

INTERNATIONALIZATION AND FIRM GOVERNANCE: THE ROLES OF CEO COMPENSATION, TOP TEAM COMPOSITION, AND BOARD STRUCTURE

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Using the complementary lenses of information-processing and agency theories, this study tests the proposition that the complexity resulting from a firm's degree of internationalization will be accommodated by its governance structure. Results from a sample of large U.S. firms support this perspective, suggesting that firms manage and cope with the information-processing demands and agency issues arising from internationalization through higher, longer-term CEO pay, larger top management teams, and the separation of chairperson and CEO positions.

Internationalization has changed the boundaries and nature of strategy, competition, and competitive advantage (Bartlett & Ghoshal, 1989; Melin, 1992; Porter, 1986; Prahalad & Hamel, 1994). Advances in technology and communications have brought distant lands closer and made it necessary to "leverage" product innovations and good business ideas across national borders (Bartlett & Ghoshal, 1989; Conference Board, 1995; Kim & Mauborgne, 1991). At the same time, firms operating in multiple countries are confronted with multipoint competition (Knickerbocker, 1973; Prahalad & Doz, 1987; Roth, 1995), which compels them to function as integrated wholes. Moreover, there are competitive pressures for firms to become more international (Hamel & Prahalad, 1994; Zachary, 1996) and, as firms do so, their survival increasingly becomes a function of their ability to cope with the high levels of complexity that derive from heterogeneous cultural, institutional, and competitive environments and the need to coordinate and integrate their geographically dispersed resources (Gomez-Mejia & Palich, 1997; Kim & Mauborgne, 1993; Roth & O'Donnell, 1996). For these reasons, international firms have often been held to represent the most complex managerial decision-making environment (Conference Board, 1995; Prahalad, 1990).

The question of how large firms strive to manage and cope with the complexity arising from the internationalization of their operations remains one of the most pressing issues in the fields of inter-

national and strategic management (Kim & Mauborgne, 1996; Prahalad, 1990). Importantly, a critical determinant of a firm's ability to successfully deal with such complexity is its governance structure (Bartlett & Ghoshal, 1989; Child, 1972; Daily & Schwenk, 1996; Hoskisson, Hitt, & Hill, 1993; Melin, 1992; Thompson, 1967). In particular, the ways in which members of its top management team (TMT) are rewarded (Gomez-Mejia, 1992; Rajagopalan & Finkelstein, 1992), the composition of the top team (Ancona & Nadler, 1989; Michel & Hambrick, 1992; Wiersema & Bantel, 1992), and board structure (Baysinger & Hoskisson, 1990) have weighed heavily in the dialogue on firm governance. From a practical standpoint, TMT compensation, composition, and board structure are three of the few factors that boards and management can directly control in international firms (Ghoshal & Nohria, 1989; Kim & Mauborgne, 1991, 1996). Given that, and also that a firm's degree of internationalization is an important determinant of the complexity it faces, this research studies the relationship between a firm's degree of internationalization and its governance.

A firm's degree of internationalization reflects its dependence on foreign markets for customers and factors of production, and the geographical dispersion of this dependence (Sullivan, 1994); we emphasize the relationship between corporate governance and such internationalization for two specific reasons. First, governance has important implications for the way in which top management teams process information. For instance, top teams reside at the strategic apexes of firms (Mintzberg, 1973) and therefore personally deal with the com-

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plexity the firms face in their competitive environments (Hambrick, Cho, & Chen, 1996; Thompson, 1967). This position results in the need for TMT members to process large amounts of diverse and conflicting information (Ancona & Nadler, 1989; Finkelstein & Hambrick, 1996), and the ability to do so is likely to be both valuable and rare (Henderson & Fredrickson, 1996; Roth, 1995). Moreover, researchers have argued that governance arrangements should be aligned with the level of such information-processing demands (Galbraith, 1974; Henderson & Fredrickson, 1996; Zajac & Westphal, 1994). Given the increased complexity arising from firm internationalization, top teams are tasked with even greater information-processing requirements, which in turn can be facilitated by corporate governance arrangements (Baysinger & Hoskisson, 1990; Donaldson & Lorsch, 1983; Kim & Mauborgne, 1991, 1993, 1996; Lawrence & Lorsch, 1967; Michel & Hambrick, 1992).

Second, because the corporate governance literature is theoretically grounded in information economics (Eisenhardt, 1989) and is concerned with the efficient structure of organizations (Baysinger & Hoskisson, 1990; Williamson, 1975, 1984), it prescribes governance mechanisms that are expected to effectively monitor and motivate top executives (Jensen & Murphy, 1990). However, just as internationalization increases information-processing demands, it also often increases both a top team's specialized knowledge of a firm's diffused local markets and operations and the ambiguity surrounding team members' actions (Nohria & Ghoshal, 1994). Thus, a classic agency situation emerges, with the board role of directly monitoring executive performance made more difficult (Eisenhardt, 1989; Gomez-Mejia & Balkin, 1992; Nilakant & Rao, 1994; Zajac & Westphal, 1994). Further, agency theory suggests that this monitoring problem may be largely resolved through governance arrangements that align the interests of a top team's members with the profit-maximizing intentions of firm shareholders (Eisenhardt, 1989; Jensen & Murphy, 1990). Nonetheless, despite the potential agency problems inherent to firm internationalization (Baysinger & Hoskisson, 1990; Finkelstein & Hambrick, 1988, 1996; Roth & O'Donnell, 1996), little is known about the association between internationalization and governance (Egelhoff, 1982; Melin, 1992).

In the following section, an overarching theoretical framework is introduced that links internationalization with governance. It develops the logic that (1) internationalization increases the complexity, and therefore the information-processing and agency demands, facing a firm and its top execu-

tives and (2) firms will manage such demands by instituting more efficient (in terms of information acquisition and monitoring) governance arrangements.¹ Taken together, the complementary perspectives of information-processing theory and agency theory provide a richer theoretical context for the study of governance than either perspective alone offers. For example, when governance is viewed solely from an agency perspective, its scope is theoretically limited to executive long-term compensation or board outsiders (Finkelstein & Hambrick, 1996; Gomez-Mejia & Wiseman, 1997). However, by recognizing agency theory's roots in information economics (Eisenhardt, 1989), and therefore its theoretical ties to information processing (Galbraith, 1974; Tushman & Nadler, 1978), we can consider a larger set of governance arrangements in our framework, including TMT and board structure. Governance hypotheses pertinent to CEOs, top teams, and boards of directors are then developed from this theoretical framework, and our research design, which involved a sample of large U.S. firms,² is then described. The article concludes with a discussion of its findings and suggestions for future research.

THEORY DEVELOPMENT

A striking feature of organizations is their complexity and, for an increasing number of U.S. firms, such complexity can be associated with their degree of internationalization (Hamel & Prahalad, 1994; Prahalad, 1990; Weick & Van Orden, 1990). Conceptually and practically, a firm's degree of internationalization is multidimensional. As was mentioned above, degree of internationalization refers to the extent to which a firm depends on foreign markets for customers, factors of production, and the capacity to create value, and to the geographical dispersion of such dependence. Specifically, managerial complexity increases along with increases in the extent and dispersion of a firm's dependence on its international operations. Al-

¹ The processes by which governance mechanisms are adopted is similar in both international and domestic-only U.S. firms (i.e., CEO compensation is determined by a compensation committee and compensation consultants). Such processes are described by Finkelstein and Hambrick (1996), Gomez-Mejia and Wiseman (1997), and the series of studies by Westphal and Zajac (Westphal & Zajac, 1994, 1997; Zajac & Westphal, 1994, 1996).

² Although the broader theory developed here is applicable to both U.S. and non-U.S. firms, because significant differences in specific country pay and governance practices exist, large U.S. firms were emphasized in this study. Refer to footnotes 4, 5, and 7 for examples of such differences.

though researchers may strongly disagree on whether internationalization leads to differences of *kind* or of *degree* among firms, they do at least agree that the "enactment" (Weick, 1979) of international markets increases the complexity of managerial tasks throughout an organization (see the dialogue between Ghoshal [1987] and Kogut [1989] for the flavor of this debate). Therefore, the more extensive a firm's degree of internationalization, the greater the level of complexity confronting its top management team.

The complexity arising from internationalization is typically associated with two factors. First, as a firm expands beyond its domestic markets, it is likely to enact a greater diversity of cultures (Gomez-Mejia & Palich, 1997; Hofstede, 1980), customers, competitors, and regulations (Brahm, 1994). Often, such diversity is at odds with the domestic managerial mindset of the top team (Ohmae, 1989; Perlmutter, 1969) and puts pressure on the team to fragment its attention geographically (Ghoshal & Nohria, 1989; Kim & Mauborgne, 1991). Moreover, this predicament is compounded by both the top-down management style characterizing U.S. and European firms (Kagano, Nonaka, Sakabara, & Okumura, 1985; Schneider & De Meyer, 1991) and the trend toward more centralized decision making in large U.S. multinationals (Conference Board, 1994, 1995; Eccles & Nohria, 1992; Hudson & Lublin, 1994).

Second, there are tremendous competitive pressures for international firms to extract synergies across product, geographic, and other markets (Bartlett & Ghoshal, 1989; Roth & O'Donnell, 1996; Rumelt, 1974).³ Indeed, theorists and practitioners alike have asserted that internationalization requires a firm to place a premium on swift and internationally coordinated action, to have the capacity to reconcile system and subsystem priorities, and to have the ability to develop and sustain a sense of community within the organization's global web of subsidiaries (Bartlett & Ghoshal, 1989; Conference Board, 1995; Kim & Mauborgne, 1991). Taken together, the factors discussed above serve to compound the complexity of a top team's tasks.

³ Competitive or internal pressures for coordination and integration are not necessary for the top team to face increased complexity in firms with high degrees of internationalization. Absent such pressures, the first factor, heterogeneity of cultures, customers, competitors, and regulations, provides ample managerial complexity in and of itself. We introduce the second factor because anecdotal and empirical (Kim & Mauborgne, 1991; Roth, 1995) evidence suggests it to be increasingly prevalent in international firms, and because of the compounding effect it will have on the already high level of complexity facing top teams.

Such complexity also increases the information-processing demands placed upon firms and their TMTs. For example, according to the information-processing perspective, firms are open social systems that interface with internal and environmental sources of complexity. Viewed from this perspective, a firm must develop information-processing mechanisms capable of dealing with complexity—that is, able to efficiently collect, gather, and process relevant information (Tushman & Nadler, 1978). The diversity of customers, competitors, and regulations accompanying internationalization increases the volume, variety, and disunity of the information that TMTs must process (Weick & Van Orden, 1990). Similarly, information-processing requirements are exacerbated as internal interdependencies "become more complex, [and] coordination and mutual problem demands increase" (Tushman & Nadler, 1978: 616). For example, interdependency and coordination demands are increasingly placed on firms as they expand internationally (Kim & Mauborgne, 1991, 1996; Roth & O'Donnell, 1996).

The complexity and resulting information-processing requirements associated with internationalization also have important implications for the agency relationship between the owners and executives of firms, and, more specifically, for the compensation and monitoring of executives (Nohria & Ghoshal, 1994; Roth & O'Donnell, 1996). A firm's degree of internationalization compounds the agency relationship for at least two reasons. First, internationalization can result in a far-flung enterprise characterized by localized and specific knowledge (Nohria & Ghoshal, 1994). Such knowledge increases information asymmetry between principals and agents, thus compounding the agency problem (Gomez-Mejia & Balkin, 1992; Williamson, 1975). Second, the complexity of international operations is likely to increase the ambiguity surrounding cause-effect relationships, provide multiple decision options, and thus result in greater agent discretion (Eisenhardt, 1989; Gerhart & Milkovich, 1990; Hambrick & Finkelstein, 1987; Roth & O'Donnell, 1996). Furthermore, such discretion has been traditionally viewed as a prime source of principal-agent discord (Williamson, 1964). Taken together, the above issues of information asymmetry and discretion would seem to create a situation that makes direct board monitoring more difficult.

Governance and International Complexity

Although the impact of internationalization on a firm is likely to be pervasive (Bartlett &

Ghoshal, 1989; Prahalad, 1990; Weick & Van Orden, 1990), we emphasize the association between internationalization and the governance arrangements surrounding the upper echelon. In this view, information-processing demands (Tushman & Nadler, 1978) and agency concerns (Eisenhardt, 1989) are at least partially isomorphic throughout an organization, and governance structure is expected to accommodate the increased complexity associated with internationalization. Such an emphasis on governance as a response to internationalization reverberates with the writings and theorizing of Perlmutter (1969), Prahalad and Doz (1987), Bartlett and Ghoshal (1989), and Chandler (1990) and with surveys by the Conference Board (1982, 1994, 1995) of top executives regarding the management of their international operations. Moreover, providing specific evidence that the influence of international complexity extends to the upper echelon, Calori, Johnson, and Sarnin (1994) found that CEOs' information-processing demands were correlated with their firms' global scope (a construct comparable to degree of internationalization). Similarly, Henderson and Fredrickson (1996) found that complexity demands on CEOs were a function of other firm-level characteristics. We therefore argue that the agency and information-processing requirements placed on the CEO, the TMT, and the board of a firm will be at least partially isomorphic with the requirements placed on the firm as a whole by its degree of internationalization. Such research on the association between internationalization and governance has been largely neglected despite its practical and theoretical import.

Governance structure describes the monitoring, control, and incentive arrangements surrounding the members of a TMT (Williamson, 1984). These executives reside at the strategic apex of a firm (Mintzberg, 1973) and together are the information-processing center of the organization in its relationship with the environment (Thompson, 1967).⁴ Accordingly, this is also the group of managers most closely monitored by the board (Jensen & Murphy, 1990). For example, the TMT makes, influences, or is ultimately responsible for critical resource allocation decisions pertaining to investments in new products and technologies (Bower, 1970; Burgelman, 1991), competitive attacks and responses (Hambrick et al., 1996), entry into new

geographic markets (Bartlett & Ghoshal, 1989; Hudson & Lublin, 1994), and corporate acquisitions and divestitures (Haspeslagh & Jemison, 1991). It is also for these very reasons that the top team is the predominate focus of board monitoring and control activities.

However, complexity makes the relationship between senior managers' actions and firm performance highly uncertain (Daft & Weick, 1984). Therefore, some organizations researchers have concluded that a TMT's role is inconsequential, or that it is primarily symbolic at best (Pfeffer & Salancik, 1978). And yet, controversy about the efficacy or inefficacy of top teams often ignores the substantive nature of their job—that is, making sense of and managing a torrid flow of conflicting and ambiguous information (Mintzberg, 1973). Thus, although executive compensation packages may be loosely linked to performance (Gomez-Mejia, 1994; Gomez-Mejia & Wiseman, 1997), if the ability to process large amounts of information is both valuable and rare, compensation may be more tightly linked to the complexity of managerial tasks facing a TMT (Henderson & Fredrickson, 1996).

Like the information-processing perspective, agency theory is ultimately concerned with the efficient organization and distribution of information (Eisenhardt, 1989). In contrast, however, according to the agency argument, information is a commodity that can be purchased, and some governance arrangements best facilitate the transfer of information when there are information asymmetries between a firm's management and its board, whose members represent the firm's owners (Eisenhardt, 1989; Gerhart & Milkovich, 1990; Gomez-Mejia & Wiseman, 1997). Thus, although the information-processing perspective suggests that the ability to process and transfer information might be valuable, the agency view provides specific governance mechanisms by which such value may be best realized. Taken together, the information-processing and agency views suggest a relationship between internationalization, complexity, and governance.

For example, certain executive pay schemes serve to orient executives toward different aspects of their organizations and environments (e.g., Gomez-Mejia, 1992), affect risk preferences (Zajac & Westphal, 1994), and act as agency control devices (Jensen & Murphy, 1990). The size of a top management team (Haleblian & Finkelstein, 1993) or its executives' job requirements in general (Boyd, 1995) may also have implications for the ability of the team to manage complexity and for the ability of the board to manage the top team. Moreover, contemporary organization and strategy research suggests that the information-processing

⁴ Although all firms have some sort of leadership structure, comparative international research suggests that a top-down top management team view is particularly applicable to U.S. and European firms (Kagono et al., 1985; Schneider & De Meyer, 1991).

implications of these and other characteristics of governance structure may be particularly important for firms wrestling with the complexity of international competitive environments. Therefore, in the remainder of this section, we identify characteristics of corporate governance likely to be associated with firm internationalization and develop hypotheses about such associations.

CEO long-term pay mix. The *form* of compensation paid to executives is now being recognized as critical to the governance of firms (e.g., Jensen & Murphy, 1990; Zajac & Westphal, 1994). Compensation can take the form of cash (e.g., salary and bonus) or long-term contingent pay (e.g., stock options and other long-term incentive plans), and these two basic forms of compensation have very different attributes, which in turn may differentially affect executive behaviors (Jensen & Murphy, 1990). For instance, *long-term* compensation is an important form of incentive alignment (Jensen & Murphy, 1990) that converges the interests of executives with those of shareholders by offering contractual rewards for increasing the wealth of shareholders.

We argue that internationalization will result in increased use of long-term forms of pay in the mix of total CEO pay. This is because internationalization increases the problems of board monitoring. Specifically, the spatial complexity associated with the geographic dispersion (Daft, 1992) of sales, assets, and personnel may make information gathering and processing more difficult for board members. As a result, as internationalization increases, the cost and difficulty of monitoring increase. To help overcome this monitoring difficulty, boards can increase the use of long-term pay in the mix of total pay as an alternative and more efficient control mechanism. Doing so allows executives to monitor themselves by creating a convergence of interests.

For example, Roth and O'Donnell (1996) found that when the manager of a firm's foreign subsidiary had significant control over local operations, his or her pay included significantly more performance incentives. They reasoned that such incentive plans were adopted because of the difficulty of home office monitoring in high-control situations. And although Roth and O'Donnell (1996) did not study CEOs, and it is unclear whether or not the senior subsidiary executives that they surveyed were also members of corporate top management teams, their results still have application here. For instance, just as the actions of subsidiary managers may be generally more difficult to monitor than those of domestic managers, so too may be the international actions of a chief executive officer.

Moreover, because long-term compensation rewards CEOs for maximizing shareholder wealth, it should make it less likely that such executives take personal advantage of the increased information asymmetry resulting from internationalization.

In sum, the above information suggests that firms are likely to increase the proportion of pay given a long-term form when they exhibit a high degree of internationalization. Because the difficulty of board monitoring increases with internationalization, firms with a high degree of internationalization are inclined to resort to long-term compensation as an incentive alignment device—as the price the board pays for the content and application of specialized executive information. By increasing the use of long-term pay in the mix of total CEO pay, boards offer incentives to executives to monitor themselves by converging their interests with those of shareholders. This rationale is summarized in the following hypothesis:

Hypothesis 1. A firm's degree of internationalization is positively related to the percentage of CEO compensation paid in long-term forms.

Level of CEO pay. We also consider the implications of internationalization for the *level* of CEO compensation.⁵ Reiterating the logic developed earlier, as firms become more international, their chief executives will typically be faced with increased complexity. As a result, we expect some CEOs to be paid more than other executives (controlling for such factors as organizational size and prior performance) because the ability to process the information arising from such complexity is a scarce and valuable resource (Finkelstein & Hambrick, 1989; Henderson & Fredrickson, 1996). Further, as the specialized information associated with international complexity increases in value to a board, an agency solution might similarly entail increasing CEO compensation to a level on a par with its (higher) intrinsic value.

⁵ The issue of executive compensation, although under increasing scrutiny in other countries (Blitz, 1995; Moss, 1995), is especially pertinent to U.S. firms (Finkelstein & Hambrick, 1988). On average, executives of U.S. firms are paid more than executives in similar positions in non-U.S. firms, and the particulars of such compensation schemes are publicly disclosed. Moreover, given that a large proportion (148, or 36%) of the 428 firms listed in Stopford's 1992 *Directory of Multinationals* are U.S. firms, the association between U.S. executive compensation and internationalization merits attention. Further, as capital markets in other countries become more efficient, there has been a tendency for non-U.S. firms to adopt, subject to regulatory constraints, many U.S. governance practices (Chandler, 1990; Demb & Neubauer, 1992; Pennings, 1993)—including, possibly, compensation arrangements for top managers (Pennings, 1993).

Our reasoning here complements that of Finkelstein and Hambrick (1988, 1989) and Henderson and Fredrickson (1996), whose research included complexity as an important determinant of chief executive compensation. Specifically, Henderson and Fredrickson (1996) found that CEOs' pay was in part based on the complexity (gauged in terms of factors like organization structure, diversification strategy, and approach to technology) that they managed. They further argued that those sources of complexity increased the information-processing burden of CEOs. There is also a long history of empirical results that, although not expressly invoking the information-processing perspective, suggest that the complexity associated with firm size results in higher levels of CEO compensation (see Gomez-Mejia [1994], Gomez-Mejia and Wiseman [1997], and Finkelstein and Hambrick [1996] for exhaustive reviews of the CEO compensation literature). Therefore, drawing on both the information-processing and agency theory perspectives, we hypothesize that:

Hypothesis 2. A firm's degree of internationalization is positively related to the total level of its CEO's compensation.

Top Team and Board Composition

Just as internationalization heightens the information-processing and agency issues surrounding a firm's CEO and will therefore be reflected in his or her compensation package, it may also result in a shift of emphasis from the role of an individual (e.g., the CEO) to the role of the entire top team. For example, the complexity of international operations may require the CEO to delegate critical responsibilities and to otherwise rely on the substantive contributions of the TMT (Weber, 1946; Weick & Van Orden, 1990). Such a shift would be consistent with an information-processing perspective whereby teams are held to have greater processing capacity than individuals and to be able to attend to a greater number of environmental cues (Dutton & Duncan, 1987; Halebian & Finkelstein, 1993; Weick & Van Orden, 1990). From an agency perspective, more substantive contributions from a firm's top team are likely to increase the degree of information asymmetry between the top team and the board of directors.

Moreover, because firm internationalization may result in greater delegation and division of labor, it should also be associated with the composition of a TMT and board. Specifically, the information and agency perspectives suggest that the complexity associated with firm internationalization can have

implications for TMT size (the number of executives comprising the TMT), CEO duality (one individual's holding both the positions of CEO and chairperson of the board of directors), board size (the number of directors), and the representation of insiders on the board (the number of a firm's executives who are directors). This logic is developed further below.

Top management team size. An important aspect of a top team's composition is its size. TMT size refers to how many people comprise the top management team and has been most commonly regarded as a control variable in studies relating TMTs to strategy (e.g., Bantel & Jackson, 1989). However, group researchers have long argued that larger groups have more skills and abilities with which to solve large and complex problems (Hill, 1982; Jackson, 1992) and that they consequently have greater information-processing capacity (Dutton & Duncan, 1987). For these reasons, the capacity of teams to deal with complexity is often regarded as superior to that of individuals (Dutton & Duncan, 1987; Hambrick & Mason, 1984). In a partial test of this view, Halebian and Finkelstein (1993) found that, in complex environments, firms with large teams performed better than firms with small teams. Hambrick and D'Aveni similarly contended that "at a basic level, the resources available on a team result from how many people are on it" (1992: 1449). Therefore, given that a firm's degree of internationalization is a determinant of the complexity its top team faces, we expected to see international firms operating with larger top teams than less international firms. This line of reasoning is summarized in the following hypothesis:⁶

Hypothesis 3. A firm's degree of internationalization is positively related to the size of its top management team.

Although the logic for Hypothesis 3 suggests information-processing reliance on a firm's team rather than solely on its CEO, it is important to note that there are at least two reasons why we would not expect support for Hypothesis 3 to negate the logic and effects of Hypothesis 1. First, delegation from the CEO to the TMT does not diminish the importance of the CEO. Although the CEO may delegate specific tasks to others, ultimate responsi-

⁶ As mentioned in the introduction, because both information-processing and agency theory are concerned with the organization and dissemination of information, our theoretical framework explains governance arrangements on the basis of a firm's information-processing and/or agency needs. Although some hypotheses draw evenly from these two underlying theories, others may not (e.g., Hypothesis 3).

bility and authority rest with her or him. Therefore, the CEO is still expected to be compensated according to the complexity of the firm's environment, even when there are other organizational responses (e.g., delegation) to such complexity. Second, Henderson and Fredrickson (1996) found that among diversified firms, TMT size was positively associated with CEO pay. Consequently, we would not predict that increased reliance on the TMT, as implied in Hypothesis 3, will be associated with lower levels of CEO pay.

CEO duality. Duality describes the situation in which an executive holds both the CEO and chairperson of the board positions. Although there is very little systematic research regarding the determinants of duality (Daily & Dalton, 1997; Finkelstein & D'Aveni, 1994), it is widespread in large U.S. firms (Boyd, 1995; Finkelstein & D'Aveni, 1994).⁷ Further, some scholars have argued that duality may help establish unity of command and clarify decision-making authority (Daily & Dalton, 1997; Finkelstein & D'Aveni, 1994). However, duality may not be equally effective in all contexts (Boyd, 1995), and we argue that in complex environments, like those of firms with high degrees of internationalization, firms may need more delegation of authority and division of responsibility, not less. Consequently, more internationally diversified firms will be less likely to consolidate the positions of CEO and chair of the board than will less internationally diversified firms.

The dispersion of power and authority that comes with splitting the roles of CEO and chairperson not only infuses more power and authority into an organization, but also adds a potential information conduit back to the TMT and board. Thus, duality may impair the information-processing capacity of the top team and board by limiting the breadth of key positions involved in the strategic decision-making process. Therefore, the separation of CEO and chair positions may be advantageous for international firms. For these reasons, we argue that international firms may be willing to sacrifice some perception of unity of command, exchanging it for greater dispersion of power and authority. This logic leads to the following hypothesis:

⁷ Like other governance practices, the use of duality varies significantly by country. For example, Donaldson and Davis (1991) showed duality to be less common in Australia than in the United States, and Boyd, Howard, and Carroll (1994) and Demb and Neubauer (1992) showed duality to vary among European countries. Finally, in some countries duality does not exist because of regulations concerning board structure (Demb & Neubauer, 1992).

Hypothesis 4a. A firm's degree of internationalization is negatively related to duality.

If duality is indeed negatively associated with a firm's degree of internationalization, as has been argued, it should have similar implications for CEO pay. For example, research suggests that duality is positively associated with CEO compensation (Boyd, 1994). Moreover, we argue that a high degree of internationalization introduces complexity to the point that even those CEOs who do not have dual roles will be paid more than non-dual CEOs in more domestic environments. In contrast, CEOs who occupy dual roles in firms with a high degree of internationalization should also be compensated for the increased information-processing burden they carry. This interaction is summarized as follows:

Hypothesis 4b. The interaction between duality and a firm's degree of internationalization is positively related to the level of its CEO's compensation.

Board size. Research on firm governance also supports the view that the size of a board may be a function of the complexity of the firm's environment. For example, Pfeffer and Salancik (1978) argued that increases in the number of dependencies between a firm and its environment are likely to be reflected in increased organizational ties. Providing evidence of this dependency, Zald (1969) found that firm size was positively and strongly associated with board size. One way firms may handle the increased and varied dependencies associated with international operations is to add members to the board who represent or have particular expertise in some of the many international constituencies (Pfeffer, 1972) or who more generally increase the overall information-processing capacity of the group (Jackson, 1992). Thus, one response to the complexity associated with internationalization may be increased board size. This logic leads to the following hypothesis:

Hypothesis 5. A firm's degree of internationalization is positively related to board size.

The ability of a board to vigilantly monitor a CEO is a function of its access to information and its power to exert control. The governance literature often asserts that insiders are beholden to a CEO and may interfere with vigilant monitoring. However, Baysinger and Hoskisson (1990) argued that the use of insiders on a board may positively affect its ability both to process complex information about the businesses of the firm and to make strategic decisions. They also argued that insiders pos-

sess critical information regarding firms' task environments. Consequently, the more boards have access to this information, the more informed will be their decisions. In support of these arguments, Boyd (1994) found that the ratio of insiders on a board was positively associated with board control over a firm. Based on our assertion that a firm's degree of internationalization largely influences the information-processing demands placed on it and its upper echelon, the above logic leads to the following hypothesis:

Hypothesis 6a. A firm's degree of internationalization will be negatively associated with the proportion of outsiders on its board.

Moreover, as boards grow in response to the complexity of firms' environments, their makeups may become even more salient. Although group size has been shown to be positively associated with information-processing capability (Haleblian & Finkelstein, 1994), research on groups also suggests that large groups can become quite unwieldy (Gladstein, 1984). This observation raises an interesting question about board structure in complex environments, especially a highly international environment. That is, if board size increases to accommodate the complexity of internationalization, how will a firm avoid succumbing to the dysfunctional supervision and information-processing traits characterizing large groups (Finkelstein & Hambrick, 1996)? Indeed, we argue that it is in just such situations that it is particularly important for a board's composition to be more balanced with insiders. Although more constituencies may be represented by large boards, if this size is not accompanied by access to more sources of organizational and competitive information, then large boards may face increased communication and monitoring difficulties. Thus, when board size and degree of internationalization are high, insiders become particularly important sources of information. This logic leads to the following hypothesis:

Hypothesis 6b. The interaction between the size of a board and a firm's degree of internationalization is negatively related to the proportion of outsiders on the board.

Finally, because compensation structure is a powerful incentive alignment mechanism (Jensen & Murphy, 1990), it should also be associated with board structure. Accordingly, CEO long-term compensation should substitute somewhat for the need for vigilant board monitoring (cf. Rediker & Seth, 1995). Although outsiders may be more effective monitors because they are less beholden to CEOs for their employment, the need for vigilant outsid-

ers should be reduced when long-term compensation is used. Therefore, and recognizing that information-processing needs may dictate a positive relationship between the proportion of insiders on a board and a firm's degree of internationalization, such board structure may require the complementary governance afforded by long-term compensation. Thus:

Hypothesis 6c. The interaction between a CEO's long-term compensation and a firm's degree of internationalization is negatively related to the proportion of outsiders on the board.

In summary, by recognizing agency theory's roots in information economics (Eisenhardt, 1989), and therefore its theoretical complementarity to the information-processing perspective, this study has predicted a pattern of relationships between a firm's degree of internationalization and critical features of its governance structure. In terms of specific governance arrangements, our framework has emphasized the compensation of CEOs and the composition of TMTs and boards. Drawing on this framework, we predict that as firms become more international, they will rely on more highly paid CEOs and that such pay will be weighted in favor of long-term compensation. We also predict that internationalization will result in larger and more fragmented top teams (i.e., less use of duality) and larger, more insider-dominated boards. Our research methods and empirical results are presented in the sections that follow.

METHODS

Sample and Data

Drawing from the 1992 Standard & Poor's (S&P) 500 for our sample, collection efforts yielded 258 firms with usable data for the analyses. A means test indicated that these firms were not statistically different from excluded firms on the dimensions of total assets, total sales, and performance (return on assets). Compensation data came from COMPUSTAT's Execucomp service, which extracts compensation data from firm proxy statements. Data regarding the sizes of top management teams and boards were collected from *Standard & Poor's Register of Directors & Executives*. Information on duality was obtained from firm proxy statements. Finally, firm financial information was obtained from PC-COMPUSTAT, and data on foreign offices came from the *Directory of Corporate Affiliations*.

Dependent Variables

Firms are required to report information on the compensation of their five most highly paid executives. *Long-term pay mix* was the proportion of total compensation paid in long-term forms (e.g., stock options, restricted stock, and long-term incentive plans) and was calculated as long-term compensation divided by total compensation. Long-term forms of compensation were valued at the present value provided by a company in its proxy statement. With respect to stock options, the Securities and Exchange Commission (SEC) allows firms to use one of two methods: the Black-Scholes method or a simpler present value formula provided by the SEC. Because it was important that all data in the analyses use the same valuation method and because the majority of firms in this sample used the SEC method, we valued all stock options using the latter. In the SEC method, the potential value of stock options is estimated by subtracting the option grant price from the estimated stock price in ten years and discounting this difference at 5 percent per year to the present year. The estimated future stock price is the current price per share escalated by 5 percent per year for ten years.⁸

CEO compensation level was measured as the logarithm of the total of all forms of compensation granted during 1992.

We measured whether a CEO also occupied the position of chairperson of the board with a dummy variable (1 = yes). Thus, *duality* signified that one individual occupied both positions.

Measuring the precise number of executives involved in the strategic management of a firm is very difficult (Conference Board, 1982; Jackson, 1992). Therefore, we used two measures to gauge the robustness of TMT size effects. First, we measured TMT size as the count of the total number of officers in a firm (O'Reilly, Main, & Crystal, 1988). However, this count could overstate the number of executives actually involved in strategic management. Therefore, we also measured executive team size as the number of executives who were in the top two tiers of executive management (see Wiersema and Bantel [1992] and Hambrick et al. [1996] for applications of this definition). The top tier was defined as a firm's chairman, vice chairman, CEO, president, chief operating officer, and chief financial officer. The second tier was defined

as those executives holding the next highest titles (e.g., executive vice presidents or vice presidents). Approximating TMT size in these two accepted ways enabled us to test the robustness of our results to different measures.

Board size was the number of members of a board of directors, and *board structure* was the proportion of board members who were outsiders. Insiders were executives of a firm who also served on the board of directors, and outsiders were board members not otherwise employed by the firm. We also used board structure as a control variable in all models.

Independent Variable

We measured a firm's *degree of internationalization* using a variation of Sullivan's (1994) composite measure, which gauges internationalization on three important and theoretically distinct dimensions. The first dimension, *foreign sales*, was the ratio of foreign sales to total sales and reflected a firm's dependence on sales to foreign markets. The second dimension, *foreign production*, reflected a firm's reliance on owned foreign stocks and was measured by foreign assets expressed as a percentage of total assets. In the international business literature, the sales and asset dimensions address a firm's dependence on foreign consumer markets and foreign resources, respectively. The third dimension, *geographic dispersion*, gauged the number of countries in which a firm had subsidiaries, expressed as a percentage of the highest number of countries with subsidiaries represented in our sample. This dimension provides a rough indication of the cultural and institutional variety represented in the previous two dimensions (Johansen & Vahlne, 1977). The theoretical range for each dimension is from 0 to 1.

The three different variables (foreign sales, foreign production, and geographic dispersion) were summed to form our composite measure of degree of internationalization, which therefore has a theoretical range of 0 to 3. Validity assessments were consistent with Sullivan (1994); we found that these variables demonstrated high interitem reliability (an alpha of .86) and loaded on one factor with a high eigenvalue and high explained variance; in addition, the composite measure was normally distributed. Although there are multiple possible single-indicator measures of degree of internationalization (e.g., foreign sales to total sales, foreign assets to total assets, number of foreign employees to total employees, number of foreign subsidiaries), a composite measure is preferred, and Sullivan (1994) showed that these other

⁸ Previous research has shown that various option-pricing methods produce highly correlated (e.g., $r = .90$) values (Sanders, Davis-Blake, & Fredrickson, 1995). More importantly, our results were not sensitive to the method used.

measures were highly correlated, especially with regard to our sample, the S & P 500.⁹

Control Variables

Firm size is related to the level of executive compensation (Finkelstein & Hambrick, 1996; Gomez-Mejia, 1994) as well as to the complexity and information-processing demands faced by executives and boards of directors (Henderson & Fredrickson, 1996; Williamson, 1975; Zald, 1969). We therefore controlled for the effects of firm size, measured as the logarithm of firm sales. For tests relating to TMT size, we also tested whether the number of employees was a better control. The results did not vary using employees, so we report results using sales as the measure of firm size.

As firms become more dependent on international operations, they are also likely to become more diversified (Chandler, 1962). Additionally, diversification has been shown to be related to executive compensation (Henderson & Fredrickson, 1996) and to the composition of top management teams (Michel & Hambrick, 1992). We therefore controlled for *diversification level* by using an entropy measure of diversification (Palepu, 1985), calculated as $Diversification_a = \sum P_{ia} \ln(1/P_{ia})$, where P_{ia} is the proportion of firm a 's sales in business segment i .

High levels of performance may allow some firms to pay CEOs more than firms performing less well. *Firm performance* was measured as the return on assets (ROA) in 1992.

The level of executives' stock ownership is related to the proportion of pay they receive in long-term forms (Zajac & Westphal, 1994). In addition, it may be related to our other dependent variables because executives with sizable ownership in a firm are likely to be powerful and able to affect the distribution of rewards (Finkelstein & Hambrick, 1996) and the structure of the TMT (Finkelstein & D'Aveni, 1994). We measured *CEO stock ownership*

as the value of outstanding common shares owned or controlled by a firm's CEO.

An executive's position tenure may affect both the level (Hill & Phan, 1991) and the structure of the compensation he or she receives (Sanders et al., 1995). We measured *CEO position tenure* as the number of years that the executive had held his or her current position.

Shareholders who own significant blocks of a firm's outstanding stock may be able to exert significant influence on the strategy and structure of a firm and consequently, on executive compensation (Bethel & Liebeskind, 1993; Finkelstein & Hambrick, 1996). We defined a blockholder as any non-executive shareholder owning at least 5 percent of the outstanding stock of a company. The measure for *blockholders* is the sum of the percentages owned by all blockholders.

When predicting CEO compensation level, we controlled for *TMT size* (measured as the number of executives who were in the top two tiers of executive management, as described above).¹⁰ We did this because, as is argued in Hypothesis 3, internationalization is likely to result in larger teams. TMT size is also a good proxy for the number of hierarchical levels on a team, and a larger team in and of itself has been shown to result in higher CEO compensation, as the CEO has more responsibility in terms of direct reports (Henderson & Fredrickson, 1996). Therefore, TMT size was included as a control to assure that higher levels of compensation were not really a function of a mediating relationship (i.e., internationalization led to a larger team, which led to higher CEO compensation).¹¹

Vigilant boards may affect the compensation of executives (Mehran, 1995) and of top management teams (Boeker, 1992; Finkelstein & D'Aveni, 1994). We controlled for such a governance effect by including *board structure* as a control variable. As indicated above, board structure was measured as the percentage of board members who were not executives of a firm (i.e., outsiders).

Because most of the firms in our sample were highly diversified, we used research and development intensity to control for *industry effects*. Firms in industries with different levels of reliance on technology and research may experience differing levels of complexity. R&D intensity was initially measured as the ratio of R&D expenses to firm sales. When a firm's R&D expenses were reported in

⁹ We also ran all our models using alternative measures of degree of internationalization designed to capture the dispersion of foreign operations. We used two dispersion measures, one for sales and one for asset ownership. We used the entropy measure of foreign sales and assets (Kim, Hwang, & Burgers, 1989). This measure is potentially finer grained than the simple dependence measures discussed above. We used geographic categories reported by COMPUSTAT and measured entropy as follows: $Entropy_a = \sum P_{ia} \ln(1/P_{ia})$, where P_{ia} is the proportion of firm a 's sales (assets) made (owned) in segment i . This measure was highly correlated with the measure of degree of internationalization discussed above, and the results reported below were not sensitive to the measure of internationalization used.

¹⁰ Results were robust across the alternative measures of TMT size.

¹¹ No support was found for a mediating relationship as tested with the four-step analytical procedure outlined in Baron and Kenny (1986) and applied by Carpenter and Golden (1997).

TABLE 1
Descriptive Statistics and Correlations^a

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. CEO compensation ^b	7.47	0.82														
2. CEO long-term pay mix	0.35	0.25	.64													
3. TMT size ^c	18.30	11.39	.24	.20												
4. TMT size ^c	6.47	3.19	.19	.12	.23											
5. Duality	0.84	0.36	.23	.08	-.10	-.06										
6. Board size	12.28	3.29	.34	.23	.38	.17	.08									
7. Board structure	0.76	0.11	.05	.08	-.14	-.01	.17	.16								
8. Degree of internationalization	0.61	0.53	.16	.23	.23	.16	-.12	.15	-.03							
9. Sales ^b	8.44	1.10	.42	.26	.43	.16	.11	.53	.07	.14						
10. Diversification	0.56	0.52	.19	.16	.16	.07	.10	.26	.14	.15	.22					
11. ROA	5.41	6.25	.08	.03	.00	.08	-.04	-.13	-.21	.09	-.14	-.27				
12. CEO stock ownership ^d	4,000	0.18	-.00	-.19	.06	.11	.03	-.06	-.12	-.01	-.02	-.13	.22			
13. CEO tenure	7.05	4.28	.13	-.07	-.06	-.04	.22	-.09	.12	-.04	-.02	.03	.05	.17		
14. Blockholders	13.79	16.16	-.17	-.18	-.01	.04	-.01	-.07	-.04	-.08	-.18	-.13	-.02	.14	-.07	
15. R&D intensity	0.03	0.04	.03	.13	.09	.08	-.22	-.10	-.14	.44	-.13	-.13	.31	-.08	-.00	-.07

^a Correlations greater than .12 indicate $p < .05$.

^b Logarithm.

^c Variable 3 is the number of officers in a firm. Variable 4 is the number in the top two tiers of executive management.

^d In thousands.

COMPUSTAT as insignificant, we substituted zero for the level of expenses. Because this initial measure of R&D intensity resulted in some models suffering from multicollinearity, we therefore substituted an alternative measure suggested by Wruck (1993). This measure creates a variable to indicate whether a firm is in a research-intensive industry. If the firm's R&D expenditures were material and required federal reporting, we concluded it was in a research-intensive industry. If the firm had expenditures so low that they were immaterial and disclosure was not required, we coded the firm as in an industry that was not research-intensive. The transformed measure, a dummy variable (1 = yes, 0 = no), both eliminated multicollinearity problems and provided results consistent with the continuous measure of R&D intensity.

Estimation Methods

For models with continuous dependent variables (Hypotheses 1, 2, 4b, and 6a–6c), we used ordinary least squares (OLS) regression. However, for Hypotheses 3, 4a, and 5, OLS was inappropriate because the measures are not continuous. For Hypothesis 4a (duality), the measure is binary, so we estimated this model with logistic regression. For Hypothesis 3 (TMT size) and Hypothesis 5 (board size), the measures are counts. Count data of positive integers with limited ranges violate the assumptions of OLS. Thus, we used Poisson regres-

sion, which is an appropriate analytical method for this latter type of data.¹²

RESULTS

Table 1 contains a summary of descriptive statistics for all our variables, along with their intercorrelations and scaling. Support for our predictions will be shown when the coefficient for our independent variable is significant, its sign is in the predicted direction, and the full model's R^2 shows a significant increase over that for the control model. In the cases in which an interaction was predicted, we estimated three models (controls only, controls plus main effects, and a full model).

Table 2 reports the results for our tests of long-term forms of pay (Hypothesis 1). Consistent with prior research, the controls for firm size, firm performance, and R & D intensity were positively associated with CEO long-term pay mix, and CEO stock ownership was negatively associated with such pay (model 1). Recall that we predicted that the complexity of firm internationalization would introduce significant agency monitoring problems and that, in response to these agency problems, firms would use more long-term pay in the total

¹² Some research suggests that negative binomial regression analysis is more appropriate for this type of count data (Ramaswamy, Anderson, & DeSarbo, 1994). However, we found no significant difference in results when using negative binomial regression and therefore used Poisson regression because of its significant computational efficiencies.

TABLE 2
Results of OLS Regression Analysis for CEO
Long-Term Pay Mix^a

Variable	Model 1	Model 2
Degree of internationalization		0.08** (0.03)
Sales (logarithm)	0.05*** (0.01)	0.04** (0.01)
Diversification	0.03 (0.03)	0.03 (0.03)
ROA	0.05* (0.02)	0.05 [†] (0.03)
CEO stock ownership	-0.22** (0.09)	-0.23** (0.08)
CEO tenure	-0.03 (0.03)	-0.04 (0.03)
Blockholders	-0.02 [†] (0.01)	-0.01 (0.01)
Duality	0.05 (0.04)	0.06 (0.04)
Board structure	0.09 (0.13)	0.10 (0.13)
R&D intensity	0.07** (0.03)	0.02 (0.04)
Intercept	-0.22 (0.16)	-0.21 (0.16)
Adjusted R ²	.13	.15
Change in adjusted R ²		.02**

^a Standard errors are in parentheses. *N* = 258.

[†] *p* < .10

* *p* < .05

** *p* < .01

*** *p* < .001

One-tailed tests for hypothesized effects, two-tailed tests otherwise.

pay mix. As predicted, model 2 indicates that degree of internationalization was positively and significantly associated with CEO long-term pay.

Table 3 reports the results for our tests of CEO compensation level. Model 1 reports the control variables in our models predicting CEO compensation level. Confirming findings from prior research, the coefficients for such controls as firm size, diversification level, ROA, CEO tenure, TMT size, and duality were positive and significant. In model 2 of Table 3, and consistent with Hypothesis 2, a firm's degree of internationalization was positively related to the compensation level of its CEO; however, this result was marginally significant, and the degree of internationalization did not appreciably increase the variance explained by our model.

Table 4 reports the results for TMT size (Hypothesis 3). Models 1 and 3 report the results for control variables only (for number of executives and number of executives in the top two tiers, respectively), and models 3 and 4 add our independent variable.

TABLE 3
Results of OLS Regression Analysis for CEO
Compensation Level^a

Variable	Model 1	Model 2	Model 3
Degree of internationalization		0.12 [†] (0.09)	0.38* (0.19)
Degree of internationalization × duality			-0.35* (0.21)
Sales (logarithm)	0.26*** (0.04)	0.25*** (0.04)	0.25*** (0.04)
Diversification	0.16 [†] (0.09)	0.15 [†] (0.09)	0.16 [†] (0.09)
ROA	0.03** (0.01)	0.02** (0.01)	0.02** (0.01)
CEO stock ownership	-0.04 (0.25)	-0.06 (0.26)	-0.08 (0.25)
CEO tenure	0.02* (0.01)	0.02* (0.01)	0.02 [†] (0.01)
Blockholders	-0.05 [†] (0.02)	-0.05 [†] (0.03)	-0.05 [†] (0.03)
TMT size	0.03* (0.01)	0.02 [†] (0.01)	0.03* (0.01)
Board structure	0.09 (0.39)	0.01 (0.39)	0.01 (0.39)
R&D intensity	0.08 (0.09)	0.01 (0.11)	0.02 (0.11)
Duality	0.32** (0.13)	0.34** (0.12)	0.39** (0.13)
Intercept	4.43*** (0.47)	4.56*** (0.47)	4.29*** (0.49)
Adjusted R ²	.25	.25	.26
Change in adjusted R ²		.00	.01*

^a Standard errors are in parentheses. *N* = 258.

[†] *p* < .10

* *p* < .05

** *p* < .01

*** *p* < .001

One-tailed tests for hypothesized effects, two-tailed tests otherwise.

The results in both models 2 and 4 suggest support for Hypothesis 3—that is, degree of internationalization was positively and significantly associated with the size of a top team. This relationship appeared to hold regardless of whether we measured the TMT's size as the number of officers or more narrowly, as the number of officers in the top two tiers of management.

Table 5 reports the results of our models for duality (Hypothesis 4a), but its interaction with degree of internationalization to predict CEO compensation (Hypothesis 4b) is presented in Table 3. Model 1 (Table 5) reports the coefficients for our control variables, and model 2 adds our independent variable, degree of internationalization. As can be seen in this table, Hypothesis 4a was supported, with the coefficient of degree of interna-

TABLE 4
Results of Poisson Regression Analysis for TMT Size^a

Variable	Total Number of Officers, Model 1	Total Number of Officers, Model 2	Top Two Tiers, Model 3	Top Two Tiers, Model 4
Degree of internationalization		0.17** (0.07)		0.12* (0.06)
Sales (logarithm)	0.23*** (0.02)	0.22*** (0.03)	0.07** (0.03)	0.06** (0.03)
Diversification	0.15* (0.06)	0.14* (0.06)	0.08 (0.06)	0.07 (0.05)
ROA	0.01 (0.01)	0.04 (0.05)	0.01* (0.00)	0.01* (0.00)
CEO stock ownership	0.18 (0.16)	0.15 (0.16)	0.24 [†] (0.14)	0.22 (0.13)
CEO tenure	-0.02 (0.07)	-0.02 (0.08)	-0.04 (0.07)	-0.05 (0.07)
Blockholders	0.03 (0.02)	0.03 [†] (0.02)	0.02 (0.01)	0.02 (0.02)
Board structure	-0.70** (0.28)	-0.68** (0.28)	0.16 (0.26)	0.14 (0.25)
R&D intensity	0.05 (0.06)	-0.04 (0.08)	0.02 (0.06)	-0.06 (0.07)
Duality	-0.19* (0.08)	-0.18* (0.08)	-0.12 (0.08)	-0.10 (0.08)
Intercept	1.43*** (0.30)	1.45*** (0.34)	1.09*** (0.30)	1.15*** (0.30)
χ^2	1,247.11	1,229.87	375.83	365.60
Change in χ^2		17.24*		10.23*

^a Standard errors are in parentheses. $N = 258$.

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

One-tailed tests for hypothesized effects, two-tailed tests otherwise.

tionalization being positive and significant in predicting duality. In Table 3, however (model 3), the interaction of duality and internationalization is negatively related to CEO compensation—results that are contrary to Hypothesis 4b.¹³ The main effect for degree of internationalization was still positive, stronger, and significant in the full, albeit conditional, model.

To better understand the relationships underlying the interaction term, we decomposed it into its simple effects (Jaccard et al., 1990). Calculating the slope of duality at high and low levels of degree of internationalization (the median plus and minus one standard deviation, respectively), we found that the slope was positive at low internationalization levels but became negative ($p < .05$, ad-

justed Bonferoni procedure) as internationalization passed its median value. Plotting the interaction, following Stone and Hollenbeck (1989), confirmed this relationship. In addition, we used the high and low levels of degree of internationalization just discussed to examine mean levels of pay for dual and nondual CEOs. This supplementary analysis revealed that as internationalization increased, compensation levels increased more for nondual CEOs than for those who also occupied the position of board chair.

Table 6 reports the results for our models (Hypothesis 5) predicting board size. Consistent with Hypothesis 5, the effect of degree of internationalization was positive and significant (model 2). At high levels of firm internationalization, boards are larger than they are when internationalization is relatively low.

Table 7 reports the results for our tests regarding board structure. In model 2, degree of internationalization was not significant; however, its coefficient was positive and significant in the fully spec-

¹³ All interactions reported in the tables have been centered to avoid multicollinearity and to aid interpretation (Jaccard, Turrisi, & Wan, 1990). Sensitivity analysis proved that uncentered interactions provided results harmonious with those reported. Centered results are reported to aid in interpretation of interaction effects.

TABLE 5
Results of Logistic Regression Analysis for CEO/
Chairperson Duality^a

Variable	Model 1	Model 2
Degree of internationalization		-0.74* (0.41)
Sales (logarithm)	0.23 (0.17)	0.31 [†] (0.18)
Diversification	0.75 [†] (0.41)	0.80* (0.41)
ROA	0.03 (0.03)	0.04 (0.03)
CEO stock ownership	0.96 (1.76)	0.93 (1.73)
CEO tenure	0.18** (0.06)	0.19*** (0.06)
Blockholders	0.00 (0.01)	-0.00 (0.01)
TMT size	-0.08 (0.05)	-0.07 (0.05)
Board structure	4.29** (1.66)	4.61** (1.71)
R&D intensity	-0.75 [†] (0.43)	-0.34 (0.48)
Intercept	-4.05* (1.94)	-4.85** (2.02)
χ^2	32.08	36.40
Change in χ^2		4.38*

^a Standard errors are in parentheses. $N = 258$.

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

One-tailed tests for hypothesized effects, two-tailed tests otherwise.

ified conditional model (model 3). Thus, contrary to Hypothesis 6a, degree of internationalization was positively associated with the proportion of outsiders on a board when the effects of its interaction with board size and CEO long-term pay mix were accounted for. As the interactions were centered, the main effect for degree of internationalization can be interpreted as an effect at average levels of the moderating variables (Jaccard et al., 1990). Moreover, as shown in model 3, both Hypothesis 6b and Hypothesis 6c were supported: the interactions of both board size and CEO long-term pay mix with internationalization were negatively and significantly associated with the proportion of outsiders on a board. Decomposition and plotting of these interactions, following the procedure reviewed for Hypothesis 4b, revealed that CEO long-term pay mix and board size in firms with low internationalization were negatively related to such board structure, but those variables were positively re-

TABLE 6
Results of Poisson Regression Analysis for
Board Size^a

Variable	Model 1	Model 2
Degree of internationalization		0.05 [†] (0.03)
Sales	0.12*** (0.01)	0.11*** (0.01)
Diversification	0.08** (0.03)	0.08** (0.03)
ROA	0.02 (0.20)	0.00 (0.03)
CEO stock ownership	-0.03 (0.08)	-0.04 (0.08)
CEO tenure	-0.01* (0.00)	-0.01* (0.00)
Blockholders	0.01 (0.01)	0.01 (0.01)
Board structure	0.29* (0.13)	0.30* (0.13)
R&D intensity	-0.05 (0.30)	-0.03 (0.04)
Duality	0.03 (0.04)	0.03 (0.04)
Intercept	1.25*** (0.15)	1.25*** (0.16)
χ^2	158.06	156.00
Change in χ^2		1.98

^a Standard errors are in parentheses. $N = 258$.

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

One-tailed tests for hypothesized effects, two-tailed tests otherwise.

lated to structure in highly internationalized firms ($p < .05$, adjusted Bonferoni procedure).

To facilitate the following discussion of our findings, which are based on seven different dependent variables and nine different hypotheses, we summarize all hypothesized effects and actual results in Table 8. As can be seen in the table, we found all nine predicted relationships to be significant; however, two of the nine (those testing Hypotheses 4b and 6a) were significant in the direction opposite that predicted. In the next section we discuss these findings.

DISCUSSION

Using the logic that internationalization is a pervasive source of organizational complexity and therefore increases both the information-processing demands placed on top management teams and the difficulty of executive monitoring by boards, we argued that a firm's degree of internationalization

TABLE 7
Result of OLS Regression Analysis for Board Structure^a

Variable	Model 1	Model 2	Model 3
Degree of internationalization		-.01 (.01)	.12** (.05)
Degree of internationalization × board size			-.07* (.04)
Degree of internationalization × CEO long-term pay mix			-.11** (.06)
Sales (logarithm)	-.06 (.07)	-.06 (.07)	-.03 (.08)
Diversification	.03 (.10)	.04 (.14)	.02 (.10)
ROA	-.03** (.01)	-.03** (.01)	-.03** (.01)
CEO stock ownership	-.06 (.04)	-.06 (.04)	-.06 (.04)
CEO tenure	.03* (.01)	.03* (.01)	.02 (.01)
Blockholders	-.01 (.04)	-.01 (.04)	-.01 (.04)
R&D intensity	.00 (.01)	.01 (.02)	.01 (.02)
Board size	.05* (.02)	.06* (.02)	.01** (.00)
Duality	.05** (.02)	.05** (.02)	.05** (.02)
CEO long-term pay mix			.09* (.04)
Intercept	.71*** (.06)	.70*** (.06)	.60*** (.07)
Adjusted R ²	.08	.08	.11
Change in adjusted R ²			.03***

^a Standard errors are in parentheses. *N* = 258.

+ *p* < .10

* *p* < .05

** *p* < .01

*** *p* < .001

One-tailed tests for hypothesized effects, two-tailed otherwise.

will have significant effects on its choice of corporate governance arrangements. We found a clear pattern of results to support such an argument.

As a starting point, we measured internationalization on several important dimensions. Using this rich measure, we found degree of internationalization to be positively associated with CEO pay in two primary ways. First, it was associated with higher proportions of long-term pay (Hypothesis 1). Specifically, we theorized that international firms present monitoring problems for boards because such monitoring becomes increasingly difficult as the spatial complexity associated with geographic dispersion of sales, assets, and personnel increases. Thus, we argued that firms with high degrees of internationalization would be likely to increase the

use of long-term forms of pay in the mix of total compensation as an incentive alignment device. Our results support that logic. Second, we argued that the complexity of internationalization would result in higher pay (Hypothesis 2). Not only did we find support for this logic; we additionally found that the effect of degree of internationalization on pay level was even greater for those CEOs who did not also occupy the position of board chair (Hypothesis 4b). We will comment more on this finding below.

Moreover, we predicted that internationalization would be associated with TMT size and duality. If internationalization results in greater information-processing demands, as we have argued, then it should be associated with larger top teams. Higher information-processing demands then make it desirable to divide the CEO and board chair positions. Such division of duties may allow a firm to more efficiently handle the information-processing needs associated with international complexity. Supporting these views, we found that the size of a firm's TMT was positively associated with its degree of internationalization (Hypothesis 3). Moreover, duality was less likely in highly international firms (Hypothesis 4a). Taken together, these results suggest that the information-processing demands associated with international operations result in firms' implementing a governance structure that maximizes the information available to their TMTs and boards.

Similarly, we also found that the size and composition of the board of directors were associated with a firm's degree of internationalization. For example, the size of the board was positively associated with internationalization (Hypothesis 5). This result supports our argument that the complexity arising from internationalization should have effects on board size over and above the effects of other sources of complexity. Further, the proportion of outsiders on the board was also positively associated with a firm's degree of internationalization (contradicting Hypothesis 6a). And although we originally argued for a negative effect because of the need for information possessed by board insiders in highly international firms, in retrospect it appears that the main effect for board structure may be a governance response to increased complexity. That is, because a firm's high degree of internationalization results in increased information asymmetry between the board and the TMT, the board's first line of defense may be to assure that it has the power (i.e., representation) to control the TMT. Moreover, we can further speculate that our finding for the interaction of board size and degree of internationalization implies that

TABLE 8
Summary of Predictions and Findings^a

Predictor	Dependent Variables											
	CEO Compensation		CEO Long-Term Pay Mix		TMT Size		Duality		Board Size		Board Structure	
	Predicted	Found	Predicted	Found	Predicted	Found	Predicted	Found	Predicted	Found	Predicted	Found
Degree of internationalization, Hypothesis 1	+	+										
Degree of internationalization, Hypothesis 2			+	+								
Degree of internationalization, Hypothesis 3					+	+						
Degree of internationalization, Hypothesis 4a							-	-				
Degree of internationalization × duality, Hypothesis 4b	+	-										
Degree of internationalization, Hypothesis 5									+	+		
Degree of internationalization, Hypothesis 6a											-	+ ^a
Degree of internationalization × board size, Hypothesis 6b											-	-
Degree of internationalization × long-term pay mix, Hypothesis 6c											-	-

^a Main effect was conditional on inclusion of moderating variables.

when a board gets quite large, and group dynamics begin to detract from efficient board monitoring, its proportion of insiders is higher (Hypothesis 6b). Thus, in highly international firms with large boards, insiders are perhaps needed to facilitate the exchange of information effective monitoring requires.

Finally, we found that when the proportion of long-term compensation was high, the proportion of outsiders was lower (Hypothesis 6c). Although this result seems to be consistent with the arguments about substitution of agency control mechanisms made by Zajac and Westphal (1994), Rediker and Seth (1995), and others, it is nonetheless surprising given the growing institutional pressures favoring independent (outsider-dominated) boards (Westphal & Zajac, 1997). Despite such pressures, however, long-term compensation appears to act increasingly as a substitute for vigilant external

monitors, the greater a firm's degree of internationalization.

The interaction of duality and degree of internationalization had a negative effect on CEO compensation level, also a surprising result. For example, on the basis that even though dual roles would be less efficient, and therefore less prevalent among firms with a high degree of internationalization, we argued that CEOs who also held the chair position would nonetheless be more highly compensated than those who did not (Hypothesis 4b). Decomposition revealed that this was indeed the case but that nondual CEOs received greater premiums for increased internationalization than did dual CEOs. Thus, duality seems to constrain, not augment, the pay increase associated with high levels of internationalization. Therefore, and contrary to previous research (Boyd, 1994), the relationship between du-

ality and CEO compensation level does not generalize to all organizational contexts.

Although the results of this research show that a relationship between governance structure and internationalization does indeed exist, several important questions remain unanswered. For example, because our research design was cross-sectional, we were unable to test causal arguments. We emphasized the idea that firms will adapt their governance structures to address the information-processing and agency needs arising from their international strategies because much of the organizations literature suggests such an adaptive perspective (e.g., Burgelman, 1991; Chandler, 1962). However, it is also likely that the opposite causal chain may occur. That is, efficient governance arrangements that are more appropriate for managing complexity may actually help firms to become more international. In our view, a reinforcing spiral probably occurs over time, with governance arrangements changed to fit firm strategy and strategy changing as a result of governance arrangements (Burgelman, 1991; Miles & Snow, 1978). If that is so, making a strong case for unidirectional causality would be counterproductive. However, it is nonetheless reasonable to question the circumstances surrounding how and when changes in governance arrangements lead, lag, or evenly pace changes in a firm's degree of internationalization.

Further, to the extent that shareholders seek increases in financial performance, it is also reasonable to question the degree to which the governance arrangements treated in this study actually are associated with performance advantages in internationalizing firms. Yet although both the agency and information-processing perspectives imply that appropriate strategy-structure alignment will contribute to firm performance (e.g., Galbraith, 1974; Jensen & Murphy, 1990), current governance research has found such a link to be elusive and suggests that at best it is likely to be very complex (Finkelstein & Hambrick, 1996; Gomez-Mejia, 1994; Gomez-Mejia & Wiseman, 1997; Henderson & Fredrickson, 1996; Jensen & Murphy, 1990). For example, although we argued that several governance responses to internationalization would be efficient (that is, they would help a TMT process more complex information and help the board monitor the activities of the TMT), such mechanisms are not void of performance-diluting costs (Williamson, 1984). Similarly, because governance mechanisms are a *firm-level* response to complexity, they may not impact financial performance, which may itself be largely a function of system (i.e., *industry-level*) dynamics (Gomez-Mejia & Wiseman, 1997). Research by Roth and O'Donnell

(1996) suggested that appropriate governance configurations were associated with firm performance in international firms, but those authors established such a relationship only at the foreign subsidiary level. Further, it is unlikely that firms adopt *all* the governance mechanisms at their disposal, as these mechanisms are not costless (Zajac & Westphal, 1994). Therefore, future research should strive to uncover the performance implications of an alignment between corporate governance arrangements and internationalization.

Finally, although we have shown support for the argument that firms respond to international complexity through governance, extensions of this study should give consideration to conditions that may increase or decrease the strength of this argument. For example, we have already noted that institutional factors, such as country differences, will largely constrain the set of governance arrangements or other responses to complexity that firms can feasibly implement (Boyd et al., 1994; Demb & Neubauer, 1992; Pennings, 1993). For instance, U.S. firms are limited in the degree to which they can participate in cartels or otherwise "share" competitive information that could reduce the complexity they face. Thus, institutional constraints are a strong boundary condition on our theoretical framework.

Similarly, the level of managerial discretion (Hambrick & Finkelstein, 1987; Westphal & Zajac, 1997), applied broadly to a top management team and its board, appears relevant to our theorizing on internationalization and firm governance. For example, both the agency and information-processing perspectives contain the assumption that governance arrangements will increase efficiency because the relevant parties (i.e., CEO, TMT, and board) have the discretion, in addition to the motivation, to act or to otherwise substantively impact firms. However, if one of these parties—such as the CEO—has limited discretion, a firm may limit the extent to which it relies on high pay or long-term pay mix as a response to international complexity. To complicate matters further, the complexity characterizing internationalization suggests that it will provide executives with greater discretion than they would enjoy in more domestic settings (Hambrick & Finkelstein, 1987), and TMTs may actually develop their firms' international activities expressly to expand their discretionary sets (Carpenter & Golden, 1997). Therefore, although our theoretical framework emphasized the link between internationalization and governance mechanisms, it seems reasonable that discretion may be interrelated with both of these important constructs.

Our findings and their interpretation and subsequent discussion must be considered in the context of the study's limitations. For example, we relied on archival data, which provide but a rough indication of underlying processes and relationships. Although such data are appropriate to measure objective pay levels and pay mix (e.g., the proportion of pay in long-term forms), as Gomez-Mejia observed, such data may not "adequately capture the nuances underlying executive compensation decisions and its positive or negative repercussions for the firm" (1994: 161). And, although our empirical results supported our hypotheses, degree of internationalization did not explain a tremendous amount of additional variance in our models. Thus, alternative methodologies are needed to better explain the underlying behavioral and cognitive dynamics of these predictions (e.g., Kim & Mauborgne, 1991, 1993). It should also be mentioned that our focus on U.S. firms limits the generalizability of the study's findings to comparable institutional environments. However, given the scope and impact of U.S. business practices, these findings have likely import for a large part of the global economy.

An additional caveat is the need to consider alternative interpretations of our results. For example, there are possibly sociopolitical and institutional arguments that would also support at least some of our hypotheses. For example, highly international firms may split the chairperson and CEO roles and have larger top management teams and boards for reasons stemming from outside political pressures, such as a need to assuage the demands of diverse stakeholders. Although such an explanation does not support all of our predictions and findings, especially those concerning compensation (as do the information-processing and agency perspectives), future research should investigate them more thoroughly.

A third caveat concerns determinants of and responses to complexity. Drawing on theory and anecdotal evidence, we emphasized internationalization as a pervasive determinant. Yet there are multiple sources of complexity facing firms (Henderson & Fredrickson, 1996), just as there are multiple responses to such complexity (Galbraith, 1974). For this reason, we controlled for a number of theorized determinants of complexity (for instance, firm size, hierarchy, and technology) and similarly controlled for alternative governance responses to it (for instance, we controlled for executive hierarchy when predicting CEO compensation). However, given the constraints of archival data, we were unable to account for such sources of complexity as a firm's stage in the internationalization process

(whether it was, for instance, an exporter versus an overseas manufacturer) and possible structural responses to complexity (for instance, M-form versus matrix versus hierarchy, joint venture participation, or use of non-U.S. executives to manage foreign subsidiaries). Nevertheless, to the extent that we did not control for sources or responses to complexity that are *alternatives* to those we modeled, our tests are noisy and therefore conservative.

In conclusion, by coupling the agency and information-processing perspectives on governance, in this study we begin to integrate disparate yet complementary research in organizational theory and international business. Specifically, our findings lend support to the argument that a firm's degree of internationalization is reflected in its governance arrangements. Overall, this study contributes to the nascent yet growing stream of research that considers the governance issues associated with changes in the global competitive milieu (Daily & Schwenk, 1996). We propose that future research extend this study by exploring how other aspects of firm governance and organizational structure impact and interact with the complex organizational and industry transformations accompanying the internationalization imperative.

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