# The Value of Human Capital Specificity Versus Transferability

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Human capital is a key resource for which firms compete intensely. Human capital theory suggests that firms value both transferable and specific human capital. Yet as transferability increases, specificity decreases. This article examines the value firms place on acquiring executives' human capital as a function of its transferability versus specificity. Using longitudinal data from more than 9,000 executives, this article shows that executives moving to more similar firms receive greater increases to pay than nonmovers and those moving to less similar firms. This article suggests these increases reflect the differential value associated with various types of human capital.

Human capital, which refers to the knowledge and skills held by individuals and obtained through their education, training and experience, is frequently cited as an intangible resource that contributes to firm performance and advantage (Becker, 1962; Hitt, Bierman, Shimizu, & Kochhar, 2001). Indeed, it can be of such great organizational value that research is increasingly recognizing the intense competition for human capital (Gardner, 2002, 2005). With a particular focus at the executive level, research suggests that hiring firms, especially competitors, value the transferable component of executives' human capital, and this value is reflected in the compensation they offer executives to entice them to join their firms (Combs & Skill, 2003; Gardner, 2005; Harris & Helfat, 1997; Wezel, Cattani, & Pennings, 2006). The contrast to transferability is specificity. Human capital specificity refers to the degree to which an individual's knowledge, skills, and experience are so rare or unique they generate above average organizational rents for the firm (Hatch & Dyer, 2004; Hitt et al., 2001; Wang & Barney, 2006). The more specific the human capital, the greater value it brings to an organization (Barney, 1991; Klein, Crawford, & Alchian, 1978). Although purely firm-specific human capital lacks transferability, there is research suggesting that specific human capital that is also transferable may be valued by other firms (Harris & Helfat, 1997; Hatch & Dyer, 2004).

When comparing the concepts of transferability and specificity within the context of the executive labor market, we are presented with a paradox. Some literature suggests that firms would provide greater compensation to executives who possess higher levels of transferable human capital

(Harris & Helfat, 1997). At the same time, there is also research suggesting that firms will value executives who possess human capital that is high in its specificity (Coff, 1997; Hatch & Dyer, 2004; Wang & Barney, 2006). Yet human capital theory suggests that as transferability increases, specificity decreases (Harris & Helfat, 1997). As a result, as human capital becomes more specific (and hence less transferable), there are forces at work both increasing and decreasing its market value. Research is unclear on the implications of human capital specificity and transferability on the executive-level labor market and its associated value by hiring firms. This article contributes to this literature by examining the value firms place on acquiring executives' human capital as a function of its transferability versus specificity.

Research on human capital is increasingly recognizing the importance of understanding not just how firms compensate individuals for their human capital but also how specifically firms compete against each other for this important, intangible resource (Gardner, 2005). As such, examining human capital within the context of job mobility and employee succession is an increasingly important domain of research (e.g., Gardner, 2005; Harris & Helfat, 1997; Rao & Drazin, 2002; Wezel et al., 2006). And yet, although some have made specific hypotheses differentiating between some categorizations of human capital (e.g., Harris & Helfat, 1997), the issue of the tradeoff between transferability and specificity has not been addressed. In addition, although a large stream of literature examines determinants of executive compensation, most of this work (e.g., Barkema & Gomez-Mejia, 1998; Deckop, 1988; Finkelstein & Hambrick, 1988; Grossman & Cannella, 2006; Tosi, Werner, Katz, & Gomez-Mejia, 2000) considers the impact of firm characteristics—such as size, firm performance, or strategic considerations—on an executive's compensation. Certainly, some work has considered the role of executives' human capital (e.g., Castanias & Helfat, 1991; Combs & Skill, 2003; Wang & Barney, 2006), but despite the array of research on executive compensation, the field has yet to disentangle the value firms place on the human capital of the executives they hire.

The overall purpose of this article is to provide clarity on the value associated with executive-level human capital to hiring firms and ultimately to further refine the theory of human capital with regard to the issue of specificity against transferability. Using a subset of the ExecuComp database (Standard & Poor's, 2005), we examine executive compensation over time with a particular focus on the changes in pay that occur when an executive gains employment with a different organization. We examine the degree of similarity between the firms left and entered by executives and how this similarity is related to their compensation changes. Our goal is to contribute to the current literature on both human capital theory and firm mobility.

# The Human Capital Continuum

Human capital contributes to a firm's sustained competitive advantage to the degree it is heterogeneous and immobile (Barney, 1991). To meet these criteria, human capital must be (1) valuable, (2) rare, (3) imperfectly imitable, and (4) imperfectly substitutable. Executive-level human capital is believed to contribute to firm distinction and advantage because, as part of helping create firm-based capabilities, this form of human capital is difficult to imitate with exactly comparable knowledge and skills (Barney, 1991; Lopez-Cabrales, Valle, & Herrero, 2006). In part, this is because executives' human capital is largely tacit and involves learning by doing (Castanias & Helfat, 1991). In addition, executive-level human capital is complex and high in its uniqueness, two other criteria that help establish imitation barriers (McEvily & Chakravarthy, 2002). Finally, executive-level human capital is developed through work experiences, often over the course of a career. With each executive accumulating his or her own set of unique learning into a bundle of tacit knowledge, it is likely that executives, while replaceable, cannot be duplicated (Hitt et al., 2001). As a result, a firm is likely to find it impossible to replicate the executive-level knowledge base and skill set of another firm with its own. If a firm does desire this form of human capital, it must "hire it away" to bring it in-house.

Early conceptualizations of human capital presented a simple dichotomy of definitions— it was either generic and thus of use to all other firms or it was firm specific and thus by definition of no market value (Becker, 1962). Yet, even from its earliest beginnings, it has been recognized that human capital is not so readily categorized. Indeed, Becker (1962), in his seminal work, suggests that "some training may be useful not in most firms, nor in a single firm, but in a set of firms defined by product, type of work, or geographical location. For example, carpentry training would raise productivity primarily in the construction industry" (Becker, 1962, p. 24). As firms compete for executive-level human capital, the notion that different aspects of an executive's human capital may be differentially valued has become salient (Gardner, 2002, 2005). At one extreme, executives may possess generic skills, such as leadership, planning, and decision-making skills, that are not unique to any particular firm or type of business (Castanias & Helfat, 1991); at the other extreme, executives may possess highly specific information—such as trade secrets, customer lists, strategic plans, and knowledge of specific production processes—that are of potential value perhaps only to a firm's direct competitors (Blake, 1960). The question becomes, how much do firms value the specificity versus the transferability of executives' human capital?

The specificity of human capital can be viewed as falling along a continuum, ranging from purely firm specific to purely generic (Castanias & Helfat, 2001). The categorizations of human capital types

along this continuum "include skills in both narrowly and broadly defined industries, as well as skills in closely related and less closely related industries" (Castanias & Helfat, 2001, p. 663). At one extreme of this continuum, individuals develop knowledge and skills that are unique to a single firm. This highly specific human capital loses most of its value when executives move between firms because of its lack of transferability (Castanias & Helfat, 2001; Harris & Helfat, 1997).[i] Yet, as soon as one moves off this extreme point of the continuum, human capital, although still highly specific in its nature, takes on some transferability. As a result, it has potential value to other firms. Its specificity, by definition, makes this human capital rare and potentially valuable. Its transferability makes it portable to at least some other firms. We argue that this form of human capital is likely to have the highest value to a limited number of other firms, specifically a firm's direct competitors.

There is abundant evidence suggesting that certain aspects of a firm's knowledge—such as customer lists and product formulae—are, in fact, valued by a firm's direct competitors. In the legal arena, there is a long history of the use of noncompete agreements as a means of preventing this form of knowledge from being used by either a competitor or by the employee beginning a competing business (for a review, see Blake, 1960). Early applications of these protections have conceptualized this sort of firm-based knowledge akin to property, which led to legal writings and court decisions based on legal theories pertaining to property rights (Blake, 1960). Employees' competitor-specific knowledge also includes knowledge of business plans, upcoming projects, past projects, and market knowledge (Stone, 2002), in addition to personal contacts, often referred to as an executive's social capital (Belliveau, O'Reilly, & Wade, 1996). Indeed, an executive's social capital or social status, as well as depth and breadth of network ties, is considered valuable to organizations, as evidenced by executive compensation levels (Belliveau et al., 1996; Seibert, Kraimer, & Liden, 2001).[ii]

Another form of firm knowledge of potential value to competitors is knowledge of what does not work. Referred to as "negative knowledge" (Stone, 2002) or "negative trade secrets" (Hamler, 2000), this entails knowledge gained through research and experience discovering dead ends, pitfalls, and faulty processes that fail to produce valued business outcomes. Although this sort of knowledge is clearly not as tangible as a specific formula or customer list, it is a rare and difficult-to-imitate source of knowledge and is of potentially great value to competitors who may yet pursue the approaches already learned by one firm.

It is also worth noting that the potential value of competitor-based knowledge does not require the employee to purposely divulge trade secrets or "steal" away customers. A relatively recent development in the legal area is the theory of inevitable disclosure, which posits that "an employee who

has been exposed to her employer's trade secrets will inevitably disclose or use those secrets in the course of her new employment, and therefore should be enjoined from working for her former employer's competitors" (Koh, 1999, p. 276). Although courts are applying this doctrine somewhat inconsistently (Koh, 1999), highly specific firm knowledge, even if not purposely used, is of value to a firm's competitors.

It is important to note, though, that just because human capital can be so specific and valuable that there have been examples of it having been granted protection by the courts does not mean that it necessarily always receives such protection. First, employees are often not forced to sign noncompete agreements. Recent surveys show that only half of firms require their employees to sign noncompete agreements (Berthiaume & Parsons, 2006; Gurchiek, 2005), and one third of CEOs' contracts do not include noncompete agreements (Schwab & Thomas, 2006). Second, noncompete agreements are not always enforceable. California law, for example, expressly prohibits the use of noncompete agreements (Ingram, 2002; Leonard, 2001), and although some states do have laws that seem to support enforcement of noncompete agreements (e.g., South Dakota, North Carolina, and Georgia; see Hogan, 2006), courts have often been hesitant to enforce them (Ingram, 2002; Stone, 2002). Thus, although the possibility exists for legal protection and injunctive relief, the departure of employees to competitors is a salient issue in the modern workplace (e.g., Gardner, 2005; Leonard, 2001; Segal, 2005), and a firm's ability to protect this highly specific human capital is limited.

Next along the continuum, human capital can be more transferable than the highly specific knowledge described previously yet be more specific than to be viewed as generic human capital. Castanias and Helfat (1991, 2001) proposed a managerial rents model in which they argue for the existence of industry-related human capital. Industry-related human capital refers to knowledge and skills that are only relevant within a firm's specific industry (Castanias & Helfat, 1991, 2001). This category of human capital is distinguishable from human capital that can be protected by noncompete agreements in that two firms could be in the same industry but not be direct competitors. Consider, for example, two mining companies in which one mines gold ore and the other nickel. These two firms would possibly rely on similar suppliers yet have different customer markets. The firm that mines nickel could be interested in the industry knowledge of the executive from the gold-mining firm, even though the firm is not a direct competitor. So, for example, the nickel-mining firm may be interested in the executive's experience negotiating with the union representing miners (industry-specific human capital) but would not be interested in knowledge of the specific techniques associated with mining gold ore.

Industry-related knowledge represents a broad category of human capital that is somewhat specific and somewhat transferable. Unfortunately, the use of the term *industry* has varied extensively in human capital research and has thus represented a wide range of potential similarities between firms. For example, in Porter's (1985) five-forces model, industry refers to firms with whom one is specifically competing. Following this approach, Buchholtz, Ribbens, and Houle (2003) defined "similar firms" as those possessing the same four-digit Standard Industrial Classification (SIC) code. So too, Bailey and Helfat (2003) classified industry-specific experience in the same manner. Some have defined industry-specific human capital as experience within firms classified by the same three-digit SIC code (e.g., Harris & Helfat, 1997; Parent, 2000); others have used broader definitions, using two-digit SIC codes (e.g., Hatfield, Liebeskind, & Opler, 1996; Shaver & Flyer, 2000). Tang and Tseng (2004) used an even broader conceptualization of industry, providing categories somewhat between one- and two-digit SIC codes, such as "agriculture, forestry, and fishing"; "energy and mining"; and "construction." In sum, when scholars have referred to "industry-specific human capital," they have not necessarily been referring to the same specificity of skills and knowledge. We thus agree with Castanias and Helfat (2001) that human capital specificity is an issue of degree, and although the discussions regarding the definition of industry-specific human capital have varied, we employ the theoretical framework proposed by Castanias and Helfat (2001) to examine the degree of specificity against the degree of transferability of human capital.

Generic human capital represents knowledge and skills that generate value or rents for any firm that makes use of them (Bailey & Helfat, 2003). This category refers to general managerial approaches to work—such as motivating staff, planning budgets, or working on a team—that would be of value in any industry. Although generic human capital is highly transferable and many executives hold this skill set, it does not necessarily provide firm distinction.

Considering the specificity and transferability of human capital as on a continuum, we pose the following arguments. First, human capital theory suggests that greater specificity (and thereby rarity) should be associated with greater value to those firms who can benefit from such human capital, whereas lower specificity (and thereby lower rarity) is of less value to those same firms. Second, at the same time, greater specificity is associated with lower transferability, making highly specific human capital of value to fewer firms. Thus, less specific human capital will have value, albeit limited value, to a greater number of firms than will more specific human capital. Consequently, when individuals move between firms, aspects of their human capital lose value to the extent to which the executives' human capital is no longer applicable to the new organization. So, for example, when executives switch firms, their firm-specific capital loses value; when executives move within their industry from a competitor to a

noncompetitor, highly specific components of their human capital lose value, and when they move outside their industry, all but their most generic components of their human capital lose value. Third, the compensation a firm offers a potential executive reflects the value the firm associates with the executive's human capital (Castanias & Helfat, 2001). However, although the focus of this article is on human capital theory and firm mobility, we recognize that compensation decisions involve more than only evaluations of human capital. In part, compensation systems are very complex, involving different forms of pay with distinct characteristics (cf., Milkovich & Newman, 2005). We use these arguments to frame the specific hypotheses discussed subsequently.

## Hypotheses

Similar to other research on human capital (e.g., Bailey & Helfat, 2003; Harris & Helfat, 1997), we examine the executive labor market to consider the effects of specificity and transferability reflected on compensation. Specifically, executive-level movements (i.e., changes from one firm to another) provide an opportunity to examine the value of human capital, as such movements should reveal information about the degree to which hiring firms desire various forms of executives' human capital. Although there are many different reasons that employees in general (e.g., Gardner, 2002, 2005; Trevor & Wazeter, 2006) and executives specifically (e.g., Cheramie, Sturman, & Walsh, 2007) may leave an organization and join another, compensation clearly plays an important role in the executive labor market, and we expect to observe positive effects on compensation associated with executive moves. That said, the nuances of compensation and the nature of organizational changes adds complexity to understanding the effects of executive moves and merits some detailed attention. Thus, before discussing how various sorts of executive moves differentially relate to compensation changes, it is important to first explore the effects of executive moves in general on specific components of compensation.

In any given year, employees develop their various forms of human capital. Executives either take their human capital on the external labor market or remain with their current firms. Research has suggested that those who leave their firms to pursue an external labor market strategy likely realize a pay premium relative to those who pursue an internal labor market strategy and remain with their firms (Brett & Stroh, 1997; Sonnenfeld & Periperl, 1988). Building on this concept, as well as on the theory that firms compete for human capital (Gardner, 2005), we suggest that transferable human capital has the potential to derive a compensation premium from other firms and this premium will be greater than what a current firm might pay to retain an executive. In addition to the labor-market explanations, this

should occur for potentially three reasons. First, aspects of the economic rents associated with an individual's human capital are already shared with and retained within the firm (Peteraf, 1993). Because the existing firm partially owns the rent, if the individual leaves, the firm still retains aspects of the knowledge. Second, a firm has a greater inventory of its own knowledge. Although the competitor can only acquire this knowledge by recruiting and hiring the executive, the firm can develop it within its own ranks (Lepak & Snell, 1999). For these two reasons, the firm has less of a need to retain the executive than another firm does to hire the executive. A third reason to expect greater pay associated with executive moves is that firms wishing to acquire an executive need to pay a premium to the individual to compensate for the personal cost, difficulty, and risk associated with switching firms (Harris & Helfat, 1997). Hence, we expect that executives who move to other firms will receive greater increases in compensation than executives who remain with their firms.

A complexity, though, is that compensation is not so simply defined. Executive compensation consists of salary, bonuses, perquisites, stock grants, stock options, and so on (Milkovich & Newman, 2005). These different forms of pay serve different purposes, and thus, we do not expect that the effects of human capital will apply similarly across all forms. We thus need to create specific hypotheses by form of pay.

Salary represents the fixed component of pay. It is a negotiated amount that is agreed on by both parties to induce (at least in part) the applicant to take the position. We thus believe that base pay is a direct measure of the value a company places on acquiring an individual and hence serves as an approximation of the worth of the specific human capital. Once negotiated, salary rarely decreases. Certainly, raises may be a reflection of how the company performs, how a compensation committee evaluates an executive, market forces, and so on, but because of the stable nature of salary, increases in salary due to human capital should be observable for many time periods after a move occurs. For salary, we therefore predict the following:

**Hypothesis 1***:* Executives who move to other firms will receive greater increases in salary than executives who remain with their firms, and a greater salary level should be sustained for the executive's tenure within the organization.

Contingent cash compensation (bonuses and other cash payments) is another important component of executive compensation (Milkovich & Newman, 2005). Unlike salary, though, the size of this component of pay is usually dependent on various factors. These factors include individual performance, organizational performance, and the firm's performance compared to various

expectations, resulting in bonus decisions generally being under the discretion of compensation committees (Bergman & Scarpello, 2002). As a result, there is no simple relationship between contingent pay and firm performance (Bergman & Scarpello, 2002). Although the size of potential bonuses may be used to entice an individual to change firms, ExecuComp (the data source in this study) reports resultant bonuses. For example, bonus target (not reported in ExecuComp or other public sources) is a negotiated quantity in executive compensation packages, but the resultant bonus amount paid (which is publicly available and reported in ExecuComp) during the course of the year is contingent on this target and other factors.

Although bonuses are generally supposed to be a contingent form of pay (Bergman & Scarpello, 2002; Milkovich & Newman, 2005), it is common practice that executive contracts have specified bonuses (plus specified signing bonuses) within the first year (King, 2001; cf., Anders, 2003; Cox, 2007; Dash & Cox, 2006). Thus, for this first year, the bonus is not truly contingent pay. As such, similar to salary, the bonus in the first year will reflect the organization's efforts to acquire an executive, and thus, we expect it will be greater for those who switch organizations versus those who remain with their firms. In other words, we expect that organizations trying to acquire an executive will provide a greater guaranteed first-year bonus than firms will pay to keep their current executives. Yet, over time (and often after this first year), the size of the bonus will be contingent on other factors. We thus expect to observe an increase in this component of pay in the first year after an organizational move but not necessarily in later years. Hence, we predict the following:

**Hypothesis 2:** Executives who move to other firms will receive greater increases in their bonuses than executives who remain with their firms, but this effect should not necessarily remain for the executive's tenure within the organization.

In addition to base pay and bonuses, compensation also includes long-term compensation (Milkovich & Newman, 2005), which has different contingencies than bonuses. For example, long-term incentives often are accumulated over time, so time must pass before the awards can be acquired (e.g., time must pass before a stock option can be exercised, if the value of the stock even increases); similarly, long-term incentives often require time to be vested. Executives who switch firms must often forego existing unvested long-term incentives at their departing companies and must also wait before receiving such awards at their new companies. Obviously, executives will know this, and when moving, the compensation package they negotiate likely has at least the opportunity for executives to recover this value (in addition to perhaps increases in salary and bonuses to offset this loss). Given the

importance of long-term compensation as a component of executive compensation, as well as based on how important long-term compensation is to the recruitment and retention of executives (Milkovich & Newman, 2005), we expect any initial loss in long-term compensation will be recouped over time:

**Hypothesis 3***:* Executives who move to other firms will receive an initial decrease in their long-term compensation than executives who remain with their firms.

**Hypothesis 4:** Over time, executives who move to other firms will receive greater total long-term compensation than executives who remain with their firms.

To examine the effects of transferability and specificity, we now consider the value associated with the various forms of transferable human capital. If pay increases were only due to the need to compensate executives for the risk or inconvenience associated with changing companies, then the type of move should not affect the price premium paid to executives. However, human capital researchers have argued that transferable forms of human capital are differentially valued in the labor market, depending on their degree of specificity (Bailey & Helfat, 2003; Harris & Helfat, 1997; Parent, 2000).

We build from this idea to suggest that the additional value associated with transferable human capital that is higher in its specificity would be reflected in greater compensation paid to executives by firms that desire this specific human capital. This more specific human capital should hold superior value over less specific human capital as a valuable, rare, and nonreplicable resource (Barney, 1991). Thus, we expect that executives who move to firms that are more similar to the firms from which they are departing (and we would argue that benefit from the higher degree of human capital specificity) will receive greater increases in compensation than executives who move to noncompeting firms within the same industry or to other industries.

Specifically, we argue that executives will realize greater compensation by moving to similar competitors than they would by moving to firms that do not compete within the same industry. Competitors would be willing to pay a premium for highly specific knowledge that someone can bring to an organization over more generic forms of knowledge that may be useful but have less of an immediate potential strategic impact. Firms operating in completely different industries would only value the most generic forms of knowledge (e.g., general management skills, leadership abilities), which by definition are the least rare. This general knowledge should be associated with the lowest premium for executives switching organizations. Thus, we expect that firm similarity—which we define as the extent to which two firms are competing in the same business, producing the same goods, or providing the same

services—will affect the degree to which a firm would desire highly specific knowledge from an executive. Considering the various forms of compensation, we hypothesize the following:

**Hypothesis 5:** Executives who move to more similar firms will receive greater increases in salary than executives who move to less similar firms, and a greater salary level should be sustained for the executive's tenure within the organization.

**Hypothesis 6:** Executives who move to more similar firms will receive greater increases in their bonuses than executives who move to less similar firms, but this effect should not necessarily remain for the executive's tenure within the organization.

**Hypothesis 7:** Over time, executives who move to more similar firms will receive greater total long-term compensation than executives who move to less similar firms.

## Method

### Data

The data used in this study are a subset of those contained in the ExecuComp database (Standard & Poor's, 2005). The database contains information on executive compensation (generally, the top five paid executives in each firm) in addition to company information of the executives' employing firms. The full database (at the time of this study) contains data from 1992 to 2005, with information on 28,326 executives and 2,704 companies.

Executives and the ExecuComp database are an appropriate sample to test our hypotheses for a number of reasons. First, as noted by Castanias and Helfat (1991), the human capital of the entire top management team is important to the firm. It is therefore valuable to consider the implications of human capital for more than just the CEOs of organizations. Second, the ExecuComp database provides the opportunity to consider a highly heterogeneous sample. Individuals identified in the database come from 2,704 organizations and 10 industries. Third, the database affords us the opportunity to examine individuals longitudinally. Longitudinal analysis enables us to consider pay changes for individuals over time and thus gives us the best opportunity to consider the potential causal implications of executive moves. Finally, the size of the database is sufficient, both in terms of number of years of data and the number of individuals in the database, to provide powerful statistical tests.

To test our hypotheses, we used a subset of the entire database. First, most obviously, we wanted to identify executives who changed organizations. Because we wanted to study changes in compensation after executives switched organizations, the executive needed to leave one organization

in the database and be hired by another firm also in the database. Because of the nature of our analyses (to be discussed below), we required that there be at least 1 year of data both before and after the organizational movement and a total of at least 4 years of data for each executive. We eliminated any apparent executive moves that were attributable to being from a merger, takeover, or company name change. We also checked to ensure that each line of data represented pay from a full year; if the data were from a portion of a year, the line of data was deleted. Ultimately, we were able to accumulate data on 844 executives who switched organizations. These executives originated at 633 companies (i.e., before the move), changed to 628 resultant companies (i.e., after the move), and involved 1,092 companies.

In addition to executives who changed employers, our hypotheses required that we compare the pay changes of this sample to executives who did not switch employers. Our sample thus included nonmoving executives from the same organizations. This included all executives in the database who came from the same 1,092 total companies associated with the "movers" and for whom the database likewise had at least 4 years of data. This resulted in 8,171 other executives. The resultant data set contained information on 9,015 executives from 1,092 companies. For each executive, we had from 4 to 14 years of data ($M = 6.68$, $SD = 2.66$), yielding a total sample of 60,184 person–years.

Dependent Variables

ExecuComp provides data on executives' salaries, bonuses, and total compensation. We examined three components of pay: base pay (salary), short-term contingent cash compensation, and long-term compensation. Base pay was provided by the database. We examined bonus, rather than total cash compensation, because total cash compensation included both base pay and bonuses. Effects associated with base pay would be reflected in total cash compensation, and the two analyses may not be meaningfully different. Therefore, we used bonus as a dependent variable. We also examined long-term compensation. The ExecuComp database provides two measures of total compensation: one examining stock options calculated using the Black-Sholes formula, the second examining the value of exercised stock options. We calculated long-term compensation by subtracting total cash compensation from the first total compensation measure, and thus, our analysis of total compensation included the estimated value of granted stock options. Note that because all of the compensation measures are highly skewed, we transformed each measure using natural logarithm.

Independent Variables

**Organizational changes.** The hypotheses of our study focus on the extent that increases in executive pay are associated with executive moves of various types. To represent the nature of these moves, we used information obtained from each firm's SIC code. SIC codes are four-digit numbers used to classify businesses. The structure contains 10 broad divisions (e.g., mining, manufacturing) represented by the first digit (i.e., the left-most digit of the four-digit SIC code). (Note that the term *division* is the one used by the Department of Labor in the *SIC Manual*. For the *SIC Manual* and more detail on SIC codes, see *SIC Division Structure*, n.d.). Because changes in the SIC code represents a central component in our analyses, we provide additional detail on what each sort of change signifies. Note that the ExecuComp database only provides a single SIC code per executive. We were unable to control for companies that may compete in multiple SIC codes.

SIC codes are created in a hierarchical structure; thus, subsequent digits provide more specificity about the type of business. With four-digit SIC codes, the similarity of firms associated with executive moves is reflected by one of five possibilities: The SIC codes could differ in their first, second, third, or fourth digits, or they could remain the same. A change in the first SIC code digit represents the greatest change, signifying a change in organizations that crosses the broadest definition of divisions (such as from retail trade to construction or from mining to finance). A change in the second digit (meaning the first digit remains the same, but the second digit is different) represents a change in what the *SIC Code Manual* refers to as "Major Groups." For example, within the "Finance, Insurance, and Real Estate" division, this could be a change from insurance carriers to a credit institution; within manufacturing, it could be a change from a furniture business to chemicals. When the third digit changes, the individual is changing organizations within the "major group." So, for example, within the transportation services group, this could be a change from passenger transportation to freight transportation; within the leather and leather products major group, this could be a change from luggage to footwear. A change in the fourth digit represents an even smaller shift, often referring to a change in the specific product produced by a business, such as within metal mining, changing from a iron producer to a copper producer; for services, a change in the fourth digit of the SIC code would occur from moving from a restaurant to a hotel. Finally, if an individual is changing organizations but the entire four-digit SIC code remains the same, then the person is changing to an organization providing the same product or service.

We measure firm similarity by comparing the SIC codes of the company left by each executive to the SIC of the company he or she entered. For any given executive move, by examining the extent to which SIC codes of the executive's old and new firms changed, we were able to create a series of

dummy variables to reflect the degree of firm similarity. In addition, we were interested in potentially capturing two effects associated with executive moves: any effects that occur only within the year of the move (such as a one-time bonus as part of the compensation package to attract the executive) and sustained changes that occur (such as an increase in salary that continues while the person remains in the new firm). We therefore created two sets of dummy variables to represent the two timeframes that we might expect to observe.

The first set of dummy variables refers only to the year of move. These are listed below in order of most similar to least similar. For brevity, we refer to "Year of Move" as "YOM."

**YOM (Fourth-Digit Same):** Equal to 1 in the year that a person changed to a company with the same four-digit SIC code as the one the individual left.

**YOM (Third-Digit Same):** Equal to 1 in the year that a person changed to a company with the same three-digit SIC code as the one the individual left (e.g., from SIC Code 1234 to 123X). Individuals coded 1 for "YOM (Fourth-Digit Same)" are also coded 1 for "YOM (Third-Digit Same)."

**YOM (Second-Digit Same):** Equal to 1 in the year that a person changed to a firm with the same two-digit SIC code as the one left (e.g., from SIC Code 1234 to 12XX). All individuals coded as 1 for "YOM (Fourth-Digit Same)" are coded as 1 for "YOM (Second-Digit Same)"; also individuals coded as 1 for "YOM (Third-Digit Same)" are coded as 1 for "YOM (Second-Digit Same)."

**YOM (First-Digit Same):** Equal to 1 in the year that a person changed to a company with the same one-digit SIC code as the one the individual left (e.g., from SIC Code 1234 to 1XXX). Note that all individuals coded as 1 for "YOM (Fourth-Digit Same)," "YOM (Third-Digit Same)," or "YOM (Second-Digit Same)" are coded as 1 for "YOM (First-Digit Same)."

**YOM (Any Change):** Equal to 1 in the year that a person changed organizations. This variable equals 1 for all movers in the year of the move, regardless of SIC code. Thus, anyone coded 1 for any of the variables listed above will also be coded as 1 for "YOM (Any Change)."

As noted in our hypotheses, however, we expect that compensation changes may occur beyond simply the first year of the contract. Given our longitudinal analyses, we wanted to see if the effect associated with certain types of executive moves created increases in pay that lasted throughout the tenure of the individual at the new firm. We created a set of dummy variables that would be coded as 0 before a move and coded as 1 in the year of the move and for all years subsequent to the move. The specific variables are labeled and defined below:

**Mover (Fourth-Digit Same):** Equal to 1 if the person changed to a company with the same four-digit SIC code as the one the individual left.

**Mover (Third-Digit Same):** Equal to 1 if the person changed to a company with the same three-digit SIC code as the one the individual left. Note that all individuals coded as 1 for "Mover (Fourth- Digit Same)" are coded as 1 for "Mover (Third-Digit Same)."

**Mover (Second-Digit Same):** Equal to 1 if the person changed to a company with the same two-digit SIC code as the one the individual left. Note that all individuals coded as 1 for "Mover (Fourth- Digit Same)" or "Mover (Third-Digit Same)" are coded as 1 for "Mover (Second-Digit Same)."

**Mover (First-Digit Same):** Equal to 1 if the person changed to a company with the same one-digit SIC code as the one left. All individuals coded as 1 for "Mover (Fourth-Digit Same)," "Mover (Third-Digit Same)," or "Mover (Second-Digit Same)" are coded as 1 for "Mover (First-Digit Same)."

**Mover (Any Change):** Equal to 1 if the person changed organizations. This variable will equal 1 for all movers, regardless of SIC code. Thus, anyone coded 1 for any of the variables listed above will also be coded as 1 for "Mover (Any Change)."

In sum, the five YOM and five Mover dummy variables provide a hierarchy with which to test the effects of firm similarity associated with executive moves. The YOM variables allow us to look for effects only in the first year following a move, and the Mover variables allow us to test for more sustained effects. By looking at greater degrees of similarity as signaled by the hierarchical structure of the SIC code (as opposed to looking at one type of firm similarity), the hierarchical structure of the set of dummy variables provides us with the opportunity to provide a conservative test of our hypotheses. In addition, by employing all of the dummy variables described earlier, we can examine the extent to which executive moves between firms of different degrees of similarity are associated with changes in different forms of executive compensation.

**Time.** Given we are studying longitudinal observations of individual compensation data, an important factor to account for is the passage of time. Not surprisingly, we expect that pay increases with time. At the heart of our hypotheses, though, is that different events that occur over time (i.e., firm changes of various sorts) affect the size of pay increases in a given year. We also considered that pay changes would not be linear, and so we included a quadratic term for time. Note that orthogonal polynomials are used because they provide the clearest interpretations of the effects associated with time. That is, by being able to decompose a trend into its components (linear and quadratic), one can

assess more directly the constructs associated with intra-individual change (Sturman, 2007). The values for the orthogonal polynomials were obtained from statistical tables reported in Fisher and Yates (1957).

**Other control variables.** To support our hypotheses, a number of alternative explanations need to be ruled out. These included that pay changes for moves of various sorts are due to the industry to which the executive moved, that pay changes are due to performance differences between employers, or that pay changes are explained by the size of the new employer.

First, we included dummy variables to represent the division of each firm. (Altogether, there are 10 divisions, although none of our sample are from Division A, Agriculture, Forestry, and Fishing.) In our analyses, the manufacturing division (Division D) served as the omitted variable, as it was most represented in our sample.

Second, it is possible that pay would increase because executives move to employers with better organizational performance who can afford to pay more. We wanted to control for the potential effect of moving from a competitor who has lower performance than the company to which the executive moved. As is common with organizational research, we measured firm performance as return on assets (ROA; Venkatraman & Ramanujam, 1986), and thus, we controlled for ROA in our analyses. If a move occurred, then the change in ROA from the prior company (measured in the prior year) to the new company was recorded; otherwise, it was coded as 0 (in a variable we labeled "ROA Change"). Because of the wide tails to the distribution of ROA changes, the square root of the values was used to make the distribution more normal (for negative values, the square root of the absolute value was used and then made negative).

A third explanation for potential pay increases associated with executive moves is that individuals are moving to companies of different sizes. Evidence suggests that firm size is positively associated with pay level (Finkelstein & Hambrick, 1989; Lallemand, Plasman, & Rycx, 2005; Tosi et al., 2000) and pay changes (Lambert, Larcker, & Weigelt, 1991). We wanted to control for the potential of firm-size and firm-size changes to cause observed shifts in compensation. We created another variable, called "Firm Size," coded as the number of employees (in thousands) of the company. Additionally, we created a variable called "Size Change," coded as the difference between the number of employees (in thousands) of the company the employee left and the company the employee entered. (If no move occurred in any given year, "Size Change" was set to 0.) Again, the square root of the absolute value of the measure was used to reduce the skew of the distribution.

Analyses

To test our hypotheses, we used longitudinal data to examine within- and across-person differences by using hierarchical linear modeling (Raudenbush & Bryk, 2002). Specifically, we employed a cross-classified random effects model (see Raudenbush & Bryk, 2002, chapter 12). A cross-classified random effects model is a form of hierarchical linear model but where the data structure does not have a strict hierarchy. In this study, we have multiple observations of compensation clearly nested within the individual, but some individuals are nested within two different employers (i.e., anyone who moved). Research in labor economics has demonstrated that both person-level and organizational-level effects can influence pay levels (see Abowd, Kramarz, & Margolis, 1999; Abowd, Kramarz, & Roux, 2006). We wanted to capture both the person effects and firm effects to better explain the sources of variance in pay so that we did not inappropriately attribute variance to certain phenomenon because of specification error. With the data being longitudinal, error in a given time period is predicted to be on top of the estimated error from the previous period; hence, the model employs a cumulative error effect in the actual analyses (see Raudenbush & Bryk, 2002, chapter 12).

Essentially, cross-classified random effects models operate similarly to more traditional hierarchical linear models except that random effects are modeled for both the individual and the firm. This methodology allows us to model individual compensation trends—simultaneously controlling for within-person, across-person, within-firm, and across-firm variance—and to estimate the effects of executive moves on pay levels. Our hypotheses relate to an overall prediction that executive moves will yield increases in compensation beyond the passage of time or other sorts of changes related to organizations. Whereas Hypotheses 1 to 4 predict effects for moves in general, Hypotheses 5 to 7 predict that greater degrees of similarity will lead to greater compensation levels. Using the set of dummy variables described earlier, the Level 1 model we estimated is as follows:

$$\begin{aligned}\text{Compensation}_{ijk} = {} & B_{0ik} + B_{1ik}(\text{time}_{ijk}) + B_{2ik}(\text{time}^2{}_{ijk}) + B_{3ik}(\text{ROA}_{ijk}) + B_{4ik}(\text{ROA Change}_{ijk}) + B_{5ik}(\text{Firm Size}_{ijk}) \\ & + B_{6ik}(\text{Size Change}_{ijk}) + B_{7ik}\text{YOM(Any Change)}_{ijk} + B_{8ik}\text{YOM(First Digit Same)}_{ijk} \\ & + B_{9ik}\text{YOM(Second Digit Same)}_{ijk} + B_{10ik}\text{YOM(Third Digit Same)}_{ijk} + B_{11ik}\text{YOM(Fourth Digit Same)}_{ijk} \\ & + B_{12ik}\text{Mover(Any Change)}_{ijk} + B_{13ik}\text{Mover(First Digit Same)}_{ijk} + B_{14ik}\text{Mover(Second Digit Same)}_{ijk} \\ & + B_{15ik}\text{Mover(Third Digit Same)}_{ijk} + B_{16ik}\text{Mover(Fourth Digit Same)}_{ijk} + e_{ijk}\end{aligned}$$

For each individual, we employed a random effects model to represent the individual's starting pay ($B_{0ik}$) and average pay increases associated with time ($B_{1ik}$, $B_{2ik}$). The inclusion of the random effects means that for each executive, the model calculates the individual's intercept and trajectory of their compensation over time, adjusted for company-specific differences.

For the other coefficients, we did not desire to model individual-specific or company-specific variability (i.e., we desired to model a fixed effect for these coefficients). That is, there should be a net effect for each sort of organizational change, and we were not interested in modeling any within-person or within-firm variance for these coefficients (i.e., $B_3$ through $B_{16}$). Thus, our Level 2 models are represented as follows:

$$B_{0ik} = S_{00} + S_{01-08}\left(\text{Division} - \text{Dummies}_j\right) + b_{00i} + c_{00k} \quad \text{[Level 2, eq. 1]}$$

$$B_{1ik} = S_{10} + S_{11-18}\left(\text{Division} - \text{Dummies}_j\right) + b_{10i} + c_{10k} \quad \text{[Level 2, eq. 2]}$$

$$B_{2ik} = S_{20} + S_{21-28}\left(\text{Division} - \text{Dummies}_j\right) + b_{20i} + c_{20k} \quad \text{[Level 2, eq. 3]}$$

$$B_{3ik} \text{ to } B_{16ik} = S_{3,0} \text{ to } S_{16,0} \quad \text{[Level 2, eqs. 4-17]}$$

Note that the Level 1 model described above mentions "Compensation" as the dependent variable. In the actual implementation, we analyzed the model three times with the dependent variables of ln base pay, ln bonus, and ln long-term compensation.

## Results

Summary statistics of the variables used in the study are presented in Table 1. Results of our models are reported in Tables 2 and 3. Table 2 reports the coefficients estimated by the model; Table 3 reports the final estimation of the variance components of the various models. Tests revealed that there was indeed both within-person and within-firm variance in all models (all tests for random effects are significant at $p < .0001$), confirming the use of the cross-nested hierarchical linear model. The results demonstrate a number of statistically significant effects on compensation associated with executive moves, largely supporting our hypotheses.

The analyses of salary revealed that executive moves, and moves to firms of greater similarity, yielded increases in salary that were sustained over time. As shown in Table 2, any executive coded as a mover [Mover (Any Change)] received a positive increase in ln salary for the year of the move, and for all subsequent years, the individual was observed in the data set (supporting Hypothesis 1; $p < .001$).

Results also show that executives also receive a positive increase in ln bonus for the year of the move and all subsequent years that individual was observed in the data set ($p < .001$). We had predicted in Hypothesis 2 that this bonus would not necessarily be sustained, as executives may have guaranteed bonuses and signing bonuses in the first year of a new contract but that bonuses would be contingent on other factors in later years. However, our results suggest that executives who change organizations do receive an increase in their bonuses, and this benefit (similar to salary) is sustained over time.

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

| | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Ln salary | 5.76 | 0.58 | — | | | | | | | | | | | | | | | | | |
| 2. Ln bonus | 4.47 | 2.21 | .34 | — | | | | | | | | | | | | | | | | |
| 3. Ln long-term compensation | 5.70 | 2.50 | .45 | .28 | — | | | | | | | | | | | | | | | |
| 4. Time | 6.68 | 2.66 | .26 | .10 | .21 | — | | | | | | | | | | | | | | |
| 5. ROA | 2.79 | 21.13 | .06 | .16 | .05 | −.04 | — | | | | | | | | | | | | | |
| 6. ROA change | 0.016 | 8.82 | .00 | .00 | .00 | .00 | .07 | — | | | | | | | | | | | | |
| 7. Firm size | 24.84 | 65.06 | .28 | .14 | .16 | .04 | .03 | .00 | — | | | | | | | | | | | |
| 8. Size change | −0.08 | 21.58 | −.01 | .00 | −.01 | −.01 | .01 | .23 | .02 | — | | | | | | | | | | |
| 9. YOM (Any Change) | 0.014 | 0.118 | .04 | .02 | .03 | .06 | −.02 | −.04 | .00 | −.16 | — | | | | | | | | | |
| 10. YOM (First-Digit Same) | 0.008 | 0.091 | .03 | .02 | .02 | .05 | −.02 | −.06 | −.01 | −.14 | .77 | — | | | | | | | | |
| 11. YOM (Second-Digit Same) | 0.005 | 0.073 | .02 | .01 | .01 | .04 | −.01 | −.02 | −.01 | −.14 | .60 | .78 | — | | | | | | | |
| 12. YOM (Third-Digit Same) | 0.004 | 0.061 | .02 | .00 | .01 | .04 | −.02 | −.03 | −.01 | −.09 | .51 | .67 | .86 | — | | | | | | |
| 13. YOM (Fourth-Digit Same) | 0.003 | 0.055 | .02 | .00 | .01 | .03 | −.01 | −.05 | −.01 | −.06 | .46 | .60 | .76 | .89 | — | | | | | |
| 14. Mover (Any Change) | 0.047 | 0.212 | .12 | .04 | .07 | .19 | −.02 | −.02 | .00 | −.08 | .51 | .39 | .31 | .26 | .24 | — | | | | |
| 15. Mover (First-Digit Same) | 0.027 | 0.163 | .09 | .03 | .06 | .14 | −.02 | −.03 | −.01 | −.07 | .40 | .53 | .41 | .35 | .32 | .75 | — | | | |
| 16. Mover (Second-Digit Same) | 0.017 | 0.128 | .07 | .02 | .04 | .11 | −.01 | −.01 | −.02 | −.07 | .31 | .42 | .53 | .46 | .41 | .58 | .77 | — | | |
| 17. Mover (Third-Digit Same) | 0.012 | 0.108 | .06 | .01 | .04 | .10 | −.01 | −.02 | −.01 | −.05 | .27 | .36 | .46 | .54 | .49 | .49 | .65 | .84 | — | |
| 18. Mover (Fourth-Digit Same) | 0.010 | 0.098 | .06 | .01 | .03 | .09 | −.01 | −.03 | −.01 | −.03 | .24 | .32 | .41 | .48 | .54 | .44 | .59 | .76 | .90 | — |
| 19. Division B | 0.04 | 0.19 | −.05 | .00 | .00 | .00 | .00 | .00 | −.05 | .00 | .00 | .00 | .00 | .01 | .01 | −.01 | −.01 | .01 | .01 | .01 |
| 20. Division C | 0.01 | 0.10 | .01 | .02 | −.01 | .00 | .00 | .00 | −.01 | .00 | .00 | −.01 | .00 | .00 | .00 | −.01 | −.01 | −.01 | −.01 | .00 |
| 21. Division D | 0.45 | 0.50 | −.04 | −.02 | .02 | .00 | .01 | .01 | −.06 | .01 | −.01 | .00 | −.01 | −.01 | −.01 | .00 | .02 | −.01 | −.01 | −.02 |
| 22. Division E | 0.13 | 0.33 | −.03 | −.05 | −.06 | −.05 | .01 | .00 | −.03 | .00 | −.01 | .00 | .01 | .00 | .00 | −.02 | −.01 | .01 | −.01 | .00 |
| 23. Division F | 0.03 | 0.17 | −.02 | .00 | −.04 | .01 | .00 | .00 | −.04 | .00 | .00 | −.01 | .00 | −.01 | −.01 | .00 | −.01 | .00 | −.01 | −.01 |
| 24. Division G | 0.10 | 0.30 | .06 | −.04 | −.04 | .00 | .03 | .00 | .21 | .01 | .00 | .01 | −.01 | .00 | .00 | −.01 | .00 | −.02 | −.01 | −.01 |
| 25. Division H | 0.12 | 0.32 | .11 | .14 | .11 | −.02 | −.01 | −.01 | −.03 | −.01 | .00 | .01 | .01 | .01 | .02 | .00 | .02 | .02 | .02 | .03 |
| 26. Division I | 0.13 | 0.34 | −.04 | −.03 | −.01 | .07 | −.04 | −.01 | .00 | −.02 | .02 | −.01 | .00 | .01 | .00 | .03 | −.02 | .00 | .01 | .01 |
| 27. Division J | 0.00 | 0.03 | .03 | .03 | .03 | .00 | .00 | .00 | .05 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | −.01 | .00 | .00 | .00 |

*Note:* ROA = return on assets; YOM = Year of Move. Correlations above the dotted line are for Level 1 descriptive statistics; those below are for Level 2 descriptive statistics. All correlations are based on $N = 60{,}184$. Correlations greater than .00 are significant at $p < .05$.

**Table 2**
**Final Estimation of Fixed Effects**

| | Dependent Variable | | | | | |
|---|---|---|---|---|---|---|
| | ln Salary | | ln Bonus | | ln Long-Term | |
| Fixed Effect | Coefficient | *SE* | Coefficient | *SE* | Coefficient | *SE* |
| Intercept, $B_0$ (random effect) | | | | | | |
| $S_{00}$ (Intercept) | 5.72 | 0.09*** | 4.87 | 0.36 | 4.04 | 0.49*** |
| $S_{01}$ (Division B) | –0.17 | 0.11 | –0.37 | 0.41 | 0.64 | 0.55 |
| $S_{02}$ (Division C) | –0.05 | 0.10 | –0.63 | 0.37 | 0.27 | 0.50 |
| $S_{03}$ (Division E) | 0.00 | 0.10 | –0.73 | 0.37* | 0.42 | 0.51 |
| $S_{04}$ (Division F) | –0.08 | 0.11 | –0.38 | 0.42 | –0.24 | 0.57 |
| $S_{05}$ (Division G) | 0.03 | 0.10 | –1.05 | 0.38** | –0.32 | 0.52 |
| $S_{06}$ (Division H) | 0.18 | 0.10 | 0.34 | 0.38 | 1.39 | 0.51** |
| $S_{07}$ (Division I) | –0.13 | 0.10 | –0.78 | 0.37* | –0.50 | 0.51 |
| $S_{08}$ (Division J) | 0.33 | 0.32 | 0.15 | 1.21 | 1.91 | 1.63 |
| "Time" $B_1$ (random effect)[a] | | | | | | |
| $S_{10}$ (Intercept) | 0.32 | 0.01*** | 0.04 | 0.05 | 0.67 | 0.06*** |
| $S_{11}$ (Division B) | 0.01 | 0.03 | 0.48 | 0.17** | 0.66 | 0.22** |
| $S_{12}$ (Division C) | 0.05 | 0.05 | 0.83 | 0.32** | 0.78 | 0.41 |
| $S_{13}$ (Division E) | 0.02 | 0.02 | 0.43 | 0.10*** | 0.54 | 0.13*** |
| $S_{14}$ (Division F) | 0.05 | 0.03 | 0.52 | 0.19** | 0.02 | 0.24 |
| $S_{15}$ (Division G) | 0.02 | 0.02 | 0.27 | 0.11* | 0.53 | 0.14*** |
| $S_{16}$ (Division H) | 0.00 | 0.02 | 0.23 | 0.10* | 0.41 | 0.13** |
| $S_{17}$ (Division I) | 0.07 | 0.02*** | 0.26 | 0.09** | 0.61 | 0.12*** |
| $S_{18}$ (Division J) | 0.16 | 0.15 | 0.17 | 0.91 | 0.49 | 1.19 |

*(continued)*

**Table 2 (continued)**

| | Dependent Variable | | | | | |
|---|---|---|---|---|---|---|
| | ln Salary | | ln Bonus | | ln Long-Term | |
| Fixed Effect | Coefficient | *SE* | Coefficient | *SE* | Coefficient | *SE* |
| "Time[2]" $B_2$ (random effect)[b] | | | | | | |
| $S_{20}$ (Intercept) | 0.11 | 0.04* | –0.51 | 0.40 | 0.78 | 0.47 |
| $S_{21}$ (Division B) | 0.05 | 0.16 | –0.35 | 1.44 | –2.28 | 1.69 |
| $S_{22}$ (Division C) | –0.47 | 0.31 | 1.37 | 2.79 | –9.05 | 3.28** |
| $S_{23}$ (Division E) | 0.00 | 0.10 | 1.81 | 0.86* | 0.74 | 1.00 |
| $S_{24}$ (Division F) | 0.09 | 0.18 | –1.72 | 1.62 | –1.17 | 1.91 |
| $S_{25}$ (Division G) | –0.05 | 0.11 | 0.58 | 0.93 | –1.19 | 1.10 |
| $S_{26}$ (Division H) | –0.04 | 0.10 | 1.20 | 0.88 | 1.72 | 1.04 |
| $S_{27}$ (Division I) | –0.10 | 0.09 | –0.09 | 0.80 | 1.00 | 0.96 |
| $S_{28}$ (Division J) | 0.44 | 0.81 | 3.64 | 0.81 | 6.47 | 9.30 |
| ($B_3$) ROA | 0.00040 | 0.0005*** | 0.011 | 0.0005*** | 0.0062 | 0.00059*** |
| ($B_4$) ROA Change | 0.00008 | 0.00020 | 0.00054 | 0.0014 | –0.0029 | 0.0019 |
| ($B_5$) Firm Size | 0.0012 | 0.000094*** | 0.0042 | 0.0005*** | 0.0069 | 0.00068*** |
| ($B_6$) Size Change | 0.00029 | 0.00007*** | 0.00019 | 0.00048 | –0.0004 | 0.0007 |
| ($B_7$) YOM (Any Change) | 0.0010 | 0.014 | 0.11 | 0.12 | –0.75 | 0.15*** |
| ($B_8$) YOM (First-Digit Same) | –0.018 | 0.024 | 0.35 | 0.20* | 0.29 | 0.25 |
| ($B_9$) YOM (Second-Digit Same) | 0.010 | 0.035 | –0.20 | 0.29 | 0.47 | 0.37 |
| ($B_{10}$) YOM (Third-Digit Same) | –0.0002 | 0.049 | 0.10 | 0.41 | –0.94 | 0.53 |
| ($B_{11}$) YOM (Fourth-Digit Same) | –0.024 | 0.044 | 0.44 | 0.22* | 0.46 | 0.48 |
| ($B_{12}$) Mover (Any Change) | 0.099 | 0.019*** | 0.32 | 0.07*** | 0.24 | 0.08** |
| ($B_{13}$) Mover (First-Digit Same) | 0.064 | 0.031* | –0.022 | 0.12 | 0.26 | 0.17 |
| ($B_{14}$) Mover (Second-Digit Same) | –0.047 | 0.044 | –0.15 | 0.17 | –0.10 | 0.25 |
| ($B_{15}$) Mover (Third-Digit Same) | 0.11 | 0.063* | 0.20 | 0.26 | 1.19 | 0.53* |
| ($B_{16}$) Mover (Fourth-Digit Same) | 0.079 | 0.034* | –0.014 | 0.24 | –0.06 | 0.34 |

*Note:* ROA = return on assets; YOM = Year of Move.
a. Coefficients and standard errors in this section are multiplied by 10.
b. Coefficients and standard errors in this section are multiplied by 100.
*$p < .05$. **$p < .01$. ***$p < .001$.

**Table 3**
**Final Estimation of Variance Components**

| | Ln Salary | Ln Bonus | Ln Long Term |
|---|---|---|---|
| Random effect | | | |
| Across individual | | | |
| INTRCPT1, $b_{00}$ | | | |
| Variance component | 0.11 | 0.12 | 0.90 |
| Degrees of freedom | 8973 | 8973 | 7846 |
| Chi-square | $1.35 \times 10^{10}$*** | $1.35 \times 10^{9}$*** | $1.64 \times 10^{9}$*** |
| Time slope, $b_{10}$ | | | |
| Variance Component | 0.00056 | 0.00059 | 0.0022 |
| Degrees of freedom | 8973 | 8973 | 7846 |
| Chi-square | $1.33 \times 10^{10}$*** | $1.21 \times 10^{9}$*** | $1.61 \times 10^{9}$*** |
| Time$^2$, $b_{20}$ | | | |
| Variance Component | 0.00021 | 0.00046 | 0.0027 |
| Degrees of freedom | 8,973 | 8,973 | 7,846 |
| Chi-square | $1.29 \times 10^{10}$*** | $1.17 \times 10^{9}$*** | $1.56 \times 10^{9}$*** |
| Across companies | | | |
| INTRCPT1, $c_{00}$ | | | |
| Variance component | 0.085 | 1.28 | 2.24 |
| Degrees of freedom | 1,235 | 1,235 | 1,228 |
| Chi-square | 166.29*** | 12,419.18*** | 3,470.94*** |
| Time slope, $c_{10}$ | | | |
| Variance component | 0.00015 | 0.0071 | 0.012 |
| Degrees of freedom | 1,235 | 1,235 | 1,228 |
| Chi-square | 111.43*** | 5,676.92*** | 3,228.79*** |
| Time$^2$, $c_{20}$ | | | |
| Variance component | 0.00003 | 0.0056 | 0.0068 |
| Degrees of freedom | 1,235 | 1,235 | 1,228 |
| Chi-square | 105.73*** | 4,947.31 | 3,896.79*** |
| Level 1 | | | |
| e | 0.027 | 2.70 | 4.23 |
| Model deviance | 5,911.22 | 203,033.09 | 230,877.48 |
| Number of estimated parameters | 54 | 54 | 54 |

*$p < .05$. **$p < .01$. ***$p < .001$.

Our third hypothesis predicted a one-time decrease in long-term compensation associated with an executive move, whereas our fourth hypothesis predicted a sustained positive effect. Both of these hypotheses are supported, as evidenced by the negative effect associated with YOM(Any Change) (B = –0.75; p <.001) and the positive effect of Mover (Any Change) (B =0.24, p<.01).

Tests of the effects associated with the various levels of firm similarity provided some support of our hypotheses. Hypothesis 5, which had predicted positive sustained effects for greater similarity on salary, was generally supported. Executive moves to firms where the Sturman et al. / Human Capital Specificity vs. Transferability 309 SIC code remained the same in the first digit, third digit, and fourth digit all resulted in cumulative increases in ln salary (supporting Hypothesis 5; all at p >.05). The only result not fully in support of Hypothesis 5 regarding firm similarity and salary increase was for an executive move with no change in the second digit of the SIC code. Executive moves between

companies with the same two-digit SIC code were not associated with an increase in salary beyond that achieved by an executive move to a firm where the first digit remained the same and an executive move in general. Recall that these effects are cumulative. That is, those moves coded as having their second digit remain the same were also coded as having moved and having their first digit remain the same. Thus, according to our results, executives switching to a company with no change in the first two digits of their SIC code do not experience a gain in salary different from those who had no change in their first digit.

Tests of the sixth hypothesis, that executive moves to firms of greater similarity would be associated with one-time increases in bonuses, were only partially supported. Specifically, significant effects were found when the first digit of the SIC code remained the same [for YOM (First-Digit Same) $B=0.35$, $p<.05$] and additional increases were observed when the entire four-digit SIC code remained the same [for YOM (Fourth-Digit Same) $B=.44$, $p<.05$]. Significant effects were not detected for YOM (Second-Digit Same) or YOM (Third-Digit Same).

Contrary to Hypothesis 7, the effects of firm similarity on long-term compensation were not very strong. The only significant effect was found for executive moves to companies where the third digit of the SIC code remained the same. In these cases, there was an additional significant increase in long-term compensation that remained in effect over executives' tenure in their firms [for Mover (Third-Digit Same) $B=1.19$, $p<.05$]. Thus, firm similarity had some effect for long-term compensation but not as strongly as we had predicted.

It should be noted, though, that although we did not detect positive effects for all measures representing different degrees of firm similarity associated with executive moves, none of the results were opposite of what we predicted (i.e., no results were significant and negative). Thus, although we do not show that every degree of greater similarity was associated with increases in all forms of compensation, our results present a general pattern that executive moves toward firms of greater similarity (with the exception of those moving to a company with the same two-digit SIC code) result in some degree of greater pay in at least some form of compensation. That is, for executives, moving to another company yielded increases in base pay, bonuses, and long-term compensation (after a 1-year decline). Moving to a company with the same one-digit SIC code yielded additional increases in salary and a 1-year bonus increase. Moving to a company with the same three-digit SIC code yielded further gains in base pay and long-term compensation. And executive moves of the greatest similarity (to a company with the same four-digit SIC code) reaped even greater base pay and an initial bonus.

## Discussion

This article addresses a paradox in human capital theory, where both human capital specificity and transferability are valued but increasing one necessarily decreases the other. By showing that firms provide greater compensation to executives who possess transferable human capital that is also higher in its degree of specificity, we provide insight into the value associated with human capital in the executive labor market for all types of firms, including an executive's current employer. Consistent with human capital logic surrounding the concept of specificity, as well as legal theories, our results indicate that highly specific human capital that is limited in its transferability is worth the most in terms of executive salary and this effect sustains itself over time. Indeed, increases in executives' salary paid by competing firms represent a statistically significant difference over and above the increases in salary that executives receive when they move to noncompeting firms in the same or different industries—or alternatively remain with their companies, with the exception that changes in the second SIC code digit were not different beyond those incurred from changes in the first SIC code digit. Those executives who made a move to organizations most like the ones they were departing (as signified by both organizations possessing the same four-digit SIC code) realized the highest average increases in base pay compared against all movers and nonmovers.

We also found evidence that the degrees of firm similarity as captured by SIC codes related to increases in various forms of compensation. With the expected exception of a decrease in long-term compensation in the year of a change, all of our statistically significant effects indicated that executive moves led to increases in all forms of compensation, with additional increases for moves to firms with greater similarity to an executive's current organization.

Human capital is viewed as an organizational resource that contributes to a firm's competitive advantage to the degree it is heterogeneous and immobile (Barney, 1991). Because executive-level human capital is complex and high in its degree of specificity, it is difficult to imitate (Hitt et al., 2001; McEvily & Chakravarthy, 2002). This characteristic implies that one way (perhaps the only quick way) for a company to obtain needed human capital that is immediately and highly applicable to the current competitive situation is to acquire executives from competing firms. Such acquisitions may also be a means to take competitive advantage away from competitors (Gardner, 2005). Indeed, the transferable and highly specific human capital of executives likely qualifies as a heterogeneous resource because it is considered valuable, rare, and nonsubstitutable. And with salary, initial bonuses, and long-term compensation acting as signals of value, results in this study confirm that more specific human capital holds the greater value to firms. In fact, evidence of the growing use of noncompete agreements and

our findings, which demonstrate that a price premium is paid to executives moving to a direct competitor, suggest that highly specific transferable human capital may be an important knowledge-based resource. Our analyses show that this form of human capital is different from and valued more than what has previously been referred to as generic or industry-specific human capital (Castanias & Helfat, 1991, 2001).

Although this study largely contributes to the literatures of human capital and executive compensation, our findings also have some important implications for practice. One such contribution is that our results may provide benchmarks for firms (and executives) negotiating compensation packages for new hires. Although there is readily available market data with regard to pay levels of executives at a wide variety of firms, the magnitude of pay premiums for executives who change employers has not previously been estimated.

In addition, our findings also may help inform firms wrestling with the concern of how to encourage their executives to invest their time to develop highly specific human capital. It has been argued that because firm-specific human capital has (by definition) no market value, employees will avoid making investments in such knowledge and skills (e.g., Alchian & Demsetz, 1972; Wang & Barney, 2006; Williamson, 1985). Yet our results show that highly specific human capital does command a premium when executives change employers. Consistent with the legal literature regarding protected knowledge, some sorts of knowledge that have been labeled as firm specific (cf.,Wang & Barney, 2006) may actually be highly valuable to very similar firms. The value that other firms place on highly specific relevant human capital may create the sort of incentives needed to encourage executives to invest in developing a highly specific knowledge and skill set within the firm. The related implication for organizations trying to encourage firm-specific investments is that they may be paying an unnecessary risk premium to their executive-level employees. On the other hand, if firms employ restrictive noncompete clauses, removing the opportunity for executives to switch to highly similar firms, they may ultimately create the sort of problem Wang and Barney (2006) discuss and thus actually create the need to use incentives to encourage executives to invest in developing highly specific human capital. Although certainly there are many political factors involved in the determination of executive compensation (e.g., Combs & Skill, 2003; Siegel & Hambrick, 2005), through considering the risk of executive departures to similar firms, as well as the potential use of noncompete agreements to try to restrict executive movements, our results do provide some insights to help guide executive compensation policy.

Although our results demonstrate the value of specific human capital against the value of transferable human capital in the labor marketplace, we do temper our findings with a few important

limitations. First, similar to all other empirical work on human capital, we do not directly measure executive-level human capital. Prior research on human capital frequently approximates the construct with broad measures, such as education and experience. For example, in a meta-analytical review that examined, in part, the relationship between human capital and salary (Ng, Eby, Sorensen, & Feldman, 2005), of the 196 studies examined, 86 used temporal measures (i.e., job tenure, organizational tenure, work experience) to approximate human capital and 67 studies used broad measures that would have very little variance in our sample of executives (i.e., hours worked and education). Certainly, a more detailed understanding of the components of human capital would allow researchers to better understand how firms value specific skill and knowledge sets and how this human capital ultimately contributes to firm success. The approach we take with our study, though, helps temper this concern. By modeling the within-person relationship between time and pay and by considering changes in pay associated with executive moves, we are implicitly controlling for many components of human capital by examining the effects on pay after controlling for individual and organizational characteristics at prior time periods. Furthermore, by examining changes in all four digits of the SIC code, whereas most prior research has simply considered a single type of change, we consider firm similarity with greater precision than other research in this area. Nonetheless, the precision of human capital measurement is a limitation of the majority of research involving human capital and is an issue for this entire field.

A second limitation relates to the limitations of the ExecuComp database. For our compensation measures, it would have been informative to have data on the potential size of executives' bonuses and the projected schedule for long-term incentives. This type of data would have enabled us to more directly measure the extent to which firms seek to purchase (or retain) human capital. Had we been able to analyze bonus potential, we would have expected that this variable would have behaved similarly to base pay. However, bonus potential, or even bonus target, is generally not publicly available, and the actual pay results that we had on hand (such as those reported in the ExecuComp database) are affected by both the contract and contextual factors (e.g., firm performance, individual performance, market performance).

The ExecuComp database is also limited in that it only provides a single SIC code per executive. As such, we could not control for companies that possessed more than one SIC code. This lack of precision may cause certain moves to appear less similar than they may actually have been, potentially causing the more similar moves to appear less significant than they truly were. The ExecuComp database certainly provides a number of important advantages, including its sample size, coverage of a diverse set of industries, and its longitudinal nature. But its precision is not ideal, and future research

may benefit from more detailed examinations of compensation contracts to reveal the different ways in which firms seek to purchase and retain human capital (cf., Schwab & Thomas, 2006).

Finally, the generalizability of our findings beyond the executive level is unclear. It is certainly plausible that the nature of human capital changes as one rises within a company. That is, although executives may be privy to corporate strategies, market research, negative knowledge, and other competitive information, the human capital of lower level employees may be less useful to other companies. A more refined measure of what constitutes human capital may be useful for considering its potential marketability to competitors below the executive level.

Yet, recognizing these limitations, it is worth noting that the nature of our study's analyses provides crucial advantages in our hypothesis tests. Although one can never conclusively infer causality, the nature of our study and tests provides robust support for our assertion that executives who move to other firms receive greater compensation associated with the value of their human capital than those who remain with their firms. Highly specific, transferable human capital does indeed have market value for executives, more so than any other type of human capital. Interpreted most cautiously, our results show that an executive move to a company with the same four-digit SIC code was associated with greater subsequent increases in salary and initial bonuses than when other types of moves occurred, as well as when no move occurred. Also note that although these increases were greater than for those who switched to firms where the third digit of the SIC code remained the same as the organization from which they departed, those executives who switched to firms with the same three-digit SIC code enjoyed increases to their base pay and long-term compensation that were greater than the increases received by those who moved to firms of less similarity.

Our findings were shown by modeling within-person, across-person, within-firm, and across-firm differences. For research to demonstrate causality, the causing event must precede the effect, the cause and effect must covary, and alternative explanations must be ruled out (Shadish, Cook, & Campbell, 2002). In our study, executive moves occurred before the resultant compensation change, and the statistically significant findings demonstrate a relationship between type of firm changes and greater increases in compensation. Although one cannot refute all alternative explanations, the random effects model (which captures individual and firm-specific errors), in addition to our controls for industry, ROA, ROA changes, firm size, and firm size changes, does indeed help rule out a notable number of potential alternatives. In all, we believe we provide strong evidence that more specific human capital has greater value in the executive labor market than does more transferable but less specific human capital.

## Conclusion

We offer what we believe is a provocative finding that aspects of executives' highly specific knowledge are valuable and that this form of human capital has long been transferable to competing firms. In fact, the mobility of highly specific human capital, combined with the heterogeneity that it can bring to competing firms, makes this form of human capital the most valuable form of human capital in the executive labor market. Our findings offer confirmation that specific, transferable knowledge is sought after so much so that it commands a price premium in the labor marketplace. In the tradeoff between specificity and transferability, the increased market value of more specific skills and experiences seems to outweigh the disadvantages of limited transferability. Indeed, the presence and associated market value of highly specific human capital offers a revised perspective on different forms of human capital, the value associated with their degree of heterogeneity and mobility, and ultimately firms' beliefs in the ability of these knowledge-based resources to contribute to distinction and advantage.

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[i] Note that a firm may still want to acquire an executive with firm-specific human capital, specifically for the purposes of taking this human capital away from a competitor. The research by Gardner (2002, 2005) discusses how the acquisition of human capital involves hypercompetition for a limited, intangible resource. But it is generally well accepted in the economics literature that firm-specific human capital is only of use to the single firm in which it was developed (Bailey & Helfat, 2003; Becker, 1962; Castanias & Helfat, 1991; Harris & Helfat, 1997; Wang & Barney, 2006).

[ii] Research has examined the degree executives' social capital affects their marketability (Belliveau et al., 1996; Seibert et al., 2001). However, in our context, we view executives' social capital as part of their human capital or their knowledge about network ties that would have value to their firms.