

WHY TOP MANAGEMENT TEAM CHARACTERISTICS MATTER WHEN EMPLOYING A CHIEF OPERATING OFFICER: A STRATEGIC CONTINGENCY PERSPECTIVE

JEREMY J. MARCEL*

McIntire School of Commerce, University of Virginia, Charlottesville, Virginia, U.S.A.

Critics of the CEO/COO duo have stressed that this arrangement burdens the firm with increased costs and decreases the CEO's effectiveness. This study adopts an upper echelon perspective to argue that the presence of a COO may also create TMT-level information-processing benefits that can improve firm performance in certain conditions. Data from a sample of 153 firms in five industries highlight a strong positive relationship between the presence of a COO and two established measures of firm performance: return on assets and market-to-book ratio. The data also suggest that those relationships are contingent on the broader characteristics of the TMT.

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INTRODUCTION

Recent research spotlights the 'CEO/COO duo,' or the decision to employ both a chief operating officer (COO) and a chief executive officer (CEO), as a common but unexplored structural arrangement (Hambrick and Cannella, 2004; Zhang, 2006). The presence of a COO is intriguing because it suggests that the CEO has formally relinquished some of his or her traditional leadership functions to a COO (Bennett and Miles, 2006: 3). Some theorists speculate that delegating responsibility in this fashion can allow the CEO to better cope with the overwhelming complexities of leading a large organization (Bass and Stogdill, 1990: 405). Practical observers, however, have been more skeptical. These critics suggest that the presence of a COO can create accountability problems for the CEO (Abelson, 1999), can burden

shareholders with an expensive but unnecessary executive (Murray, 2000), and may promote the hiring of inexperienced CEOs (Charan and Colvin, 1999). In a first attempt to empirically examine this issue, Hambrick and Cannella (2004) found that CEO/COO duos are associated with inferior financial performance, which supports a skeptical view of the COO role.

Still, research has not fully addressed the *top management team (TMT)* - level information-processing benefits and contingencies that may arise from this arrangement. A long tradition of upper echelon research spotlights demographic factors that aid firm performance by prompting executives to socialize and communicate in ways that increase the thoroughness of information-processing (Bantel and Jackson, 1989; Pelled, Eisenhardt, and Xin, 1999). Likewise, organizational theorists note that the formal hierarchy within the executive group influences patterns of communication and decision making (e.g., March and Simon, 1958: 158). Given the influence of TMT composition and structure on information-processing, this study suggests that the presence or

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*Correspondence to: Jeremy J. Marcel, McIntire School of Commerce, University of Virginia, PO Box 400173, Charlottesville, VA 22904, USA. E-mail: jmarcel@virginia.edu

absence of a COO will influence the social routines that executives use to make decisions. For instance, splitting various leadership roles between a CEO and COO suggests that those roles will necessarily be coordinated socially, rather than cognitively by a single leader. Such a relationship creates benefits ranging from simple division of labor to the heterogeneity of perspectives that two, rather than one, executive brings to strategic decisions. The presence of a COO also decentralizes decision-making authority and potentially reduces power distances within the TMT (Zhang, 2006). Both of these factors can influence the thoroughness of TMT information-processing, and by extension firm financial performance.

This study's overarching proposition is that the presence of a COO is likely to confer TMT-level information-processing benefits that improve firm performance, but that these benefits are more likely in particular situations. The study uses a strategic contingency model to identify the particular situations where firms might gain most from these information-processing benefits—most notably those where the demographic factors that can otherwise prompt the TMT toward more thorough information-processing routines are absent. Leveraging prior upper echelon research as a guide, the study hypothesizes that the relationship between the CEO/COO duo and financial performance depends on the functional diversity, tenure diversity, and age of TMT members. Empirical analysis of data from 153 firms in five industries suggests that the composition of the TMT affects how and why CEO/COO duos influence firm performance.

BACKGROUND AND HYPOTHESES

This study focuses on instances where a CEO formally delegates leadership functions to a COO, rather than on whether or not an executive with a COO title is present. This is a key distinction because in some cases the COO title is bestowed simply to signal future succession plans (Cannella and Shen, 2001). A COO relieves the CEO of substantive responsibilities for the operations of the firm (Bass and Stogdill, 1990: 405). Bennett and Miles (2006: x) report that 'the COO is typically the key individual responsible for delivery of results day-to-day, quarter-to-quarter.' Hambrick and Cannella (2004) report a similar separation

between long-term and short-term goals, as well as between external and internal leadership functions. The internal functions that are often undertaken by the COO include the motivation and monitoring of employees, the communication and implementation of strategies, the allocation of resources, and the handling of disturbances (Hambrick and Cannella, 2004). Ostensibly, the presence of a COO allows the CEO to devote greater attention to long-term planning and to coordinating the firm's interdependencies with powerful external constituents (Pfeffer and Salancik, 1978).

This separation of leadership functions, along with the division of information rights and authorities (Galbraith, 1973; March and Simon, 1958: 158), is codified in the management hierarchy. For instance, Hambrick and Cannella reported that in all of the firms that they studied:

all business units, as well as some staff/support areas (e.g., information technology and procurement), reported to the COO. In turn, the COOs and most staff areas—especially finance, general counsel, public/investor affairs, and business development—reported to the CEOs. (Hambrick and Cannella, 2004: 961.)

Despite this bifurcation of the chain of command, the tasks delegated to the COO remain inextricably linked with those of the CEO (Zhang, 2006). For intuitively obvious reasons, the CEO and COO functions must be coordinated and successfully integrated if the firm is to succeed (Andrews, 1980). Much of the antidotal criticism of the COO role has emphasized the difficulty and burdensome cost of actually coordinating CEO and COO functions.

The CEO/COO duo and firm performance

Critics of the CEO/COO duo stress three reasons why this arrangement might harm firm outcomes. First, Charan and Colvin (1999) argue that CEO/COO duos can harm performance because they structurally separate strategy formulation and implementation, which weakens the CEO's capacity to lead the firm. If the presence of a COO means that 'internally oriented' information is routed away from the CEO (March and Simon, 1958: 158), then this arrangement may diminish the CEO's ability to intervene when internal functions fail. In the best case, the presence of a

COO suggests that the CEO's capacity to intervene in internal crises is no longer unfettered; it is instead governed by the working relationship between CEO and COO and whatever constraints that relationship imposes.

Second, Abelson (1999) suggests that the structural division of leadership roles can be problematic because it makes it easier for CEOs to escape accountability. Shareholders suffer when CEOs are allowed to incorrectly attribute organizational failure to the shortcomings of the COO without consciously reckoning and addressing the underlying causes of that failure. In many cases, the 'scapegoating' of a COO reflects conscious efforts by the CEO to shift blame (Boeker, 1992). In other cases, censure or dismissal of a COO can reflect the common, but harmful, managerial bias of attributing negative outcomes to factors outside of one's control (Shaver, 1970). Regardless of intent, the convenient attribution of error to a COO can decrease the CEO's accountability to shareholders, diminish the likelihood that CEOs actively reassess past decisions, and encourage organizational inertia (Carpenter and Seo, 2007; Lant, Milliken, and Batra, 1992).

Third, Murray (2000) notes that employing a COO is a costly arrangement, one whose costs are borne by shareholders and includes added salary for an expensive, but ultimately unnecessary, executive, as well as the time and costs associated with coordinating an additional layer of bureaucracy (Judge and Miller, 1991). For critics, the added costs of a COO are particularly troubling because this arrangement can allow CEOs to prioritize leadership roles that increase their personal visibility, compensation, and chances for subsequent employment (Murray, 2000). Charan and Colvin (1999), for example, suggest that the presence of the COO can signal that the CEO is either uninterested or perhaps unqualified to fulfill specific leadership roles.

The little academic research that has considered how this structure might benefit the firm has mainly emphasized individual-level issues. For example, some suggest that employing a COO helps the CEO overcome the natural limitations of bounded rationality, allowing the CEO to concentrate on, and thus better perform the externally oriented work, while a COO devotes needed attention to pressing operational issues (Bass and Stogdill, 1990). Hambrick and Cannella's (2004) finding that CEO/COO duos are more common when the CEO

is also board chairman is consistent with the idea that a COO protects the CEO from being 'spread too thin' (Hambrick and Cannella, 2004). Zhang (2006) makes a similar but distinct argument, that the presence of a COO represents an important counterweight against CEO entrenchment because the COO is a plausible successor if organizational performance declines. According to that view, the presence of a COO may reduce the likelihood that the CEO indulges in self-interests or complacency. Broadly speaking, whether the delegation of some leadership functions to a COO makes the CEO a better leader is an open question. However, it is critical to acknowledge that the choice to employ a COO likely has structural implications for the broader patterns of socialization and information-processing within the TMT, activities that can themselves influence the likelihood of firm success.

Studying the COO role within the context of TMT information-processing is critical because patterns of social interaction shape how executives understand and interact with their environment (Maitlis, 2005). According to Huber and Daft, executives 'define and create meaning through discussion, groping, trial and error and sounding out,' all with the aim of identifying what information is relevant and what should be done about it (Huber and Daft, 1987: 151). As noted earlier, prior research highlights factors that improve firm performance by prompting TMT members to increase the thoroughness of these information-processing routines (Amason and Sapienza, 1997; Pelled *et al.*, 1999). Two specific rationales suggest that employing a CEO/COO duo might also improve the thoroughness of these processes.

First, the presence of a COO has the potential to increase the task-oriented conflict that top executives experience as they interpret and act on issues. Task-oriented conflict within groups increases the thoroughness of information-processing routines because resolving that conflict requires greater levels of information exchange, which prompt group members to more thoroughly discuss alternatives and critique assumptions (Amason and Sapienza, 1997). For this reason, firms can benefit when TMT members have divergent backgrounds and different experiences, or when they lack common language or perspectives for solving problems (Pelled *et al.*, 1999). Other factors can also prompt more thorough information-processing. For

example, information-processing routines can benefit when groups use techniques like devil's advocacy or dialectical inquiry to purposefully prompt task-oriented conflict (Schweiger, Sandberg, and Rechner, 1989). Consistent with that view, the separation of leadership tasks implicit in the CEO/COO duo is important because it implies that the decisions associated with various roles will be coordinated socially by the CEO and COO, rather than unified through one person's decisions. If this delegation prompts the CEO and COO to engage in extensive coordination, then CEOs working with COOs may benefit from a novel and valuable source of task-oriented conflict.

Coordinating CEO and COO tasks is likely to be challenging because COOs are responsible for such broad swaths of firm activities (Vancil, 1987). The complexity and intricacy of this coordination increases the chances that social interaction reveals differing assumptions, understandings, and expectations, or outright disagreements that prompt closer thinking by the CEO. As Bennet and Miles suggest, the COO is seldom in a position to impose his or her understanding over the opinion of the CEO (Bennet and Miles, 2006: 68). Nevertheless, even simple questioning, protests, or requests for clarity can help increase the likelihood that decisions are made carefully, perhaps bringing valuable information to light and preemptively identifying issues that could hamper future success. This is why the upper echelon literature, more generally, tends to associate TMT heterogeneity with innovativeness, openness to new ideas, and firm performance (Carpenter, 2002).

The capacity of a COO to prompt this kind of task-oriented conflict undoubtedly depends on the personalities and relationships of the two top executives. However, the likelihood of this top-level conflict is partially determined by structure, because in all cases COOs are financially rewarded for facilitating firm success, and are publicly responsible for the outcome of key operations, the results of which can impact their reputation and access to other jobs (Zhang, 2006). Even in the absence of CEO/COO conflict, the presence or absence of a COO may influence information-processing. For example, laboratory studies on perceived accountability demonstrate that individuals who expect that they will have to describe and explain their decisions to others tend to use more exhaustive information-processing routines (Tetlock, 1983). From a structural perspective,

the separation of top functions between CEO and COO necessitates that these individuals discuss and explain their decisions to one another, if only to anticipate potential areas of conflict.

The second reason to expect that the presence of a COO will improve firm performance involves the link between TMT power distribution and group member involvement. Given that a large component of TMT information-processing is achieved socially, high-quality information-processing routines require the involvement, expertise, and candidness of many different executives (Hambrick, 1994). The willingness of TMT members to share information and to debate possible meanings is particularly important in large firms where executives can exclusively control data that is related to the narrow realm of activities that they oversee (Redding, 1972). The structure of the management hierarchy, in this case whether there is a COO, can impact how willingly executives share and socially act on information.

While firms as a whole benefit from thorough information-processing, the social interactions that necessarily underlie that kind of decision making can pose considerable political risks for the individual executive. TMT members who are less powerful can hesitate to emphasize information that contradicts existing perceptual norms (Finkelstein, 1992). Executives with less formal authority may doubt that their divergent perspectives can influence decision making. These executives may even fear retribution for stressing unpopular interpretations of data, or for suggesting courses of action that contradict the opinions of more powerful executives (Eisenhardt and Bourgeois, 1988). One consequence of this dynamic is that executives may withhold crucial data, and in the extreme, try to subversively undermine the outcomes of unpopular decisions (Guth and MacMillan, 1986).

Managerial hierarchies characterized by extreme power distances or centralization of control are most likely to hamper the communication of disagreement because decision involvement in these scenarios are more constrained by formal authority structures (Ibarra, 1992). Alternatively, 'expertise and competence are better predictors of decision involvement when power is decentralized' (Bunderson, 2003: 462). Given that the presence of a COO decreases power distances within the team (Zhang, 2006: 286), the presence of a COO may increase the TMT's capacity to leverage many more and, perhaps, dissenting perspectives.

In practical terms, TMT members may be willing to raise discrepant information or contrary views with the COO because that executive has the power to affect change, but may also lack the full authority to dismiss team members. TMT members may also come to view the COO as a 'super colleague' who has the legitimacy to deliver bad news to the ultimate decision maker, the CEO. Given that a capacity to perceptually recognize and reconcile information that challenges prior choices is necessary to thorough information-processing (Lant *et al.*, 1992), the presence of a COO could aid firm performance.

Thus in summary, critics of the CEO/COO duo suggest several reasons why that structural choice can harm both the CEO's effectiveness and the firm's chances for success. Alternatively, an upper echelon perspective suggests that the presence of a COO will benefit TMT information-processing. Given upper echelon research showing that quality information-processing can significantly improve firm financial performance, I hypothesize that these group-level information-processing benefits can outweigh the costs identified by others.

Hypothesis 1: The presence of an executive in a COO position is positively related to subsequent firm performance.

Strategic contingencies

If the presence of a COO benefits firm performance by improving TMT information-processing, then *the firm should benefit most* from a COO when the other factors that can prompt thorough information-processing are absent. Upper echelon research has consistently linked three demographic characteristics of the TMT to how thoroughly that group approaches its information-processing work: functional heterogeneity, tenure heterogeneity, and age. The following section examines whether these factors moderate the impact of the CEO/COO duo.

TMT functional heterogeneity

Functional heterogeneity captures the extent to which there is a heterogeneous mix of functional experience within the TMT, and by extension whether team members use a limited or varied set of functionally based schema for decisions

(Bantel and Jackson, 1989). Functional heterogeneity in teams can help overcome narrowly directed information-processing because individual members must actively reconcile the differences in their frames of reference for decision making (Gupta and Govindarajan, 1984). Prior research shows that functionally heterogeneous teams experience lower levels of group consensus (Knight *et al.*, 1999) and more of the task-oriented conflict that prompts thorough decision making (Pelled *et al.*, 1999). The performance benefits associated with higher levels of TMT functional heterogeneity have been observed in firm innovativeness (Bantel and Jackson, 1989), clarity of strategies (Bantel, 1993), and responsiveness to competitive attacks (Hambrick, Cho, and Chen, 1996). To the extent that functionally heterogeneous TMTs already benefit from more thorough information-processing, theory suggests that the presence of a COO will add little marginal benefit vis-à-vis related costs.

Hypothesis 2: The relationship between the presence of a COO and firm performance will be stronger when the TMT exhibits low levels of functional heterogeneity.

TMT tenure heterogeneity

Whereas functional heterogeneity captures schema differences due to functional training and long-standing functional affiliations, *tenure heterogeneity* captures whether TMT members possess schema that have been shaped by a set of common versus unique managerial experiences (Wiersema and Bantel, 1992). Schema can be rigid and inflexible in the short run, but can change as decision makers accumulate evidence that confirm or disprove prior thinking (Fiske and Taylor, 1991: 152). One result of this learning is that a cohort—or a group of executives—exposed to a common set of experiences, often develops common attitudes and similar interpretations of events (Allen and Cohen, 1969). 'Members of a common cohort are more likely to have similar outlooks than individuals in different cohorts' (Michel and Hambrick, 1992: 18).

TMT tenure heterogeneity indicates that executives have entered into the team at different times, forcing the group to integrate persons who lack the shared experiences that are common to the rest (Wiersema and Bantel, 1992). It increases

the likelihood of beneficial task-oriented conflict because it disrupts the homogenizing effect of group socialization, making it more likely that executives retain different points of view, sources of information, and repertoires for solving problems (Greening and Johnson, 1997). Tenure heterogeneity also undermines the stable working relationships that others have linked to risk aversion, adherence to the status quo, and groupthink (Bantel and Jackson, 1989; Pfeffer, 1983). Given that the value of a COO should be less when the TMT already exhibits characteristics that prompt thorough information-processing, I expect the following:

Hypothesis 3: The relationship between the presence of a COO and firm performance will be stronger when the TMT exhibits low levels of tenure heterogeneity.

TMT age

Theory also suggests that TMTs with older members are less likely to engage in exhaustive information-processing (Hambrick and Mason, 1984). Older executives are more likely than young executives to develop rigid cognitive models that limit the flexibility of information search and interpretation processes (Hitt and Barr, 1989). Increased age can create a preference for established routines that have worked well in the past (Carson, 1972), but that can reduce the TMT's capacity to recognize change and react appropriately (Bantel and Jackson, 1989). This tendency also makes it difficult for older TMTs to cope with new and unusual information and problems (Campbell, 1977). Increased TMT age has been linked to executives being less responsive to competitive attacks (Hambrick *et al.*, 1996) and emerging innovations (Bantel and Jackson, 1989). Given this, theory suggests that TMTs with an average age greater than those at similar firms are more likely to benefit from the presence of a COO.

Hypothesis 4: The relationship between the presence of a COO and firm performance will be stronger when the TMT is older than those at other firms.

METHODS

The sample consists of all firms with 1998 sales greater than \$500 million from five industrial sectors: apparel, chemical, food, furniture, and industrial equipment. I studied large firms because these organizations typically have a socially distinct TMT tasked with significant information-processing burdens. Likewise, limiting the study to five industries allows for full control over industry effects.

Performance and firm-level variables were collected from *Compustat*. TMT data were coded from Dun & Bradstreet's *Reference Book of Corporate Management* (Dun & Bradstreet, 1993–2001), annual reports, and proxy statements filed with the Securities and Exchange Commission (Carpenter, 2002). Consistent with practices in prior related research, I define the TMT as the CEO, chairman, CFO, COO/president, and the next layer of the management hierarchy (Carpenter, 2002; Wiersema and Bantel, 1992). Complete data were available for 153 of 192 firms that met the initial criteria.

Dependent variables

Following Hambrick and Cannella (2004), I used two measures of *firm performance*: average return on assets (ROA) and average market-to-book ratio (MTB) for the period between 1999 and 2001. The MTB ratio is defined as the market value of the firm's common equity divided by the book value of equity. This variable captures the premium that stockholders place on the firm's equity, which reflects investors' sentiment regarding the firm's future prospects.

Independent variables

Following the protocol established by Hambrick and Cannella (2004: 966–967), I identified a firm as employing a CEO/COO duo when an executive other than the CEO: (1) held the COO/president title and (2) served primarily as a COO rather than an heir apparent. Regarding this second criteria, I used the 'four-year age rule' to distinguish between heirs apparent and COOs. A COO/president who was older than the CEO, or no more than four years younger than the CEO, was designated as a COO. A COO/president who was more than four years younger than the CEO was coded

as an heir apparent. Prior research suggests that the four-year cutoff is appropriate because few boards of directors would sanction an heir apparent who could not serve at least four years (Hambrick and Cannella, 2004: 967).

I took two additional steps to validate this protocol for this sample. First, I examined *ex post* fates of executives. Of those executives classified as an heir apparent, 74 percent were promoted to CEO at the time of the firm's next succession. Alternatively, only 31 percent of those classified as COO succeeded to the CEO role. Second, I also examined whether an executive other than the CEO continued to hold the COO/president position following the next succession, or whether the firm discontinued that position. Using the four-year rule, 71 percent of those firms classified as employing a COO continued to use that role after the next succession. Alternatively, 89 percent of those firms with an heir apparent completely discontinued the separate COO/president role at the time of the next succession. Together, this evidence suggests that the four-year-rule does largely distinguish COOs from heirs apparent. I used 1998 data to classify firms as employing a COO, an heir apparent, or neither. Fifteen percent and 18 percent of sample firms employed a COO and an heir apparent, respectively.

TMT functional heterogeneity, the extent to which TMT members possess a variety of functional backgrounds (Finkelstein and Hambrick, 1996), was measured with Blau's (1977) heterogeneity index and the categorization criteria outlined in Wiersema and Bantel (1992). I used two items to capture the overarching concept of *TMT tenure heterogeneity* as it relates specifically to whether members of the TMT share common managerial experiences. *Team tenure heterogeneity*, the extent to which executives have shared common experiences as members of the TMT, was calculated as the standard deviation of the TMT's team tenure divided by the mean (Wiersema and Bantel, 1992). *Organizational tenure heterogeneity* captures the extent to which executives share common organizational experiences, and was calculated in the same way. *TMT average age* was measured as the average age of TMT members. Like CEO/COO duos, TMT variables were coded using 1998 data.

The study also includes several controls. I measured *TMT size* as the number of persons composing the TMT. The study also controls for *TMT age*

heterogeneity, *TMT average team tenure* and *TMT average organizational tenure*. The *level of diversification* was calculated using the entropy measure based on 1998 business activities (Jacquemin and Berry, 1979). *Organizational size* was measured as the amount of 1998 revenues. *Historical performance* was controlled as the average ROA and MTB between 1994 and 1998. I measured *environmental dynamism* as the temporal variation in industry sales and employment growth during the years between 1999 and 2001 (Zhang and Rajagopalan, 2004). I controlled for *CEO organizational tenure* and whether the CEO had previously held the COO position (*CEO ever COO*). Finally, I used dummy variables to control for *industry membership*.

Analyses and results

I employed a lagged cross-sectional design that used the presence of a COO in 1998 to predict average firm performance over the subsequent three years (i.e., 1999–2001). This lagged design, as well as the three-year average performance window, is consistent with prior high-quality research examining the connection between the TMT and firm performance (Carpenter and Sanders, 2002). The time-lagged analysis strengthens assumptions of causality, but also implicitly assumes that management structure is somewhat stable over time.

To empirically examine this assumption, I used logistic regression analysis to determine if the presence of a CEO/COO duo in 1998 predicted management structure at the end of the performance period (i.e., 2001). Regression results (not shown here) reveal that, for this sample, the presence of a COO in 1998 is positively and significantly related to the firm using the same structural arrangement in 2001 ($\beta = 3.015$; $p < 0.001$). A similar relationship exists for the 1994–1998 interim ($\beta = 3.037$; $p < 0.001$). Only 16 percent of the firms changed whether they employed a COO between 1994 and 1998, while 26 percent changed between 1998 and 2001. While this data suggest that management structures appear to be fairly stable over time, this study added two important controls. Because the structure of the management hierarchy is more likely to change following a CEO succession, I controlled for whether a succession occurred during the performance period. The study also directly controls for whether the firm changed the structure of its management hierarchy between

Table 1. Hierarchical OLS regression: CEO/COO duo, TMT, ROA, and MTB

Dependent variable	Model 1 ROA	Model 2 ROA	Model 3 ROA	Model 4 MTB	Model 5 MTB	Model 6 MTB
TMT size	0.065	−0.016	0.048	0.115	0.067	0.143
Diversification	1.278	1.514	1.581	−1.882*	−1.745*	−1.601*
Firm size (millions)	0.01e-04	0.01e-04	0.07e-05	0.02e-04**	0.01e-04**	0.01e-04**
Historical performance	0.685**	0.699**	0.710**	0.386**	0.395**	0.405**
Industry dynamism	−0.094	−0.309	0.073	−0.101	−0.226	0.395
CEO ever COO	−1.875	−1.512	−1.510	−0.253	−0.160	0.631
CEO organizational tenure	0.126	0.132**	0.118*	0.015	−0.042	−0.018
CEO succession (1999–2001)	−4.172**	−4.481**	−4.631**	−0.950	−1.130	−0.990
Change in structure (1999–2001)	1.387	1.463	1.527	0.133	0.177	0.651
Heir apparent	0.100	0.841	0.689	0.238	0.669	0.309
TMT average org. tenure	−0.101	−0.091	−0.058	−0.099	−0.093	−0.095
TMT average team tenure	−0.245	−0.260+	−0.293+	−0.001	−0.010	−0.054
TMT age heterogeneity	6.944	9.658	13.911	−6.555	−4.980	3.629
TMT functional heterogeneity	0.938	2.018	1.462	−2.408	−2.290	−0.467
TMT org. tenure heterogeneity	0.409	−0.105	−1.163	2.112	2.457	2.642
TMT team tenure heterogeneity	0.677	0.414	−0.076	0.267	0.300	0.559
TMT average age	0.091	0.229	0.185	−0.144	−0.135	−0.182+
CEO/COO duo		3.462*	−59.074*		2.010*	−55.586*
CEO/COO duo X TMT functional heterogeneity			−1.151			−22.406**
CEO/COO duo X TMT org. tenure heterogeneity			19.786*			11.686*
CEO/COO duo X TMT team tenure heterogeneity			−8.751			−8.787+
CEO/COO duo X TMT average age			1.152*			1.064**
N	153	153	153	153	153	153
R ²	0.406	0.427	0.458	0.373	0.392	0.458
R ² change (d.f.)*	NA	0.02(1)+	.03(4)	NA	.02(1)+	.06(4)**

+ $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$

* All six models include five industry dummy variables, not reported here

1998 and 2001. Table 1 shows the results of the hierarchical OLS regression.¹

Results of the hierarchical regression provide strong support for Hypothesis 1, which predicted that the presence of a COO is positively related to subsequent firm performance. Models 2 and 5 show that the presence of a COO is positively related to both subsequent ROA ($\beta = 3.46$; $p < 0.05$) and MTB ($\beta = 2.01$; $p < 0.05$). In practical terms, because the average ROA for firms in this sample was 5.4 percent, the coefficient parameter of 3.46 represents a significant increase in profitability for firms with a COO. For MTB, a

coefficient of 2.01 also reflects a significant premium over the average MTB ratio of 4.8.

The results reported in Models 3 and 6 also provide partial support for Hypothesis 2, which predicted that the benefits of a COO are more likely when TMT members exhibit low levels of functional diversity. As predicted, higher levels of functional heterogeneity negatively moderates the relationship between the COO role and MTB ($\beta = -22.40$; $p < 0.01$), but not the relationship between this structure and ROA. The data also strongly support Hypothesis 4, which predicted that a COO is more likely to benefit those firms with relatively older TMT members. As predicted, as the average age of TMT members increase, the positive influence of the CEO/COO duo on ROA ($\beta = 1.15$; $p < 0.05$) and MTB ($\beta = 1.065$; $p < 0.01$) also increases. Finally, data in Models 3 and 6 contradict Hypothesis 3, which predicted that the presence of a COO will benefit performance more when the TMT exhibits low levels of tenure heterogeneity. Contrary to expectations, the

¹ To account for possible endogeneity bias, this study used a two-stage least square estimation technique to simultaneously model both the likelihood that firms use a CEO/COO duo, and the subsequent performance implications of that choice. Comparison of the results from the selection model and the single-stage OLS regression show essentially identical results, which suggests that the former analysis technique is unnecessary. Thus, the study ignores the selection model and focuses solely on the estimation of firm performance using the one-stage model.

results show that ROA ($\beta = 19.78$; $p < 0.05$) and MTB ($\beta = 11.68$; $p < 0.05$) benefit more from the CEO/COO duo when TMT members have *more* heterogeneous rather than *less* heterogeneous organizational tenures. Thus, in summary, it is clear that the performance consequences of the CEO/COO duo are contingent on several characteristics of the TMT.

DISCUSSION AND CONCLUSION

Increased firm size, rapidly changing technology, and the growing intricacy of competitive environments have made the management of modern organizations more and more complex. Over the last 25 years, strategic management researchers have extensively examined one managerial response to that growing complexity—executives' reliance on social decision-making activities (Weick, 1995). While the social aspect of management makes the TMT particularly important, the capabilities and the accountability of the CEO are also crucial because that person leads the TMT (Hambrick, 1994). Against this backdrop, researchers have found the COO role intriguing because some consultants and practitioners argue that this arrangement increases costs and decrease CEO's personal effectiveness. This study expands the scope of inquiry and integrates upper echelon research to explore the team-level contingencies associated with this arrangement.

In a sample of industrial firms, the presence of a COO is positively related to two measures of performance. This main effect is consistent with the idea that formally delegating CEO tasks to a COO can have benefits for how TMTs coordinate and share information (Amason and Sapienza, 1997; Schweiger *et al.*, 1989). Evidence that the COO role benefits firm performance more when the TMT is older and when the TMT has lower levels of functional diversity also supports this information-processing argument. Specifically, theory suggests that the presence of a COO can benefit particularly older and less functionally diverse TMTs more because these groups otherwise have a tendency to use less active and exhaustive information-processing activities.

This study also originally hypothesized that the presence of a COO should benefit performance more when the TMT has low tenure diversity—primarily because cohorts with little tenure

diversity share a common set of experiences that can homogenize beliefs (Wiersema and Bantel, 1992). Executives in this kind of group also often develop adaptive social routines that allow them to avoid the task conflict that improves decisions (Michel and Hambrick, 1992). Despite this reasoning, data suggest that COOs are more beneficial when TMTs have dissimilar organizational tenures. One interpretation of this finding may lie in the fact that tenure diversity is more likely than functional diversity to also prompt harmful, non-task-oriented, emotional conflict (Pelled *et al.*, 1999: 4–5). This is because, in addition to reflecting differences in beliefs and experience, differences in organizational tenure can also represent salient self-categorization schemes that individuals use to stereotype, distance and disparage persons with different opinions (Turner, 1975). Whereas differences due to functional perspective can be assuaged by cross-training or exposure to others, tenure differences are more permanent and are thus more likely to result in dysfunctional social processes characterized by anger and resentment (Pelled *et al.*, 1999; Tajfel, 1982). The presence of a COO may be beneficial in these cases because more coordination is achieved between the CEO and the COO.

The contingency analysis presented in this study is intriguing because it uncovers the first significant moderators of the COO-performance relationship, suggesting that this structural arrangement is more appropriate in particular situations. These TMT-level contingencies are also important because they suggest that the impact of this structure on performance arises at least partially from its influence on group processes. The positive main effect between the COO role and performance is also intriguing, in part, because it contradicts Hambrick and Cannella's (2004) earlier conclusion that this arrangement leads to lower firm performance. This contradictory evidence may reflect the fact that I examine the cross-sectional impact of this arrangement, whereas Hambrick and Cannella (2004) examine firm performance over the tenure of COO-prone and COO-adverse CEOs.

Closer examination of my sample compared to the one presented by Hambrick and Cannella (2004) suggests other intriguing differences. I examined industrial companies rather than a broader sample including service firms. Industrial firms may possess a stronger 'operations-based' rationale for the presence of a COO, which

decreases the likelihood that the use of a COO simply reflects the CEO's inability or disinclination to perform operations-oriented functions. Hambrick and Cannella (2004) reported that a CEO was more likely to employ a COO when he or she did not hold the COO position prior to becoming CEO. In this sample of industrial firms, whether the CEO had previous COO experience is not related to whether the firm had a COO ($\beta = -0.345$; $p = 0.597$). Moreover, 84 percent of the CEOs in this sample had served as COO prior to becoming CEO. This figure is dramatically higher than Hambrick and Cannella's report that only 32 percent of CEOs in their sample had previous COO experience. The two research samples also seem to differ in the stability of management structures. Hambrick and Cannella (2004) argue that the choice to employ a CEO/COO duo is 'revisited annually,' a conclusion supported by their finding that the structure of a firm's management hierarchy in a focal year was not related to the historical arrangement of that hierarchy (2004: 975). My comparison of firm hierarchical structure in 1994, 1998, and 2001 suggests that this arrangement is more stable over time, with changes more likely following CEO successions.

These sample differences are significant because they indicate that more research is needed to understand whether firms differ in why and how they use this structural arrangement. At the industry level, the prevalence of COOs may depend on the technical complexity or knowledge specificity of operations, or other factors that exacerbate differences in the skills required from the CEO and COO. At the firm level, research might investigate the possibility that the COO role persists because it facilitates long-established but idiosyncratic organizational routines that are difficult to change. A deeper sense for how firms employ the COO role is integral to better modeling the eventual impact of this choice on performance.

This study primarily emphasizes theory that relates to the structural implication of the COO role, or how the formal presence or absence of a COO can affect TMT behavior. Clearly, the performance consequence of a CEO/COO duo will also depend on the specific nature of the collaborative relationship between the CEO and COO (Zhang, 2006). That relationship is potentially problematic because even a non-heir COO is a potential successor if organizational performance falters (Cannella and Shen, 2001). CEOs can view the COO as

either a partner or as a rival (Zhang, 2006), which can influence how effectively those top executives collaborate. Cannella and Shen (2001) have examined factors that complicate the CEO-heir apparent relationship. Similar work on the interpersonal aspects of the CEO-COO relationship could help research better model the impact of this arrangement. Critical aspects of this relationship might include whether or not the CEO hired the COO, whether they have worked together in previous jobs, their demographic similarities, their interpersonal attachment to one another, and whether the COO was at any time a rival candidate for the CEO position. The specifics of how work is delegated may also determine the eventual impact of this arrangement on performance. It would be helpful to understand: (1) how many and which CEO job tasks are delegated, (2) whether the specific tasks delegated to a COO remain constant over time, or whether top executives swap tasks on an *ad hoc* basis, and (3) are top roles defined institutionally, or depending on how executives perceive their own particular strengths and weaknesses. A simple issue like whether the CEO and COO work at the same or different physical locations could also help researchers understand how this arrangement can affect social decision-making processes.

For this study, the compelling aspect of the CEO/COO duo is the formal delegation of CEO functions to another executive, and how that structure changes subsequent patterns of TMT socialization. Scholars have begun to theorize about other types of 'co-leadership' within firms (Heenan and Bennis, 1999). That stream of research acknowledges that some CEOs delegate substantial leadership functions to persons other than the COO. These co-leaders can be co-CEOs, chairmen, chief financial officers, or longtime aides-de-camp. Given that the relationship between delegation and socialization is a central phenomenon of interest, future research might empirically examine how other formal or informal sorts of leadership delegation influence group processes.

Future research might also address some of the limitations of this study. First, I do not measure information-processing directly, but rather use TMT characteristics to infer the likely affect on group processes. Research could directly investigate how employing a COO changes the level of socialization and communication within the broader TMT. Does employing a COO actually

promote integrative patterns of socialization and more exhaustive information-processing routines? Does the impact on group behavior depend on unidentified implementation choices?

Second, this study used the four-year age rule introduced by Hambrick and Cannella (2004) to discriminate between COOs and heirs apparent. In addition to the fact that this rule coincided with *ex post* fates of the executives in my sample, I chose to use this rule to insure some basic level of comparability with the only other empirical work exploring the performance consequences of the CEO/COO duo. Nevertheless, research that further validates this coding scheme or uses other data collection techniques to directly assess job delegation by the CEO could improve research in this area.

In conclusion, this study suggest that the choice to employ a COO can prompt information-processing benefits that improve overall firm performance. Results also suggest, however, that the likelihood of realizing those benefits depends on the characteristics of the broader TMT. Within this contingency framework, the study identifies the specific situations where CEO/COO duos are most advantageous to the firm. These contingencies are crucial because they suggest that CEO/COO duos influence performance at least partially through their impact on group processes. A variety of research opportunities exist to better define both the antecedents and consequences of this interesting arrangement.

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