

ABSTRACT

Title of Dissertation: **HUMAN CAPITAL, SOCIAL CAPITAL,
AND EXECUTIVE COMPENSATION:
HOW DOES THE SLICE OF PIE
EXECUTIVES APPROPRIATE COMPARE
TO WHAT THEY BRING TO THE TABLE?**

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Prior research has identified the manner in which human capital, social capital, and other intangible resources create value for organizations. Among such resources, those contributed by a firm's top managers have been singled out as particularly important for the generation and preservation of competitive advantage. However, the costs incurred to gain access to these resources, which reside at the individual and relational levels rather than at the firm level, are rarely considered. In this dissertation, I focus on individual executives as the level of analysis instead of the traditional view of firms as unitary actors in order to study intra-organizational value appropriation. I focus on the most direct and economically significant form of value appropriation by top managers: executive compensation.

I introduce a theoretical framework linking executive compensation to executive-level intangible resources including human capital and social capital. I distinguish between generic and firm-specific forms of capital due to differences in

the causal mechanisms linking each type of resource to compensation. Generic resources convey market power and are directly appropriable by executives. Firm-specific resources have no value outside the firm and therefore do not convey market power, yet they will convey a different sort of power derived from familiarity, visibility, and legitimacy.

Drawing on a sample of 71 executives from 36 publicly-traded US firms in high-technology industries, I provide empirical results that are broadly supportive of three of four hypotheses. Executive compensation is found to be positively related to generic human capital (measured by the breadth of executives' experience across multiple industries), generic social capital (external network size, external network range) and firm-specific social capital (the strength of intra-TMT ties, internal network size, criticality of internal ties, criticality of external ties). I find no evidence linking executive compensation to firm-specific human capital.

These results demonstrate the hazard of focusing on the value created by human capital and social capital without also considering the costs firms incur to access those resources.

Keywords: executive compensation, value appropriation, human capital, social capital.

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WHAT THEY BRING TO THE TABLE?

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Dedication

To Papa: you are all I aspire to become.

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Chapter 1: Introduction

Value Appropriation and the Cost of Strategic Resources

Through this dissertation, I aim to contribute to the body of knowledge regarding *intra-organizational value appropriation*, which refers to the process by which value that has been captured by the firm is appropriated by individual stakeholders within the firm. Research in strategic management has generally centered on how firms gain and sustain competitive advantages over rivals in order to appropriate value (i.e., inter-organizational value appropriation), while ignoring the issue of how this value is divided among internal stakeholders (Coff, 1999). Internal stakeholders such as managers, shareholders, and employees will often have conflicting interests, and it may be possible to identify conditions that enable one of these groups to appropriate greater value. Specifically, I focus on the appropriation of value associated with the intangible resources controlled by a firm's top managers, including human capital and social capital. These resources have been singled out in prior research as instrumental for the creation of value and competitive advantage (Itami, 1987; Nahapiet & Ghoshal, 1998). Yet given that these resources reside at the individual rather than organizational level, the individuals themselves should be able to appropriate much of the value. Using executive compensation as the primary indicator of an executive's ability to capture value and focusing on individual executives as the unit of analysis, I investigate the extent to which human capital and social capital influence value appropriation by executives.

Top managers bring a range of intangible resources to the table. Some of these resources are firm-specific, including tacit knowledge of organizational processes and routines, the ability to understand and navigate internal political processes, social ties within the top management team, and social ties with other key internal stakeholders. Other resources are more generic in nature and can be redeployed in other organizational settings, including the executives' educational background and technical knowledge, general management skills, prior work experience in related and unrelated industry environments, and social ties with external parties such as suppliers, customers, competitors, partners, financial institutions, trade associations and other complementors.

These resources may generate substantial value for firms, but at what cost?

Cost and Competitive Advantage

The primary objective motivating most strategic management research is to explain how firms can generate and sustain a competitive advantage over rivals. Most definitions of competitive advantage require that the return from firm actions exceed the cost (e.g., Porter, 1985). However, as discussed by Rumelt (2003), while most definitions of competitive advantage rely heavily on the notion of value exceeding costs, 'costs' (e.g., direct costs and opportunity costs) are ill-defined and poorly understood. In particular, there seems to be a tacit assumption that firm-specific resources have no cost because they are not tradable, and therefore non-tradable resources are more desirable than are resources for which factor prices are well-defined. Lippman and Rumelt (2003) refer to this as the 'factor price fallacy', and they argue that tradable resources should be more, rather than less, desirable.

Executive human capital and social capital are not directly tradable, but these resources reside at the individual and relation levels, and the services rendered from the deployment of these resources are directly tradable. By measuring various dimensions of executives' human capital and social capital in this study, I seek to identify the dimensions that are associated with tangible increases in the amount of money firms spend in compensation to access the resources. By evaluating the link between human capital, social capital, and executive compensation, it is possible to identify the specific characteristics of intangible resources that firms pay to access.

A central premise advanced in this dissertation is that the extent to which human capital and social capital are either firm-specific or generic should have an important impact on value appropriation. Generic resources may be deployed in a variety of organizational settings without losing their value, and the portability of these resources should allow executives to directly capture the value generated by the generic resources they control. For instance, if an executive possesses valuable academic credentials or connections with important government officials, the executive should be able to command greater compensation. Because generic resources are portable between firms, the executive can make a credible threat of switching firms in order to obtain higher pay. Resources that are firm-specific, on the other hand, do not convey market power upon executives, since the value of a firm-specific asset in the next-best application is zero (Klein, Crawford, & Alchian, 1978). From an economic perspective, executive compensation should not be related to firm-specific human capital and social capital. From a social and political perspective,

however, executives may still be able to command greater compensation from firm-specific resources. This idea is developed and discussed in Chapter 3.

I test these hypotheses using a sample of 71 executives from 36 high technology firms. The sample is constrained to executives in publicly-traded firms, for whom compensation data are readily available. The unit of analysis throughout this study is the individual, and individual-level resources are linked to individual-level compensation.

Definitions and Boundaries of the Study

Although more specific definitions are embedded in the text, I offer the following brief definitions of key terms utilized in this dissertation.

Intra-organizational value appropriation is the process by which individual stakeholders within the firm benefit personally from firm activities. This includes directly quantifiable revenue streams such as shareholder returns, executive compensation and labor contracts, as well as abstract, unquantifiable benefits such as surplus utility and satisfaction. I focus here on the tangible, quantifiable benefits (i.e., compensation) accrued by one set of internal stakeholders: top management team members.

In general, my analysis assumes that an increase in the value appropriated by executives diminishes the amount of value that may be appropriated by shareholders and other stakeholders. In other words, I evaluate the value appropriation process by assessing the size of the pie captured by each executive, holding the size of the overall pie constant; the cost of executive compensation is ultimately borne by shareholders and other stakeholders in the form of higher accounting costs or diluted

share value. This assumption does not account for any potential impact that executive compensation schemes may have on top management productivity.

The process of value appropriation causally follows and is closely tied to the processes of value creation and inter-organizational value appropriation (i.e., how firms capture value and utilize isolating mechanisms to prevent competitors from appropriating value). Value creation and inter-organizational value appropriation are outside the scope of this dissertation. Coff (1999) has argued that these subjects have played a central role in strategic management theory, and that the greatest unknowns relate to intra-organizational value appropriation.

One reason why strategy research has neglected intra-organizational value appropriation is that the level of analysis is nearly always the firm or some higher-level aggregate (i.e., industry, population, organizational field, strategic group, competitive arena). The only way to address intra-organizational value appropriation is to focus on the individual as the level of analysis, as I do here. Organizational level variables are also considered, but only in order to control for their influence over the relation between individual-level resources and individual-level compensation.

I focus on two sets of intangible resources contributed by executives: human capital and social capital. *Human capital* is an individual-level resource that includes accumulated experience, skills, education, and other forms of knowledge (Becker, 1993). *Social capital* is a relational resource that includes the characteristics (e.g., size, range, strength, criticality) of the social networks executives maintain with alters located both within and beyond the firm. Social capital is owned jointly by both parties to a relation, and as such exhibits ill-defined property rights relative to human

capital; however, individuals may exploit their social capital for personal gain. This approach is in line with the work of Burt (1992, 1997) but in contrast with certain other research (e.g., Portes & Sensenbrenner, 1993; Putnam, 2000) that views social capital as principally a public or collective good.

Organization of this Dissertation

The dissertation proceeds as follows. In the next chapter, I briefly review related empirical research and discuss how I intend to contribute to established streams of research, including research in the relatively narrow field of executive compensation, as well as broader schools of thought within strategic management such as the resource-based view of the firm. In Chapter 3, I first discuss the process of intra-organizational value appropriation and how this process is driven by the resources executives control. Then I advance a series of hypotheses linking executive compensation—the most important and most direct manifestation of value appropriation and the cost firms incur to access resources controlled by top managers—to human capital and social capital, with further distinctions between generic and firm-specific resources. Chapter 4 outlines the methodology employed in the study. In Chapter 5, I present the main results as well as a series of analyses to evaluate the robustness of the results. In Chapter 6, I discuss the implications of this work for research and practice and identify some unresolved issues.

Chapter 2: Gaps in the Literature

The purpose of this chapter is to review the most closely related empirical research in order to identify gaps in the literature and areas in which this dissertation may lead to the generation of new insights. First, I review related research on executive compensation, particularly as it relates to human capital and social capital. Next, I discuss the relevance of this dissertation to research in strategic management, particularly as pertains to levels of analysis issues and also to the resource-based view of the firm.

Executive Compensation

The most direct contribution of this dissertation is to add to the body of knowledge related to executive compensation. This contribution is made by shedding light on the link between executive compensation and both human capital and social capital, as well as by focusing on the important role played by the degree of firm-specificity of these resources.

Human Capital and Executive Compensation

Several studies have analyzed the link between executive compensation and human capital, yet the results have been far from conclusive. The most frequently employed measures of human capital have been tenure and, to a lesser extent, education. The relation between executive compensation and tenure has been found to be positive (Fisher & Govindarajan, 1992; Barkema & Pennings, 1998), negative (Hogan & McPheters, 1980), inverted U-shaped (Carpenter & Wade, 2002), and non-

significant (Deckop, 1988; O'Reilly, Main & Crystal, 1988; Rajagopalan & Prescott, 1990; Hambrick & Finkelstein, 1995). Education has generally been measured as years of formal education, which has been found by some to be positively related to compensation (e.g., Agarwal, 1981; Fisher & Govindarajan, 1992; Leonard, 1990), but other studies have produced non-significant results (Finkelstein & Hambrick, 1996).

Even though prior research has addressed the impact of human capital on executive compensation, there are three reasons why this study has the potential of adding significant value. First, virtually all prior studies have utilized coarse proxies for executive human capital. For instance, though tenure is often employed as an indicator of firm-specific human capital, the time one has spent in a firm is likely to be loosely related to one's firm-specific knowledge, and tenure may also serve as an indicator of managerial power (Hill & Phan, 1991; Barkema & Pennings, 1998) or managerial entrenchment and inertia (Hambrick & Fukutomi, 1991; Miller, 1991). In the present study, in addition to employing the commonly-used measures of human capital as tenure and years of education, I also introduce two new measures of human capital to reflect (1) the cross-industry diversity of each executive's prior experience and (2) firm-specific knowledge of organizational processes. Second, most prior research has focused exclusively on the CEO level, which may explain the lack of significant findings¹. Others have suggested that due to selection processes, there may be little variance in human capital at the CEO level, and the variance that does exist among CEOs is not well represented by coarse measures such as tenure and

¹ Exceptions include Fisher & Govindarajan (1992), who sampled SBU managers, and Carpenter & Wade (2002), who sampled the four top levels of organizational hierarchies.

years of education (Finkelstein & Hambrick, 1996). Third, the present study focuses on technology-intensive industries, which are human capital-intensive and typically allow for a high degree of managerial discretion (Hambrick & Abrahamson, 1995).

Social Capital and Executive Compensation

Although not nearly as common as studies of human capital, five prior studies have explored the relation between social capital and executive compensation. Based on a sample of 1402 top management team members of medium-sized and large Dutch firms, Boxman, De Graaf & Flap (1991) found a significant, positive relation between cash compensation and a two-item measure of social capital consisting of the frequency of contact with other organizations and the number of memberships in elite clubs. In a sample of 111 managers from 28 underperforming Swedish firms, Meyerson (1994) found that salary was positively related to the strength of external social ties. External network size was not significantly related to salary, though network size was constrained to a maximum of 15 ties. Further, since the sample consisted entirely of underperforming firms, it is unclear whether the discovered relationships are functional or dysfunctional. In a sample of 61 CEOs of publicly traded US firms, Belliveau, O'Reilly & Wade (1996) found that CEO cash compensation was negatively related to the social status (i.e., memberships on corporate boards, social clubs, etc.) of the firm's compensation committee chair, measured both in absolute terms and relative to the CEO. Compensation was not significantly related to either absolute CEO status (i.e., CEO status relative to other CEOs, rather than relative to the compensation committee chair) or social similarity between the CEO and compensation committee chair. In the only managerial

compensation study to include internal social networks (i.e., social ties within the firm) in addition to external networks, Burt (1997) found in a sample of senior managers in a large investment bank that bonus pay was significantly related to a 'network constraint index' which varies with network size, density and hierarchy and was designed to measure the extent to which an individual's social networks bridge structural holes. Finally, drawing on a sample comprised of 460 Fortune 1000 CEOs, Geletkanycz, Boyd & Finkelstein (2001) investigated the link between CEO compensation and a seven-item factor reflecting the CEO's participation on other corporate boards. External board ties were positively but weakly related to compensation, and this relation was stronger for CEOs of highly diversified firms. Together, these five studies represent broad diversity in both methodology and results. Social capital was alternatively measured as social status and external social ties, with only one study including (but not analyzing independently) internal social ties. Three of the five studies confounded social capital with social status, which are often treated as separate constructs in sociology, with status following social capital (Lin, 1999).

Four factors set the present study apart from prior research linking executive compensation to social capital. First, this is the only study to include both internal social networks and external social networks, thereby incorporating both generic and firm-specific forms of social capital. On a related note, this is the first study to provide a theoretical framework justifying why both generic and firm-specific forms of social capital should be linked to compensation. Third, this study employs measures of social capital that move beyond ambiguous but commonly-used variables

that confound multiple constructs (e.g., external board ties, membership in elite clubs and other measures of status). Measures of status are not ideal proxies for social capital, and they introduce doubts concerning the direction of causality: status is often considered an outcome of compensation (Finkelstein & Hambrick, 1996). Finally, this is the first study to link compensation to the social ties of executives in a cross-section of publicly-traded US firms.

Firm-Specificity of Resources and Executive Compensation

Firm-specificity has been singled out in prior research as an important and even defining characteristic of strategic resources. Human capital theory (e.g., Becker, 1993; Hashimoto, 1981) has addressed the potential for market failure and ill-defined property rights that may inhibit investments in firm-specific resources. Resource-based view theorists (Barney, 1991; Collis & Montgomery, 1995; Peteraf, 1993) have argued that firms are able to appropriate value generated by firm-specific resources. More recently, though, Lippman and Rumelt (2003) have countered that specificity is neither necessary nor sufficient for resources to be valuable for firms.

In terms of the intangible resources contributed by executives such as human capital and social capital, does firm-specificity increase or decrease the amount of value appropriated by the executives rather than the firm (i.e., shareholders)? This question has been addressed in prior empirical studies, though without any clear resolution. For instance, Harris and Helfat (1995) find that external CEO successors receive greater compensation than internal successors. The authors contend that external successors will earn greater initial compensation than internal successors because they are forgoing the future value of their firm-specific skills. Following this

argument further, however, leads to the conclusion that the only way to receive compensation for one's firm-specific skills is to defect to another firm. It appears implausible that firms would pay more for resources that are of no use to the firm than for resources that are of direct use.

Rather than inferring resource endowments on the basis of whether an executive was an internal or external successor, I provide direct measures of firm-specific and generic resources for both human capital and social capital. In terms of theory, I argue that generic resources are portable between firms, and executives with generic forms of capital (e.g., experience spanning many industries, formal education, social ties to alters outside the firm) will possess market power. These executives have the ability to make credible threats to take their resources elsewhere, which allows them to appropriate value from the generic resources. Firm-specific resources, on the other hand, exhibit ill-defined property rights, but may generate appropriable returns for executives by conveying a different source of power, one that relies not on market recourse but rather on visibility, legitimacy, and familiarity within the firm. By measuring several forms of generic and firm-specific resources and linking these resources to executive compensation, I am able to determine precisely which forms of capital may enable value appropriation by executives.

Additional Areas in Compensation Research

Though the extensive stream of research regarding executive compensation (typically from a strategy, finance, or economics perspective) has developed fairly autonomously from the even larger body of research on overall compensation issues

(usually from a I/O psychology or human resource management perspective), there are elements of the latter that can inform the present study and vice versa.

One central theme in compensation research has been the question of whether compensation is or should be set on the basis of internal equity and/or external equity (Gomez-Mejia, Balkin, & Cardy, 2001). Internal equity compensation models emphasize fairness of compensation in terms of relative pay and pay that is commensurate with the skills, effort and time invested by the employee. This model, also referred to as distributive justice, contrasts with an external equity or labor market model, whereby individuals' salaries are compared to equivalent workers in the labor market rather than inside the firm. Internal equity models are more likely to be employed in established firms operating in mature industries, whereas younger firms and those operating in dynamic and high-tech industries are more apt to utilize external equity models (Gomez-Mejia, 1997). The current study, which focuses on high technology firms, is therefore more likely to involve firms using external equity models.

General compensation research is also relevant for the present study because it tends to analyze the micro-level processes behind the macro-level phenomenon studied in most executive compensation research. For instance, much of the executive compensation literature is predicated on theories of power and dependence, including agency theory (e.g., Murphy & Baker, 1990; Grabke-Rundell & Gomez-Mejia, 2002). But whereas these mechanisms are rarely studied directly in executive compensation research, and therefore remain a 'black box', psychology-based compensation research tends to study these processes in a more direct manner, such

as through policy capturing and laboratory studies (Stevens, Bavetta & Gist, 1993). For instance, Bartol and Martin (1988; 1989; 1990) studied the link between dependence and compensation, and how this link is strengthened by actions such as threatening to quit. These micro-level studies can inform the present study and shed light on the specific processes by which executives engage in value appropriation.

The present study may also have implications for the broader area of compensation. One limitation of psychology-based compensation research, according to Rynes and Bono (2000), is that studies rarely focus on pay determination with compensation as the dependent variable (which is the norm in economics, finance and strategy), opting instead to analyze some aspect of the pay determination process as the dependent variable. Via the present study, I aim to identify macro-level phenomena related to the link between human/social capital and executive compensation. The research findings may create new opportunities for future research to untangle the micro-level processes behind these phenomena.

Strategic Management

At a broad level, the present study contributes to strategic management research by focusing on individual-level value appropriation by top managers. More specifically, this perspective exposes weaknesses in the resource-based view of the firm.

Levels of Analysis in Strategy Research

The well-established field of competitive strategy has shed light on the process by which firms compete against rivals to capture value and to generate and sustain competitive advantages. While primarily oriented toward product markets, research in the field has also addressed competition in factor markets, such as the

process by which firms gain leverage over suppliers and alliance partners. However, since the firm is virtually always the unit of analysis and is often even analyzed anthropomorphically, the question of how value is distributed among internal stakeholders (i.e., shareholders, management, employees, etc) is rarely addressed or even acknowledged as a valid question. This limitation applies not only to externally-focused models of strategy based on the work of Michael Porter (1980, 1985), but also to the internally-focused models exemplified by the resource-based view (Barney, 1991).

Treating firms as unitary actors is analytically useful for certain purposes but may very well lead to misguided conclusions for both theory and practice. In particular, most strategy research implicitly assumes that what is good for the firm is equally beneficial for all internal stakeholders (Coff, 1999). This would require that value is distributed proportionately among stakeholders, and that actions undertaken by individuals including top executives, middle managers, core knowledge workers, and all other internal stakeholders are motivated by a desire to influence the amount of value appropriated by the firm—the ‘size of the pie’—rather than how value is captured by different stakeholders—how the pie is sliced. On the contrary, it is more reasonable to assume that individual internal stakeholders are more concerned with the maximization of their own personal utility, i.e., their own slice of pie. The assumption of individual utility maximization forms the bedrock of economic theory, and although this assumption is often challenged, it serves as a formidable null hypothesis. It is unreasonable to assume that value will be shared evenly or equitably within a firm, though one might seek to identify conditions when that occurs.

The Resource-Based View of the Firm

The resource-based view of the firm (RBV) is the research stream within strategy that has the most to lose by ignoring how value is distributed among internal stakeholders, due to the emphasis placed within the RBV on firm-specificity, social complexity, intangibility, and ‘human’ assets. A central tenet of RBV theory is stated succinctly in a recent article by Wang, Barney and Reuer (2003: 50): “One of the most important sources of economic value for a corporation and ultimately equity holder wealth are the firm-specific investments made by its stakeholders”. Resources that are firm-specific, socially complex, intangible etc. are presumed to be more likely to yield sustainable competitive advantages (Barney, 1991), yet they are also likely to be more difficult to manage (Coff, 1997), and these attributes may create greater possibilities for value to be appropriated by internal stakeholders other than shareholders.

My approach explicitly accommodates and evaluates the possibility that individual executives will appropriate value that would otherwise be accrued by shareholders. As such, this approach is a response to a recent call by Blyler and Coff (2003) for empirical research that does not treat firms as monolithic entities and that considers the role of managerial resources such as social capital in value appropriation.

In the next chapter, I outline the process of intra-organizational value appropriation in greater detail, particularly as it concerns executive human capital and social capital.

Chapter 3: Human Capital and Social Capital as Determinants of Executive Compensation

Initial research examining intangible resources, among which human capital and social capital figure prominently, focused on identifying the value created by such resources (e.g., Barney, 1991; Itami, 1987). To the extent that value appropriation was considered, this was generally limited to explaining how value can be retained within the firm, and how isolating mechanisms may be employed to prevent appropriation by competitors. Recently, researchers have started asking and answering questions about the cost of strategic and intangible resources, and about the process of *intra-organizational value appropriation*, i.e., how value retained within a firm is distributed among shareholders, managers, and other internal stakeholders (e.g., Barney, 2001; Blyler & Coff, 2003; Coff, 1999). Empirical research has begun to show that superior resource endowments may provide competitive advantage without providing superior firm performance or shareholder returns (Ray, Barney, & Muhanna, 2004), particularly when the resources underlying the competitive advantage reside at the individual rather than organizational level (Chacar & Coff, 2000). Although rarely framed in terms of value appropriation, much of the executive compensation literature can also be interpreted through a value appropriation lens. In particular, prior researchers have examined the link between executive compensation and both human capital (Finkelstein & Hambrick, 1989; Hambrick & Finkelstein, 1995; Harris & Helfat, 1997) and social capital (Belliveau,

O'Reilly, & Wade, 1996; Boxman, De Graaf, & Flap, 1991; Burt, 1997; Geletkanycz, Boyd, and Finkelstein, 2001; Meyerson, 1994).

In this section of the dissertation, I seek to contribute to the emerging stream of research on intra-organizational value appropriation as well as more well-established fields of research (i.e., executive compensation, human capital, social capital, and the resource-based view) by examining the manner in which executive compensation is related to human capital and social capital. On a conceptual level, I distinguish between the ways in which value is appropriated from generic resources versus firm-specific resources. Empirically, I incorporate multiple dimensions of human and social capital as predictors of executive compensation. By doing so, I am able to identify the specific dimensions of human capital and social capital which generate real costs for firms.

The Value of Human Capital and Social Capital

In this dissertation, I focus on two categories of intangible resources—human capital and social capital—for two reasons. First, as I outline in this section, these resources have been identified as playing a central role in value creation for firms. Second, as I discuss in a subsequent section, these resources ultimately reside at the individual and relational level, which implies that individual executives are likely to appropriate at least some of the value created by their human capital and social capital.

Human Capital

Human capital consists of the productivity-enhancing and income-enhancing skills, knowledge, experience and health possessed by individuals; these resources result from investments such as education and training (Becker, 1993). Human capital first came to assume a major role in economic theory out of the recognition that theories centered on physical resources explained little of the variation between countries in economic performance. Similarly, human capital has assumed a major role in theories of firm performance. Scholars now widely concur that firm performance is more heavily dependent upon the deployment of human capital embedded in a firm's human resources than upon the deployment of physical and financial resources (Pfeffer, 1994; Kogut & Zander, 1996).

While human capital has the potential of creating value at all levels of the firm, management scholars have emphasized the important role executive-level human capital plays in affecting firm performance and other outcomes (Hambrick & Mason, 1984; Castanias & Helfat, 1991; Pennings, Lee & Van Witteloostuijn, 1998). The link between executive human capital and value creation has generally been borne out by empirical research which has found significant positive relations between managerial human capital and organizational innovation (Bantel & Jackson, 1989; Wiersema & Bantel, 1992), corporate growth (Norburn & Birley, 1988), survival (Pennings, Lee, & van Witteloostuijn, 1998) and financial performance (Norburn & Birley, 1988; Sherer, 1995). However, the link with performance in particular has not always been direct and positive. Hitt, Bierman, Shimizu, and Kochhar (2001), for instance, found a U-shaped relation between the human capital of

partners and the performance of law firms. The authors interpreted their results as an indication that human capital may be valuable but costly, hence the link between managerial human capital and performance may be indirect (Hitt et al, 2001). Pennings et al (1998) found the opposite relation, an inverted U, between human capital and organizational survival for Dutch accounting firms. As has been the case for other resources (e.g., Ray, Barney, & Muhanna, 2004), it appears that organizational human capital may have a stronger impact on outcomes such as knowledge creation, innovation, and competitive advantage than on financial performance and survival.

Social Capital

According to Adler and Kwon (2002: 18), “The core intuition guiding social capital research is that the goodwill that others have toward us is a valuable resource.” This value results from the information, influence, and solidarity ensuing from the goodwill (Sandefur and Laumann, 1998). Goodwill in this sense is not directly measurable and would likely lead to tautological research findings even if it were measurable; instead, empirical studies of social capital generally focus on the attributes of social network ties (e.g., network size, range, redundancy, centrality, and strength of ties). These ties include both internal (bonding) and external (bridging) ties, and the distinction between these two types of networks is often of theoretical value (Adler & Kwon, 2002).

The central hypothesis of social capital research within strategic management is that social capital facilitates value creation and is therefore related to outcomes such as organizational performance (Uzzi, 1997), innovation (Nahapiet & Ghoshal,

1998; Tsai & Ghoshal, 1998) and survival (Pennings et al, 1998). Among the various levels at which social capital may create value, the upper echelons of organizations figure prominently. As in the case of human capital, top managers have a greater opportunity to be the “authors of their jobs” (Burt, 1997: 352). Burt (1997: 362) provided empirical support that social capital is more valuable at higher levels of the organizational and went so far as to state that “Social capital studies of managers in jobs with large numbers of peers can be put aside as ill-designed.”

Social capital may be defined at the individual level, or at the level of a collectivity such as a group, firm, organizational field, community or nation (Kilduff & Tsai, 2003). The choice between the individual and the collective as the level of analysis for social capital is not merely a methodological choice, but rather an ideological one. Approaches that focus on collective social capital (e.g., Leana & Van Buren, 1999; Putnam, 1995) are predicated on the public goods aspect of social capital (Coleman, 1990). Because social capital reflects the degree of social embeddedness and shared values within a collectivity, the beneficial outcomes associated with social capital are often presumed to be accrued by the collective rather than by specific individuals (Portes & Sensenbruner, 1993). Approaches that focus on individual social capital (e.g., Burt, 1997) relax the assumption that value creation will inherently lead to collective value appropriation. Instead, whether individuals and/or collectivities will appropriate value created by social capital may only be answered by adopting a multi-level analytical approach.

The greatest number of contributions related to the individual-level benefits of social capital pertain to job mobility. Individual social capital has been found to be

linked to both inter-organizational mobility (i.e., finding a job with a new employer) and intra-organizational mobility (i.e., being promoted). Granovetter (1973) argued that weak ties are more likely to be helpful in finding a job than strong ties because weak ties are more likely to provide access to non-redundant information. This hypothesis has received broad support (Granovetter, 1974), though it has been acknowledged that the causal factor is the extent to which the tie bridges structural holes rather than tie weakness (Burt, 1992). See Lin (1999) for a review of studies linking individual social capital to status attainment, of which inter-organizational mobility is a key indicator. Looking at inter-organizational mobility from the other side of the employment contract, employers also benefit from using social capital to conduct recruitment and hiring (Fernandez, Castilla & Moore, 2000). In terms of intra-organizational mobility, social capital generally facilitates promotion within a firm. Specifically, promotion rates are higher among individuals whose social networks bridge structural holes (Burt, 1997), but the likelihood of promotion is also higher among individuals whose networks exhibit greater homophily (Ibarra, 1992). Podolny and Baron (1997) partially reconcile these seemingly contradictory findings by identifying the type of tie as a crucial contingency, such that sparse boundary-spanning ties are valuable for task-advice ties but that dense, cohesive networks are valuable for buy-in ties.

Resource Specificity and Value Appropriation

In the sections that follow, I distinguish between generic and firm-specific forms of human and social capital. Although I argue that executives will be able to appropriate value from both generic and firm-specific resources, the causal

mechanisms underlying value appropriation in the two cases will be very different. Generic resources convey market power upon executives, whereas firm-specific resources convey institutional power. Moreover, the distinction between generic and firm-specific resources is crucial in order to compare the value appropriated by executives with the value appropriated by shareholders, as I do in Chapter 4.

Control of Generic Resources Conveys Market Power

I use the term generic resources to refer to all resources that are not firm-specific (Becker, 1993). Generic resources are still likely to be specialized if they are to be valuable and rare, but the nature of their specificity differs importantly from firm-specific resources. Resources that are specialized but not firm-specific, such as industry-, country-, and technology-specific resources, may be somewhat illiquid due to thin markets, but they (or the services they render) remain tradable. Firm-specific resources, on the other hand, have diminished value when deployed outside a particular firm. Firm-specific resources have been singled out within the resource-based view as playing a crucial role in the creation of sustainable competitive advantage (Barney, 1991). However, while strategically important resources are often firm-specific, specificity itself is neither necessary nor sufficient to make a resource valuable. In fact, *ceteris paribus*, tradable resources should be *more* desirable (Lippman & Rumelt, 2003).

Generic resources are either directly tradable or are capable of rendering services that are directly tradable. We can therefore refer to generic resources as *portable*. For instance, credentials such as a law degree or CPA status are not directly tradable, but services rendered by the human capital underlying these credentials are

easily traded and are amenable to market valuation. Likewise, social ties are rarely bought and sold, but may be possible to place a monetary value on the services they render, such as through brokerage fees. By controlling scarce yet portable resources embodied in their human capital and social capital, executives may be able to ensure that their own switching costs are less than their firms' switching costs. In other words, these executives derive market power from the establishment of small numbers bargaining for only one party involved in a transaction.

Market power is not impeded by the fact that human capital and social capital are inseparable from the executives in whom these intangible resources are embedded. As long as the resources are not firm-specific, the services they render may be re-deployed in other firms, thus altering the amount of value an executive appropriates. For instance, at the CEO level, outside successors generally earn more than internal successors (Gilson & Vetsuypens, 1992; Joskow, Rose, & Shephard, 1993; Hambrick & Finkelstein, 1995; Harris & Helfat, 1997). Harris and Helfat (1997), who found that successors from outside the industry receive the greatest compensation, followed by outsiders from within the industry then by internal successors, have interpreted this finding as signifying that external successors are being compensated for the firm-specific human capital foregone when they switch firms. In complete contrast with these authors, I believe these results indicate that external successors receive greater compensation because their skill set is more generic in nature, and therefore conveys market power. Internal successors, in contrast, cannot make a credible threat of switching firms to appropriate greater value, because their resources would be less valuable in another firm.

Control of Firm-Specific Resources Conveys Institutional Power

If a resource is entirely firm-specific, it is not portable and cannot convey market power, since the value generated by the resource in its next-best application is zero (Becker, 1993: 41-42; Klein, Crawford, and Alchian, 1978). The only recourse available to the resource owner is to withhold the resource from use (e.g., voluntary turnover in the employment context), which would force the resource owner to forego compensation for firm-specific resources. In economic terms, a firm should be able to retain valuable human capital and social capital by distributing only a small portion of the value generated. The opportunity cost of resources that are entirely firm-specific is zero, and a firm need only pay a trivial amount to exploit existing firm-specific resources (Klein et al, 1978). The only reason a firm would pay more would be to provide a monetary incentive (i.e., a sort of efficiency wage) for employees to work harder and to make future investments in firm-specific resources (Becker, 1993: 40-51; Peteraf, 1993). Such incentives may not even be necessary or useful, given that many firm-specific resources such as intra-firm social networks and tacit knowledge of organizational processes are often by-products of other activities and result from the deployment of existing resources, rather than resulting from purposive investments (Dierickx & Cool, 1989; Coleman, 1990; Prahalad & Hamel, 1990). In certain cases, particularly for social capital, attempts to purposely invest in firm-specific resources may be completely counter-productive. As Burt (1992: 24-25) states regarding blatantly instrumental approaches to managing social capital: “Judging friends on the basis of efficiency is an interpersonal flatulence from which

friends will flee.” This leads one to the conclusion that firms will appropriate the lion’s share of value created by firm-specific resources.

Why, then, might firms provide seemingly needless compensation for firm-specific resources? To begin to answer this question, one must consider that the managerial labor market is an economically imperfect market (Simon, 1951), and firms are social institutions driven by social norms and political forces in addition to market forces (Scott, 1995). Firm-specific resources will not convey market power, but they may convey other benefits upon executives, such as legitimacy, visibility, access to information, and influence. For instance, an executive who possesses unique tacit, firm-specific knowledge resulting from having spent her entire career within a single firm would find it hard to make a credible threat to defect to a rival firm; however, her unique understanding of organizational processes and politics makes it unlikely that she would need to make such a threat anyway. Instead, an individual possessing such resources is likely to have considerable direct and indirect influence over resource allocation decisions within the firm, including her own compensation. This may result from the overt exercising of power, from more covert forms of influencing outcomes by exploiting information asymmetries, or even from completely subconscious process of social comparison and social influence. I refer to influence that is based on the control of firm-specific resources rather than on tradable resources as institutional power.

Value appropriation processes in general are likely to be driven by a combination of economic, social and political processes. Economic processes are likely to play a dominant role in driving inter-organizational value appropriation (i.e.,

how firms compete against each other to capture value), but this role is likely to diminish for intra-organizational value appropriation (i.e., how individuals within a firm position themselves to capture value). In contrast, social and political processes will play a stronger role in intra-organizational value appropriation than in inter-organizational value appropriation. This is due to the fact that organizations represent a fundamentally different means of governing transactions, one in which an ex ante large numbers condition is transformed into a small-numbers relation (Coase, 1937; Williamson, 1985).

In the specific case of value appropriation by executives, empirical evidence indicates that political and social processes have a substantial impact on executive compensation. Executive compensation among publicly traded US firms is characterized by a seemingly paradoxical combination of high visibility and low transparency. Compensation is visible because SEC rules mandate that firms disclose the form and amount of compensation received by up to five executives. The visibility of executive pay encourages social comparison processes whereby executives are compared to 'comparable' executives at 'comparable' firms (O'Reilly, Main & Crystal, 1988; Belliveau, O'Reilly & Wade, 1996). Because pay is visible, compensation serves not only as a monetary form of appropriation but also as an indicator of status. Compensation consultants are commonly employed to guide the process of social comparison. At the same time, however, visible ex post compensation amounts may be contrasted with opaque ex ante compensation schemes. Certain actions, such as the announcement of incentive plans that are not implemented (Westphal & Zajac, 1994), may act as symbolic actions that obscure the

actual basis upon which compensation is determined. The pay received by ‘comparable’ executives at other firms is fairly transparent, but the basis upon which ‘comparable’ firms are identified is not (Porac, Wade & Pollock, 1999). Even incentive structures that are explicitly designed to align the interests of executives and shareholders, such as stock options, may detract from transparency by masking the costs borne by shareholders. Additional elements of executive value appropriation that may lack transparency and promote political posturing and opportunism include options re-pricing (Pollock, Fischer & Wade, 2002), insider trading (Coff & Lee, 2002), payments to departing executives, and stealth compensation (Bebchuk, Fried & Walker, 2002).

Together, the high visibility and low transparency of executive pay allow executives to ‘game’ the system. The greater the amount of firm-specific resources an executive controls, the better the executive is likely to be at playing the game. For more overt political processes, executives may secure increased compensation by controlling information flows and exploiting social relations. For more covert and even sub-conscious social processes, executives may benefit from the legitimacy, visibility, and familiarity conveyed by firm-specific resources².

I have argued that market forces are the main factor behind the link between generic resources and executive compensation, and that social forces play a more dominant role than market forces in linking firm-specific resources to executive compensation. However, market and social/institutional forces work in tandem in both cases, and it is neither possible nor necessary to separate the two. For instance, firms may not need to provide significant amounts of compensation in order to induce

² Note the contrast with market power, which depends on scarcity.

managers to contribute their existing firm-specific resources, since these resources command little if any market value. I have argued that the reason these resources are likely to be positively related to compensation is that executives who command substantial firm-specific resources will be powerful, visible, and legitimate within their organizations. But there are economic mechanisms behind this link as well. Specifically, a firm is likely to compensate executives for existing firm-specific resources in order to induce employees into investing in the accumulation of new firm-specific resources, as an incentive for managers to contribute their firm-specific resources in creating value for their firms (i.e., an efficiency wage), and as a means of guaranteeing the services rendered by the manager's resources. Moreover, as discussed below, it may not always be apparent which resources are firm-specific, and most resources will exhibit both generic and firm-specific characteristics. If a certain executive excels at managing a particular R&D team, is the executive's superior performance related to firm-specific skills that would be irrelevant outside the current firm, team-specific skills that can travel between firms but only if other team members do so as well, or generic skills that could be applied to the management of any R&D team? The only way to know with certainty, for the manager and/or the person(s) setting the manager's compensation, would be for the manager to depart the firm. The firm may be willing to provide extra compensation in order to avoid that outcome.

Linking Human and Social Capital to Executive Compensation

In this section, I present formal hypotheses linking the compensation an executive receives to the resources that she brings to the table, including generic

human capital, generic social capital, firm-specific human capital, and firm-specific social capital. For each class of resources, I first discuss the manner in which these resources create value for firms, then I explain why executives should be able to appropriate some or all of the value that is created. In a subsequent section, I discuss the implications of the differences between generic and firm-specific resources for determining whether executives or shareholders will appropriate greater value.

Generic Human Capital

Generic human capital includes education, training, and accumulated experience that are applicable in multiple organizational contexts. This does not imply that generic human capital cannot be specialized, rare, or valuable. To the contrary, generic human capital may be quite specialized, but in a manner that does not constrain its portability beyond a single firm. Resources that are specialized but not firm-specific, such as technology-, industry- or country-specific resources (e.g., earning an MD in cardiology, developing expertise with nanotechnology, or accumulating experience in a particular foreign country) are still portable, whereas resources that are truly firm-specific are only deployable within a single firm.

While all forms of human capital are subject to market imperfections because these resources are illiquid and embedded in individuals, well-functioning markets are most likely to exist for generic, rather than firm-specific, human capital. At the extreme, “Perfectly general training would be equally useful in many firms and marginal products would rise by the same extent in all of them. Consequently, wage rates would rise by exactly the same amount as the marginal product and the firms providing such training could not capture any of the return,” (Becker, 1993: 34)

which explains why the costs of investments in generic human capital are generally borne by individuals rather than their employers. Therefore, I hypothesize that generic human capital will convey market power upon executives, allowing them to obtain higher compensation in exchange for the services rendered from their human capital.

Specifically, I focus on two dimensions of generic human capital: formal education and breadth of experience.

Formal education. Compensation is generally closely related to the amount of formal education a person has received. Empirical studies have documented the link between education and income across numerous industries and countries (Becker, 1993). However, most of these samples were drawn from the general population or from lower levels of organizations. At the upper echelons of public corporations, the link between formal education and compensation may be weaker. Even though organizational performance is more likely to be influenced by the capabilities of a single employee when that individual is a top manager of the firm (Hambrick & Mason, 1984; Finkelstein & Hambrick, 1996), differences in the formal education of executives may have little relation with differences in organizational performance or individual compensation. First, top managers tend to be fairly homogenous in terms of educational background—the vast majority have university degrees, and a disproportionate number were educated in a small number of elite schools (Finkelstein & Hambrick, 1996: 21). Furthermore, many of the skills needed to be an effective manager are acquired through learning-by doing rather than formal education (Mintzberg, 1973).

Prior research provides some support for a link between education and executive compensation. In a sample comprised of SBU heads, Fisher & Govindarajan (1992) found that compensation was positively related to the years of education. In a sample consisting of multiple hierarchical levels of executives, Leonard (1990) found strong evidence of a link between education and compensation: each additional year of schooling was associated with an 11% increase in pay, and generic human capital had a much larger impact on compensation than did firm-specific human capital. Given that the present sample includes high technology firms, and that managers must understand complex technical issues to lead such firms, we expect to find a positive linear relation between formal education and executive compensation.

Breadth of experience across industries. In addition to formal education, another important dimension of generic human capital is the extent to which an executive possesses broad experience that transcends a single industry. Top managers with broad experience may exhibit cognitive complexity and a broader perspective. In particular, executives who have experience spanning multiple industries are likely to have faced a wider range of operating environments; learning how to survive and thrive in diverse environments should convey an advantage upon executives with broad experience. Collective cognition tends to emerge within industries and creates pressure for the homogenization of cognitive schemata within a given industry (Spender, 1989). To the extent that an executive has acquired experience in diverse industry settings, the executive should be more resilient against

myopic industry mindsets and should be better able to identify opportunities to transfer best practices and other forms of knowledge between industries.

In addition to the value-creating benefits of broad experience, executives with experience in multiple industries should also be more capable of capturing existing value. Consider two executives, the first of which has spent 25 years in the grocery industry, and an equally tenured executive whose experience spans five different industries. Upon deciding to seek out new employment, the first executive is likely to enter the market for grocery or retail executives, while the latter will be entering the broader managerial labor market for all industries. The executive with the wider opportunity set is more likely to command greater compensation.

Hypothesis 1. The amount of generic human capital an executive has accumulated (measured in terms of years of education and breadth of experience across industries) will be positively related to executive compensation.

Generic Social Capital

An executive's generic social capital (i.e., social capital that is not firm-specific) consists of 'bridging' ties to external contacts, while firm-specific social capital consists of 'bonding' ties to contacts within the firm. In operational terms, generic social capital can be measured by assessing key attributes of an ego's ties to alters located outside the firm (e.g., external network size, range, and strength of ties), while firm-specific social capital may be evaluated by examining the same attributes of the ego's internal social network ties.

Of the three ways in which social capital creates value (information, influence, and solidarity), the information benefits of generic social capital are most

evident. Boundary spanning ties help a firm gain and sustain a competitive advantage by helping to identify shifts in the external environment and competitive dynamics, as well as by gaining access to key external constituencies such as regulatory bodies, financial institutions, and trade associations. More directly, many external ties relate to a firm's physical and knowledge supply chain, or to customers. For instance, external ties may help a firm identify opportunities to enhance innovation through collaboration (Powell, Koput, & Smith-Doerr, 1996). In all cases, external social capital creates value for firms by providing access to information and/or influence.

Generic social capital conveys market power, and much of the value generated by external social capital will be directly appropriable by the executives themselves (Blyler & Coff, 2003). In contrast with firm-specific ties, external ties take on a private goods nature (Leana and Van Buren, 1999). While external ties remain relational assets and are therefore unlikely to be directly tradable, the brokering services provided by such ties are tradable. I focus on three attributes of external social capital: external network size, external network range, and the strength of external ties³.

External Network Size. Just as firms with large and diverse networks are able to enjoy access to wider information sources and reduce dependence on any single contact, so will individuals (Burt, 1992). Executives who maintain larger external networks are likely to have a more complete understanding of their firm's external environment and will likely be quicker to learn of changes in that environment. Not only can such executives create more value by helping their firms

³ Additional attributes of social capital, such as network centrality, could also be linked to value appropriation. I do not address network centrality because it cannot be measured in egocentric networks, as discussed below.

navigate their environment, but they will also be better able to identify opportunities for individual advancement. Since generic social capital is at least partially portable, they can also parlay their large external networks into a more appealing job with another firm.

External Network Range. Network range refers to the diversity of social ties within a social network (Scott, 1991). Although larger networks tend to exhibit greater range, this is not always the case. The greater the range of an executive's external network, the greater will be the diversity of information the executive can access. Since most firms are subject to a wide variety of external exigencies and top management positions require cognitive complexity to process diverse and potentially contradictory information, top managers will benefit from having access to a wider range of social contacts.

Strength of External Ties. *Ceteris paribus*, the stronger an external tie, the more valuable the tie. If ties are to be seen as conductors of information between nodes, strong ties have better conductivity than weak ties. Strong ties are more cost effective than weak ties in transmitting complex information and tacit knowledge across organizational boundaries (Hansen, 1999), and they are more useful for politically sensitive tasks and occasions that require high levels of trust between organizations (Uzzi, 1997). However, I acknowledge that the beneficial aspect of external tie strength may be dampened by the possibility that strong ties are redundant ties (Granovetter, 1973). Strong ties may also be more costly to maintain (Hansen, 2001).

Hypothesis 2. *The amount of generic social capital an executive has accumulated (measured in terms of external network size, external network range, strength of external ties, and criticality of external ties) will be positively related to executive compensation.*

Firm-Specific Human Capital

Becker (1996: 11) summarizes the economic perspective on firm-specific human capital as follows:

“By definition, firm-specific knowledge is useful only in the firms providing it, whereas general knowledge is useful also in other firms. Teaching someone to operate an IBM-compatible personal computer is general training, whereas learning the authority structure and the talents of employees in a particular company is specific knowledge. This distinction helps explain why workers with highly specific skills are less likely to quit their jobs and are the last to be laid off during business downturns. It also explains why most promotions are made from within a firm rather than through hiring—workers need time to learn about a firm’s structure and ‘culture’—and why better accounting methods would include the specific human capital of employees among the principal assets of most companies” (Becker, 1996: 11).

Elsewhere, Becker (1993) further explains that although all forms of human capital are relatively illiquid, firm specific human capital is perfectly so. He concludes that firms have no economic reason to invest in purely generic human capital, but they

will rationally pay for a portion of firm-specific training costs, since employees are able to appropriate only a small portion of the value of firm-specific human capital. Executives can leverage generic human capital to appropriate greater value, even when the generic human capital is highly specialized, such as Peteraf's (1993) example of a Nobel laureate. But when the human capital is firm-specific, the executive cannot rely upon market power.

Instead, firm-specific human capital conveys institutional power by enabling an executive to navigate the subtleties of the firm's informal structure. I focus on two dimensions of firm-specific human capital that may enable an executive to appropriate value: tenure and knowledge of organizational processes.

Tenure. The most common and intuitive indicator of firm-specific human capital is tenure. As executives accumulate additional tenure, they acquire greater task knowledge (albeit with diminishing returns) and power, though the diversity of information sources they employ is likely to decline (Hambrick & Fukutomi, 1991). At the CEO level, prior research has generally failed to identify significant linkages between tenure and compensation (Deckop, 1988; O'Reilly, Main, and Crystal; Rajagopalan and Prescott, 1990; Hambrick and Finkelstein, 1995). Tenure is a fairly crude measure of firm-specific human capital, and it may also be viewed as an indicator of other constructs, such as managerial entrenchment and power (Hill & Phan, 1991; Barkema & Pennings, 1998).

Knowledge of Organizational Processes. Although substantial measurement challenges exist, it may be more fruitful to attempt to directly measure firm-specific human capital, rather than utilizing convenient proxies such as tenure. The most

important factor underlying the presumed link between firm-specific human capital and executive value appropriation is tacit knowledge of organizational processes and routines. These processes and routines are widely heralded as key drivers of sustainable competitive advantage and even as the basis of a theory of the firm (Kogut & Zander, 1996). Such advantages may be sustained in equilibrium due to the attendant uncertain imitability and causal ambiguity (Lippman & Rumelt, 1982). However, these same characteristics can inhibit the transfer of knowledge within the firm, thereby limiting the ability of firms to exploit complex and tacit firm-specific knowledge (Coff, 1997).

Executives who are able to understand and manage organizational processes that elude codification will not only help their firms succeed, but will also be positioned to advance their own careers. For instance, Krackhardt (1990) found that individuals with more accurate cognitive maps of internal social networks tend to be perceived as more powerful. Through the possession of firm-specific knowledge that is hard to come by, such as understanding how information flows within the organization or how control is distributed, executives should be better able to appropriate greater value. Not only will these executives be able to create more value, but they will be able to position themselves favorably within existing incentive structures and/or revise those incentive structures to suit their personal preferences.

Hypothesis 3. The amount of firm-specific human capital an executive has accumulated (measured in terms of tenure within the firm and knowledge of organizational processes) will be positively related to executive compensation.

Firm-Specific Social Capital

There are numerous reasons to believe that firm-specific social capital is associated with value creation. Many of these reasons are provided by Nahapiet and Ghoshal (1998), who identify three dimensions of social capital that create value for firms: the structural and relational dimensions, which respectively include social interactions and the assets embedded in those interactions, and the cognitive dimension of social capital, which includes shared goals, norms and values. The structural dimension consists of internal ties that make it possible to combine knowledge within the firm to create new value. The relational dimension serves as a trust-based governance system that enables transactions that could not as easily transpire across market-mediated transactions. The cognitive dimension provides a common language for the effective transfer of information within the firm.

Although the above factors imply that internal social ties will enable value creation, firm-specific social capital is most frequently thought of as a public good and may not generate appropriable value for individuals. Citing other authors (Asefa & Huang, 1994; Fukuyama, 1995; Putnam, 1993), Leanna and Van Buren (1999: 540) state that “the ‘payoff’ from individuals’ acts to enhance social capital directly accrues to the social unit as a whole and only indirectly back to the individual.” How, then, might it be possible that executives may directly appropriate value from firm-specific social capital?

From an economic perspective, it is easy to see that firm specific social capital will not convey market power and therefore the value created by firm-specific social capital should be retained by the firm rather than appropriated by individual

executives. From a social and political perspective, it may also appear at first that value from firm-specific social capital will not be appropriated by individuals because instrumental actions taken by executives to leverage value from their internal networks are not likely to be perceived well within the organization. It is one thing for an executive to demand higher compensation because the executive maintains exclusive ties to potential clients or regulatory bodies. Demanding higher compensation because one has strong ties to internal stakeholders is less justifiable.

In limited circumstances, such as intra-TMT ties discussed below, individuals may overtly exercise institutional power to capture value from firm-specific social capital. More commonly, however, executives are more likely to appropriate value from firm-specific social capital in a covert manner, much in the same manner as firm-specific human capital. Internal social networks may be deployed to opportunistically control information flows, not only overcoming existing information asymmetries but also creating new ones. Executives that have accumulated superior firm-specific social capital possess a superior understanding of the dynamics within an organization, and are going to be more capable of steering those dynamics in their favor. Even if their internal networks are structurally redundant, executives may exploit their central positions and strong ties to extract greater value.

The cognitive dimension of social capital may inhibit both overt and covert efforts to capture value. To the extent that an executive possesses greater firm-specific social capital, she is likely to subscribe to a greater proportion of the shared values, goals and norms of reciprocity within the firm. The executive is less likely to

deploy her social capital in an instrumental and opportunistic fashion. However, she is also less likely to need to do so in order to capture value. The executive who possesses greater firm-specific capital will exhibit greater legitimacy, visibility and status within the firm.

To further explore the relation between internal social networks and value appropriation, I focus on five dimensions of internal social capital: the strength of intra-TMT ties, internal network size, internal network strength, the criticality of internal ties, and the criticality of external ties.⁴

Strength of Intra-TMT Ties. That maintaining strong ties within the top management team should help an executive appropriate value would be of little surprise to critics of social capital theory. These critics (e.g., Locke, 1999) have argued that social capital constitutes little more than an ‘old boys’ network. A top management team comprised of strong ties among all members may act as a rent-seeking cabal that seeks to maximize value appropriation at the expense of value creation and at the expense of shareholders. Within such a system, individual executives may increase their pay by consolidating their role within the cabal.

There are also less nefarious reasons to believe executives who maintain strong ties within the top management team will receive greater compensation. Strong ties are more effective for the transfer of sensitive, complex, and/or critical information (Krackhardt, 1992; Hansen, 1999). It may simply be in the firm’s best

⁴ These appear to be the most relevant properties of internal social capital. Intra-TMT network size would be irrelevant, since all TMT members are tied to each other by definition. Similarly, internal network range is not useful, since most executives maintain at least one tie in all internal constituencies.

interest to allocate power and compensation to those executives who are best able to serve as conduits for the flow of information within the top management team.

Internal Network Size. An important function played by top management teams is to identify and mobilize knowledge that is being created at lower levels of the firm. Not all executives will have sufficient access to such knowledge.

Executives who maintain social ties with a larger set of internal stakeholders will be better positioned to identify, transfer, and combine knowledge that resides at lower levels of the organization. Even if these ties are structurally redundant, an executive should be able to exploit her hierarchical position to reap benefits from the ties.

Executives are not necessarily expected to create new knowledge, but rather to identify opportunities to deploy knowledge that is being created or accumulated at lower levels of the organization.

Strength of Internal Ties. As in the case of external social ties, strong internal ties may be more effective conduits of certain types of information than will weak internal ties. Internal ties are more likely to be structurally redundant than will bridging ties and will not convey market power. Yet executives who maintain strong internal ties can depend on their internal contacts to help them consolidate their own personal power within the organization. For instance, Burt and Ronchi (1990) recant the story of a manager who was fired as a cost-cutting measure. Unbeknownst to the top management team, the manager they fired had personally recruited 106 people to the firm. Upon his dismissal, these strong ties mobilized in a hostile fashion against the management. In an even more transformational case, Frank Quattrone consolidated his personal power by maintaining strong ties to his team of more than

100 analysts; he and his team appropriated the lion's share of the profits they generated and transferred firms as a team to seek out an even more favorable arrangement (Chacar & Coff, 2000).

Criticality of Internal Ties. Whereas tie strength relates to the conductivity of social ties, criticality relates to whether the node at the other end (i.e., the alter) is a source of valuable information or goodwill. Social ties that are strong and numerous are likely to have little bearing on an individual's compensation unless the ties are also valuable for the executive's job. Individual executives benefit personally from being uniquely positioned to handle critical contingencies (Hickson et al, 1971). The criticality of internal ties refers to the extent to which an executive's ties outside the TMT but within the firm are of great importance to the firm.

Criticality of External Ties. As in the case of internal ties, executive compensation is likely to be dependent on not only the quantity and strength of external ties, but also on the extent to which the ties are useful for helping manage critical contingencies. One way an executive may assume such a role is to develop social ties with key external parties, since strategic contingencies often arise from an organization's dependence on external parties for resources (Pfeffer & Salancik, 1978). Although external ties are generally thought of as a generic form of social capital, the extent to which these generic resources are critical to the firm's operations is itself a firm-specific characteristic. For this reason, I have classified the criticality of internal ties as a form of firm-specific social capital.

Hypothesis 4. *The amount of firm-specific social capital an executive has accumulated (measured in terms of intra-TMT tie strength, internal network size,*

strength of internal ties, criticality of internal ties and criticality of external ties) will be positively related to executive compensation.

Chapter 4: Methodology

In this chapter, I review the research methods employed in this dissertation.

Sample and Research Procedures

The data analyzed for this dissertation were collected as part of a larger project undertaken by three doctoral students and two professors at the University of Maryland. Data collection efforts included the administration of survey instruments completed by executives during the second half of 1999, from which most key explanatory variables were obtained. The dependent variable, executive compensation, as well as control and moderator variables were obtained from subsequent corporate SEC filings. The procedure followed for sampling and data collection is outlined below.

Sample

Our sample of 71 executives from 36 firms was drawn from the population of publicly-traded firms in technology-intensive industries located in the US Mid-Atlantic region. The sample is restricted to publicly-traded firms because only these firms are required to report executive compensation data to the SEC⁵. We decided to focus on firms in three broad technology-intensive industries (information and communication technology, biotechnology/biomedical, and engineering) in order to minimize intra-sample variance due to industry differences. Technology-intensive industries were selected because prior research has demonstrated the important role

⁵ As part of the same data collection effort, we collected data from a limited number of private firms as well. However, since compensation data are not available for the private firms, they have been entirely excluded from the present analysis.

executive human capital and social capital play in creating value in technology-intensive industries, which are generally characterized by high managerial discretion (Hambrick and Abrahamson, 1995). The sample was geographically constrained to one region of the United States to facilitate data collection.

Once the target population was identified, we contacted the CEO of each firm to request participation. 42 of the 110 public firms agreed to participate and returned surveys, resulting in a participation rate of 38%. Non-responding firms cited a variety of reasons for not participating, among which the most common reason was the existence of an explicit corporate policy against participation in research studies. In order to test for response bias, we compared participating and non-participating firms by annual revenue, net income, and number of employees. On average, responding firms had slightly larger revenue and greater net income but fewer employees; none of these differences were statistically significant at $p < .10$, however.

Each CEO was asked to identify the set of managers who are most typically involved in determining the overall strategic direction of the firm, which is a common method for defining top management teams (Finkelstein and Hambrick, 1996), and signed a letter of support requesting that top management team members complete a survey⁶. Of the 261 top management team members identified by participating CEOs (an average of 6.2 per firm), 145 (56%) returned surveys, 9 of which were partially incomplete and therefore unusable. Although completed surveys were received from 136 executives from 42 firms (i.e., 52% of the executives of participating firms),

⁶ Distinct survey instruments were also distributed to corporate human resource executives and to core knowledge workers at lower levels of the corporate hierarchy. However, the present study is centered on data obtained from the top management teams.

compensation data were only available for those executives who were listed in the companies' SEC filings. The response rate that compares favorably with other surveys of top managers of publicly-traded firms. The principal title held by executives in the sample includes CEO (15 observations), President and/or COO (10), Executive Vice President (10), CFO (11), Senior Vice President (33), Vice President (39), and other (18, including CTO, HR director, legal counsel, controller, and SBU manager).

In proxy statements filed annually with the SEC, firms are required to report three years of compensation data for 'named' executives, which include the CEO and the four most highly paid executives whose salary and bonus exceeds \$100,000. Therefore, focusing exclusively on the named executives may introduce bias and may artificially constrain intra-TMT variance in executive compensation. Unfortunately, the compensation data of non-named executives cannot be known with certainty. Instead, for any given non named executive, compensation must be lower than that received by the lowest-paid named executive (or lower than \$100,000 if fewer than five named executives are listed⁷). Case-wide deletion of observations for non-named executives is a more conservative approach, and I have chosen to adopt this approach for the main results, in spite of the lower sample size (i.e., 71 executives from 36 firms).

Data Collection

The dependent variable in my analysis, executive compensation, is derived from SEC filings. Publicly-traded corporations are required to disclose compensation

⁷ Three of the firms in our sample reported fewer than five 'named' executives.

data for named executives in proxy statements, form DEF-14, filed with the SEC prior to each annual meeting of shareholders. Social capital and human capital measures were collected during the second half of 1999. In order to match compensation data to the same period, I utilized proxy statements filed during the calendar year 2000, which corresponds to firms with fiscal years ending between the fourth quarter of 1999 and the third quarter of 2000. In a small number of cases, compensation data were not available for that time period. This generally occurred for firms that ceased to report proxy statements during 2000, due to having been acquired by another firm or being de-listed from the stock exchange. In these cases, I utilized compensation data for the previous year. In unreported models, I used an alternative method of assessing compensation, based on average compensation for a three-year period starting with the year prior to data collection. Three-year average compensation correlated at 0.92 with one-year compensation, and both measures produced virtually identical results.

Most independent variables of interest (i.e., measures of human capital and social capital) were obtained through a survey completed by each participating executive. A copy of the survey is included in the appendix of this dissertation. The survey instrument completed by each executive assessed the executives' ego-centered social networks by prompting executives for information regarding social ties with fourteen categories of alters, including ties with other top management team members, nine categories of external contacts, and four categories of internal contacts. When possible, the accuracy of the self-reported data was corroborated

using archival sources. For instance, annual reports and company web sites were used to confirm self-reported information concerning education and prior experience.

Additional variables were obtained from archival sources. Corporate financial data, market performance, and measures of corporate governance were obtained from the Compustat database and from SEC filings including annual reports and proxy statements. I also utilized information from the websites of companies in the sample as an additional source of data on executive human capital and directors.

Variable Definitions

Dependent Variable: Executive Compensation

We focus on publicly disclosed executive compensation (i.e., salary, bonus, options, restricted stock, and other forms of compensation) as the primary observable mechanism through which executives appropriate value. Compensation data were obtained from proxy statements filed with the SEC. I focused on total compensation in order to include as many forms of value appropriation as possible and because variable pay such as bonuses and stock options account for a large portion of total compensation for executives of publicly traded firms, and I did not hypothesize different effects for different forms of compensation. As is common in executive compensation research (e.g., Lambert, Larcker, and Weigelt, 1993), I valued stock options at 25% of the exercise price for our main models, though I also include a model with stock options valued at 50% of the exercise price⁸. For the sample of 71

⁸ While variations of the Black-Scholes formula are also commonly used, particularly in studies using the ExecuComp database, Black-Scholes is arguably inappropriate for the valuation of executive stock options. In spite of its computational rigor, this approach requires the unreasonable assumption that an external market for options exists or that executives may diversify their option-related risk, and more importantly, there is little evidence that executives seek to maximize the Black-Scholes value of their

executives and with options valued at 25% of the exercise price, the average total compensation received was \$622,760, which includes \$170,915 in salary, \$92,929 in bonus, \$197,143 in stock options, and \$37,266 in other forms of compensation. Considering that the average top management team of sampled firms included 6.45 individuals, the total compensation received by top managers for an average firm (\$4.02 million) is equivalent to approximately 6% of average EBIT and 16.8% of net income, suggesting that top managers in the sampled firms appropriate a significant portion of the value created within their firms.

Independent Variables: Generic Human Capital

Human capital includes the knowledge an individual has accumulated through formal education, training, and experience.

Education. I measure formal education as a count measure of the number of years of post-secondary education completed by each executive (Fisher & Govindarajan, 1992; Leonard, 1990). On average, executives in the sample completed just over 6 years of post-secondary education.

Breadth of Experience. I measure the extent to which an executive's prior experience is applicable in a diverse range of industry settings by including a count measure of the number of industries in which each executive has been employed.

This measure of breadth of experience ranges from 1 to 6 industries for the sampled executives.

options, rather than relying on simple heuristics such as the exercise price and number of shares (Lambert, Larcker, and Verrecchia, 1991; Murphy, 1985). Lambert, Larcker and Verrecchia (1991) show that simpler procedures for valuing options, such as the one used in this paper, produce valuations similar to the Black-Scholes value. Similarly, Lewellen, Park and Ro (1995) found that Black-Scholes options valuations for 215 firms averaged 37.2% of the exercise price multiplied by the number of shares, and approximately 60% of the values fell between 25% and 50% of the exercise price.

Independent Variables: Generic Social Capital

Each measure of social capital employed in this study was derived from surveys in which executives were prompted to describe their ego-centered social networks according to the type of contact. In operational terms, I defined generic social capital as the characteristics of all social ties with external contacts and firm-specific social capital as the characteristics of all social ties with internal contacts. For generic social capital, executives were asked to report the characteristics of social ties to nine categories of external alters, including financial institutions, suppliers, customers, competitors, alliance partners, government agencies, trade associations, external board members, and others. Consistent with a modified position-generator approach (Lin & Dumin, 1986), executives were asked to identify the number of contacts within each category, then to assess the nature of the ties within each category. From this information, I created three variables to represent attributes of the sampled executives' generic (i.e., external) social networks: external network size, range of external ties, and strength of external ties.

External Network Size. One indicator of the extensiveness of an executive's boundary-spanning social network is external network size. Operationally, external network size is defined as the sum of an executive's contacts across all nine categories of external ties. Count measures of social ties are commonly used in network research to capture the size dimension of social capital (Scott, 1991; Wasserman & Faust, 1994).

Range of External Ties. Measures of network range are often employed to complement measures of network size. Both measures serve as a reflection of the

extensiveness of an egocentric network, but network range introduces new information concerning the diversity of an individual's social ties. Inclusion of network range is particularly important if and when ties within a given group (i.e., financial institutions) can be viewed as structurally equivalent. Diverse ties to alters who are not structurally equivalent may be valuable to both the executives themselves and their firms by creating opportunities to bridge structural holes (Burt, 1992). As is conventional in network studies following position-generator procedures (e.g., Walker, Wasserman, & Wellman, 1993), the range of external ties is measured in this study by the number of external categories in which an executive maintains social ties. Values of the variable may therefore vary between 0 and 9. Not surprisingly, the range of external ties is positively correlated with external network size ($r = .39$), but the correlation is not high enough to create problems of multicollinearity.

Strength of External Ties. Conceptually, tie strength consists of three dimensions: frequency of interaction, duration of the relationship, and emotional intensity of the bond (Granovetter, 1973). Empirically, most published research in management fields has focused on the first two dimensions and omitted emotional intensity (Krackhardt, 1992), even though research in sociology has suggested that emotional intensity or closeness is the best single measure of tie strength (Marsden & Campbell, 1984). When emotional intensity has been included, this has generally taken the form of a dichotomous measure of whether or not the relationship is considered a friendship, as opposed to a relationship that entails less emotional intensity (e.g., Brass & Burkhardt, 1992; Kilduff & Krackhardt, 1994).

I operationalized the strength of external ties as a linear combination of the standardized scores for the three dimensions of tie strength. Frequency of interaction is measured in terms of the average number of times per month that the executive interacts with the average alter. Duration of ties is represented by the mean length of time the executive reports to have known the average contact within each category. Rather than forcing a dichotomous characterization of whether or not a contact is a friend, emotional intensity was measured directly through the question “How close is your relationship with these contacts on average?” Responses could vary on a Likert-type response scale from 1 = ‘not at all close’ to 5 = ‘extremely close’, and the overall measure of emotional intensity for each executive was obtained by taking the average score across all categories of external ties.

Independent Variables: Firm-Specific Human Capital

I focus on experience and knowledge as indicators of firm-specific human capital.

Tenure in Firm. An executive with a longer tenure in the firm is likely to have acquired a greater amount of firm-specific tacit and explicit knowledge. I include a measure of the number of years each executive has spent at her current organization as a proxy for firm-specific human capital. However, as discussed in Chapters 2 and 3, prior research linking tenure to compensation has produced mixed results, which may be partially due to the weakness of tenure as a proxy for firm-specific human capital.

Knowledge of Organizational Processes. Although human capital is most often measured in terms of years and credentials, the amount of time an individual

has spent at an activity and the credentials one has to show for it are imperfect measure of accumulated tacit and explicit knowledge. Other researchers have acknowledged a need for more reasonable proxies for the quality of managerial skills, not just the types of skills (Castanias & Helfat, 2001; Bailey & Helfat, 2003). In order to obtain a more direct measure of firm-specific human capital, I created a variable which reflects the extent to which a given executive understands complex organizational processes within his or her firm. Each executive completed a 15-item survey regarding the knowledge creation capability of their firm, which included dimensions of access to knowledge, combination capability, and anticipated value, following Nahapiet and Ghoshal (1998). For each firm, an average score was obtained on each item, and individual responses were compared to the average to construct an overall measure of an individual executive's concordance with the perceptions of other TMT members. This measure was computed as the Euclidean distance between the focal executive's responses and the average response for the executive's firm. Values were then subtracted from zero so that higher values signify greater knowledge of organizational processes. The validity of this measure was supported by analyzing differences between executives according to structural position. In an unreported regression, I found that inside directors scored significantly higher than executives who do not sit on their firms' boards. Similarly, I observed anticipated differences between executives depending on the titles they hold; Presidents/COOs and CEOs demonstrated the greatest understanding of their organizations' knowledge creation capability, while CFOs scored lower on average than all other top management team members. These findings are consistent with

expectations of the roles played by different executives, particularly that COOs are likely to possess greater amounts of firm-specific knowledge while CFOs are likely to possess less (Cannella and Hambrick, 2003).

Independent Variables: Firm-Specific Social Capital

Firm-specific social capital was assessed in a similar fashion to generic social capital, with minor differences. First, firm-specific ties can be broken down between ties within the upper echelon of the firm (i.e., intra-TMT ties), and ties to other parts of the organization. Measures such as network size and range are irrelevant for intra-TMT ties, since TMTs are fully connected networks. Therefore, I captured three dimensions of firm-specific human capital: intra-TMT tie strength, internal network size, and strength of internal (i.e., within the firm but non-TMT) ties.

Intra-TMT Tie Strength. I assessed the average strength of intra-TMT ties by aggregating the standardized averages for duration, frequency, and closeness of ties with other members of the firm's top management team.

Internal Network Size. Internal network size is a count measure of the number of social ties an executive maintains within the organization but excluding the TMT. Executives were prompted to enumerate ties to four internal categories: operations/manufacturing, sales/marketing, research and development, and other.

Strength of Internal Ties. For the same four categories of internal ties, a measure of average tie strength was created by aggregating the standardized averages for duration, frequency, and closeness of internal ties.

Criticality of Internal Ties. Whereas the measure of tie strength attempts to capture the connectivity of the tie, criticality assesses the relevance of the information

and goodwill that may be conveyed by the nodes (i.e., the alters with whom an executive is connected). The most critical ties are those that are of importance or value to the firm. Accordingly, each executive was asked to assess the criticality of ties maintained in each of the four internal categories.

Criticality of External Ties. As in the case of the criticality of external ties, the criticality of internal ties was computed as the weighted average of an executive's assessment of the degree to which his/her ties across each of the nine external categories, by responding to the following question: "How important are they (the ties within a given category) for your firm's goals?" Answers were allowed to range from 1 (not important) to 5 (critical). In order to obtain a single measure of the criticality of each executive's external ties, I calculated a weighted average of the criticality of ties across the nine categories, since executives may maintain many ties in some categories and few ties in others.

Control Variables

Control variables include items measured at the level of the individual (ownership in the firm, directorship status), firm (corporate governance, TMT size, firm size, firm performance) and industry (industry membership).

Ownership. I account for each executive's equity stake in the firm by a measure of the percentage of stock held by the executive. Prior research has shown that ownership may influence the level of compensation and/or pay mix, though it is unclear whether high ownership levels indicate an alignment of managerial and shareholder interests (Jensen & Murphy, 1990) or increased managerial power relative to the board (Finkelstein & Hambrick, 1989; Barkema & Pennings, 1998).

Directorship. I control for executives' structural position in their firms through the use of a dummy variable indicating whether or not the executive sits on the company's board of directors. Inside directors are likely to have greater influence and status within the organization than will other executives (Finkelstein & Hambrick, 1996), and are therefore likely to receive greater compensation. Because an executive's network position is likely to be closely related to her structural position, I was cautious to avoid over-controlling for structural position. Therefore, I exclude this variable from the main models reported, but I also report a model including this variable. 26 of the 136 executives in the sample were inside directors.

Firm size. In past studies, organizational size has generally been the strongest predictor of executive compensation (Tosi, Werner, Katz, & Gomez-Mejia, 2000). I control for differences in size by including the natural logarithm of annual revenue.

Firm performance. As indicated by executive compensation research steeped in agency theory, executive pay is or should be linked to indicators of firm performance. Although empirical research has shown that the link between firm performance and executive pay is much weaker than agency theory would seem to indicate (Jensen & Murphy, 1990), I included measures for three distinct dimensions of firm performance. I include a measure of two-year total stock returns for market performance. I account for differences in profitability by including ROE. Revenue growth, which is particularly important as a measure of performance for young firms and for firms in high technology sectors, is measured as two-year sales growth, ending in the year in which network and compensation data were collected.

Corporate governance. Executives of firms with weaker governance structures should be able to appropriate a larger amount of value at the expense of shareholders. Researchers and practitioners often disagree concerning what constitutes good governance. For instance, standards in the United States favor boards with a large proportion of outside directors to promote independence, whereas European standards favor boards with a larger proportion of inside directors, who are likely to possess better information upon which to base governance decisions. One factor that has been often identified as shifting power toward executives and away from shareholders is the predominance of directors that were nominated to the board by the sitting CEO. Following prior research (Peck and Simon, 1998; Pollock, Fischer, and Wade, 2002; Wade, O'Reilly, and Chandratat, 1990; Westphal and Zajac, 1998), I include a measure of the percentage of directors that were nominated during the current CEO's tenure. Higher values indicate weaker external oversight and greater CEO influence over the board of directors.

TMT size. The information processing demands placed upon executives in large top management teams may be less severe than for executives in smaller TMTs, and managerial power is likely to be more concentrated in small TMTs. I include a count measure of the number of executives in each firm's TMT to control for the possibility that larger TMTs may include executives with lower compensation.

Industry dummy variables. In case there are systematic differences between the three technology-intensive industries represented in our sample, I include indicator variables for the engineering industry and information and communication technology. The omitted group is biomedical/biotechnology.

Data Analysis

In this section, I first explain how I accommodated the multi-level nature of the data and theory. Then I discuss the statistical methods employed and compare them to alternative methods.

Level of Analysis

The issue of level of analysis is rarely straightforward, though it is often depicted as such. Research questions related to value appropriation, in particular, introduce complex theoretical and empirical issues related to the level of analysis. Firms may be depicted as competing at one level to appropriate value that exists at a higher level (e.g., industry, organizational field, or population), then internal stakeholders compete at a lower level to appropriate the value that has been appropriated by the 'firm'. These internal stakeholders, in turn, may be analyzed at the individual level of analysis, as I do here, or they may be analyzed at the group level, such as by focusing on the top management team, unions, or shareholders. Thus there are at least four potential levels of analysis: the competitive arena (industry, organizational field, population, or strategic group), the firm, internal stakeholder groups (top management team, unions, shareholders), or individual internal stakeholders (top managers, employees, individual owners).

In the empirical portion of this dissertation, I focus on the ability of top managers to appropriate value from individual level resources that they control. The main analytical models are single level models, whereby individual-level compensation is related to individual-level human capital and social capital. I have chosen the individual as the level of analysis rather than the top management team so

as to avoid having to assume an equitable distribution of value among top managers. Prior research into pay dispersion within top management teams has indicated important variance between firms in the distribution of value within TMTs (Henderson & Fredrickson, 2001). Firm-level factors act merely as control or nuisance variables in the main model.

Statistical Method: Random Effects Regression

My choice of analytical method for the statistical analysis of the data was primarily motivated by levels of analysis concerns. First, the sample consists of 134 executives nested within 42 firms; any statistical method utilized must account for the lack of independence between observations within the same firm. Similarly, both the data and the theory span multiple levels of analysis. Accordingly, the analytical method must be appropriate for analyzing both an individual-level model with firm-level control variables as well as a cross-level moderator model.

I have chosen to utilize random effects models for the statistical analysis. Random effects models, which are also referred to as random effects generalized least squares (GLS), are commonly utilized within economics and increasingly within strategy for the analysis of panel data such as cross-sectional time-series (e.g., a panel of firms observed at multiple points in time). Random effects regression is likewise appropriate for analyzing nested data, such as observations of individuals nested within firms, and is commonly employed within sociology for this purpose (Mason, 2001).

In a random effects model of individuals nested in firms, the intercept term in the regression equation is allowed to vary randomly between groups (i.e., firms in this

case) but is not estimated for each group. The coefficients and intercept that are estimated represent expected values (means) of the parameters being estimated, which assumes that the sample is drawn from a larger population and that the researcher desires to draw conclusions regarding the population rather than just those entities that are directly sampled. Unlike fixed effects models, random effects regression permits the inclusion of variables that do not vary within groups (i.e., in this case, firm-level variables such as size and performance). However, by adopting a random effects model, one not only has the freedom but the obligation to include relevant group-level variables, since random effects regression requires the assumption that group effects are uncorrelated with the other regressors. The validity of this assumption of orthogonality of the random effects and the regressors may be tested via a Hausman test, which evaluates whether the random effects estimator is consistent by assessing whether the estimated coefficients vary significantly from those estimated in a fixed effects model, which is consistent but inefficient (Greene, 2000: 576).

For each random effects model reported in this dissertation, a Hausman specification test was performed and indicated that the assumptions upon which the random effects models are based are tenable. In other words, the firm effects and the explanatory variables were found to be orthogonal, implying that both random effects and fixed effects estimators are consistent, and the random effects estimators are efficient. These results support the adoption of random effects modeling.

To provide further support for the choice of analytical method, I briefly review alternative methods that could have been used.

Ordinary Least Squared (OLS) with Robust Clustering. Standard OLS regression without clustering has been employed in prior compensation studies with hierarchical data (e.g., Gerhart & Milkovich, 1990; Fisher & Govindarajan, 1992; Meyerson, 1994), but it is inappropriate when more than one observation per firm exists because OLS relies heavily upon the assumption of independence of observations. The strong (and unrealistic) assumption of independence of observations within a given firm may be relaxed by employing OLS regression with robust clustering. Using this procedure, the regression coefficients are identical to those produced by OLS, but the standard errors have been adjusted to account for the lack of independence. While this represents an improvement over standard OLS, the regression results may still only be correctly interpreted narrowly, and random effects specifications are to be preferred if the assumptions upon which random effects models rely are tenable (Stata, 2003). In certain cases, clustering may serve as an adequate method for handling contextual influences that are strictly nuisance variables, but this method is inadequate for handling contextual influences that are of theoretic interest (Snijders & Bosker, 1999).

Fixed Effects Regression. Computationally, fixed effects regression is equivalent to standard OLS regression with the additional inclusion of dummy variables for each group or context (in this case, the group is the firm). The primary difference between random effects and fixed effects models is the manner in which group-level effects are allowed to be estimated. In fixed effects models, the slope is fixed across all groups, and the constant term is allowed to vary but assumes a fixed value for each group. In other words, for data of individuals nested in firms, a fixed

effects model estimates a fixed slope across all firms, and all differences across firms is accounted for by differences in the firm-level constant terms that are fixed values, rather than random values perceived as drawn from a wider population. In terms of the present study, a fixed effects model would assume that firm membership may alter an executive's compensation but may not alter the relation between the executive's resources and compensation. The fixed effects specification is most relevant for drawing conclusions regarding a specific sample, and is less appropriate for drawing out-of-sample conclusions (Greene, 2000). Operationally, unobservable firm effects are controlled for indirectly in the fixed effects models (i.e., via the inclusion of firm dummy variables), but observable firm-level factors cannot be included due to the lack of intra-firm variation.

For these reasons, I have chosen to employ random effects regression over fixed effects regression. However, since fixed effects models provide a different way of looking at firm effects in the data, and since fixed effects regression has been employed in at least two prior studies of nested executive compensation data (Leonard, 1990; Carpenter & Wade, 2002), I present the results of fixed effects models as a supplement to the main models.

Hierarchical Linear Modeling. HLM is commonly employed for modeling multilevel analysis, such as students nested within classrooms, employees nested within firms, or residents nested within neighborhoods (Hofmann, 1997; Hox, 2002). HLM allows the researcher to empirically determine the appropriate level of analysis when theory is ambiguous. HLM is also appropriate for analyzing cross-level moderator models, such as in this study. This technique has been successfully

employed to study compensation by Ang, Slaughter, and Ng (2002), who tested a cross-level moderator model of compensation for 1,576 IT staff in 39 firms. It would appear, therefore, that HLM is an appropriate tool for analyzing a broad range of issues related to top management teams, including compensation. However, HLM models that explicitly model regression slopes for each group require an adequate number of observations per group. Given that top management teams tend to be comprised of 4 to 6 individuals (e.g., Haleblan & Finkelstein, 1993; Finkelstein & Hambrick, 1996), HLM is not well-suited to studying top management teams unless a very large number of teams have been sampled. The random effects approach employed for this dissertation may be viewed as a special case of HLM, i.e., one in which coefficients are not explicitly estimated for each group.

Chapter 5: Results

Table 1 consists of a correlation matrix for the variables included in the regression models. However, due to the nested nature of the data, the simple correlations are of limited interpretive value, particularly in the case of the firm-level control variables, in which intra-firm variance is zero by definition (e.g., firm size). That said, the high correlation between firm size and compensation provides further justification for using either random effects or fixed effects regression and for the inclusion of these variables in the random effects models. Most correlations between independent variables used in the same regression are low; only five exceeded $r = 0.30$. These five include the correlations between external network size and external network range ($r = 0.39$); firm tenure and the strength of intra-TMT ties ($r = 0.35$); the strength of intra-TMT ties and the strength of internal ties below the TMT level ($r = 0.33$); the strength of intra-TMT ties and TMT size ($r = -0.41$); and the strength of internal ties and the criticality of internal ties ($r = 0.71$). Because the last of these is quite high, I ran models in which only one of the two variables was included so as to avoid problems of multicollinearity. In a later section, I discuss how that influenced the results.

In Table 2, I present a correlation matrix for variable values that have been mean-centered according to the mean value for all observations within a given firm. This allows one to view relations between the relative values of the different variables and produces estimates that are closer to the results of the random effects regression

shown below. Firm-level control variables are omitted from this table due to the lack of intra-firm variation.

Table 1: Correlation Matrix

Variable	Mean	StdDev	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 ln(total pay), options-25%	12.8	0.92	1.00																				
2 ln(total pay), options-50%	13	1.03	.99	1.00																			
3 education, years	6.23	2.32	.40	.40	1.00																		
4 breadth of experience, # industries	2.32	1.26	-.05	-.07	-.16	1.00																	
5 external network size (# direct ties)	110	185	.13	.10	.00	-.09	1.00																
6 external network range (categories)	4.7	1.84	.20	.18	.08	-.15	.39	1.00															
7 strength of external ties	0	1.86	.18	.21	.21	-.18	.05	.16	1.00														
8 criticality of external ties	3.55	1.03	.18	.19	.07	-.12	.08	-.05	.29	1.00													
9 tenure in firm, years	9.24	8.27	.05	.03	.00	-.11	.11	.05	.19	.17	1.00												
10 knowledge of org. Processes	25.8	7.09	.31	.30	.24	-.26	.05	.04	.12	.07	.04	1.00											
11 strength of intra-TMT ties	0.45	2.3	-.12	-.12	.00	-.04	.06	.12	.18	.22	.35	-.09	1.00										
12 internal network size (# direct ties)	35.3	49.5	.34	.35	.09	-.08	.27	.27	.00	.07	.10	.05	.08	1.00									
13 strength of internal ties	-0.16	2.24	-.05	-.04	-.01	-.03	-.19	.06	-.02	.28	.11	-.09	.33	.14	1.00								
14 criticality of internal ties	3.89	1.45	.13	.14	.08	.03	-.20	.07	-.07	.17	-.02	-.01	.05	.27	.71	1.00							
15 ownership (% of stock held by exec)	1.52	2.83	-.13	-.14	.09	-.02	.24	.23	.07	.01	.15	-.09	.26	-.04	-.02	-.02	1.00						
16 board member indicator (1=director)	1.32	0.47	.14	.09	.12	.02	.14	.18	.02	.04	.22	.11	.22	.00	.00	-.04	.52	1.00					
17 size, ln(revenue)	4.72	1.89	.77	.78	.22	-.03	.07	.08	.16	-.05	.12	.22	-.26	.25	-.14	-.07	-.25	-.14	1.00				
18 performance, 2-year stock returns	74.5	290	.21	.18	-.05	.13	.12	-.03	-.02	.01	-.01	.12	-.17	-.01	-.04	.01	-.07	-.07	.03	1.00			
19 profitability, ROE	-23.5	233	.14	.14	.06	.05	.03	.07	.08	-.01	.16	.08	-.08	.04	-.07	-.11	.01	.10	.28	.02	1.00		
20 growth, 2-year sales growth	19.2	107	-.10	-.11	.00	-.05	-.06	.00	.19	.02	-.15	-.05	-.15	-.10	-.10	-.18	-.06	-.07	-.07	-.06	-.10	1.00	
21 governance; board named by CEO	0.55	0.36	.24	.25	.13	-.04	.05	-.01	-.11	.05	.03	-.03	.17	.14	.18	.17	.07	-.03	.10	-.18	-.15	-.32	1.00
22 TMT size	6.45	2.32	.06	.05	-.13	.20	.22	-.05	-.10	-.22	.01	-.17	-.41	.01	-.29	-.17	-.14	-.20	.46	.22	.11	.07	-.17

n = 71; correlations of r = 0.20, 0.23, and 0.29 are significant at $p \leq 0.10$, 0.05, and 0.01 respectively. Significant correlations are reported in bold.

Table 2: Correlation Matrix for Firm Mean-Centered Data

Variable	Mean	StdDev	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 ln(total pay), options-25%	0	0.30	1.00														
2 education, years	0	1.59	0.14	1.00													
3 breadth of experience, # industries	0	0.96	0.26	0.11	1.00												
4 external network size (# direct ties)	0	128.15	0.50	0.02	-0.16	1.00											
5 external network range (categories)	0	1.49	0.43	0.10	-0.03	0.52	1.00										
6 strength of external ties	0	1.63	0.07	0.08	-0.10	0.32	0.23	1.00									
7 criticality of external ties	0	0.91	0.19	-0.06	-0.13	0.16	-0.01	0.11	1.00								
8 tenure in firm, years	0	5.70	0.01	-0.25	-0.06	0.15	0.04	0.20	0.11	1.00							
9 knowledge of org. Processes	0	3.19	0.06	0.22	-0.17	0.16	0.15	0.04	-0.22	-0.09	1.00						
10 strength of intra-TMT ties	0	1.20	0.35	0.04	0.04	0.26	0.20	0.24	0.26	0.36	0.00	1.00					
11 internal network size (# direct ties)	0	33.93	0.28	-0.13	-0.09	0.27	0.30	-0.01	0.11	0.13	0.12	0.06	1.00				
12 strength of internal ties	0	1.74	-0.18	0.11	-0.17	-0.30	-0.03	-0.05	0.37	0.04	-0.21	0.06	0.13	1.00			
13 criticality of internal ties	0	1.30	-0.13	0.16	-0.01	-0.38	-0.04	-0.23	0.15	-0.04	-0.20	-0.10	0.26	0.80	1.00		
14 ownership (% of stock held by exec)	0	1.69	0.35	0.22	-0.04	0.42	0.46	0.15	-0.03	0.16	0.16	0.03	0.05	-0.05	-0.10	1.00	
15 board member indicator (1=director)	0	0.33	0.55	0.24	0.20	0.30	0.33	0.07	-0.04	0.18	0.28	0.20	0.04	-0.04	-0.12	0.55	1.00

Each variable has been mean-centered according to the mean value for all executives within the same firm.

n = 71; correlations of r = 0.20, 0.23, and 0.29 are significant at $p \leq 0.10$, 0.05, and 0.01 respectively. Significant correlations are reported in bold.

Main Empirical Results

Table 3 presents the main results, which consist of random effects regression models predicting executive compensation for the sample consisting of 71 executives from 36 firms. Within the table, four models are presented in a stepwise manner. Model 1 includes only the individual- and firm-level control variables. Model 2 includes the control variables as well as the measures of generic human capital (H1) and generic social capital (H2). Model 3 includes the control variables as well as the measures of firm-specific human capital (H3) and firm-specific social capital (H4). Finally, Model 4 includes all explanatory variables and represents a joint test of all four hypotheses.

Each model reported is statistically significant, and in each case, a Wald test confirmed that the explanatory variables of interest were jointly statistically significant beyond the control variables. The model containing only the control variables explains a large portion of the variance in compensation ($R^2 = 0.7997$), though the variance explained increases further with the introduction of the human capital and social capital variables (to $R^2 = 0.8318$ in the full model). For each model, a Hausman test confirmed that the assumptions upon which the random effects model is based on tenable (i.e., the coefficients as a group are not statistically different from those obtained with a fixed effects model).

In the following sections, the results pertaining to each hypothesis are discussed. Note that significance tests reported in the table are one-tailed tests.

Table 3: Main Results without Imputed Data: Random Effects Regression Predicting ln(Total Compensation)

	Model 1 no imputed data Control Variables		Model 2 no imputed data Hypotheses 1 & 2		Model 3 no imputed data Control Variables		Model 4 no imputed data Hypotheses 1-4		
Generic Human Capital:									
education, years			0.0162	<i>0.0213</i>			-0.0035	<i>0.0218</i>	
breadth of experience, # industries			0.0927	*** <i>0.0342</i>			0.0720	* <i>0.0329</i>	
Generic Social Capital:									
external network size (# direct ties)			0.0011	*** <i>0.0003</i>			0.0008	** <i>0.0003</i>	
external network range (# categories)			0.0552	** <i>0.0288</i>			0.0401	† <i>0.0269</i>	
strength of external ties			-0.0370	<i>0.0257</i>			-0.0326	<i>0.0244</i>	
Firm-Specific Human Capital:									
tenure in firm, years					-0.0127	<i>0.0260</i>	-0.0094	<i>0.0052</i>	
knowledge of org. processes					-0.0048	<i>0.6040</i>	-0.0030	<i>0.0091</i>	
Firm-Specific Social Capital:									
strength of intra-TMT ties					0.0765	*** <i>0.0020</i>	0.0541	** <i>0.0243</i>	
internal network size (# direct ties)					0.0026	*** <i>0.0009</i>	0.0013	† <i>0.0009</i>	
strength of internal ties					-0.0813	<i>0.0326</i>	-0.0606	<i>0.0311</i>	
criticality of internal ties					0.0722	† <i>0.0465</i>	0.0863	* <i>0.0482</i>	
criticality of external ties					0.0688	† <i>0.0452</i>	0.0773	* <i>0.0413</i>	
Control Variables:									
ownership (% of stock held by exec.)	-0.0049	<i>0.0225</i>	-0.0232	<i>0.0193</i>	0.0035	<i>0.0184</i>	-0.0102	<i>0.0189</i>	
board member indicator (1 = inside director)	0.4454	*** <i>0.1249</i>	0.3095	*** <i>0.1022</i>	0.4747	*** <i>0.1035</i>	0.3922	*** <i>0.0991</i>	
size, ln(revenue)	0.4543	*** <i>0.0431</i>	0.4694	*** <i>0.0480</i>	0.4429	*** <i>0.0488</i>	0.4708	*** <i>0.0518</i>	
performance, 2-year stock returns	0.0007	** <i>0.0002</i>	0.0004	* <i>0.0002</i>	0.0008	*** <i>0.0002</i>	0.0006	** <i>0.0002</i>	
profitability, ROE	-0.0004	<i>0.0003</i>	-0.0006	<i>0.0003</i>	-0.0005	<i>0.0003</i>	-0.0006	<i>0.0003</i>	
growth, 2-year sales growth	-0.0004	<i>0.0006</i>	-0.0003	<i>0.0006</i>	-0.0005	<i>0.0006</i>	-0.0004	<i>0.0006</i>	
governance; % of board named in CEO's tenure	0.1032	<i>0.2122</i>	0.0448	<i>0.2254</i>	0.0575	<i>0.2271</i>	0.0628	<i>0.2350</i>	
TMT size	-0.1389	*** <i>0.0366</i>	-0.1855	*** <i>0.0422</i>	-0.1280	*** <i>0.0427</i>	-0.1691	*** <i>0.0454</i>	
industry	-0.3197	<i>0.2682</i>	-0.4592	† <i>0.2894</i>	-0.3631	<i>0.2912</i>	-0.4230	<i>0.3002</i>	
industry	0.0066	<i>0.2359</i>	-0.0626	<i>0.2507</i>	-0.0503	<i>0.2591</i>	-0.0772	<i>0.2653</i>	
constant	10.9513	*** <i>0.3512</i>	10.4613	*** <i>0.4087</i>	10.8110	*** <i>0.0000</i>	10.2869	*** <i>0.5271</i>	
Number of Executives; Number of Firms	71	36	71	36	71	36	71	36	
Adjusted R-squared within; Wald X ² statistic	0.7997	156.14	0.8272	187.42	0.8118	186.04	0.8318	215.98	

One-tailed significance tests: † p < .10, * p < .05, ** p < .01, *** p < .001. Standard errors in italics.

Hypothesis 1: Generic Human Capital

Hypothesis 1 states that generic human capital, measured by years of education and breadth of experience, will be positively related to executive compensation. Education is not significantly related to compensation in spite of a high simple correlation ($r = 0.40$). This result is consistent with much prior research and with the argument that education is a screening mechanism for top management positions, hence there is little variation among top managers in educational attainment (Leonard, 1990). Breadth of experience is positively related to compensation. Each additional industry in which an executive has experience is associated with an increase of 7% to 10% in compensation. As a group, the two variables are significant, but since the coefficient for only one of the two measures of generic human capital is significant, hypothesis 1 is partially supported.

Hypothesis 2: Generic Social Capital

In hypothesis 2, I posited that generic social capital, measured by external network size, external network range, the strength of external ties, and the criticality of external ties, should be positively related to executive compensation. The variables are significant as a group, and coefficients for two of the three measures of generic social capital are significantly related to compensation, although one of those (external network range) is only significant at $p \leq 0.10$ in the full model. These results provide support for hypothesis 2. The more extensive an executive's network of direct external social ties, the greater the executive's compensation; each additional tie is associated with a 0.08% to 0.1% increase in compensation. For external network range, each additional category in which an executive has developed social

ties is associated with an increase in compensation between 4% and 6.4%. Compensation was not significantly related to the strength of external ties.

Hypothesis 3: Firm-Specific Human Capital

Hypothesis 3 states that firm-specific human capital, measured by tenure in the firm and knowledge of organizational processes, will be positively related to executive compensation. Neither variable is positively related to compensation in the regression models, and hypothesis 3 is not supported. The measure of knowledge of organizational processes is positively correlated with compensation ($r = 0.30$), but the coefficient for this variable is not significant in the regression models. Tenure, in contrast, is not significantly correlated with compensation, and the coefficient is negative and would be significant in some of the regression models (at $p \leq 0.10$) using a two-tailed significance test in lieu of the one-tailed test for a positive relation that I utilized. Further, tenure is not significantly related to knowledge of organizational processes, even though there are systematic differences in the latter variable between executives in different positions (i.e., CEOs and COOs exhibit greater knowledge of internal processes, whereas CFOs exhibit less firm-specific knowledge; likewise, inside directors appear to understand the inner workings of the firm better than their non-director peers in the TMT), as discussed above. Together, these results support the arguments outlined in the theory section, in which I contend that tenure is a poor proxy for firm-specific human capital. Again, the results provide no support for hypothesis 3.

Hypothesis 4: Firm-Specific Social Capital

Hypothesis 4 states that firm-specific social capital, measured by the strength of intra-TMT ties, internal network size, the strength of internal ties, the criticality of internal ties, and the criticality of external ties is positively related to executive compensation. The coefficients for these variables are significant as a group, and there is support for a link between compensation and intra-TMT tie strength ($p \leq 0.01$) as well as the number of direct internal ties ($p \leq 0.10$). Each additional internal tie is associated with an increase of 0.13% to 0.28% in compensation. The rate of return to internal ties is higher than the return to external ties, but this difference is not statistically significant. The economic significance of the coefficient for tie strength is not as directly interpretable.

The coefficient for the strength of internal ties is negative and would be significant in one of the two models if a two-tailed test of significance were used. The coefficient for the criticality of internal ties is positive and significant in one of the two models. However, due to the high correlation between internal tie strength and the criticality of internal ties ($r = 0.71$), I tested unreported models in which each of these two variables was sequentially omitted. In both cases, the coefficient for the remaining variable was not statistically significant. It appears that any link found between internal tie strength and compensation or between the criticality of internal ties and compensation is merely a relic of the high correlation between the two explanatory variables. Finally, the criticality of external ties is significantly related to compensation, albeit at $p < .10$. I conclude, therefore, that executive compensation is positively related to intra-TMT tie strength, internal network size and the criticality of

external ties but is not related to internal tie strength nor the criticality of internal ties. Hypothesis 4, therefore receives some support, with three of five variables positively related to compensation.

Control Variables

Several of the control variables employed in the analysis are significantly related to compensation, and the control variables as a set explain a large portion of the variance in compensation. In particular, firm size (i.e., the natural logarithm of revenue) is highly associated with compensation and independently explains a large portion of the variance. This is consistent with most prior studies, except certain studies that use revenues as a sampling frame (e.g., Fortune 100 firms).

Compensation was also positively related to an individual-level dummy variable indicating whether the executive was a member of the company's board of directors, as well as with stock returns. TMT size was also related to compensation, such that executives from larger teams received lower pay, *ceteris paribus*. The coefficients for the remaining control variables were not significant.

Evaluating the Robustness of the Results: Alternative Models

Researchers inevitably confront decisions related to sampling, variable definition, and statistical methods that may influence the results of their analysis. The present dissertation is no exception.

I have attempted to select the most appropriate methodology for the main results, as presented and justified above. To assess the extent to which these results are dependent upon the methods employed, however, I have also evaluated a series of

alternative models. Concordance of results between the models would indicate that the results are robust to differences in model specification. Variation between models would increase the importance of justifying the ‘right’ approach.

Additional Tests for Robustness

In addition to evaluating models using the imputed compensation data, I report six additional models in Table 4 and Table 5. Each model represents a change in the way a variable is operationalized or in the manner in which the regression model is specified. In the remaining models (i.e., models 5-10), I

Table 4: Tests for Robustness: Variations on Regression of ln(Total Compensation) without Imputed Data

	Model 5 Exec. Comp. with Options Valued at 50%		Model 6 Fixed Effects		Model 7 Reduced Number of Control Variables		Model 8 Addition of Number of Employees as Control Var.	
Generic Human Capital:								
education, years	-0.013	<i>0.0232</i>	-0.0137	<i>0.029</i>	-0.0066	<i>0.0229</i>	-0.0035	<i>0.0214</i>
breadth of experience, # industries	0.067 *	<i>0.0347</i>	0.0678 *	<i>0.039</i>	0.0591 *	<i>0.034</i>	0.0692 *	<i>0.0323</i>
Generic Social Capital:								
external network size (# direct ties)	0.0007 **	<i>0.0003</i>	0.0007 *	<i>0.0004</i>	0.0006 *	<i>0.0003</i>	0.0007 **	<i>0.0003</i>
external network range (# categories)	0.0389 †	<i>0.0284</i>	0.0418 †	<i>0.032</i>	0.0405 †	<i>0.027</i>	0.0405 †	<i>0.0264</i>
strength of external ties	-0.0255	<i>0.0256</i>	-0.0234	<i>0.0285</i>	-0.0281	<i>0.0255</i>	-0.0318	<i>0.0239</i>
Firm-Specific Human Capital:								
tenure in firm, years	-0.0122	<i>0.0055</i>	-0.0124	<i>0.0061</i>	-0.0106	<i>0.0054</i>	-0.0099	<i>0.0051</i>
knowledge of org. processes	-0.0061	<i>0.0098</i>	-0.0097	<i>0.0133</i>	0.0027	<i>0.0095</i>	-0.0026	<i>0.009</i>
Firm-Specific Social Capital:								
strength of intra-TMT ties	0.0522 *	<i>0.0257</i>	0.0587 *	<i>0.0292</i>	0.0622 **	<i>0.024</i>	0.0526 **	<i>0.0239</i>
internal network size (# direct ties)	0.0021 *	<i>0.001</i>	0.0015 †	<i>0.0011</i>	0.0014 †	<i>0.001</i>	0.0013 †	<i>0.0009</i>
strength of internal ties	-0.0738	<i>0.0331</i>	-0.0655	<i>0.0411</i>	-0.0593	<i>0.0332</i>	-0.059	<i>0.0306</i>
criticality of internal ties	0.1019 *	<i>0.0512</i>	0.0899 †	<i>0.0636</i>	0.0901 *	<i>0.0513</i>	0.0835 *	<i>0.0473</i>
criticality of external ties	0.0795 *	<i>0.0434</i>	0.086 *	<i>0.0478</i>	0.0909 *	<i>0.0432</i>	0.0768 *	<i>0.0405</i>
Control Variables:								
ownership (% of stock held by exec.)	-0.0125	<i>0.02</i>	-0.0013	<i>0.023</i>			-0.0114	<i>0.0186</i>
board member indicator (1 = inside director)	0.4042 ***	<i>0.1043</i>	0.4363 ***	<i>0.1155</i>	0.3839 ***	<i>0.0963</i>	0.4144 ***	<i>0.098</i>
size, ln(revenue)	0.5293 ***	<i>0.0574</i>			0.3741 ***	<i>0.0511</i>	0.4014 ***	<i>0.0651</i>
performance, 2-year stock returns	0.0006 **	<i>0.0003</i>					0.0006 **	<i>0.0002</i>
profitability, ROE	-0.0006	<i>0.0003</i>			-0.0004	<i>0.0003</i>	-0.0005	<i>0.0003</i>
growth, 2-year sales growth	-0.0004	<i>0.0007</i>					-0.0005	<i>0.0006</i>
governance; % of board named in CEO's tenure	0.1127	<i>0.2632</i>					-0.0278	<i>0.2365</i>
TMT size	-0.1977 ***	<i>0.0505</i>					-0.163 ***	<i>0.0447</i>
ln (number of employees in firm)							0.0959 *	<i>0.0562</i>
industry	-0.4935	<i>0.3369</i>					-0.3945	<i>0.2949</i>
industry	-0.0784	<i>0.2968</i>					0.0044	<i>0.2645</i>
constant	10.432 ***	<i>0.5731</i>	11.525 ***	<i>0.4966</i>	9.4956 ***	<i>0.4395</i>	10.638 ***	<i>0.5562</i>
Adjusted R-squared within; Wald X ² statistic	0.8375	214.15	0.8078	F=6.31	0.654	150.62	0.8458	227.49

One-tailed significance tests: † p < .10, * p < .05, ** p < .01, *** p < .001. Standard errors in italics. Each model consists of 71 executives from 36 firms.

Model 5 incorporates an alternative valuation of executive stock options. Whereas the main models value options at 25% of the exercise price, options are valued at 50% of the strike price for Model 5. This is the same approach taken by Lambert et al (1993) and others, and most Black-Scholes valuations of options fall between these two values (Lewellen, Park & Ro, 1995). The results of Model 5 are virtually identical to those produced in the main model (i.e., Model 4). We can conclude that the method of valuing stock options does not have a material impact on the regression results.

Although the Hausman test failed to show a significant difference between the reported random effects models and the equivalent fixed effects regression, I report the results of the fixed effects regression in Model 6. For this model, only individual-level control variables are included, since fixed effects models cannot accommodate variables for which there is no within-group variation. Otherwise, the results of Model 6 are entirely consistent with the main model, Model 4.

For the main model in which imputed data are excluded, the sample size is 71 and independent variables include 12 variables related to the hypotheses and 10 control variables. While this model produces meaningful results that are consistent with the theory, the statistical power of the model is limited and the large number of explanatory and control variables is a legitimate concern. To evaluate the extent to which the results of Models 1-4 were dependent upon the inclusion or exclusion of certain control variables, I systematically evaluated each variable employed in the analysis. In Model 7, I report the results of a regression incorporating a minimal number of control variables. Specifically, the model includes one individual-level

variable (board membership) and two firm-level variables (firm size and financial performance). It was not sensible to omit these variables, since doing so yields a significant Hausman test and indicates that the assumptions upon which random effects regression are based are untenable. In order for the model to be properly specified, these variables must be included in the analysis. The results indicate that in spite of modest changes in coefficients and significance levels, the results of the main model are robust to the inclusion and/or exclusion of all control variables except firm size, performance, and executive directorship status.

I also include a model which includes the addition of another control variable: the natural logarithm of the number of employees. There are two reasons to believe that it might be important to control for the number of employees. First, in the human capital-intensive industries in which these firms compete, employees are perhaps the best measure of the firm's valuable assets. Second, some of the social capital variables (particularly internal network size) may be dependent on the number of employees in a firm, rather than revenues. I first investigated the possibility of using the number of employees as a control for firm size in lieu of revenue. I found that the number of employees was correlated with revenue at $r = .92$, and with internal network size at $r = .24$; it was not significantly related to any of the other social capital variables. However, I found that by replacing firm revenues with the number of employees, the Hausman test failed, indicating that the assumptions upon which the random effects model is based were no longer tenable. In other words, removing revenue from the regression model causes it to be mis-specified, even when the number of employees is included. When the random effects model is mis-specified

and the Hausman test fails, the typical recourse is to use a fixed effects model, which excludes firm-level variables but includes dummy variables for each firm. Therefore, in spite of the high correlation between firm revenues and employees, I report a regression in which both variables are included (Model 8). The coefficient for the number of employees is positive and significant, and the coefficient for revenues remains significant. Otherwise, the main results from Model 4 continue to hold.

Table 5 includes the final two tests for robustness. In Model 9, I replace the internal network size variable with a measure of the density of internal social networks. Density is computed as the ratio of internal network size to the number of employees; as such, it is constrained to values between 0 and 1. From a conceptual perspective, a density measure has some appeal and captures a slightly different construct. Beyond controlling for the maximum number of internal ties (i.e., the number of employees; see above), this variable depicts the degree to which an executive is well-connected within the firm in a relative rather than absolute sense. When including the density measure, I have omitted the internal network size variable to avoid multicollinearity. Although the two variables are only modestly correlated, at $r = 0.17$, internal network size is the numerator in the ratio used to compute density. Empirically, the density measure does not produce significant results, whereas the coefficient for the simple count of internal ties generally does produce significant results. The density measure applies only to internal ties and not to external ties, since the maximum number of external ties is not bounded.

Table 5: Tests for Robustness Using Alternative Measures for Independent Variables

	Model 9		Model 10	
	internal network density		uniqueness of external & internal ties	
Generic Human Capital:				
education, years	-0.0067	0.0223	-0.004	0.0226
breadth of experience, # industries	0.0751	** 0.0341	0.0628	* 0.0338
Generic Social Capital:				
external network size (# direct ties)	0.001	*** 0.0003		
external network range (# categories)	0.0455	* 0.0276	0.0529	* 0.0272
strength of external ties	-0.033	0.0252	-0.0205	0.0254
Firm-Specific Human Capital:				
tenure in firm, years	-0.0082	0.0054	-0.0088	0.0054
knowledge of org. processes	-0.0016	0.0095	-0.0014	0.0094
Firm-Specific Social Capital:				
strength of intra-TMT ties	0.0506	* 0.0252	0.0625	** 0.0249
internal network size (# direct ties)				
density, internal (internal ties as % of employees)	0.0011	0.3117		
uniqueness of internal ties (distance from average)			0.0224	** 0.0094
uniqueness of external ties (distance from average)			0.0023	† 0.0017
strength of internal ties	-0.0705	0.0313	-0.0588	0.0329
criticality of internal ties	0.1159	** 0.0454	0.074	† 0.0494
criticality of external ties	0.0817	* 0.0426	0.0813	* 0.0429
Control Variables:				
ownership (% of stock held by exec.)	-0.0158	0.0207	-0.011	0.0207
board member indicator (1 = inside director)	0.3817	*** 0.1034	0.3781	*** 0.1028
size, ln(revenue)	0.4745	*** 0.0523	0.4661	*** 0.053
performance, 2-year stock returns	0.0005	** 0.0002	0.0007	** 0.0002
profitability, ROE	-0.0006	0.0003	-0.0006	0.0003
growth, 2-year sales growth	-0.0003	0.0006	-0.0004	0.0006
governance; % of board named in CEO's tenure	0.0998	0.2416	0.0708	0.2402
TMT size	-0.1755	*** 0.0457	-0.157	*** 0.0459
industry	-0.4105	0.3003	-0.4549	0.3088
industry	-0.0499	0.2661	-0.086	0.2726
constant	10.132	*** 0.5258	10.277	*** 0.542
Number of Executives; Number of Firms	71	36	71	36
Adjusted R-squared within; Wald X ² statistic	82.99	206.79	0.8214	200.72

The final test of robustness concerns internal network size as well as external network size. To this point in the analysis, I have focused on these constructs in theoretical and empirical terms as absolute measures of network size, and they are represented by count measures of the number of direct ties each executive maintains with internal and external alters. Rather than focusing on absolute measures of network size, however, it may be more valuable to focus on the extent to which a given executive's network is unique in the sense that the executive is tied to contacts (or 'types' of contacts) with whom other TMT members are not connected. Such a measure would more closely approximate Burt's (1991) conception of structural equivalence and the position of the 'tertius gaudens', the actor who is able to benefit by brokering information exchange between two disconnected parties. It may be argued that within-firm uniqueness would matter more for firm-specific resources than for generic resources. In the case of generic resources, what likely matters most is whether there is a market value for the resources, or in other words, how unique or redundant are the resources in the overall labor market? In the case of firm-specific resources, on the other hand, scarcity within the firm is likely to matter more. In either case, however, executives may be able to gain higher returns from contacts that bridge structural holes than from ties that are structurally equivalent to those maintained by other executives in the TMT.

While the random effects regression technique utilized in the analysis partially accounts for and estimates the degree to which a given executive is unique in terms of network characteristics, relative to peers within the same TMT, this is done in an indirect fashion. In order to account more directly for the intra-firm uniqueness of

each executive's external and internal networks, I first calculated the firm-level mean number of contacts held by TMT members in each firm for each of the nine external categories of ties as well as for the four internal categories of ties. I then computed a single measure of the extent to which each executive exceeded the average number of ties in each category. I measured the 'distance' between each executive and the mean by taking the Euclidean distance of the focal executive's ties minus the average number of ties in each category (i.e., the sum of the squared amount of 'surplus' ties within each category). Ties were only considered unique if the executive exceeded the TMT average (i.e., executives with fewer ties than the mean were treated as if they had the average number of ties). The resulting measures were highly correlated with the corresponding simple count measures of network size: external network size was correlated with the uniqueness of external ties at $r = 0.86$, while internal network size was correlated with the uniqueness of internal ties at $r = 0.58$.

In Model 10, I enter the uniqueness of ties measures into the regressions and omit the corresponding network size variables. As shown in Table 5, the results are very similar to the results of the main model. Like external network size, the coefficient for the uniqueness of external ties is positive and significant, albeit at a lower level of significance. As in the case of internal network size, the coefficient for the uniqueness of internal ties is positive and significant.

Chapter 6: Discussion

The results of the empirical analysis provide broad support for three of the four hypotheses advanced in this dissertation. Consistent with Hypothesis 1, executive compensation was found to be positively related to one of two measures of generic human capital: the number of industries in which each executive has accumulated experience. Consistent with Hypothesis 2, compensation was found to be positively related to two of three indicators of generic social capital: external network size and the range of external ties. Consistent with Hypothesis 4, compensation was found to be positively related to three of five measures of firm-specific social capital: the strength of intra-firm ties, internal network size, and the criticality of external ties. The analysis did not provide support for Hypothesis 3, in which I argued that executive compensation should be positively related to firm-specific human capital.

In this final chapter, I discuss the implications of these results for research and practice, as well as some unresolved remaining issues.

General Contributions and Strengths

Aside from contributing to specific research streams as outlined below, the present study features several strengths. First, the analysis is based on a field study which elicited detailed information from executives to capture constructs that are often represented by loosely-related proxies (e.g., social capital is assessed here by network ties rather than inferred from board and/or club memberships), as well as to

capture multiple dimensions of human and social capital. This enables us to move beyond the question of ‘Do human and social capital matter in the determination of executive compensation?’ to now address ‘Which dimensions of human capital and social capital matter in the determination of executive compensation?’ Second, the sample includes executives from a cross-section of publicly-traded firms, rather than a single firm. Third, while the independent variables are obtained from self-reported sources in order to accurately measure human capital and social capital, these variables are matched against a dependent variable that is obtained from an external source—executive compensation data filed with the SEC. Fourth, the results of the analysis are generally robust to alternative approaches, including a different method of valuing stock options, fixed effects regression, the inclusion and exclusion of control variables, and the substitution of alternative explanatory variables which operationalize the underlying constructs in different ways.

I have provided theoretical and empirical support for a causal relationship between human and social capital and executive compensation. The establishment of causal relationships rather than simple correlations is often a challenge; this is particularly true for executive compensation. Compensation varies little over time: annual observations of executive compensation often correlate at 0.90 or higher, which diminishes the potential value of longitudinal research. For this study, several factors help support the conclusion that human and social capital lead to executive compensation. First and foremost, the theoretical mechanisms outlined in chapter 3 specify that value is embedded in and created through the deployment of resources including human capital and social capital; executives appropriate a portion of the

value they bring to the table through their compensation. In terms of the empirical analysis, the dependent and independent variables are obtained from distinct sources, alternative variables and analytical methods yield robust results, and the executives' resources have been evaluated on the basis of primary data rather than archival proxies. This point is particularly important in the case of social capital, since archival proxies of social capital are generally status-based (e.g., number and type of board and club memberships), and status attainment can just as easily be viewed as being influenced by both social capital and compensation, rather than as a proxy for social capital (Lin, 1999).

The Cost of Strategic Resources and the Resource-Based View of the Firm

Within the resource-based view of the firm, resources that are firm-specific, socially complex and intangible are theorized to be more likely to yield sustainable competitive advantages (Barney, 1991). However, research indicates that the same types of resources are also likely to be more difficult to manage (Coff, 1997), and these attributes may create greater possibilities for value to be appropriated by internal stakeholders other than shareholders. In particular, top managers may be well-positioned to reap the benefits generated from the human capital and social capital they contribute to their firms.

More generally, there is a need within RBV-related research to better understand the cost of strategic resources. As noted in Chapter 1, multiple and often conflicting definitions of competitive advantage exist, but most incorporate the notion of value creation exceeding actual costs or opportunity costs. Studying the value of strategic resources is useful only if one also understands the cost of strategic

resources. Are the dimensions of strategic resources that lead to value creation also the dimensions of strategic resources that generate costs for firms? Most extant research has been predicated on a tight coupling between value creation and value appropriation. For instance, Geletkanycz, Boyd and Finkelstein (2001) explicitly assume that the set of executive-level resources that lead to value creation also drive executive compensation. This need not be the case, however. Instead, it may be that certain dimensions of human/social capital are associated with both value creation and executive compensation, certain others create value for firms but do not generate additional compensation for executives, and certain others allow executives to command higher compensation but do not contribute to firm performance.

The present study begins to address this issue by identifying the dimensions of executive human capital and social capital that are associated with elevated compensation expenditures for firms. My approach explicitly accommodates and evaluates the possibility that individual executives will appropriate value that would otherwise be accrued by shareholders. As such, this approach is a response to a recent call by Blyler and Coff (2003) for empirical research that does not treat firms as monolithic entities and that considers the role of managerial resources such as social capital in value appropriation. My findings indicate that executive human capital and social capital are associated with tangible monetary expenses borne by shareholders. Prior research has told only half of the story by focusing exclusively on the benefits of strategic resources. As a result of these findings, future research must account for the costs of developing and deploying intangible resources if we are to develop a testable resource-based theory of competitive advantage.

Executive Compensation: The Influence of Human Capital

This study provides several direct contributions to research on executive compensation. Whereas an extensive body of research on the returns to human capital across the general population has consistently found a significant relation between human capital and income (Becker, 1993), findings have been less consistent at the executive level (Combs & Skill, 2003). It appears implausible that human capital should somehow matter less at higher levels of the organization than it does at lower levels. Instead, others have interpreted these inconsistent findings as evidence that the type of human capital that matters at the executive level is not effectively captured by simple measures such as years of education, number of degrees obtained and organizational tenure (Finkelstein & Hambrick, 1996). In this study, I have introduced new measures of human capital to capture the inter-industry breadth of executive experience and executives' tacit knowledge of organizational processes. Obtaining a more complete picture of executive human capital has enabled a more complete albeit complex understanding of executive compensation.

Firm-Specific Human Capital and Executive Compensation: Non-Significant

Findings

One complex and surprising feature of the results is the lack of a significant relation between firm-specific human capital and executive compensation. While hypothesis testing standards caution against the over-interpretation of non-significant results, two potential explanations include methodological issues and theoretical rationale.

From a methodological standpoint, three potential factors include measurement error, sampling bias, and inadequate statistical power. Measurement error may explain the lack of a relation between tenure and compensation, since tenure can also be an indicator of inertia, power, and entrenchment (Hill & Phan, 1991; Barkema & Pennings, 1998). But the second measure of firm-specific human capital, which assesses the extent to which an executive's understanding of organizational knowledge processes concurs with the judgments of other TMT members, is less likely to be confounded with these other constructs. Second, sampling bias may result if the companies and industries sampled are less likely to value firm-specific human capital than are other companies and industries. The sample is comprised of executives from a range of firms that operate within three separate high-tech industries (i.e., information and communication technology, biotech/biomedical, and engineering), so for bias to occur, high technology firms would need to value firm-specific human capital less than do firms using mature technologies. This possibility cannot be entirely ruled out, since technology firms may rely heavily upon resources that are specialized to an industry but not to the firm itself, yet it seems improbable that high-tech firms would benefit less from the deployment of firm-specific knowledge than would low-tech firms. Further, high tech industries are more likely to base general compensation systems on external equity (i.e., external labor market) rather than internal equity (i.e., distributive justice among internal stakeholders) models (Gomez-Mejia, 1997); it is possible that firm-specific resources relate more closely to an internal equity model. The third potential methodological explanation is that the actual effect size of firm-specific human

capital on compensation is too small to be detected in a sample of 71 executives. I cannot rule out this possibility entirely.

From a theoretical perspective, why might firm-specific human capital such as knowledge of organizational processes not yield positive returns for executives? The answer may lie in both economic and social processes. From an economic perspective, firm-specific resources do not convey market power, decreasingly the likelihood of an executive making a credible threat to put the resources to use in another firm for greater pay. But why would firm-specific human capital yield no returns when multiple dimensions of firm-specific social capital are significantly related to compensation? One possibility is that these social resources convey legitimacy, social influence, and social comparisons, while knowledge resources do not. Similarly, relevant stakeholders (i.e., compensation committee members and the CEO) may be incapable of assessing the firm-specific knowledge of individual executives.

Executive Compensation: The Influence of Social Capital

Four factors set the present study apart from prior research linking executive compensation to social capital. First, this is the only study to include both internal social networks and external social networks, thereby incorporating both generic and firm-specific forms of social capital. On a related note, this is the first study to provide a theoretical framework justifying why both generic and firm-specific forms of social capital should be linked to compensation. Third, this study employs measures of social capital that move beyond ambiguous but commonly-used variables that confound multiple constructs (e.g., external board ties, membership in elite clubs

and other measures of status). Measures of status are not ideal proxies for social capital, and they introduce doubts concerning the direction of causality: status is often considered an outcome of compensation (Finkelstein & Hambrick, 1996). Finally, this is the first study to link compensation to the social ties of executives in a cross-section of publicly-traded US firms. Specifically, I find that executives receive higher compensation when they have larger external networks, external ties with a more diverse range of contacts, external ties with important alters, larger internal networks, stronger ties to others in the TMT and criticality of external ties. Thus, both generic and firm-specific forms of social capital affect an executive's ability to appropriate rents.

Strong Ties and the Dark Side of Social Capital

While most social capital research focuses on the socially productive or 'bright' side of social capital, researchers have begun to acknowledge and analyze the 'dark side' of social capital, of which there are three main elements. First, strong social ties lead to strong social norms, cognitive convergence (i.e., groupthink), and obligations, which may in turn cloud one's judgment and constrain an individual's ability to adapt to changing task environments and to transmit and receive information (Gargiulo & Benassi, 2001; Hansen, 1999). Second, interpersonal relations take time and effort to create and maintain, hence the benefits individuals accrue through social capital are accompanied by tangible and opportunity costs (McFadyen & Cannella, 2004). Third, the private costs and benefits of social capital may not correspond perfectly with the social costs and benefits of social capital. Specifically, negative externalities may arise from the existence of 'old boys'

networks (Locke, 1999), which may exist as mechanisms for value appropriation rather than value creation (Blyler & Coff, 2003). Note that each of the three elements imply that strong ties are likely to have a more substantial dark side than will weak ties: strong ties may be more constraining, more costly in a private sense (i.e., more costly for an individual executive), and more costly in a social sense (i.e., more costly to other stakeholders in the executive's firm).

The present research introduces new insights and new questions regarding the dark side of social capital, particularly as concerns strong social ties. For individual executives, investments in certain elements of social capital yield positive returns (i.e., external network size, external network range, strength of intra-TMT ties, internal network range, criticality of external and internal ties), while others do not (i.e., strength of external ties, strength of internal ties). Interestingly, the strength of ties is significantly related to compensation only for intra-TMT ties. Since strong ties are more costly to maintain, strong ties outside the TMT (i.e., ties within the firm but outside the TMT, as well as ties outside the firm) feature a dark side for executives: executives yield no return on their investment. In terms of intra-TMT ties, on the other hand, executives are compensated for maintaining strong ties. At the social level (i.e., in terms of shareholders and other non-executive stakeholders of the firm), strong executive ties to alters outside the TMT do not present a dark side (i.e., the firm does not compensate executives for maintaining strong ties outside the TMT).

Two possible explanations for these findings exist. From one perspective, strong intra-TMT ties create more value than do strong ties to other internal stakeholders and to external parties, and executive value appropriation is simply

commensurate with value creation. Evidence exists to support the hypothesis that the relation between tie strength and value creation is contingent upon the type of tie. Prior research has shown that strong ties are more effective for the transfer of complex and emotionally sensitive information, whereas weak ties are more effective for introducing new information (Granovetter, 1973; Krackhardt, 1992; Hansen, 1999). It is plausible that intra-TMT ties are more valuable for their ability to enable the integration of complex and emotionally sensitive information (thus requiring strong ties), while ties outside the TMT are more valuable for their ability to introduce novel information to the upper echelon of the firm (thus requiring large and diverse networks of ties).

Alternatively, it may be that differences in value appropriation are driving these findings. Independent of differences in value creation, tie strength may yield appropriable benefits for executives only in the case of intra-TMT ties. First, strong ties entail norms and obligations. Executives may find it more costly and less beneficial to be beholden to individuals from lower levels of the firm and from outside the firm than to other TMT members. Strong intra-TMT ties may create an 'old boys' network, whereby all members are mutually indebted. In such a system, executives are likely to promote the use of social comparison in executive compensation—encouraging higher salaries for close peers will then help elevate one's own compensation.

More generally, it is important that future research consider not only the implications of strong ties on value creation but also on value appropriation. As discussed above, a series of studies have now shown strong ties to be more effective

means of channeling certain types of information. Moreover, researchers have begun to identify other nuances in the relation between strength of ties and value creation. McFadyen and Cannella (2004), for instance, recently found that tie strength is positively related to knowledge creation for biomedical researchers until tie strength exceeds the mean by 0.6 standard deviations, at which point it begins to be negatively related to knowledge creation. In other words, at low and moderate levels, tie strength is positively related to knowledge creation, but the relation becomes negative at high levels of tie strength. Together, these studies shed light on the process by which the type and strength of social ties are related to value creation, but they do not generally specify whether the ensuing value is accrued by individuals or their firms. Future research should explore how the dual processes of value creation and value appropriation are impacted by factors such as the strength and type of ties.

Firm-Specificity of Intangible Resources

Well established streams of research substantiate the theoretical significance and practical implications of the concept of asset specificity. In transaction cost economics, asset specificity serves as the foundation of a theory of the firm. Labor economics distinguishes between generic and specific resources in order to investigate the associated variation in rates of return and incentive structures, as well as the impact on performance at the organizational and societal levels. Within strategy, the resource-based view of the firm is centrally concerned with the development and exploitation of firm-specific resources (Barney, 1991; Ghemawat, 1991; Mahoney & Pandian, 1992).

Firm-specific resources are generally defined as assets that have positive value within one firm but zero value in the second-best application (Klein et al, 1978). Although the concept of firm-specificity plays a major role in theories within economics and management and can be defined clearly in a theoretical sense, from a more practical perspective purely firm-specific assets are rare at best and non-existent at worst. As Lazear (2003) recounts, when pressed for examples of firm-specific human capital, labor economists conjure up contrived or vague examples such as ‘knowing how to find the restrooms’, ‘learning who does what at the firm and to whom to go to get something done’, and ‘learning to use equipment or methods that are completely idiosyncratic.’ He argues that truly firm-specific resources may not exist; instead, resources exhibit varying degrees of specialization, and the human capital of certain individuals appears to be firm-specific because it contains elements that are specialized to teams or processes within a single firm, and because the resources needed to thrive within a given firm may include a unique basket of generic resources (e.g., a unique pairing of resources that are not themselves firm-specific such as knowledge of tax laws, computer software, and managing R&D teams possessed by a manager in a company developing specialized tax software).

The distinction between generic and specific resources, therefore, is oddly as vague as it is important. If a manager has developed specialized resources, are those resources truly firm-specific (in which case the executive is unlikely to be able to appropriate most of the value), or are they specialized resources that may be valuable in other firms? In the present study, I introduced hypotheses linking executive compensation to 5 measures of generic human/social capital and 7 measures of firm-

specific human/social capital. I found significant, positive relations between executive compensation and three generic resources (i.e., breadth of experience, external network size, external network range). I have also found significant, positive linkages between compensation and three measures of firm-specific resources (i.e., intra-TMT tie strength and internal network size the criticality of external ties).

Which matters more in explaining compensation: generic or firm-specific resources?

Are these resources truly generic/firm-specific?

Regarding the first question, the evidence does not indicate a significant difference between generic and firm-specific resources as a whole. When entered sequentially, the two sets of variables explain a similar portion of the remaining variance. The only generic and firm-specific assets that are in the same scale, external network size and internal network size, yield coefficients that are not significantly different. Therefore I conclude that both generic and firm-specific resources have a significant impact on executive compensation, and neither one plays a more important role than the other.

In terms of the second question, attempting to completely discriminate between generic and firm-specific resources may prove to be an unproductive exercise. The most firm-specific resources are bound to have a generic component: social ties within the firm may continue to be of some use to a departing executive, and knowledge of a firm's internal processes may be useful for benchmarking internal processes in other firms. Likewise, the most generic resources can take on a firm-specific dimension. Firms are configurations or bundles of resources, many of which are generic and some of which are firm-specific. The most generic resources may be

assessed in terms of their uniqueness in broader factor markets (e.g., by assessing the going rate for corporate attorneys) or in terms of their uniqueness within the configuration of a single firm (e.g., the uniqueness of an attorney's skill set within the firm and/or the criticality of those skills in light of the firm's legal needs).

Intra-Organizational Value Appropriation

Empirical support for Hypotheses 1, 2, and 4 indicates that executives appropriate a portion of the value they contribute to their firms through generic human capital, generic social capital, and firm-specific social capital. The amount they appropriate is far from trivial: TMT compensation equates to 16.8% of net income for the average firm in the sample. The role of individual resources in value appropriation is also economically significant. For the average executive (e.g., \$622,760 in annual income), each industry in which the executive has experience is associated with \$45,000 in additional compensation. Each external tie is associated with \$500 in annual compensation, while internal ties are associated with approximately \$800 in pay. Being connected to an additional type of external party is associated with \$25,000 in compensation. Lastly, increases of a standard deviation in intra-TMT tie strength and the criticality of external ties are associated with compensation increases of \$77,000 and \$50,000, respectively.

As significant as these sums are in economic terms, the evidence does not indicate what share of the value is appropriated by executives and how this compares to value being appropriated by other stakeholders, or whether or not the arrangement is functional in the sense of promoting efficient resource allocation. Do executives appropriate the 'right' amount of value—just enough to give them the incentive to use

their resources to create value for the firm? Or do executives leverage their human capital and social capital to extract value that would otherwise accrue to shareholders or other stakeholders, perhaps even destroying value along the way? What happens to executives who are not able to appropriate value from the resources they control? Over time, does this increase the likelihood of turnover and reduce the rate of investment in new firm-specific resources?

Unfortunately, the present study cannot provide definitive answers to these questions. Future research should explore the issue of identifying who gets the rents. In order to address this research question, the research must be explicitly multi-level in design, and must allow for unequal rates of return between stakeholders. It is entirely plausible that the accumulation and deployment of certain resources will benefit executives at the expense of their firms' shareholders, or vice versa. For instance, Staw and Epstein (2000) found that the adoption of popular management techniques lead to an increase in executives' reputation and compensation but had a negative or non-significant impact on firm performance. Further evidence of this sort would reinforce the need to avoid the assumption that rents are shared, which is too common of an approach in strategy research.

Implications for Practice

Managers and shareholders need to better understand the payoffs from different sorts of investments in intangible resources. Although research has begun to shed light on the linkage between human and social capital and performance (Becker, 1993; Collins and Clark, 2003), decisions concerning policies to build human and social capital may rest on knowledge of who receives the benefits. For example,

decisions to invest in executives with broad industry experience must be weighed against the probability that they will be able to extract considerable additional compensation than others with more specific experiences. Moreover, executives who have developed large, diverse external networks can also demand greater compensation. The question must be asked whether these networks confer greater value than their costs, especially when such executives pose a greater threat to leave the firm by virtue of these same networks. Each firm should assess the net value of these resources for the firm after accounting for executive value appropriation: which resources are worth the added expense? Moreover, recent scandals in public corporations have underscored the need for greater oversight of executive behavior. Shareholders and other stakeholders should be wary of the governance implications of cozy relations within the TMT. Where executives' personal interrelationships inhibit critical and objective assessment of worth, compensation abuses may occur.

For individual executives, the implications are even less ambiguous. Simply put, it pays to develop certain types of personal resources. Executives who seek to increase their compensation should invest in certain forms of human capital (i.e., cross-industry experience) rather than others (i.e., formal education, tenure, knowledge of organizational processes). Similarly, the pay-off to investments in certain forms of social capital is positive (i.e., large and broad external networks, large internal networks, strong ties within the TMT, and ties to critical internal and external parties), while other investments yield no noticeable monetary benefits (i.e., strong external ties, strong ties to internal parties other than TMT members). These results show that it pays to act as a 'free agent' by moving between industries in order

to obtain experience and contacts, and to maintain extensive social networks with diverse sources. Strong ties are not essential in these areas—the benefits of the increased conductivity of strong ties may be negated by the costs of maintaining such ties and the greater likelihood of redundancy. At the same time, however, executives can profit from understanding and exploiting their firm’s unique environment, which may be accomplished by developing ties with critical internal and external constituencies as well as by maintaining strong ties within the upper echelon of the firm.

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