidence in favor of the premise that pay dispersion has positive effects on motivation (Heyman, 2005; Lallemand et al., 2004). Stemming from tournament theory, the main prediction is that actors' efforts increase with the spread between winning and losing prizes (Knoeber & Thurman, 1994; Lazear & Rosen, 1981). This prediction has enjoyed appreciable empirical support through the years (Gibbs, 1994; McLaughlin,

1988). For example, in a study of 3,510 employers, DeVaro (2006) demonstrated that larger pay spreads positively influenced employee performance. In another study, Knoeber and Thurman (1994) compared the performance predictions of tournament and linear performance evaluation structures, finding that effort and performance were affected more by the difference in pay than by the actual level of pay. An impressive body of empirical management research has uncovered evidence in favor of tournament theory's basic premise regarding compensation structures (e.g., Cappelli & Cascio, 1991; Conyon, Peck, & Sadler, 2001).

These results notwithstanding, scholars have argued that pay dispersion primarily trains individuals' efforts on near-term metrics (Marginson & McAulay, 2008). In this way, pay dispersion is argued to motivate a sharp focus on short-term outcomes (Laverty, 1996). For example, as individuals compete with one another for promotion to higher levels of organizations, those doing the promoting often compare candidates on the basis of financial barometers, such as quarterly sales or returns, particularly if they reside in different organizational areas (Brown, Sturman, & Simmering, 2003; Siegel & Hambrick, 2005). In such situations, employees may feel compelled to make choices that offer relatively fast paybacks to rapidly enhance their potential for promotion (Meulbroek, Mitchell, Mulherin, Netter, & Poulsen, 1990; Narayanan, 1985). This could focus their efforts on short-term objectives, designed to increase their personal performance and maximize their potential for promotion (Wahal & McConnell, 2000).

Recent tournament theory research in the marketing literature supports these arguments (Syam, Hess, & Yang, 2011). Given that firms spend more than $26 billion annually on sales contests, marketing scholars have taken a keen interest in how to create optimal designs of rank-order tournaments as a motivational device (Kalra & Shi, 2001; Poujol & Tanner, 2009). Studies show that increasing sales tournament prize money dispersion is highly effective in improving sales peoples' motivation and, thus, yields greater short-term performance (Garrett & Gopalakrishna, 2010; Kalra & Shi, 2001; Poujol & Tanner, 2009). This application of tournament theory in marketing is consistent with our suggestion that pay dispersion may result in short-term performance benefits for firms. Tournament theorists working in the areas of sport management (Frick, 2003) and law (Price, 2003) have uncovered similar findings with respect to the immediate benefits of prize dispersion in tournaments. Given this evidence, we hypothesize the following:

*Hypothesis 1*: Pay dispersion is positively associated with short-term firm performance.

## *Pay Dispersion and Long-Term Performance*

There are, however, some actions that are effective in the short term but that produce suboptimal results in the long term (Hayes & Abernathy, 1980; Rappaport, 2005). For example, in the marketing research described above, scholars found that high sales tournament reward dispersion can lead to short-term benefits that accrue at the expense of long-term performance as salespeople neglect customer relationship development and fail to meet customer service expectations (Oliver & Anderson, 1994; Poujol & Tanner, 2009). The argument here is that striving for short-term measures can have adverse consequences for the long-term value-generating capability of the firm (Van der Stede, 2000). Laverty (2004) calls this a "temporal trap," because it exchanges short-term profitability for requisite long-term positioning, growth, and change.

Higher levels of pay dispersion may make employees more vulnerable to these temporal traps because large gaps in pay motivate those individuals to engage in activities that yield early benefits at the expense doing what is right for the firm over the long run (Becker & Huselid, 1992; Bothner, Kang, & Stuart, 2007). There may be, therefore, a disincentive for long-term investment because the potential economic value of investments with payouts beyond the life of a tournament is less observable than the value of investments where managers can realize gains quickly. In this way, some have argued that pay dispersion motivates economic short-termism, wherein a focus on near-term goals precludes a long-term perspective (Laverty, 2004; Marginson & McAulay, 2008).

Within tournament theory, the role of social comparison is helpful in explaining the long-term consequences of pay dispersion. Tournament theorists acknowledge that the existence and awareness of a tournament implies that participants engage in pay comparisons (Lazear & Rosen, 1981). In fact, the effectiveness of promotion tournaments are based on upward comparison between lower-level employees and those who reside at higher levels of the organization. It is this upward pay comparison that is designed to motivate employees to expend more effort to perform better (Lazear & Rosen, 1981). However, individuals also compare their pay to that of others with a view toward making sense of their abilities and gauging the fairness of rewards (Finkelstein et al., 2009). Indeed, tournament theory research has shown that relative assessments of pay are actually even more salient to individuals than are the absolute amounts of pay they receive (Folger & Cropanzano, 1998; Heyman, 2005). Unfavorable comparisons can result in lower morale and reduced motivation, which would likely have adverse effects on the firm's long-term performance trend (we use the term *long-term performance trend* to describe the direction of a firm's performance over time as opposed to a snapshot of performance at any particular point in time).

Consistent with this idea, equity theory research holds that, over time, pay dispersion encourages employees to take corrective action to restore perceptions of fairness. In this way, pay dispersion can reduce cooperation, productivity, commitment, and retention (Bolino & Turnley, 2008; Shaw & Gupta, 2007; Trevor & Wazeter, 2006). In support, equity scholars have found that pay dispersion can motivate competitive behaviors that produce adverse long-term performance effects, such as reckless actions (Becker & Huselid, 1992), political behavior (Dallas, 2011), and uncooperative behavior (Lazear, 1989). Equity theory research also draws attention to a more final consequence, which is increased job exit (Messersmith et al., 2011). Bloom (1999), for instance, notes that by-products of competitive behavior in promotion tournaments can include reduced employee commitment and workforce instability. Thus, equity theory describes how the positive impact of motivating firms' high performers through interrank pay dispersion could be offset over the long term via lower levels of cooperation and higher levels of turnover (Drago & Garvey, 1998).

Taken together, this research suggests that pay dispersion can lead to having top managers and their employees focusing on short-term results at the expense of long-term goals, social comparisons that reduce morale and motivation, and feelings of inequity among lower-level employees that can trigger a number of mechanisms that adversely affect the firm's long-term performance trend (Brown et al., 2003; Pfeffer & Langton, 1993). These arguments point to the following hypothesis:

*Hypothesis 2*: Pay dispersion is negatively associated with the firm's long-term performance trend.

### *Institutional Investors and Pay Dispersion*

A wide range of scholars have shown that institutional investors are influential in affecting firm policies (Connelly, Hoskisson, Tihanyi, & Certo, 2010; David, Hitt, & Gimeno, 2001; Filatotchev & Toms, 2006). This group of investors consists of mutual funds, hedge funds, pension funds, banks, insurance companies, foundations, and endowments that, according to SEC rules, manage more than $100 million. Such investors have considerable clout owing to their centralized voting rights, vast resources, large staffs, and membership in dedicated coordinating bodies, such as Institutional Shareholder Services and the Council of Institutional Investors (Gillan & Starks, 2000). Institutional investors have garnered steadily increasing shares of equities markets, making them a powerful economic force (David et al., 2007). Researchers have demonstrated the extent of their reach with regard to firm activities such as innovation, risk taking, corporate social performance, and compensation policies (Almazan, Hartzell, & Starks, 2005; David, Kochhar, & Levitas, 1998; Hoskisson, Hitt, Johnson, & Grossman, 2002). Building on this work, we focus on the influence of institutional investors on pay dispersion.

Through the years, a number of influential scholars have voiced concerns that equity markets essentially force managers into myopic decision making (Porter, 1992). These authors argue that capital markets operate efficiently only with respect to changing expectations of short-term earnings (Froot, Scharfstein, & Stein, 1993). That is, owing to the rate at which securities turn over, capital markets do not consistently place a premium on long-term value and competitive advantage (Loescher, 1984). Investors, the reasoning goes, have neither the interest nor the knowledge to wait for long-term results, and instead continually push for steadily increasing quarterly results (Matsumoto, 2002). More recently, however, other scholars have advanced this literature by showing that different institutional investors may have dissimilar temporal preferences, and therefore some may be more interested in long-term outcomes than others (Samuel, 2000; Wahal & McConnell, 2000). Acknowledging the varying temporal preferences of institutional investors has gained momentum in the literature as researchers have found this distinction to be consequential to the influence that investors impose on managers (Hoskisson et al., 2002; Tihanyi, Johnson, Hoskisson, & Hitt, 2003). This is likely to be an important distinction with respect to how investors impact pay dispersion (Hartzell & Starks, 2003).

To investigate this influence, we categorize institutional investors according to their preferences (Zheng, 2010). The classification system that is most germane is Porter's (1992) description of shareholders based on trading behavior. In this system, "dedicated" investors acquire concentrated positions in a small number of firms and hold their shares over time (Bushee, 2004). "Transient" investors, on the other hand, acquire stakes in a wider range of firms and generate substantial turnover of shares in their portfolios (Bushee, 2001). Transient and dedicated investors represent opposite extremes; other investors, such as indexed or exchange-traded funds, are less likely to make trading decisions based on specific firm actions or policies, and are therefore of less theoretical interest.

### *Transient Institutional Investors*

Transient institutional investors move their holdings in and out of firms frequently, leading some to label them as short-term "traders" rather than "owners" (Hendry, Sanderson,

Barker, & Roberts, 2006). As a result, transient institutional investors' preferences for firm outcomes are largely immediate, which can increase short-term pressures on firms. These investors maintain ownership in a broad array of firms, which diminishes their ability to be keenly aware of the operations of any one of their holdings. In addition, transient institutional investors turn their portfolios over frequently, which restricts their ability to develop expertise with respect to particular firms (Loescher, 1984). Furthermore, transient institutional investors are typically beholden to their own constituents that are demanding of consistent positive quarterly returns (Koh, 2007; Marginson & McAulay, 2008). As a consequence, transient institutional investors tend to rely on financial controls and short-term financial barometers of performance. This short-term focus suggests that transient investors are not likely to be concerned about the strategic implications of pay dispersion, which require time to take hold, but instead favor compensation structures that yield near-term benefits.

Another argument regarding the influence of transient investors on pay dispersion surrounds the notion of risk propensity. Pay dispersion could be described as a risky strategy. There are potential rewards, because high top manager pay may have immediate benefits insofar as it assists in attracting well-known managerial talent, which could have signaling value for investors (Higgins & Gulati, 2006). However, there is also downside risk because of its potential implications for the broader organization (Bloom & Michel, 2002). Tolerance for this kind of risk is high for transient institutional investors. These investors maintain broad portfolios with high turnover, so they are less concerned about the risk incurred by any one firm in their portfolio because there is a high probability they will not even hold the firm in the periods ahead (Bushee, 2004; Gompers & Metrick, 2001). Thus, for transient investors, compensation policy risk is mitigated by their diversified and fast-moving holdings.

Based on these ideas, we suggest that higher levels of transient institutional ownership likely result in pressures for short-term, risky strategies, including higher levels of top manager pay and, thus, greater pay dispersion. Some have described owners having influence on firm policies through the mechanisms of exit, voice, and loyalty (Gillan & Starks, 2000; Kochar & David, 1996). In the case of transient investors, it may be that their influence on pay dispersion is less a result of voice or loyalty than of managerial reaction to pressures associated with the threat of exit (Parrino, Sias, & Starks, 2003). Recent work by Dikoli, Kulp, and Sedatole (2009) yields preliminary support for this point of view. These authors hypothesize and find that top manager compensation policies "will reflect firm reactions to the investor base and, in particular, to the presence of high levels of transient institutional investors" (Dikoli et al., 2009: 740). We agree and suggest that firms are both aware of the composition of their investor base and that they make compensation policy choices in accordance with transient-induced short-term pressures. These arguments point to the following hypothesis:

*Hypothesis 3*: Ownership by transient institutional investors is positively associated with pay dispersion.

### *Dedicated Institutional Investors*

Dedicated institutional investors, on the other hand, bring considerable resources to their investments, and these resources are concentrated on a small number of firms in a few industries (Bushee, 1998). Accordingly, dedicated institutional investors tend to become familiar

with the top managers of firms they own and are often involved in the actions and policies those managers implement (Koh, 2007). This makes dedicated investors more tolerant of firm actions, such as an acquisition or establishment of a subsidiary, that might have negative short-term economic implications but provide long-term competitive value. In the same manner, it makes them less tolerant of activity that could harm the firm's long-run prospects. Dedicated institutional investors are able to rely on strategic controls when evaluating firm activity, suggesting they are in a position to understand the firm's actions and appropriately value its policies, including its compensation structures (Chen, Harford, & Li, 2007).

Also, dedicated institutional investors maintain investments over time with little turnover. The potentially negative effects of pay dispersion on organizational outcomes, such as job satisfaction and organizational commitment, manifest themselves over time and are not always readily observable (Winter-Ebmer & Zweimuller, 1999). Given dedicated investors' long investment horizons, they are likely to be sensitive to such organizational practices that could have detrimental effects on the firm's trend in long-term performance. Rather than managers simply reacting to the composition of their investor base and the threat of investor exit, dedicated institutional investors may take an active role in influencing a firm's compensation policies (Dikoli et al., 2009). Consistent with this notion, Hartzell and Starks (2003) show that institutional investors that exercise voice through shareholder proposals and sitting on the board of firms they own do affect compensation practices. Firms with high levels of dedicated ownership, therefore, may be subject to the influence of these long-term investors and adopt lower levels of pay dispersion in accordance with their preferences.

Last, risk propensity arguments are pertinent to this class of investors as well. The level of risk for these owners is even higher than most. Specifically, dedicated investors' ownership portfolios are highly concentrated in a small number of firms, making them more susceptible to risk factors in any given firm (David et al., 1998). As a consequence, they are vulnerable to organizational practices that hold the potential for introducing volatility. This suggests that top managers in firms with high levels of dedicated ownership might consider it difficult to institute actions that could have negative long-term consequences, such as increasing TMT compensation at the expense of employees. Given these arguments, we propose that dedicated owners are likely to understand the potentially negative long-term implications of a wide gap in pay and discourage the existence of high levels of pay dispersion in firms they own. Therefore, we hypothesize the following:

*Hypothesis 4*: Ownership by dedicated institutional investors is negatively associated with pay dispersion.

## Method

### *Sample and Measures*

The sample for our study included all publicly traded firms listed in the S&P 1500 composite index during the years 1996 to 2006 that report labor expenses, plus actively traded firms that were once part of the S&P 1500 but have since been removed. The S&P 1500 index combines firms from the S&P 500 large-cap, S&P 400 mid-cap, and S&P 600 small-cap, which provides a comprehensive range of firms and industries for testing the antecedents and consequences of pay dispersion. Standard & Poor's has added a few other large publicly

traded firms to their Execucomp and Compustat databases by client request, and we included these in our sample as well. To identify changes over time we collected data covering an 11-year window, terminating in 2006, which allowed us to calculate a subsequent 5-year performance trend. We eliminated firms with poor reporting and controls by imposing a restriction that they have complete financial data.[2] This yielded a sample of 2,410 observations when testing the short-term performance consequences of pay dispersion. The sample was reduced to 1,863 for analysis of the long-term performance trend over 5 years because some firms dropped out of our sample owing to factors such as acquisition or delisting.

We drew the data for this study from four main archival sources. We collected top manager compensation data from the Execucomp database, which provides information about salary, bonuses, and options for CEOs and other top managers. We obtained information about firm-level characteristics and industry-level trends from the Compustat Fundamentals Annual database and product and geographic diversification data from the Compustat Segments database. Last, we gathered data on the firm's ownership structure from the Thomson Reuters database on institutional common stock holdings and transactions, which is derived from filings of Securities and Exchange Commission (SEC) form 13F.

*Dependent variables*. There are three dependent variables in our analyses: short-term performance, long-term performance trend, and pay dispersion. We operationalized *short-term performance* as return on assets in the focal year of analysis. Return on assets is the ratio of net income to total assets and measures the profitability of a firm relative to its size.

We operationalized *long-term performance trend* as the slope of the regression of annual return on assets over 5 subsequent years, beginning in the focal year of analysis. Several scholars have established a 5-year time frame as appropriate for the study of long-term performance (e.g., Boyd, 1995; Simerly & Li, 2000). Individual growth trajectories (i.e., trends) for each firm allow us to observe the direction of performance over time, thereby providing more detail about firm-level changes in performance than that which would be provided by simple averages or snapshots of performance at any one point in time (Singer & Willett, 2003).

We operationalized *pay dispersion* as a ratio variable, with the numerator representing the average TMT total compensation and the denominator reflecting average employee compensation (excluding TMT compensation). We calculated average TMT total compensation by summing top managers' annual salary, bonus, other annual compensation, value of restricted stock grants, Black–Scholes value of stock option grants, and long-term incentive payouts, then dividing that figure by the number of top managers in the firm, as reported in Execucomp. The SEC requires that firms provide compensation information for their CEO and the four next highest paid managers (Fredrickson et al., 2010). Execucomp records all of this information plus compensation information for any other top managers voluntarily disclosed by the reporting firm. Similar to prior research, our sample contained a mean of 5.87 top managers per firm. We calculated the denominator of pay dispersion, average employee pay, as the total labor expenses for the firm (excluding TMT pay) divided by the number of employees.

Although some have discussed problems associated with the use of ratio variables, our dependent variable measures a theoretical construct that has two components. Ratios are important when they measure multidimensional constructs in which variations in one

variable are theoretically meaningful with reference to variations in the other. For example, Wiseman (2009) describes how a firm's market value is an important dependent variable by itself, but that market value divided by replacement value (i.e., Tobin's *q*) is of special theoretical interest and therefore serves as a common ratio dependent variable. In the same way, scholars often examine the level of top manager compensation by itself (Devers, Cannella, Reilly, & Yoder, 2007), but it takes on special meaning when considered in view of how everyone else in the organization is being compensated at the same time (Beaumont & Harris, 2003; Cowherd & Levine, 1992). Pay dispersion is operationalized as a theoretically prescribed ratio (Firebaugh & Gibbs, 1985), and this particular ratio has taken a prominent place in academic discussion (Bogle, 2008; Charness & Kuhn, 2007; Murphy & Zabojnik, 2004; Nichols & Subramaniam, 2001). Pay dispersion has become the cornerstone of tournament theory and is frequently operationalized as a ratio (Gupta et al., 2012).

*Independent variables*. The predictors of pay dispersion are focused on institutional owners with at least 1% equity in any of the focal firms during our sampling window, a criterion that is commonly applied in governance research to remove the effects of marginal equity holders (Hoskisson et al., 2002; Johnson & Greening, 1999; Tihanyi et al., 2003). We categorized each of these institutional investors annually as being either dedicated, transient, or neither, in accordance with Bushee's (1998) categories. By categorizing institutional investors annually, our study captures subtle changes in their trading behavior and thus allows us to operationalize differences in institutional investor preferences over time. This yields a more process-oriented measure than is typically found in research on shareholder influence (Gillan & Starks, 2000).

Following Bushee (1998), our categorization of institutional investors as dedicated, transient, or other was determined by three factors: portfolio diversification, portfolio turnover, and trading sensitivity. Portfolio diversification is a composite measure of the average percentage of the institution's holdings invested in each firm, the average size of the institution's ownership position in its portfolio of firms, the percentage of holdings invested in firms greater than 5%, and a Herfindahl concentration index of the owner's holdings. Portfolio turnover is also a composite of the annual change in ownership positions and the percentage of firms that the investor has held continuously for at least two years. Trading sensitivity combines a ratio of changes in ownership position to firm's earning announcements with the average earnings change in firms bought minus firms sold. For each institutional investor, all of these variables are entered into a k-means cluster analysis on the factors to obtain separation into three groups (Bushee, 1998). Transient institutions have high portfolio turnover, diversified portfolios, and are sensitive to current earnings reports. Dedicated institutions have low turnover, concentrated holdings, and have low sensitivity to current earnings. All other combinations are relegated to the third category, other investors (Ke & Petroni, 2004; Koh, 2007).

Having categorized each institutional investor that holds appreciable shares (1% or more) of any of our focal firms, we then calculated the percentage of dedicated and transient institutional ownership in a given firm-year (Ke & Ramalingegowda, 2005). We operationalized these variables by dividing the number of shares owned by dedicated or transient institutional investors in a given firm by the total number of shares outstanding for that firm (Higgins & Gulati, 2006). Consistent with prior research in this area (Connelly, Tihanyi, Certo, & Hitt,

2010), dedicated institutional ownership ranged from 0% to 74.71% and transient institutional ownership ranged from 0% to 62.57%. All ownership variables represent shares owned at the end of the year prior to which we measure pay dispersion, so that independent variables precede the dependent variable.

*Control variables*. We controlled for several factors that could also influence our dependent variables. First, because prior firm performance is often a strong indicator of future performance and generally associates with firm resources and pay, we controlled for *prior year performance* as return on assets (ROA) one year prior to the focal year of analysis. Because ROA is the ratio of net income to total assets, it also serves as a control for organization size (including the natural log of assets as a control yielded results consistent with the models presented here). Furthermore, firms with higher levels of product and international diversification are more complex and top managers generally have greater functional and geographic experience than those in less diversified firms, which may allow them to command higher salaries (Carpenter & Sanders, 2004). Thus, we controlled for *product diversification* and *international diversification* with inverse Herfindahl indices that increase with higher levels of diversification. We calculated this index for product and geographic diversification by taking the inverse of the sum of squares of the proportion of total sales from each industry or geographic segment in which the firm operates.

We also controlled for three industry level factors that could influence firm performance and pay dispersion: *munificence, dynamism*, and *complexity*. We followed the recommendations of Boyd (1995) for these measures. Munificence refers to the capacity of an industry to support sustained growth. We calculated munificence as the regression of industry sales over time divided by mean industry sales, using a 5-year window with the focal year as the last year in the series (Bergh, 1998). Dynamism captures the level of instability or turbulence present in an industry. We calculated dynamism as the standard error of the prior regression divided by mean industry sales (Lepak, Takeuchi, & Snell, 2003). Complexity reflects the inequalities amongst competitors with monopoly or oligopolistic market structures representing less complex competitive environments than those industries closer to a perfect competition framework. We measured complexity with a Herfindahl index, calculated as the sum of squares of market shares of all firms in each four-digit SIC category (Fischer & Pollock, 2004).

We also included a set of *year* dummy variables to control for temporal effects. Finally, in our models testing the impact of pay dispersion on short- and long-term performance we controlled for dedicated and transient ownership, and in our models predicting pay dispersion we controlled for prior year pay dispersion. Table 1 shows the descriptive statistics for all the variables used in this study.

## Results

### *Analysis*

Our data are longitudinal in nature with repeated measures for each firm across multiple years. Using ordinary least squares (OLS) regression increases the likelihood of heteroscedastic error terms and autocorrelation, so panel data of this nature are frequently estimated using fixed effects or random effects models (Devers, McNamara, Wiseman, & Arrfelt,

**Table 1**
**Descriptive Statistics**

| | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Pay dispersion | 49.45 | 69.07 | | | | | | | | |
| 2. Return on assets[a] | 3.60 | 6.76 | .10 | | | | | | | |
| 3. Product diversification | 0.23 | 0.28 | .12 | .09 | | | | | | |
| 4. International diversification | 0.10 | 0.20 | .18 | .05 | .63 | | | | | |
| 5. Complexity | 0.14 | 0.15 | –.00 | .12 | .35 | .24 | | | | |
| 6. Dynamism | 0.03 | 0.03 | –.08 | .11 | .10 | .07 | .36 | | | |
| 7. Munificence | 0.09 | 0.08 | –.01 | .07 | –.02 | –.02 | .07 | .35 | | |
| 8. Dedicated institutional ownership[a] | 6.13 | 8.57 | .07 | .06 | .10 | .10 | .06 | –.03 | –.02 | |
| 9. Transient institutional ownership[a] | 5.97 | 8.21 | .01 | .09 | .10 | –.00 | .06 | .08 | –.00 | .17 |

*Note:* $N$ = 2,410. Correlations greater than .04 are significant at $p < .05$, and correlations greater than .05 are significant at $p < .01$.
[a]Expressed as a percentage.

2008). We conducted a Hausman (1978) test, which indicated the appropriate choice was a fixed effects model ($\chi^2 = 880.54$, $p < .001$). Fixed effects models provide within-firm regression estimation and a conservative test of our hypotheses (Sanders, 2001). We used robust standard errors in all analyses (though results without using robust standard errors were consistent with those presented here).

We first tested the influence of pay dispersion on short-term performance in the focal year (Time t) while controlling for prior performance (Time t-1). Table 2 shows the tests of Hypothesis 1, which predicts that higher pay dispersion is positively associated with short-term performance. In Model 1, the only significant control variable was transient ownership, indicating that higher transient ownership was positively associated with short-term performance. In Model 2, the coefficient for pay dispersion was positive and significant ($p < .01$), supporting Hypothesis 1.

We then tested the influence of pay dispersion on the long-term performance trend (Time t to Time t+4), again controlling for prior performance (Time t-1). Models 3 and 4 in Table 3 show our tests of Hypothesis 2. As the results of the control model reveal, prior performance was a negative predictor of long-term performance. Next, as Model 4 shows, the influence of pay dispersion on the long-term performance trend was negative and significant ($p < .01$), supporting Hypothesis 2.

Last, we tested the influence of dedicated and transient ownership as antecedents (at Time t-1) of pay dispersion in the focal year (Time t). Models 5 and 6 in Table 4 show our tests of Hypotheses 3 and 4. Tests of the control variables revealed that product diversification levels and prior firm performance positively influence pay dispersion, suggesting that top managers appear to be disproportionately rewarded when firms are diverse and have performed well (e.g., Devers et al., 2007). As shown in Model 6, the coefficient for transient investors was positive and significant ($p < .05$), supporting Hypothesis 3. The coefficient for dedicated investors was negative and significant ($p < .05$), supporting Hypothesis 4. Entering the transient and dedicated institutional investor variables separately does not change these results.

**Table 2**
**Fixed Effects Panel Regression of Short-Term Firm Performance**

| Variable | Model 1 | Model 2 |
|---|---|---|
| Constant | 1.45 | 2.05* |
| | (0.95) | (1.00) |
| Control variables | | |
| Prior year performance | 0.12 | 0.11 |
| | (0.10) | (0.10) |
| Product diversification | 0.00 | 0.00 |
| | (0.01) | (0.01) |
| Geographic diversification | –0.05 | –0.05 |
| | (0.04) | (0.04) |
| Complexity | –0.01 | –0.01 |
| | (0.03) | (0.03) |
| Dynamism | –0.02 | –0.01 |
| | (0.06) | (0.06) |
| Munificence | 0.02 | 0.01 |
| | (0.02) | (0.02) |
| Dedicated ownership | –0.00 | –0.00 |
| | (0.03) | (0.07) |
| Transient ownership | 0.08** | 0.07* |
| | (0.03) | (0.03) |
| Year (effects coded) | Included | Included |
| Independent variable | | |
| Pay dispersion | | 0.01** |
| | | (0.00) |

*Note:* $N = 2{,}410$. Robust standard errors are in parentheses.
*$p < .05$. **$p < .01$. One-tailed tests for hypothesized variables, two-tailed tests for control variables.

## *Supplemental Analyses*

The possibility exists that our pay dispersion variable was endogenous. Therefore, we conducted an additional set of analyses to determine whether potential endogeneity was influencing our findings. In this set of analyses we reestimated our models using the *xtabond2* procedure in STATA, which utilizes the generalized method of moments (GMM) model also known as *system GMM*. The *xtabond2* procedure is designed for panels that may contain fixed effects and heteroscedastic and correlated errors within units, and employs first differencing, which instruments variables with suitable lags of their own first differences, to eliminate these issues and potential sources of omitted variable bias (please see Arellano & Bover, 1995; Blundell & Bond, 1998; Roodman, 2009). Furthermore, and importantly, *xtabond2* also allows the ability to specify variables as endogenous to examine whether potential endogeneity is influencing findings.

To run our analyses of the supplemental tests of Hypotheses 1 and 2, we used the two-stage GMM estimator procedure in *xtabond2* (that employs robust standard errors). In doing so, we specified pay dispersion as an endogenous variable with a complete lag structure. The results of these analyses were entirely consistent with those of the first two sets reported in

**Table 3**
**Fixed Effects Panel Regression of the Long-Term Firm Performance Trend**

| Variable | Model 3 | Model 4 |
|---|---|---|
| Constant | 0.06 | –0.203 |
| | (0.69) | (0.72) |
| Control variables | | |
| Prior year performance | –0.08** | –0.08** |
| | (0.03) | (0.03) |
| Product diversification | –0.00 | –0.00 |
| | (0.01) | (0.01) |
| Geographic diversification | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Complexity | –0.03 | –0.03 |
| | (0.02) | (0.02) |
| Dynamism | –0.04 | –0.04 |
| | (0.06) | (0.06) |
| Munificence | –0.02 | –0.02 |
| | (0.01) | (0.01) |
| Dedicated ownership | –0.03 | –0.02 |
| | (0.02) | (0.02) |
| Transient ownership | –0.01 | –0.01 |
| | (0.01) | (0.01) |
| Year (effects coded) | Included | Included |
| Independent variable | | |
| Pay dispersion | | –0.01** |
| | | (0.00) |

*Note:* $N = 1{,}863$. Robust standard errors are in parentheses.
**$p < .01$. One-tailed tests for hypothesized variables, two-tailed tests for control variables.

the manuscript in Tables 2 and 3. This, and tests of overidentifying restrictions (Sargan & Hansen *J* statistics), demonstrated that our instruments were exogenous, suggesting that potential endogeneity was not biasing our results. In addition to the tests above, we also reestimated our models using short-term (annual) and long-term (trend over 5 years) measures of *return on sales* and found results consistent with those reported above.

## Discussion

Although scholars have long-suggested that pay dispersion has important consequences for performance (Heyman, 2005; Winter-Ebmer & Zweimuller, 1999), a full understanding of its effects remains elusive. Some suggest pay dispersion positively influences effort and performance (Heyman, 2005; Lallemand et al., 2004; Main et al., 1993). Others, highlighting equity concerns, draw attention to potential negative performance implications pay dispersion may produce (Grund & Westergaard-Nielsen, 2008; Shaw & Gupta, 2007; Siegel & Hambrick, 2005; Trevor & Wazeter, 2006). While a complete understanding of the consequences of pay dispersion is underdeveloped, research offers even less guidance about its possible antecedents (Gupta et al., 2012; Jirjahn & Kraft, 2007). In this study, we develop and

**Table 4**
**Fixed Effects Panel Regression of Pay Dispersion**

| Variable | Model 5 | Model 6 |
|---|---|---|
| Constant | –2962.62 | –2702.03* |
| | (1096.32) | (1093.14) |
| Control variables | | |
| Prior pay dispersion | –0.04 | –0.04 |
| | (0.06) | (0.05) |
| Prior year performance | 59.21* | 57.31* |
| | (26.91) | (26.82) |
| Product diversification | –15.83* | –17.33* |
| | (7.86) | (7.91) |
| Geographic diversification | –8.41 | –9.10 |
| | (14.79) | (14.83) |
| Complexity | 61.89 | 60.54 |
| | (47.04) | (47.30) |
| Dynamism | –14.73 | –22.11 |
| | (50.28) | (51.67) |
| Munificence | 16.85 | 19.76 |
| | (14.20) | (14.40) |
| Year (effects coded) | Included | Included |
| Independent variables | | |
| Transient ownership | | 25.79* |
| | | (12.65) |
| Dedicated ownership | | –31.88* |
| | | (17.05) |

*Note:* $N$ = 2,292. Robust standard errors are in parentheses.
*$p$ < .05. One-tailed tests for hypothesized variables, two-tailed tests for control variables.

test a theoretical explanation of the intertemporal performance consequences and antecedents of pay dispersion using a comprehensive set of firms from a wide range of industries We believe our results have key implications for both theory and practice.

## *Pay Dispersion Research*

Perhaps most important is our finding that intrafirm, interrank pay dispersion has significant implications for organizational performance. Although empirical findings of studies examining the effects of pay dispersion within organizations have been conflicting, less research specifically examines interrank pay dispersion between the highest and lowest levels of the organization (Eriksson, 1999). Those that do are usually limited to a subset of the organization: top, middle or bottom (Brown et al., 2003; Siegel & Hambrick, 2005). Few studies have examined top-to-bottom, vertical pay dispersion such as that which companies must report to be in compliance with the Dodd-Frank Act (e.g., Eriksson, 1999). As a result, the literature on pay dispersion has reflected "a certain fragmentariness or case-study quality across the studies, which examine specific, usually narrow labor markets" (Grund & Westergaard-Nielsen, 2008: 487). Our study helps smooth these spiky empirical results by investigating pay dispersion in an unusually rich and expansive set of firms.

Findings appear to show that pay dispersion has more nuanced implications for organizational performance than currently acknowledged. Scholars often draw on tournament theory assumptions to explain results that positively link pay dispersion to firm performance and equity theory assumptions to explain negative performance effects. In this study we hypothesize and find that, rather than contrasting, both tournament theory and more equity-based arguments can help explain the effects of pay dispersion when temporal differences are considered.

Our study also provides some methodological advances for research on pay dispersion. Empirical research vertical, intrafirm pay dispersion has been decidedly narrow (Takacs-Haynes, 2008). While there have been studies in a number of industries, few have attempted to simultaneously examine firms in multiple industries. We hope, therefore, that the combination of a longitudinal examination of both short- and long-term performance indicators across industries adds an element of comprehensiveness to the empirical body of pay dispersion research.

Future research on pay dispersion might build on our findings to further our understanding of its antecedents and consequences. Beyond the firm-level consequences discussed in our study, there may be other meaningful consequences of widening pay gaps, such as effects on the speed or complexity of a firm's competitive actions. Similarly, higher levels of pay dispersion might also influence a firm's relationships with customers and suppliers. We would encourage scholars working in the areas of competitive dynamics and interorganizational relationships to explore these possibilities. Furthermore, scholars might extend our findings by considering other potentially important drivers of pay dispersion. Given our findings regarding competing short- and long-term performance outcomes, there may be other governance factors, such as board characteristics or the market for corporate control, that change the likelihood of firms adopting higher levels of pay dispersion. We expect social network research might also be informative in this regard and could help explain how higher levels of pay dispersion diffuse among a network of organizations.

### *Tournament Theory Research*

The results shown here also extend the literature on tournament theory. Tournament theory has gained tremendous momentum in management research as a means to explain variation in compensation levels and practices (Connelly et al., 2014; Gomez-Mejia, Trevino, & Mixon, 2009; Messersmith et al., 2011). Its most prominent prediction is that wider differences in pay motivate more effort and greater performance (DeVaro, 2006). However, if, as our results suggest, pay dispersion yields short-term benefits with negative long-term repercussions, a natural question is this: To what extent do those responsible for controlling pay dispersion allow, or even facilitate, its growth? In this study, we address this question by developing and testing a theoretical explanation of ownership antecedents of pay dispersion. We believe that by beginning to shed light on the drivers of pay dispersion between top-level managers and non-top-level managers, our study adds an element of comprehensiveness to this important and influential body of work.

Tournament theorists might extend our work by exploring variations of our theory to uncover boundary conditions, or potential moderators, of our hypothesized relationships. For instance, an underlying assumption of tournament theory is that employees are strongly motivated by compensation, but this may be truer in some countries than in others

(Takacs-Haynes, 2008). Therefore, empirical examination of how cultural factors change the effectiveness of compensation tournaments could yield interesting results (Oxelheim & Randoy, 2005). Also, a moderating influence on actor effort in tournaments could be the number (McLaughlin, 1988) or type (Nippa, 2010) of people competing in the tournament. Thus, our findings regarding the effects of pay dispersion could be moderated by the number of levels in the organization, the number of people competing at each level, or the culture of the organization. Furthermore, our findings regarding different owner preferences for tournament-based compensation mechanisms suggest there may be room for integrating agency theory with tournament theory. In particular, multiple agency theory (Arthurs, Hoskisson, & Busenitz, 2008) may help describe how managers address the competing interests of principals.

### *Implications for Practice*

Though there are exceptions, we expect that top managers are generally interested in increasing their pay. However, our study draws attention to two cautions those managers should observe. First, increasing pay dispersion could have important negative long-term ramifications both for their firms and the people they employ, thereby placing their financial, human, and social capital at risk (Heyman, 2005; Winter-Ebmer & Zweimuller, 1999). Second, as our study shows, pay dispersion between top manager and other employees is dependent, in part, on the ownership structure of their firms. Therefore, managers interested in following the trend of those who have expanded pay dispersion in their firms would do well to consider their existing governance structures, what kind of owners they wish to attract, and actions they might take to woo those potential shareholders (Bushee, 2004).

Furthermore, anecdotal evidence suggests that increasing pay dispersion could have important policy implications. For example, our findings about institutional investor influence on pay dispersion may motivate regulatory bodies, such as oversight committees, unions, or government agencies, to more powerfully focus their energies on methods designed to force influential investors to support firm policies and structures that reward long-term performance. Pay dispersion may trigger actions that have important consequences for human resource managers by affecting recruitment, selection, and retention of both top managers and other employees. We suggest that developing a more complete understanding of how pay dispersion influences human resource policies and practices, TMT recruitment and retention, and other stakeholders offers interesting and potentially fruitful research opportunities.

## Conclusion

Many top managers earn more on the year's first workday than the average employee in their organization earns for the entire year (Liberto, 2011). Policy makers and the media lament the ramifications of this widening pay gap and speculate about its causes (Patton, 2012). Meanwhile, the academic community is still working to understand the factors that bring about this state of affairs and has not yet been able to provide clear, consistent guidance about its implications for firm performance. By reconciling tournament and equity theory approaches to pay dispersion, we hope our study brings a measure of clarity and academic insight to this discussion.

## Notes

1. The Dodd-Frank Act mandates reporting of CEO-to-worker pay dispersion. We extend consideration of this issue to the top management team (TMT) by exploring the ratio of total annual TMT compensation, including the CEO, to the mean annual compensation of all employees except the TMT. Doing so avoids the "no tomorrow" effect of tournaments, wherein the CEO could earn considerably more than the remainder of the TMT, and focuses our study on the relative compensation of a conceptually meaningful group that has been the focus of much academic attention.

2. Using *t* tests, we calculated differences between firms in our sample and those that did not have complete data. For example, reporting of labor costs is less rigorously controlled by SEC guidelines than the other variables in our study and is less well represented in archival databases. In our tests, we found that firms in our sample were larger and had marginally fewer transient institutional investors than those without complete data. There were, however, no other significant differences between the two samples in terms of other predictors in our models, including return on assets and dedicated institutional investors. We do not expect the slight emphasis on larger firms in our sample would bias the results, but this could be one potential limitation of our study.

## References

Almazan, A., Hartzell, J. C., & Starks, L. T. 2005. Active institutional shareholders and costs of monitoring: Evidence from executive compensation. *Financial Management*, 34:5-34.

Arellano, M., & Bover, O. 1995. Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68: 29-51.

Arthurs, J. D., Hoskisson, R. E., & Busenitz, L. W. 2008. Managerial agents watching other agents: Multiple agency conflicts regarding underpricing in IPO firms. *Academy of Management Journal*, 51: 277-294.

Baker, G. P., Jensen, M. C., & Murphy, K. J. 1988. Compensation and incentives: Practice vs. theory. *Journal of Finance*, 43: 593-616.

Becker, B. E., & Huselid, M. A. 1992. The incentive effects of tournament compensation systems. *Administrative Science Quarterly*, 37: 336-350.

Bergh, D. D. 1998. Product-market uncertainty, portfolio restructuring, and performance: An information-processing and resource-based view. *Journal of Management*, 24: 135-155.

Beaumont, P. B., & Harris, R. I. D. 2003. Internal wage structures and organizational performance. *British Journal of Management*, 41: 53-70.

Bloom, M. 1999. The performance effects of pay dispersion on individuals and organizations. *Academy of Management Journal*, 42: 25-40.

Bloom, M., & Michel, J. G. 2002. The relationships among organizational context, pay dispersion, and managerial turnover. *Academy of Management Journal*, 45:33-42.

Blundell, R., & Bond, S. 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87: 115-143.

Bogle, J. C. 2008. Reflections on CEO compensation. *Academy of Management Perspectives*, 22: 21-25.

Bolino, M. C., & Turnley, W. H. 2008. Old faces, new places: Equity theory in cross-cultural contexts. *Journal of Organizational Behavior*, 29: 29-50.

Bothner, M. S., Kang, J., & Stuart, T. E. 2007. Competitive crowding and risk taking in a tournament: Evidence from NASCAR racing. *Administrative Science Quarterly*, 52: 208-247.

Boyd, B. 1995. CEO duality and firm performance: A contingency model. *Strategic Management Journal*, 16: 301-313.

Brown, M. P., Sturman, M. C., & Simmering, M. J. 2003. Compensation policy and organizational performance: The efficiency, operational, and financial implications of pay levels and pay structure. *Academy of Management Journal*, 46: 752-762.

Bushee, B. J. 1998. The influence of institutional investors on myopic R&D investment behavior. *Accounting Review*, 73: 305-334.

Bushee, B. J. 2001. Do institutional investors prefer near-term earnings over long-run value? *Contemporary Accounting Research*, 18: 207-246.

Bushee, B. J. 2004. Identifying and attracting the "right" investors: Evidence on the behavior of institutional investors. *Journal of Applied Corporate Finance*, 16: 28-34.

Cappelli, P., & Cascio, W. F. 1991. Why some jobs command wage premiums: A test of career tournament and internal labor market hypotheses. *Academy of Management Journal*, 34: 848-868.

Carpenter, M. A., & Sanders, W. 2004. The effects of top management team pay and firm internationalization on MNC performance. *Journal of Management*, 30: 509-528.

Charness, G., & Kuhn, P. 2007. Does pay inequality affect worker effort? Experimental evidence. *Journal of Labor Economics*, 25: 693-724.

Chen, X., Harford, J., & Li, K. 2007. Monitoring: Which institutions matter? *Journal of Financial Economics*, 86: 279-305.

Connelly, B. L., Hoskisson, R. E., Tihanyi, L., & Certo, S. T. 2010. Ownership as a form of corporate governance. *Journal of Management Studies*, 47: 1561-1589.

Connelly, B. L., Tihanyi, L., Certo, S. T., & Hitt, M. A. 2010. Marching to the beat of different drummers: The influence of institutional owners on competitive actions. *Academy of Management Journal*, 53: 723-742.

Connelly, B. L., Tihanyi, L., Crook, T. R., & Gangloff, K. A. 2014. Tournament theory: Thirty years of contests and competitions. *Journal of Management*, 40: 16-47.

Conyon, M. J., Peck, S. I., & Sadler, G. V. 2001. Corporate tournaments and executive compensation: Evidence from the U.K. *Strategic Management Journal*, 22: 805-815.

Cowherd, D. M., & Levine, D. I. 1992. Product quality and pay equity between lower-level employees and top management: An investigation of distributive justice theory. *Administrative Science Quarterly*, 37: 302-320.

Dallas, L. 2011. Short-termism, the financial crisis, and corporate governance. *Journal of Corporation Law*, 37: 264-362.

David, P., Bloom, M., & Hillman, A. J. 2007. Investor activism, managerial responsiveness, and corporate social performance. *Strategic Management Journal*, 28: 91-100.

David, P., Hitt, M. A., & Gimeno, J. 2001. The role of institutional investors in influencing R&D. *Academy of Management Journal*, 44: 144-157.

David, P., Kochhar, R., & Levitas, E. 1998. The effect of institutional investors on the level and mix of CEO compensation. *Academy of Management Journal*, 41: 200-208.

David, P., O'Brien, J. P., Yoshikawa, T., & Delios, A. 2010. Do shareholders or stakeholders appropriate the rents from corporate diversification? The influence of ownership structure. *Academy of Management Journal*, 53: 636-654.

Davis, G. F., & Cobb, J. A. 2010. Corporations and economic inequality around the world: The paradox of hierarchy. *Research in Organizational Behavior*, 30: 35-53.

DeVaro, J. 2006. Strategic promotion tournaments and worker performance. *Strategic Management Journal*, 27: 721-740.

Devers, C. E., Cannella, A. A., Reilly, G. P., & Yoder, M. E. 2007. Executive compensation: A multidisciplinary review and synthesis of recent developments. *Journal of Management*, 33: 1016-1072.

Devers, C. E., McNamara, G., Wiseman, R. M., & Arrfelt, M. 2008. Moving closer to the action: Examining compensation design effects on firm risk. *Organization Science*, 19: 548-566.

Dikoli, S. S., Kulp, S. L., & Sedatole, K. L. 2009. Transient institutional ownership and CEO contracting. *Accounting Review*, 84: 737-770.

Drago, R., & Garvey, G. T. 1998. Incentives for helping on the job: Theory and evidence. *Journal of Labor Economics*, 16: 1-25.

Dye, R. A. 1984. The trouble with tournaments. *Economic Inquiry*, 22: 147-149.

Ehrenberg, R. G., & Bognanno, M. L. 1990. The incentive effects of tournaments revisited: Evidence from the European PGA Tour. *Industrial and Labor Relations Review*, 43: 74-88.

Eriksson, T. 1999. Executive compensation and tournament theory: Empirical tests on Danish data. *Journal of Labor Economics*, 17: 262-280.

Filatotchev, I., & Toms, S. 2006. Corporate governance and financial constraints on strategic turnarounds. *Journal of Management Studies*, 43: 407-433.

Finkelstein, S., Hambrick, D. C., & Cannella, A. A. 2009. *Strategic leadership: Theory and research on executive, top management teams, and boards*. New York: Oxford University Press.

Firebaugh, G., & Gibbs, J. P. 1985. User's guide to ratio variables. *American Sociological Review*, 50: 713-722.

Fischer, H. M., & Pollock, T. G. 2004. Effects of social capital and power on surviving transformational change: The case of initial public offerings. *Academy of Management Journal*, 47: 463-481.

Folger, R., & Cropanzano, R. 1998. *Organizational justice and human resource management*. Thousand Oaks, CA: Sage.

Fredrickson, J. W., Davis-Blake, A., & Sanders, W. M. G. 2010. Sharing the wealth: Social comparisons and pay dispersion in the CEOs top team. *Strategic Management Journal*, 31: 1031-1053.

Frick, B. 2003. Contest theory and sport. *Oxford Review of Economic Policy*, 19: 512-529.

Froot, K. A., Scharfstein, D. S., & Stein, J. C. 1993. Risk managements coordinating corporate investment and financing policies. *Journal of Finance*, 48: 1629-1658.

Garrett, J., & Gopalakrishna, S. 2010. Customer value impact of sales contests. *Journal of the Academy of Marketing Science*, 38: 775-786.

Gibbs, M. 1994. Testing tournaments? An appraisal of the theory and evidence. *Labor Law Journal*, 45: 493-493.

Gillan, S. T., & Starks, L. T. 2000. Corporate governance proposals and shareholder activism: The role of institutional investors. *Journal of Financial Economics*, 57: 275-305.

Gomez-Mejia, L., Trevino, L. J., & Mixon, F. G. 2009. Winning the tournament for named professorships in management. *International Journal of Human Resource Management*, 20: 1843-1863.

Gompers, P. A., & Metrick, A. 2001. Institutional investors and equity prices. *Quarterly Journal of Economics*, 116: 229-260.

Grossman, W., & Hoskisson, R. E. 1998. CEO pay at the crossroads of Wall Street and Main: Toward the strategic design of executive compensation. *Academy of Management Executive*, 12: 43-57.

Grund, C., & Westergaard-Nielsen, N. 2008. The dispersion of employees' wage increases and firm performance. *Industrial and Labor Relations Review*, 61: 485-501.

Gupta, N., Conroy, S. A., & Delery, J. E. 2012. The many faces of pay variation. *Human Resource Management Review*, 22: 100-115.

Hartzell, J. C., & Starks, L. T. 2003. Institutional investors and executive compensation. *Journal of Finance*, 58: 2351-2374.

Hausman, J. A. 1978. Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 46: 1251-1271.

Hayes, R. H., & Abernathy, W. J. 1980. Managing our way to economic decline. *Harvard Business Review*, 58: 67-77.

Henderson, A. D., & Fredrickson, J. W. 2001. Top management team coordination needs and the CEO pay gap: A competitive test of economic and behavioral views. *Academy of Management Journal*, 44: 96-117.

Hendry, J., Sanderson, P., Barker, R., & Roberts, J. 2006. Owners or traders? Conceptualizations of institutional investors and their relationship with corporate managers. *Human Relations*, 59: 1101-1132.

Heyman, F. 2005. Pay inequality and firm performance: Evidence from matched employer-employee data. *Applied Economics*, 37: 1313-1327.

Higgins, M. C., & Gulati, R. 2006. Stacking the deck: The effects of top management backgrounds on investor decisions. *Strategic Management Journal*, 27: 1-25.

Hoskisson, R. E., Castleton, M. W., & Withers, M. C. 2009. Complementarity in monitoring and bonding: More intense monitoring leads to higher executive compensation. *Academy of Management Perspectives*, 23: 57-74.

Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Grossman, W. 2002. Conflicting voices: The effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies. *Academy of Management Journal*, 45: 697-716.

Jirjahn, U., & Kraft, K. 2007. Intra-firm wage dispersion and firm performance: Is there a uniform relationship? *Kyklos*, 60: 231-253.

Johnson, R. A., & Greening, D. W. 1999. The effects of corporate governance and institutional ownership types on corporate social performance. *Academy of Management Journal*, 42: 564-576.

Kalra, A., & Shi, M. 2001. Designing optimal sales contests: A theoretical perspective. *Marketing Science*, 20: 170-193.

Ke, B., & Petroni, K. 2004. How informed are actively trading institutional investors? Evidence from their trading behavior before a break in a string of consecutive earnings increases. *Journal of Accounting Research*, 42: 895-927.

Ke, B., & Ramalingegowda, S. 2005. Do institutional investors exploit the post-earnings announcement drift? *Journal of Accounting and Economics*, 39: 25-53.

Kepes, S., Delery, J., & Gupta, N. 2009. Contingencies in the effects of pay range on organizational effectiveness. *Personnel Psychology*, 62: 497-531.

Khan, R., Dharwadkar, R., & Brandes, P. 2005. Institutional ownership and CEO compensation: A longitudinal examination. *Journal of Business Research*, 58: 1078-1088.

Knoeber, C. R., & Thurman, W. N. 1994. Testing the theory of tournaments: An empirical analysis of broiler production. *Journal of Labor Economics*, 12: 155-179.

Kochar, R., & David, P. 1996. Institutional investors and firm innovation: A test of competing hypotheses. *Strategic Management Journal*, 17: 73-83.

Koh, P.-S. 2007. Institutional investor type, earnings management and benchmark beaters. *Journal of Accounting and Public Policy*, 26: 267-299.

Krantz, M., & Hansen, B. 2010. CEO pay soars while workers' pay stalls. *USA Today*. http://usatoday30.usatoday.com/money/companies/management/story/CEO-pay-2010/45634384/1e. Accessed March 5, 2013.

Lallemand, T., Plasman, R., & Rycx, F. 2004. Intra-firm wage dispersion and firm performance: Evidence from linked employer-employee data. *Kyklos*, 57: 533-558.

Lambert, R. A., Larcker, D. F., & Weigelt, K. 1993. The structure of organizational incentives. *Administrative Science Quarterly*, 38: 438-461.

Laverty, K. J. 1996. Economic "short-termism": The debate, the unresolved issues, and the implications for management practice and research. *Academy of Management Review*, 21: 825-860.

Laverty, K. J. 2004. Managerial myopia or systemic short-termism? The importance of managerial systems in valuing the long term. *Management Decision*, 42: 949-962.

Lazear, E. P. 1989. Pay inequality and industrial politics. *Journal of Political Economy*, 97: 561-580.

Lazear, E. P., & Rosen, S. 1981. Rank-order tournaments as optimum labor contracts. *Journal of Political Economy*, 89: 841-865.

Lepak, D. P., Takeuchi, R., & Snell, S. A. 2003. Employment flexibility and firm performance: Examining the interaction effects of employment mode, environmental dynamism, and technological intensity. *Journal of Management*, 29: 681-703.

Liberto, J. 2011. CEOs earn 343 times more than typical workers. *CNNMoney*, April 20.

Loescher, S. M. 1984. Bureaucratic measurement, shuttling stock shares, and shortened time horizons: Implications for economic growth. *Quarterly Review of Economics and Business*, 24: 8-23.

Main, B. G. M., O'Reilly, C. A., & Wade, J. 1993. Top executive pay: Tournament or teamwork? *Journal of Labor Economics*, 11: 606-628.

Marginson, D., & McAulay, L. 2008. Exploring the debate on short-termism: A theoretical and empirical analysis. *Strategic Management Journal*, 29: 273-292.

Matsumoto, D. A. 2002. Management's incentives to avoid negative earnings surprises. *Accounting Review*, 77: 483-514.

McLaughlin, K. J. 1988. Aspects of tournament models: A survey. *Research in Labor Economics*, 9: 225-256.

Messersmith, J. G., Guthrie, J. P., Ji, Y. Y., & Lee, J. Y. 2011. Executive turnover: The influence of dispersion and other pay system characteristics. *Journal of Applied Psychology*, 96: 457-469.

Meulbroek, L. K., Mitchell, M. L., Mulherin, H., Netter, J. M., & Poulsen, A. B. 1990. Shark repellents and managerial myopia: An empirical test. *Journal of Political Economy*, 98: 1108-1117.

Mishel, L., & Sabadish, N. 2012. CEO pay and the top 1%: How executive compensation and financial-sector pay have fueled income inequality. *Economic Policy Institute*. http://www.epi.org/publication/ib331-ceo-pay-top-1-percent/. Accessed March 5, 2013.

Murphy, K. J., & Zabojnik, J. 2004. CEO pay and appointments: A market-based explanation for recent trends. *American Economic Review*, 94: 192-196.

Nalebuff, B. J., & Stiglitz, J. E. 1983. Prizes and incentives: Towards a general theory of compensation and competition. *Bell Journal of Economics*, 14: 21-43.

Narayanan, M. P. 1985. Observability and the payback criterion. *Journal of Business*, 58: 309-323.

Nichols, D., & Subramaniam, C. 2001. Executive compensation: Excessive or equitable? *Journal of Business Ethics*, 29: 339-351.

Nippa, M. 2010. On the need to extend tournament theory through insights from status research. In J. L. Pearce (Ed.), *Status in management and organizations*: 118-152. New York: Cambridge University Press.

Oliver, R. L., & Anderson, E. 1994. An empirical test of the consequences of behavior-and outcome-based sales control systems. *Journal of Marketing*, 58: 53-67.

Oxelheim, L., & Randoy, T. 2005. The Anglo-American financial influence on CEO compensation in non-Anglo-American firms. *Journal of International Business Studies*, 36: 470-483.

Paletta, D. 2010. It has a name: The Dodd/Frank Act. *Wall Street Journal*, June 25.

Parrino, F., Sias, R., & Starks, L. T. 2003. Voting with their feet: Institutional ownership changes around CEO turnovers. *Journal of Financial Economics*, 68: 3-46.

Patton, L. 2012. McDonald's $8.25 man and $8.75 million CEO shows pay gap. *Bloomberg News*. http://www.bloomberg.com/news/2012-12-12/mcdonald-s-8-25-man-and-8-75-million-ceo-shows-pay-gap.html. Accessed March 5, 2013.

Pfeffer, J., & Langton, N. 1993. The effect of wage dispersion on satisfaction, productivity, and working collaboratively: Evidence from college and university faculty. *Administrative Science Quarterly*, 38: 382-402.

Porter, M. E. 1992. *Capital choices: Changing the way America invests in industry*. Boston: Harvard Business School.

Poujol, F. J., & Tanner, J. F. 2009. The impact of contests on salespeople's customer orientation: An application of tournament theory. *Journal of Personal Selling and Sales Management*, 30: 33-46.

Price, B. M. 2003. How green was my valley? An examination of tournament theory as a governance mechanism in Silicon Valley law firms. *Law and Society Review*, 37: 731-764.

Rappaport, A. 2005. The economics of short-term performance obsession. *Financial Analysts Journal*, 61: 65-79.

Roodman, D. 2009. A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics*, 71: 135-158.

Sahadi, J. 2007. CEO Pay: 364 times more than workers. *CNNMoney*, August 29.

Samuel, C. 2000. Does shareholder myopia lead to managerial myopia? A first look. *Applied Financial Economics*, 10: 493-505.

Sanders, W. G. 2001. Behavioral responses of CEOs to stock ownership and stock option pay. *Academy of Management Journal*, 44: 477-492.

Sapp, S. G. 2008. The impact of corporate governance on executive compensation. *European Financial Management*, 14: 710-746.

Shaw, J. D., & Gupta, N. 2007. Pay system characteristics and quit patterns of good, average, and poor performers. *Personnel Psychology*, 60: 903-928.

Shin, J. Y., & Seo, J. 2011. Less pay and more sensitivity? Institutional investor heterogeneity and CEO pay. *Journal of Management*, 37: 1719-1746.

Siegel, P. A., & Hambrick, D. C. 2005. Pay disparities within top management groups: Evidence of harmful effects on performance of high-technology firms. *Organization Science*, 16: 259-274.

Simerly, R. L., & Li, M. 2000. Environmental dynamism, capital structure and performance: A theoretical integration and an empirical test. *Strategic Management Journal*, 21: 31-50.

Singer, J. D., & Willett, J. B. 2003. *Applied longitudinal data analysis: Modeling change and event occurrence*. New York: Oxford University Press.

Syam, N. B., Hess, J. D., & Yang, Y. 2011. Sales contests versus quotas with imbalanced territories. *Marketing Letters*, 24: 229-244.

Takacs-Haynes, K. T. 2008. Executive compensation in an international context: The role of informal and formal institutions. In L. Gomez-Mejia & S. Werner (Eds.), *Global compensation*: 86-99. London: Routledge.

Tihanyi, L., Johnson, R. A., Hoskisson, R. E., & Hitt, M. A. 2003. Institutional ownership differences and international diversification: The effects of boards of directors and technological opportunity. *Academy of Management Journal*, 46: 195-211.

Trevor, C. O., & Wazeter, D. L. 2006. A contingent view of reactions to objective pay conditions: Interdependence among pay structure characteristics and pay relative to internal and external referents. *Journal of Applied Psychology*, 91: 1260-1275.

Van der Stede, W. A. 2000. The relationship between two consequences of budgetary controls: Budgetary slack creation and managerial short-term orientation. *Accounting, Organizations and Society*, 25: 609-622.

Wade, J. B., O'Reilly, C. A., & Pollock, T. G. 2006. Overpaid CEOs and underpaid managers: Fairness and executive compensation. *Organization Science*, 17: 527-544.

Wahal, S., & McConnell, J. J. 2000. Do institutional investors exacerbate managerial myopia? *Journal of Corporate Finance*, 6: 307-329.

Whoriskey, P. 2011. With executive pay, rich pull away from rest of America. *Washington Post*. http://articles.washingtonpost.com/2011-06-18/business/35234600_1_income-gap-personal-income-capital-gains. Accessed March 5, 2013.

Winter-Ebmer, R., & Zweimuller, J. 1999. Intra-firm wage dispersion and firm performance. *Kyklos*, 52: 555-572.

Wiseman, R. M. 2009. On the use and misuse of ratios in strategic management research. In D. A. Ketchen & D. Bergh (Eds.), *Research methodology in strategy and management*, vol. 5: 75-110. Bradford, UK: Emerald.

Yoshikawa, T., Phan, P. H., & David, P. 2005. The impact of ownership structure on wage intensity in Japanese corporations. *Journal of Management*, 31: 278-300.

Zheng, Y. 2010. Heterogeneous institutional investors and CEO compensation. *Review of Quantitative Finance and Accounting*, 35: 21-46.